

# **Income Impact Analysis -2010**

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**Tamil Nadu**



International Development Enterprises (India)



## IMPACT ANALYSIS- TAMILNADU

### 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 83 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 ₹ 31,280, minimum being ₹17,853.
- 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 and cash crops.

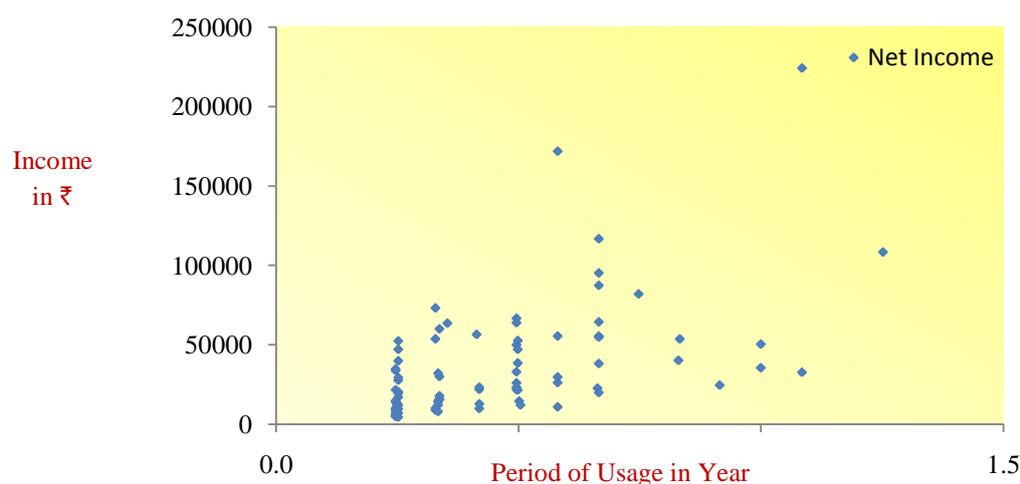
- On an average cost of cultivation was 44% of gross returns from crops
- Plant nutrients (27.84%), hiring of agricultural equipments (15.6%) and pesticides (13.76%) were the major cost components
- 78.6% of the smallholders cultivated single crop for a given period of usage, and 21.4% cultivated two crops
- 49% of the crop plots were in the range of 0.75 to 1 acre and 15% 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 (Figure1.1) 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 of ₹ 17,853 (which is 12% higher than what was targeted). Median net annual income for the small holders was ₹ 31,280.

### 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 (57 %) 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	13.25%
₹ 30,000 to ₹ 50,000	30.12%
>₹ 50,000	56.63%

For smallholders with net annual income greater than Rs 50,000 per acre, **GCA was less than or equal to 0.5 acre for 30%, 0.5 to 1 acre for 57%**, 1 to 1.5 acre for 9%, and 1.5 to 2 acre for 4%. 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 0.3 to 4.2 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)**

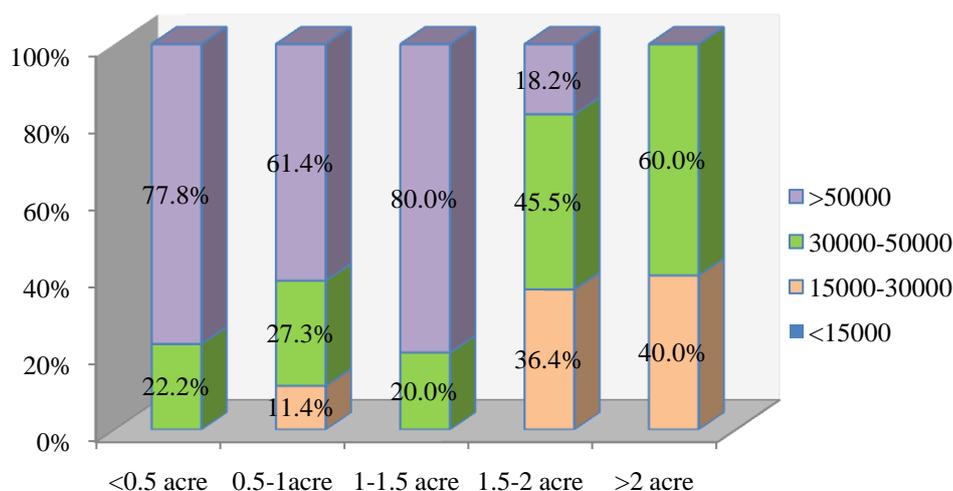


Figure 1.3 shows that in case of **smallholders with even less than 0.5 acre GCA, net annual income per acre was minimum ₹ 30,000**, i.e. 22.2% earned in the range ₹ 30,000 to ₹ 50,000 and 77.8% earned above ₹ 50,000. Similarly for smallholders with GCA in the range 0.5 to 1 acre, 11.4% earned ₹ 15,000 to ₹ 30,000; 27.3% earned ₹ 30,000 to ₹ 50,000 and 61.4% earned above ₹ 50,000 per acre.

With affordable drip irrigation the small holders cultivated larger areas. Compared to conventional irrigation with low water use efficiency, drip irrigation not only increase the water use efficiency but also better yields, hence higher incomes.

## Cropping Pattern

### Cropping Intensity

Prior to use of KB drip the most of the smallholders cultivated only during the monsoons. Now 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 small-holders cultivated one to two crops using KB drip, largely depending on the period they have used KB drip and cropping area. The smallholders had a narrow crop selection and mostly cultivated a single crop in larger size plots. 78.6% cultivated only a single crop during a given period of usage and rest 21.4% took up two crops.

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

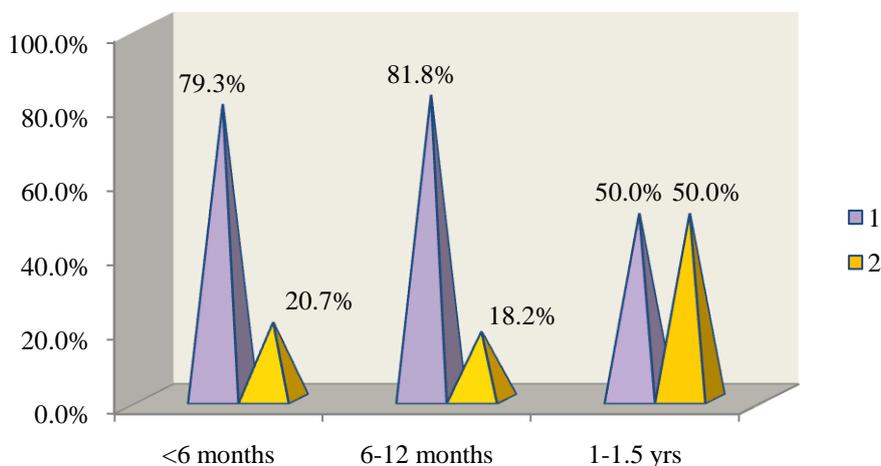
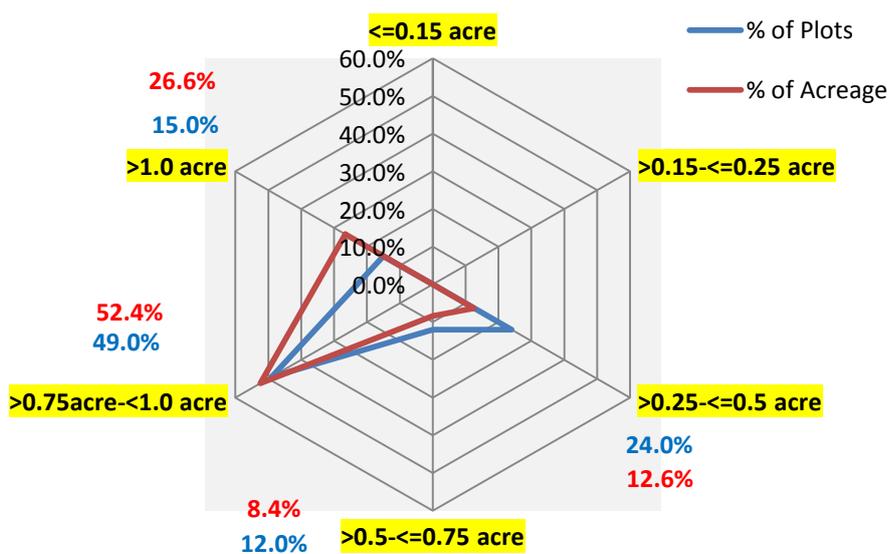


Figure 2.1 explains the number of crops cultivated by the small-holder farmers with different usage periods. Majority (79.3%) of the smallholders who had used KB drip for six months or less cultivated only a single crop. But a larger percentage of smallholders who had used it for longer periods cultivated two crops; e.g. 50% of the smallholders who used KB drip for one to one and a half years cultivated two crops.

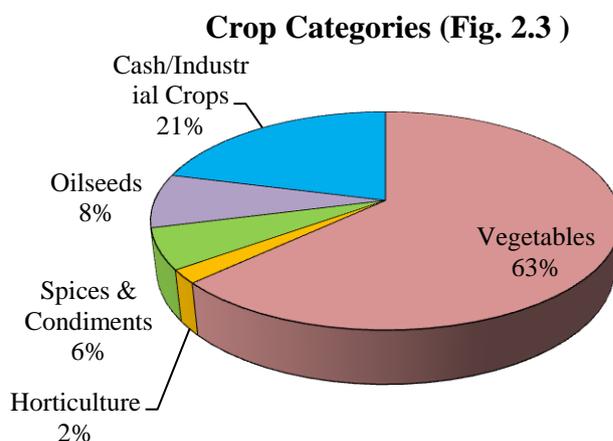
Plot size for any given crop was **greater than 0.75 acre in 64% cases** (> 0.75 acre in case of 49% crop plots and >1 acre in case of 15% crop plots) which accounted for **78.6% of the total acreage under study**. 36% plots were in the size range 0.25 to 0.75 acre with 21% of the acreage (12% plots were of the size 0.5 to 0.75 acre with 8.4% of the acreage and 24% of the plots were of size 0.25 to 0.5 acre with 12.6% of the acreage).

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

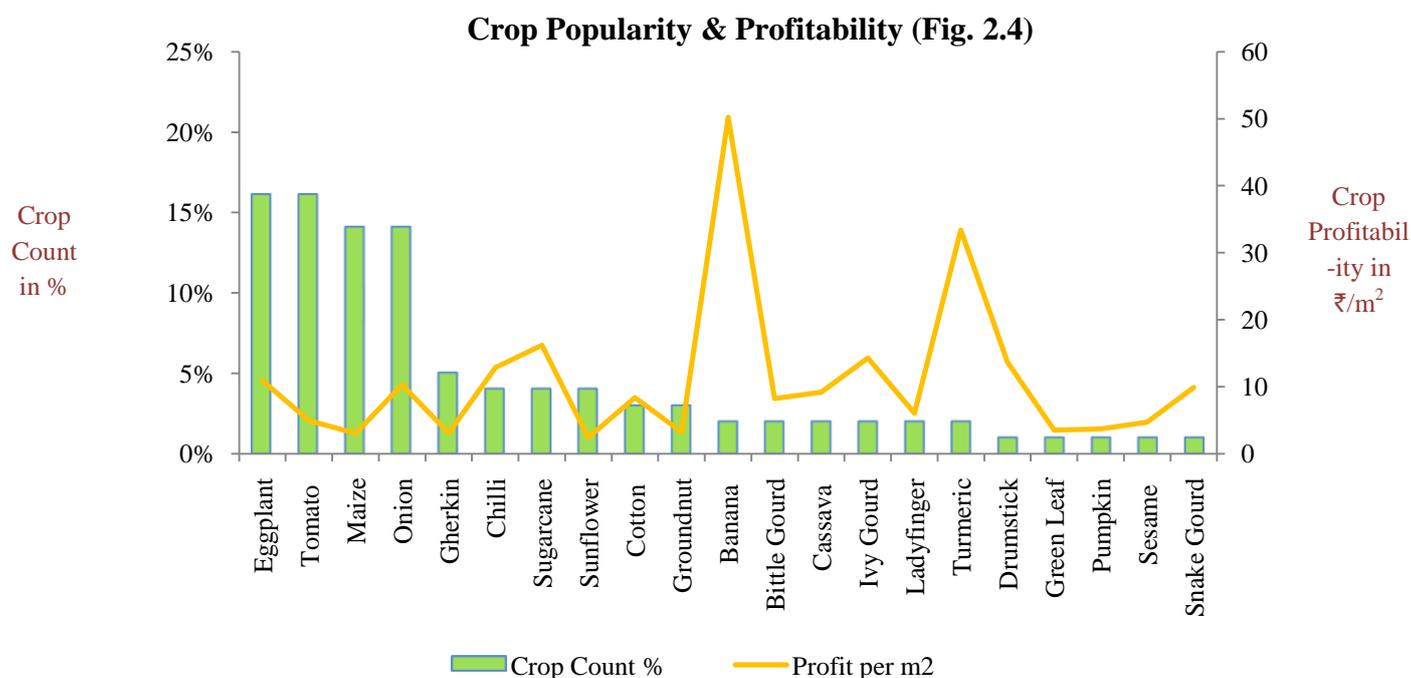


## Crop Portfolio

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



Most popular crops in the region were eggplant, tomato, chilli, maize and onion. On the contrary most highly profitable crops were banana (Rs 50/m<sup>2</sup>) and turmeric which accounted for a small proportion of the total crops cultivated in the region. Maize crop was cultivated in response to the demand for feed for local poultry industries.



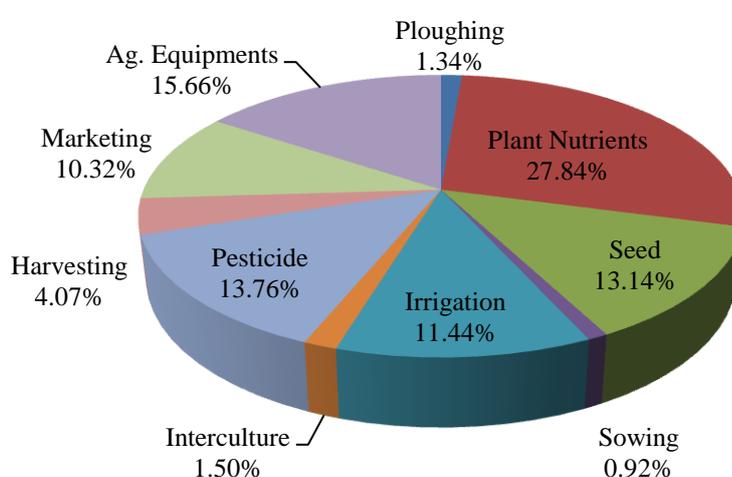
However, choice of crops in general, was rarely based on market requirement or profitability. Profitability of crops like banana or turmeric was much higher than those of highly popular crops.

## 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 21% of the income to 71%, average being 44%.

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



Overall, plant nutrients (28%) and cost of hiring agricultural equipments (16%) were major cost components. Agriculture equipments were hired for operations like ploughing, sowing, application of nutrients and chemicals, interculture and harvesting. Such operations accounted for cost of agricultural wage labour as well. Cost incurred on pesticides was high (14%) and higher than that of seed material.

### Selling Price

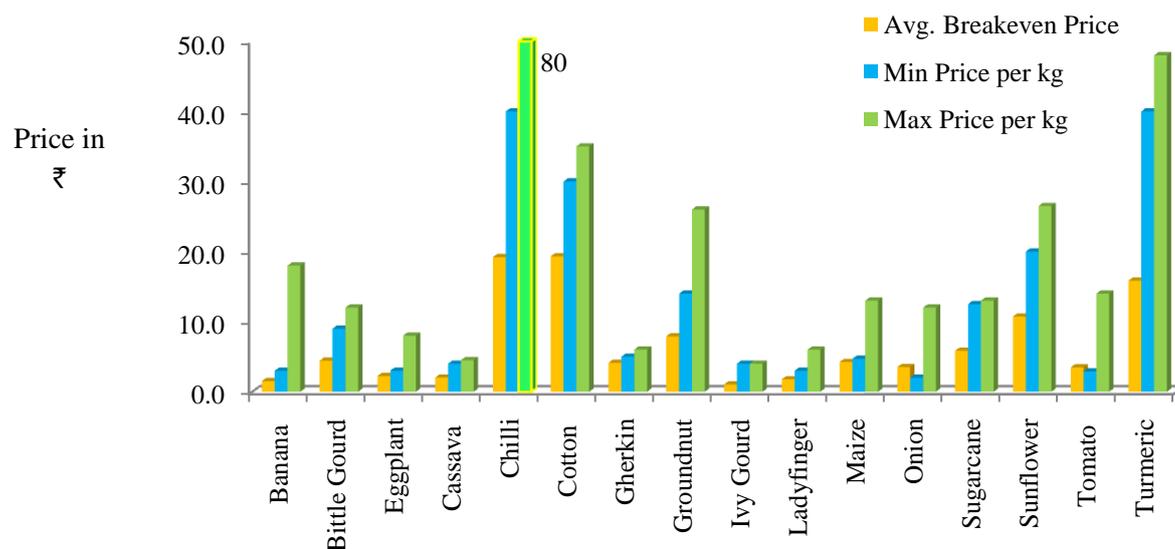
The prices that the smallholders received in return for sale of any crop showed wide variations (figure 3.2). Maximum price for any given crop was at least twice the minimum selling price. For crops like banana, onion and tomato, maximum prices were more than five times the minimum prices.

### 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

Smallholders are often laggards in adoption of new technologies because of financial constraints. KB drip was not only an affordable technology for the smallholders but also a tool to practise efficient use of water. Though constraint to irrigation has been overcome through KB drip, there are other facets of agriculture which need to be addressed:

- Widening the crop portfolio, since majority of the smallholders cultivated a single crop. This would also help mitigate risks of crop failure, if any
- Cost of cultivation was comparatively higher in the state, with 44% of gross returns as an average. For crops like gherkin, tomato and cotton investments were found to be 60% to 70% 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