

Factors Affecting Benefits From The Treadle Pump A Study

For



INTERNATIONAL DEVELOPMENT ENTERPRISES (INDIA)

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By

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FACTORS AFFECTING BENEFITS FROM THE TREADLE PUMP - A STUDY-

1.0 Background

International Development Enterprises (IDE) has been marketing treadle pumps under the brand name **KB** (Krishak Bandhu) for the last 6-8 years in various parts of east India. A study, sponsored by the **Swiss Development Cooperation** (SDC), was conducted under the overall guidance of **Prof. Tushar Shah** during 1998-99. In its enquiry into the impact of treadle pumps on the lives of small and marginal farmers, the study found wide variations in the income earned. Out of every 100 customers, an estimated 20 were found to be earning less than the average of Rs.4500, while another 20 were estimated to be earning at least 5 times the average!

The current study probes this variation. A good understanding of the factors underlying this variation would help in shaping the Treadle Pump Marketing Programme better, so as to deliver a higher value-addition to the treadle pump customer.

2.0 Objectives

- To study the low earners and the high earners to understand the reasons behind the varied impact.

3.0 Methodology

A series of in-depth interviews were carried out with both low and high earners in three Regional Offices, namely, Bihar, W. Bengal and Uttar Pradesh. The following sampling plan was adopted:

- 10 Low Earners and 10 High Earners from each of the above mentioned ROs. were chosen from a list prepared by the field staff
- The sample in each RO was spread over at least two Field Offices so as to reasonably represent the Region
- The customer selected was one who had used the treadle pump for at least 2 years
- The user had not received the pump free of cost, but had purchased it.

The in-depth interviews covered the following areas among others:

- Land holding
- Location of land,
- Cropping pattern,
- Detailed cost and income analysis
- Cropping intensity
- Input levels
- Family size and education
- Access to market
- Brand recall
- Brand equity
- Promotion mix – what seems to work

The following areas were covered under each RO:

Sl. No.	Regional Office	Districts Covered
1	Bihar	Sitamarhi & Ranchi
2	W. Bengal	Dakshin Dinajpur & Coochbehar
3	Uttar Pradesh	Kushinagar & Bharaich

4.0 Findings

An analysis of the reasons underlying the wide variation in income revealed the following three factors:

- Size of land holding
- Cropping intensity
- Choice of crop & crop timing

4.1 Size of Land Holding

The absolute size of the landholding determines the earning potential. This was the reason often advanced by farmers when asked about the variation in income levels within the same area.

However, there are farmers with very tiny landholdings but have a high income due to higher cropping intensity such as, Ram S. Mahto of Sitamarhi. He has only about 0.5 acres but due to a combination of high cropping intensity and excellent crop timing managed to earn a net income

of about Rs.60,000/year!!!! So also Satish Sarkar of D.Dinjapur. With a land size of just 0.17 acres, he earned a net income of Rs.9380/year. (**See Annexe 1**)

However, size of land still determines earning potential. What explains the difference in earnings between Ram Mahto and Satish Sarkar is just the difference in landholding. Both have a cropping intensity of about 300%, but the land holding of Ram Mahto is about 3 times that of Satish Sarkar!

4.2 Cropping Intensity

Cropping intensity is defined as the ratio of gross cropped area to net cropped area, expressed as a percentage.

$$\text{Cropping intensity (CI)} = \frac{\text{Gross cropped area} \times 100}{\text{Net cropped area}}$$

It indicates how many times in a given period, a piece of land has been brought under cultivation. In general, the higher the CI, the greater the earnings for similar landholding size. For example, let us consider the case of Vishram Singh of Kushinagar and Ram Mahto of Sitamarhi. Vishram Singh has twice as much land as Ram Mahto does, yet the net income is just about half. Indeed, with a CI of 300%, Ram Mahto is effectively cultivating 1.5 acres to just 0.77 acres of Vishram Singh with a CI of 77%.

4.3 Choice of Crop & Crop Timing

What one grows and when one grows it has a bearing on the earnings. As Ram Mahto says, “Cauliflower fetches an extremely good price for a very short period around Diwali, when it is in great demand for the Chatt festival. This time I sold about 700kg at Rs.15/kg. After this period, the rate declined sharply to just about Rs.8/kg. I earned a net income of Rs.12,000 from just 0.5 acres of cauliflower. So choice and timing of crop is very important.” Similarly, those that grew coriander during winter and spinach during summer reaped a rich harvest.

On the contrary, those that did not time the crop well could not earn well. Ganesh Kumar of Parori, Sitamarhi also grew cauliflower, but missed the Chatt festival. Although yield was comparable to Ram Mahto's, income was low due to lower selling rates. Ganesh's cauliflowers were sold for just Rs.5/kg.

Vegetables were found to be the most remunerative to grow with the treadle pump. The light irrigation that the treadle pump provides is ideally suited for its growth. On the other hand paddy, including boro china (Summer rice) is hardly remunerative for the effort involved in irrigating it with the treadle pump. It makes economic sense to cultivate boro rice under the treadle pump only if the opportunity cost of own labour is close to zero! **(See Table 4 for detailed Cost of Cultivation of Boro Rice)**

In addition to the above-mentioned three factors, there are other factors that affect the income earning potential, directly or indirectly.

4.4 Location of Land

Almost all the respondents mentioned this as the major limiting factor that determined earning potential. All the three regions covered under the study are characterised by high rainfall, often leading to flooding of low-lying areas. Floodwaters in some areas such as Sitamarhi and Coochbehar recede only after about 5-6 months, rendering the land unfit for any crop other than paddy. Thus location of land determines the choice of crop. Lowlands generally, are used to cultivate paddy and uplands for the more remunerative crops such as vegetables.

Since the land is flooded for long durations, the cropping intensity is reduced thereby adversely affecting the earning potential. In addition, paddy is the least remunerative of crops when grown under irrigated conditions, using treadle pump. **(See Tables 1 to 5 for crop-wise Net income/acre)**

Indeed, except in Ranchi, where flooding is not a problem, it is the upland areas that offer great potential for adoption of treadle pumps.

4.5 Distance from Home

The distance of the cropland from the homestead is a crucial factor that determines earning potential. Typically, farmers who had their lands far away from their homes took up fewer crops (lower CI) and also hesitated to take up vegetable cultivation. Many others overcame this problem by building a small house on the cropland and staying there until the crop was harvested, while their families continued to stay on in the house in the village. An example is Ram Singh of Bazerkeraiya, Kushinagar. He was lucky though; that all the land fit for vegetable

cultivation was in one parcel. Others who have their upland spread over 3-4 parcels just leave some land fallow after kharif.

4.6 Level of Inputs

Along with the wide variation in income, is the variation in the level of inputs. The following table illustrates this:

Sl. No.	Item	Ram Mahto, Sitamarhi	S. Sohan Ranchi	Gari, Satish Sarkar, D. Dinajpur	Dhiren Burman, Coochbehar	Vishram Singh, Kushinagar
1	Seeds	2125.20	1194.44	2820	170	1522.10
2	Fertilisers	2473.31	722.22	2400	975	1524.68
3	Pesticides	1431.70	0	460	55	207.80
4	Total	6030.20	1916.67	5680	1200	3254.55

Note: All figures in Rs./acre

The key cash inputs that go into crop production are Seeds, Fertilisers and Pesticides. Water and labour are not taken into account, since they do not entail a cash expense. Except for Ram Mahto, the expenses of the rest of them on pesticides are negligible. Indeed, this is intriguing because pest attack is a major problem in vegetable crops. Similarly, the level of fertiliser used is also very low except in the case of Ram Mahto. Accordingly, the earnings/acre for him is also almost two times that of the next best. (**See Annexe 1**)

4.7 Access to Markets

All the areas studied, except Coochbehar, grow vegetables extensively. For vegetable growers throughout the country, usually it is access to markets and price stability that are major concerns. Interestingly, none of the farmers interviewed, mentioned marketing as a problem. Only when probed repeatedly did they mention that prices fell, but only by the end of the crop season.



The routine for a vegetable grower in these areas is a tough one. The day begins with tending to the crops or irrigating. By afternoon, harvest for the day's market is done. Usually, the women in the household carry the harvest as a head-load and hawk it at the nearby market (haat). They return only when all the vegetables have been sold off. To support such a routine, crops ready for daily harvest are needed. Farmers therefore go for diversified cropping. It helps them have some crop ready for the daily harvest and also reduces the risk of losses due to pest attack or poor prices.



For example, Bishnui Mahto of Bariarpur treks 3km to Sitamarhi thrice a week to hawk his vegetables. Occasionally, he sells to traders from Darbhanga and Ghorashan, who come to the railway station at Sitamrahi or Bhasar-Parsauni. Indeed, what is surprising is that for an area that cultivates so much of vegetables, Sitamarhi town

has no market place for the vegetable sellers. There are no traders who could buy and transport to more distant markets.

Similar is the situation in Ranchi. Motilal Mahto of Manatu, cycles to Ranchi (about 12km away) everyday to hawk his vegetables outside the Pandra Agriculture Market (on a lucky day) or from house to house.

In all the areas studied, except Bhabraich, the farmers mentioned no traders, a designated market place or a system of auctioning. In Fatehpurwa, vegetables are taken to the Darga Mandi in Bhabraich town and sold by means of an auction. Traders charge a 6% commission from the sellers, but prices were usually higher too!

4.8 Family Size

Since the treadle pump involves a lot of hard work, it was expected that larger family size would have a direct impact on the earning potential. However, this was not borne out by the survey. For example, Ram Mahto with just two adults (he and his wife) earned far more than the rest of them, while Sohan Gari with 3 adults (he, his wife and son) could earn hardly any income. Farmers occasionally did mention this as one of the factors affecting income-earning ability. Usually, though, they qualified it by saying that merely having a large family was not sufficient; they must be willing to work hard too.

It was thought that it was the older generation that was willing to work hard and therefore formed the potential segment for the treadle pump. However, it is our observation that it is the head of the family, in most cases a middle-aged father, who was using the pump.



4.9 Caste & Other Barriers

Caste was found to be a barrier only in one of the villages covered. Sibram Pandey from Gangapur, Bhabraich is a Brahmin (upper caste) as are many others in the village. They feel it is taboo to grow vegetables and hawk them in the nearby market. They therefore, sell their produce to anyone who can buy from them at the farm itself.

Other than this village, caste formed no barriers in either using the treadle pump or earning an income from it. While the Mali community (Kushwahas in Bihar and E.Uttar Pradesh) dominated the user profile, other communities too used the treadle pump. However, the upper caste rarely ever featured in the user profile.

In Bihar and Uttar Pradesh, women were not found to be using the treadle pump. A woman sows, weeds and harvests, but does not pedal the pump. In some cases, the men complained of

the high workload but still would not transgress the local tradition. In contrast, women in both Jharkhand and W.Bengal used the pump extensively.

4.10 Other Findings

Apart from the above, the study also focused on issues related to the brand and sources of information to the customer. The following are the findings:

4.10.1 Brand Image

The KB brand enjoys tremendous goodwill among the customers. It is, however, usually linked to the face of IDE in the field, the Marketing Assistant. The close bond shared between the MA and the customer is indeed, touching. Many of the customers welcomed the MA as a member of the family, during our survey. Customers associated the company marketing the pump with one that is genuine and cared for the small farmers!

4.10.2 Brand Recall

In contrast, the recall of the brand name KB was very poor. Hardly any of the customers could recall the brand name without prompting. Almost no one could recall the punch line, “Apna paani..... KB hai mahan”. Even when the punch line was shown in the local language, they could not read the brand name since it was in English!

The KB Pump was usually referred to as, “Dab dabi”, “Paaye chaapa”, “Dheki kol”, “Dheki machine” or more crudely as “laathwallah pump”. Most of the users were not even aware of the KB stickers on the pump.

In a situation where the brand image is good, but not identified with the brand name, the position of the brand in the customers mind can be easily usurped by a competitor.

4.10.3 Promotion & the Customer

Among all the channels of information to the customer that IDE uses, only two were mentioned repeatedly by all the customers; word of mouth and haat demonstrations. Almost no one

mentioned, wall paintings, dealer boards or short campaigns. Video film shows were mentioned in a few places. No one could recall the details of a wall painting.

Usually, the decision to purchase was triggered by good word of mouth from a neighbour or a relative or a live demonstration at a haat. As a marketing strategy it would be useful to identify and encourage good word of mouth, by positively rewarding such behaviour.

In addition, it would be useful to listen to the conversation between a user and a prospective customer. The feeling we got from the talking to the customers was that while the benefits of the treadle pump were mentioned, the drudgery was highlighted. A way must be found to package and present the benefits of the treadle pump to counter the undeniable drudgery involved.

5.0 Suggestions

- Cropping Intensity and Crop Timing are the most important factors that affect income-earning potential. Therefore, information about planning the use of available land may be presented to the customers to enhance their incomes.
- Cropping mix that can increase the CI may be suggested to the customers.
- The level of inputs use is very low. This may have been due to uncertainty in the past about availability of water when needed. With assured irrigation, higher levels of inputs would surely lead to higher earnings. Therefore, customers must be educated about the level of use of inputs such as fertilisers, etc.
- Currently, no customer mentioned marketing as a problem. However, they could earn more if they were linked to larger markets. IDE may like to choose a small area that has a high concentration of treadle pump users such as, area around Sitamarhi town and try and link them to major markets. Of course, cultivation of speciality vegetables would greatly enhance the potential to link. For example, if the farmers could grow, say, gherkins, they could even be exported!
- The area that can be irrigated by the efforts one man is limited. If the women of the household also participate, the income earning potential would go up. Indeed, if more women can be persuaded (perhaps the men have to be persuaded to let the women

pedal the pump!!!) to use the pump, it is likely that households that have not purchased it for fear of too much hard work for only one person would change their minds.

- The promotion mix needs to be revamped. The contents also must be looked at again. The physical benefits of the pump are conveyed adequately. The subtler benefits of high income, better standard of living, etc are not conveyed at all, although the impact on the customer in this regard is evident.
- The major channel aiding the decision to purchase the pump is good word of mouth. A mechanism to identify and reward such persons is essential. In most of the villages we visited during the survey, it was usually the first customer or the mistry that had brought in business in a steady stream in the subsequent years.
- The general refrain from the customers was that the pump gave them enormous benefits, but it was a lot of hard work. A strategy must be devised to stress the benefits from the pump and deflect from the drudgery that it entails. Indeed, the belief of farmers that a lazy farmer can never be successful could be used effectively!

6.0 Conclusion

The impact of the Treadle Pump Programme on the lives of small and marginal farmers is extremely significant. All efforts must be made to reach out to more and more such farmers who could benefit from



the simple technology. In addition, to making the pump available, if IDE could also communicate and offer a package to help customers earn a higher income by better agronomic management, the impact would be manifold.

Annexe 1

A detailed cost and income analysis was carried out during the course of the survey. Analysis of cost and income for 5 customers representing the three ROs is presented in Tables 1 to 5. A summary of the tables is presented below:

Sl. No.	Factor	Ram Mahto, Sitamarhi	S. Sohan Gari, Ranchi	Satish Sarkar, D. Dinajpur	Dhiren Burman, Coochbehar	Vishram Singh, Kushinagar
1	Land Holding Acres.	0.5	1.06	0.17	2.33	1.00
2	Cropping Intensity %	295.45	16.98	300	85.71	77
3	Cost of Cultivation	28848.45	1730	8060	12400	8491
4	Total Income	86950	3450	17440	28600	34000
5	Net Income	58101.75	1720	9380	16200	25509
6	Net Income/acre	39330.42	9555	18760	8100	33128
7	Net Income/ Cost of Cultivation	2.01	0.99	1.16	1.31	3.00
8	Inputs*/Acre	6030.20	1916.67	5680	1200	3254.55
9	Earnings/ Acre Owned	116203.50	1622.64	56280	6942.86	25509

Note: Figs in blue indicate the highest in the category and in bold italics indicate the lowest in the category.

* Inputs include cost of seeds, fertilisers and pesticides only.