

POVERTY ALLEVIATION AS A BUSINESS

MARKETS
SUSTAINABILITY
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+ NETWORKING SERVICES

Berne, Switzerland
March, 2000

THE MARKET CREATION APPROACH TO
DEVELOPMENT
A STUDY BY URS HEIERLI WITH SUPPORT
AND CONTRIBUTION FROM PAUL POLAK



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Paul Polak is the founder and president of IDE, International Development Enterprises in Denver, USA. He has contributed to this study in the conceptualisation of the market creation approach and with two annexes.

Photo from the cover page: The creation of a market for trees and latrines has allowed this family in Bangladesh to provide useful products to poor people; after being themselves below the poverty line, they now run a nursery and a latrine production centre as a flourishing business.

They are not an exceptional cases: in Bangladesh, there are 2500 flourishing nurseries and 6000 private latrine producers.

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This family near Indore (India) can grow 100 tomato plants with this bucket kit. They fill the bucket twice a day with water; this is enough to water the plants. Low cost drip irrigation saves up to 75% of water; in this area a litre of water costs almost as much as milk.

ACKNOWLEDGEMENTS

TO MY DAUGHTERS MALA MAGDALENA AND LISA LATIKA

This study is a synthesis of two working periods: 8 years at SKAT, the "Swiss Centre for Development Co-operation in Technology and Management", from 1979 to 1987, and 12 years as co-ordinator of SDC in Bangladesh and India from 1987 to 1999. It tries to capitalise on those approaches which have worked and which have shown a large impact on poverty alleviation.

I am very grateful to my predecessor in Bangladesh, Erwin Baenteli, for the hint he gave me during his handover to me. I had asked him: "So many things have failed in this country which Henry Kissinger had termed a "basket case"; so isn't there anything which works?" In reply, he said to me: "I think all those things which are driven by the private initiative of the poor may work". How right he was! Nobody, at that time, would have dared believe that private initiative taken by the poor could unfold the power to make a million treadle pumps work, plant a 100 million trees or produce a million latrines every year – all being a good business for the poor.

I am very grateful to SDC for the 4 months of sabbatical between my postings in India and in Berne, which allowed me to think about the "market creation approach to development" and to write down my thoughts. The discussions with many of my colleagues have helped me enormously to streamline these thoughts.

I am extremely grateful for the hospitality of all the SDC offices and SDC partners who have shown me their projects during my extensive field trips in the last months and who have answered all my questions with patience and understanding.

I am especially thankful to Paul Polak, the founder and president of IDE, for the extraordinary co-operation and his contribution to this study; sometimes daily exchanges by email or over the phone have given shape to this study in many ways. The inspiring friendship we share over the last 12 years is a gift of god for both of us. I would also like to thank the staff of IDE in Bangladesh, Nepal and India, especially Bob Nanes; thanks to his ingenuity and perseverance we have so much to offer today. Finally, I would like to thank my wife Françoise for her outstanding patience and the discipline, she showed in reviewing my texts, for her constant challenges to focus my thoughts when they were confusing, and for my family's understanding while doing this study.

Urs Heierli (Berne, March 2000)

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EXECUTIVE SUMMARY

FOCUS OF THE STUDY

This study focuses on the **creation of a market for products which are useful to the poor and allow them to get out of the poverty trap**. Consequently, the topic of this study is not "export marketing" or "fair trade" which can be associated to the theme of market creation.

In this study, one looks at six concrete examples in showing how trees, treadle pumps, rope pumps, maize silos, roofing tiles and latrines can make a difference to the poor.

In this sense, it is a **"product" approach**. Marketing is used to achieve large-scale dissemination and a big reach-out.

The market creation approach to development is a strategy which combines two aims:

- To supply to poor people useful and affordable products with a high poverty alleviation impact and
- To create a viable business as a private delivery channel, preferably run by poor people.

In the market creation approach to development, there are **3 key elements**:

- **need-based product development** for products with a high impact on poverty alleviation, putting the accent on affordability and high returns on investment;
- **the promotion and marketing** of these products, so that the poor can learn about their existence and
- **the creation of a market for these products** to the extent that it becomes viable for the private sector to deliver these products as a business.

This paper contains an analysis of 6 programmes of SDC; it looks at their impact and at the profitability of their respective delivery channels. The methodology followed is to scrutinise these projects with the eyes of a marketing professional and to discuss the 4 Ps of marketing: **product**: what exactly is the product? Hardware or software? Is the product a tree for fodder, fuel and fruits or, as it is the case in Bangladesh, is it a long-term asset which can serve as a social insurance in case of emergency? When a child is sick, the tree can be chopped and sold;

price: the art of pricing, so that the product is affordable but still profitable for the supply channel;

place: the supply channel which may consist of many small businesses for making, selling and installing the product;

promotion: ways and means to promote the product with a conservative customer constituency.

It is not only justified for development co-operation to initially subsidise market creation; it is even a very good investment, as the approach may have very high performance indicators. One million dollars investment may result in up to 100 million dollars return on investment in terms of poverty alleviation. The (small scale) private sector alone would not invest in market creation as it is difficult to recover initial costs, because successful products can easily be copied once there is a market.

The good performance is due to the fact that, if it is profitable, a private delivery channel can supply the products effectively and sustainably. Low profits in the supply channel are, however, the main problem of the six examples studied.

Market creation is a **very long-term investment** and a donor needs patience and endurance to really unfold the potential. The theory about the product cycle – known from conventional marketing theory – shows that the maturation of a product in the market may take time and good promotional efforts. Market creation is successful if a product reaches a critical mass.

Early adopters of a technology are always "elites" or pioneers, **the poor are among the "followers"** who first wait and see. Thus, it is important not to target only the poor with innovative products, as they want to avoid risks and see how effective the products are. At the same time, sales must take up fast for the marketing channel to be profitable.

Product development for the poor means an interactive process which takes the poor seriously as a customer and tries to understand his/her needs and constraints. The products must satisfy felt needs, be **affordable** and produce very **high returns**.

The products require intensive **promotion and marketing efforts** to make the products known and to set up a delivery channel which can supply the products and spare parts profitably. Promotion needs to be sustained for quite some time due to the conservative nature of the market for the poor.

For the market creation, it may be necessary to create a **"big kick" in order to reach the critical mass**; and this may only be possible in cooperation with larger campaigns supported by the government and many other

organisations (for instance latrine promotion) or with links to the corporate sector (the treadle pump was originally promoted by the Bangladesh Tobacco Company).

In order to sustain promotional efforts and to make use of existing marketing channels, synergies with **the corporate sector** should be sought. Co-operation with large companies in marketing useful products for the poor could create win-win situations for the companies and for development organisations, and reduce the cost of marketing considerably.

Besides the six examples referred to, there are several products with a high poverty alleviation impact close to a breakthrough:

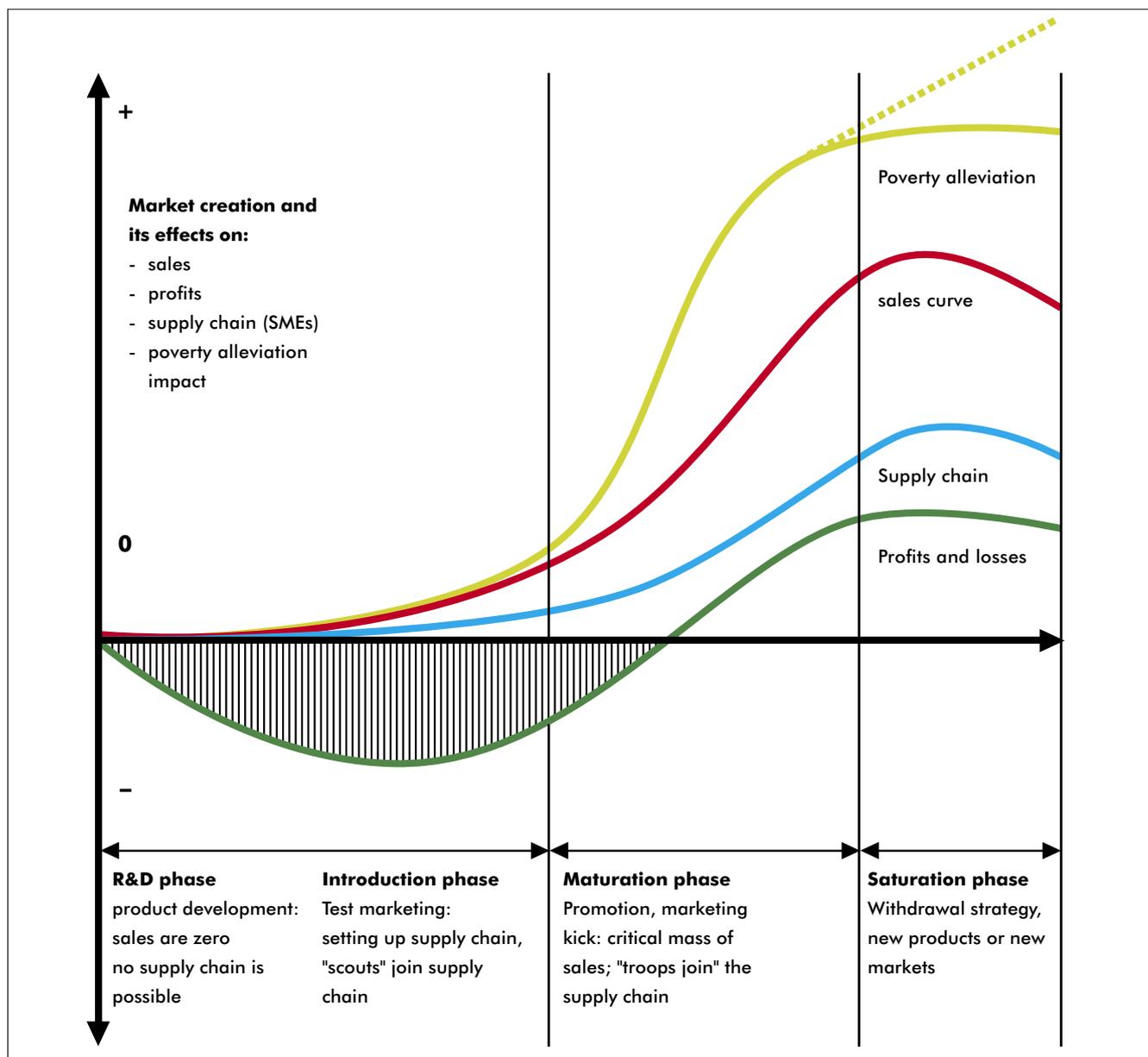
- there is a huge potential to save water and to increase yields with **low-cost drip irrigation**: several models are

already test-marketed, which range from a "bucket kit" for 10 \$ to kits for cotton farmers for 250 \$ per acre, one fifth of the normal cost for drip systems;

- cost-effective building materials other than tiles can contribute to the reduction of the housing gap if marketed and promoted effectively in favor of those who construct their house themselves, which is the case for the majority of the poor housebuilders in developing countries. Such a reality allows many small enterprises to emerge;

- a reliable low-cost solar lantern would bring light to millions of rural households who will never get a chance to be connected to the grid;

In the study "do's and don'ts" of donors in supporting the market creation approach to development are presented as well as the main roles and guiding principles for funding such programmes.



Possible improvements for marketing strategies are also presented, showing especially how one can increase the presently low profits in the supply channel.

Finally, institutional issues are discussed, including how the market creation approach to development can be replicated on a larger scale and how partnership between governments, NGOs and the corporate sector can emerge.

THE SIX EXAMPLES

The following six examples are looked at in detail, and analysed according to the 4 Ps of marketing and according to the different performance parameters, especially in view of the potential for scaling them up and replicating them in other countries.

"Hundred million trees as a social insurance scheme: the village and farm forestry programme in Bangladesh"

"Pedalling out of poverty with the treadle pump in Bangladesh, India and Nepal"

"60 kilograms more maize per family with "Postco-secha" silos in Central America"

"2'000 micro-concrete roofing workshops produce over 150'000 roofs per year"

"6'000 private workshops produce over one million latrines per year in Bangladesh"

"The rope pump in Central America: the scope for private drinking water supply".

Project	Input in \$	Output in \$	Reach-out
Forestry Bangladesh	~7 m \$ in 15 years	min. 90m \$/year present value	650'000 families
Treadle Pump Bangladesh	~7 m \$ in 15 years	min. 100m \$/year farmers profit	min. 1 m families (6 m people)
Maize Silos Central America	12 m \$ in 18 years	min. 6m \$/year savings + profits	min. 170'000 families
Roofing tiles (global)	7-10 m \$ in 15 years	12-16m\$/year cheaper materials	+ 150'000 new families per year
Latrines Bangladesh	~10 m \$ (social mobilisation)	min. 8m \$/year savings in health	+ 1,2 m new families per year

m = million

1

THE MARKET CREATION APPROACH TO DEVELOPMENT

FOCUS OF THE STUDY

This study focuses on the **creation of a market for products which are useful to the poor and allow them to get out of the poverty trap**. Consequently, the topic of this study is not "export marketing" or "fair trade" which can be associated to the theme of market creation.

In this study, one looks at six concrete examples in showing how trees, treadle pumps, rope pumps, maize silos, roofing tiles and latrines can make a difference to the poor.

In this sense, it is a **"product" approach**. Marketing is used to achieve large-scale dissemination and a big reach-out.

1.1. INTRODUCTION: POVERTY ALLEVIATION AS A BUSINESS FOR THE POOR

The market creation approach to development is a strategy which combines two aims:

- To supply to poor people useful and affordable products with a high poverty alleviation impact and
- To create a viable business as a private delivery channel, preferably run by poor people.

In development co-operation, other approaches are also dealing with opening markets, but they are quite different:

- Trade and export promotion seeks to open up markets for existing products in new regions;
- Transportation projects (feeder roads, suspension bridges, road construction in general) aim at stimulating trade and opening up markets – again for existing products – in new regions.

In the market creation approach to development there are **3 key elements**:

- a) need-based product development**, for products with a high impact on poverty alleviation, stressing on affordability and high returns on investment;
- b) the promotion and marketing** of these products so that the poor can learn about their existence; and
- c) the creation of a market for these products** to the extent that it becomes viable for the private sector to deliver these products as a business.

Given the above definition, the "market creation approach to development" goes beyond the BDS (business development services) approach, which uses marketing

as a technique and as a service to small enterprises. Marketing has now become a widely accepted tool for small enterprise promotion and many marketing efforts by "marketing facilitators" or private marketing providers have been supported in the "BDS" framework. Some literature has also been published, recently¹. These efforts are geared towards helping small enterprises to market **their product**, no matter what these products are. This is an important difference to the perspective taken in this study.

The market creation approach to development – as I see it – is a method to use a profitable delivery channel – preferably run by micro-enterprises – to supply large quantities of products which have a high poverty alleviation impact or ecological advantages, or both together.

This paper contains an analysis of 6 programmes of SDC; it looks at their impact and at the profitability of their delivery channel. The methodology followed is to scrutinise these projects with the eyes of a marketing professional and to discuss the 4 Ps of marketing (**product, price, place and promotion**).

1.1.1. THE CONVENTIONAL DEVELOPMENT APPROACH

Conventional development approaches aim at partnerships with government departments or NGOs (or a combination of both), with the objective to deliver a good or service to the "target population". Funds from a donor are channelled to the beneficiaries through these partnerships. Many of these approaches focus on the delivery of inputs or non-tangible services through public infrastructure, rather than on their provision directly to individual persons, thus these inputs are spread out more evenly among the population.

Very often, this delivery channel is highly subsidised: the "beneficiaries" may be asked to contribute in terms of fees, but in reality, it is often not possible to recover the cost from the "target population".

Fortunately, marketing is not any longer controversial among small enterprise promotion specialists. This has not always been so: in many **classical fields** of development (such as water supply, forestry, credit delivery), it is still a rather new dimension and sometimes there is even resistance to accept a wider role for the private sector. A close friend of mine, who is anything but dog-

matic, expresses it this way: "most of us in the development field carry a life-long baggage of biases about profit being bad and traders being the villains of society".

Even if this is changing rapidly and if it is not an issue for donors of small enterprise promotion any more, I would still draw the attention to some ideological barriers which continue to be part of the heritage, we have to deal with in some fields of mainstream development. This heritage is adverse to the creation of a private supply chain and requires a shift of the mindset. The Indian government, for instance, has set up a state run delivery system for rural credit with targeted subsidised lending to reduce the power of the moneylender. Now, this has changed, and private delivery systems for micro-credit have been allowed – but are still not allowed to take savings. In this new delivery channel for credit, middle-

men (or "middlewomen") are playing an important role in the form of "self-help groups".²

Similarly in water supply, the traditional approach of treating water as a free good which the government has to deliver to everybody like a human right is still over-shadowing reality in many countries, although it is changing now. Until recently, hand pumps have been centrally procured worldwide by an agency of UNICEF in Copenhagen, and there may be many other examples where – although with the best possible intentions – barriers are still hampering the creation of a flourishing private sector. Still today, many projects aim at delivering centrally procured handpumps directly to the "beneficiaries", thus preventing private pump dealers to emerge – then how can one still wonder why nobody is supplying spare parts.

The conventional development approach



1.1.2. THE BDS APPROACH FOR MICRO-ENTERPRISE PROMOTION

"Donors and governments view the growth of small enterprises as critical to coping with the challenges posed by rising unemployment. For at least two decades, therefore, donors have been supporting the provision of non-financial services, or 'Business Development Services' (BDS), for small enterprise development. These services include training and counselling, as well as services to improve access to appropriate technology, information and markets.

In most cases, the services have been delivered with large subsidies, and cost recovery has only been a secondary issue. Recently, however, it has been acknowledged

that this situation is unsustainable; small enterprises require continued support to meet changing and ongoing business development needs, while donor funds are finite. There is, therefore, increasing interest now in how BDS might be provided on a sustainable basis."³

The BDS approach is focusing on setting up a private market for BDS providers who would deliver training, counselling and technology. They would recover their costs by charging fees to the micro-enterprises for their services.

The Business development services approach



1.1.3. THE MARKET CREATION APPROACH: POVERTY ALLEVIATING PRODUCTS MADE AND SOLD AS A PRIVATE BUSINESS

The market creation approach to development observes the BDS principles but goes beyond that. Whereas a BDS concept would let the "market" or micro-enterprises choose their products, the market creation approach emphasises on specific products which have a high poverty alleviation impact.

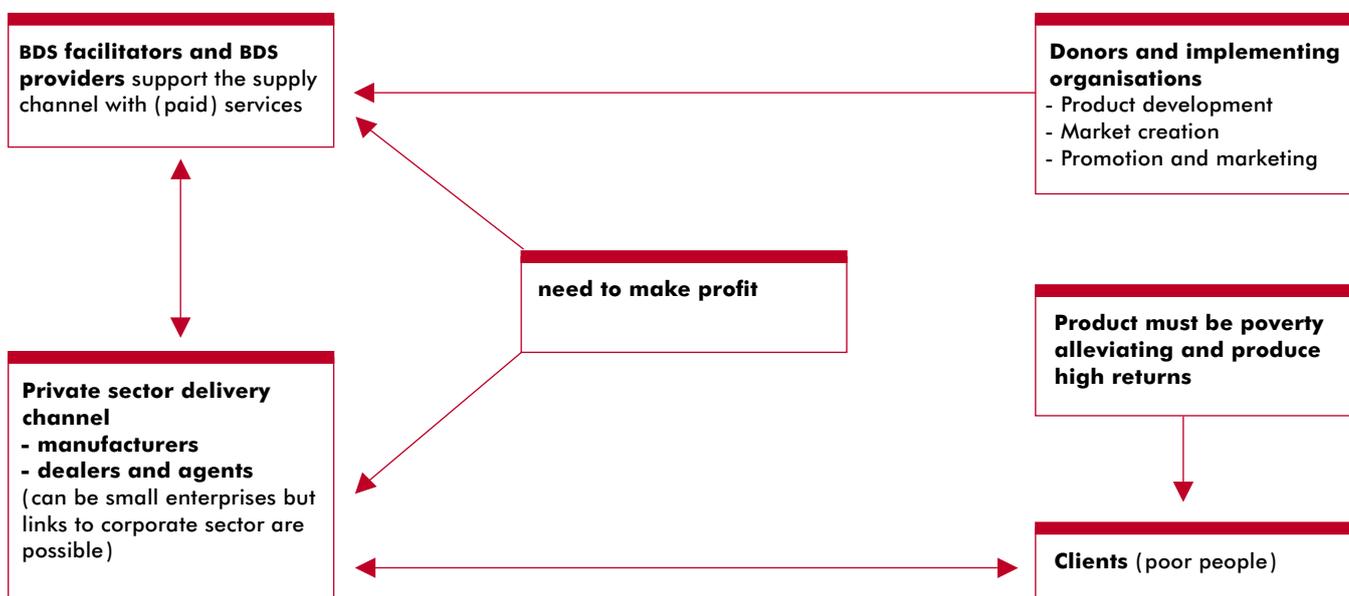
One of the weaknesses of small enterprises in developing countries is the lack of capacity to innovate and the technology dualism of micro-enterprises.⁴ The focus of the market creation approach to development is therefore on the following 3 areas:

1. Need-based product development
2. Marketing and promotion.
3. The creation of a sustainable market

The delivery of goods and services is taken care of by a private delivery channel, comprising ideally of micro-enterprises; however, some activities in the channel may be linked to the corporate sector. In this paper, the involvement of the corporate sector in so-called "public-private partnerships" is even advocated for.

Marketing is the key strategy of this approach, it is thus quite logical to follow some basic principles, orientations and experiences from the world of marketing, especially the 4 Ps, as described in detail in the next chapter.

The market creation approach to development



1.2. THE 4 PS OF MARKETING

We are using the well-known 4 Ps of marketing as an analytical tool:⁵

- **Product:** what is the product or service exactly?
- **Price:** how much does it cost?
- **Place:** where can I buy it?
- **Promotion:** how do I make the product known?

1.2.1. PRODUCT: MORE THAN JUST "HARDWARE"

To understand what the product is may not be so trivial as it looks at first glance. Classical development co-operation has been long dominated by a "supply side" approach: Times may have changed now, but in the early

days of development co-operation, it was even suspicious to promote a product which looked good: products for the poor should look poor, they should be simple, very much in line with Henry Ford's saying: "you can have it in all colours, provided it is black". I think, we must learn that people, and especially poor people, have aspirations and feelings which we should take seriously. When the director of a samba school in Rio de Janeiro was asked: "why do (poor) people spend so much money on these costumes for the Carnival?", he replied: "you know, you rich people may adore poverty, but we poor people, we love luxury!". What is the difference between a watch and a Rolex, or between a computer and an "I-Mac"?

Good products are not only rational and useful tools to do something; good products stand for a lifestyle, they translate feelings and values.

The definition of the product is highly relevant in the 6 examples given below: for example, is the product a tree which gives fodder, fuel or fruits? Or is it before everything an asset, a savings scheme, a social insurance? These are crucial questions: it is still the same tree, but consists of an entirely different product as it is perceived by the customer.

In addition, and as mentioned already before, the products must be affordable and have high returns on investment and a significant impact on poverty alleviation.

1.2.2. PRICE: THE ART OF PRICING – WHAT PRICE QUALITY?

Pricing is an art and needs a lot of intuition. The price can be too high = no sales; The price can be too low = no profit

For the poor, products are extremely price elastic, i.e. a relatively low price increase can have a considerable impact on the reduction of sales. This sensitivity to prices means that quality (connected to higher prices) is not a universal criteria for purchase by the poor. In the case of the treadle pump, farmer often prefer to buy cheaper pumps even if they are of lower quality and durability. Attempts to eliminate the cheap and low quality treadle pumps in Bangladesh have miserably failed: over 50% of the pumps sold promoted by IDE were in the lowest category of quality, lasting only 2 years. This is by no means an argument for giving a low priority to quality: to the contrary, the poor deserve the best quality. However, one needs to consider the price elasticity as well, and it is finally the customer who sets the quality standards.

In order to make the supply channel profitable despite the described reality, price differentiation is very important: As we can see from one of the examples below, a red micro-concrete tile can fetch 7 \$, whereas a grey tile may only be sold at the break-even price of 4\$. Increased quality and value addition may rise prices considerably as we shall see in the example of village forestry.

With respect to the market of the poor, another intricacy is the "**entry-price**" which needs to be low. For poor people, cash is such a precious good that they often buy in very small quantities, although they pay more in the long run. The art of marketing to the poor is to pack the goods in very small units: a rural retail shop will sell cigarettes by the piece, shampoo by the "sachet" and beer by the glass.

1.2.3. PLACE: THE SUPPLY CHANNEL

Even professional marketers sometimes ask themselves why intermediaries are needed. An intermediary is a cost factor and needs a profit margin or a commission. However, sales through a local dealer or representative are often more effective and even more cost-effective than direct sales. Distributors and dealers are closer to the clients than the manufacturer, and their marketing costs may be lower. A strong supply channel is one of the best assets, a company can have, and investing in the loyalty of dealers is a very crucial task of marketing.

Additionally, many people involved in development co-operation have an ideological problem with intermediaries, since many initiatives are targeting middlemen as potential sources of exploitation. The role of dealers and agents needs to be revised, especially under the criteria of effectiveness and justice. A good supply channel needs profit margins to sustain itself and be effective.

Quite often, a dealer provides additional services to the customer such as after sales service, stocking of spare parts, etc. Sometimes, dealers also provide credit to their customers because they know the people in the village.

1.2.4. PROMOTION: CREATING AWARENESS ABOUT THE PRODUCT

Promotion is more than advertising, it implies a two-way communication with the customers. Mass media play an important role in promotion. Rural customers, especially, need to see what they want to buy. They never buy anything which they have not seen in operation, or – even better – which their neighbour has not yet already bought. They want to touch it, feel it, try it. For this reason, demonstrations represent the most important tool for promotion.

Early adopters belong to the village elite and the poor are late followers, since they want to avoid all risks. Often, the poor are late buyers, because they are short of cash and must have more time to collect enough funds.

Promotion is very difficult in rural areas: on the one hand, attending a farmers' fair ("mela") may reach ten thousand farmers at the same time, on the other hand, geographical distance and lower population density may make it a costly affair.

One issue is how to sustain promotion. Development co-operation can and should support good promotional efforts with mass media, films, posters, etc. It is difficult to sustain it, but promotion that is not continuously repeated fades out; Coca Cola is nowadays known to

everybody, but if it were not continuously advertised, customers would even forget Coca Cola and remember the brand of the competitors better.

Another intricacy is the difficulty to include promotional costs in the price of investment goods; it seems easier to promote consumer goods. To add a few cents for promotion on each bottle or each sachet is less visible than adding a hefty amount to the cost of an investment good. If the price of an investment good were to become much higher than its cost, the incentive to copy would be increased. Moreover, the nature of investment goods does not allow for repeat sales.

In order to finance promotion on a sustainable basis, development co-operation should seek links to the corporate sector and tie up the products to their supply channel: These companies may have a long-term interest in promotion if they can sell preferably small amounts on a regular basis to new customers (like cement companies with roofing tiles, agro-input companies with micro-irrigation, etc.).

1.3. MARKET CREATION AND DONOR FUNDING

1.3.1. OBSTACLES IN CREATING A MARKET IN FAVOR OF THE POOR

There are several obstacles which make the market development in favour of the poor a tricky and cumbersome task:

- Many attitudes of the poor are such that they are not attractive customers in the short run: they **turn their penny** many times before they spend it; they buy only in small quantities, and it may be quite tough and harsh to develop these markets.
- Poor customers **are very conservative** and—by nature—risk-avoiding. Conservatism, especially in rural areas, is notorious: a market is only created after some early adopters have taken it up, and after many followers have seen and tested it... Then only, will the whole mindset change and the critical mass will be there to allow the private sector to supply products profitably. We shall elaborate further on this phenomenon when we discuss the AIDA model (see below). But one has to distinguish between a few early adopters and the many followers.
- Quite often, there are also **cultural and other barriers** which hamper the development of markets for innovative products. In many regions, for example, it is culturally not accepted that women would use bicycles or go to the market. Or, the absence of a regular electricity supply is one of the constraints for marketing electric appliances.
- Another reason why these markets are underserved is the **urban bias of many marketing efforts**. This may start with the fact that marketing managers prefer to live and work in an environment which they know, where they can send

their children to good schools, etc. There is a strong bias towards urban mainstream marketing⁶ and there is also a strong bias towards "marketing to the affluent": One can find several best-sellers with this title⁷, but I could not trace one single book about "marketing to the poor".

- The poor can **not afford to buy big quantities**. The most revolutionary marketing idea for rural markets is **the "sachet"**, a tiny portion packaging, which allows selling small quantities for an affordable price. It is an irony that a poor person may pay several times more when buying small quantities rather than the "jumbo pack" which rich people can afford. This reflects the fact that it is more expensive to market to the rural poor, smaller quantities make the products accessible to people who have little cash.

1.3.2. WHY DOES THE PRIVATE SECTOR NOT CREATE THE MARKETS ON THEIR OWN?

The private sector will only step in, if the volume of goods sold allow a profitable supply chain. **Initially, it is therefore justified to subsidise market development.** Market development is even a good investment for development co-operation agencies, provided they do it correctly. But, why does the private sector not invest in market development on its own? Individual enterprises may invest in products for the poor, but generally only once the market has reached a significant size.

The examples given below show how one can create a market for products – latrines and trees are typical for this – which were not accepted before, even when given free of cost. The efforts necessary to create a market for such products, such as latrines, trees, treadle pumps, silos and roofing tiles or rope pumps, should not be underestimated. It may require 5 to 10 years, but once there is a significant demand, the private sector develops almost on its own.

Market creation is a typical task of marketing, and the corporate sector does it all the time. However, the small private sector does not invest in activities such as: research and product development; setting-up of marketing and supply channels; large-scale promotion activities leading to the creation of a market.

The reason is that the small private sector cannot recover these costs, because it is difficult to defend the exclusivity of the product. In future, it may be possible to recover more of these costs through branding and other means as it was the case in the examples presented here.

The problem of cost recovery is especially difficult if we talk about **investment goods or durable goods**, because they may be immediately copied by others. The market provides little protection against copying: the patent

protection is not effective and the brand protection may not be existent either.

Of course, copying is also a danger for any product, be it sweets, beer, soft drinks or even investment goods. The conventional strategy against copying is to distinguish the product from others by branding, but also by applying high-tech features. In our cases, this is neither possible nor desirable. In our examples, the success comes exactly from being copied and from giving opportunities to small enterprises to produce and sell them.

For consumables, the situation is different: branded products like soft-drinks, cigarettes, sweets, chips, etc. are all very well marketed and the corporate sector has managed to create a market for them. Consumer goods can be **sold in small quantities but regularly**; this makes it easier to add a tiny percentage on each "sachet" to recover the promotion and marketing cost. For investment goods which are more costly and where repeat sales are not possible, this is much more difficult: if one adds a percentage to an investment good for promotion cost, it is an invitation for a competitor to undercut the machine with a cheaper copy. This is the main reason why consumer goods have penetrated rural markets to a larger extent than investment goods.

A good example for this is the promotion of gas and/or electric stoves in Europe and America: both were heavily promoted by the gas and the electricity companies, not by the stove-makers. The gas company has an interest to invest in promotion of a gas stove, because once a household switches to gas, it will remain a customer for many years. Till today, the gas and electricity companies offer very good cooking classes in Switzerland, free of cost. One single household converting to either one of the fuels pays every month a tiny little fee back to the company for this training course. But how could one do this for the promotion of energy saving wood-stoves?

1.3.3. PHASES OF THE PRODUCT-CYCLE AND EFFECTS OVER MARKET CREATION

How does a market creation approach work over time? We have introduced different parameters in the following graph⁸: the sales curve; the profit curve; the number of micro-enterprises that join the supply channel and the poverty alleviation effect (in terms of number of clients, income generated, etc.)

In the marketing theory about the **product cycle**, it is well known that all products undergo four different phases:

1. In the R&D phase sales are zero, and only prototypes are produced and tested. It is important to realise that

feedbacks from test marketing should feed the R&D efforts, and many products need considerable adaptation in every new region.

2. In the introduction phase the product needs to be test marketed. During the R&D phase and the introduction phase, even a corporate sector company makes losses. The marketing channel is developing slowly, those who join the channel (as manufacturers or dealers) are the "scouts", the pathfinders/pioneers. However, some poverty alleviation is already taking place with every product sold.

3. In the maturation phase, the market takes up and demonstration effects lead to higher sales and higher profits; if the market pioneers can recover the introduction cost from the channel, more and more units join the channel; the "troops" of dealers and manufacturers will play safer than the pioneers. The poverty alleviation effect is now reaching its peak (cumulative effects of all adopters). For instance, in the case of the Postcosecha silos, sales presently double every 3 years in Central America⁹; these silos are thus in the middle of the maturation phase, but it is expected that in some areas there will be a saturation after some years.

4. In the saturation phase, the sales of the promoted product are declining, profits too, and some units even withdraw. The withdrawal strategy should now define how to sustain the channel, by introducing new products or moving to new markets. The poverty alleviation effect remains at the same high level thanks to the cumulative adopters.

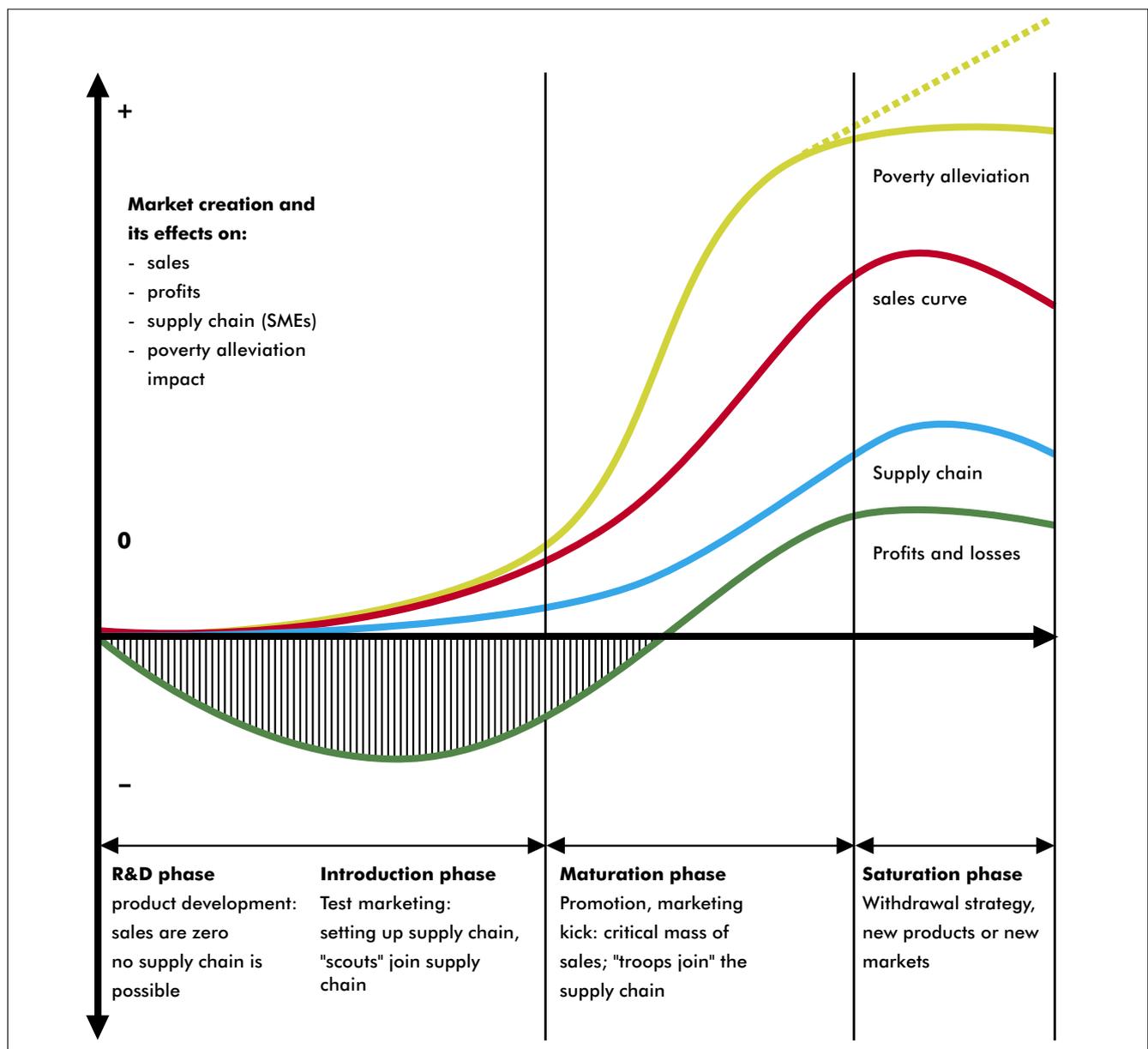
Sales usually start very slowly and do not take up in the introductory phase. In our case, since there is a need for thorough R&D and participatory product development, R&D and introductory phase may last between 5 and 10 years. The **losses occurred in this phase may not be recovered** with the product later on, as it is difficult to achieve an exclusivity like a product developed by the corporate sector. The R&D costs may be borne by development agencies or donors, but it may in future be possible to develop products – for example the solar lantern described below – which may also recover the investments in the introduction phase.

In the maturation phase, sales are going up steadily and the focus is brought on the development of the delivery channel. As the channel development is linked to micro-enterprise promotion, this process may also be a relatively slow one, and it is often worth including poor people with entrepreneurial spirit into the channel. For instance, there is hardly a better target group to be found than "core farmers" to run nurseries. Dealers and mistries, latrine producers or "artesanos" are preferably poor local people.

In the saturation phase, a withdrawal strategy for the initially promoted product must be applied by introdu-

cing new products which make the channel sustainable and which can even take care of the further expansion or at least keep it where it should be. During the withdrawal strategy, one should analyze the market thoroughly and find ways to increase value in the supply channel or to cut the cost of distribution. This can include linking the product to corporate sector marketing channels or trying to organize the producers and dealers in associations. The withdrawal strategy should also look at product diversification and the introduction of new products; moving in to new markets should also be studied. The time lag of a market creation approach can be extremely long, and sometimes, success occurs long after one has withdrawn: during my field trip in Honduras I met a hardware shop-owner who is supplying chimneys for the "Lorena stove" in the "Yoro" region. Apparently, a market has been created for such chimneys, as they are sold by the thousands. How has this happened? I

learnt that the "Lorena stoves" had been introduced by SDCs "integrated rural development project" which is already closed for more than 8 years. I then met a lady who had rebuilt a Lorena stove in her house, just two months ago, and she had learnt the technique in this project.



1.3.4. THE BIG KICK WHICH LEADS FROM INTRODUCTION TO MATURATION

In the initial phase, the supply channel is still the responsibility of a few pioneers, and sales are modest. In this phase, the market creation may need a kick to bring it into a more dynamic gear. Without such a "kick", the channel may well remain "lethargic". This has again to do with the phenomenon of the scouts and the troops: "Research on the new product diffusion process based on a study of consumer electronics retailers found that there are two types of retailers: scouts (innovators) and troops (followers). The classification is based on the extent to which one retailer influences others. **Scouts** are the first retailers to adopt a new product. They are likely to commit themselves to a new product or commit themselves to a new product through a small order. On the other hands, **troops** purchase a product only when scouts experience satisfactory sales levels."¹⁰

There are more than enough examples of development products which have never even reached the "scout stage", and very few which have really managed to scale up to the stage of maturity and mass dissemination. How have they managed to reach maturation the introductory phase?

For example in the case of the treadle pump, the product received a "big kick" from the "**Bangladesh Tobacco Company**" in Rangpur, which sold the pump to their contract farmers on a loan basis and recovered the money through the purchases of tobacco. In the case of the latrines in Bangladesh, it was the "social mobilization campaign" which led to the critical mass which is necessary for troops to join the market channel.

1.4. THE PERFORMANCE OF THE MARKET CREATION APPROACH

1.4.1. IMPACT AND REACH-OUT

Market creation programmes can have a very high impact and reach out to an impressive number of beneficiaries or – more precisely – clients. The ultimate success of a market creation approach is a new constellation in the market, which gives room for a viable supply channel for the new products and thus creates both employment on the supply side and consumer satisfaction on the demand side. To create a new market is not an easy task and it may not always happen, even if everything has been planned to perfection.

One of the best examples of a market creation approach with a very large development impact is the AMUL experience in India, the setting up of milk co-operatives which have considerably changed the rural landscape.

"Operation Flood" started in 1970 and had the specific target to organise 10 million farmers in 30'000 villages and to bring them into the supply channel for milk products which were marketed by AMUL throughout the country. The charismatic leader behind this landmark programme, Dr. V. Kurien¹¹, has pursued this market creation with a lot of ingenuity, with the help of a conducive policy environment. Thanks to some protection, the Indian farmers have succeeded despite higher costs than the prevailing prices – also heavily subsidised by the milk producing countries – on the world market.

If the product really meets the needs of the people – which is proven once they start buying it – one can achieve a considerable reach-out. The marketing approach is also relatively cost-effective, since the delivery channel is private and profitable, it is sustainable and does not need direct support.

This study is reviewing 6 projects supported by SDC in Asia and Latin America, where the private sector is used as delivery channel. All of these 6 projects are very effective for poverty alleviation and have high performance records; but they have identical problems, mainly low profit in the supply channel. Each of these projects – except the rope pump, which is a new project – has a reach-out of at least one million people; one million dollars from donors can generate an output of up to 100 million dollars per year. In addition, the delivery channel exists further after withdrawal of donor support.

The above table shows – in a condensed form – the key performance indicators: the input in terms of donor funds, the output in terms of economic performance at the level of the "client" (beneficiary), and the reach-out, the number of beneficiaries.¹² These indicators are described more precisely in annex 1.

Performance indicators for the projects

Project	Input in \$	Output in \$	Reach-out
Forestry Bangladesh	~7 m \$ in 15 years	min. 90m \$/year present value	650'000 families
Treadle Pump Bangladesh	~7 m \$ in 15 years	min. 100m \$/year farmers profit	min. 1 m families (6 m people)
Maize Silos Central America	12 m \$ in 18 years	min. 6 m \$/year savings + profits	min. 170'000 families
Roofing tiles (global)	7-10 m \$ in 15 years	12-16m \$/year cheaper materials	+ 150'000 new families per year
Latrines Bangladesh	~10 m \$ (social mobilisation)	min. 8 m \$/year savings in health	+ 1,2 m new families per year

m = million

1.4.2. GOOD REASONS FOR SCALING UP AND BRINGING THE APPROACH INTO THE MAINSTREAM

The above examples are still marginal projects or programmes, they are not as well known to the development community as the "Grameen Bank", despite the fact that they have somehow a comparable impact. The Grameen Bank has 2 million customers, and has received over 100 million dollars donor input; each of these projects has an impact on a constituency of roughly one million "beneficiaries" or more, whereas the investment into these projects has been much lower, to the tune of 7-12 million dollars.

It is, therefore, justified to look at the market creation approach to development as a mainstream development approach and bring the method and its effects to the notice of a broader public.

1.4.3. EFFICIENCY: VERY HIGH RETURNS ON DONOR MONEY

We have seen that the ratio between input and output is very good in all the examples. The reason for this high efficiency is that the donor has only to invest in the creation of a space for the private sector to operate. The delivery channel is working on its own initiative, once it is profitable.

The market creation approach to development uses small and micro-enterprises as a delivery channel. These are very cost-effective for all "local" tasks in the delivery channel, such as manufacturing, selling and installing simple goods. As long as the supply channel makes profit – even modest profit – the activity can go on, after withdrawal of donor's support as well.

However, this study also shows a **common problem** in all projects: **the supply channels are not very profitable**, with the exception of Forestry in Bangladesh, where the nurseries are a really flourishing business. Several re-commendations on making the supply channel more profitable will be formulated in chapter 5.2.

1.4.4. EFFECTIVENESS: CAN SOME PRODUCTS MAKE A DIFFERENCE TO THE POOR?

Useful products for the poor can change their lives. Poor rural women, especially, have not even been considered to be consumers: whereas, for the work of men a lot of technologies have been introduced, such as tractors, ox-carts, bicycles, scooters, diesel pumps, women still carry buckets, walk on their own feet, use sickles and other hand-tools which have a very low productivity. With the introduction of least-cost drip irrigation in the form of "bucket kits" and "drum kits" in India, women can grow vegetables worth 3'000 Rupees out of an investment of less than 1'000 Rupees. Nirmala, a woman from Indore (see photo) and her neighbour, Sampat Bai, have told me that **"the drum kit has changed their lives!"**¹³

An impact study on the treadle pump in Bangladesh, Nepal and India clearly shows that the owners of a treadle pump make at least 100 \$ net income per year, and 20% of the farmers make 500 - 600 \$ per year. This is the difference between being below and above the poverty line.

Of course, poverty is not easy to eradicate¹⁴: poverty does not only mean a lack of resources, but dependence, indebtedness, isolation and marginalisation. Even a miracle product cannot just wipe out these factors. But a good product like a treadle pump, a bucket kit, a latrine, a tree can provide the physical basis for changing life.

There are concrete examples of families who thanks to the use of a treadle pump, have been able to "pedal out of poverty", and thus could offer a better education to their children and experience other forms of social development.

1.4.5. MARKET CREATION APPROACH AND POVERTY ALLEVIATION

The market creation approach has a specific advantage of being able to reach out to large numbers: the first five examples reach at least one million people, and some of them have a considerable "mushrooming" effect. For instance the Village Forestry Program in Bangladesh will perform better every year, provided there is no sudden demand saturation for trees occurring.

This growth is only possible if the supply channel is performing and profitable. For this reason, it is crucial to understand the main characteristics of the market creation approach: the key condition is to have a market.

The early adopters are not the poorest, but the village elites, the rich consumers, the rural middle-class, etc. The poor aspire to become like them, and the market will only grow if the "better off" have paved the way for the followers.

The impact study of the treadle pump has confirmed this: the treadle pump has a very significant and large scale poverty alleviation impact, although the first buyers are not the poor.

Many mistakes have been made by targeting "useful" products too closely to the poor alone: so many roofing tiles workshops have been supported by NGOs in areas where there are simply not enough roofs to be built. It may also happen that the products get an attribute of being a "**product for the poor**" which is often translated then as a "poor product" that nobody wants to buy, and certainly not the poor.



This is Nirmala a poor women near Indore (India); she has installed a drip irrigation "drum kit" for 25 \$ and grown vegetables for 90 \$ after 3 months; this has doubled their cash income and there were more vegetables left to eat

1.4.6. SUSTAINABILITY AND PROMOTION: PARTNERSHIPS WITH THE CORPORATE SECTOR AND WIN-WIN SITUATIONS

One problem is difficult to solve: for a development agency or for small enterprises, sustained promotion is hardly possible. In order to enhance the reach-out and to improve sustainability co-operation with the corporate sector seems to be an important aspect of the strategy. Such models of co-operation should be based on synergies and should provide a win-win situation: it should be more cost-effective to use an existing marketing channel (for instance agro-input dealers or cement distributors) rather than building up a separate channel. For the corporate sector, such a co-operation should bring a long-term benefit such as more loyalties from the dealers, a better marketing mix and new clients to the company. A corporate sector company can develop new markets: for instance the small and marginal farmers, self-constructors in the low-cost housing market. On its own, the company would not have naturally targeted these markets nor would it have had the knowledge – or sometimes the vision – to develop them. Although, it is amazing to see how many thousand of small shops belong to a supply channel of large multinational companies, it is not a common practice in commercial marketing to involve small and micro-enterprises.

Such partnerships are a new field for development co-operation as well as for the corporate sector. They are not yet proven on a large scale, but it is evident that they are a form of co-operation of the next millennium. The World Bank is emphasising such public-private partnerships as a new form of development¹⁵. However, for the time being, there are many more frustrations than success stories to be shared. An endeavour by "Hope International" to mobilise the corporate sector for development co-operation in India has been rather disappointing: "Most companies were content with donating money, something that didn't need too much involvement. Anything that entailed continuous involvement and responsibility was tedious".¹⁶

Nevertheless, it seems very interesting and promising to involve the corporate sector and to seek new synergies through their presence on the market:

- The first reason is the high existing frustration connected to the "state-driven" delivery approaches and to the failure to eradicate poverty through the public sector programmes.
- The second reason is the growing scarcity of available public funds, and
- The third reason is the need for the corporate sector – in its own long-term interest – to contribute actively to large scale poverty eradication.¹⁷

2

KEY ASPECTS OF THE MARKET CREATION APPROACH TO DEVELOPMENT

2.1. DEFINITION: WHAT DOES IT MEAN TO CREATE NEW MARKETS?

The three key aspects of the market creation approach are treated here in separate chapters, although they are very much inter-linked and should not be treated in isolation. They consist of the following headings:

CREATING NEW MARKETS WITH PRODUCTS FOR THE POOR WHICH CHANGE THEIR LIVES

Definition: The market creation approach to development is a process that exploits a previously unrecognized vast gap in the market place by designing or identifying products which achieve breakthroughs in affordability and are capable of increasing the income and productivity of poor customers significantly. These products are made available to large numbers of poor people through targeted effective mass marketing strategies.

- "Breakthroughs in affordability" means cutting the cost of useful conventional products at least in half, by identifying trade-offs between quality and price that are acceptable to poor customers, and/or by packaging these products in affordable slices and/or by allowing payments in installments;
- "Increasing the income of poor customers" means that each breakthrough product must be capable of earning a net annual return of at least 100 percent on its purchase price;
- "Large numbers" means that each breakthrough product must be capable of producing global sales of at least one million.

"I don't serve markets! I create them" (Akio Morita)

A well-known example for such a market creation is Akio Morita's development of a "pocketable" (not only por-

Product development, Promotion and Market creation. It is not possible in such a text to describe everything at the same time. But what is **the creation of new markets** for products which can change the lives of the poor? What distinguishes this approach from serving existing markets? We have tried to give the following definition:

table) Sony transistor radio and later on the famous "walkman" which allowed to bring music to millions new customers (students, drivers, servants, etc.) who do not have the money and the space to buy one of the "Cadillac-sized" hi-fi equipments which were fashionable in the USA in the early 50's. Morita could purchase the patent for the transistor radio from RCA, Radio Corporation of America, for only 25'000 dollars and lay the ground for a world class company: SONY.

"Irrigation for the poor, not for golf courses"!

Similarly, one could exploit the totally under-served market of almost one billion small and marginal farmers without access to water with low-cost micro-irrigation equipment. Nowadays, the micro-irrigation industry is focusing on the high-tech and high cost market (golf courses being one of the prime movers), whereas millions of farmers and horticulturists could double their annual income by having access to a "bucket kit" of low-cost drip irrigation which would cost 5 \$ and produce a return of 100 \$ in vegetables.

2.2. PRODUCT DEVELOPMENT: PRODUCTS FOR THE POOR 2.2.1. BACKGROUND AND RATIONALE

It was the development of personal computers by Jobs and Wosniak working in a garage that gave birth to hundreds of thousands of new small enterprises writing PC software programmes or making hardware components like joysticks and cables or assembling them. The development of new high impact products has been the touchstone of the development of new markets, and has allowed a dramatic increases in opportunities for new profitable businesses.

Similarly, the development of low-cost small plot irrigation devices like treadle pumps have opened new opportunities for tens of thousands of small enterprises to produce, distribute, market and install affordable small plot irrigation for the poor farmers who buy them. A market-driven process of product development is required to design products capable of creating new markets for poor customers.

Economically, products for the poor can have a very high multiplication effect: if a million poor households can increase their consumption by 100 dollars, this may

mean doubling their income; that makes a significant difference to the economy, much more than if a few urbanites get the same amount of money in their hands.

The creation of "purchasing power for the poor" is another aspect of the market creation approach and has a

PETER DRUCKER ON PRODUCTS

- "There is no such thing as a "resource" until man finds a use for something in nature and endows it with economic value. Until then, every plant is a weed... The penicillin mould was a pest, not a resource.. until Alexander Fleming realised that this pest was exactly the bacterial killer bacteriologists had been looking for".

- "There is no greater resource than 'purchasing power'. But purchasing power is the creation of the innovating

2.2.2. THE OPPORTUNITIES: "THE MACHINE CULTURE" HAS NOT REACHED THE POOR (ESPECIALLY WOMEN)

In terms of needs and opportunities, there are plenty of them among the poor. They use – very often – rudimentary and inefficient tools and technologies, or, as Tushaar Shah points out, the "machine culture" has not reached the poor, especially not the women in rural areas. Thus, there is scope for the mechanisation of many processes from irrigation to harvesting, storing and processing of agricultural goods.

However, there are difficult circumstances which hamper the mechanisation process. Culturally, we are talking about an environment which has not seen many changes for centuries and traditional societies are not known to be innovative at all. The key constraint for the "machine culture" is the lack of resources and the very limited capacity to invest (especially up-front). This makes the task of product development extremely challenging, **as the products need to be affordable and have very fast payback rates.**

2.2.3. THE CHALLENGE: TO FIND OTHER PRODUCTS, AS GOOD AND SUITABLE AS THE TREADLE PUMP

There are several approaches to product development for poor people. Frances Stewart made the distinction between "upgrading traditional technologies" versus "downscaling modern technologies".¹⁹ In the early – and even in the late days – of the appropriate technology movement, one felt that improvements in efficiency of 10 - 20% are satisfactory to introduce new technologies. These modest performance standards – together with

lot to do with the development of products for the poor. See the box on Peter Drucker and the creation of purchasing power and value.¹⁸

entrepreneur. The American farmer had virtually no purchasing power in the early nineteenth century... Then, one of the many harvesting-machine inventors, Cyrus McCormick, invented instalment buying. This enabled the farmer to pay for a harvesting machine out of his future earnings rather than out of past savings."

- The bucket kit for low-cost drip irrigation which costs 5 dollars but is able to generate a 100 dollars return (see chapter 4.2) could be one of the innovations to create purchasing power for the poor.

poor marketing strategies – are probably responsible for the failure of large-scale dissemination.

It is pointless to think that a traditional society will change its hundred year old traditions because of 10 or 20% improvement in efficiency and cost reduction. If the product is not able to bring a radical change and at least 50 to 70% improvement, it will fail. Even such improvements may not be enough to guarantee a fast adoption.

SDC has supported the development of wood-gasifiers for small scale industries in India (see below, chapter 4.4) where the energy savings are in the region of 70%; but even these savings would not to be a reason for the industry to invest. With other improvements, the gasifier for the silk industry saves over 500 Rupees a day (100 from energy and 400 from quality improvement) and this leads to a payback period of only 120 days; but the industry is still reluctant to invest. This has to do with the extreme risk-avoiding attitude, an environment spoilt by subsidies – where all investments bear up to 90% subsidies – but also with an attitude hostile to innovation: pioneers are not appreciated but rather laughed at.

Products which bring a radical change such as a treadle pump or low-cost drip irrigation are rare to find, and one should not underestimate the design and product development efforts put into making the technology simple.

Moreover, we should not underestimate what such innovations mean: anybody who would still manage to improve the efficiency of a diesel engine by 10% would be nominated for a Nobel prize. We are talking here of technologies which increase efficiency by 50 to 70% and

have a ROI (return on investment) of 300-400%. These innovations are not to be found every day.

2.2.4. THE PROCESS: NEED-BASED, PARTICIPATORY R&D

It would be rather futile to think of new inventions which match the performance criteria of affordability, suitability and extremely high return. What we are talking about is more the **adaptation and optimisation of existing technologies to local conditions**. It is often less difficult to find a potentially suitable technology which already exists and adapt it to the needs of the poor customer. Most promising for such an approach is the "down-sizing" of modern technology and making it available in "affordable slices", just like the "sachet revolution" for consumer goods.

- The process to find such products can be structured as follows – although – in view of the earlier remarks on the need to use one's own intuition to create new markets, there is no cook-book recipe which will lead to success:
- **The identification of new markets** shapes the initial product concept;
 - **The affordability target** for the product should be determined by obtaining systematic information about the annual cash income, the disposable income, competing demands on available cash, and market research on the price which customers are willing to pay.
 - **The identification of trade-offs between product quality and affordability** should be determined according to the willingness to pay by the customers;
 - **A prototype** should be built for the **proof of concept** and critical review by the future customer should already start;
 - **Modification of the prototype** should be based on initial simple tests and customer feedback;
 - **Laboratory tests** on modified prototypes should be conducted;
 - **Field tests** of modified prototypes with representative samples of target product customers will lead to new feedback;
 - **Modification of the product** should take place in accordance with the feedback from customers who tested it
 - **Further adaptation of the product** by incorporating the customer feedback from the demonstration phase and market test phase during the test marketing phase
 - **Final adaptation of the product to local conditions** when it is introduced to a new market, a new geographic area, or a new country, through systematic customer feedback from demonstrations, field tests, and market tests in the new market area.

These steps are a possible approach to product development. In the case of the SDC-supported development of the gasifier, there were 5 prototypes developed and tested in the real environment of silk reeling industries.

Several participatory workshops with engineers, reelers, a design professor, economists and marketing specialists were conducted. Such long and participatory design strategies are infrequent and challenging. Most academic or government-owned research institutions do not work in such a participatory manner and would not treat "simple people" like silk reelers as the real experts. This is one of the reasons why so few technologies for the poor have succeeded, so far.

2.2.5. BEST PRACTICES: GUIDELINES FOR PRODUCT DEVELOPMENT

It is yet again difficult to apply schematic approaches for product development, but here are some guiding principles for best practices. Clear criteria for new products capable of creating new markets should include the following dimensions:

- Each new product must be capable of generating a net cash return of at least 100% per year on its purchase price for the customer who buys it;
 - The global market should be big enough to generate at least 1 million sales or be a strategic input for an industry sector with a large impact;
 - New products should be cheap enough to be affordable for the poor person who buys it or have a very short payback period;
 - New products must make a significant positive contribution to the income and productivity of the poor customers who buy them;
 - New products must match specific customer requirements. For example, irrigation technology must be small enough and fit the micro-plots of typical small poor farmers
 - Adoption of the product should produce a positive environmental impact, or at worst have a neutral environmental impact;
 - Adoption of the product should generate a positive impact on gender equity, or at worst a neutral impact;
- Products should fit the local culture.

2.2.6. OPTIMISING AFFORDABILITY MUST BE A CENTRAL PART OF THE DESIGN PROCESS

Affordability is defined on the basis of detailed information about product customers, including annual income, disposable income, competing demands for available cash, and feedback from target customers about the price, they are willing to pay for the product. This usually means cutting the cost of existing comparable products at least in half.

This can usually be accomplished by a disciplined process defining key contributors to cost of the existing product, and identifying trade-offs between efficiency and affor-

dability that are acceptable to target customers in order to lower the fair market price.

It may also be accomplished by more efficient new marketing channels which give the poor better access. For instance, micro-finance does not need subsidized interest rates, it is more than enough to reduce the cost of credit from the money lender through credit groups which reduce the transaction costs. Affordability needs a thorough analysis of the "real world" of poor customers and not by calculating the interest rates "on paper", i.e. rates which do not include the commissions and bribes to the bank manager nor the "transaction" cost of getting the loan approved.²⁰

The idea for new products can come from poor customers or from outsiders, but the product development process must be governed by systematic top quality engineering and with constant feedback from target customers. The ability to listen to the customer is here of paramount importance. The final decision on the product to go ahead or not with the new product is to be made on the basis of feedback from poor customers during product development, product adaptation, market testing and market research.

2.2.7. EXAMPLE: THE CASE OF THE "BUCKET KIT" DEVELOPMENT IN MICRO-IRRIGATION

In annex 2, Paul Polak narrates the story of the development of the "bucket kit" for low-cost drip irrigation. A technology which looks very simple in hindsight, but took many trial and error steps to reach that stage of maturity. Even after more than seven years of development, the technology is just about to become mature for large scale dissemination. (See Annex 3: "The design process for the IDE low-cost drip irrigation system").

2.3. PROMOTION AND MARKETING

2.3.1. BACKGROUND AND RATIONALE

In the creation of the new market for personal computers, the development of the product was a necessary but not sufficient first step. The new market was not created until a process of marketing, promotion and sales created sufficient customer demand to make the new market sustainable in the market place. One of the key marketing promotion strategies of the famous "Apple" computer was to penetrate schools and make the young generation computer literate fast.

The creation of new markets that serve poor customers follow the same process. The creation of a new market for treadle pumps in Bangladesh required a twelve-year investment in promotion and marketing to reach suffi-

cient sales volumes to reach the threshold of profitability for the thousands of small enterprises engaged in its production, distribution, marketing and installation. We have seen before that the product cycle will need time and a critical size of the market until the "troops" join in the marketing channel. Promotion is therefore a really critical task, and it is obvious that **generic promotion of a product cannot be done by small enterprises.**

2.3.2. HOW TO INFORM CONSERVATIVE BUYERS: SEEING IS BELIEVING

A farmer does not buy anything, he has not seen or touched. This is true for most people, and even one of the first lessons of IKEA: Ingvar Kamprad's genial idea was to add an exhibition hall to the mail order business. Promotion can mean many things, but most and foremost, it means to **demonstrate** the product first to the "early adopters" and once these pioneers have thoroughly tested it, the followers may come and buy it also.

It is critical to reach a critical mass in order to overcome cultural barriers of the non-adopters. For instance, women can only use bicycles in certain areas after some pioneering women have done it for many years and a critical mass has opened the way for the others. Sometimes, it is difficult to reach potential customers: for instance, when IDE introduced "village dramas" as a mass media promotion strategy, 5'000 farmers came to see it every night, but only men did: women could not come to the village due to the "purdah".

Sometimes, this critical mass can only be achieved through a specific institutional promotion; then, it is very tempting to bring in the government and make use of its power to reach everywhere. But sometimes, a wrong or careless promotion can also spoil the market. For instance, the Indian government has very often subsidised a non-mature technology and literally "dumped" it on the market. Products – such as solar lanterns or solar street lights – were put on the market, but as there was no supply channel, they were poorly maintained and broke down. In the centre of a village, I saw a broken solar streetlight; as the light did not work, people were saying: "there is not enough sun for solar lights". This has discredited the technology for almost ever. The light simply did not work because nobody had put water into the battery.

2.3.3. THE PROCESS: HOW TO DEVELOP A PROMOTION STRATEGY

Thorough market research should shape the product development as well as the marketing and promotion strategy.

From the market research, one gains a clear picture about the perceptions of the customers, their needs and desires. In addition, systematic market tests with target customers after the completion of the product development process should also shape the marketing, promotion and sales strategy, and even the marketing and promotion initiatives should be field tested with target customers and adapted according to the results. Finally, systematic market research feedback including procedures such as focus groups will further refine the marketing strategy. What is advocated for is a really inter-active process and the willingness to learn from the customers.

Cultural variables and customs, and the characteristics of the target customer group determine specific marketing and promotion campaigns. For example, if the majority of target customers are illiterate, promotional material must communicate to people who can't read. If target customers frequently attend village markets and regional bazaars, promotional strategies that fit the context of markets and bazaars are likely to be effective. Sometimes, it is advisable to include village leaders or religious leaders in the campaign. For instance, the social mobilisation campaign for sanitation in Bangladesh did not only involve teachers and para-military volunteers but also the mullahs and other leaders.

The body of knowledge that already exists for marketing, promotion and sales is directly applicable to the design of marketing and promotion strategies for poor customers after modification to fit the specific local context.

2.3.4. WHAT DID IDE EXACTLY DO IN BANGLADESH?

IDE has reached the achievement of having 1.3 million treadle pumps sold in Bangladesh. How this was done is narrated by Paul Polak step by step in Annex 3. It is quite surprising to see how many efforts went into a trial and error process and into promotional activities. It would be an illusion to think of such a process as a linear route from A to B. One of the many reasons for success was the constant listening of the customers and the adaptation to their needs. (see Annex 3: "How IDE installed 1.3 million treadle pumps in Bangladesh by activating the private sector: the practical steps").

2.3.5. BEST PRACTICES: GUIDING PRINCIPLES AND THE EXAMPLE OF SANITATION IN BANGLADESH

As we have already noted, it is difficult to give specific guidelines for promotion and there is a risk to become ridiculous out of a specific context. The guidelines should thus be taken with a pinch of salt.

- Donors or venture capitalists should be willing to invest at least three times as much as is required for product development in order to reach the thresholds for the sales volume required by small businesses involved in producing, selling and installing new products to achieve profitability.
- Marketing, promotion and sales strategies must be shaped by a process of systematic market research on target customers for the product, in which customers for the product play a central role.
- Marketing, promotion and sales strategies must fit the social context and key personal characteristics of target customers. Detailed written brochures describing the product are useless for illiterate customers.
- Marketing, promotion and sales strategies are shaped and modified by a systematic process of test marketing and market research before they are implemented.
- Marketing, promotion and sales strategies are further adapted as a result of field experience obtained in the first phase of their implementation.
- Marketing, promotion and sales campaigns should be tied to the achievement of specific sales targets.
- Cost-effectiveness standards should be established for investment in marketing and promotion and should be tied to the achievement of sales targets, and the impact on customer income generated by reaching sales targets.

An excellent example for a market creation through promotion is the "social mobilisation campaign" for sanitation in Bangladesh which has opened a business opportunity for 6'000 private latrine producers (see below).

2.4. CREATING A MARKET – HOW TO GO ABOUT IT?

2.4.1. BACKGROUND AND RATIONALE: IS THERE A MARKET OF THE POOR?

Yes, poor people are very cautious customers. Nowadays, they are now rather underserved by the market, because the mainstream marketing efforts go to the minority of the urban affluent groups, to the "happy few" and not to the masses. The table below shows the consumer classes in India. Especially in rural areas, the market of the poor is very large and dynamic.

It is often overlooked that the market of the poor is huge and largely untapped: "Nine hundred million people. Seven hundred and eighty million consumers of cooking oil. Seven hundred and six million consumers of tea. Four hundred and fifty million buyers of casual footwear. Forty million TV-owners. Two-and-a-quarter million automobile owners. This is a market called India".²¹

Wealth Pyramid India	Nr. of households/people
Very rich	1 m households (6m people)
Consumer Class	30m households (150m people)
"Climbers"	50m households (275m people)
"Aspirants"	50m households (275m people)
Destitute	35m households (210m people)

The market of the poor is underserved, but it represents often the bulk of the market:

- For instance, the **demand for low-cost housing** is in many countries much higher than the demand for middle and high income housing: however, this market can only be tapped with cost-effective building materials: poor people cannot do much with a bag of cement, but can achieve a lot with a concrete block or with other "Lego-type" building materials; the lower the cost of a house is, the larger is the demand. Everybody dreams of a house, but this dream is highly price-elastic.
- **In India, rural markets** are booming mainly due to nine consecutive good monsoons which resulted in surplus income for farmers over a sustained period of time.²² But little is known about the size and scope of these markets: for instance, the importance of the so-called "Traditional haats and melas" (farmer's fairs) in India, of which over 47'000 take place in regular intervals and which have an average daily turnover of over 4'000 \$ and over 4'500 visitors.²³
- These markets are **not easy to penetrate**, mainly because of a lack of understanding by the – mostly urban – market researchers. Roda Mehta, one of the few Indian specialists in rural communication writes what follows: "I believe that if we were to be effective communicators in rural markets and to build strong rural brands, we clearly have a long way to go in building our knowledge of consumers: their value system, the relevance of products and the means by which we communicate with them".²⁴

2.4.2. WHY IS THE MARKET OF THE POOR UNDERSERVED?

It is not easy to understand why the poor – in most countries the majority of the people – have been ignored as customers and why minorities are so pampered with public attention and advertisements: it has to do with a cocktail of prejudices that the rich and the affluent are good buyers and that the poor are "lost cases". Evidence for these distorted "glasses" is striking:

- All over the world, shop owners have been opposed to creating pedestrian zones because they perceived their best client as the one who parks his "Rolls Royce" in front of the shop! Consumer surveys proved, however, that

most clients come by foot, and since the introduction of over 1'000 pedestrian zones in Germany, the turnover has increased for most of the shops.²⁵

- Maybe because we all admire the rich and the affluent, we look up to them and look down on the poor (or shamefully besides them). This may be the reason why Thomas Stanley is so obsessed to target "the affluent" as a market and tries to identify the "millionaires" as potential buyers. He argues that the number of millionaires will be growing with rising prosperity.²⁶
- The same kind of glasses brings the marketing focus on the phenomenal number of the "rising middle class" in India and gives the perception that they will buy whatever one wants to sell them in their euphoria of consumerism.
- At the same time, the much larger population from the rural and informal sector is ignored by official statistics and quite often also by those who promote industry and trade. The "forgotten sector" of "non-farm employment" provides over one fifth of rural employment and one third of the income of rural households, but the general perception of rural India is that everybody in rural areas is a farmer.²⁷

2.4.3. FORGOTTEN CONSUMER SEGMENTS

In most cases, a revolutionary market creation has taken place when a "forgotten consumer segment" was disclosed – and very often with it a poor consumer who was not in a position to afford something earlier:

- When **Akio Morita** bought the patent of the transistor for the ridiculous amount of 25'000 \$ from RCA (the Radio Corporation of America) he had a completely different consumer in mind than the mainstream market for "Hi-Fi" radios which dominated the upper range market. He wanted to make a small radio which would fit into the pocket of a shirt: it should be not only "portable", it should be "pocketable". A similar reasoning was behind the development of the "walkman", a pocketable music player. With this in mind, Sony discovered the millions of music lovers who did not own a living room half the size of a concert hall: students, workers, servants etc.²⁸
- Similar perceptions of a changing socio-economic structure led the marketing genius **Ingvar Kamprad** to the revolutionary **IKEA** model of marketing: affordable but well designed furniture for the low- and middle income families in suburban apartments. He realised that the farming population was rapidly declining: "During the 1950s alone, fifty thousand farms closed down; that number doubled in the following decade. In thirty years, employment in agriculture was reduced by 75 percent, and the suburbs grew as if sprouting out of the ground outside the cities. The building program that came to have such an enormous influence on IKEA – or rather the need for IKEA – broke all records. During the first twenty years, after the end of the war, one million new apart-

ments were built."²⁹ In order to cater to this market, Ingvar Kamprad had to break all the rules of the traditional furniture industry and develop products and marketing channels which were affordable, and which combined the advantages of mail ordering (catalogue) with an exhibition where the quality could be seen and touched.

-In a similar way, the pioneers of the silicon valley started to develop, in a garage, a product which was affordable for the masses and not for the happy few. The IBM patriarch Watson had estimated the world market for computers at no more than 5 pieces, when computers were still huge machines which needed a room as big as the hangar of an aeroplane. The Steve Jobs, the Bill Hewletts and Dave Packards of this world challenged this belief by developing products which turned out to become affordable for people whom Mr. Watson would never have considered as customer. No wonder that IBM had to undergo a severe crisis to change this own mindset and accept the personal computer as an alternative to the centrally operated mainframe.

-The "market creation approach to development" should work in much the same way: it should look at a new group of customers, the poor as a potential customer; it should look at what he/she can afford, and even more important, it should look at him/her as a potential to generate more income or an asset. The product should bring so many advantages to a poor family that it is affordable and that it creates more wealth rapidly.

-It was in this perspective that **Mohammed Yunus** discovered the landless poor women in Bangladesh as the most reliable customer for credit with a repayment rate of more than 98%, when beforehand, the nationalised banks had given credit to the rich farmer and sometimes the recovery was less than 3%. How come, a poor woman without the possibility to give any collateral as security could become such a good client? Very simple: "a woman who wants to borrow from the **Grameen Bank** must find four other women who are eligible for membership. That is, they must be also poor".³⁰

2.4.4. THE POOR AS CUSTOMERS AND ENTREPRENEURS, INSTEAD OF BEING RECIPIENTS OF CHARITY

There are several reasons why this way of looking at the market of the poor as an opportunity has not taken place:

large corporations focus on higher margin markets serving richer customers; existing micro-enterprises aren't capable of creating new markets; there is in developing countries a scarcity of start-up capital for investment with long term future returns; NGOs and donors see the poor as beneficiaries instead of seeing them as customers; Agriculture Research Institutions like the CGIAR network are structured to disseminate new products

through partner governments instead of creating private sector markets. This favors rich farmers and puts poor farmers at a disadvantage

No coherent model for creating new markets is available.

The six examples described in the next chapter illustrates our different approach and show how powerful it can be. Such a changed perception can indeed create multiple impact opportunities: increase the income and productivity of poor customers; create new opportunities for thousands of new micro-enterprises; create new opportunities for micro-credit; create new jobs for the poor; improve the village economy.

In other words, create a very positive impact, with very few negative consequences.

2.4.5. PROCESS: MARKET RESEARCH TO UNDERSTAND NEEDS

There is little doubt that a successful market creation strategy needs a thorough understanding of the needs of poor people; in addition, one needs to look at them with their hidden potential and without preconceived ideas and the attitude: "I (we) have the solution for you". Such an approach is common to Akio Morita, Ingvar Kamprad and Mohammed Yunus. Besides a good deal of intuition and sensitivity, it also requires **good market research**.

In his new book "Kotler on marketing"³¹, Philip Kotler defines a marketing opportunity "as an area of buyer need and interest in which there is a high probability that a company can perform profitably by satisfying that need." There is no simple recipe to find and exploit such an opportunity. Kotler describes the question of research in a nice anecdote:

"Research is the starting point for marketing. **Without research, a company enters a market like a blind man.** The story is told about a Hong Kong shoe manufacturer who wonders whether a market exists for his shoes on a remote South Pacific island. He sends an *order taker* to the island who upon a cursory examination wires back: 'The people here don't wear shoes. There is no market.' Not convinced, the Hong Kong shoe manufacturer sends a *salesman* to the island. This salesman wires back: 'The people don't wear shoes. There is a tremendous market.' Afraid that this salesman is being carried away by the sight of so many shoeless feet, the Hong Kong manufacturer sends a third person, this time a *marketer*. This marketing professional interviews the tribal chief and several of the natives, and finally wires back:

'The people here don't wear shoes. However they have bad feet. I have shown the chief how shoes would help his people to avoid foot problems. He is enthusiastic. He estimates that 70 percent of his people will buy the shoes at the price of \$10 a pair. We probably can sell 5'000 pairs of shoes in the first year. Our cost of bringing the shoes to the island and setting up a distribution channel would amount to \$6 a pair. We will clear \$20'000 in the first year, which, given our investment, will give us a rate of return on our investment (ROI) of 20 percent which exceeds our normal ROI of 15 percent. This is not to mention the high value of our future earnings by entering this market. I recommend that we go ahead.'³²

Then, Kotler mentions how important it is to understand the real needs of the islanders and to adapt the product to the specific requirements of this new market. To do this, he distinguishes between three types of marketing approaches:

- "responsive marketing" which means "finding and filling needs" (for instance recognizing that women want to spend less time in cooking and cleaning led to the invention of the modern washing machine, pressure cooker, etc.);
- "anticipative marketing" which recognizes "emerging or latent needs" such as deteriorating water qualities leading to bottled mineral water;
- "need-shaping marketing" which is the boldest level of marketing when a company introduces a product or service that nobody asked for (like the "walkman"). Akio Morita summarizes his marketing philosophy in these words: "I don't serve markets. I create them".³³

Very often – and most relevant in our case of marketing to the poor – it is to make a product more affordable. This may happen through changing the product (packing in small quantities like the "sachet" or developing an affordable product like the "walkman" or a treadle pump) or through a new manufacturing or distribution system (IKEA). It is, however, very crucial to put **pricing strategies**³⁴ into the core of market creation approaches. Good pricing can create or destroy a new market.

2.4.6. BEST PRACTICES: GUIDING PRINCIPLES AND THE EXAMPLE OF VILLAGE FORESTRY IN BANGLADESH

In order to promote "market creation approaches", donors should support the implementation of initiatives to create new markets that produce a positive impact by serving poor customers.

For this to occur, some criteria for the new markets should be established which ensure that the new markets produce a positive impact that improves the income and productivity of the poor.

These criteria should include the following:

- The new market, when established, should operate sustainably in the private sector
- Donor investment should stimulate the creation of sustainable new markets, and avoid subsidizing the purchase price of new products
- Initial subsidies may be needed in product development and promotion with the aim of creating a critical mass where "troops" can join and not only the "scouts"
- The new products on which new markets depend should be cheap enough to be affordable without subsidy for the poor customers who buy them
- The new market should provide opportunities for the poor people who are customers for the new goods or services to significantly increase their income and productivity
- It should provide opportunities for a significant number of new private sector micro-enterprises to be established to produce, distribute, market, and install the new products or services purchased by poor customers
- The impact of the new market should be, at worst, neutral with regard to its impact on gender equity and the environment

A first step in making this happen is the preparation of practical guidelines for the process of creating new markets:

- It should depend on the collection of specific information from and about poor customers
- It should include the systematic identification of key constraints to the increased income and productivity of poor customers
- The products and services identified as prime movers for the creation of the new market should make a direct contribution to increased income and productivity on the part of the poor people who purchase them
- Poor customers must play key roles in the process of identifying and evaluating the potential of new markets
- The concepts that are central to the creation of the new market must be evaluated and modified through the crucible of systematic feedback from the poor customers who purchase the concerned products.

The definition of small and micro-enterprises should be broadened to include the majority of small farmers in developing countries who cultivate less than two hectares.

Donors should support handover to a sustainable private sector as an acceptable and desired outcome strategy for internationally funded development projects,

Among the six examples presented below, the Village and Farm Forestry Programme in Bangladesh is an example of best practice for a market creation programme. It has achieved to create a market for trees as an asset for

the poor and made it possible that poor people could make a flourishing business from the supply of the saplings.

3 SIX EXAMPLES OF EXISTING PROJECTS WITH A MARKET CREATION APPROACH

3.1. HUNDRED MILLION TREES AS A SOCIAL INSURANCE SCHEME: THE VILLAGE AND FARM FORESTRY PROGRAMME IN BANGLADESH

3.1.1. OVERVIEW

The VFFP (village and farm forestry programme) in Bangladesh started in 1986 as an action research programme of SDC. Its aim was to stimulate tree plantation in Northern Bangladesh. With growing population pressure, the forest area in Bangladesh has shrunk further every year (in 1986, less than 10% of the total area was still forest land) and there is growing pressure on biomass production for fuel, fodder, fruit and timber. The only space to grow more trees is in the fields and people's homesteads.

The project started with NGOs and so-called "core farmers" whose role was to convince their peers about the usefulness of planting trees around their house and in rice fields as inter-cropping. At the beginning, the "core farmers" were paid extension workers. The project se-

lected a number of flood-resistant, nitrogen-fixing and fast-growing tree species which would produce high yields and should not lower rice yields significantly if their branches are chopped regularly.

The project has become a major success story for the following reasons:

- At the start of the project, in 1986, one could not even expect people to plant trees if saplings were given "free". Today, the saplings fetch a good price and have become an economic value.
- 650'000 participating farmers are proud owners of trees as their precious asset; contrary to the initial perception, they do not buy trees mainly for short-term income benefits (like fodder, fuel and fruits) – although these are important side benefits – but for a long-term investment. **People plant trees as an inflation-free savings scheme, and as a social insurance.** In case of an emergency, the tree can be chopped and sold for cash. In this sense, it is an extremely good investment for a family who buys



North Bangladesh has become green again; these trees can be chopped and sold in case of emergency

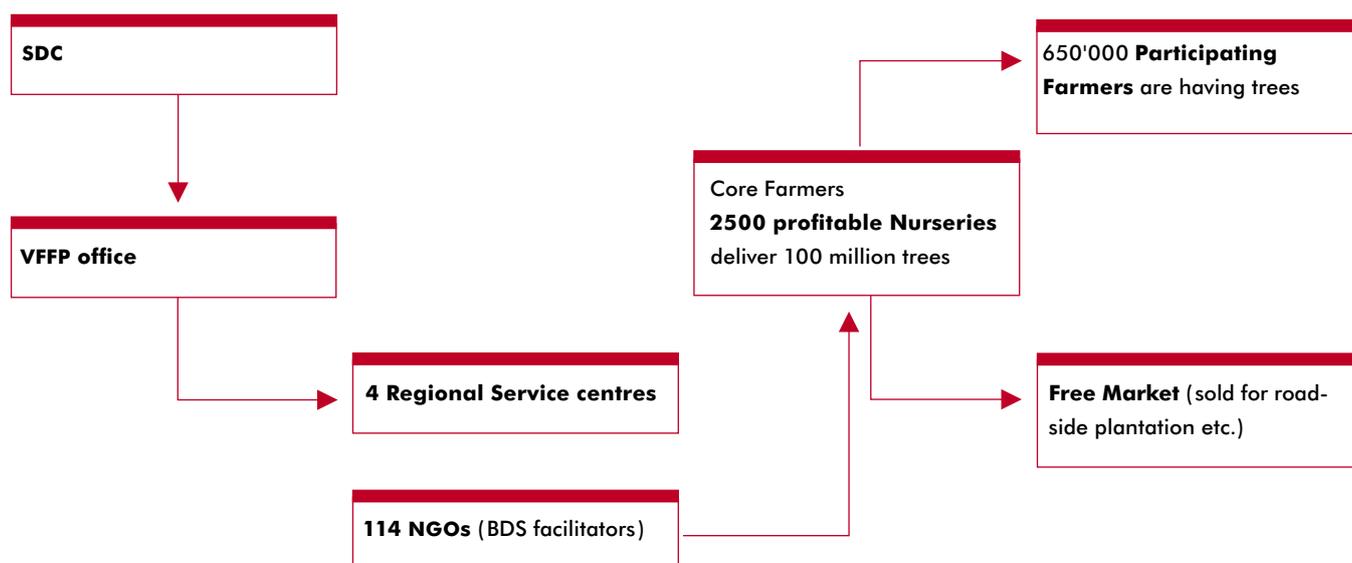
15 saplings per year for \$1.50 and gets a net present value (NPV) of 90 \$ per year as a relatively safe deposit. It is very rare that trees are washed away by the floods.

- This favourable trend in pricing has turned the nurseries of the "core farmers" from a side activity to a very profitable business. Since the "core farmers" have been selected among very poor people with an enterprising spirit, the 2500 nurseries that exist today have turned into flourishing businesses. They make an average turnover of 5 \$ per day and have sold 105 million trees as of today. Soon, they will deliver **100 million trees every year**.
- VFFP is good value for donor money: SDC has invested roughly 7 million dollars in the last 15 years, but the asset creation with the participating farmers in terms of NPV is already 90 million \$/year.

3.1.2. THE MARKETING CHANNEL

A detailed description of the VFFP marketing channel can be seen in Annex 1. In a nutshell, the channel is as follows:

The marketing channel of vffp



after 7 years, the tree really represents a capital asset worth 20 to 100 dollars. As the trees can be easily made to cash in emergencies, these assets are indeed a very **interesting form of a rural social insurance**.

The Price

Pricing is the very key to success for VFFP. Initially in 1986, tree saplings had to be "free of cost" (even then it was hard to find someone to plant them). In the second phase, the project "dared" to ask for 50 paisas per sapling.

SDC has set up a small co-ordination unit – originally within the co-ordination office – which worked first with a small number of NGOs, later on with 114 of them, of which 80 did not receive any funds. The key concept was to set up the nurseries with the "core farmers". These have now become a flourishing business.

3.1.3. THE 4 PS OF VFFP

The Product

The project has selected and tested various fast growing tree species which would resist the climatic conditions of Bangladesh, especially the floods and water logging at monsoon time. Today, several dozen species have been chosen which have a high survival rate and very high returns. In fact, the trees have become an economic asset for the poor and a source of family income. They are, however, most appreciated as a long-term investment like a saving scheme. If a family plants some saplings, they yield some fodder, fuel and fruits in a period of two to three years, whereas

Today, the average price for a sapling in the market is 5 - 6 Takas (10 US cents), and it is also "cheap" to plant trees around homesteads and as intercropping in rice fields. The issue of knowing whether trees affect the productivity of rice negatively has always been controversial. Some enemies of the project said, "Bangladesh will go hungry", if this project is implemented. However, the rice yields diminish only gradually and they are by far compensated by the higher income from the trees. In a country like Bangladesh with its extremely high population density, it is crucial that trees are using little space, mainly



This is Amina Begum, once a poor lady who now produces 120'000 saplings per year and makes a turnover of 14'000 \$

the vertical space to create economic value. In this sense, trees make use of the scarce Bangladeshi surface just as skyscrapers do in Manhattan.

The Place: 2500 profitable nurseries

Initially, "core farmers" were chosen as paid "extension workers" of the project; only gradually, the small nurseries attached to these "core farmers" became a main activity. With rising volumes and prices, these nurseries turned out to become very profitable.

Amina Begum was a very poor lady when she started the nursery business. Today, she grows 120'000 saplings per year on her one-acre farm near Rajshahi. She makes a turnover of TK 700'000 per year (14'000 \$) and a profit of probably well over \$ 10'000. This is a gold mine in a country where the GNP per capita is 350 \$ and where the daily wage is not more than 1 \$ a day.

Promotion

In this project, promotion was good, but could have been better: The promotion happened mainly through local NGOs and through the "core farmers" (peer group). Only lately, some films were made and the media are used to promote the idea. One recently made TV spot

positions the VFFP as a social insurance scheme and motivates people to plant trees, so that they have an iron reserve in case of emergency.

Today, the project has created a very good visibility since in North Bangladesh, the landscape has become visibly green. The government was always rather hostile ("it will affect rice yields"), but the officials slowly see the impact and the advantages of the project. However, governments always remain rather sceptical towards private ownership of trees, it is somehow in contradiction to the conventional mindset of Ministries of Forests. Although the project has an incredible track record, replication has not taken place in other countries (laws may not permit private tree ownership, like for instance in India).

3.1.4. OUTLOOK

Since this programme has set up a private delivery channel for 100 million trees per year, it would be possible to make an even larger programme sustainable.

Till now, the driving force has been the free market, where 70% of the saplings are sold: the institutional demand from NGOs, especially for roadside tree plantation programmes, is the reason for this remarkable progress.



Amina Begum has built this pavillon especially for hosting her clients (11`000 Takas investment)

However, the fact that 650'000 families have invested in trees as their savings and social insurance is a unique dimension of this programme. This aspect is relevant much beyond the forestry aspects: many Asian countries face a growing problem with their old age population; the family ties become looser, and in this sense, non-financial means of social security and savings can become a very important social strategy. Would it be possible to set up an insurance company with trees as part of its assets?

3.2. PEDALLING OUT OF POVERTY WITH THE TREADLE PUMP IN BANGLADESH, INDIA AND NEPAL

3.2.1. OVERVIEW

In the 70s, the occurrence of famines in Bangladesh laid a great emphasis on food security and consequently on the need for irrigation to increase production. Like many other donors, SDC supported a project of training mechanics for maintaining diesel pumps. However, an evaluation in 1980 revealed that irrigation can create very severe equity problems: as a matter of fact, diesel pumps with their large command areas were accentuating the differences between rich and poor farmers. The pump owners were converted into "water lords", because they had too much water, and the poor smallholders had to

buy the water from them. This made them more dependent and – in many cases – they eventually had to sell their land.

In this context, the treadle pump became very interesting, as it was selected only by the poor: it is a pedal-driven pump which can irrigate about half an acre, costs 15-25 dollars and allows for an additional crop.

The breakthrough for the treadle pump came in the early 90's, when sales crossed the mark of 100'000 pumps per year, and a critical mass and density of pumps were achieved. It was the merit of many organisations to have been involved (several NGOs were engaged in the development and early dissemination of the pump), but large numbers of pumps sold are certainly the achievement of IDE (International Development Enterprises), an American-based NGO, for focusing on "marketing". IDE, with the support of SDC, has set up a strong private delivery channel which manufactures the pump in small workshops and sells it through dealers and "installers".

Today, the treadle pump is widely used in Bangladesh, Eastern India and Nepal, i.e. in areas which are well endowed with a groundwater table not lower than 6 metres.



This is Amina Begum, once a poor lady who now produces 120'000 saplings per year and makes a turnover of 14'000 \$

Today, the main features of the treadle pump (TP) are as follows:

- The pump is very cheap: it costs between 15 and 35 dollars, depending on the depth of the water table and the quality and make of the pump. Most pumps are bought cash, but some dealers give credit to the farmers.
- An average TP user makes an additional **net income of at least 100 \$ per year**; this is a conservative estimate, as a recent impact study³⁵ shows that 20% of the farmers make 500-600 \$ more income on half an acre of land. Since it is very labour-intensive, the pump is selected by the target group of the poor who own very little land: landholdings of up to half an acre are defined as landless people and those who have a little more are marginal farmers. In some areas, farmers grow more rice for home consumption; in other areas, they grow very profitable vegetables, both for home consumption and as a cash crop.
- There are **over one million TP users** in Bangladesh and over 100'000 in India and Nepal. Altogether, these pumps generate more than **100 million dollars additional net income per year** into the hands of poor farmers. This is certainly a remarkable social achievement. It seems that a considerable percentage of treadle pump owners could "graduate" to becoming diesel pump owners. The treadle pump is therefore an important "entry ticket" into the "machine culture", as it is shown in Tushaar Shah's im-

impact study. It is estimated that the concerned one million families of Bangladesh, thanks to the returns due to the treadle pump, have been able to go beyond the threshold of the poverty line.

- There is a potential of ten million users in Eastern India and Nepal, in the so-called "poverty square" which packs 400 million of Asia's 900 million poor. It is a huge task for IDE and others to raise the sales from the present impressive level (80'000/yr in Bangladesh, 50'000/yr in India) to the desired level to fulfil the task... If a further programme can tap the 10 million TP market, it would pump **1 billion dollar net income per year to the poor in the poorest pocket of the world.**
- In order to achieve this, considerable further scaling-up of the market creation approach is needed and probably a revised strategy which would make the marketing channel more profitable: one of the present problems is a relatively low profit margin especially at the level of the manufacturer.

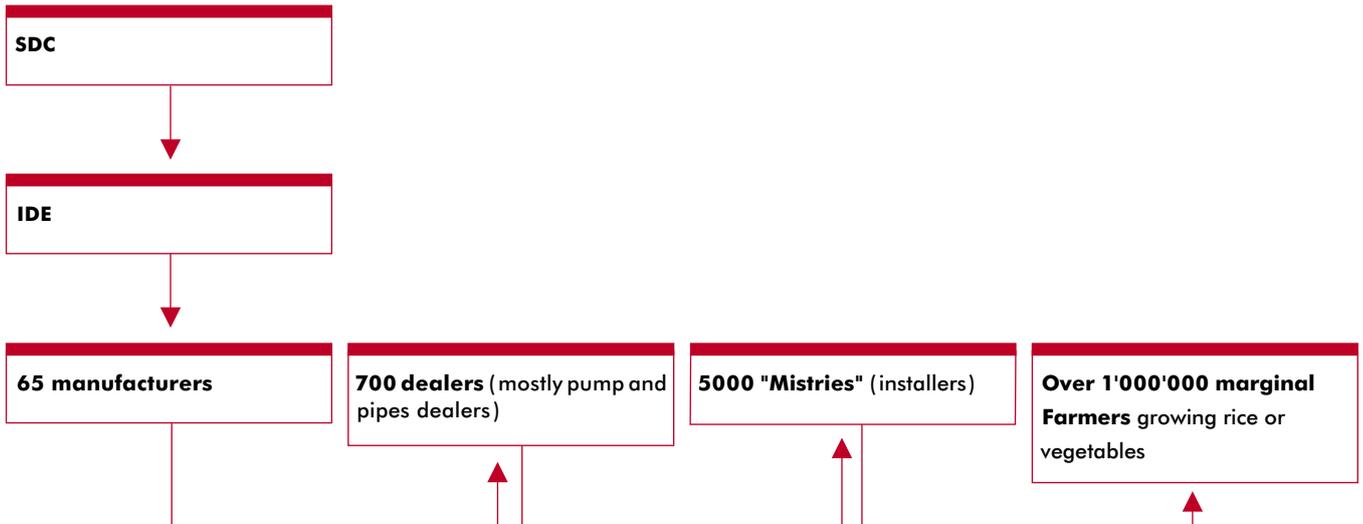
The treadle pump provides excellent returns for donor money: with an investment of roughly 7 million dollars in the last 15 years to IDE (the facilitating NGO), over 100 million dollars of returns have been generated annually by previously very poor farmers.

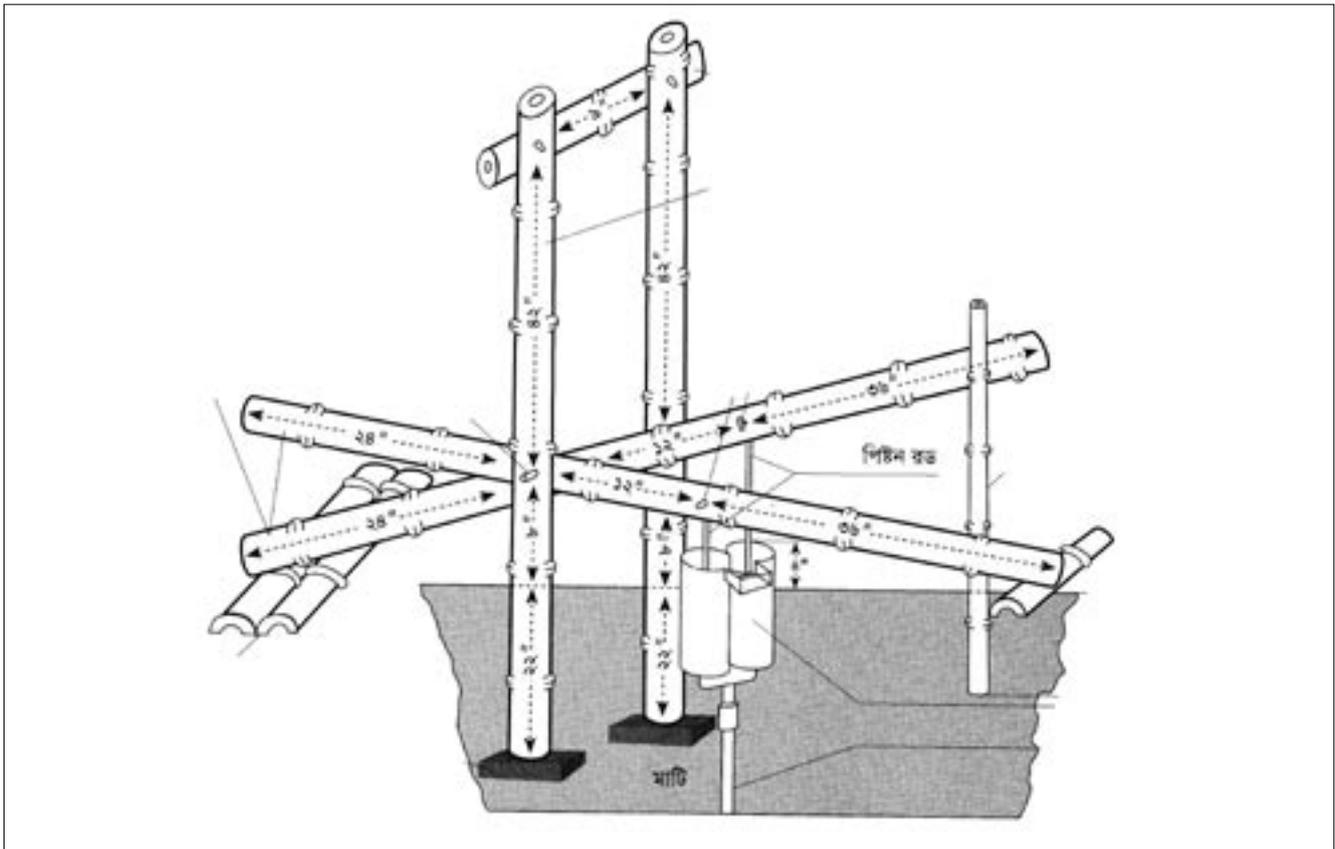
3.2.2. THE MARKETING CHANNEL

The marketing channels in Bangladesh, Nepal and India are slightly different from each other. In all cases, IDE (International Development Enterprises), is the main marketing facilitator. SDC is supporting substantially the programmes in Bangladesh and India. For illustration, we describe here the marketing channel in Bangladesh:

it consists of 65 manufacturers, 700 dealers, and 5000 "installers". They make and sell the pump with profit, but not to the tune, one would like to see. The profit in the supply channel is especially low for the manufacturer (who has less than 50 US cents profit per pump) but grows at every step; dealers make 3 \$, "installers" 2 - 6 \$ profit: not a bad business, but little compared to the minimum extra net income of 100 \$ which the farmer earns by the pump.

The marketing channel for the treadle pump in Bangladesh





A lot of effort has been put into making the treadle pump a simple technology

3.2.3. THE 4 PS OF THE TREADLE PUMP

The product is excellent

The product is excellent, and it should not be underestimated that the treadle pump is a product which is difficult to be matched in its performance, efficiency and its capacity to alleviate poverty. Although it looks very simple – and it is indeed very simple – it is ingeniously designed, and many years of dedicated engineering work have gone into it, just to make it so simple.

- The idea for the treadle pump has been promoted by Mr. Dev, a local workshop owner in Kurigram, but his cement pump did not really work. The treadle pump in its present form has been designed by Gunnar Barnes, a Norwegian engineer from RDRS, Rangpur-Dinajpur Rural Services, an NGO working in Northern Bangladesh. The pump is so simple that it can be manufactured and repaired locally: no doubt, it would merit many design awards for its simplicity, efficiency and extremely high returns.
- The pump can lift water from a maximum depth of around 7 metres: this makes it suitable for almost 90% of the agricultural land of Bangladesh. However, the water table in Bangladesh is now sinking, and efforts to further improve the treadle pump are urgently needed (tests with deep-set treadle pumps are underway).
- In India and in the Terai region of Nepal, the need to

adapt the pump to the local conditions is also very important, and today, IDE disposes of a variety of pump types. However, it seems that the original design from Bangladesh is still the favourite model chosen by the farmers.

- With affordable micro-irrigation (low-cost drip and sprinkler irrigation), the scope of poverty alleviating irrigation technologies has become much wider, since they can also be used in semi-arid zones with low water tables. These technologies may even become very strong answers for the growing water scarcity in the next millennium. (see detailed descriptions in the chapter on "scaling up".)

The price

For the farmer, the price is excellent, but not for the manufacturer:

- The price of the treadle pump ranges from 12 to 35 dollars; pump sales seem to be very price elastic, and farmers would buy cheaper pumps even if the quality is bad and if they have to replace the pump after some time. For the farmer, this is not so much of a problem as the payback period is in any case only 3-4 months.
- The price is, however, quite discouraging for the manufacturer: producing only the sheet metal part of the pump which costs 250 Taka (5 US \$), he makes a profit of only 25 Taka (50US cents). Unfortunately, it has never been-



This is workshop of Xavier Rozario (with the pump), a graduate of MAWTS (Mirpur Agricultural workshop and Training School). He started a rural workshop in Natore 10 years ago and makes 3000 pumps a year

possible to raise the price in the last 12 years, even after we realised that the manufacturer is in fact the only "loser" in the channel.

- Fortunately, it looks better for the dealers and the "installers": the dealer sells the pump and the pipes for around 1200 Taka (24 \$) and he makes a profit of 150 Taka (3 \$) on the whole set. The "mistry" ("installer") sinks the pump in a day or two (the soil is very easy to penetrate in Bangladesh) and he earns 2-6 \$ for the installation of one pump.

The Place

- The weakest link in the supply channel is the manufacturer. The dealers and "installer" are much better off. In order to make the channel more dynamic, the marketing strategy should find ways to improve the profitability at all levels, especially if one aims at recovering some promotion costs.
- One way to strengthen the supply channel is to expand the product range and the product mix (adding several pump types, micro-diesel sets, affordable micro-irrigation technologies). A small dealer-cum-installer near Rajshahi is now selling a new low-cost drinking water pump, the Jibon pump: he has previously had a very low turnover, but if he can sell these pumps, his life will change. One pump costs 5'000 Takas and he is confident that he can sell 100 pumps.

- Xavier Rozario sold 4'500 pumps in the best year and sold 3'000 pumps last year. For him, it is not a bad business because he is a large manufacturer; however, he foresees a saturation in his region, as a considerable share of TP owners have now been able to buy diesel pumps. He will gradually step out of the TP business and diversify into new products.
- It seems to be better to have smaller dealers than larger ones: for a large dealer, the treadle pump sales are "peanuts", whereas for a small one, it can be good business. The small dealer will be more committed to do some promotion; the larger one will just stock the pumps, as one of many items.
- One important new avenue to add more value to the products is to add knowledge and inputs like better seeds; for this, cooperation with existing marketing channels can create synergies and reduce costs.
- Given the fact that the more dynamic TP adopters (these 20% who earn 500-600 \$ a year) spend a non-negligible part of their income to buy more agro-inputs (25 \$ per year), it would in fact make a lot of sense for agro-input companies and their dealers network to promote the treadle pump and micro-irrigation devices together.

Promotion

IDE has done outstanding promotion in Bangladesh and India. Originally, the marketing concept was quite heavily influenced by the decentralized rural marketing structure of the "Ciba-Geigy Agro-Chemicals Ltd." at the time (today Novartis). Nowadays, it seems that the Novartis dealers in Bangladesh admire the effective promotional work of IDE with its convincing demonstrations, farmers' meetings, etc.

- IDE started a very successful mass media campaign: in 1991, a group of actors was engaged to show 200 "village theatre performances" attended by 5'000 and more farmers. This campaign alone reached out an audience of over one million farmers; it was followed by film performances and video van tours.
- How to make promotion a continuous process? This is costly and a development organisation cannot justify the continuous funding of publicity campaigns. Without that, sales decline after a while. In view of the low profit margins, it is an illusion to believe that the manufacturer can invest in promotion. I visited a large manufacturer in Bogra who produces 80'000 cast-iron pumps and has a turnover of one million dollars per year (100 times more than an average TP manufacturer): he has just started to invest "mildly" in promotion and to print some stickers.
- It should be interesting for an agro-input company to promote the treadle pump and micro-irrigation devices: it is now proven that purchases of agro-inputs increase significantly once farmers can irrigate, and indeed one fourth of the TP adopters purchase for 25 \$ more agro-inputs per year.

3.2.4. OUTLOOK: THE BILLION DOLLAR QUESTION

How can IDE and others tackle the bigger challenge of selling 10 million pumps? As Tushaar Shah concludes in his impact study: "Eastern India and Nepal Terai have an ultimate market potential for some 10 million treadle pumps. If and when IDE does saturate this market potential, it will have probably accomplished one of the most powerful – and best targeted – poverty alleviations, the world has ever seen, by increasing net annual income of South Asia's poorest rural households by a billion dollars! The question is if it will, and when."³⁶

How could this scaling up been done? This study is not the place to provide an answer to this question: it is a huge task and may go well beyond the strength of IDE and SDC.

- Can it be done by involving the government (in promotion and not through their "subsidy machinery")? It is certainly important to involve the governments and the

irrigation lobby in a sound policy dialogue. It is crucial to realise a paradigm shift of the irrigation philosophy: irrigation should not only be looked at through the distorted glasses of the "command area" approach: involving small farmers and bringing them into the "machine culture" would really mean a new agricultural revolution, a highly effective strategy in view of the challenge of the future double food and water scarcities. It would also be time to analyse the potential of small and micro-irrigation in terms of poverty alleviation. We must change our views and understand that it does matter very much **who** irrigates and **who** benefits from the water available for agriculture.

- It should also be done in involving the corporate sector and the dealers' network of large agro-input companies. Just as they played a major role in the "green revolution", could they play their part in the micro-irrigation revolution, a "blue revolution"? For these companies, it would mean investing in a new marketing focus, but it would be very rewarding to get 10 million new customers who would purchase agro-inputs for 250 million dollars a year.

3.3. 60 KILOGRAMS MORE MAIZE PER FAMILY WITH "POSTCOSECHA" SILOS IN CENTRAL AMERICA

3.3.1. OVERVIEW

The "Postcosecha" silos are made from tin-sheets by "artesanos" and have a varying storage capacity from 70 kgs to 1350 kgs. The project started already in the 80's in Honduras and is spreading now to Nicaragua, El Salvador and Guatemala.

The main features of Postcosecha are the following³⁷:

- Over 170'000 silos have been distributed so far in Central America, they can store 1,25 million tons of maize and avoid yearly losses of over 10'000 tons from rats and bugs. This means, each family has 60 kilograms per year more maize to eat.
- A silo costs between 12 \$ (for 70kg) and 63 \$ (for 1350kg) and pays itself in 4 years (for 70 kg) or in 3 years (for 1350 kg) if one includes the value of the grain losses (8% per year) into the calculation; however, if one adds the earnings made from price fluctuations, the payback remains 4 years for the small silo, but becomes only 9 months for the large one.
- The silos are manufactured by 620 "artesanos" in small workshops and the average net earning per workshop is 700 \$ per year. This is not a bad additional income but not enough for many of the "artesanos" to live from silos alone; most of them produce also other products.
- Postcosecha is quite a good investment for donors: One million \$ per year of donor money provides 6.2 million \$ gains per year to all silo owners.



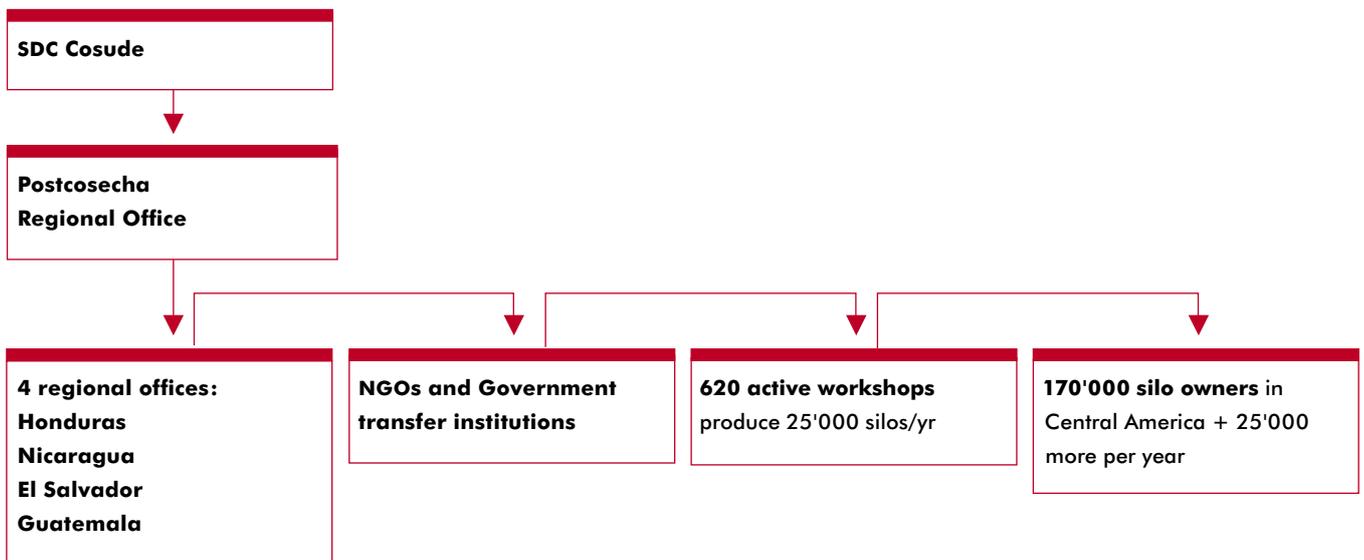
One of 620 "artesanos" in Central America: making silos is not his only business, he is also a farmer.

3.3.2. THE MARKETING CHANNEL

COSUDE (SDC in Central America) and the respective partner institutions in the different countries have set up a channel consisting of over 250 "transfer institutions" as facilitators which provide training and extension ser-

vices. The core of the programme is made of the 620 active "artesanos" who operate in the 4 countries and who deliver profitably the silos to the targeted families. Every year, another 25'000 silos are added to the present size of operation. Replication is planned in other countries, including a low profile expansion to Mexico.

The marketing channel for the Postcosecha Silos in Central America



3.3.3 THE 4 PS OF POSTCOSECHA

The **product** is thoroughly tested and proven; it suits perfectly the context of Central America. Small farmers and even non-farming families have a silo to store their maize grains which they consume daily to make the "tortilla". The silo is sold with instructions for use and chemical products to eliminate bugs; it must be totally airtight to avoid grain losses. Consequently, poor handling and bad quality silos without air-tightness create problems.

The **price** is enough to cover the cost and a margin of around 30%. For the customer, the silos are still slightly expensive and the amortisation is only very fast with the gains from price fluctuations. The silos are paid back in less than a year, i.e. with one harvest. This is not bad, but still lower than the gains of village forestry and the treadle pump. In order to make the entry price more affordable to the poor customers, links to micro-credit schemes have been established; over 30% of the silos are sold in connection with a micro-credit.

The **place** consists mainly of the "artesanos" who sell the silos directly to the farmers. This concept seems to be rational in view of the high transportation costs. In future, the inclusion of dealers into the supply channel should be looked at: Without dealers, the sales volumes of silos are low and the overall profit per "artesano" remains modest. This is reflected in the fact that most "artesanos" can not live from silos alone. The project strategy has always been to strengthen small "artesanos" and in creating a direct link between them and the farmers. There are good reasons to do so and achieve more decentralisation. But during my field trip, I realised that the project does not include one of the largest tin-making workshops in Honduras as part of the supply channel, although that workshop is manufacturing at least as many silos as a middle-sized "artesano". This large workshop has a vast dealer network in many of the villages and dealers sometimes give credit to their customers. Such a set-up could speed up dissemination, as the initial cost of acquiring a silo may be a heavy burden on the cash budget of a family.

The **promotion** has been done very extensively, and the involvement of government departments and of many NGOs has certainly helped to create a large coverage. The high visibility is probably the best asset which has been achieved in creating a market for the silos. Today, however, it is difficult to sustain this promotion. The project is trying hard to involve the "artesanos" in promotion, but the success rate does not seem to be very promising. It is remarkable that some of the "artesanos" are air some advertisement spots to increase the sales of their

own silos in the local radio station. However, it would be too much to expect the "artesanos" to do generic promotion of the silos and the storage technology.

3.3.4. OUTLOOK

With the new phase of the project, there is a remarkable shift from "aid-driven" approach to an entrepreneurial and marketing oriented approach. One of the key targets of the project in the next 8 years (1999 - 2006) is to achieve a "critical mass"³⁸, and this is indeed the key element of a market creation approach to achieve. A high visibility of silos is certainly a crucial element to make "the sales sustain on their own", but it would – in my view – be an illusion to expect that this can be achieved without sustained promotion.

There have been some attempts to replicate the programme elsewhere, for instance in Paraguay and Peru. The technology has spread out on its own from Guatemala to the border region of Mexico. The project is very well documented³⁹ and has excellent promotion tools and training manuals⁴⁰. But large scale replication has had limited success so far, similarly to the two examples described above, village forestry and treadle pump. Why are such important, proven and promising technologies not spreading all over the world?

There are two proposals on the table to replicate Postcosecha in Latin America:

- "Postcosecha Light", a replication programme with local partner organisations, based on training "artesanos" in silo technology, a full promotion package and with some inputs in monitoring and evaluation;
- A full replication programme of Postcosecha by SDC, as in Central America including the full promotion package.

Can "Postcosecha Light" work in a new country? There are very good chances, provided a substantial investment goes into market creation and promotion. It would be worth investing in such programmes elsewhere, as the additional investments are small in comparison to the previous investments in Central America. However, "Postcosecha Light" will not work, if the market creation effort is not done: It is very unlikely that a few "artesanos" can create a new market even for the best technology. One of the essential dimensions of the "market creation approach" is a **critical mass**, and this will never be achieved by putting the responsibility for promotion on the shoulders of the "informal sector".

This does not mean that the only alternative is to replicate exactly the same set-up elsewhere as in Central America: it would be worth to elaborate a sound promotion and marketing strategy for replicating "Postcosecha" in many

countries. Such a new strategy should – most likely – stress on finding new alliances, for instance with agro-input companies who have an existing network for promotion and extension. In India, one fertiliser company showed interest in promoting technologies for post-harvest loss reduction. If such links with agro-input companies can be forged, the product would become slightly different from a "piece of hardware". It would then be more easy to bank on the "artesano" as a hardware supplier, and on the fertiliser company as the promoter. The "artesanos"

alone are not capable of creating a new market, because the margins are limited and because it is difficult to realize "repeat" sales once a customer is identified. This is similar to the example of the gas (or electric) stoves which have been promoted and for which a market was created **by the gas companies** and not by the stove makers.⁴¹ A fertiliser company would be able to serve their clients better if they save money from avoided post-harvest losses and if they can purchase more agro-inputs.

3.4. 2'000 MICRO-CONCRETE ROOFING WORKSHOPS PRODUCE 150'000 ROOFS PER YEAR



A school in Nepal covered with micro-concrete roofing tiles

3.4.1. OVERVIEW

Around 15 years ago, a technology called "fibre-reinforced roofing sheets" drew the attention of appropriate technologists and initially, everybody loved it: it was simple, ecological and looked as though it was an alternative to asbestos sheets. However, initial failures led to frustrations and in 1983, SKAT, the "Swiss Centre for Development Cooperation in Technology Management", was mandated by SDC to study the technology and to set up a network of properly assisted micro-enterprises.⁴²

Today, the main features of the "micro-concrete roofing (MCR) tiles" network are the following:

- Over 2'000 workshops all over the world produce MCR tiles and sell around 150'000 average sized roofs per year for low-cost houses and for the mainstream market.
- The tiles – as a rule – are priced cheaper than GI sheets but more expensive than thatched roofs: an MCR roof costs around 4 \$ per m² and is very strong, if properly made.
- MCR workshops are moderately profitable; if they stand on their own, it may take 2 years to get the initial in-

vestment of 5'000 \$ back (for one table, moulds and curing tank). However, if an experienced entrepreneur produces other products as well (cement blocks) and if he can provide installed roofs (instead of tiles only), the business may be more profitable.

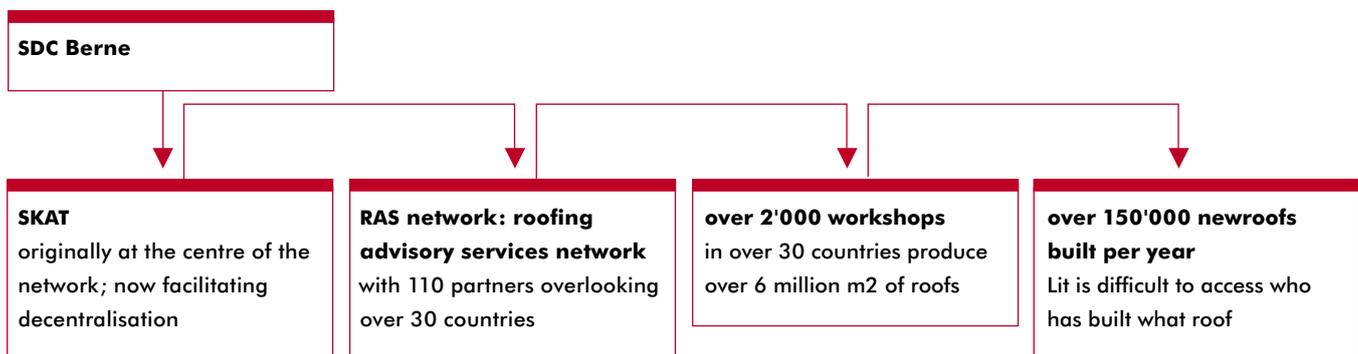
-The technology is now proven and ready for a truly large-scale dissemination. This could be done with a package of technologies for the whole range of materials for cost-effective housing and with targeted and good promotional activities.

The marketing channel consists of at least 2'000 small private workshops, but this may be a very conservative estimate. J. P. M. Parry – one of the pioneers of the technology and supplier of equipment – alone has sold almost 2000 vibrating tables in the last 15 years.

These workshops are supported by a network of support organisations in over 30 countries. The network provides training, manuals, specifications for manufacturers, and a monitoring system, MEPI, which keeps track of the

3.4.2. THE MARKETING CHANNEL

The marketing channel for Mcr (micro-concrete roofing tiles) globally



progress in the countries of operation. MEPI monitors over 1100 workshops, but it is increasingly difficult to overlook the true picture because many new workshops are coming up without any formal relationship with the network. There are more than 14 manufacturers of equipment, mainly tables and moulds, which are part of the network. The network has been able to generate some funds to finance its own activities, but like in all associations of small industries, there are also great difficulties to motivate the small entrepreneurs to contribute.

3.4.3. THE 4 PS OF MICRO-CONCRETE ROOFING TILES

The **product** is proven as an excellent roofing material, if it is manufactured (and installed) with due care and knowledge. Quality control is one of the key issues and in many cases, the quality has deteriorated due to the lack of training or simply carelessness. As the product is only branded with local brands, it is difficult to maintain the set quality standards. Despite this, the product has received the recognition as an accepted building material in many countries; SKAT and the network have paid very special of attention to quality. Reality is, however, sometimes different: despite the clear recommendation that it is not worth producing equipment or moulds local-

ly – unless there is a sizeable market for equipment – many producers have made their own tables and their own moulds, sometimes not at all on account of quality.

It has been shown in a market study that the product has a good market in certain areas, mainly if it can compete with a thatched roof market where prices are increasing, or with burnt clay tiles markets, where quality and availability are declining.⁴³

The **price** of the tiles lies – depending on the specific local situation – between that of thatched roofing material and that of corrugated iron sheets. In India, for instance, thatch is becoming more expensive than MCR tiles, and the durability of thatch is only 2-3 years. However, one has to distinguish between the cost of tiles and the cost of the roof. As a rule of thumb, a m2 of tiles costs between 4 m\$ (for simple gray tiles) and 7 \$ (for painted color tiles); for a laid roof, this cost doubles per m2.

The **place** consists mainly of the workshops, but in many cases, there are other players involved as well: masons, roof-layers, dealers. In most cases, it is very interesting for the tile-maker to offer not only tiles but entire roofs and employ or contract a team of roof – layers. By pro-

viding a service (hardware plus software), the profitability of a workshop can be significantly increased.

The **promotion** has been very weak, especially if one considers that the building materials market is a very conservative market. Nobody wants to invest in materials which are considered as "risky". Thus, it is important to "demonstrate" with a critical mass of roofs which serve as examples for the "followers" to adopt new materials. One crucial task of promotion is to have MCR accepted in every country (usually by the "Bureau of Standards") as an accepted building material. Without this, no public institution may consider MCR as building materials for schools, hospitals or even low-cost housing.

3.4.4. OUTLOOK

A detailed description of a scaling-up strategy for cost-effective building materials is presented in the following chapter. Here, we summarise only a few points:



A tilemaker can produce around 150 tiles per day on one table with one or two helpers

MCR tiles have the potential to become major contributors to cost-effective housing, but there are also some limitations:

- MCR being only a solution for the roof, it is not sufficient for large-scale acceptance as a building material; it is crucial to position MCR with complete housing solutions, including walling, flooring, windows and doors.⁴⁴
- For large-scale promotion of MCR, cooperation with cement companies should be envisaged.
- The channel should be made slightly more profitable by implementing a product diversification including products like high value tiles and by introducing more branding and links to existing distributors' networks.

3.5. 6000 PRIVATE WORKSHOPS PRODUCE OVER A MILLION LATRINES PER YEAR IN BANGLADESH

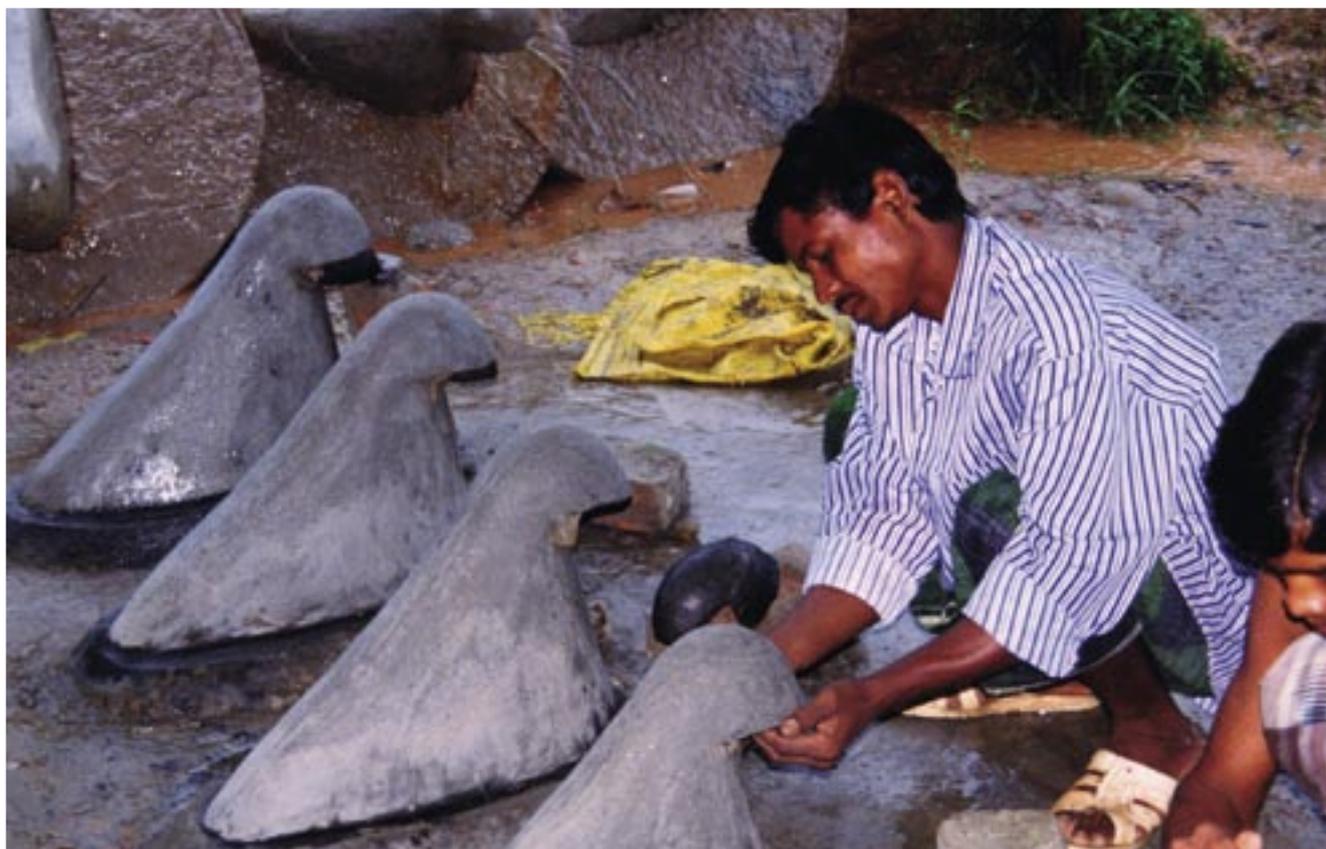
3.5.1. OVERVIEW

One of the most amazing examples of a socially relevant business is the story of private latrine producers in Bangladesh⁴⁵. SDC has supported a water and sanitation project in Bangladesh with UNICEF and DANIDA. Whereas the installation of pumps through the government agency DPHE (Department of Public Health Engineering) has been quite successful, it was much tougher to convince people of sanitation and hygiene.

A review of sanitation programmes in developing countries undertaken by UNICEF revealed that "investment in sanitation has been inadequate for several reasons. The demand is often low, and stimulating it takes time and money. Many development institutions are not attuned to demand-led programming, which may explain their unenthusiastic approach to investing in sanitation. ... Because demand for sanitation must often be generated, project success depends more on marketing than on the efficiency of engineers and builders. The scope and pace of programme development are defined by consumer demand."⁴⁶ In Bangladesh, a large and well conceived national "social mobilization campaign" for sanitation made latrines popular and created space for a flourishing private sector.⁴⁷

Here follows the key features of "sanitation by the private sector":

- Today, around 6'000 private workshops produce latrines and sell them despite stiff competition from subsidised government latrines. An average workshop may produce around 200 latrines per year at a sales price of 10 \$. The profit per workshop and per year may be in the order of 200 to 300 \$; it is not much, but still a welcome additional source of income in rural Bangladesh.
- Unfortunately, 900 of the government-owned DPHE sanitation centres still exist and undergo heavy losses; they



One of the larger workshops; the demand is good due to a local promotion programme of NGOs

undermine the market with subsidised latrines and have nevertheless difficulties to sell their products.

- People are willing to pay for latrines, because of prestige, comfort, privacy and also for health reasons. The health benefits of a latrine which costs 10 \$ (for 5 rings and one slab) are in the order of 8 \$ per year. However, the health impact of latrines is visible only if most families of a local community adopt better hygiene practices. "The national survey on latrine producers and market demand" conducted in 1994, showed that the number of people who realise the usefulness of having a latrine

has been growing but that the low-level household income continues to remain the main problem. The survey recommended therefore to promote also the low-cost technology options of home-made sanitary latrines.⁴⁸

- Bangladesh has been able to increase the use of sanitary latrines from 4% in 1985 to 44% in 1997.⁴⁹ Today, the 900 DPHE, the 500 NGO and the 6000 private latrine producers, sell altogether around 1.2 million latrines per year. At this rate, it may take another 12 years to reach full coverage. This is a very good record in South Asia.
- At the beginning of the project, in 1992, the private pro-

The marketing channel for latrines (bangladesh)



ducers were at the centre of attention; however, many suggested options to support them, for instance with credit, did not work out.⁵⁰ The strategy was very clearly – and this was very wise – to focus on market creation. This, indeed, worked and it seems that the entrepreneurs will take care of themselves, once there is a market.

- Today, neither SDC nor any other donor seem to consider the private latrine producers as a target for BDS (Business development services), but it would be well worth exploring whether these small businesses can become more viable and unleash their full potential. One of the options would be to think of building material workshops; there are already some workshops producing Micro-concrete roofing tiles.

3.5.2. THE MARKETING CHANNEL

Whereas other markets have been promoted through strengthening supply channels, the market for latrines has been created only by stimulating demand, and private producers have responded to the "social mobilisation campaign". Although DPHE has distorted the market in supplying subsidised latrines, the private sector could compete with DPHE and develop its own market. This led even to the piling up of stocks in DPHE centres. Nevertheless, one has to admit also that the presence of DPHE has initially allowed to make the product well-known in rural Bangladesh, which was the starting point for the development of a market.

3.5.3. THE 4 PS OF PRIVATE LATRINE PRODUCTION

The **product** seems to have a very good acceptance. Most people buy the latrine for reasons of prestige, comfort and privacy, and they build a superstructure made of bamboo on the top. Some people do not buy a pan with 5 rings but only with one or two rings. There are also quite a few home made latrines which may be of low standard but very cheap. The home-made latrines were recommended as an entry point, but the social mobilization campaign motivated people to construct a hygienic latrine (water-sealed latrine). It is interesting to observe that, due to the social mobilization campaign, the product is much more than simply hardware; the latrine is only the physical part of the product. The real product is a "hygienic sanitation practice" which includes for instance washing of hands. It is remarkable that some private latrine producers have included this "software" into their product and do promote themselves hygiene practices.⁵¹

The **price** depends on the standard; a home-made latrine is generally affordable for everybody, whereas a water-sealed latrine with one pan and 5 rings costs 10\$. This

is too much for the poorest, but it is reachable for a great majority of people. The margins for the manufacturer are satisfactory, though one cannot become a very rich person from a latrine business.

The **place** includes many actors, especially the NGOs and the government as promoters of hygienic practices. The VSCs (Village sanitation centres) of DPHE are in competition with the NGO centres and the private producers, but the private manufacturers seem to do quite well. It is indeed amazing to see how dynamic the sanitation industry has become: there is hardly any village in Bangladesh without a producer and it is more and more common to see a rikscha or a bullock cart loaded with a latrine, on the way to a new customer. The fact that 1,2 million latrines are sold every year with a total turnover of 10 million \$ is an important factor of the village economy of rural Bangladesh.

It is obvious that, in this case, **promotion** was and is the key to success. The fact that a well conceived, software-oriented promotion campaign has created a market for a product which was considered a hopeless case, is a remarkable achievement. Initially, one thought that people would not even accept latrines free of cost. It is an indicator that it is important for development cooperation to focus on more software than hardware, and to improve communication.

3.5.4. OUTLOOK

It looks as if one should explore ways to support the latrine workshops further and to analyse their growth potential. Where has it happened that 6'000 small enterprises have emerged in less than 5 years with hardly any support? It would be interesting to know more about entrepreneurial profiles and the network of potentials. Bangladesh has not many non-farm industries in rural areas, and based on the latrine producers, some industrialization could well take place. The obvious diversification would be in cement-based building materials. An earlier study by SDC on the scope of building materials discarded cement-based products at that time due to the fact that Bangladesh does not have stones and needs to import cement. This, however, has not been a real hampering to the cement based building industry and it seems that the potential is there. It also seems likely that a cement company will soon be opened in Bangladesh.

A very promising approach is now pursued by SDC in Bangladesh⁵² to open the participation of the private sector in the whole water supply sector and to apply a "demand approach for behavior change, pumps and latrines". The purpose is to achieve a synergy of various partnerships.

This new approach would define marketing strategies with the following elements:

- the creation of VDCs (Village development centres) through which the villagers would take action to improve their situation;
- the development of affordable "Watsan" (water and sanitation) products in consultation with the users/customers;
- integrating partner packages (what different NGO partners have to offer) in one integrated WPP (Watsan Partnership Project);
- the development of joint marketing messages and promotion campaigns that include village participation, hygiene changes, and water and sanitation options linked to suppliers;
- the development of income generating activities/products linked to water supplies, and
- phasing-out within three years."⁵³

This demand side approach is now tested and looks very promising: it has among other dimensions developed the "Jibon" pump which is a cheaper drinking water pump costing one third of the "Tara" pump. It is marketed through similar channels as the treadle pump.

The other large potential is replication. Why has the same strategy not been successful in other countries? In India, for instance, the sanitation coverage is much lower. It is

obvious that several basic conditions must be in place to implement successfully a "social mobilisation campaign". It would be an illusion to think that such a "social mobilisation campaign" could just be aired through television programs: it requires a strong commitment of many organisations, including the government, village leaders and religious leaders, etc.

3.6. THE ROPE PUMP IN CENTRAL AMERICA: THE SCOPE FOR PRIVATE DRINKING WATERPUMPS

3.6.1. OVERVIEW

The rope pump is not a new invention, it has been known for over 100 years. But only since 1990, "after a ten-year development process, the rope and washer pump has proven its efficiency, low breakdown rate, low price, and very high social acceptance"⁵⁴ Today, there may be over 30'000 "bombas de mecate" in place all over Central America.

Many efforts went into the development of the pump in Nicaragua at the time of the revolution: the first prototypes were developed and disseminated at the CITA-INRA (Appropriate Technology Research Centre of the Agrarian Reform Institute). In 1985, the institute was disbanded and the future of the rope pump became uncertain. Some 50 prototypes had been made, but nobody dared to go



The rope pump is very popular in Central America due to low cost and high efficiency

ahead with a commercial production and dissemination. "it was an ill wind, however, that blew good fortune to the project. In September 1988, hurricane 'Juana' struck Nicaragua, devastating much of the atlantic coast of the country. A total of 200 rope pumps were sold to the international organisations which were providing emergency aid to the victims of the disaster".⁵⁵

The breakthrough came only when a group of dedicated people founded a private company "Bombas de Mecate" and started manufacturing the pump on a regular base. They set standards of quality and also managed the intricacies of mass production and marketing. During the first 5 years, the company made losses; only in the last two years, the company's balance sheet reached the black bottomline.

3.6.2. THE MARKETING CHANNEL

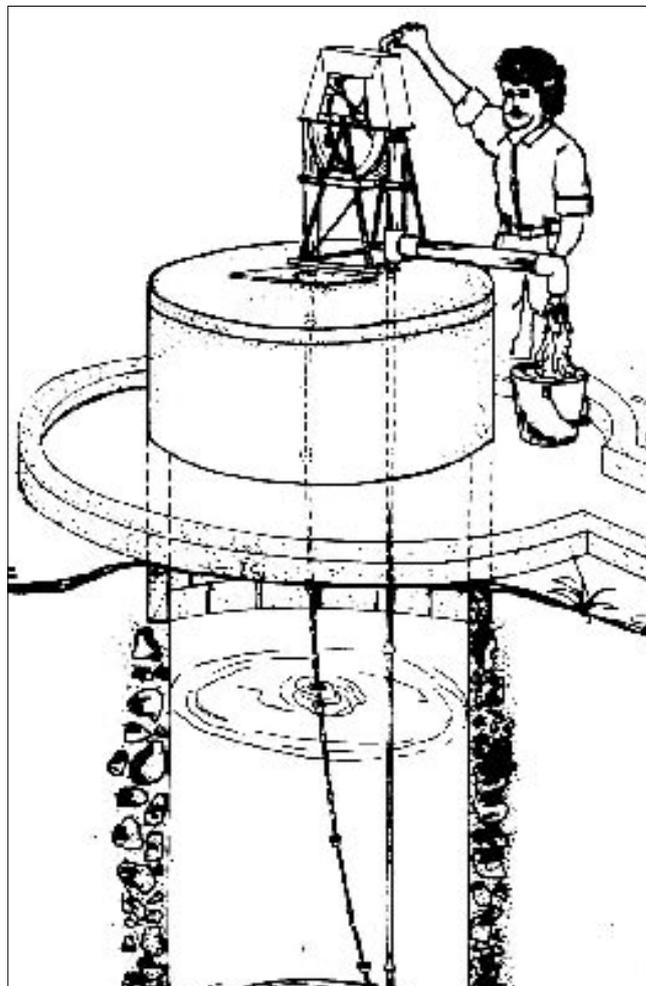
In Central America, there are many small manufacturers of the rope pump who are not operating as industries but rather as "artesanos". They make pumps on order, and they use all kind of qualities, materials, etc. It is not known how many producers exist, but most of them have simply copied or re-invented the pump, some with great ingenuity, some with rudimentary knowledge and practice. Very clearly, some pumps are below acceptable standard and may have damaged the reputation of the pump. But in view of the high price elasticity of the pump, many people prefer to have a cheap locally-made pump.

Bombas de Mecate (BdM) employs 25 people and produces around 3'000 pumps per year. The company is certainly the trend setter and the largest manufacturer. They have also set up a workshop in Honduras with 7 employees.

The pump manufacturers deliver the pump directly at the site. Even BdM is delivering the pump on 4-wheel drive vehicles; one team of 2 with a vehicle can install 4 pumps per day. There are no dealers or intermediaries involved at present, and this is in my view a disadvantage for large-scale production, as it will increase installation costs, giving room for the local production by "artesanos". This is not necessarily a bad development, but it will hamper the rhythm at which the industrial rope pump can spread.

3.6.3. THE 4 PS OF THE ROPE PUMP

The **product** is excellent and well adapted to the local environment. In order to achieve a full coverage in rural areas of Central America, there may be no better solution. It is very simple, easy to operate and can pump



from a well which is 60 metres deep. It is much more efficient than the bucket and rope system which is very cumbersome to operate. The efficiency of the rope pump is apparently very high: 80-90%.

The **price** is very attractive: a family rope pump costs around 70 \$ and a communal pump around 100 \$; this compares very favourably to the 500 \$ of an India Mark II or Afridev pump. This price excludes the cost of the well, and the installation cost. Installation by BdM can be relatively high, depending on the distance (BdM charges a fee per kilometre). The willingness to pay⁵⁶ for the rope pump is very high, despite the still pertaining perception that water supply is a "human right" and therefore a duty of the government. It seems that private sales of pumps cannot reach the very poor – at least in the absence of credit – but they reach now an amazingly high proportion of the total population. There is indeed no harm that NGOs like CARE or even the government gives the pump on credit or even free, provided it can target this subsidy very well. However, it would be disastrous if subsidies were to erode the willingness to pay and destroy the viability of the supply channel.

The **place** is still weak: only BdM has been able to set up a significant operation and a relatively large market is required to maintain it. The potential is very high, though: in Nicaragua only, there are 250'000 open wells which wait for a rope pump to be installed. It seems to be crucial to strengthen the supply channel and BdM is now thinking of integrating dealers and "installers" into the channel.

However, the crucial bottleneck is **promotion**: although the pump is already quite widely known, there are hardly any efforts done for a systematic promotion. BdM has invested 15'000 \$ of their own money in promotion, and this stretches their limits already a great deal. A well conceived promotion campaign at the level of Central America would certainly open up the market more sig-

nificantly and give room for many workshops to come into existence.

This promotion cannot be done by the industry on its own: first of all, the margins are not enough to allow for promotion costs on a sustained and significant scale; secondly, any promotion done by BdM or by other workshops is **generic** promotion which will also benefit the "copiers".

3.6.4. OUTLOOK

It would be more than desirable to have a larger dissemination of the rope pump in Central America and in the rest of the world. This pump is now at a stage where



This private workshop "Bombas de Mecate" manufactures around 3'000 pumps per year and has reached the stage of profits after 5 years of operation. In the picture: Mr. Juan Gago, one of the owners.

it would qualify for a larger effort of replication and dissemination.

BdM has already got a mandate to set up a technology transfer unit and has documented the technology very well. However, in order to achieve a technology transfer to many other countries, it is not sufficient to have this transfer unit. It would be desirable to set up a network similar

to the SKAT RAS (roofing advisory service) network. The BdM transfer unit could then play the role of the nodal agency for Central America and become a centre of excellence for training. It also seems important to separate the dissemination activities from the private company BdM in order to avoid any conflict of interest. Whereas BdM is a rope pump **provider**, the transfer unit must be a **facilitator**, and these two roles are not always compatible.

The same distinction should be made for the promotional activities. It would be very wise – and probably the best possible support for large-scale dissemination – to launch a really significant promotion and marketing campaign for the pump. This could be done as a **public investment** and would by no means be a subsidy to a single company, provided this promotion remains generic and promotes the pump as such and not individual companies. Such a campaign could even be a good investment for the water supply programmes in Central America, as it would save on the cost of water supply if a strong private supply channel can emerge.

4 THE FUTURE: HOW TO SCALE UP THE MARKET CREATION APPROACH

4.1. BRINGING THE MARKET CREATION APPROACH INTO THE MAINSTREAM

4.1.1. GOOD REASONS FOR MAINSTREAMING AND SCALING UP

The presented examples are still marginal projects or programmes, and they are not known to the development community and to the world as model cases. Despite having a comparable impact to that of the "Grameen Bank", not much is known about the power and potential of the market creation approach.

Micro-credit (targeting groups of poor people as customers for credit) has become a mainstream instrument of development policy. Similarly, the market creation approach deserves to become a **mainstream instrument of development co-operation**, because it can give an answer to some very striking problems of the world. The market creation approach is an unusual but very effective and efficient way to development, because it can **make a business for poor people out of development**

tasks. In this sense, it is a model which may unleash some of the energies required to overcome the global poverty problem in a sustainable and relatively fast way. The approach is also in line with current thinking on "good governance", as it may strengthen and empower the private sector and civil society and mobilise them for the cause. With ever scarcer resources for development, the task of poverty alleviation should not remain a domain and responsibility of the government alone.

4.1.2. NECESSARY STEPS TO BRING THE MARKET CREATION APPROACH INTO THE MAINSTREAM

What is not known cannot be a model and the first task is to know more about the market creation approach to development. There are several steps needed to get the market creation approach into the mainstream:

- First step: we should document the market creation approach and make it known to the public.
- Second step: we should initiate a forum for dialogue and



This is a drum kit for drip irrigation which costs around 25 \$, including the drum, and which can irrigate 500 plants. This widow and her son have bought 3 drum kits and made 75 \$ return on each kit in one season (three months)

liaise with interested donors, NGOs and the corporate sector;

- Third step: we should realise some large-scale dissemination projects and create examples which become success stories;
- Fourth step: we should create the institutional set-up for large-scale dissemination programmes.

In the following two chapters we shall sketch out a strategy for scaling up micro-irrigation and cost-effective building materials.

4.2. EXAMPLE 1: SCALING UP LOW-COST MICRO-IRRIGATION

4.2.1. WHY MICRO-IRRIGATION? TACKLING BOTH POVERTY AND WATER SCARCITY

The pre-condition for scaling up a market creation approach is to have a product which can be applied almost universally and which has a large impact on the livelihoods of many people. This is the case for irrigation, provided it can be made available to the millions of small farmers:

- Three quarters of the farmers in developing countries cultivate less than 5 acres. A typical farmer in Bangladesh, for example, cultivates a total of one and a quarter acres divided into 4 or 5 separate plots.
- The irrigation technology available today on the market does not meet the needs of small and poor farmers: as shown previously, the World Bank promoted pumps in Bangladesh for a command area of 40 acres (deep tubewell) or 15 acres (shallow tubewell). For the majority of small and marginal farmers, the access to irrigation is difficult and costly, but with products cheap enough to be affordable and small enough to fit the needs of small plots between a quarter acre and a half-acre, one could achieve a substantial improvement in productivity and increase in rural incomes.

Micro-irrigation is such a technology: it is well known that without water, nothing can grow, and with water, crops can sprout and grow even in a desert. In terms of poverty alleviation, it can make more of a difference for a farmer to have access to water than to land. Paradoxically: a farmer without a pump seems to be less well off than a landless farmer, because – without water – the land is useless and life extremely risky. Crop failures can ruin the lives of small farmers.

IDE, International Development Enterprises, an America-based NGO, has developed suitable technologies for these small farmers. There are basically three technologies available:

1. The treadle pump: this technology is described here, as well as the impressive impact, it has had on poverty

alleviation in Bangladesh, Nepal and India. However, little is known about it. A documentation about its impact and the approach used by IDE is under preparation. There is a potential for 10 million treadle pumps in Eastern India, Nepal and Bangladesh. However, in other parts of the world, it is difficult to achieve high numbers, as the treadle pump is not suitable for water tables deeper than 6 m.

2. Low-cost drip irrigation: Access to drip irrigation removes a critical constraint to small farm productivity technology in semi-arid areas. But conventional drip systems are too expensive to be affordable and unavailable for land below one acre. In a four-year design process in which small farmers played a key role, IDE developed drip technology that cut the cost of conventional drip systems by two-thirds and IDE customized it for small plots. The low-cost drip systems start at \$5 for a bucket kit irrigating a 20 sq. meter kitchen garden, and can be expanded in steps up to 5 acres.



Water scarcity and drip: some facts!

- The next century will see large parts of the world having acute water shortage;
- 80% of the water is used in irrigation;
- Drip irrigation saves up to 60%; sprinkler irrigation up to 50% of water % compared to flood irrigation;
- Only 2% of agricultural soils are under drip, mostly in Israel and USA;

- Conventional drip systems are costly: approx. 1'000-2'000 US \$ per acre;
- IDE has developed a range of affordable systems for landless people and for small farmers; they cost a fraction of this, starting at 5 \$. The average cost is 250 \$/acre.

3. Low-cost sprinkler irrigation: IDE is developing a variety of low-cost small plot sprinkler irrigation systems in India and Nepal in a process similar to the one used to develop new markets for low-cost drip irrigation.

New markets operated by private sector micro-enterprises initiated in the past two years in India and Nepal have now sold and installed the first 10,000 low-cost drip systems. Low-cost drip test plots are being tested by small farmers in China, Sri Lanka, Vietnam, Zimbabwe, Zambia and Haiti. Netafim, the Israeli irrigation multinational, Chapin Watermatics, a New York-based drip irrigation company, and the Yanshan Institute, a small company in Beijing, are private sector players in the rapidly emerging new global market for low-cost drip irrigation.

As a result of the rapid development of this new global affordable drip irrigation market place, IDE has joined forces with Sandra Postel⁵⁷, a noted water environmentalist, to launch a global initiative on water saving irrigation. The purpose of this initiative is to expand the global adop-

tion of drip irrigation from its current low level of 3 million hectares (1% of global irrigated acreage) to 40 million hectares by the year 2015. The achievement of this goal would have profound positive impact on growing water scarcity projected over the next quarter century, and on the world's capacity to feed its rapidly growing population.

4.2.2. CREATING A MARKET FOR MICRO-IRRIGATION

In order to create a market for poverty-oriented micro-irrigation, two changes need to happen:

- **On the demand side: small farmers and gardeners must be convinced;** this is the easier part of the game, apparently, because initial demonstration projects in India and China have shown an enthusiastic response. It was not at all difficult to convince the farmers, but obviously without a local demonstration and testing at the site of farmers or small horticulture plots, nobody understands what is talked about.
- **On the supply side: drip companies must be convinced that the low-cost market is the solution for the future.** This seems to be the more difficult part, as the mindsets are geared towards high-cost and high-tech systems which needs to be installed tailor-made by an irrigation engineer. The prevailing, very heavy subsidy system in India is reinforcing this trend towards high-cost and



A very poor woman near Indore (India) is proud and happy with this bucket kit which irrigates 100 plants



IDE is developing a horticulture income kit which will maximise the income from a 40m² plot; it may look similar as this model from USA and will have instructions in form of pictures on how to install and how to grow vegetables with a high yield. It may cost 10 dollars and should yield at least 100 dollars.

prevents drip companies from setting up a marketing channel for low-cost systems. Some drip companies (there are more than 50 in India) are changing their perception now, as they see that the subsidies will dry out.

However, drip companies have tried to recover their costs through sophisticated parts (such as the drippers); there are some fears that low-cost systems will be too "generic" to control a marketing channel. Indeed, the low-cost drip system uses "generic" materials from different drip companies, and it may become a difficult task to set up local assemblers and dealers. This calls for involving other players such as NGOs, agro-input companies, donors and the government. It seems obvious that the drip companies will not be able to create the market for low-cost systems because it will erode their margins on the high-cost systems.

4.2.3. PRODUCT DEVELOPMENT AND PRODUCT RANGE (DRIP, MICRO-DIESEL)

The major challenge for a market creation approach in micro-irrigation is to develop a range of products which entirely satisfy the needs – and unleash the potentials – of marginal farmers and horticulturists. The following range

of products which is now tested has received an overwhelming response by poor people and an extremely fast adoption. The fact that in less than 2 years of test marketing over 10'000 units have already been distributed is a remarkable indicator that the products really cover a widespread need, not at all a market niche, but a tremendous market potential.

Mini-systems for horticulture (bucket kit)

The bucket kit consists of a bucket (or two) with one to four drip lines. It costs only 5 \$ but can already generate an income of 50 to 100 \$ in one season, depending on the crop. Without a bucket kit, many families cannot or would not grow vegetables, simply because they would need too much water. With the bucket kit, a bucket full of water twice a day is enough. Very often, a bucket needs to be carried for half-an-hour or more.

IDE is now working hard to develop the "horticulture income-generating kit". This combines hardware and software, and would optimise the crop output of a small family around their homestead, using the small kitchen garden, the fence and also the roof (where many poor people already grow pumpkins). Thus, it could make cash crop farmers out of very poor people who have

access to 40-100 square meter of land and/or improve their home consumption of vegetables. However, to develop such an optimised kit and select the best crops and species will require a massive collaborative effort involving agricultural research stations, NGO's, major donors and the corporate sector. It has the potential of reaching half the present poor population of the world, i.e. those who have access to a tiny piece of cultivable land, including the fences and the roof.

The purpose is to create a bucket kit self-explanatory with assembling instructions for the kit on the box and drawings on ways to plant vegetable crops.



This drawing by IDE India gives an idea of the kit

Midi-systems for small and marginal farmers (drum kits and sprinklers)

Different models of low-cost drum kits have been developed for different crops and spacing patterns. The cost of these kits is in the range of 25 dollars. They may help grow 500 plants on average. They are also complemented by low-cost sprinklers which may irrigate small plots of wheat, sorghum or millet. Sprinkler irrigation saves a little less water than drip irrigation, but is much more efficient than flood irrigation.

An example: Sampat Bai, her sprinklers and her drum kit:

Sampat Bai lives near Indore in India and has a family of 7 people to feed (3 sons, one daughter). Her husband, Somaji, is a wage labourer and earns 30Rs/day (less than one \$). They have one acre of land on which they grow wheat and soybean. She has a pump (5 hp) and bought two moveable sprinklers from IDE; the whole installation cost Rs. 2500 (60 \$) and each sprinkler can irrigate a radius of 40 feet. If she moves the two sprinklers in 8 shifts (16 sprinkler points), she can irrigate the whole acre of land. She saves 50% water and would in

any case not have enough water to irrigate the land with flood irrigation.

She has also installed a drum kit with 5 drip lines and irrigates roughly an extra 100m². Every week, she expects to sell two baskets of tomatoes and eggplant at Rs. 100 each for 10 to 16 weeks. In addition to their home consumption, the overall income from the drum kit is therefore Rs. 1000 to Rs. 1600 in cash, but she saves another Rs. 100 per week, as she does not have to buy vegetables from the market (she used to buy vegetables for that sum). She says that the drum kit saves her work as the garden is very close to her house.



Sampat Bai has a family of 7 to feed. With the sprinkler, she can grow wheat. With the drum kit she could grow vegetables for 100 dollars



Customised systems for small and middle farmers (water impact and global drip initiative)

For large-scale crops such as cotton or sericulture, there are also systems in the test marketing phase. Especially for cotton, there are now pre-packed systems available which can be installed at a cost of roughly 350 \$ per acre without a pump and 450 \$ per acre with a pump. This is considerably less than what a customised system would cost now, even including the subsidies. The average cost

for conventional installed systems is at least in the order of 1500 \$ per acre and the minimum area for an installation is 2,5 acres.

IDE has been able to lower the cost by pre-packing the systems in kits for 10'000 m². Four such kits are enough for an acre, and they can be installed one after the other. These kits were tested in the "Maikaal" project, a commercial project growing organic cotton in the Indore region of India. The project works with over 1'000 farmers and grows biological cotton on 7'000 acres. Farmers are very enthusiastic about the drip system, because it allows them to grow the cotton earlier in the season, which increases their yields considerably, and makes the cotton more resistant to pest attacks.



Creating new markets means customising and packaging systems for specific needs: this kit is for 10'000 m² of cotton and costs 75 \$ (1 acre requires 4 such kits)

Smaller pumps (electric pumps and micro-diesel)

The most common pump in India is a 5 horsepower diesel engine. There are also 3 hp engines available, but as the subsidy is given for the 5 hp pumps, demand focusees on the latter. Most small farmers cannot use such a big pump. IDE is therefore looking for a mini-diesel pump of 0,5 or 1 hp. This would suit most marginal

farmers' needs and be much cheaper to operate. Till now, operation costs have been heavily subsidised in India both for electric as well as for diesel pumps: electricity is given "free" of cost or at nominal rates, and diesel has also been highly subsidised. When the Indian government withdrew the diesel subsidy after the landslide election in autumn 1999, the parameters for cheap irrigation were suddenly set afresh.

In combination with water saving irrigation devices such as drip or sprinkler irrigation, it is possible to use a 0,5 hp pump and have almost the same irrigation effect as with a 5 hp pump.

4.2.4. PROMOTION AND MARKETING

Place: manufacturers, assemblers and dealers

It would be important to set up a supply channel for manufacturing, assembling and selling low-cost drip and sprinkler irrigation. In India, the material for drip and sprinkler irrigation is available on the market, in other countries, the supply of materials and their cost needs to be studied. Basically, the key problem is to set up local assemblers who can work with a few tools and can start assembling low-cost drip kits with a working capital of 200 to 300 \$. For cotton kits, the working capital requirement may be higher, but with a stock worth 2000 \$ of material, a local assembler can already go quite far. A network of dealers would also be required, as the assemblers may not be good at sales and promotion.

Promotion: agro-input companies

Agro-input companies could indeed play a major role in promoting low-cost irrigation devices, and it would make a lot of sense for them to do so. As the impact study of the treadle pump has shown, 20% of the farmers make 500 - 600 \$ out of their half-an-acre plot, and yearly, they purchase around 25 \$ worth of agro-inputs. This is a good potential market for seeds, pesticides and fertilizers, and if the agro-input companies give good advice to the small and marginal farmers, the crop yields may increase significantly.

One of the distributors of a large agro-input company in Mahhubnagar, India, has a network of over 100 dealers; he has created an NGO which gives advice to the farmers on how to use the inputs in an optimal way. The farmers are paying for this advice, a sign that they value it as being worth cash. Indeed, far-sighted companies prevent their farmers from using too many pesticides and fertilisers at the wrong time. This distributor is very motivated to promote low-cost drip irrigation devices in

the district where he is operating. Such a cooperation could also reduce significantly the marketing costs for micro-irrigation, as the network of dealers already exists.

The big kick to create a critical mass

One important aspect of market creation is to achieve a critical mass and density as fast as possible – at least in some places. In the case of the treadle pump, this kick came from the Bangladesh Tobacco Company. It delivered the treadle pump on a loan basis to their contract farmers growing tobacco and recovered the loan with the tobacco purchases. This created for some time a critical density in Northern Bangladesh, in the operating area of RDRS (Rangpur-Dinajpur Rural Services), the NGO which has developed the treadle pump.

In order to "give such a kick", it is important to cooperate with a large corporate sector company (for instance Maikaal Bio Re Ltd.), which can reach out to a large number of farmers and create an incentive to set up a supply channel in the respective area. Cooperating with large NGOs or watershed projects may also be useful to create the critical mass.

4.2.5. SUMMARY: NECESSARY STEPS TO BRING MICRO-IRRIGATION INTO THE MAINSTREAM

A strategy bringing low-cost micro-irrigation into the mainstream could consist of the following steps:

- To prepare a **documentation on the approach and impact** of the treadle pump in Bangladesh, India and Nepal. This work is under way, but more is needed, especially to explore the potential for micro-irrigation, and to determine the scope of a large programme, as well as the potential impact on alleviating poverty and reducing water scarcity.
- To finalise **product development and test marketing**. For this, it is planned to optimise the product in order to make the marketing more cost-effective and the channel more profitable. The product range and mix are described here and should focus on mini-, midi- and maxi-solutions.
- To engage a **dialogue with interested donors and NGOs** to bring the topic of poverty oriented micro-irrigation into the agenda of donors and NGOs.
- To follow up the initiated **dialogue with some agro-input companies** (Novartis and Nagarjuna fertilisers), to draw their attention to the enormous potential of serving small clients who have not used any irrigation technology and are now coming into the market as producers.
- To set-up some **pilot projects for large-scale dissemination**. Such an endeavour should be a joint co-operation between one donor agency (which does funding, policy dialogue and monitoring of social and economic impact), one implementing NGO (as facilitator of BDS), one agro-

input company (promotion and use of the dealers network) and one private delivery channel (workshops, assemblers, "installers" and a drip company for supplying the materials).

- To bring a **policy dialogue in motion** which looks at micro-irrigation with the perspective of a significant global initiative for alleviating poverty and water scarcity;
- It may be too early to think of an **institutional set-up** for large scale-dissemination strategies, but it is clear that an institution is needed which can do the lobbying, the facilitation of BDS and the co-ordination of projects and programmes. As an NGO, IDE is doing this job very well, but in order to achieve an even larger impact, it is required to make use of existing marketing channels. For this, a strong co-ordinating body would be required.

4.3. EXAMPLE 2: SCALING UP THE SALE OF BUILDING MATERIALS AND CLOSING THE HOUSING GAP

4.3.1. OUR ASSETS: A SOUND TECHNOLOGY, SMALL ENTERPRISES AND A NETWORK

The micro-concrete roofing tile case is the only example focusing clearly on small enterprise promotion. The SKAT RAS (roofing advisory service) and the global network have acted as facilitators for the 2'000 workshops that exist today.

The network has achieved a remarkable progress, and has offered extremely valuable inputs to support the industry:

- Over 30 publications dealing with the technology, management, marketing, and extensive training materials have been produced; many of them are available in several languages.
- An advisory network is active in over 30 countries and is able to provide training and other kinds of support.⁵⁸ This network may partly be sustainable, but it is not very likely that it will be strong without external support.

In this sense, it is a legitimate question to ask for how long such a network needs support and when the sector will be able to finance its networking activities through the contributions of its members.

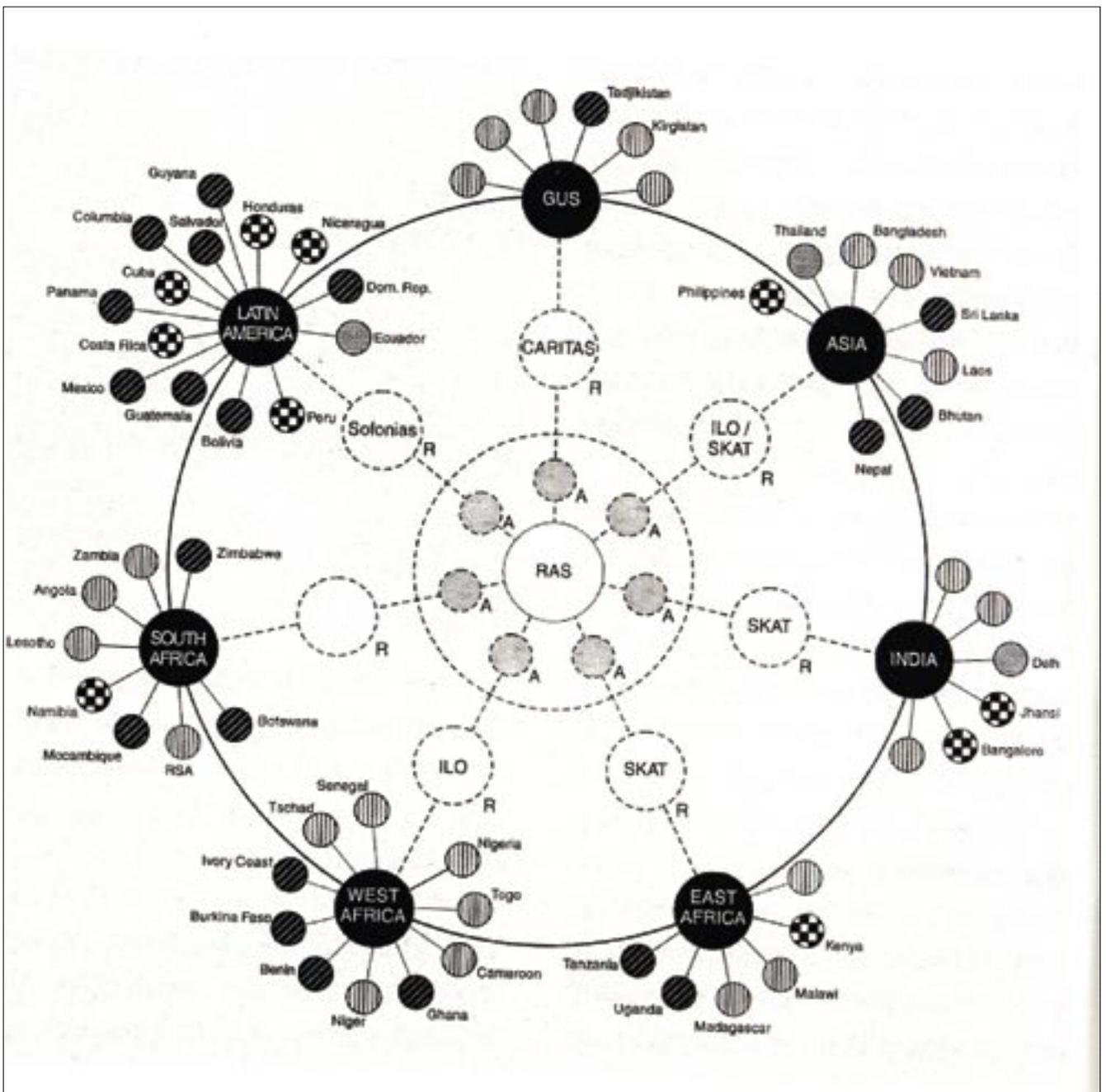
The answer to this question is open, but the reason why the progress – though remarkable – is very slow has to do with the fact that **market creation** has not taken place yet. Except in some countries like Honduras or Cuba, the critical mass has not yet been achieved to make of MCR a mainstream building material with a market share of at least 10%. Future efforts should therefore focus on market creation and tackle the demand side.

But which one of the following markets is the right market? Should it be the rural market, as many NGO

representatives who have promoted MCR would like it most? My impression is that many MCR workshops have been set up in an area where the demand for tiles is sub-critical and does not allow for an "all-year-round" production; Should it be the market of the middle class? In some countries, MCR workshops have started to tap this middle class market, and it makes sense to have a product mix which allows for better margins; apparently, it is crucial to supply this market, as people are willing to pay 7 \$ for a red painted tile compared to 4 \$ for a grey tile. Or, should it be the large low-cost housing market of the self-constructors? In this case, it is by far not enough to supply only roofing tiles but a whole range of cost-effective building materials and to market them in a suitable manner.

4.3.2. CREATING THE MARKET: TAPPING THE HOUSING MARKET OF THE POOR

Where is the market for cost-effective building materials? The housing gap in many developing countries is very big, and there is little hope to close it with the present approaches. In India, the housing gap is over 40 million houses; moreover, most rural houses are of inferior quality and there is a strong desire to improve houses by moving from "kutcha" materials (thatch, straw, mud) to "pucca" materials (concrete, bricks, tiles, etc.). In Mexico, the housing gap is 6 million units and the present delivery system cannot even cope with the growth rate of the population, so that the gap is widening.



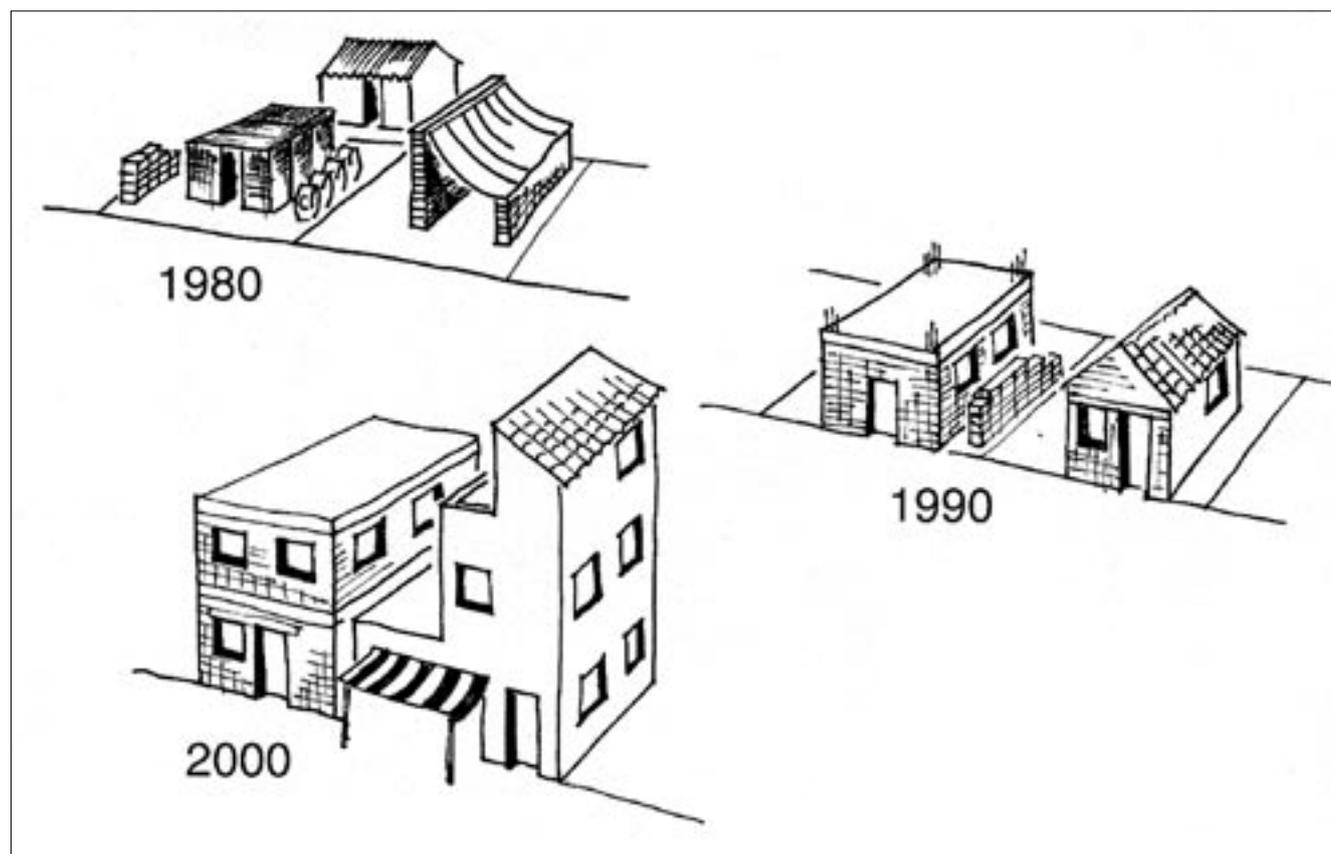
Cost-effective building materials are the key to solving the housing gap. The cheaper the house, the more it will be affordable, and the larger the demand will be. In this sense, housing is very price elastic, but one should not want to compromise on quality. People want to have the assurance of durability for their precious investment in housing and would not risk to invest in poor materials.

Most low-cost housing schemes do not reach the majority but only limited groups:

- one approach is geared towards people with a regular employment where it is possible to give a loan and recover the interest from the salaries; in most cases, they come from a lower middle class – and are not poor;
- the other approach is to provide very small low-cost houses to lower class people, but the houses need such heavy subsidies that there is always a significant group which remains excluded.
- the large majority is thus not having access to what they need: they do not have the collateral for getting a loan and in any case they would not be able to afford the interest on a loan of more than 2 - 3000 \$; at the same time, they do not qualify for a subsidised house. Even in the case of the large-scale housing scheme in South Africa, the poorest seem to be excluded from the subsidies.⁵⁹

The majority of the poor in developing countries do dream of having a house, and the only way to fulfill this dream is to build it on their own (self-construction) and in "instalments" (over a period of 10 - 20 years.) If one observes urban slums over a longer period, one sees a lot of gradual progress: in the first years, the materials are cardboard, jute bags or whatsoever; after 5 years, some of the walls are made of concrete blocks; after 10 years, the house has a concrete roof, and after 20 years, it may have a second floor. This "brick by brick" method of **"incremental house construction"** is by far the most important market for building materials, and it will realistically be the only hope for the large majorities to have decent shelter conditions.⁶⁰

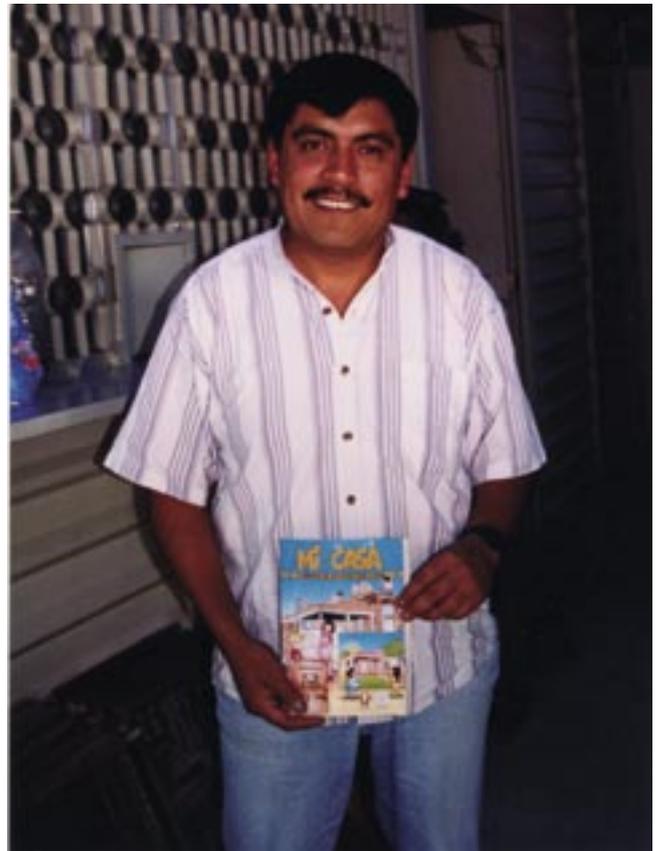
Observations in Mexico show that many poor families purchase building materials very regularly: every Saturday, when the husband comes home with the salary, they go and buy a few bricks. Women are often the driving force behind such a purchase because they are more interested in the improvement of the family, and a house represents security, dignity and stability. Purchasing building materials "brick by brick" is also a kind of inflation-proof saving scheme, and it has the additional advantage that the money cannot be spent for drinking.



Brick by brick evolution of the low-cost informal housing sector: "incremental" housing is the most promising strategy to tap the housing market of poor people and to solve their housing problem; their house will evolve over a period of 10 to 20 years



This is a "Mi Casa... es posible!" centre for the "self-constructor" in Mexico. Cementos Apasco have set up over 100 such centres in Mexico where people can buy all materials, get a manual, drawings for 10 housetypes and advice from 2 students in architecture trained in counselling.



4.3.3. PRODUCT DEVELOPMENT AND MIX

A scaling-up strategy for cost-effective building materials needs first of all to broaden the product mix and to offer cost-effective solutions for entire houses; that means the following:

- offering a range of building materials for flooring, walling, roofing and even windows, doors and sanitary equipment.
- looking at the product in a more holistic way: nobody dreams of a tile, but every family aspires to have a decent house.
- Including besides the building materials services like architecture, masonry, roof-laying, etc.

For many of these applications, the technologies are there and the knowledge is available from the wider network in which SKAT and RAS have been involved: the BASIN network (building advisory services network) provides solutions for walling, roofing, binders and earth construction.

4.3.4. PROMOTION AND MARKETING (LINKING UP WITH CEMENT COMPANIES)

In order to reach the majority of the low-cost building market – and the self-constructor – innovative marketing strategies are required. An excellent example of

such a marketing effort is the initiative "Mi Casa... es posible!" in Mexico which was set up by Apasco Ltd., a cement company belonging to the Holderbank group. "Mi casa" is a programme which targets the self-constructor as a client and provides him with all he needs to realise his dream, to build a house.

Apasco has set up over 130 "Mi Casa" centres, run by their distributors, where the self-constructor can do the following: buy the building materials at a decent cost, get model plans, a training manual, a training video and courses, get advice (two students of engineering/architecture are posted in each centre and give advice in technical and legal matters).

It would make a lot of sense to cooperate with such marketing networks and link the micro-enterprises to the cement distributors. This would enhance the promotion for the materials, set quality standards and get the products under a brand name, rather than having them as "generic" products.

On the other hand, it is very important to **integrate micro-enterprises** into the supply channel of cement companies which cater to the needs of self-constructors. Micro-enterprises have the following advantages, and also some disadvantages:

- If the micro-enterprise produces a good product which can reduce the cost of building materials per m², it will enhance the potential of housing considerably. If the price elasticity is more than 1, it can be assumed that a decrease in costs will lead to an over-proportional increase in demand;
- Micro-enterprises are operating in a decentralised manner and thus have lower distribution and transport costs. Micro-enterprises may also have generally lower production costs because of lower capital intensity.
- Finally, micro-enterprises can provide additional jobs and this advantage on its own can stimulate the demand through the additional incomes generated.
- But micro-enterprises have also one disadvantage: without supervision, the quality has a tendency to deteriorate if competition is mainly focused on lowering prices (by lower quality standards). Here, a link up with the formal sector (like a cement company) can set quality standards through branding and influence the whole industry in a positive way.

It is important to set in motion a sustained and effective **promotion**: it is remarkable that all the 2000 MCR workshops have come into place without any significant promotion. This is all the more surprising as the building materials market is extremely conservative. Promotion

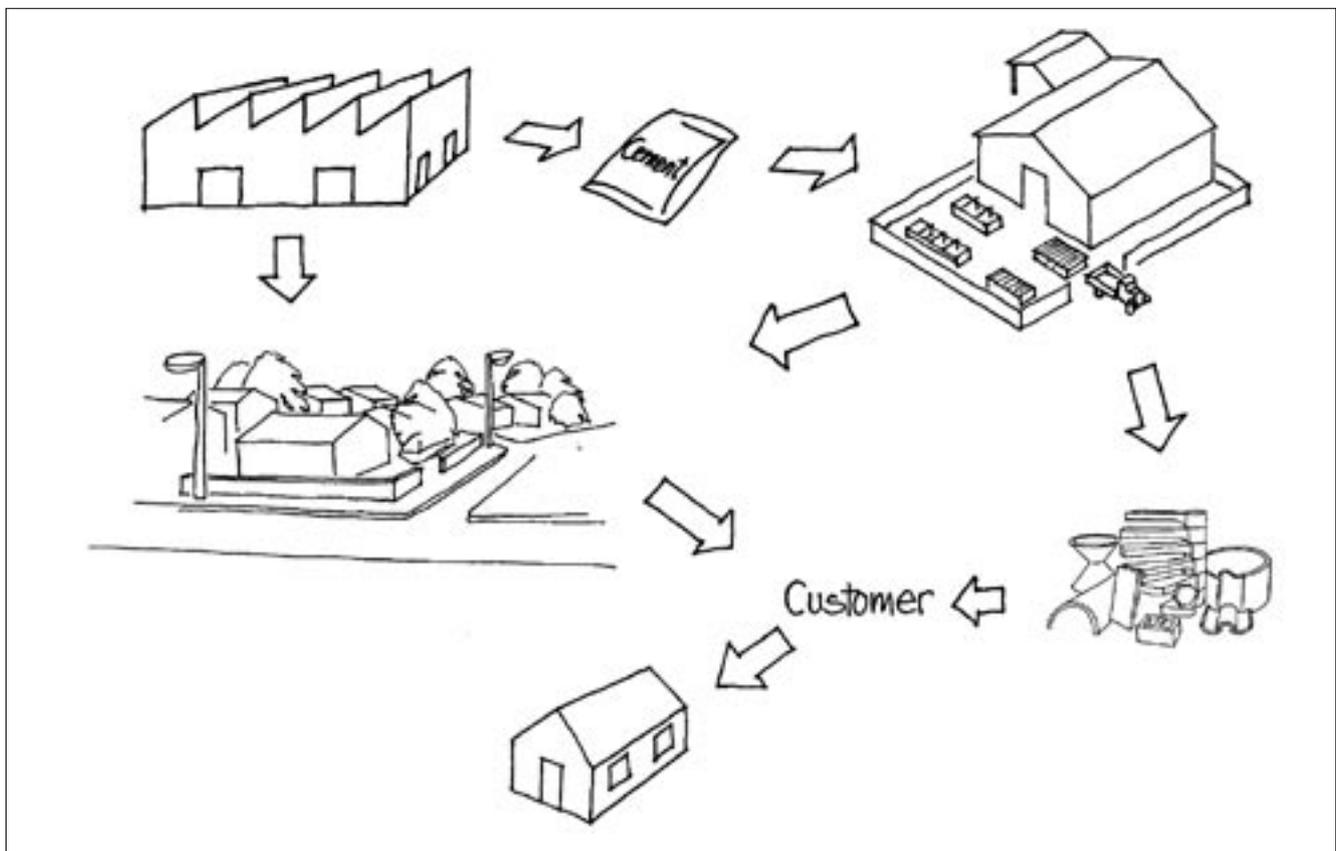
would consist of many different initiatives: demonstrations, model houses, mass media and last but not least information of the key stakeholders and decision-makers of low-cost housing programmes, such as developers, architects, masons, etc. If cement companies were to sponsor the promotion of cost-effective building materials, the growth path would become steeper very fast and it would soon reach a critical mass.

4.4. OTHER PRODUCTS WITH A HIGH POTENTIAL

4.4.1. SOLAR LANTERNS FOR THE MILLIONS OF RURAL HOUSEHOLDS WITHOUT LIGHT

Hundreds of million of people in rural areas do not have access to electricity and will not have it for a long time. They depend on kerosene lamps, candles or battery torch lights. A solar light could make a world of difference to these families and could especially improve drastically the education of the children and even adults.

SELCO (Selco Photovoltaic Electrification Systems, Bangalore, India) ⁶¹ installs successfully home systems with 2 or 4 lights, at a cost of Rs. 11'500 (300 \$) and Rs. 18'500 (450 \$) respectively. Such stationary solar lighting systems are still relatively expensive and are more a solution for



To involve micro-enterprises into the distribution channel of a cement company can create a win-win situation: it allows to offer cheap materials (bricks, roof tiles, floor tiles) in good quality; branding could improve quality control and increase sales substantially

the "rural middle class". Smaller systems in the form of solar lanterns were put on the market, but they were not reliable and broke down after a while. This is due to poor design and lack of maintenance. The Government of Kerala alone had put 20'000 solar lanterns with a subsidy on the market, but most lanterns went out of operation very soon. Without the establishment of a sustainable supply channel with dealers and servicing facilities, people quickly lose the confidence in solar systems.

It would be a great – but not impossible – challenge to design a sturdy solar lantern for poor people at a cost of 50-70\$⁶² and to market it in such a way that spare parts and after sales service are guaranteed. The market potential would easily go up to 10-50 million units and all these would provide a lot of social benefit.

4.4.2. WOOD GASIFIERS FOR HUNDREDTHOUSANDS OF SMALL INDUSTRIES

The technology of wood gasification is basically very old and has been very widely used during war time to run cars and trucks. However, after the war, these vehicles soon disappeared. The gasification of wood chips occurs in a chamber with temperatures beyond 1'000°C into



A reliable solar lantern could bring light to millions of poor households and change their lives considerably. There is a very positive correlation between light and educational progress

producer gas, but it is not a very clean gas and needs a lot of cleaning and filtration to be used in an engine.

However, if used for direct thermal applications such as cooking, drying or heating, the cleanliness of the gas is not a problem. Energy savings of up to 70% can be realized, compared to traditional firewood ovens and stoves. At present, TERI (the Tata Energy Research Institute, New Delhi) has developed several models of gasifiers for small industries in India. These applications have an enormous

potential, as there are hundred thousands of small industries waiting for improved fuel efficiency.

The first model is a gasifier for the sericulture industry⁶³ which saves around 60% of firewood in the cocoon cooking process and has also other advantages which are even more important: due to the controlled gas flame, the temperature can be controlled much more precisely which leads to higher silk yields, better silk quality and working conditions. This gasifier costs around 1500\$ including new cooking vessels and has a payback period of 100 days only. This model is now test marketed, but the relatively high initial investment makes sales difficult in a conservative industry which has not faced any technological changes in the last 50 years. A similar model for the ten thousands of dyeing units in India will soon be launched on a larger scale.

A cheaper model (150\$) for cardamom drying⁶⁴ has been tested for two years in Sikkim (India) and more than 50 units have been disseminated so far. It saves 70% of energy, but since there is plenty of firewood available next to the drying units, that aspect is less important than the fact that the gas flame is smoke-free and substantially improves the quality of the dried product.

As one can conclude from the illustrations above, gasifiers have a very wide application in many small industries in developing countries not only to save significant amounts of fuel (50-70%) but also to provide much better quality, since the firing is cleaner and the temperature can be controlled easily.

However, as small industries are very conservative, scarce of capital for upfront investment and their processes are very demanding, it is challenging to create a market: to achieve the critical mass which would allow to set up a supply channel is a real hen and egg problem.⁶⁵

4.4.3. SODIS – CLEAN WATER FROM THE SUN

SODIS – Solar water disinfection – is a very relevant and useful technology, and it is very simple. Micro-organisms are vulnerable to light and heat; it is well-known that ultraviolet radiation is used for sterilisation as well as heat in the form of boiling water. The secret behind SODIS is to combine these two effects: if dirty water is exposed to light for 5 hours and heated to 50°C, the micro-organisms are completely inactivated.

A thorough study at EAWAG (Swiss Federal Institute for Environmental Science and Technology) focused "on these combined effects and discovered synergies between solar radiation and temperature. This recorded phenomenon



This wood gasifier for a sericulture reeling unit saves up to 60% of firewood and increases the silk yield and quality considerably. Gasifiers provide clean heat and a flame which can be regulated; it has a big scope in small industries like dyeing units, bakeries, etc.



This family in Bangladesh is testing SODIS: with 10 bottles (painted black on one side), they can get clean water for their family by putting the bottles in the sun for 5 hours

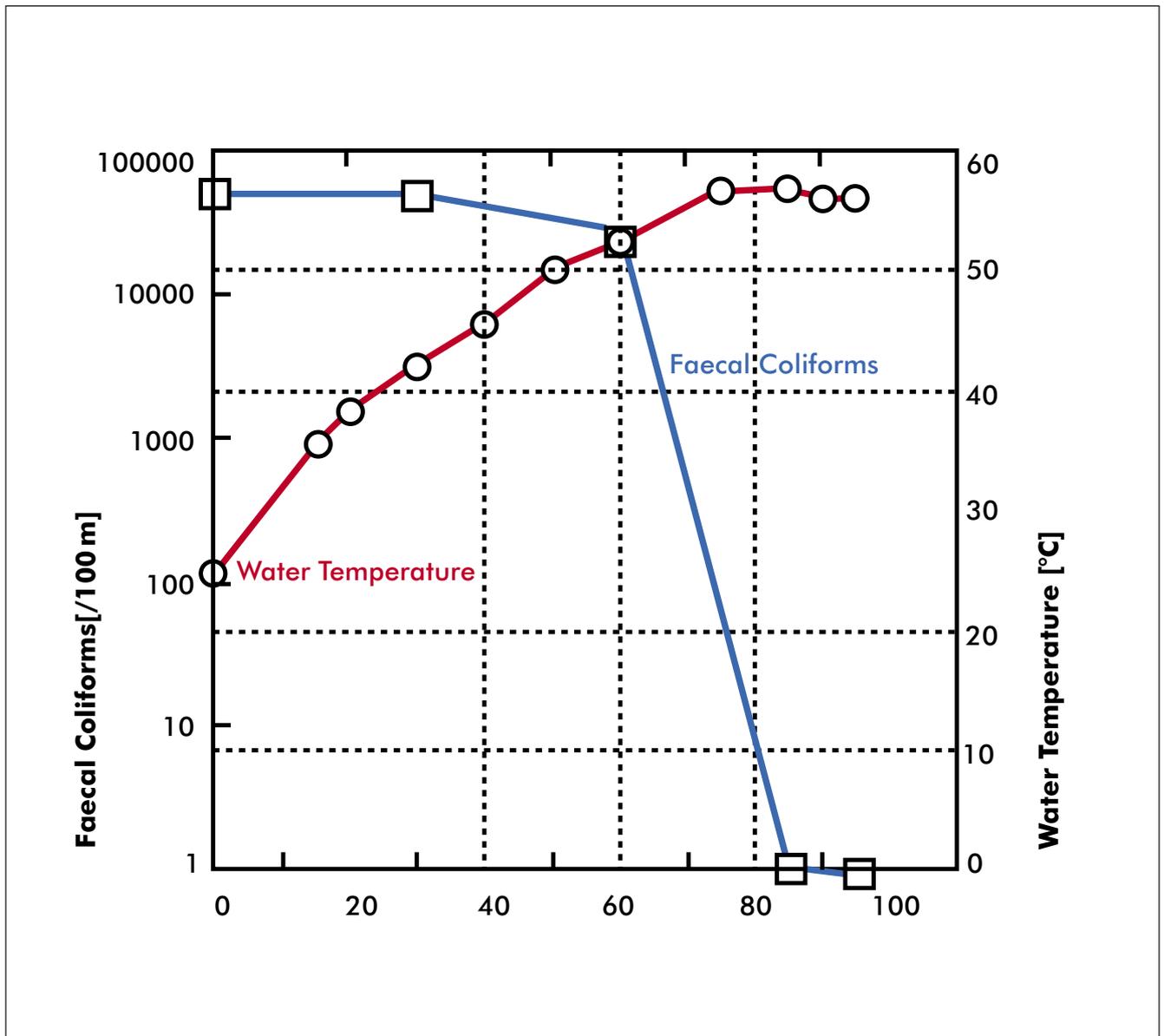
constitutes a breakthrough in the development of the technology, and significantly enhances the potential of SODIS applications."⁶⁶

This scientific base means that a very simple technology can be used to disinfect contaminated water, and this can become very relevant for the health of many families: today, over 2.5 million children die every year from diarrhoeal diseases; this is as much as "one Jumbo jet of children crashing into the sea every hour."⁶⁷ The technology consists simply of a one litre bottle which is painted black on one side and which lets the light through

on the other half. If such bottles are put for 5 hours on the roof, a family has safe drinking water.

A family with 8-10 bottles can produce enough water for their daily drinking and cooking needs. How to create a market for such a cheap technology? Is it too cheap? What would be a suitable supply channel?

Extensive field tests in Colombia, Bolivia, Burkina Faso, Bangladesh and Indonesia have shown that the cultural acceptance is very good. What a challenge to find a good marketing strategy for this useful technology!



5.1. HOW TO FUND MARKET CREATION PROJECTS? METHODOLOGICAL ISSUES FOR DONORS

5.1.1. THE MAIN ROLES OR "RULES OF THE GAME" IN CREATING MARKETS

The roles of the involved institutions should be differentiated and the "rules of the game" should clearly be the following:

- The **donors** and implementing organisations are **facilitators only** and must full-heartedly support private enterprises; donors and implementers must understand the needs of the private sector, especially the fact that they need to make profit! As facilitators, they must support marketing efforts through policy dialogue, conducive environments, R&D and promotion;
- The **"doers"** are private enterprises! They should take their responsibility and act as efficient and effective suppliers of the products and services and they should make profit.
- There may be a lot of **other actors** such as BDS providers (training, delivery of raw materials and intermediate goods) and government agencies (for regulation, standards, etc.); they should also primarily be **facilitators**.
- For good and sustainable **promotion**, business associations can be created, if the supply channel is profitable enough; another way is to seek a co-operation with larger companies which have a direct or indirect interest in promoting specific products and are willing to integrate enterprises into their supply channel.

So far, so good. However, this is so in theory, and the **practice** may slightly deviate from these principles. Creating a market means to field as many products into the market until there is a critical mass. Who fields the first products, before any supply channel is in operation? Obviously, the facilitating organisations need to become a "doer", initially. This is also not a problem, since there is nothing to be "distorted", if the supply channel does not exist. However, it requires a lot of wisdom and discipline to withdraw in the right moment and to become a facilitator, once the channel starts to develop.

We must recognise that it may be **psychologically** difficult to limit oneself to the role of facilitator, and that there is a real dilemma between the role of facilitator and that of being a "doer". It is quite understandable that young and motivated MBA graduates from IDE do not only want to promote the sales of others. It is hard to be in the field and work for the benefit of the dealers; especially since these dealers are not always the incarnation of sympathy. It was a painful process for IDE and SDC when one group

of IDE in Bangladesh split away and created its own "Krishok Bandhu" company. The staff was very motivated to make out of treadle pump dissemination a business of its own. On the one hand, this is a sad development, because the impact on creating supply capacity is higher as a facilitator than as a BDS provider. On the other hand, one has also to admire that "Krishok Bandhu" has survived as a private company until today, despite the low margins with the treadle pump.

Another painful aspect has to do with **profits**. A crucial dimension of a market creation approach is to accept profit as the driving force to create "vibrant" markets. The Village forestry programme in Bangladesh is an illustration of this: forestry is such a dynamic market because it is a really flourishing business for both the nurseries as well as the customers of tree saplings.

At the other end of the spectrum is the DPHE (Department of Health and Public Engineering) in Bangladesh which is still delivering latrines with a subsidy and thus undermines the private sector. But even here remains the question if a market for latrines could have emerged without DPHE fielding many thousands of latrines and creating a "critical mass" of examples.

5.1.2. DO'S AND DON'TS FOR DONORS AND FACILITATORS

To create a market is demanding and requires patience, persistence and understanding:

- **Patience:** the market creation approach cannot bring fast results, a market must grow and the "doers", the private sector, need to be motivated to play the major role. A supply channel can emerge only slowly (see the chapter about "scouts" and "troops") and the channel can only become profitable once there is a critical mass. Any hasted action – such as giving away the goods for free or subsidizing them – may be counterproductive;
- **Persistence:** donors need to facilitate the creation of a conducive environment and may need to invest significant amounts of time in a policy dialogue with all the involved partners. Barriers may consist of missing legal provisions (ownership of trees, building standards, etc.), of over-regulation or of a distorting subsidy culture;
- **Understanding:** donors should understand thoroughly the logics and the economics of their partners, especially the need of small enterprises to make profit. This is not always obvious, as many development workers may

be motivated to promote products rather than the supply channel. In some parts of the world, there are still prevailing biases against "profit" and "middlemen", especially among development workers and NGOs.

Facilitation means to create a space **for others** and refrain from sitting in the driver's seat. This is very difficult and demanding. Whoever has learnt driving a car appreciates the difficult role of a driving instructor: sitting next to the learner, giving him the steering wheel and encouraging him to drive, equipped only with clutch and brakes for emergencies. Such driving lessons are not free of conflicts, especially if the driving instructor is the husband or the father.

5.1.3. DO DONORS CREATE ARTIFICIAL OR SUSTAINABLE MARKETS?

Donors can have a lot of impact in creating markets, but they can also prevent markets from emerging: there are many examples where interventions of donors, governments or NGOs have been counter-productive. The fact that there is a market for solar water heaters in Nepal but not really in India has more to do with the subsidy policy of the government and some donors than with anything else. Donors have therefore quite a delicate role: they should support and facilitate real market trends and not create artificial conditions for products which are not sustainable in the long run.

It must be stated very clearly that, out of the 6 examples only the roofing tiles network has been designed as a "business promotion" programme. The projects have followed the **guidelines for BDS** (Business development services)⁶⁸ even less. All projects started long before the guidelines were developed, and their objectives were slightly different. The BDS guidelines basically advocate for support interventions which are in line with the market forces and which do not distort the market. The emphasis is on services which are really useful for small enterprises, for which they are willing to pay and for which no subsidies are required in the long run.

The market creation approach to development goes beyond the BDS approach: it develops technologies and products, opens up the market for them and creates at the same time good opportunities for micro-enterprises. There are more risks involved in this approach, and to judge whether one is on the right track or not is more difficult.

The objectives of the 6 projects are the following – compared to those of BDS: **1.** VFFP: to green the landscape with trees on farmers' land – and not to make a business out of nurseries; **2.** Treadle pump: to provide access to

equitable irrigation to marginal farmers – and not to create a profitable supply channel; **3.** Postcosecha: to provide storage capacity and liberate farmers from the monetary losses due to rodents and price fluctuations – and not to make the "artesanos" viable; **4.** MCR: to set up at least 1'000 MCR micro-enterprises within 10 years; – this example is the closest one to a small business promotion programme; **5.** Sanitation: to stimulate the demand for latrines for the private sector – but not to create a profitable supply channel. **6.** Rope pump: to achieve a breakthrough for the rope pump – but only one supplier, "Bombas de Mecate", has really started a small industry.

5.1.4. WHAT SHOULD THE DONORS FUND?

Donors can distort the market if they are not careful and not focused in their interventions. As facilitators, they should only finance "**common goods**" which serve many enterprises and not subsidise individual companies. Such non-distorting interventions are in the following areas: R&D and product development; Test marketing and product adaptation; Promotion and market development; Training at all levels (subsidised but against fees); Policy dialogue, advocacy and creating public awareness.

As the graph on "market creation" shows (see chapter 1.3), there are long periods of losses which even a corporate sector company would have to bear during product development and the introduction phase. For the products we are looking at, these costs may not be recovered easily, unless the promoter produces the products in exclusivity. This, however, would eliminate the possibility of creating a supply channel through micro-enterprises. Therefore, R&D costs, market creation and promotion must as a rule be funded by donor contributions.

However, future market creation approaches may also consider ways and means to recover more of the market creation costs by introducing branding, patenting and quality control mechanisms, etc. This recovery can happen through franchising fees, but more easily by providing some technical inputs which are part of the end-product.

To **collect fees for services** is the main guiding principle of the BDS approach, but it may not always be easy. It is for this reason why it is important that the service provider is ideally a private company: People are used to pay fees to a private business, but they would not pay a donor or an NGO.

Whenever possible, services should be offered for a fee, customer friendly and suited to the needs. If the client can not pay for the service, then one may subsidise the client, but not the service provider. This requires to involve as

far as possible private sector intermediaries: an agro-input distributor of Novartis in India runs an extension service for farmers and farmers pay the fee without questioning it. Of course, they know what they get and that it is worth their money. A recently set-up private training centre for cost-effective building materials in India plans to collect fees for the training of entrepreneurs; since the training centre belongs to a private manufacturer of block-making machines, nobody expects free services from him.

We should also not forget that in practice we may well operate in a heavily subsidised environment. In India, for instance, there are subsidies for energy, for pumps and for a million of other things. As a result of this and of the bias towards large scale farming, technologies for small farmers are often absent: although three quarters of the farmers in developing countries have less than 5 acres of land, there is no conventional irrigation technology available with less than 5 horse-powers. These inappropriate technologies have been pushed into the market with very high subsidies: in India, one can get a diesel pump for less than 10% of the cost and the price of diesel was about half the world market price until very recently. These facts should also be taken into consideration when we talk about distortion, and it would be highly unfair to state that small irrigation technologies like the treadle pump and low-cost drip irrigation should come into place simply by the market forces. There is no harm if a donor develops technologies for poor people and does promotion of small scale irrigation technologies within such an environment of "mainstream distortion".

5.1.5. TIME FRAME FOR SUPPORT: 10 YEARS AND MORE

It should be recognised that the time frame for all these projects is at least 10 years. They start with action research and undergo lots of changes in the approach and strategy. None of the projects achieved significant numbers very fast. It is even a characteristic of the market creation approach that it requires a lot of time to set up a private delivery channel. As this private sector responds to signals from the demand side of the market, it necessarily takes time till one reaches a critical mass. It is a typical hen and egg problem: if there is no demand, there is no supply, and both need to grow slowly and steadily together. Keeping this long incubation period of 10 years and more in mind, we should recognise that, if successful, the projects merit a scaling-up, and this requires a different approach than in the gestation period. It would be a big mistake to step out just when the (exponential) growth curve turns into a steep upwards direction.

Understandably, one may be "tired" after 10 years, but there is a real chance to make a large impact once one

has reached such a critical mass. However, we should not do "just more of the same", but work out specific dissemination strategies which can reach large numbers. This is definitively a different approach than bringing an action research programme into motion.

Marketing has to deal with product cycles and one of the strategic models to explain this cycle is the "AIDA model":

-
- Awareness:** it takes time to create awareness (early adopters first come forward)
 - Information:** it takes more time till a user has all the information he/she needs
 - Decision:** only then, will people take a decision (for instance to buy a pump)
 - Action:** it may take even more time till people (especially the poor) take action (they may for example have no money)

The consequences of this AIDA pattern is that project cycles will be very long-term, even for scaling them up. The AIDA model shows for instance that there is no use to do further promotion in a village where the early adopters have just purchased a pump. For the next one or two years, the late follower group will observe and they will not buy before they have seen the early adopters succeed. Patience is a good companion for a market creation approach. As we have seen in chapter 1.3, the results of a market creation approach come into the open very slowly and very late, but they are even more sustainable and pertaining. The rewards of market creation approaches are only visible after 10 or 20 years of nurturing.

5.1.6. REPLICATION OR RE-INVENTING THE WHEEL?

The past and present investment in terms of money and energy made into the six projects is enormous. It would be well worth replicating them. The accumulated know-how could be used in other areas as well and this may lead to better results than starting new projects from scratch.

However, SDC is not well equipped for replication. The dominating working principles are the "country programmes" which are formulated from a very local field perspective and not at all from the perspective of "opportunities". This has produced good results and quality, and I know from my own experience how difficult it is to change such an approach. For a replication strategy, the focus on the country programmes would create many obstacles: for instance, to replicate the treadle pump in Nepal is most suitable in the Terai region, but SDC works in the hills. To replicate programmes from Nepal in India (for instance solar water heaters) would be most suitable

in the hills, but the India programme is focussed on the South. I am convinced that if we link the replication too close to the Country Programme approach, we will have a vehicle similar to the one described by the Swiss Federal Minister T. Wahlen: "This is a car with a very small and weak engine, but you should see what powerful brakes it has" (he referred to the Swiss system of direct democracy, where almost any decision can be the subject of a referendum).

It may be more realistic and more appropriate to create a new external agency (or it is more likely to mandate one or more existing ones) for the replication of successful projects. Such an organisation should specialise in this task and have only this objective in mind; it should be in a position to work in the countries where the **best opportunities**, potentials and partners exist for this replication. This could happen in the form of a regional programme which does not have the limitations of SDCs country programme frames, and it should promote the replication with an explicit BDS and market creation approach.

5.1.7. THE DISLIKING OF MARKETING IN DEVELOPMENT: WHY ARE DONORS NOT JUMPING IN?

There seems to be surprisingly little attraction for donors to promote "market creation approaches". IDE has – despite its phenomenal track record in terms of impact – not managed to get many donors on board. Everybody seems to be interested in the product and IDE should install drip irrigation in all parts of India, in the rest of the world, but very few donors would support the effort of creating a market. It would probably be much easier to get 10 million dollars to give one million bucket kits away to poor families then investing one million in a delivery channel which may supply ten million bucket kits over time.

Why is this so? I have no answer myself. Maybe it has to do with the fact that so little is known about the approach, about its intricacies and especially its long-term effects. Maybe, most of the donor money is either tied up for government programmes or geared up for more short-term results; it is a fact that much more money is available for disaster aid than for extremely long-term indirect programmes, where it is also difficult to get the final credit ascribed to one single organization.

5.2. HOW TO IMPROVE MARKETING STRATEGIES? ISSUES FOR PROJECT IMPLEMENTERS

5.2.1. KEY PROBLEM NR. 1: HOW TO MAKE THE SUPPLY CHANNEL MORE PROFITABLE?

The Village Forestry Programme in Bangladesh (VFFP) is the only project with really financially flourishing micro-

enterprises – the nurseries. All the other projects suffer from relatively poor profit in the supply channel. The micro-enterprises delivering the goods survive, but they do not really flourish, and they expand very slowly. This is an issue to be addressed, because better profits would improve the efficiency and effectiveness of the supply channel and also increase the outreach and sustainability.

How can the supply channel increase profit? Basically through two methods, higher sales volumes or higher prices. For increased volumes, it is crucial to improve the **promotion**, for higher prices, the answer may consist of creating a **"product with a plus"**, a product with a higher value added.

- In the **VFFP**, people are already now willing to pay 100 Takas for a grafted high-yielding quality tree sapling, compared to 5 or 6 Takas for an ordinary sapling. Quality saplings will increase the profit of the nurseries and tree growers significantly: there is a very high potential for quality improvement.
- Around 20% of **treadle pump** owners do not only earn 100\$ extra income but 500-600\$ from half an acre land: these are farmers who do not just plant rice but grow high value vegetables. To unleash this big potential, it may be useful to add good inputs such as quality seeds, know-how and good practices; this may increase the yields manifold. It may be a good chance to add value to the delivery channel by selling treadle pumps with good seeds, fertiliser and know-how. This constellation is naturally a good illustration for agro-input companies, showing them why it is a good investment to promote the treadle pump. IDE has been influenced in the design of their marketing channel in Bangladesh by the Ciba Geigy agro-input company there; now, it would be interesting to link up again for the promotion of the pump.
- For Postcosecha **silos**, one could also look at the agro-input companies as potential dealers and promoters, since the farmers buy quite a few agro-inputs. This may not be realistic in Central America for lack of good marketing practices in the agro-input business, but one fertiliser company in India has expressed interest in promoting technologies to avoid post-harvest losses. A good strategy to raise profit for the "artesanos" can consist of product diversification and of the supply of a "product plus". Already now, some "artesanos" make a range of other products as well; the "rope pump" could be an excellent product companion.
- For **MCR** tiles, a broader product range (colour tiles) is a "must", but the inclusion of other cost-effective building materials (for floors, walls, doors and windows) and the links to the supply channel of cement companies can effectively make their business more profitable.
- For **latrines**, the manufacturing of other cement products, such as MCR tiles, floors, walls, doors and windows could be a way to improve the returns of the workshops. More-

over, linking up workshops to the marketing network of cement companies could create win-win situations for all partners: the latrine producers in Bangladesh consume 35'000 tons of cement per year, an attractive market for a cement company.

In other words, **R&D and continuous product development are essential elements of a market creation approach** and just as promotion needs to be a continuous process, it is never good enough to think that a product is complete in itself. In this sense, we need to learn a lot more from commercial marketing.

5.2.2. PRODUCT RANGES AND MIXES: HARDWARE OR SOFTWARE?

Most products in the above examples are typical hardware products (pumps, silos, tiles). For such products, the profit margins are low: in most of the cases, the price cannot be more than production cost plus 10%, and even then, there is fierce competition.

To improve the profitability of the workshops, it is necessary to look at ways to diversify the supply of these products and to introduce more elements of "software", by including non-tangible values like services, provision of know-how, etc. This is very much related to the "product plus" concept. Examples for such developments can be as follows: "grafted trees" and know-how about growing of fruit trees; micro-irrigation kits with a package of seeds, fertiliser and know-how; supply of services to construct roofs and houses, rather than manufacturing only tiles.

5.2.3. FINANCING: LINKING UP WITH FINANCIAL INSTITUTIONS

An important link which cannot be dealt with in this study in detail is the link to financial institutions. For most products mentioned, the initial investment is high, although affordability is in the center of attention. In the case of the treadle pump, links with the "Grameen Bank" and with other micro-credit programmes have been tried successfully. Such links could and should be much more intensified. Wherever access to credit has been available, the creation of a market has been faster. The initial promotion of the treadle pump through the Bangladesh Tobacco Company was critical. For silos, latrines, roofs, pumps and low-cost drip irrigation, the availability of credit will speed up the sales considerably and also extend the reach to poorer customers. Already today, a considerable percentage of Postcosecha silos are purchased with micro-credit. A most promising avenue would also be to develop micro-credit for the self-constructor for low-cost housing.

5.3. WHAT KIND OF INSTITUTIONS ARE NEEDED? INSTITUTIONAL ISSUES

5.3.1. WHO CAN BE A GOOD FACILITATOR?

The market creation approach needs a specific type of institution. Although IDE (International Development Enterprises), a Denver-based international NGO, has been working with the market creation approach for over 15 years, its approach has not been adopted by one single other NGO on a large scale. Why is this so?

Typical NGOs would have problems with the **narrow focus of the market creation approach** and with the promotion of only one product. Even within IDE, there is a constant questioning of the staff whether they should focus on a few products or cater for the entire needs of a farming community. It is understandably a constant challenge to talk to farmers who are asking for all kinds of other things and not only for a pump. In addition, many NGOs have ideological problems with the concept of profit margins. As one consultant brought it to the point: many or rather most NGOs are "too broad-minded and not greedy enough" to do proper marketing.

In the future, large-scale dissemination projects will need NGO inputs in the sense of facilitators, but maybe not in the way, IDE is working at present. I am of the opinion that without involving the commercial private sector and especially without using the marketing channels of the corporate sector, we shall not be able to reach the numbers that are needed. Institutionally, this would require an NGO (or consultancy organisation) that would be even less of a "doer" than IDE is at present. The primary role of such an NGO would be to facilitate the creation of – in the long run profitable – BDS facilitators and providers. There is a need for a lot of coordinating, lobbying and training facility activities. This capacity can be built up and there is no reason why the six examples cannot be replicated on a very large scale. But, for this, it is important to involve other actors such as governments and the private sector, especially some large, open-minded corporate sector companies. It would be too costly to set up separate marketing channels for all the products, the poor deserve to get access to, and it would also take too long.

5.3.2. PARTNERSHIP WITH THE CORPORATE SECTOR

Neither an NGO nor a donor can sustain promotional efforts over a long period: to spread out a message continuously is very costly and it is not possible to charge any of the products with a good margin to pay for this. Coca-Cola can do so much promotion because nobody notices that, for every bottle, one pays a fraction of a cent for promotion. Producers' associations or cooperatives as "driving force"

for the promotion and expansion of these products may be far too weak, dispersed and not profitable enough to be a strong and dynamic promoter. Moreover, it is difficult to organise small and micro-entrepreneurs in an association, where they should contribute for actions which also serve their competitors. Associations are very slow instruments and they need many years of confidence-building till they become strong enough.

More promising – and maybe also very challenging and tricky – are efforts to link the supply channel with the corporate sector or other mainstream institutions. This is a new avenue which is not yet explored but seems very promising. Many open-minded companies do want to make a contribution to society as "corporate citizens". Sometimes, they do quite a lot, but they are not always very effective: why should a large company set up a hospital or behave like an NGO when they have excellent marketing skills which they could share and bring into large-scale dissemination?

5.3.3. SHOULD WE NOT CREATE A "FOUNDATION FOR MARKETING AND DEVELOPMENT"?

If large corporate sector companies discover the poor as their major future market, they could do a lot for their business and for the eradication of poverty. One restriction is that they would probably not involve micro-enterprises into their supply channel and thus not make optimal use of the power of decentralisation. But in alliance with development organisations, there would be a promising avenue.

In such a context, would then donors still be needed? This is one of the relevant key questions. If there is a market for useful products and if it is possible to sell them profitably, would then the corporate sector not see the potential of such markets and invest there?

We are not yet there! The problems mentioned in my study about the existing constraints in the supply channel do not make it possible to send a business card to a company and the rest can be taken care of. The following reasons make it unlikely that things will just happen on their own: even if there is a good future market, the corporate sector is not used to work with micro-enterprises; the market is initially still very small; within the company, many persons in many departments need to be convinced and need to understand the approach and the purpose; all this is only possible, if one creates some initial success stories.

After an initial action research or pilot phase, the role of a donor would remain: the policy dialogue needs to

be continued, because we are dealing with global problems, and it is in the interest of donors to insure that the related the social impact is properly monitored. If the market creation approach deviates from its original objective, it will also be required to have a dialogue with all the stakeholders

For all these reasons, the World Bank and other agencies have started the programme "Partnerships for Poverty Reduction", but it would be unrealistic to expect major contributions to poverty alleviation to be happening just on their own. To the contrary, my initial experience in establishing such cooperations with the corporate sector shows that it requires a lot of patience, persistence and good partnership to set up viable programmes. The corporate cultures of development organisations and of large enterprises are quite different – and not mutually known. This means that a lot of mutual learning has to take place.

In order to facilitate this dialogue and to set in motion some pilot projects, a lot of coordination, lobbying, training and conceptualisation is required. Institutionally, this would call for the creation of a "**Foundation for marketing and development**" where important donors, NGOs and the Business Community could materialise a commitment to promote a series of market creation programmes with a large impact on poverty alleviation. Such an endeavour could be especially interesting in the light of the "globalisation" debate and would be the proof to the public that there is a scope for a fruitful cooperation. Although, it seems that the creation of new institutions is not very fashionable, these days, one could imagine such a foundation to be operating with a mandate and to be funded on a fee (or franchise) basis.

6

SYNTHESIS AND CONCLUSIONS

To sum up: the market creation approach to development is very promising and powerful, it has a large impact, is relatively cheap but very sustainable. There is a real potential to significantly scale up some of the projects in cooperation with several partners:

- **donors** to initiate replicable models, to undertake a policy dialogue about them and to create the capacity of BDS facilitation;
- **NGOs** as facilitators and coordinators, to set up BDS providers and promote advocacy for the approach and the products;
- **a private supply channel** which will manufacture, sell and install the products profitably and on a large scale;
- and **selected companies from the corporate sector** support promotion and to facilitate the association and integration of micro-enterprises into their supply channels.

Each partner has a role to play, and nobody can do the job in "splendid isolation". It seems like a dream, but the examples show that the market creation approach can contribute effectively, efficiently and sustainably to poverty alleviation. It is quite understandable that sceptical readers doubt about the possibility to make a business out of poverty alleviation. But if it is possible to sell latrines, trees and pumps, and create jobs for the poor, then let us be surprised and try to work hard to reach out to many million more people. The six examples are sound enough to make us believe that such a dream can come true.

ANNEX 1 : GRAPHS OF THE MARKETING CHANNELS OF 5 OF THE 6 PROJECTS
MARKETING CHANNEL FOR TREE SAPLINGS (VFFP, VILLAGE AND FARM FORESTRY PROGRAM, BANGLADESH)

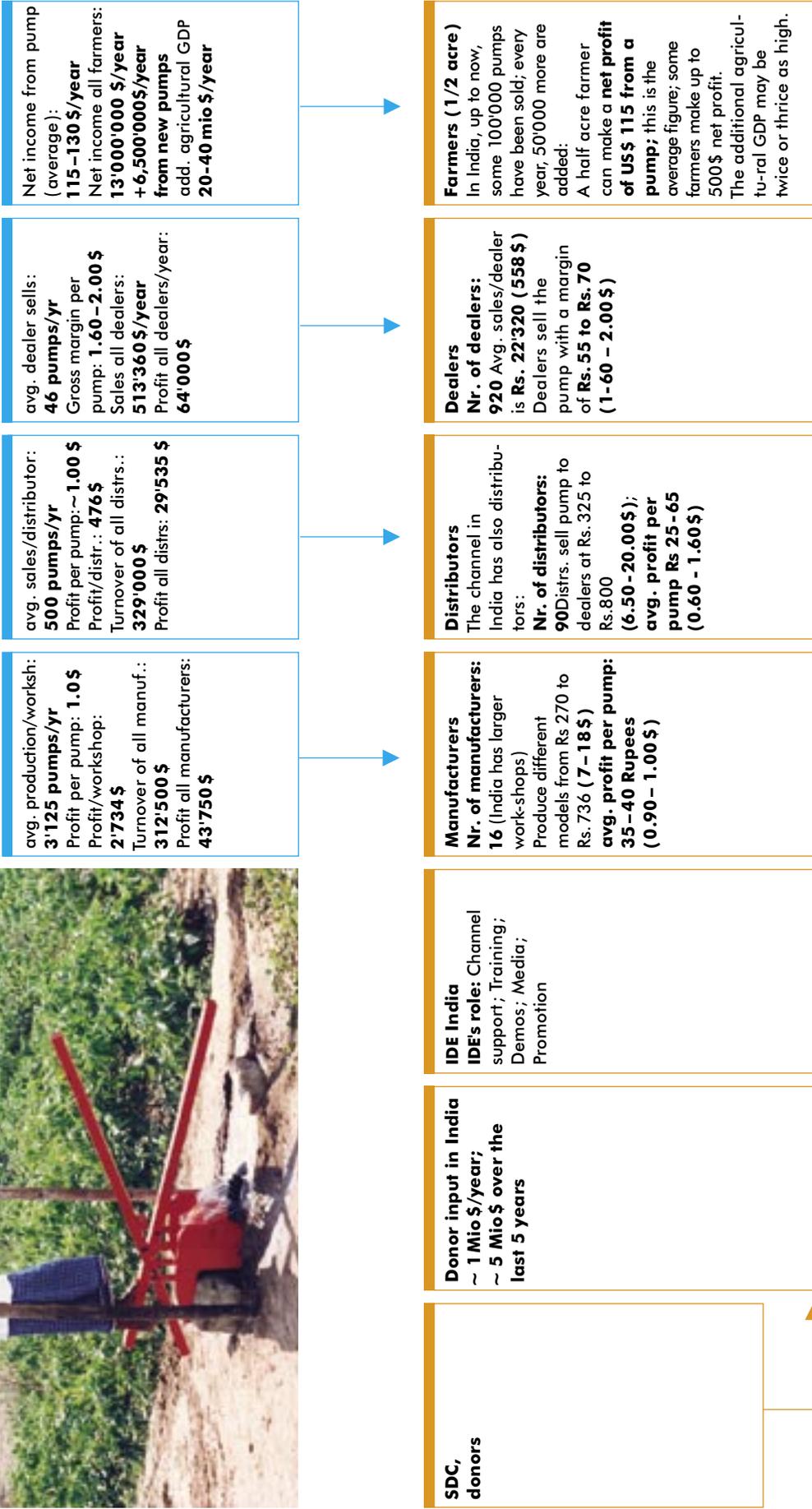


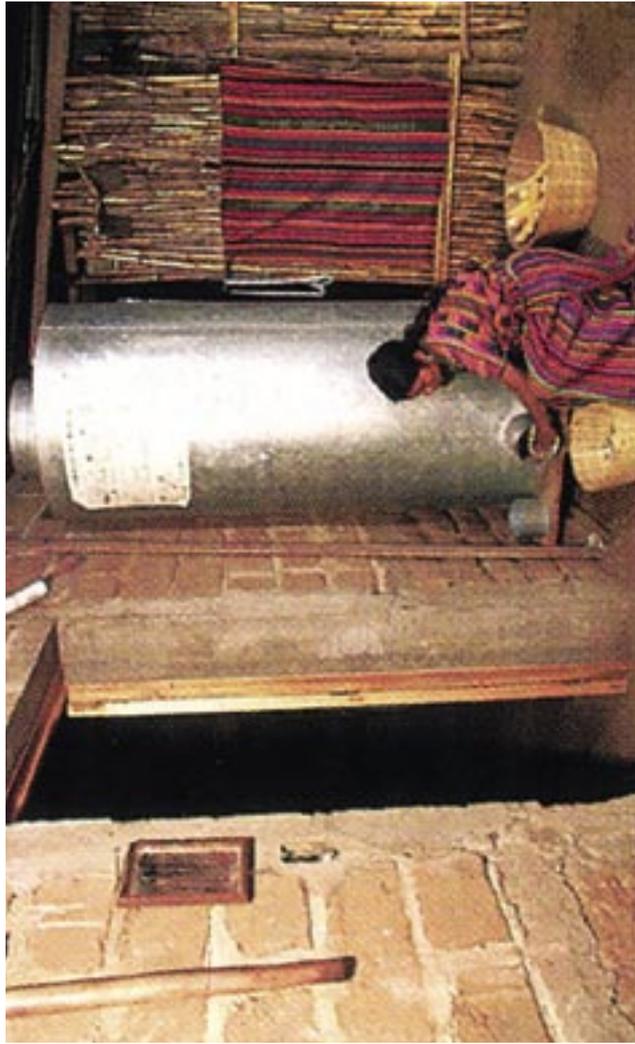
MARKETING CHANNEL FOR TREADLE PUMPS IN BANGLADESH



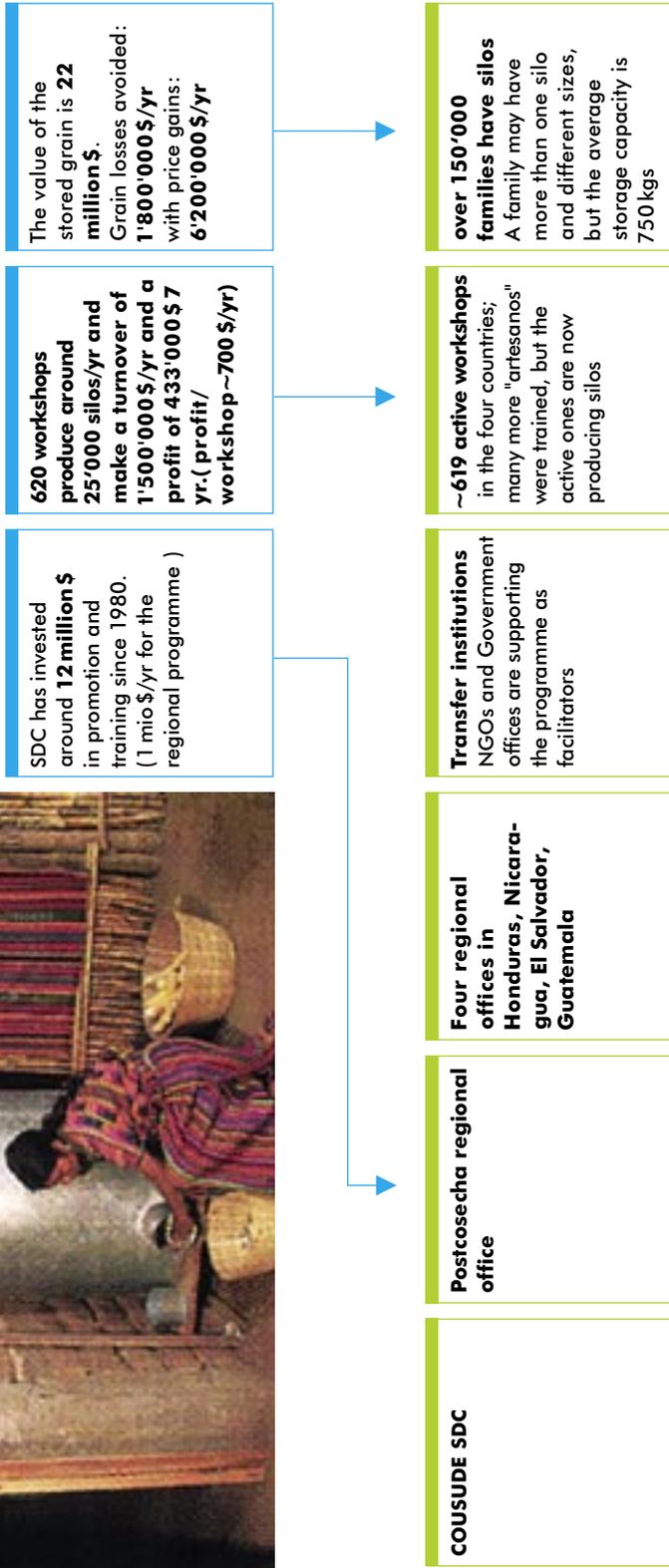


MARKETING CHANNEL FOR TREADLE PUMPS IN INDIA (FIGURES FOR MISTRIES WERE NOT AVAILABLE TO ME; INDIA HAS ONE MORE LINK IN THE CHAIN: DISTRIBUTORS)



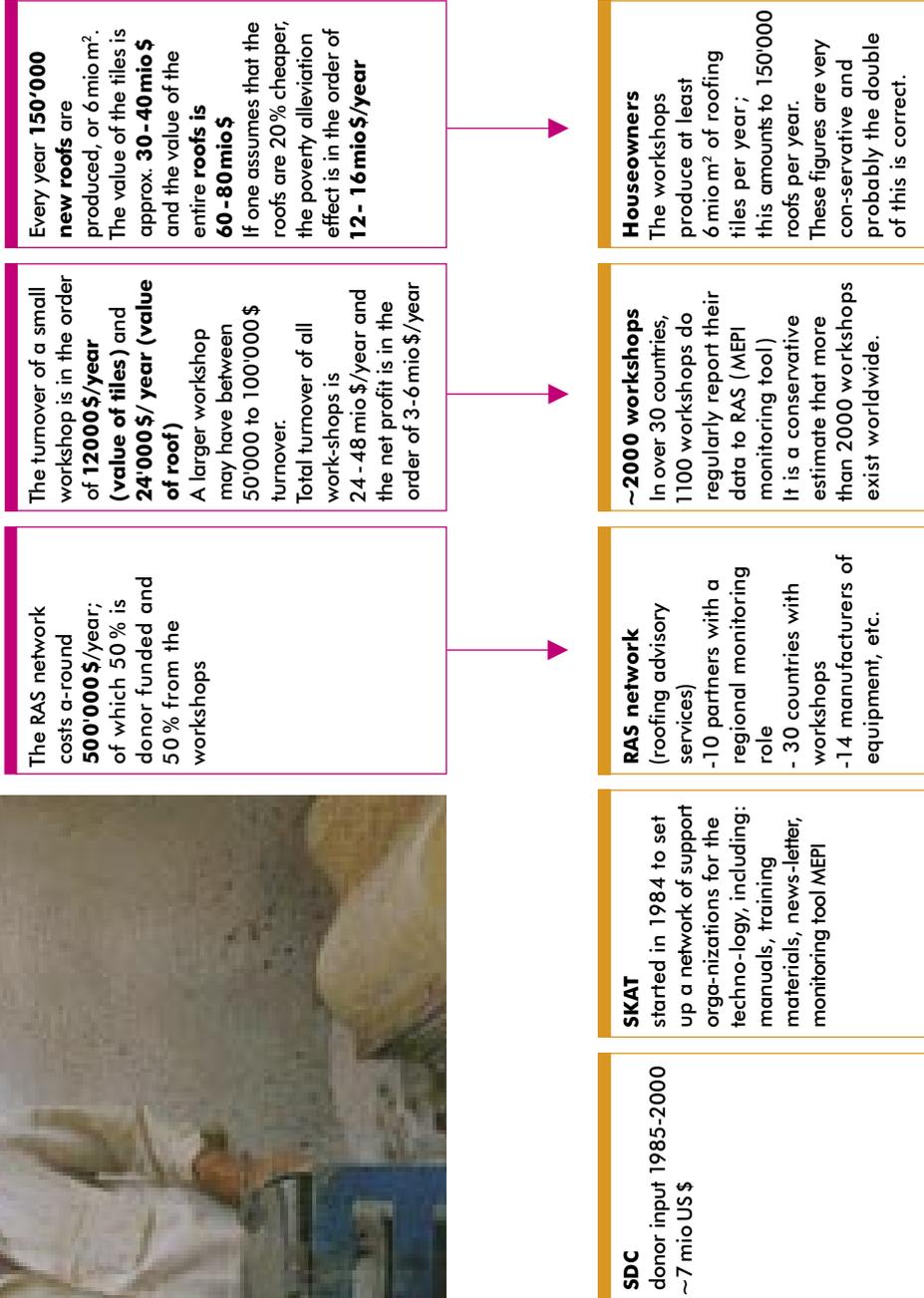


MARKETING CHANNEL FOR SILOS (CENTRAL AMERICA)



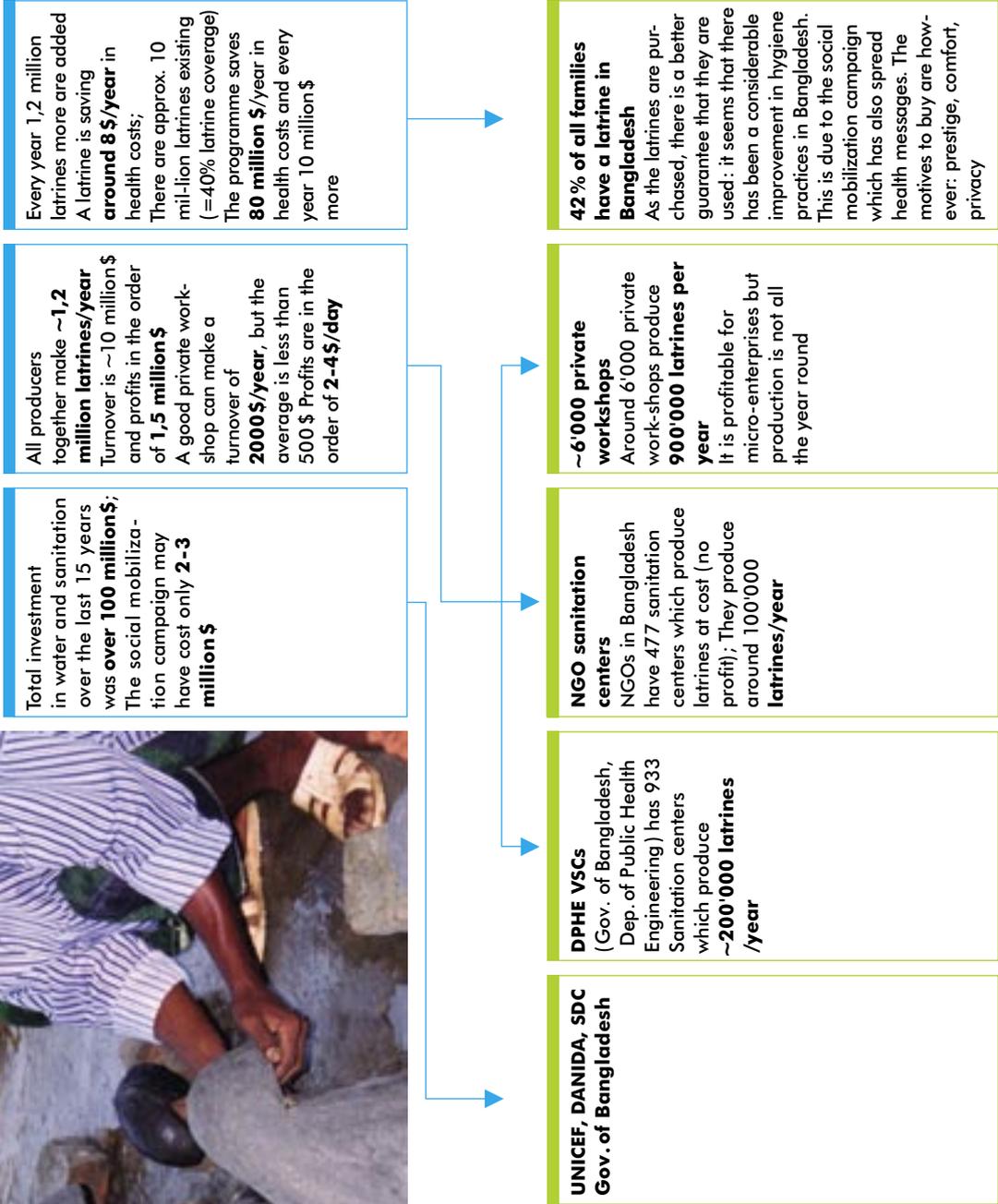


MARKETING CHANNEL FOR MCR (MICRO-CONCRETE ROOFING SHEETS, GLOBAL NETWORK)





MARKETING CHANNEL FOR LATRINES (BANGLADESH)



ANNEX 2: THE DESIGN PROCESS FOR THE IDE LOW-COST DRIP IRRIGATION SYSTEM (By Paul Polak)

The first idea for a low-cost drip system

I got interested in drip irrigation purely by accident, and I knew absolutely nothing about it at the time. We had run cargo tests with a five-ton jet barge from Idaho on a section of the Gandaki River in Nepal, and on the way back to Katmandu, we passed through the hill town of Tanzen. S.K. Upadhy, the Managing Director of the Agriculture Development Bank of Nepal had been very enthusiastic about the results of introducing bank-supported small sprinkler systems in hill villages. These Rainbird type sprinklers were pressured by a 10,000-liter tanks located in small streams 20 meters in vertical height above the field. We stopped by the bank office in Tanzen to learn how much these hill village sprinklers cost, and ended up taking a half-day walk to three hill villages to see how they worked.

The 6 or 7 farmers, we talked to were very happy with the systems and the high value horticultural crops they produced, but they cost too much to be affordable without a major government subsidy. Each sprinkler system cost about thousand dollars and served two farms, each

with one third to one half an acre of irrigated horticultural crops. I was curious about the reasons why these small sprinkler systems were so expensive. It turned out that the biggest single contributor to cost was the \$300 investment in a 10,000-liter tank made of stone and cement. Then, to get 15 or 20 meters of head, the tank had to be a relatively long distance from the field, which required another significant investment in pipe to carry the water from the tank to the field. How could we design a system that would be much more affordable? I thought, the most direct solution was to design a system that could operate under much lower pressure.

Why not just let the water dribble out of small holes in the pipe, instead of using a sprinkler? Would this allow the use of a much smaller tank that was much closer to the field, and just 2 or 3 meters above it? This would not only dramatically reduce the cost of the tank, but also decrease the investment in pipe connecting the tank and the field. We thought, it might be possible to build a system like this for about \$30 to irrigate a third to a half an acre.

We talked to Dan Spare, an irrigation engineer who had worked on rower pumps in Bangladesh and was now working on a small canal irrigation project on the Gand-



The bucket kit for low cost drip irrigation in the test laboratory of IDE India near New Delhi. A simple product with a long trial and error phase to make it suited to the needs of poor horticulturists.

aki River in Nepal. He told us that a pipe with holes in it was a form of drip irrigation, and confirmed that such a system could indeed operate on 2 or 3 meters of head. I had noticed that just about every house in typical hill villages in Nepal had stuck a little piece of cheap black pipe in a stream above the house, and used the water, it carried as wash water. I learned that the black pipe was called high density polyethylene (HDP), and it was cheap and readily available in most places in Nepal. If most remote villages in Nepal were already using this cheap HDP plastic pipe, why not use the same black pipe for the lines with holes in the new system?

When we got back to Katmandu, I wrote up a two-page concept paper with a simple drawing, proposing that we build a thirty-dollar irrigation system using HDP pipe, with the following components:

- A used fifty-five gallon drum sunk in a stream 2 or 3 meters above the field
- A simple filter using cloth or similar materials
- A length of 3/4 inch black HDP pipe running from the drum to the field
- A T fitting at the field end of the pipe, to which three lengths of half inch HDP pipe would be attached, each of which would let water dribble out of holes to a row of plants
- The holes in the pipe would be made with a hammer and a nail
- The T junction with three pipes would be shifted by the farmer from one set of rows to another to irrigate the field

Surprisingly, this simple two-page report with a drawing, written without any knowledge of drip irrigation, contained all the key elements of IDE's current low-cost drip irrigation systems. I would have been amazed to be told in 1992 that it would take 5 years of design work and adaptation by a team of IDE staff members in Nepal and India before this simple initial idea could be transformed into a low-cost system that worked.

Building the first test low-cost drip systems

We quickly learned that while it was easy to outline a plan for a simple appearing low-cost drip system on paper, it was much more difficult to build a system that worked in the field.

1. Making uniform holes in the pipe. The first problem, we ran into was that it was impossible to make holes in Nepal black HDP pipe with a hammer and a nail. Not only that, but it was critical for all the holes to be uniform so that all the plants would get the same amount of water. It took a year or more for Bob Nanes, an irrigation engineer who was the IDE Nepal country director,

and Deepak Adhikari, a creative Nepali engineer who worked with Bob, to solve this problem. They used a heated needle placed inside a soldering iron attached to a crank handle to punch uniform holes in the plastic pipe.

2. Keeping the water from squirting sideways. Now we had relatively uniform holes in the pipe, but Bob and Deepak found that under 2 or 3 meters of pressure, water squirted out of the holes for 2 or three feet, ending up away from the plants. One day Bob's wife Maya was looking at a hair curler, and came up with the solution to take a two- or three-inch length of plastic pipe, slit it horizontally, and snap it over the hole as a baffle. This made the water fall beside the pipe to the row of plants.

3. Finding a low-cost pressure tank. Bob and Deepak found that it was cheaper to use a simple 20 liter or 40 liter plastic tub from the local market, and hang it on a post or a tree 2 or 3 meters above the field, than it was to use a fifty-five gallon drum

4. The problem of plugging. The IDE Nepal team learned from farmers who agreed to try out these first systems that plugging of the holes by dirt was the biggest practical problem. Conventional drip systems attack this problem by putting a major investment in filtration. To keep the cost down, Bob and Deepak opted instead for a simple filter, and made it easy for farmers to clear plugged holes. They made the holes in the pipe the same diameter as an ordinary safety pin, which farmers used to clear plugged holes. This worked very well.

5. A practical low-cost filter. Deepak and Bob used a simple flour sifter available in the local market, with pieces of nylon shopping bag and cloth inserted as filters that could be washed out every day.

6. Testing a proof-of-concept prototype. After the year or so of time it took to develop a working low-cost drip system using holes as emitters, Bob set up a test stand to measure the hole-to-hole uniformity of flow in the system. This is an important standard measure of drip system quality, and came out at about 85%, compared with the lab-tested uniformity of conventional drip systems of 95%.⁶⁹ But the cost of the IDE system was one third of that of conventional systems and we learned that small hill farmers in Nepal did not consider a difference of 10% in uniformity very important.

Adapting the technology through small farmer experience and feedback

The next step was to get 10 small hill farmers to try the low-cost drip systems on their vegetable crops, and tell us about their experience. Most of these 10 hill farmers were growing vegetables for sale in Kathmandu, and they either had access to canal water or had been carrying water by bucket to irrigate their crops. The farmers were very positive about their experience with the small drip systems, and surprised us by saying that they re-

quired much less labor than surface flooding. They also said that the drip systems had lessened soil compaction, and improved crop yield. But they also had problems.

1. Problems with baffles- the pieces of slit pipe that were snapped over each hole to keep the water from squirting sideways would often slide away from the hole during the shifting of the lines. Deepak solved this problem by designing a baffle that gripped the pipe that could be extruded cheaply by local small shops.

2. Poor fittings. The fittings for attaching pipes to each other that were available in the local market worked poorly and often leaked. Deepak solved this problem by designing push-fit pressure fittings that made it easy for farmers to customize their systems, and talking a local entrepreneur into fabricating these push-fit joints cheaply in his small hand powered plastics injection molding workshop.

3. Too much shifting. Most farmers did not want to shift drip lines ten times, so Deepak and Bob modified the system to a one-shift or two-shift system.

4. Disputes over water. To our surprise, we learned that providing access to efficient water use through drip could precipitate disputes over water! One small farmer irrigated his vegetable plot by connecting his low-cost drip system to a miniscule stream that was regarded as too small to use it for irrigation. After seeing the valuable vegetable crop produced by the system, the farmer's neighbour cut his drip line and said that the water in the stream belonged to him. We made it a regular practice to involve the local village governance structure from the start of making drip irrigation available to village farmers.

After adapting the drip system technology and its dissemination to incorporate the experience of small farmers who had been using it, we were ready to begin the dissemination of the technology in India and Nepal.

Introducing Affordable Small Plot Drip Irrigation to India

At this point, we discussed with Urs Heierli of SDC India the possibility of testing low-cost drip irrigation technology developed in Nepal on an experimental mulberry farm for silkworm production in Andhra Pradesh in Southern India. From the field tests that followed, we learned the following.

1. Problems in shifting. Mulberry plants grow into 12-foot tall bushes or trees that are even bigger, and it is difficult to lift drip lines over mature mulberry plants to shift the lines. Many mulberry farmers are short on labour, and prefer non-shifting systems.

2. More problems in producing uniform holes. We expected to use the same heated punch method, we developed in Nepal to make uniform holes in plastic

pipe in India, but this proved impossible. The plastic lines used for drip irrigation in India are made from linear low density polyethylene (LLDP), and this is a much more elastic material than the more rigid high density polyethylene (HDP) black pipe of Nepal, and it stretches when a heated punch is applied to it, resulting in irregular holes.

Further evolution of low-cost small plot drip technology

After months of frustration, Bob Nanes from Nepal and irrigation engineers working for IDE India decided to try the concept of manufactured holes by inserting manufactured uniform diameter microtubes into holes made by a hand punch. This system was found to work very well, and had been thoroughly tested early in the history of the development of modern drip irrigation technology. We used a microtube curled around the lateral line for shiftable drip systems, and found that by using straight microtubes extending to the right and left from each lateral line, we could produce a straight microtube drip system in which one lateral line could irrigate either two or four rows without shifting. This latter system proved especially attractive to mulberry and silkworm farmers. Lab tests of the Indian LLDP microtube system revealed that it had a uniformity of 85% - 90%, which was slightly better than that of the Nepal punched hole HDP system.

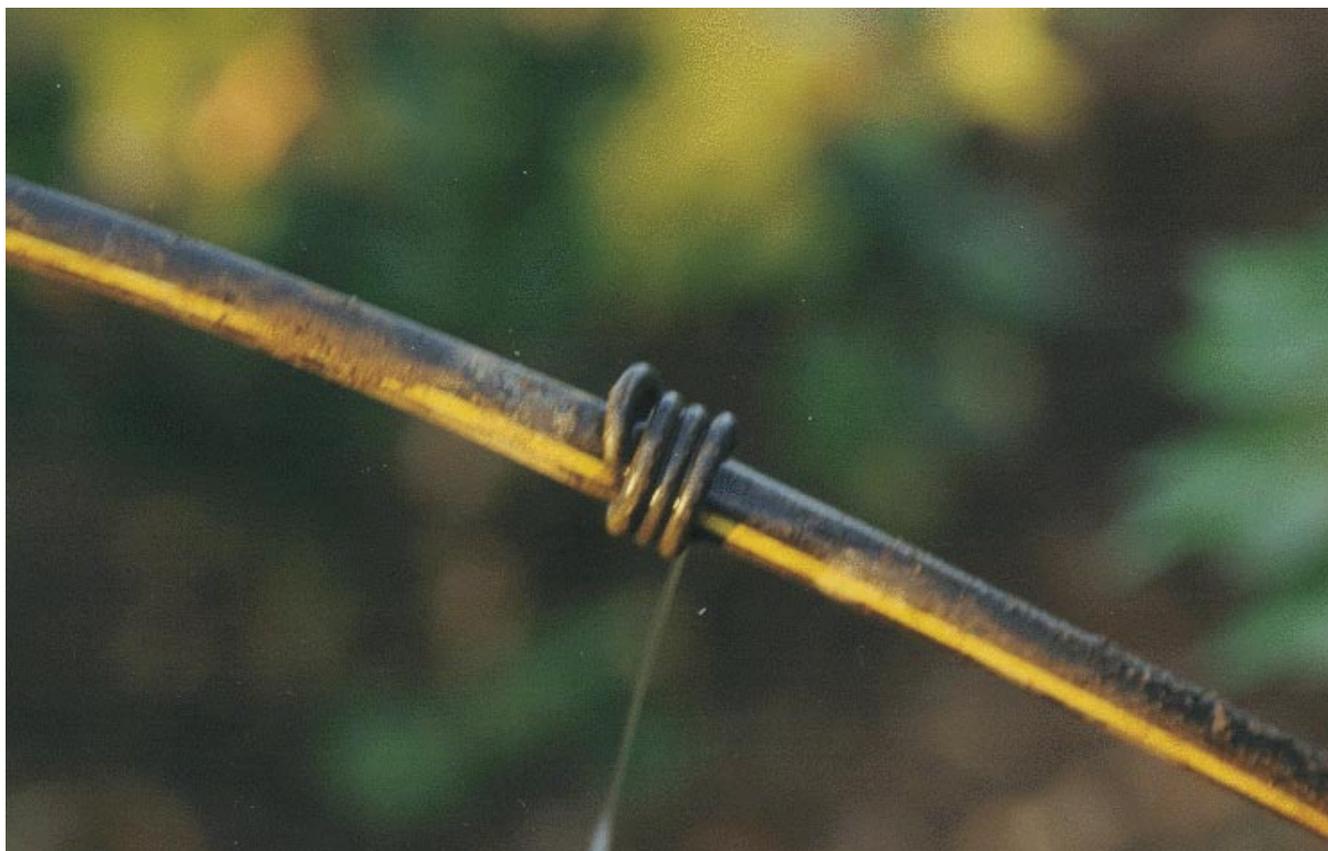
Meanwhile, in Nepal, Deepak Adhikari discovered that it was possible to produce soft PVC pipe from ordinary PVC extruders, and that this soft pipe was preferred by farmers over the more rigid black HDP pipe because it was lighter, easier to shift, and more attractive in appearance. We now had at least three different kinds of low-cost drip irrigation technology, each about one-third the cost of conventional drip irrigation.

- Shiftable, soft PVC Nepal system
- Shiftable India curled microtube system
- Non-shiftable India straight microtube system.

Comparisons of low-cost drip, conventional drip and conventional surface irrigation:

IDE India tested then the crop yield and water use, side by side, of small plots irrigated by conventional drip, IDE low-cost drip, and conventional flood irrigation methods, using cotton, mulberry, sugar cane, and vegetable crops. These tests revealed that drip irrigation:

- cut water use in half and
- increased the yield by 30% or more, compared with conventional flood, and
- there was no discernable difference in results between low-cost drip and conventional drip technology.



The "curled" micro-tube dripper: simple, low cost, if it plugs, one can simply blow it through or replace the micro-tube

Drip systems that are expandable like a Lego set

A common observation in both India and Nepal was that some farmers either had very little cash to invest, or wanted to start their experience with a cautious investment, but at the same time had the option to expand their drip system if they were successful. Over time, we developed a range of drip systems that varied in size from 20 square meters to 10 acres, and varied in cost from \$5 to \$300 dollars an acre. A critical feature of these systems was that a farmer could start at any point in the size/cost continuum, and expand his drip system with the profits it generated.

Chapin bucket kits

Dick Chapin, President of Chapin Watermatics and Stan Doerr have developed a kitchen garden kit that consists of an ordinary household bucket hung at shoulder height connected through a small filter to a drip tape distribution system which waters a kitchen garden. Bucket kits are assembled in New York and sold in countries like Kenya for \$10-12. They are being distributed primarily through church organizations in Africa and other countries. We hired Stan Doerr and his wife Beth agreed to visit our programmes in Nepal and India and install Chapin bucket kit demonstration plots. Our experience

was that these systems worked well for kitchen gardens, but it was easier for farmers to clear plugged holes or microtubes in the IDE systems than to clear emitters in drip tape that had become plugged with dirt. Drip tape was also more fragile than standard drip tubing, but the biggest disadvantage of drip tape was that it was not easy to fabricate locally, and was expensive to import. We found that it was possible to assemble bucket kits or their equivalent out of off-the-shelf locally available components in Nepal and India, and market them profitably through the local private sector, for \$5, including the bucket, which was less than half the price of imported bucket kits. Bucket kits or their equivalent have now become the standard entry point for IDE expandable low-cost drip systems.

Initiating rural marketing through the private sector

We now began to apply the same approaches to rural mass marketing, we had learned from the treadle pump program in order to initiate marketing of these systems to small farmers in India and Nepal through the local private sector. There was no drip irrigation private sector in Nepal, so we convinced a small pipe manufacturer to begin producing low-cost drip irrigation kits. In India, there already was a significant market for conventional drip irrigation, with 50 Indian manufacturers of drip irri-

gation equipment. But the smallest drip system available in India was a one-acre system, and the cost of conventional drip systems was \$750 an acre, three times the cost of an IDE drip system. We were unable to persuade any of the 50 existing drip companies in India to enter the low-cost small plot drip market, so we set up two small assembly plants making drip kits from off-the-shelf pipe and fittings.

Does the design of affordable small plot irrigation systems create a new market that serves poor customers?

Before Ford used assembly line techniques to bring the price of cars down to a price low enough to make them affordable to the working man, automobiles were toys for millionaires. Before Sony used transistors to make radios small enough to fit in a shirt pocket and cheap enough to be affordable to high school students, hi-fi systems took up to half a room and only music connoisseurs could afford them. Before Jobs and Wozniak built the Apple computer in a garage, computers filled whole buildings and could only be afforded by large universities. Can cutting the cost and size of conventional drip irrigation have a comparable impact on the existing global market for water saving irrigation?

The mass marketing of treadle pumps in Bangladesh has created a new market for affordable small plot water lifting irrigation, which has increased the net income of small poor farmers by \$130 million a year. In IDE's first two-year experience of marketing in low-cost small plot drip irrigation in India and Nepal, **10,000 systems have been purchased by small farmers**, a much steeper exponential sales curve than that of the first two years of treadle pump sales. There are hundreds of millions of farmers in the world who cultivate less than five acres on half acre plots who could benefit from affordable small plot drip irrigation. But like the market for fancy sit-down restaurants before the advent of Mac Donald's, the present world market for drip irrigation caters exclusively to the rich. Could present relatively small global sales of conventional drip irrigation in the range of \$400 million a year explode by producing low-cost small plot systems that fit the needs of the majority of the world's farmers? Only time will tell.

ANNEX 3: HOW IDE INSTALLED 1.3 MILLION TREADLE PUMPS IN BANGLADESH BY ACTIVATING THE PRIVATE SECTOR: THE PRACTICAL STEPS (By Paul Polak)

The rower pump phase

IDE's work in manual irrigation in Bangladesh began in 1984 not with the treadle pump, but with the rower pump, designed by George Klassen as a volunteer in

Bangladesh for the Mennonite Central Committee (MCC). UNICEF had introduced some 90,000 cast iron #6 pumps for drinking water, and farmers started to use some of them for irrigation. Because the rower pump used a rowing motion instead of the bent arm action of typical handpumps, it was much more efficient biomechanically for long term pumping. Treadle pumps, which were beginning to be introduced in Northern Bangladesh, were also more efficient, but IDE felt that rower pumps were easier to manufacture in volume with high quality.

MCC had installed some 2,000 rower pumps over several years, and IDE was impressed with the contribution that affordable small plot irrigation could make to improving the poverty and hunger of small farm families. We felt that if 2,000 rower pumps could produce a positive impact in opening opportunities for small farmers work their way out of poverty, 50,000 rower pumps could produce an exponentially greater positive impact. We decided to try to accomplish this by harnessing the potential in modern marketing methods adapted to the rural context of Bangladesh.

Steps in scaling up rower pump adoption

Initial organisational meeting. IDE convened a two-day meeting of all the key players in the preceding rower pump project, to brainstorm about how to go forward. We set a goal of installing 20,000 rower pumps a year within three years. Funding for the project was obtained from CIDA Canada in the amount of approximately 200,000 dollars (Can) per year for three years.

1. Removal of subsidies. Shortly after setting up an office in Bangladesh, IDE established a regular manual irrigation co-ordination committee meeting attended by all the organizations promoting manual irrigation in Bangladesh, including also donors like the World Bank and SDC. Some of the NGOs provided free well-drilling and other incentives to lower the effective cost of rower pumps for poor farmers. Because this undercut the private sector marketplace, IDE used the co-ordinating committee as a forum to promote the gradual removal of all subsidies for manual irrigation pumps, and this was successfully accomplished over a three-year period.

2. Centrally controlled or free market manufacturing? For the manufacturing of the first 2,000 rower pumps, MCC had worked with a local technical school and training center, Mirpur Agricultural Workshop and Training Services (MAWTS), headed by a dynamic Bangladeshi engineer, Ikramullah,. As the demand for rower pumps increased, we were faced with a dilemma. MAWTS was interested in doing all the manufacturing, aided by small workshops started by its students. IDE, on the other hand, wanted to continue the participation of MAWTS and its students, but at the same time wanted to open the mar-

ket to competition. This resulted in a stalemate for the first year and a half, after which other players gradually entered the market.

3. Quality control. IDE implemented 100% quality control procedures in the initial phases of expanded rower pump promotion, to ensure that initial installations worked effectively. Full-time IDE field technicians made sure that pumps were installed properly with no leaks, and made follow-up service calls.



Gunnar Barnes, a Norwegian engineer who developed the treadle pump. It took several years and contributions from many individuals including Mr. Dev from Kurigram and Dan Jenkins from USAID, before the design could be completed.

4. Facilitating a dealer/pump installer network. IDE selected village dealers who sold rower pumps with a reasonable margin, and trained well-drillers to install them correctly. At the same time, marketing staff who worked for IDE called on small farmers and encouraged them to buy rower pumps, and when a sale was made, it was made through the private sector dealer.

5. Rower pump marketing promotion activities. During the period from 1984-86, the foundation was laid for the rural mass marketing approaches that were eventually implemented for the treadle pump. A large billboard portraying a farmer operating a rower pump was placed on the main road from the airport in Dhaka, where it was seen by policy makers, government officials and business-

men on their way home from the airport. Calendars, leaflets, and posters were designed and distributed. Rower pump demonstrations were put on. As a result of all of these activities, rower pump sales passed 1,000 a month in the third year of the program.

6. Rower pumps or treadle pumps? In 1986, IDE was contacted by the Bangladesh Tobacco Company, a parastatal organisation that contracted with small farmers to produce tobacco. This company provided agricultural inputs and technology on credit, and was interested in including rower pumps as part of its inputs package. But there was a catch. Because there was a great deal of farmer interest in treadle pumps, and the company wanted to include treadle pumps in the program. In the end, IDE agreed to install 75 rower pumps and 75 treadle pumps for farmers under contract to the company.

After a season of use, the farmers reported a strong preference for the treadle pump. They said that it was cheaper, easier to operate than the rower pump, and produced more water. After looking into it and thinking it over, **we decided that the farmers were right.** IDE was now faced with a major identity crisis. We had seen ourselves as a rower pump organisation, and even carried pictures of rower pumps on the sides of our two vehicles. Were we a rower pump organisation, or an organisation dedicated to opening access to affordable irrigation water to small poor farmers?

We decided, we were dedicated to affordable small plot irrigation water for poor farmers, and changed our focus from rower pumps to treadle pumps. This meant we were willing to change again, if new better option came up.

Installing 1.3 million treadle pumps through the local private sector

Original work was done by Rangpur/Dinajpur Rural Service (RDRS) Gunnar Barnes, a Norwegian volunteer for RDRS, and his colleagues, who had designed the treadle pump on the sensible notion that a small farmer should be able to buy a manual irrigation pump for a price equivalent to the value of a sack of rice. The pump was tested in the shallow aquifers of these two provinces in northern Bangladesh, and farmers liked it. RDRS supported the development of 4 workshops that manufactured it, and put on demonstrations promoting its use, but limited its activities to Rangpur and Dinajpur. IDE agreed to promote the technology in the rest of Bangladesh.

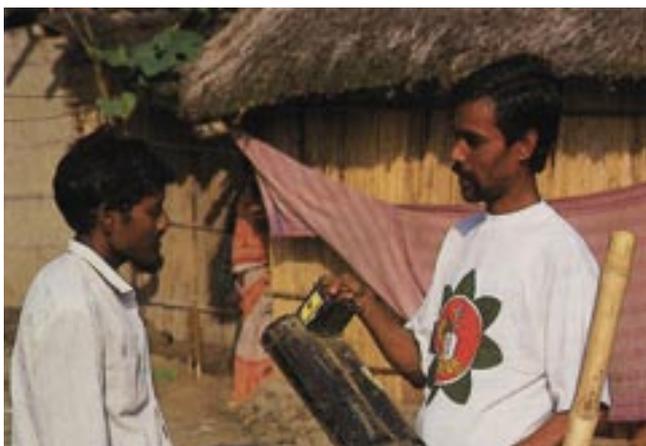
Learning from the rower pump experience

We did not abandon our rower pump promotion and about 5,000 rower pumps a year continue to be installed in Bangladesh to day. But when we shifted our major

focus to the promotion of treadle pumps, virtually all of the experience in the promotion of rower pumps proved directly applicable to the promotion of treadle pumps as well.

Building an Effective Private Sector Dealer Network

In the beginning, IDE played a direct role in the supply chain by acting as a wholesaler. We bought treadle pumps from partner manufacturers, conducted 100% quality control procedures, put an IDE Logo on pumps that passed inspection, selected village dealers, and took a 10% commission for our work, which was used to cover part of our costs. We quickly learned that selecting effective dealers was an art. If the dealer was too small, he usually couldn't afford to pay for a small inventory of pumps, and may not hold a position of respect in the village. If he was too big, on the other hand, the profits from treadle pump were not large enough to be attractive. We developed criteria for selecting well-respected dealers who already had a successful track record in marketing and had sufficient funds to buy a small inventory.



A mistri installs the pump and is often a convincing salesman, as he knows the farmers very well

1. Mistri training. Well drillers, or mistris are village mechanics who install treadle pumps. It is critical that they install each pump correctly if it is to work effectively. If the sand layer in the well that the treadle pump pumps from is not developed properly, for example, the pump will be hard to operate and will produce less water. If there are leaks in the connections, the suction mechanism that the pump depends on fails. In both instances, the customer is likely to blame the poor results on the pump rather than on the tubewell installation.

To ensure proper installation and strengthen treadle pump promotion, IDE conducted ongoing three-day training courses for well drillers with a diploma for successful

completion. This program trained thousands of well drillers, who also usually become active promoters of treadle pumps in their village. Mistris attach themselves to one or more dealers, and make a separate contract with the farmer to drill the well and install the pump when the sale is made.

2. A strong emphasis on quality control in the product introduction phase. In the product introduction phase, it is essential that each installed pump works perfectly, so that it can generate more sales. For this reason, IDE implemented 100% quality control of treadle pumps, and conducted mistri training programs, and fielded staff members who could support private sector dealers by checking on the effective operation of installed pumps and following up initial installations.

3. Recruiting, hiring and training effective IDE field staff. IDE field staff who focussed their efforts on treadle pump marketing at the village level usually had at least a high school education, exhibited a high energy level and knew how to motivate farmers to put treadle pumps in the ground. They worked with private sector dealers to build sales in each village to pass the volume threshold for sales take-off. Other field staff had technical skills that enabled them to make sure that treadle pumps were installed properly, and working well at follow-up. After a year or two in a new area, the IDE field staff would taper their involvement and move to a new area.

4. Early trials with the direct provision of credit. In an experiment supported by SDC in 1988, we implemented a trial program in which IDE made credit available directly to treadle pump customers to finance their purchase of treadle pumps. We learned that the real cost of providing small loans in Bangladesh required an annual interest rate of 40%, and that administering credit directly was a complicated business. Although the direct credit program produced reasonable repayment rates, we decided to focus IDE's efforts on the promotion of treadle pumps, and to collaborate with existing micro-credit program like the Grameen Bank and Proshika to facilitate customer access to credit

5. A variety of promotional activities. After two years, we learned from market studies that most small farmers had never heard of treadle pumps and didn't know what they were. It became clear that it would be important to initiate a number of activities to increase product awareness linked to providing specific opportunities for customers to get on a treadle pump and try it out.

a) Calendars, leaflets and posters: Since many people in rural Bangladesh don't read it was important that each of these promotional tools was understandable without words through strong attractive visual images;
b) Drama: We hired a troupe of travelling actors who gave performances in open-air settings of a play specifically written to promote treadle pumps, in which a treadle pump on stage played an important role. The



Village drama about an ugly moneylender who wants to marry the beautiful daughter of a small farmer. The treadle pump allows a "happy end". 200 performances were attended by 5'000 farmers each: more than a million farmers were "entertained"

play attracted rural audiences of 5'00 to 8'000 people;
c) A full feature entertainment movie: IDE's experience with the play led to producing a 90-minute entertainment movie, using top Bangladeshi male and female leads and a popular director. The movie was designed to convey key target messages to the audience, and once again, the treadle pump played a central role.

The first movie produced by IDE had a boy-meets-girl plot. The father of the girl is poor and can't afford a proper dowry, so the marriage is put off. The girl falls into the clutches of a dowry bandit, but in the nick of time, the father learns about treadle pumps, buys one on credit, earns a lot of money, puts up a decent dowry, and the loving couple gets married and lives happily ever after. In the middle of the movie, there is a break in the action and a treadle pump commercial leads into an opportunity for people in the audience to try out treadle pumps on stands. Then the movie resumes.

A typical performance in an open air setting draws an audience of 3-5000, some of whom have been attracted to the event by common practice of "miking", a rickshaw with a microphone announcing the coming attraction. A full-length feature movie costs about \$25,000 to produce and plays to an audience of several hundred thousand

people each year. Because of the success of the initial movie, IDE has produced a new feature promotional movie each year;

d) Troubadours: Small farmers gather at local and regional markets and bazaars, and this provides an ideal opportunity for smaller events that introduce potential customers to treadle pumps. One effective strategy uses small bands backing up a singer who entertains the crowd with a song about the treadle pump, while in the background one of the players operates a treadle pump on a stand. Leaflets about the treadle pump are distributed to the audience;

e) Rickshaw processions: Prior to the regional market, a procession of 3 rickshaws, each of which carries a portable treadle pump being pumped on a platform at the back of the form a procession through villages attracting potential treadle pump customers to the upcoming event or demonstration. At the same time, the upcoming event is announced by microphone;

f) Give the customer the opportunity to touch, feel, and operate the product: A critical component of the sales strategy for \$50,000 Kodak copying machines is to give the customer the opportunity to run some copies using the copier. Exactly the same is true for an \$8 treadle pump. A critical component of all demonstration and promotion strategies is to have a treadle pump available,

and to encourage the potential customer to get on the treadle pump and pump water with it;

g) Village dealers play an integral role in promotion strategies: Village dealers play a leadership role in promotional activities. For example, when a movie performance is scheduled, treadle pump dealers bring potential customers to the movie, publicize the performance beforehand, and are responsible for converting the interest in treadle pumps generated by the movie into sales;

6. Strategically placed demonstration plots. An important component of the marketing strategy is the establishment of highly visible demonstration plots where real farmers make money from crops grown with treadle pumps. The demonstrations are linked with dealers, so that a dealer can take a potential customer to a small farm where a treadle pump is being used, and the customer can ask the farmer questions about his experience. In the early 90's, for example, IDE established a demonstration program using 300 exemplary farmers in highly visible locations to encourage small farmers, not only to purchase and install treadle pumps, but to provide critical information about diversified high income crop strategies that could optimize their income.

7. Is the treadle pump project too single-minded? From the beginning, IDE has been criticised by the development community for being too narrow. Our single minded focus on putting treadle pumps in the ground flew in the face of integrated rural development practice, and our support to the profit-making private sector generated criticism from members of the development community who often saw businesses as major contributors to the oppression of the poor. In response, we have pointed out that poor farmers are entrepreneurs themselves, and when they double their income, they have the possibility to improve their lives. In this sense, the additional income provides a platform for development, but a guarantee that this income will be used for the betterment of the family cannot be given. Evidence shows, however, that a significant proportion of treadle pump users have improved their status and for example sent their children to school, especially when the women were directly involved.⁷⁰ At the same time, we have been willing to broaden our approach when it appears likely to be in the interest of our small farmer customers to do so.

8. IDE directly participates in only 25% of the treadle pump market place. An important factor in making the private sector supply chain for treadle pumps economically sustainable is that during most of the time it has worked in Bangladesh, IDE has been involved directly with only 25% of the private sector players in the market. Our role has been to facilitate, stimulate, and shape the market, but as soon as a vigorous private sector marketplace for treadle pumps was established, it was impossible, much less desirable to control it. For the first four years from 1984 to 1989, IDE was in a

much more controlling role focusing on 100% quality control. By 1989, sales had risen exponentially to 60,000 per year, and IDE had handed over its direct role as a wholesaler to private sector distributors. 50% of the market place now consisted of new producer/dealer networks that entered the market place without IDE's involvement because they saw an opportunity to make a profit. After 1989, the part of the market place without IDE's direct involvement stayed at 65%-75%.

9. Issues of quality and affordability in a mature market One type of new market player was the small, fly-by-night copycat who made a few hundred very poor quality pumps that failed after a week or two, and disappeared before customers realized they had been fleeced. IDE quickly learned that it was impossible to control these fly-by-night copycat operators. It was possible, however, to educate customers to differentiate between high- and low-quality products, and make an informed decision about their purchase. Some of the small producers made a very constructive contribution to the market place. They introduced treadle pumps that lasted two years instead of the seven years of the high quality pumps, and sold them at a significantly lower price. We learned that these lower standard pumps were the product of choice for many thoroughly informed customers, and this forced us to expand the product line, we promoted.

10. Defining three levels of quality standards for treadle pumps. From 1989 on, IDE promoted three different quality levels of treadle pumps in Bangladesh, based primarily on the thickness of the sheet metal used to produce the pump. The cheapest model used 18-gauge steel, was rated by IDE to have a two-year life, and was the cheapest model recommended by IDE. The most expensive model had an expected life of at least 7 years. To our surprise, the cheapest, 2-year life model instantly captured about 50% of the treadle pump market, and has remained the highest volume seller. After re-examining our assumptions, we came to the conclusion that once again, the farmer was probably right and our assumptions about quality were wrong. Small farmers in Bangladesh are always short of cash, because they have so many competing demands for it. If a 7-year life treadle pump is not affordable, it makes very good sense to buy the cheaper 2-year life pump, and use the \$100 to \$500 new net income, it generates to upgrade at the end of two years. We concluded that it was important to introduce several levels of quality and price for products we promote, and to simultaneously implement educational initiatives that support the customer's capacity to make an informed choice.

11. Lowering the cost of the tubewell. While IDE's main efforts focused on the treadle pump, two-thirds of the price of \$25 for a treadle pump installed on a tubewell comes from the tubewell and not from the pump. Because affordability is so critical to small farmers, we

looked for ways of effectively lowering the cost of the tubewell. We carried out field tests of treadle pumps using diameters of PVC tubing that varied from three-quarters of an inch to one and a half inches. To our surprise, we found that operators reported that pumps on one-inch tubing were easier to operate than pumps on a 1.5 inch tubing! Apparently, water in the pipe in one-inch tubing had to move faster between pump strokes, while the water in 1.5 inch tubing moves more slowly and tends to stop between strokes, requiring more effort to overcome inertia. The results of these tests culminated in a major product launch for one-inch tubing in Bangladesh, which has effectively lowered the cost of installed treadle pumps by 20%.

12. The KB experiment. In the mid 90's, a group of IDE staff formed a separate staff-owned company aiming at making profit and marketing treadle pumps and related products. The company has been successful and is now profitable, and it has expanded its product line to include the fabrication and marketing of handpumps. While the company has been successful, the 10,000 or so treadle pumps it sells each year now represent only a small portion of its sales. A realistic problem for the company in its transition to profitability is that the margins for treadle pumps are relatively low, requiring the company diversification to higher margin products to achieve economic sustainability.

13. Influencing policy-makers and government officials. An important part of IDE's promotional activities has been to persuade key decision-makers to support the treadle pump program. In this arena, Swiss Development Co-operation has played a major leadership role. For example, in recognition of Switzerland's 700'th anniversary, SDC held a two-day celebration at the top hotel in Dhaka that featured the treadle pump program. A premiere of the newly produced treadle pump film was aired, and an all day symposium on the treadle pump was held, where papers were delivered on the treadle pump by individuals like the head of the extension department in the Ministry of Agriculture. SDC donated 700 treadle pumps to key Bangladesh organizations to stimulate their participation in treadle pump promotion activities. As a prelude to the main evening ceremonies, the Prime Minister of Bangladesh pumped water from a model of the treadle pump installed in the hotel vestibule.

14. Working with and through NGO's. A critical part of the process facilitating treadle pump adoption was the careful design and implementation of a strategy to collaborate with and support other organizations in Bangladesh who were interested in incorporating treadle pump projects as part of their programs. The Grameen Bank, for example, launched an initiative, which at its height installed 25,000 treadle pumps one year, facilitated by credit available through the organization. As part of this

effort, the Grameen Bank set up their own treadle pump manufacturing enterprises

15. Having the right product. Bob Nanes, the IDE country director during the period when annual treadle pump sales broke through to 60,000, pointed out that even if a program establishes high initial product quality, if it implements a variety of highly effective marketing and promotion activities, and an effective private sector supply chain, all of these activities will fail unless they are linked to an outstanding product. By a combination of good luck and good choices, the treadle pump has been an outstandingly attractive product for poor farmer customers.

The ultimate outcome: opening access to affordable small plot irrigation for poor farmers in Bangladesh

Twenty percent of the 1.3 million small farmers in Bangladesh who have purchased treadle pumps earn a new net income of \$ 500 a year, and the rest have increased their income by \$100 a year or more.⁷¹ At the same time, the purchase price of the cheapest diesel pump in Bangladesh has decreased from about \$500 when the treadle pump program started in 1984, to about \$175 for a 3 hp Chinese diesel set to-day. It is reasonable to assume that poor farmers prefer pumping by machine if they can afford it, to working hard on a treadle pump. For this reason, it is also reasonable to assume that the 250,000 or so small farmers in Bangladesh who now have \$500 a year more to spend have likely been key contributors to the recent exponential increase in the sales of low-cost diesel pumps in Bangladesh.

Most owners of diesel pumps also become water sellers, or rent out their diesel pumpset when they don't need it. Since treadle pump owners also are active water purchasers, the 1.3 million treadle pump owners in Bangladesh have increased the demand in water markets, and increased the income earned by diesel pump owners from water sales. While the resulted exponential increase in the sale of diesel pumps has produced competition for treadle pump sales, the ultimate impact of strong sales of both diesel and treadle pumps has dramatically expanded the access of small poor farmers in Bangladesh to affordable small plot irrigation water.

When the treadle pump program started in 1984, there was a huge gap in the market for affordable small plot irrigation devices between buckets and \$500 diesel pumps. It is likely that the exponential sales of treadle pumps have leveraged a corresponding exponential sales curve for diesel pumps. This, in turn, has supported a rapidly expanding water market in Bangladesh, which paradoxically has become a major source of competition in the market place for treadle pumps. The outcome of all this

has been the rapid expansion of access of small poor farmers in Bangladesh to affordable irrigation water, which has been the main goal of the treadle pump program in Bangladesh all along.

FOOTNOTES

- 1** See Lene Mikkelsen: "Marketing SME Products – cases from Latin America", Small Enterprise Development, Vol 10 No. 4; Harshani Samarajeewa: "Marketing made easy", Swiss-contact, Colombo 1999; Mary Mc Vay: "Microenterprise Marketing: Trends, Lessons Learned, and Challenges – A study by the SEEP network, funded by Care International, September 1999 (www.seepnetwork.org/marketing.htm)
- 2** See Malcolm Harper: "The new Middlewomen – Profitable Banking Through on-lending Groups", Oxford & IBH Publishing, Delhi, Calcutta, 1998
- 3** Jim Tamburn: "Business development services – how sustainable can they be?" ILO, Geneva, 1998
- 4** See Thomas Fischer, Vijay Mahajan: "The forgotten sector – Non-Farm Employment and Enterprises in Rural India", Oxford and IBH, New Delhi, 1997, page 72 ff
- 5** Many books have been written on the 4 Ps and it seems that there are many other Ps added (for instance "People"); we refer here to the main 4 Ps and follow the "guru" of marketing, Philip Kotler. See Philip Kotler, Gary Armstrong: "Principles of Marketing", Prentice Hall, New Delhi, 1999 and many other books of the same author.
- 6** For a World Bank/SDC project on market development for solar photovoltaic products a market study was commissioned which focussed entirely on urban markets, because the market research agency was not capable to send their staff to rural areas.
- 7** see Thomas J. Stanley: "Marketing to the Affluent", New York 1988; Thomas J. Stanley: "Selling to the Affluent", New York 1991. Stanley is author of the bestseller: "The millionaire next door".
- 8** This graph is based on the chapter "product cycle strategies" in Philip Kotler, Gary Armstrong: "Principles of Marketing", Prentice Hall, New York, New Delhi, 1999, page 288 ff.
- 9** Data from the Credit Proposal of Posttosecha or Phase 9, Berne 1998
- 10** Barry Berman: "Marketing Channels", John Wiley, New York, 1996, page 342
- 11** See M.V. Kamath: "Milkman from Anand – the story of Verghese Kurien", New Delhi 1996
- 12** It is very difficult to define comparable figures for "output" and for "reach-out". The figures are only estimates which give an order of magnitude. Here are some explanations:
 - Output VFFP: 90 m\$ is the annual net present value created by the trees which are purchased by the participating farmers; the treadle pump output is the 100\$ net income by a million farmers; the output of the silos is the total savings in grain losses and price gains; the output of MCR is the profit of the suppliers in the channel and for latrines it is the estimated health cost saving by a latrine of 8\$/family.
 - Reach-out: in case of VFFP there are 650'000 participating farmers (families), in the case of treadle pump over 1 million farmers (families), in case of the silos, there are about 150'000 families which have a silo; in the case of MCR, there are over 150'000 new roofs made available (cumulative roofs more than a million); and in the case of latrines, there are over a million latrines per year added.
- 13** See Urs Heierli: Report on a visit to Indore and Maikaal Bio Re Ltd. (Bio cotton) for micro-irrigation; unpublished report by SDC, New Delhi, October 1998
- 14** SDC has published several papers which give a very differentiated view on poverty alleviation strategies: See SDC: "DEZA Politik für soziale Entwicklung", Bern, October 1999; H.F. Bürki: "Was ist eigentlich Armutsbekämpfung?" and "Armut und Armutsbekämpfung", Bern (internal papers) and Richard Gerster: "Alternative approaches to poverty reduction strategies" SDC working paper 1/2000, January 2000
- 15** The World Bank and other agencies have set-up a "Partnership for Poverty Reduction" program and created a databank of case studies (best practices) on partnerships between the public and private sector (see <http://www1.worldbank.org/ppr/>)
- 16** See "Profit and Philanthropy", Business World, New Delhi, 22 February 1998
- 17** See: Ariel Fiszbein, Pamela Lowden: Working together for a Change", the EDI (Economic Development Institute) Learning Series, The Worldbank, Washington 1999
- 18** See the outstanding book by Peter Drucker: Innovation and Entrepreneurship, New York 1986
- 19** See Frances Stewart: Technology and Underdevelopment
- 20** See Malcolm Harper: "Profit for the Poor – cases in micro-credit", New Delhi 1998
- 21** S.L. Rao, I. Natarajan: "Indian Market Demographics – the Consumer Classes", Global Business Press, New Delhi 1996

- 22** "Business World" Nr.16, 28 February, New Delhi 1997: "Boomtime in the Backwaters"
- 23** See Pradeep Kashyap: "Traditional Haats and Melas in India", MART (Marketing and Research Team), New Delhi, 1995
- 24** See IDE: "Roundtable on Rural Marketing – Strategies for Success (Abstracts and Solutions)", New Delhi 1998
- 25** See Urs Heierli: "Environmental Limits to Motorization – Non-motorised transport in developed and developing countries", St. Gallen and New Delhi, 1992, page 97 ff.
- 26** See Thomas Stanley: "Marketing to the Affluent", op. cit.
- 27** See Thomas Fischer, Vijay Mahajan: "The Forgotten Sector", op. cit.
- 28** See Akio Morita: "Made in Japan", New York 1986, page 115 ff.
- 29** See: Bertil Torekull: "Leading by Design – the IKEA story", New York 1999, page 40
- 30** See Alex Counts: "Give us credit – How small loans today can shape our tomorrow", New Delhi 1996, page xii
- 31** Philip Kotler: "Kotler on Marketing – How to create, win and dominate markets", New York 1999, page 36
- 32** op.cit. page 31
- 33** op.cit. page 23
- 34** See Daniel F. Spulber: "The Market Makers – how leading companies create and win markets.", New York 1998
- 35** See Tushaar Shah et al: "Pedal Pump and the Poor – Social Impact of a manual irrigation technology in South Asia", not yet published, 1999
- 36** Tushaar Shah, op.cit. page 28
- 37** The key data are taken from E. Schaltegger, M. Argüello, G. Sanchez: "Evaluación Externa del Programa Regional Postcosecha (PRP), Managua, Mayo de 1998 (internal report of SDC)
- 38** See Programa regional de Postcosecha: "Programa Operative de la Fase 1999-2002".
- 39** See Kurt Schneider: "Getreidesilos für alle – ein Erfahrungsbericht" (also available in Spanish), LBL, CH-8315 Lindau, Switzerland, 1996
- 40** There is even a manual in English: Postcosecha: "Metal silos – Manual for manufacturing metal silos for grain storage", Programa Regional de Postcosecha, SDC, Managua, April 1999
- 41** It has nevertheless taken 80 years to introduce the gas stove on a large scale (and only half of that time to promote the electric stove); for a very good description of the dissemination process see the remarkable book by Sigfried Giedion: "Mechanization takes command – a contribution to anonymous history", New York 1948, new edition 1975, page 512 ff.
- 42** This led to the publication of a compendium by H.E. Gram, J.P.M. Parry et. al: "FCR, Fibre concrete roofing", SKAT and IT publications, St. Gallen and London 1987 (see www.skat.ch)
- 43** See HOLTEC Consulting Pvt. Ltd. "Marketing and potential study for micro concrete roofing tiles", New Delhi, October 1996
- 44** This widening of the product range is highly recommended in another study by HOLTEC: "Sustainable production systems for cement based products in India", New Delhi, September 1997
- 45** See Skylark Chadha, Martin Strauss: "Promotion of rural sanitation in Bangladesh with private sector participation", Dhaka, April 1991
- 46** Anne LaFond: "A review of sanitation program evaluations in developing countries", UNICEF, New York, EHP, Environmental Health Division Activita Report No.5. USAID.
- 47** See WHO: "The Impact of social mobilization for sanitation on the private producers", Dhaka, February 1996
- 48** See: House of Consultants: "National Survey on latrine producers and market situation", Dhaka 1994, p66
- 49** See Marianne Dewier, Rabiul Islam: "Contributions of water supply, sanitation and hygiene activities to health in Bangladesh, SDC, Dhaka, December 1997, page 12 ff.
- 50** See Derrick Ikin, M. Rahman: "Report of the concept mission to develop a proposal for the promotion of latrine production by private producers in rural/semi urban areas of Bangladesh", St. Gallen, Dhaka 1992
- 51** See NGO Forum, Dhaka: "Social Mobilisation for Sanitation Project – Annual Report 1995-1996
- 52** See Peter Tschumi et al: "New concepts for Partnership in rural water supply and sanitation for the low water

table areas of Bangladesh", Dhaka July 1997

53 See Derrick Ikin et al: "SDC Marketing Strategy Mission for the WATSAN partnership project (WPP), Dhaka, October 1998

54 Henk Alberts, René Meza, Denis Solis and Marvin Rodriguez: "How the rope pump won in Nicaragua", Waterlines Vol 12 No 2, October 1993

55 Peter Sandiford, Hans Alberts, Juan Guillermo Orozco and Albert Gorter: "The Nicaraguan rope pump", Waterlines, Vol 11 No 3., January 1993

56 See Rachel Blackman: "Financing of rural water supply systems from a rights perspective – A case study of the rope pump in Nicaragua", University of Birmingham 1999

57 See Sandra Postel: "Last Oasis – Facing Water Scarcity", Worldwatch, Washington 1997, and "Pillar of Sand – Can the irrigation miracle last?", Washington, Worldwatch 1999

58 See SKAT: "MEPI 1998 – International MCR Progress Report, St. Gallen, May 1999

59 See Joel Bolnick: "uTshani Buyakhuluma (the grass speaks): People's dialogue and the South African Homeless People's Federation", IIED, London 1998

60 See: Diana Mitlin: "Reaching low income groups with housing finance", IIED, London 1996

61 See Urs Heierli: "Report on a Field visit to SELCO in Bangalore and Mangalore for solar photovoltaic installations, SDC, New Delhi 1997

62 Such a solar lantern is now under test by ITC, Intermediate Technology Consultants in cooperation with IDE. See <http://www.itcltd.com/solar/>

63 See TERI (Tata Energy Research Institute): "Development of gasifier based silk reeling oven", New Delhi 1997

64 See TERI: "Design, development and field testing of an advanced caramom curing chamber prototype for Sikkim (Pilot scale), New Delhi 1999

65 For an updated information, see www.teriin.org, biomass energy application.

66 Martin Wegelin, Bernhard Sommer: "SODIS at the turning point – a technology ready for use", SANDEC

news, EAWAG, Dübendorf, Switzerland, October 1997 (see www.eawag.ch/dept/san/)

67 Sandy Cairncross: "The impact of sanitation and hygiene on health and nutrition", Waterfront, Issue 12, December 1998, p. 3

68 See Committee of Donor Agencies for Small Enterprise Development: "Business Development Services for SMEs: Preliminary Guidelines for Donor-Funded Interventions, Washington, January 1998

69 Polak, Nanes, and Adhikari. A Low-cost Drip System for Small Farmers in Developing Countries. Journal of Water Resources, 1997

70 See Uma Ramaswamy, Sulagna Sengupta: "The treadle pump – Changing the lives of women and men", New Delhi 1999 (gender study as part of Tushaar Shah's impact study)

71 Tushaar Shah, Socio-economic Impact Study of the Treadle Pump

THE SIX EXAMPLES OF THE STUDY

The following six examples are looked at in detail, and analysed according to the 4 Ps of marketing and according to the different performance parameters, especially in view of the potential for scaling them up and replicating them in other countries.

1. "Hundred million trees as a social insurance scheme: the village and farm forestry programme in Bangladesh", 2. "Pedalling out of poverty with the treadle pump in Bangladesh, India and Nepal", 3. "60 kilograms more maize per family with "Postcosecha" silos in Central America", 4. "2'000 micro-concrete roofing workshops produce over 150'000 roofs per year", 5. "6'000 private

workshops produce over one million latrines per year in Bangladesh", 6. "The rope pump in Central America: the scope for private drinking water supply".



VFFP: Village and Farm Forestry, Bangladesh

This is Amina Begum; she was a poor woman and now runs one of the 2'500 private nurseries which deliver almost 100 million tree saplings every year. Trees have become a profitable crop for 650'000 families because they are good assets: the net present value of a tree is 6 \$ and a sapling costs 10 cents. The tree can be chopped in case of an emergency (e.g. a child's sickness).



Micro-concrete roofing tiles

Over 2'000 workshops operate in more than 35 countries; they produce 150'000 roofs per year. The workshops are viable and the technology is supported by an international network. With a good promotion and market creation, cost-effective building materials can have a big scope for expansion, contribute to closing the housing gap and give many small enterprises the opportunity to flourish.



Treadle pump (Bangladesh, India, Nepal)

Over 1 million pumps have been sold to small and marginal farmers. On half-an-acre, they can grow more vegetables or other crops and make an average additional income of 100 \$ per year. 20% of the farmers make 500-600 \$ net income per year. Around 10'000 micro-enterprises supply, sell and install the pumps in the "poverty pocket" of the world.



Private latrine producers in Bangladesh

A social mobilisation campaign for sanitation has created a market for latrines in Bangladesh; they are sold for prestige, comfort and privacy, and last but not least have a very good impact on health. The market creation has allowed 6'000 private workshops to produce latrines and compete with subsidised government latrine production centres. They produce over 1 million latrines per year and have increased coverage considerably.



Postcosecha maize silos, Central America

More than 170'000 silos have been sold by over 600 "artesanos". The silos avoid losses of over 10'000 tons of grain per year and generate savings (avoided losses and gains from price fluctuations) of more than 6 million dollars per year. A family with a silo has 61 kilograms more maize to eat, and the gains from price fluctuations allow for a payback period of less than a year.



The rope pump, Central America

The rope pump has reached a maturity in Central America which allows large-scale dissemination of this cheap and efficient water pump. It costs less than 100 \$, one fifth of conventional hand pumps and has all the potential to be disseminated in many countries as an alternative to public pumps. Market creation and promotion still need to take place, but in Central America, the critical mass has been reached.