

Income Impact Analysis -2010

Orissa



International Development Enterprises (India)



INCOME IMPACT ANALYSIS – ORISSA

Methodology

IDEI carried out an Income Impact study to understand the following issues:

1. Income generated through use of the IDEI promoted technology KB Treadle Pump (KBTP)
2. Land brought under irrigation and cultivation using these technologies
3. Various crops grown and diversity
4. Plot sizes for various crops
5. Quantity sold for each of the crops and prices obtained
6. Cost of cultivation for each of the crops
7. Components of cost of cultivation were also gathered and analyzed
8. Individual crop profitability was analyzed

Present study is based on findings from a random sample of 98 smallholders which is a part of total sample of 996.

Incomes reported are exclusively agricultural earnings through use of KBTP for irrigation. Both gross income and net income after deduction of investments have been recorded for all crops. All cost of cultivation, including labour based and input based costs were gathered. Data on income, investments or any monetary transactions are in ₹. Income mentioned for the state is median value of net annual incomes.

Key Findings

- Median net annual income for smallholder TP farmers was ₹ 26,760, minimum being ₹19,400.
- Income was independent of period of usage of TP as well as area cropped
- 98.68% of the smallholders cultivated high value crops, predominantly vegetables
- Cost of cultivation was 30% of gross returns from crops on an average

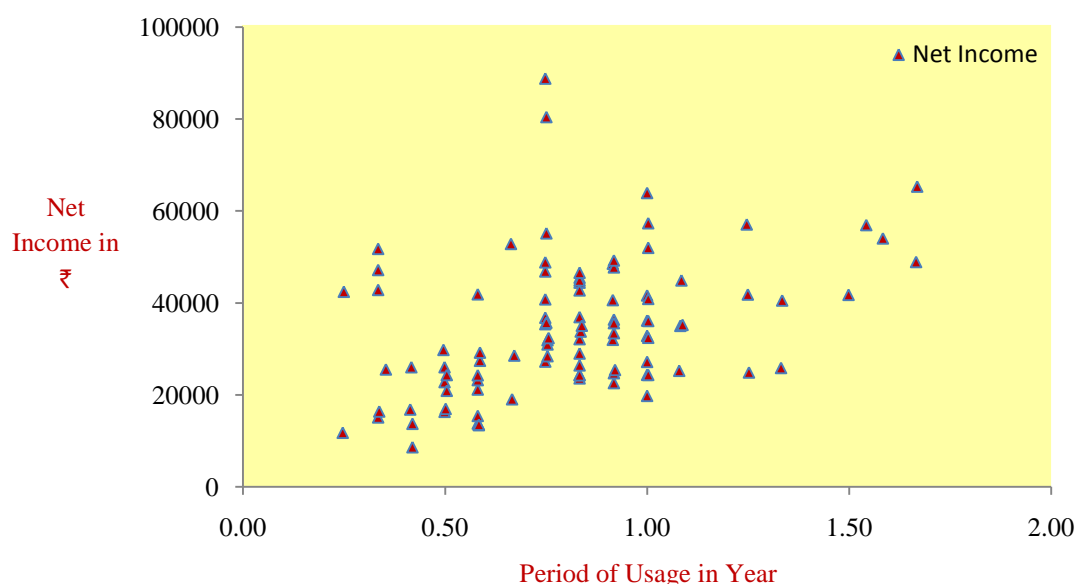
- Plant nutrients (36%), hiring agricultural equipments (22%) and seed material (13.6%) were the major cost components
- 98% of the smallholders cultivated three or more crops for a given period of usage, 50% cultivated six to nine crops
- 58.8% of crop plots were less than or equal to 0.25 acre
- Crop portfolio management was a key determinant of income

Income Pattern

Income and Usage Period

In order to understand if the period of usage of TP mattered, customers have been categorised into four categories, i.e. users below 6 months, 6-12 months, 1-1.5 years, and 1.5-2 years. The objective was to ascertain if TP technology could potentially impact the users in a relatively short period of time. The results are independent of the period of usage of TP, i.e. it applied for all TP users whether they used it for three months or two years or anything in between. Figure 1.1 shows net income of customers during the period they have actually used the TP.

Net Income & Period of Usage (Fig. 1.1)



Net incomes during the usage periods were extrapolated to net income per year. Analysis of the data shows that all the customers using TP had a minimum net annual income greater than

₹16,000. The lowest net annual income was of ₹ 19,400 (21% higher than ₹ 16,000). Median net annual income for the small holders was ₹ 26,760.

Income and Cropping Area

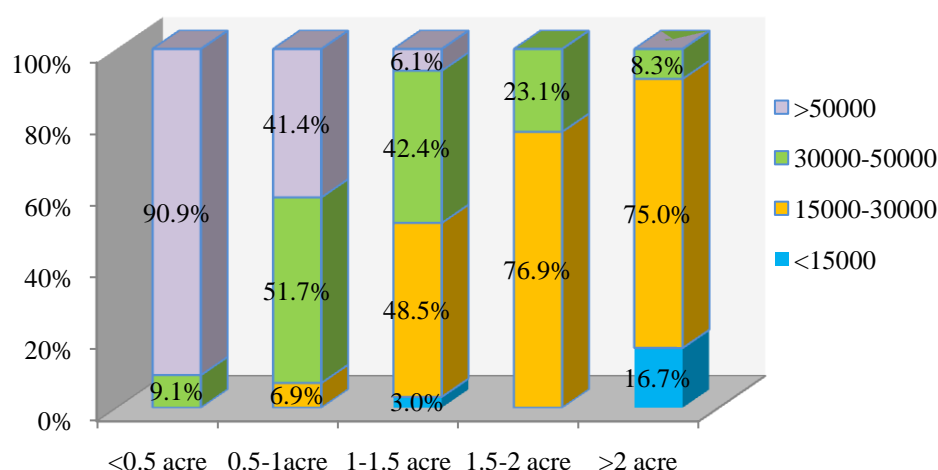
The next level of analysis was to determine if gross cropped area (GCA) had an effect on income. GCA refers to the total area under all the crops grown by a farmer (in which TP is used). It was found that GCA ranged from 0.1 to 3.2 acres for the selected set of farmers. Net annual incomes from respective cropped areas were extrapolated to get net annual incomes per acre for selected set of smallholders (Figure 1.2).

Net Annual Income per Acre (Figure 1.2)

Net Annual Income per Acre	% Customers in the Income Category
< ₹ 15,000	3.07%
₹ 15,000 - ₹ 30,000	37.77%
₹ 30,000 - ₹ 50,000	34.70%
> ₹ 50,000	24.46%

Overall, 24.5% of all the smallholder farmers earned above ₹ 50,000 per year per acre, and of these 42% had GCA less than or equal to 0.5 acre and 50% had GCA 0.5-1.0 acre. GCA was categorized into five classes, i.e. less than 0.5 acre, 0.5 to 1 acre, 1 to 1.5 acre, 1.5 to 2 acre and greater than 2 acre. The idea was to study the income variations with respect to GCA. Figure 1.3 shows various income groups across different GCAs

Net Annual Income per Acre (in ₹) & GCA (Fig. 1.3)



It was observed that unlike smallholder farmers with relatively larger cultivable areas, those with lesser cultivable area exercised optimum land utilisation. Smaller the landholding,

greater was the effort towards priority cultivation, leading to increased incomes. This is evident from the data which shows that **for farmers with only 0.5 or less GCA, 9% earned in the range of ₹ 30,000 to ₹ 50,000 and 91% earned above ₹ 50,000 per acre.** In case of farmers with GCA 0.5 to 1 acre, 7% earned between ₹ 15,000 to ₹ 30,000 per acre, 52% farmers earned in the range of ₹ 30,000 to ₹ 50,000 per acre, and 41% earned above ₹ 50,000 per acre. Hence GCA was not a determinant for net income per acre.

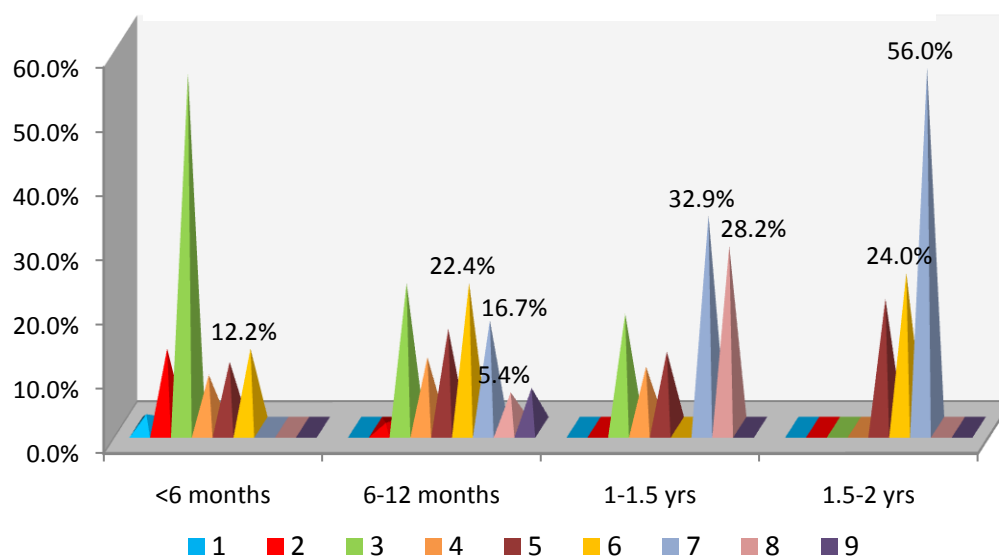
Cropping Pattern

Cropping Intensity

The data on crops grown show that 98% of the small-holder farmers using TP cultivated three or more crops for any given period of usage, depending on availability of cropping area, water for irrigation and other resources. 48% farmers cultivated three to five crops and 50% cultivated six to nine crops.

It was observed that usage of treadle pump helped farmers take up more number of crops. Arable land which would have been left fallow otherwise for lack of irrigation could be cultivated, thereby increasing the cropping intensity. Figure 2.1 explains the number of crops cultivated by the smallholder farmers with different usage periods of TP.

Period of Usage vs. No. of Crops Grown (Figure 2.1)



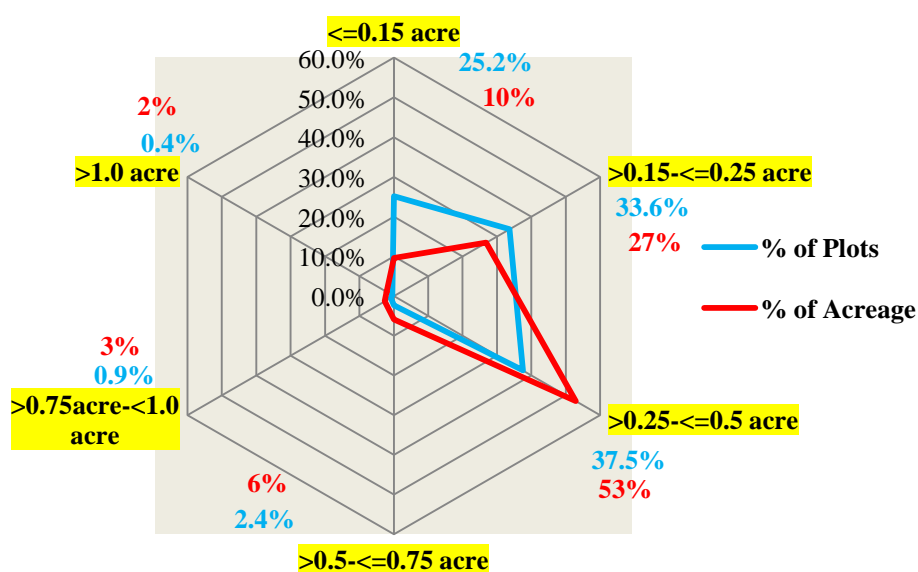
Smallholder farmers tried to maximise their incomes from limited land resources through judicious crop management. They diversified their crop portfolio and cultivated different crops in smaller plots. Acreage per crop in 96.3% of the cases was upto 0.5 acre and in 58.8%

of the cases was less than or equal to 0.25 acre. 90% of the cropping was done in plot sizes up to 0.5 acres and 37% in plot sizes less than or equal to 0.25 acres (Figure 2.2).

Smaller plots with different crops helped smallholder farmers in

- Year round access to market to meet cash needs
- Mitigate risk such as from
 - Pest attack/Crop failure
 - Glut in the market
 - Difficulties in marketing

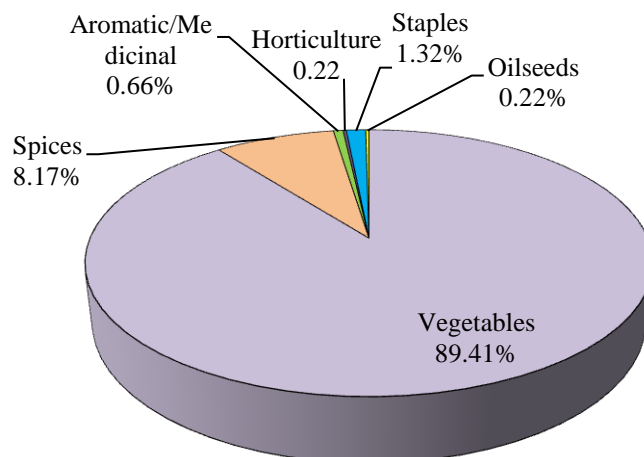
Crop Plot Sizes (Figure 2.2)



Crop Portfolio

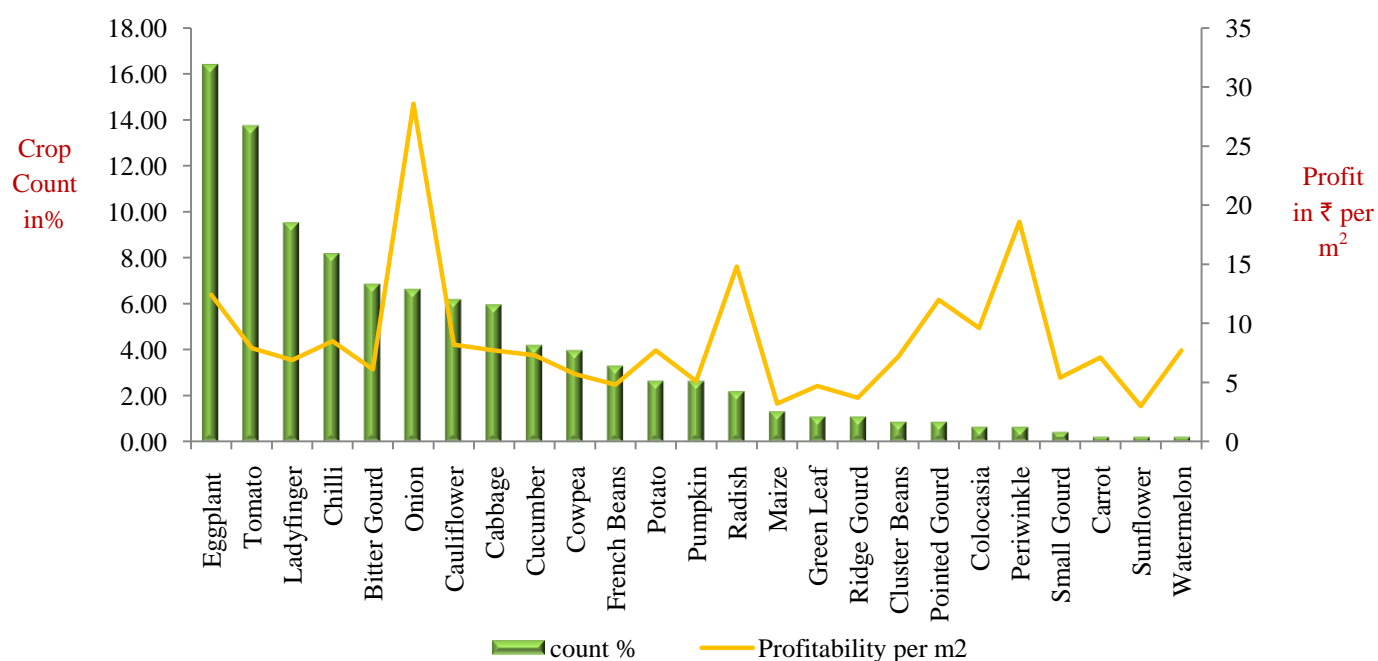
Assured irrigation encouraged the smallholder framers take up high value crops. 98.68% of the crops grown were high value crops, predominantly vegetables. Twenty five different crops were grown in the region using TP technology. Figure 2.3 shows the different category of crops grown using TP.

Crop Categories (Fig. 2.3)



There was no single dominant crop in the region. However, most popular crops were eggplant, tomato, ladyfinger and chilli. On the contrary the most profitable crops were onion, periwinkle, and radish and pointed gourd etc. with potential profitability almost twice that of the most popular crops. The crops which were both moderately profitable as well as popular were cucumber, cabbage and cauliflower. Figure 2.4 explains the popularity and profitability of crops cultivated in the region.

Crop Popularity & Profitability (Fig. 2.4)

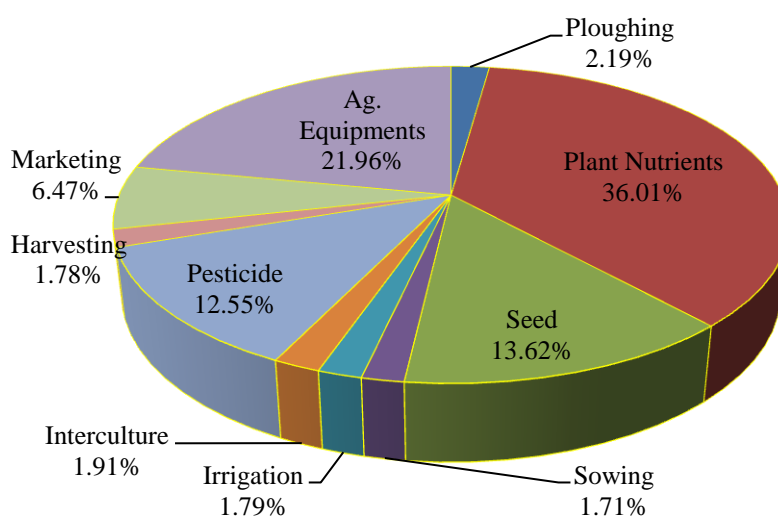


Margins

Cost of Cultivation (CoC)

Different components of the agronomic practices were studied to identify major cost component, if any, which affected the profit margins. CoC was found to be 30% of income from crops on an average. Hence the smallholder farmers earned considerable profit margins of 70%. Figure 3.1 shows the average cost on various components of cultivation.

Cost Components in Cultivation (Figure 3.1)



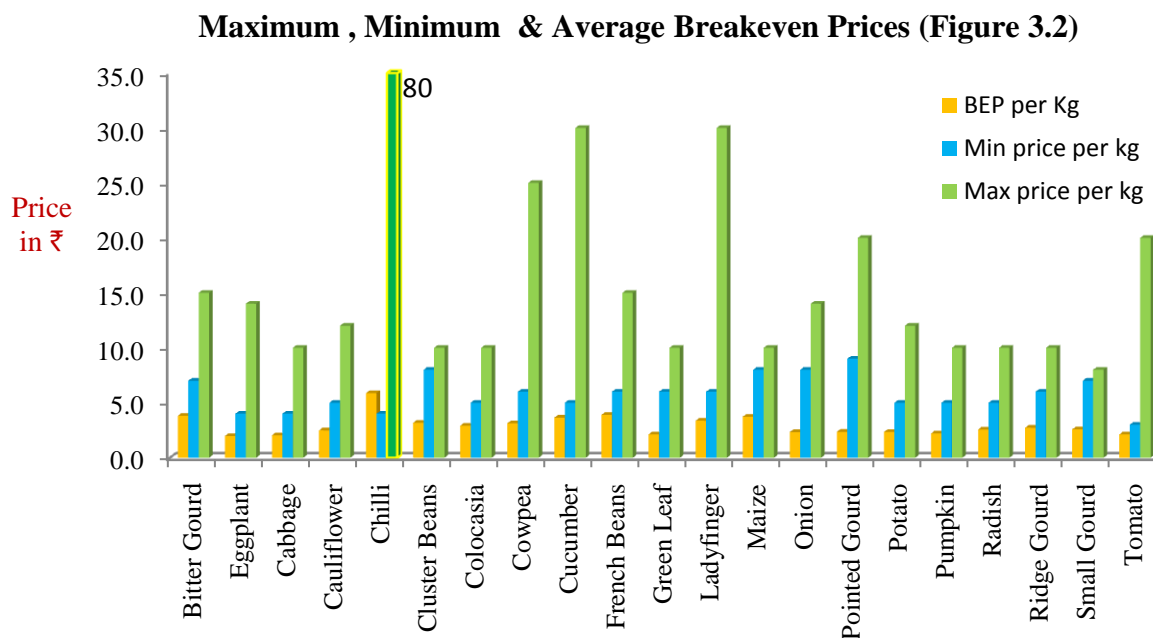
Analysis of CoC components showed that plant nutrients (manures and fertilizers) was the major source of cost (36%) followed by cost of hiring agricultural equipments (22%). Agriculture equipments were hired for operations like ploughing, sowing, application of nutrients and chemicals, interculture and harvesting. Such operations involved agricultural wage labour as well, though not significant. Cost incurred on seed material (13.6%) and pesticides (12.6%) was also high.

Selling Price

An analysis of the prices farmer received for their agricultural produce was done to understand the profit margins made by them. Hence the minimum, maximum and breakeven prices for crops were analysed. Breakeven price (BEP) for any agricultural produce is the price a farmer must receive in order to recover all the costs associated with producing the crop. BEP for all the crops grown were determined to ensure if the small-holder farmers recovered the cost of cultivation and made good profit margins.

Average BEP for most of the crops ranged from ₹ 2 to ₹ 4 per kg. The minimum price obtained for any produce was always higher than the BEP ensuring that the smallholder

farmers made profits even at the minimum prevailing prices. Figure 3.2 shows the minimum and maximum selling prices and average BEPs for various crops.



Maximum price fetched for any crop was at least twice the minimum price obtained. Maximum price variation was observed in case of ladyfinger, followed by cowpea, cucumber tomato and chilli. While farmers fetched a good price for chilli crop in general, prices for red chilli were even higher, upto ₹ 80 per kg.

Selection of right time for harvest operations, in response to market needs, fetched farmers much higher prices. So was the case with selection of rare crops. Some farmers identified the niche markets in the locality, and grew crops which fetched high margins (example- periwinkle).

Conclusion

Use of treadle pump enabled the smallholder farmers earn a minimum net annual income of ₹ 16,000. However these smallholder farmers can be facilitated to earn even higher. Some of the primary issues which need to be addressed are:

- It was observed that the smallholders spent large amounts on manures and fertilizers (36% of total investments). This is an area where cash outflows can be minimized
- Although cost of cultivation was 30% of gross returns on an average, for crops like colocasia, french bean and maize, it was higher. Such crops can be made profitable

either by reducing the costs of cultivation or introducing productivity enhancing packages

- Highly profitable crops were taken up by few smallholders only. Such crops should be popularized.