

# **Income Impact Analysis -2010**

---

**Madhya Pradesh**



International Development Enterprises (India)



## 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 Drip
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 108 smallholders which is a part of total sample of 996.

Incomes reported are exclusively agricultural earnings through use of KB Drip 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 Drip users was ₹ 54,640, minimum being ₹29,378.
- Income was independent of period of usage of KB Drip, as well as area cropped
- 100% of the smallholders cultivated high value crops; predominantly vegetables

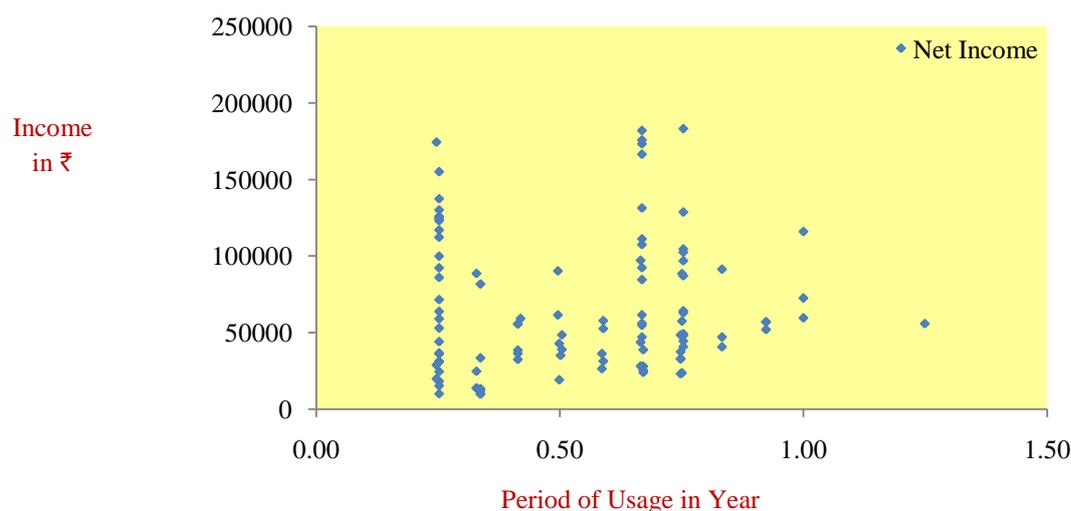
- On an average cost of cultivation was 38% of gross returns from crops
- Irrigation (20.98%), plant nutrients (18.42%), and seed material (16.25%) were the major cost components
- 68.5% of the smallholders cultivated single crop for a given period of usage, and 26.9% cultivated three crops
- 62% of the crop plots were in the range of 0.75 to 1 acre and 23.4% larger than an acre
- Crop planning based on market demands would ensure higher profits to the smallholders

## Income Pattern

### Income & Usage Period

In order to understand if a minimum period of usage was required to earn higher, users have been categorized into four groups, i.e. users below 6 months, 6-12 months, 1-1.5 years, and 1.5-2years. Net incomes of users during the period they have actually used KB drip was analysed. The results were found to be independent of period of usage of KB drip (Figure 1.1) i.e. Higher net incomes were reported for most of the users irrespective of the period used.

**Net Income & Period of Usage (Fig. 1.1)**



Net income data were then extrapolated to estimate the annual incomes for the smallholders (cropped area remaining constant). Analysis of the data showed that all the smallholders

using KB drip earned above ₹ 16,000 annually. The lowest net annual income was ₹ 29,378. Median net annual income for the small holders was ₹ 54, 640.

### 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 KB drip is used) in a given period.

Scarcity of water across the region further limited the cropping area of the smallholders. Net annual incomes from respective GCAs were extrapolated to estimate net annual incomes per acre. By doing an attempt was made to understand if productive and efficient use of water enabled the smallholders earn potentially well.

Analysis of the data showed that majority (68.5%) earned above Rs 50,000 per acre annually Figure 1.2 shows the different income categories for the smallholders.

**Net Annual Income per Acre (Figure 1.2)**

Net Annual Income per Acre	% Customers in the Income Category
< ₹ 15,000	0%
₹ 15,000 to ₹ 30,000	12.96%
₹ 30,000 to ₹ 50,000	18.52%
>₹ 50,000	68.52%

For smallholders with net annual income greater than Rs 50,000 per acre, **GCA was less than or equal to 0.5 acre for 17.6%, 0.5 to 1 acre for 47.3%**, 1 to 1.5 acre for 13.5%, and 1.5 to 2 acre for 10.8% and greater than 2 acre for 10.8%. This indicates that smallholders with than acre also did well and income was independent of GCA, which is further explained in figure 1.3.

GCA ranged from 0.45 to 6 acres for the selected set of smallholders. GCA was categorized into five categories, 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 objective was to study the income variations with respect to GCA (across the five categories)

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

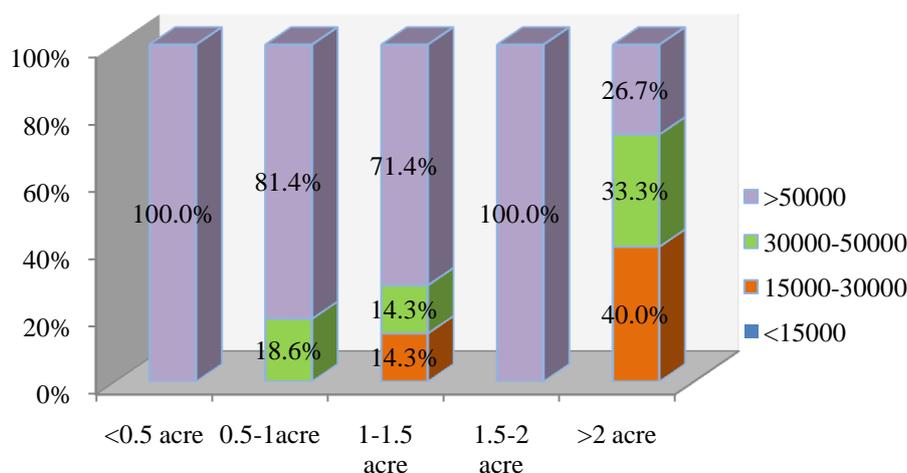


Figure 1.3 shows that in case of **smallholders with even less than 0.5 acre GCA, net annual income per acre was minimum ₹ 50,000**. Similarly for smallholders with GCA in the range 0.5 to 1 acre, 18.6% earned ₹ 30,000 to ₹ 50,000; 81.4% earned above ₹ 50,000. In case of smallholders with 1.5 to 2 acre GCA, 100% earned more than ₹ 50,000, while that was not the case with those cultivating larger areas, e.g. all income groups were seen across GCAs greater than two acres.

With affordable drip irrigation small holders cultivated relatively larger areas. Better and efficient use of water resulted in higher yields and thereby incomes.

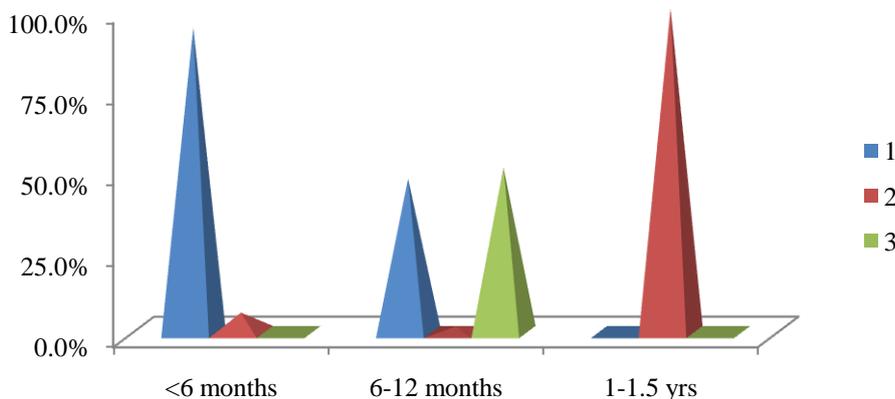
## Cropping Pattern

### Cropping Intensity

Smallholders who cultivated only a single time, during the monsoons, now were engaged throughout the year. In addition to the rainfed crop, the farmers cultivated one more crops, thus increasing the cropping intensity. The data on cropping pattern shows that the smallholders cultivated one to three crops using KB drip, largely depending on the cropping area. The smallholders had a narrow crop selection and mostly cultivated a single crop in larger size plots. 68.5% cultivated only a single crop during a given period of usage, 4.6% took up two crops and 26.9% cultivated three different crops.

Figure 2.1 explains the number of crops cultivated by the small-holder farmers with different usage periods. Majority (94%) of the smallholders who had used KB drip for six months or less cultivated only a single crop.

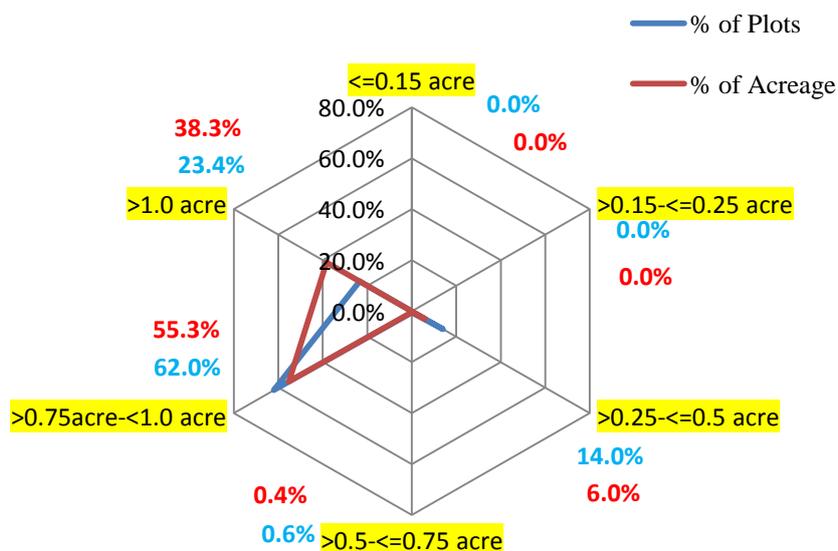
**Period of Usage vs. No. of Crops Grown (Fig. 2.1)**



50.9% of the smallholders who used KB drip for six to twelve months cultivated three crops and 47.4% cultivated a single crop. All those with more than a year of usage had cultivated two different types of crops.

Plot size for any given crop was **greater than 0.75 acre in 85.4% cases** (> 0.75 acre in case of 62% crop plots and >1 acre in case of 23.4% crop plots) which accounted for **93.6% of the total acreage under study**. 14.6% plots were in the size range 0.25 to 0.75 acre with 6.4% of the acreage (14% plots were of the size 0.25 to 0.5 acre with 6% of the acreage and 0.6% of the plots were of size 0.5 to 0.75 acre with 0.4% of the acreage). Overall, 16% of the plots were greater than or equal to 2 acre.

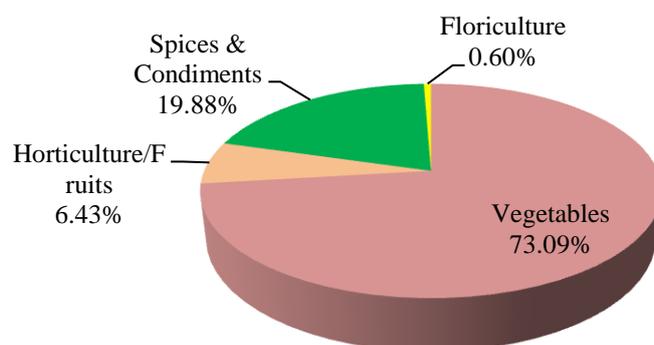
**Crop Plot Sizes (Fig. 2.2)**



## Crop Portfolio

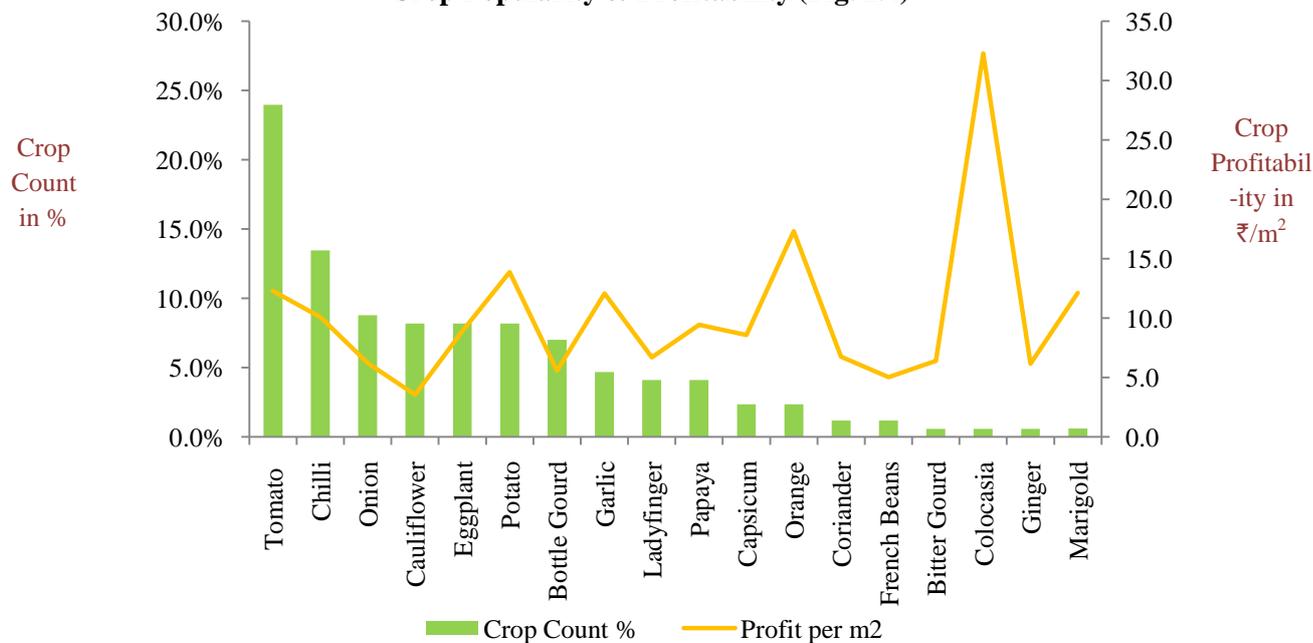
The smallholders could cultivate different crops with the limited water resources available through judicious water application possible by drip technology. Eighteen different crops were reported across the region using and KB Drip. All the crops cultivated were high value crops, predominant vegetables and spices and condiments. (Figure 2.3).

**Crop Categories (Fig. 2.3)**



Most popular crops in the region were tomato and chilli. On the contrary most highly profitable crops were colocasia, orange and potato, tomato, garlic and marigold. Most of these accounted for a small proportion of the total crops cultivated in the region (except for tomato, potato).

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

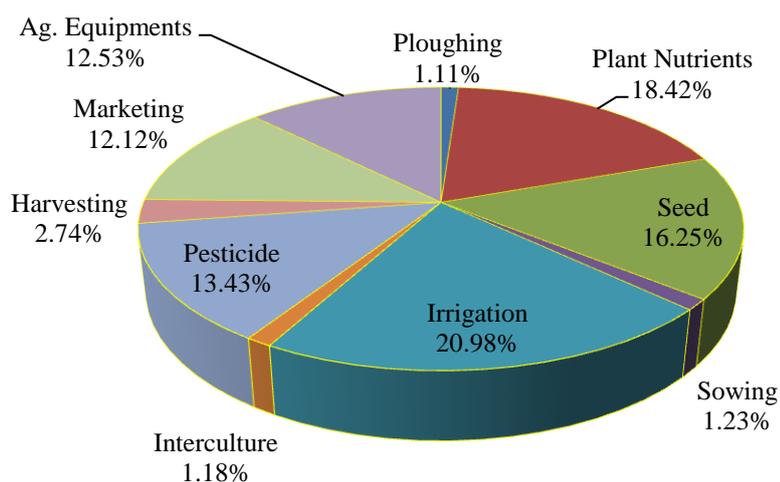


## Margins

### Cost of Cultivation (CoC)

Cost of cultivation for any crop includes the total expenses borne in raising and marketing the crop, i.e. from land preparation to point of sale of the produce. Cost of cultivation varied from as low as 14% of the income to 77%, average being 38%.

**Components of CoC (Fig. 3.1)**



Overall, irrigation (20.98%), plant nutrients (18.42%) and planting material (16.25%) were the major cost heads. Agriculture equipments were hired for operations like ploughing, sowing, application of nutrients and chemicals, interculture and harvesting.

### Selling Price

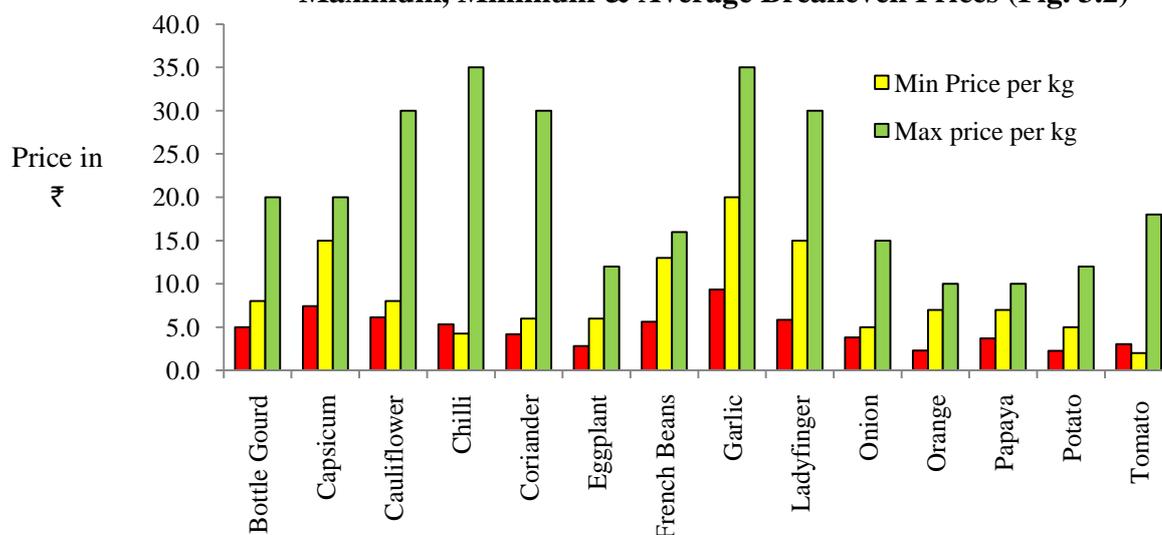
The prices that the smallholders received in return for sale of any crop showed wide variations (figure 3.2). Maximum price fluctuations were observed for chilli, coriander and cauliflower.

### Breakeven Price

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. Any selling price higher than BEP ensures profit margins to the smallholders.

For the crop produce that were sold by the small holders, selling price was always higher than the BEP for the crop. Hence the smallholders made profit even at minimum selling prices. Figure 3.2 shows the maximum and minimum selling prices and average BEPs for crops.

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



## Conclusion

Though constraint to irrigation was overcome by means of KB drip, certain other aspects of agriculture which need to be addressed are:

- Increasing the crop portfolio, since majority of the smallholders cultivated a single crop. This would also insure against any kind of risks
- Cost of cultivation was comparatively higher in the state, with 38% of gross returns on an average. For crops like bitter gourd, cauliflower, and marigold investments were found to be more than 50% of gross income. If investments can be minimized through way of low cost inputs, profits would be higher
- Smallholders can be linked to agri markets to minimize cost of marketing, which was quite high in the region