Income Impact Analysis -2010

Karnataka

International Development Enterprises (India)

IMPACT ANALYSIS- KARNATAKA

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 30 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 ₹ 48,600, minimum being ₹19,771.
- Income was independent of period of usage of KB Drip, as well as area cropped
- 97% of the smallholders cultivated high value crops; predominantly fruits and vegetables crops.

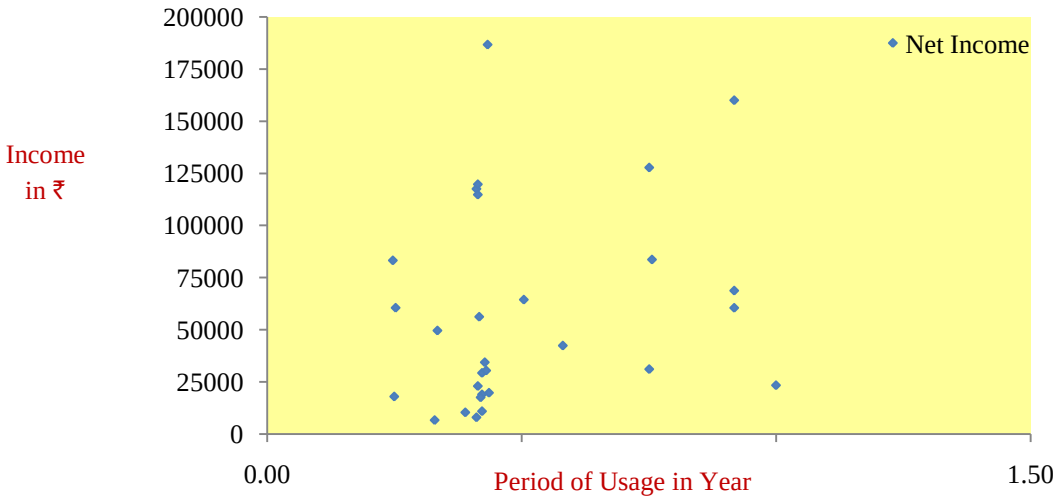
- On an average cost of cultivation was 45% of gross returns from crops
- Plant nutrients (22.47%), irrigation (19.87%) and hiring agricultural equipments (16.13%) were the major cost components
- 96.7% of the smallholders cultivated single crop for a given period of usage, and 3.3% cultivated two crops
- 41.9% of the crop plots were 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. Lowest net annual income was ₹ 19, 771 and median net annual income for the small holders was ₹ 48,600.

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 (73.33 %) 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	3.33%
₹ 15,000 to ₹ 30,000	13.33%
₹ 30,000 to ₹ 50,000	10.01%
>₹ 50,000	73.33%

For smallholders with net annual income greater than Rs 50,000 per acre, **GCA was less than or equal to 0.5 acre for 23%**, **0.5 to 1 acre for 36%**, 1 to 1.5 acre for 23%, and 1.5 to 2 acre for 9% and greater than 2 acre for 9%. 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)

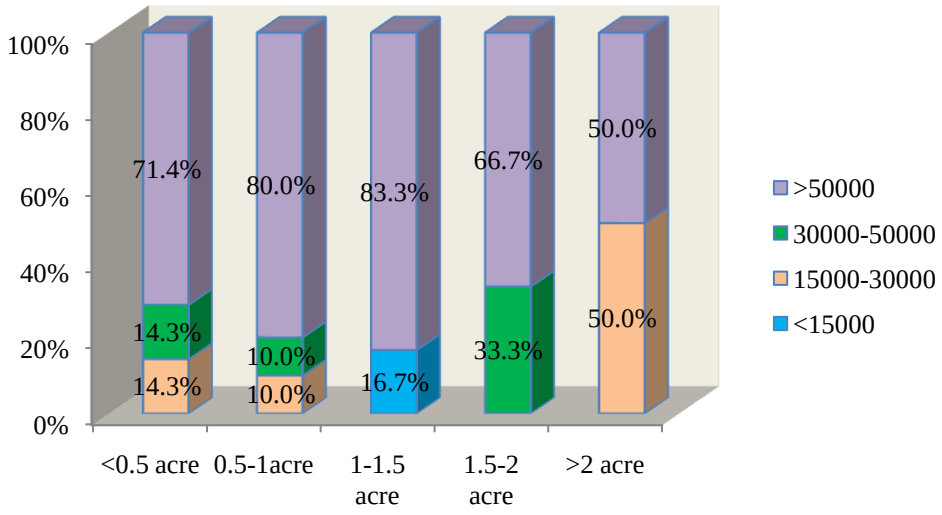


Figure 1.3 shows that in case of **smallholders with even less than 0.5 acre GCA, net annual income per acre was minimum ₹ 15,000,** i.e. 14.3% earned in the range ₹ 15, 000 to ₹ 30,000, 14.3% earned in the range ₹ 30, 000 to ₹ 50,000, and 71.4% earned above ₹ 50,000. Similarly for smallholders with GCA in the range 0.5 to 1 acre, 10% earned ₹ 15,000 to ₹ 30,000, 10% earned ₹ 30,000 to ₹ 50,000 and 80% 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 cropping area. The smallholders had a narrow crop selection and mostly cultivated a single crop in larger size plots. 96.7% cultivated only a single crop during a given period of usage and rest 2.3% took up two crops.

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

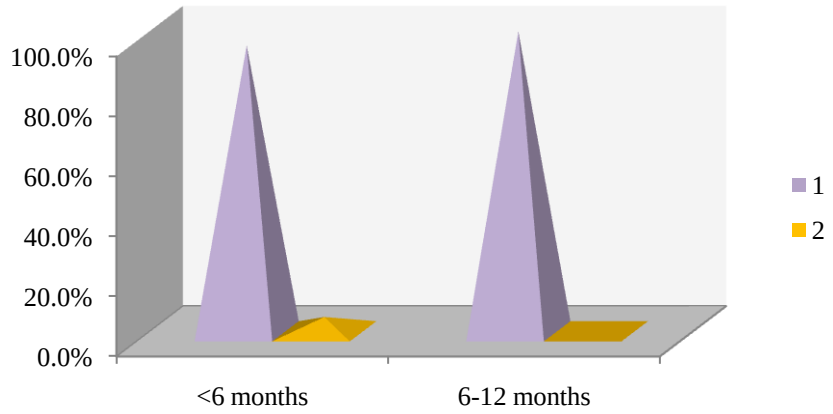
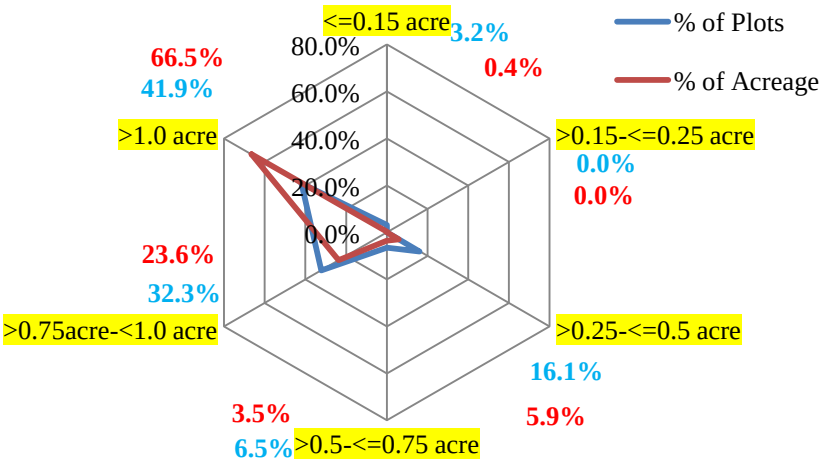


Figure 2.1 explains the number of crops cultivated by the small-holder farmers with different usage periods. Majority (95.2%) of the smallholders who had used KB drip for six months or less cultivated only a single crop. And all the smallholders who used KB drip for six to twelve months cultivated a single crop (however few customers had used KB Drip for a year.

Plot size for any given crop was **greater than 0.75 acre in 74.2% cases** (> 0.75 acre in case of 32.2% crop plots and >1 acre in case of 41.9% crop plots) which accounted for **90.1% of the total acreage under study**. 22.6% plots were in the size range 0.25 to 0.75 acre with 9.5% of the acreage (6.5% plots were of the size 0.5 to 0.75 acre with 3.5% of the acreage and 16.1% of the plots were of size 0.25 to 0.5 acre with 5.9% of the acreage).

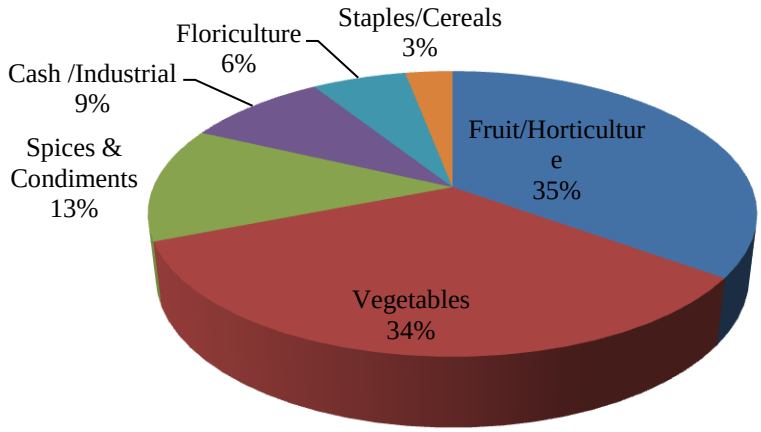
Crop Plot Sizes (Fig. 2.2)



Crop Portfolio

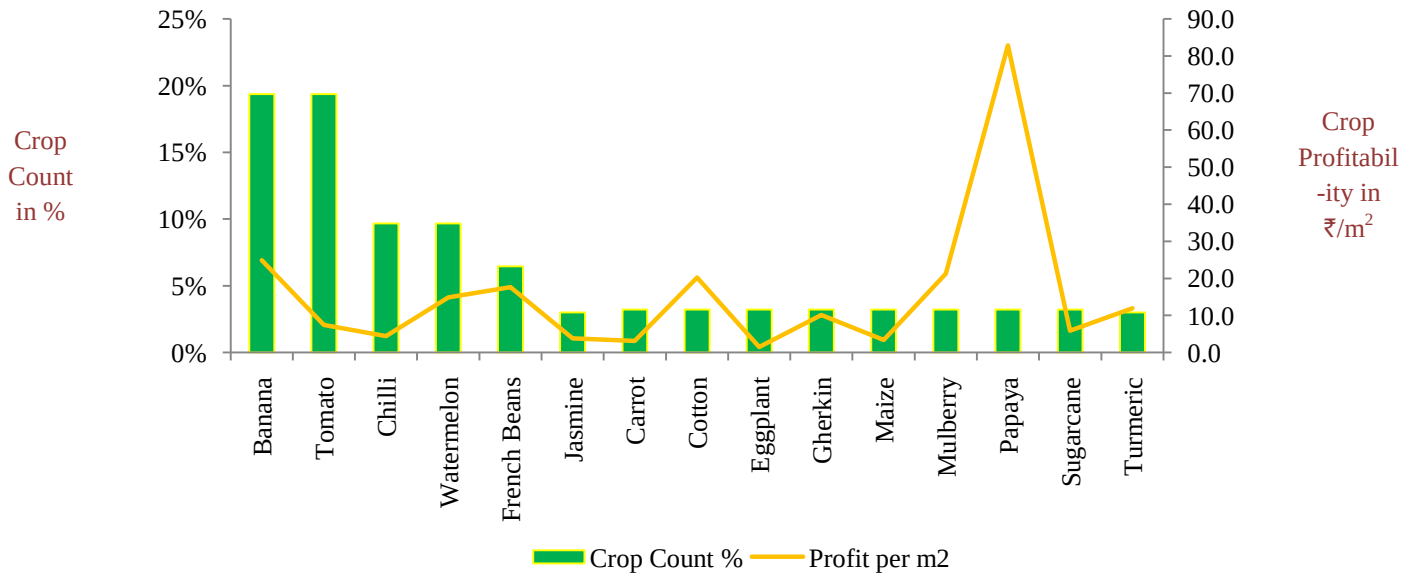
The smallholders could cultivate different crops with the limited water resources available through judicious water application possible by drip technology. Fifteen different crops were reported across the region using and KB Drip. 97% of the crops cultivated were high value crops, predominantly fruits (horticultural crops) and vegetables (Figure 2.3).

Crop Categories (Fig. 2.3)



Most popular crops in the region were banana, tomato, chilli, and water melon. Highly profitable crops were papaya, banana, mulberry and cotton which accounted for a small proportion of the total crops cultivated in the region, except for banana. Choice of crops in general, was rarely based on market requirement or profitability.

Crop Popularity & Profitability (Fig. 2.4)

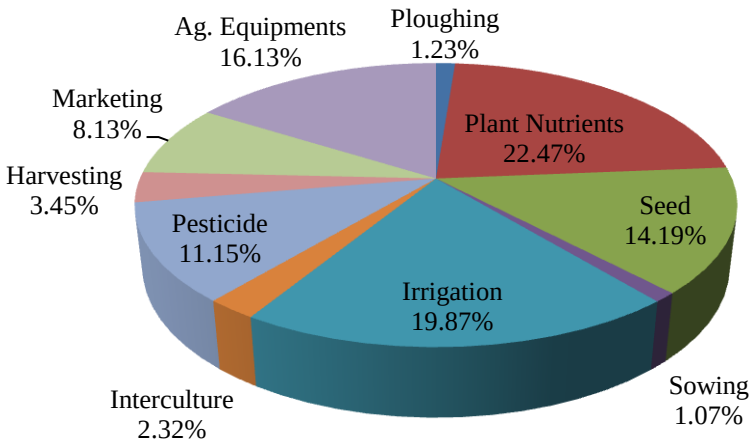


Margins

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 26% of the income to 61%, average being 45%.

Components of CoC (Fig. 3.1)



Overall, plant nutrients (22.47%), irrigation (19.87%) and hiring agricultural equipments (16.13%) were the 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.

Selling Price

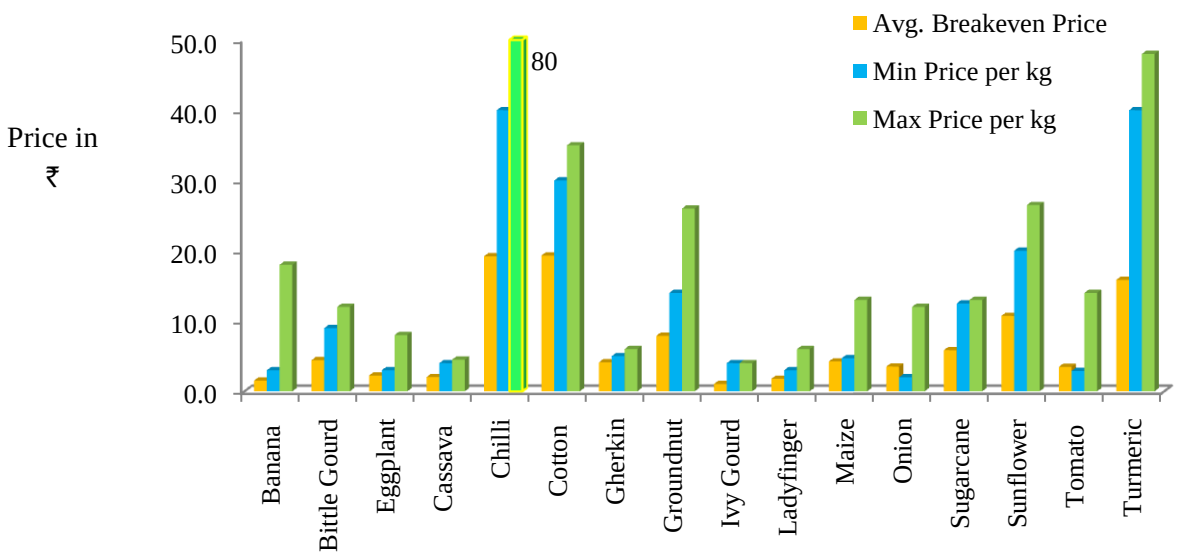
The prices that the smallholders received in return for sale of any crop showed wide variations (figure 3.2). Maximum price for any given crop was at least twice and upto five times the minimum selling price. Price fluctuations were high for banana, chilli and water melon.

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 of smallholders to ensure regular access to market and insure against any crop failure
- Cost of cultivation was comparatively higher in the state, with 45% of gross returns as an average. Several crops like turmeric, tomato, sugarcane, chilli and jasmine required higher investments. Suitable productivity enhancing packages for such crops may help the cultivators earn higher
- Smallholders can be linked to agri markets to minimize price fluctuations for smallholders as well as cost of marketing