

Income Impact Analysis -2010

Maharashtra



International Development Enterprises (India)



IMPACT ANALYSIS- MAHARASHTRA

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 139 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 ₹ 56, 280, minimum being ₹ 18,129.
- ✚ Income was independent of period of usage of KB Drip as well as area cropped.
- ✚ 97.8% of the smallholders cultivated high value crops; predominantly vegetables and fruits crops

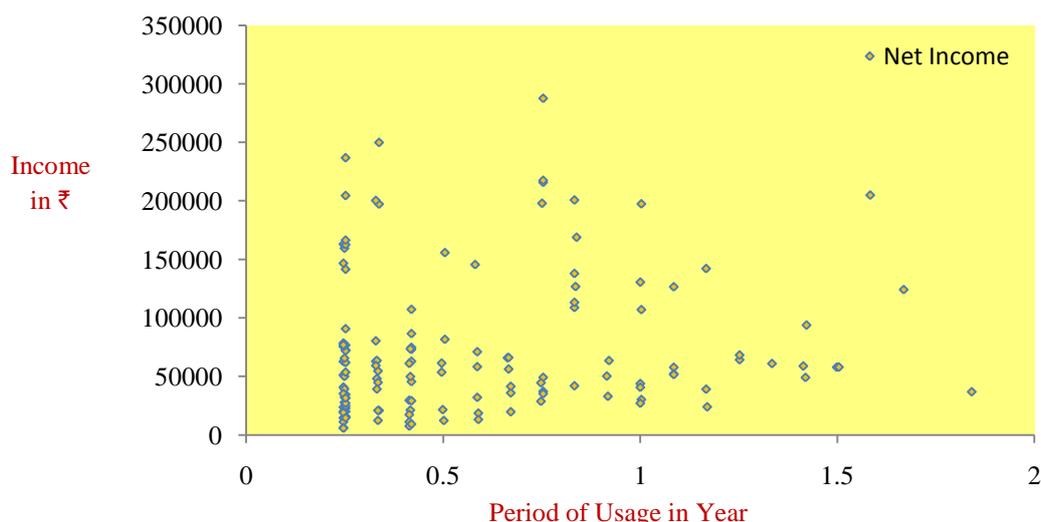
- ✚ On an average cost of cultivation was 27% of gross returns from crops
- ✚ Irrigation (24%), plant nutrients (22.4%) and seed material (20.4%) were the major cost components
- ✚ 79.2% of the smallholders cultivated single crop for a given period of usage, 16.5% cultivated two crops and 4.3 % took up three crops
- ✚ 44% of the crop plots were in the range of 0.5 to 1 acre and 25.4% 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 for earning higher income, the users have been categorized into four groups, i.e. users below 6 months, 6-12 months, 1-1.5 years, and 1.5-2 years. Net incomes of the users during the period they have actually used KB drip was analysed. The results were independent of period of usage of KB drip (Figure 1.1) i.e. Higher net incomes were reported across all the four usage groups.

Net Income & Period of Usage (Fig. 1.1)



The net income data were then extrapolated to estimate net 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. **Minimum net annual income**

recorded was ₹ 18,129 (13% higher than what was targeted). Median net annual income for smallholder Drip users was found to be ₹ 56, 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.

Net annual incomes from respective GCAs were extrapolated to estimate net annual incomes per acre. By doing so an attempt was made to understand if KB Drip enabled the smallholders, with small cropped areas, earn potentially well.

Analysis of the data showed that majority (71.9%) earned above Rs 50,000 per acre annually.

Net Annual Income per Acre (Figure 1.2)

Net Annual Income per Acre	% Customers in the Income Category
< Rs 15,000	3.6%
Rs 15,000 to Rs 30,000	13.7%
Rs 30,000 to Rs 50,000	10.8%
>Rs 50,000	71.9%

Among the smallholders whose net annual income exceeded Rs 50,000 per acre, **GCA was less than 0.5 acre for 22%, 0.5 to 1 acre for 47%**, 1 to 1.5 acre for 10%, and 1.5 to 2 acre for 16% and greater than 2 acre for 5%. This indicates that income was independent of GCA, which is further explained in figure 1.3.

GCA ranged from 0.24 to 3.2 acres for the selected set of smallholders. GCA was categorized into five categories, i.e. less than 0.5 acre, 0.5to 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

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

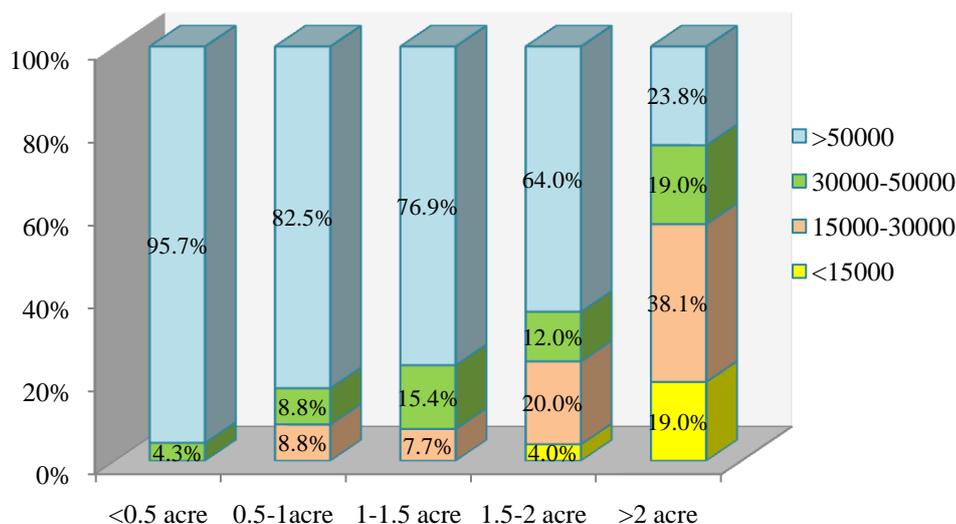


Figure 1.3

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. 4.3% earned in the range ₹ 30,000 to ₹ 50,000 and 95.7% earned above ₹ 50,000. Similarly for smallholders with GCA in the range 0.5 to 1 acre, 8.8% earned ₹ 15,000 to ₹ 30,000; an equal percentage earned ₹ 30,000 to ₹ 50,000 and 82.5% earned above ₹ 50,000 per acre.

These smallholders, who practised flood irrigation earlier, could not irrigate larger areas, with water and labour being the major constraints. But with drip irrigation comparatively larger areas were put to cultivation and there were higher yields, hence higher incomes, owing to higher water use efficiency. Thus KB drip helped the smallholders sustain their livelihood from small cropped areas.

Cropping Pattern

Cropping Intensity

The smallholders were no more restricted to rainfed farming, but cultivated crops all the year round, thereby increasing the cropping intensity. The data on cropping pattern showed that the small-holders cultivated one to three crops largely depending on the period they have used KB drip, other factors being availability of cropping area, water for irrigation etc. 79.2% of the smallholders cultivated single crop for a given period of usage, 16.5% cultivated two crops and 4.3 % took up three crops

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

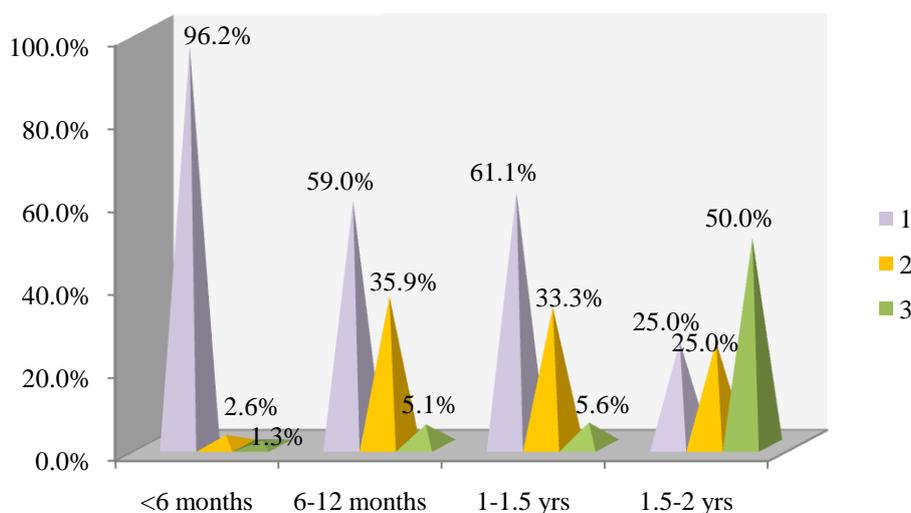
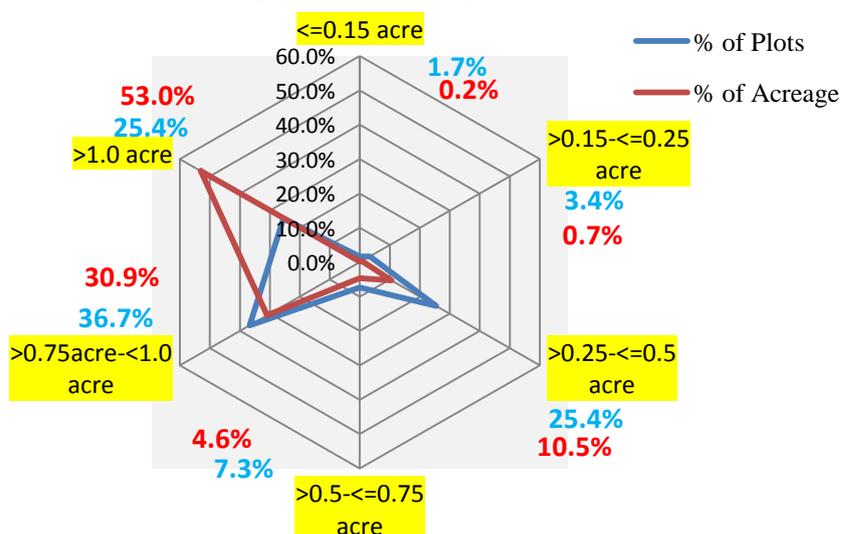


Figure 2.1 explains the number of crops cultivated by the small-holder farmers with different usage periods. Majority (96.2%) of the smallholders who had used KB drip for six months or less cultivated only a single crop. But a larger percentage of smallholders who had used it for longer periods cultivated two to three crops; e.g. 50% of the smallholders who used KB drip for one and a half to two years cultivated three crops and an equal percentage (25%) cultivated one and two crops.

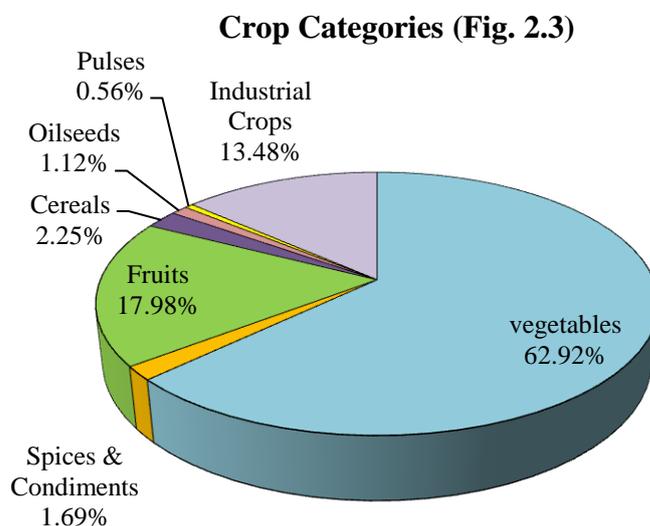
Plot size for any given crop was **greater than 0.75 acre in 62% cases** (> 0.75 acre in case of 36.7% crop plots and >1 acre in case of 25.4% crop plots) which accounted for **84% of the total acreage under study**. 33% plots were in the size range 0.25 to 0.75 acre with 15% of the acreage (7.3% plots were of the size 0.5 to 0.75 acre with 4.6% of the acreage and 25.4% of the plots of size were of size 0.25 to 0.5 acre with 10.5% of the acreage). Only 5% crop plots were smaller than 0.25 acre which accounted for just 1% of the acreage.

Crop Plot Sizes (Fig. 2.2)



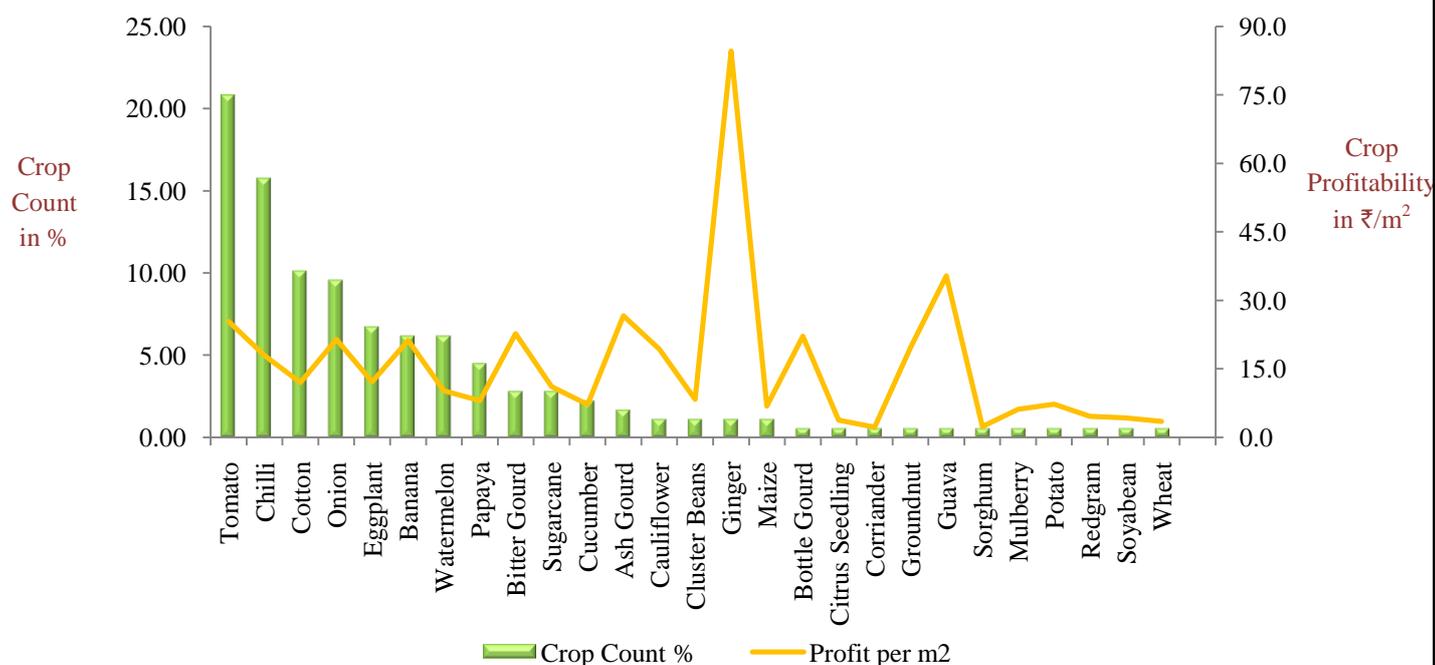
Crop Portfolio

The smallholders could cultivate different crops with the limited water resources available through judicious water application possible by drip technology. Twenty seven different crops were reported across the region using KB Drip. High value crops were predominant namely vegetables, fruits or horticultural crops (Figure 2.3).



Allied agricultural activity in the region such as sericulture encouraged some of the farmers to take up mulberry cultivation. Cultivation of such market based crops is quite advantageous because of shorter cycle of production and round the year demand from the industry, which ensures income at regular intervals.

Crop Popularity & Profitability (Fig. 2.4)



Most popular crops in the region were tomato, chilli, cotton, onion, eggplant, banana and water melon; which were found to be moderately profitable. On the contrary some of the highly profitable crops were ginger (Rs 84.6/m²), guava, ash gourd and tomato which accounted for a small proportion of the total crops cultivated in the region, with tomato as an exception (Figure 2.4).

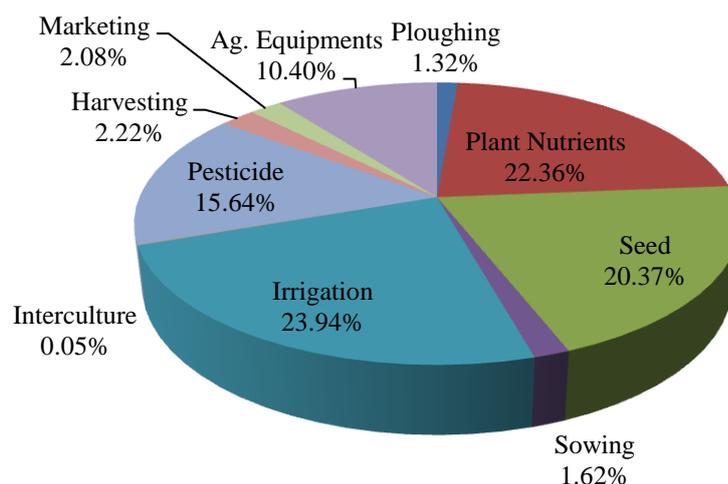
Choice of crops is rarely based on market requirement; hence crop portfolio planning is an area where these smallholders need to be trained.

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 six percent of the income in case of guava to 60% in red gram.

Components of CoC (Fig. 3.1)

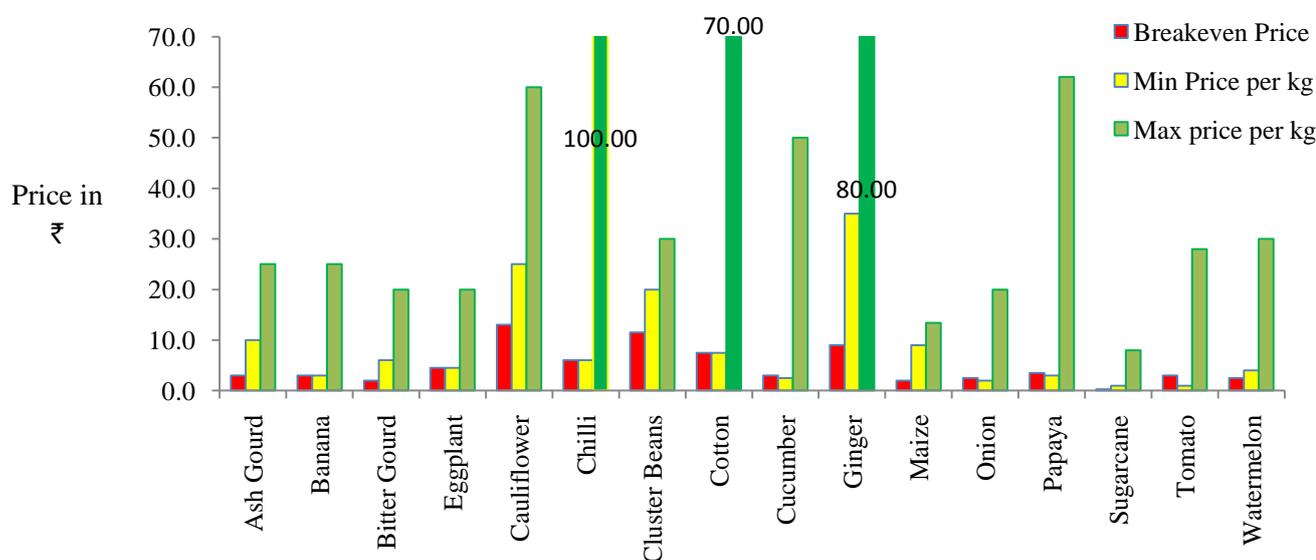


Overall, irrigation (24%), plant nutrients (22.4%) and seed material (20.4%) were the major cost components. Cost incurred on pesticides was also found to be high (15.6%)

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 higher than the minimum price received by a minimum of 50%.

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



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 BEP for the crop. Hence they made profit even at minimum selling prices. Figure 3.2 shows the maximum and minimum selling prices and average BEPs for crops. There were wide price fluctuations with maximum price more than double the minimum price in most of the cases. Maximum price fluctuations were seen in chilli, cotton, cucumber, papaya and ginger. Farmers received high price for red chilli, upto Rs 100 a kg.

Conclusion

KB drip not only made irrigation easy and affordable for the smallholders in the water starved region, but also helped them understand efficient use of water. The smallholder users earned considerably higher. Some of these smallholders raised various types of crops catering to local or distance market requirements, thereby earning greater margins.

With limited ability to invest higher in agriculture, possible means through which the smallholders can be facilitated to increase their incomes are:

- ✚ Crop diversification instead of monocropping and selection of crops which are found to be profitable
- ✚ Training smallholders on low cost and sustainable substitutes for plant production and plant protection chemicals, and seed material as well
- ✚ Knowledge of market demand and prevailing prices
- ✚ Though crops like citrus seedling and mulberry were cultivated by few smallholders in response to market demand, investments were found to be higher. If cost of cultivation of such crops can be decreased or yield increased, profits can further be maximized