

# **Income Impact Analysis -2010**

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**Madhya Pradesh**



International Development Enterprises (India)



## INCOME IMPACT ANALYSIS – MADHYA PRADESH

### 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 34 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 ₹ 21,080, minimum being ₹16,024.
- ✚ Income was independent of the period of usage of TP, and cropped area as well
- ✚ 95% of the smallholders cultivated high value crops, predominantly vegetables

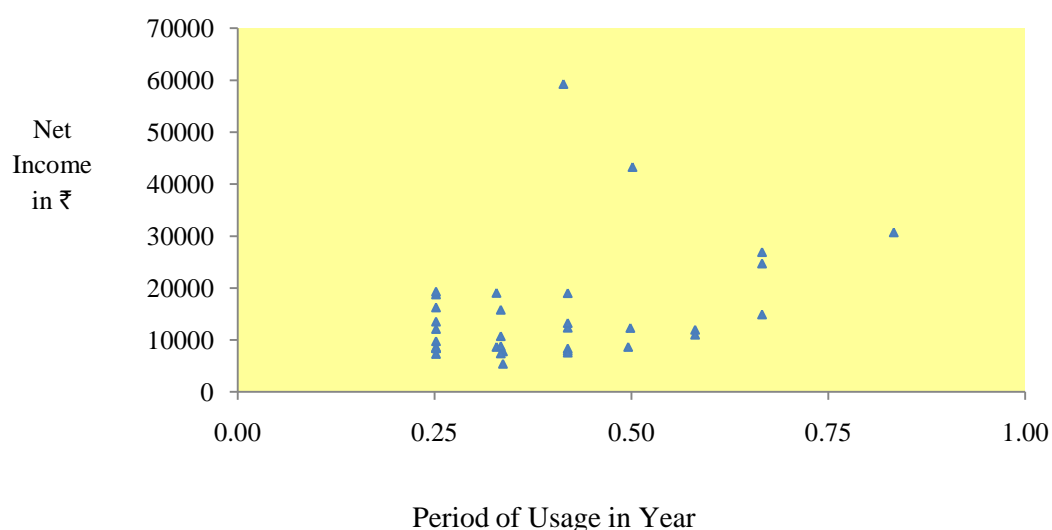
- ✚ Cost of cultivation was 28% of gross returns from crops on an average
- ✚ Hiring agricultural equipments (25.45%), plant nutrients (25.32%) and pesticides (16.09%) were the major cost components
- ✚ 74% of the smallholders cultivated two crops for a given period of usage, and rest cultivated a single crop
- ✚ 53.5% of crop plots were between 0.5 acre to 1 acre
- ✚ Crop Planning & selection were major determinants of income

## Income Pattern

### Income and Usage Period

With an objective to understand if period of usage of TP mattered, respondents have been categorised into four groups, i.e. users below six months, 6-12 months, 1-1.5 yr and 1.5-2 yr based on the period they have used the TP. Net income of users during the usage period was analysed to understand if income was proportionate to period of usage. Income was found to be independent of period of usage of TP. Smallholders who earned higher were from all the four categories.

**Net Income & Period of Usage (Figure 1.1)**



Net income figures during the usage periods were then extrapolated to estimate annual incomes of the smallholders, from their respective cropped areas. Analysis of the income estimates showed that all the customers using TP had a net annual income greater than ₹

16,000. The lowest net annual income was of ₹ 16,024 and median net annual income for the small holders was ₹ 21,080.

### Income and Cropping Area

Apart from period of cropping/usage of TP, an attempt was made to understand if the gross cropped area (GCA) was a key determinant to income. GCA here refers to the total area under all crops grown by a farmer in a given period (in which TP is used). Hence GCA as a probable factor was analysed.

GCA for the customers studied varied from as low as 0.4 to 2 acre, depending on factors such as period of cropping, no. of crops, cultivable land available, etc. 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	5.88%
₹ 15,000 - ₹ 30,000	23.53%
₹ 30,000 - ₹ 50,000	41.18%
> ₹ 50,000	29.41%

Among the smallholders who earned above ₹ 50, 000 per acre annually, 40% cultivated a gross area upto 0.5 acre and 50% cultivated 0.5 to 1 acre. This hints at the fact that smallholders with just an acre of cropping area can earn potentially well and income is independent of area put to cultivation. Figure 1.3 further explains this.

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 income variations with respect to GCA. Net annual incomes from respective cropped areas were extrapolated to obtain net annual incomes per acre for selected set of smallholders

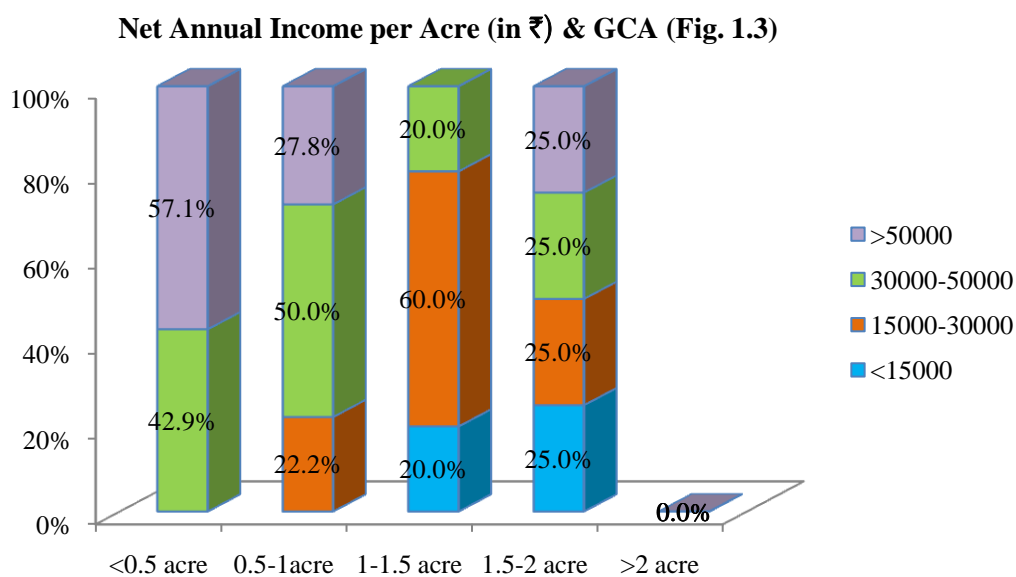


Figure 1.3 shows that all the smallholders with just 0.5 acre of GCA or even lesser, earned a minimum of ₹ 30,000 per acre annually. In case of smallholders with GCA between 0.5 to 1acre, 22.2% earned in the range of ₹ 15,000 to ₹ 30,000, 50% in the range of ₹ 30,000 to ₹ 50,000 and 27.8% above ₹ 50,000. Overall, 29.4% of all the smallholder farmers earned above ₹ 50,000 per year per acre, and of these 40% had GCA less than or equal to 0.5 acre and 50% had GCA 0.5-1.0 acre. Hence GCA was not a determinant for net income per acre.

It was observed that smallholder farmers with smaller agricultural lands did relatively better than those with larger cultivable areas. The former group exercises optimum utilisation of the limited resources available to earn the maximum. They usually go for priority cultivation, need based crop selection, etc. which fetches them higher returns.

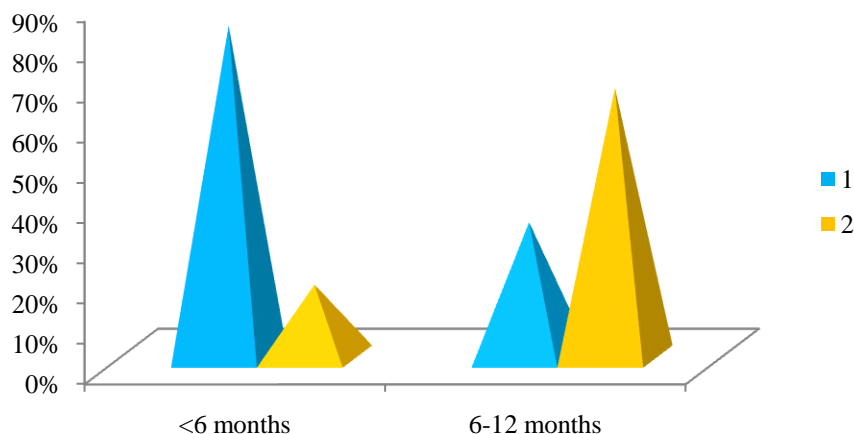
## Cropping Pattern

### Cropping Intensity

Prior to adoption of treadle pump the smallholders usually practiced rainfed agriculture with limited number of crops. With treadle pump irrigation was not only assured but easier. Hence the users cultivated crops throughout the year resulting in higher cropping intensity.

Figure 2.1 explains the total number of crops that were taken up by the smallholders who had used TP for different periods. Most of the smallholders here (74%) cultivated a single crop, and maximum two different crops (24%), for a given period of usage. They relied on a single or two different crops in larger areas, rather than cultivating many different crops in small plots. Minimum crop plot size was more than 0.25 acre (figure 2.2).

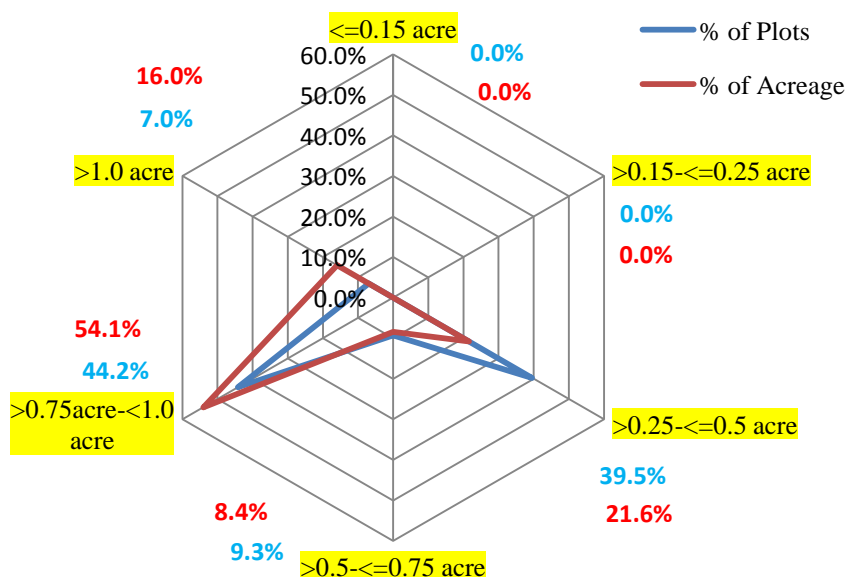
**Period of Usage and No. of Crops Grown (Fig. 2.1)**



However it was seen that most of the smallholders (92%) who took up a single crop, had used TP for six months and even lesser. While most of the smallholders (44%) with longer period of usage had taken up two crops. This is both because of completion of a crop and choice of two crops.

Approximately 93% of the crop plots were 0.5 acre to 1 acre in size (39.5% of the crop plots were between 0.25 to 0.5 acre, 9.3% between 0.5 to 0.75 acre and 44.2% between 0.75 to 1 acre), and these plots constituted 84% of the total cultivated area studied. 7% of the crop plots were greater than an acre with 16% of the acreage studied. (Figure 2.2)

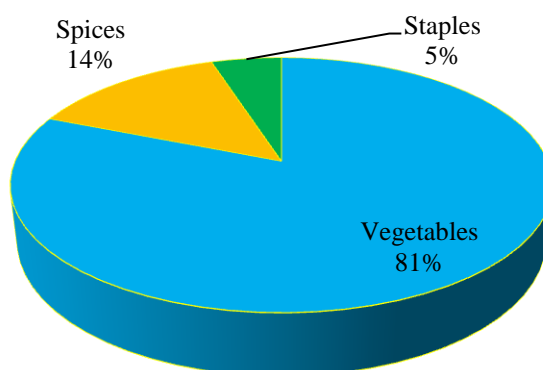
**Crop Plot Sizes (Fig. 2.2)**



## Crop Portfolio

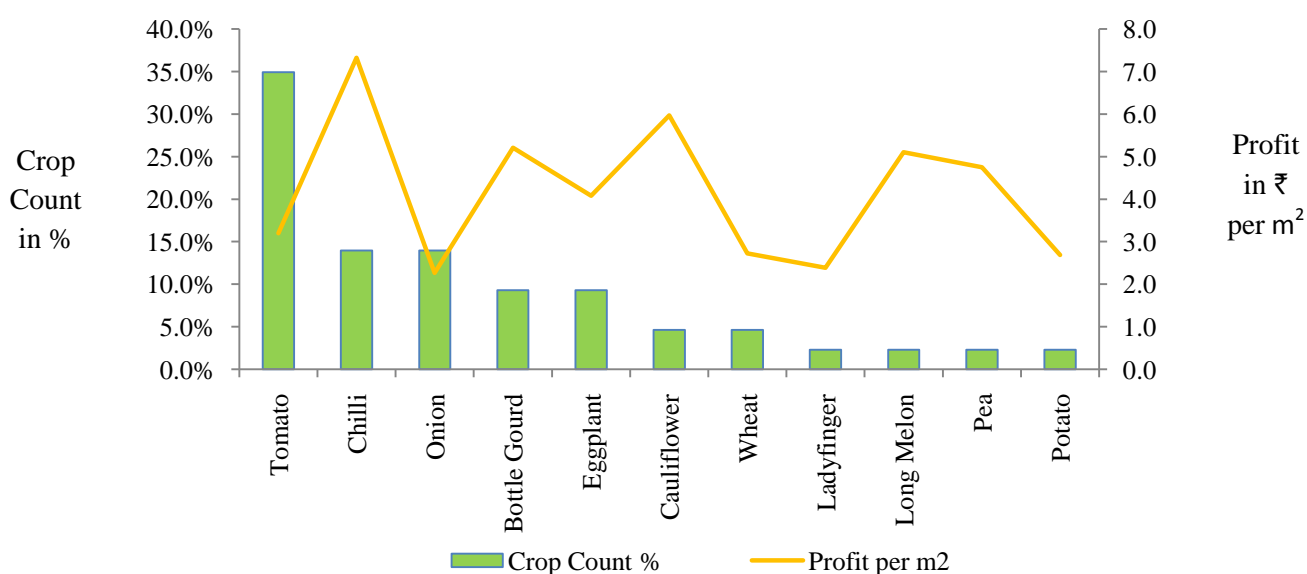
Most of the smallholders (95%) cultivated high value crops using treadle pump, with a narrow selection of crops. Vegetable crops were predominant. Eleven different crops were grown in the region using TP. Figure 2.3 shows the different category of crops grown using TP.

**Crop Categories (Fig. 2.3)**



Most popular crops in the region were tomato, chilli, and onion. Crops like chilli, cauliflower, bottle gourd and long melon were comparatively more profitable crops. Popular crops such as tomato and onion were not very profitable. Probably this is one of the areas where the smallholders can be guided.

**Crop Popularity and Profitability (Fig. 2.4)**

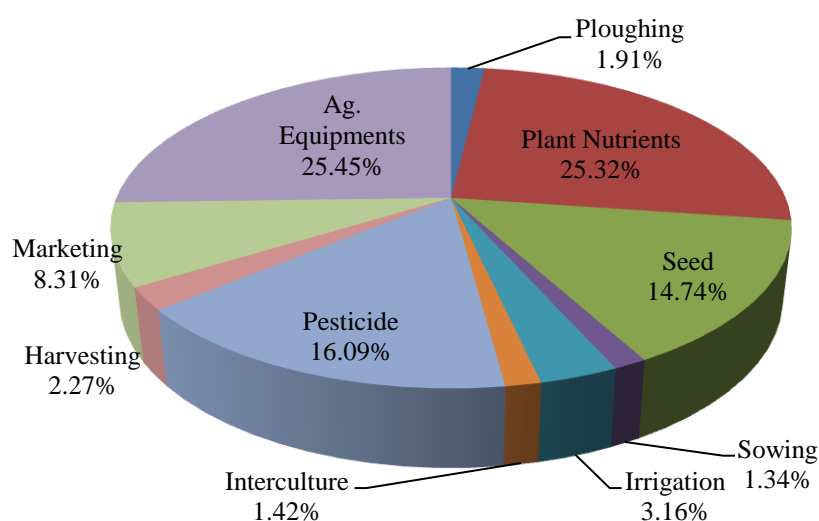


## Margins

### Cost of Cultivation

Cost of Cultivation of a crop is the total cost incurred by the smallholders in raising a crop and marketing it. So the costs start right from land preparation activities for any given crop. Average cost of cultivation for the region was found to be 28% of the gross returns, which indicates that the small holders made margins upto 72%. All the cost components were studied and categorised into two groups namely labour based and input based. Figure 3.1 explains the various cost components.

**Cost Components in Cultivation (Fig. 3.1)**



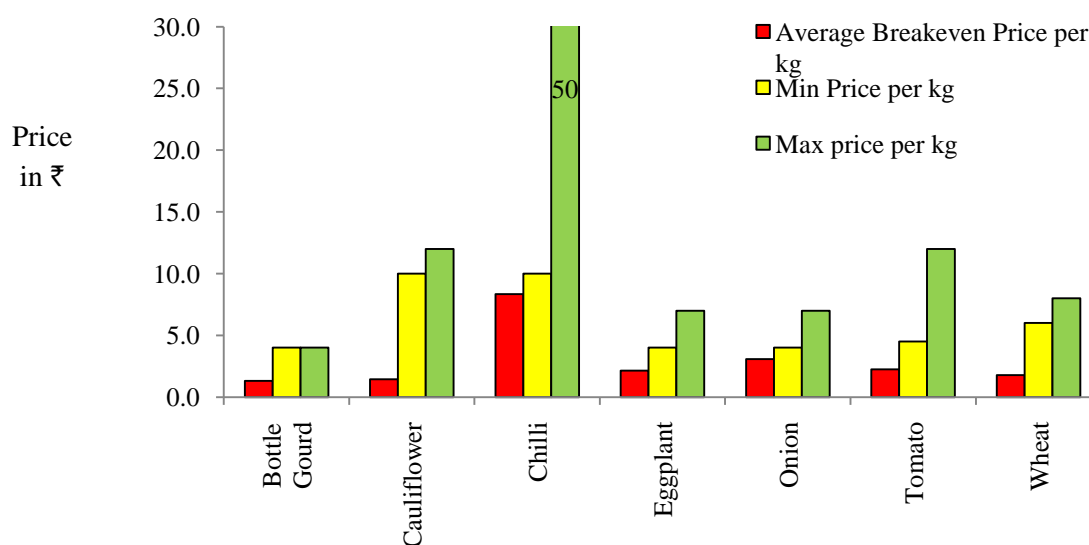
Amongst all components cost incurred on hiring agricultural equipments was the highest) 25.45% followed by that of plant nutrients, which includes the cost of fertilizers and manures (25.32) and pesticides (16.09%). Agricultural equipments were hired by smallholders for operations like ploughing, sowing, application of plant nutrients and pesticides, interculture operations and harvesting. Such operations employ paid agricultural labour in addition to family labour.

### Selling Price

Selling prices at which the smallholders sold their produce were different for different crops. Maximum price obtained for any crop was at least twice the minimum price. Maximum price fluctuation was observed in case of chilli crop, and to some extent in tomato.



**Maximum, Minimum & Average Breakeven Prices (Fig. 3.2)**



### Breakeven Price

Breakeven Price (BEP) for any agricultural produce is the minimum price a farmer must get so that he recovers all the costs incurred in producing and selling the crop. So any price above BEP ensures profits to the smallholders. For the crops that were grown and sold by the smallholders, selling price was always higher than the BEP. Hence the smallholders made profits even at the minimum selling price. Figure 3.2 shows the minimum & maximum selling prices and average values of BEPs for various crops.

### Conclusion

The objective of TP programme in the state was achieved with smallholders earning a minimum of ₹ 16,000 per year. However factors which grossly affected the margins of the smallholders in the region, if considered, shall widen the scope, e.g.

- ✚ Reducing costs incurred on plant nutrients, which was a quarter of total CoC, and also that of on pesticides
- ✚ Adoption of crops which are comparatively more profitable
- ✚ Selling prices of the commodities were comparatively low in the region. Market information may help the smallholders fetch better prices. This may further help reduce costs of marketing
- ✚ Reducing the cost of cultivation for crops like onion and ladyfinger which are taken up by good number of farmers.