

# Short term Revenue Fluctuations in Organic Farming: A Case Study of Himachal Pradesh Grower Groups\*

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## **Abstract**

In this Case study of Organic farmers in Shimla District in Himachal Pradesh, we have tried to analyse the fluctuation in cash flow for farmers who decide to enter Organic Farming. We try to understand some of the reasons that prompt farmers to enter a new mode of cultivation, their experience in this new practice and their corresponding reaction from a short to medium term perspective.

We find that farmers who enter Organic Farming are also the ones who had comparatively higher cost of cultivation pre-conversion, and their costs decrease over time post conversion. At the same time, there is a significant drop in revenue and profit associated with entering Organic farming, and small land owners without a second source of income outside farming, on average, seem to suffer more from this adverse impact. It does not necessarily mean that they revert to the chemical intensive practices they had left, but as per our observation, they have no significant reason to remain inside Certified Organic Farming either.

Thus, the government's efforts to open up international markets for certified Organic farmers while the local infrastructure is in a bad shape implies that farmers who can cope up with the initial losses can afford to stay and reap the benefits of Organic Farming and possibly premium prices for their produce, while small or marginal landholders can ill afford such a move.

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## **1.Introduction**

In India, agriculture is an extremely important determinant in the livelihood and welfare of the people<sup>1</sup>. As such, it is imperative to critically examine not only the short term, but also the long term viability of India's farms and farming resources. The Inorganic fertiliser induced Intensive agricultural practices that have been popularized in the wake of the Green Revolution, have been shown to have dubious credibility in terms of maintaining soil fertility over prolonged periods of time, vis a vis Organic farming systems<sup>2</sup>. In monetary terms, the conventional farming practices are known to cause increasing cost of cultivation over time, making the high net returns and high yields a truly unsustainable phenomenon.<sup>3</sup> Clearly, in the context of long term sustainability, Organic Farming provides a compelling alternative to the Inorganic, chemical intensive agricultural practices rampant in India. However, Organic Farming can be treated as a viable alternative to the Indian farmers only if the poor or marginalized farming community can successfully convert and continue the practice under the existing price, policy and infrastructure regime.

The International Federation of Organic Agriculture Movements (IFOAM) describes Organic agriculture as follows (UNCTAD, 2004):

*“Organic agriculture includes all agricultural systems that promote environmentally, socially and economically sound production of food and fibres. These systems take local soil fertility as a key to successful production. By respecting the natural capacity of plants, animals and the landscape, it aims to optimize quality in all aspects of agriculture and the environment. Organic agriculture dramatically reduces external inputs by refraining from the use of chemo-synthetic fertilisers, pesticides, and pharmaceuticals.”* In effect, Organic farming emphasizes on the use of Organic matter for enhancing soil properties, minimizing food chain associated health hazards and attaining closed nutrient cycles, which are the key factors for sustainable agriculture<sup>4</sup>. Worldwide, the annual growth rate of Organic Farming has been significant, and India is 13<sup>th</sup> out of 140 countries in terms of area under Organic cultivation<sup>5</sup>. Our study mainly tries to analyze a major hurdle in this conversion process and the mechanism associated therein, which can potentially prevent poor farmers from successfully converting to Organic Farming.

## **2. A Background of the Case Study**

### ***Organic Certification***

Organic Certification is a method to oversee farming practices, and guarantee that these practices follow some globally or nationally accepted standards (In India, the NPOP sets these standards, and they are enforced through the National Accreditation Body, the Agricultural and Processed Food Products Export Development Authority (APEDA), and a number of certification agencies affiliated to the NAB).

In India, it has been designed to try and give an impetus to the practice of Organic Farming, wherein Organic Farmers and quality conscious customers can engage through the existing market structure, resulting in mutual benefit. While the consumer is guaranteed 'safety from chemicals' - a catch all term that purportedly insulates the consumers from toxic farm inputs, at the farmers' end, the farmer gains since Organic farm produce is expected to earn significantly higher income vis-a-vis outside marketing options. This is indeed the case when specialized marketing co-operatives are involved<sup>6</sup> and when export to international markets is concerned<sup>9</sup>. It remains to be seen, however, if the domestic and local markets are capable of supporting Organic certification as a mechanism to facilitate conversion of non-Organic farmers to Organic, and when marketing co-operatives are absent.

### ***Himachal Pradesh :Organic Farming background***

Over the last 10 years, several initiatives by the government as well as NGO's has significantly improved the access to Certified Organic Farming for farmers in Himachal Pradesh. For instance, the cost of certification of Organic produce- represented both by the registration cost as well as the time and effort spent in lengthy documentations- is a major hurdle for farmers who wish to convert to Certified Organic farming. This hurdle has been largely removed by introduction of Group Certification, where an agency or Cooperative (an NGO in this case), handles the stringent auditing and safety requirements of a group or cluster of farmers, and the certificate is issued to this agency. The internal auditing requirements, information dissemination and other administrative tasks are handled by this agency, thus significantly reducing the Certification Cost.

Another barrier to entry in Certified Organic Farming is the fact that in Himachal Pradesh, the system of Organic production and its supply chains are new and nascent. For instance, virtually none of the farmers that were interviewed in this study, received premium prices in the market for their certified Organic produce. While a number of marketing agencies and NGO's are trying to create link-ups between the producers and the lucrative metropolitan markets, fragmented landholding and lack of cold storage makes it impossible for individual farmers to supply the produce directly to the whole sale markets in and around Delhi. On the other hand, the local *mandis* have no demand for high priced Organic produce, and the Organic produce, even when certified, has to be sold at the same price as their inorganically produced counterparts. Certification is then of little importance to the farmers. For instance, Mr Chaman Hanta, himself an active employee of the NGO, has been engaged in Organic Farming for quite some time now, without applying for certification. This, according to him, helps him get the best of both worlds- without certification he is not bound by auditing requirements to maintain specified standards for his inputs, while Organic Farming helps him cut down on costs and maintain soil fertility.

At the same time, supply chains for Organic pesticides and fertilizers vary from poor to non-existent. All of the farmers that have been spoken to, use Farm Yard Manure and Vermicompost made domestically for fertilization purposes; which sometimes fall short in terms of quality and quantity. The only recourse farmers are left with in such cases is to depend on informal, village level networks to tide over supply issues. In Theog, the headquarter of Theog block, there are multiple sellers of Inorganic fertilisers and insecticides, but Neem Tel, an Organic pest repellent that cannot be manufactured economically at a farm level, is extremely difficult to come by. These issues clearly present severe hurdles to conversion and scaling up of Organic Farming. Given these hurdles, then, it is obvious to wonder why farmers enter the fold of Certified Organic Farming to begin with.

### ***Methodology***

The case study presented in this paper is based on the following 11 villages in Theog block, Shimla District, (Chikkhar, Sandhu, Balag, Balowa, Kadeog, TunglaPajairo, Majroe, Bhot, Chalawali, Jhalli, TunglaShilnali) from where we have gathered farm business data for 190 Farmers to determine the fluctuation in revenue and profit as a function of time, post conversion to Organic Farming. 80 farmers from each category (Organic Certified, Transitional Organic and Inorganic) were selected for the survey, although there was some overlap between Inorganic and Organic farmers( a significant number of farmers surveyed had parallel operations in Organic and Inorganic farming, and in some cases, the same farmer was interviewed for data on both operations.)

NB.

- *Certified Organic Farmers* have been registered with the certification agency for more than 3 yrs for a part or whole of their operations to be brought under strict regulations.
- *Uncertified/Transitional Organic Farmers* have been registered with the certification agency for less than 3 yrs for a part or whole of their operations to be brought under strict regulations. Although they are applying Organic inputs to their fields, their produce is not certified as Organic produce as of now.
- *Inorganic Farming operations* are those which are under intensive chemical insecticides and fertiliser based practices

Our study tries to track the change in revenue and profit upto 6 years post conversion, to understand if the farmers are indeed facing a negative fluctuation in cash flow( in terms of revenue and profit), and if existing government interventions are being of sufficient help. In addition, we look at Organic Certification as an institution, and try to critique its viability.

To understand the economic incentives at play in the Organic Farming scenario, we have collected data focusing on the cost side and the revenue side of farm business income, both Organic and Inorganic, by looking at the following sources of cost and revenue at the level of individual farmers.

1. For the Cost side, we have ascertained the costs for :

- Human Labour (imputed by multiplying the total cost with ratio of land under crop concerned or the total land for which the cost was stated)

N.B.: The cost of Human Labour from inside the family is imputed using the rental rate in the village and year concerned. The farm business profit may be somewhat low, compared to the actual cash flow for the concerned farmer. However, as the number of family members participating in farming is found to stay constant over time for most respondents, this should not hamper a comparative analysis of a given respondent's farm business revenue, over time.

- Animal Labour (rented or owned which has been imputed by multiplying the total cost with ratio of land under crop concerned or the total land for which cost was stated)
- Fertility Management [Fertilizer or Organic Manure (FYM, VC) depending on the status of the farmer whether Organic or Inorganic]
- Pest, weed and disease management (Neemtel, Trycoderma treatment of seeds etc. and Insecticides, depending on the status of the farmer whether Organic or Inorganic)
- Cost for maintenance of livestock (if owned),
- Cost of machinery and Irrigation (running and maintenance cost which has been imputed by multiplying the total cost with ratio of land under crop concerned or the total land for which cost was stated)

N.B.: It was recognized that in case of a change in revenue flow, the crop mix of the concerned farmer might change to offset the impact of the losses, and hence we have tried to capture data at the crop level for two crops grown widely in the Shimla District, that is, apples and cauliflowers.

2. For the revenue side, we have collected production and price level data from the farmers. Furthermore, we corroborated this data by interviewing the Auction Recorder's Office at the Vegetable and Fruit *mandi*, at Dhalli, Shimla, which is the largest wholesale market in the vicinity of the villages that we surveyed. Significant quantities of the produce were sold at local *mandi*'s, but the Dhalli *mandi*'s price level gave us a reference point to corroborate the responses of the farmers.
3. As stated before, the farmers we have interviewed were, by and large, conducting parallel Organic and Inorganic farming operations. In some cases, we have used the same respondents to gather data on Organic as well as Inorganic farming. This has helped us to improve comparability since landholdings are not found to be too fragmented, and inherent soil characteristics stay similar as we compare different portions of the same farm.
4. Other than the cost and revenue side data, we have also collected data on a number of qualitative variables at four stages,

- a) The year prior to conversion to Organic Farming
- b) The year immediately post conversion to Organic Farming
- c) 3 years prior to date
- d) At present

N B. 'conversion' in this regard is defined as year in which the farmer had applied for certification, and stopped using Inorganic inputs.

5. The Counterfactual in our study was the Inorganic Farming business, which in spite of its long term detrimental effects is found to have a steady, helpful effect on the yield in the short term. We have calculated the Farm Business data for Inorganic Farming, and observed the percentage rise in the per hectare change in revenue and profit during the period under consideration (last 3years).
6. We have also interviewed the Agricultural Extension Officers at Theog and Shimla, and the officers at the Soil Testing Laboratory of the Agricultural Department in Shimla. The officials consistently agreed that soil health does improve as a result of conversion to Organic Farming, thereby lending support to the significant number of farmers who say they have experienced better quality of soil in their farms post conversion to Organic, in the areas where Organic Farming is being conducted. This is in agreement with the existing body of literature which states that Organic Farming, compared to purely Inorganic Farming, is better for soil, in terms of moisture retention, fertility, acidity and N-content<sup>11</sup>. The Soil Testing Laboratory however, only had sporadic data spread over the entire district. They did not have any specific data on farmers who were pursuing Organic Agriculture or any time series data on the soil chemistry of any single area. So, our findings could not be cross checked using this measure.
7. By interviewing the IFFCO Fertiliser Distribution Centre at Theog, (a block headquarters located 30 km from Shimla city), and cross checking with the Agricultural Extension Officers, we have found that over the last 5 years, fertilizers like Urea and N-P-K have not seen a fall in sales (approx. sales 2012-13: Urea : 500 tons , NPK- 150-200 tons) nor is Organic Farming viewed as a potent threat to this market of fertilizers . This information, although heuristic, seems to indicate the importance of Inorganic farming to the local farmers, and challenges the perception that Organic Farming is starting to significantly dent the share of Inorganic Farming in the state.

### **3. Cost of cultivation : Why Farmers convert to Organic**

It has been observed in several studies that yields tend to fall post conversion to purely Organic Farming, but the change in costs (due to dependence on Farm yard manure and not costly insecticides and Fertilisers) and the change in price due to a change in the yield quality makes the effect on revenue and profit ambiguous.

In our study, comparing farmers who converted to Organic Farming 3 years ago, and their Inorganic counterparts, we see the cost of cultivation has increased by more than 23% for Inorganic farmers over the last 3 years, while the same has stayed virtually constant for Organic farmers over the same time period. This clearly indicates what might be acting as an economic incentive in Conversion.

Moreover, pre conversion, the farmers who did convert to Organic had more than twice the value of mean per hectare cost than the ones who did not, and the difference in mean per hectare cost is highly significant (at both points in time).

*Table 1: Cost of Cultivation: comparison between Transitional Organic and Inorganic farmers*

Category	Mean per hectare cost 3 yrs ago (in rupees)	Mean per hectare cost now (in rupees)	Change in mean per hectare cost (% of levels 3 years ago)
Transitional Organic	328493.8195	321278.1986	-2.19657737
Inorganic	137075.806	168732.5237	23.09431447
Difference in cost	191418.01***	152545.68***	

\*\*\* 1% level of significance

No. of Farmers=80 in each category

#### **4. What happens Post Conversion: the short term effect**

During the process of certification and immediately post conversion, the farmers face a sudden decrease in their output, as has been observed in several studies<sup>9</sup> including our own. This decrease occurs especially in case of high yield conventional production systems, due to the fact that in high yield conventional agriculture, nutrient stress is low and pests and diseases well controlled, which are conditions more difficult to attain in Organic agriculture<sup>10</sup>. The only respondents who seemed to remain unaffected by the conversion at a short term level were those who were already practicing low intensity traditional agriculture in various forms, and did not really *convert* their practices.

In addition, this is also the period when the farmers' produce is not certified (for the first 3 years post conversion, the farmers' produce are not certified. This is a practice employed by all the certification agencies working in Himachal Pradesh –in particular, Morarka, IndoCert, Ecocert, etc.– and is a well-known practice employed around the globe.) The dual effect of a fall in yield and a compulsion to sell this yield in the open market at non-premium prices implies a reduction in revenue and profit for the farm business, even if the market linkage problem could be avoided and premium pricing became a reality. It is this fall in cash flow that we have tried to verify empirically.

Even after taking into account government assistance, (eg cost of setting up vermi-compost pits and worms which is sometimes covered by government subsidies, in the year of conversion) the farm business is found to suffer significantly in the years immediately following conversion (refer Table 1 and 2). This clearly is a hurdle for farmers who are not in a position to handle such a



fluctuation. Dayal Singh of village Chikkhar, for instance, has a small shop near the village school, and a family member who is working at a regular job in Shimla. He converted his entire 4 bigha of land to Organic, but could tide over the revenue fall because of these non-farm incomes. On the other hand, Surat Ram Sharma, of village Balowa, who had registered for conversion as early as 2005 and has visited Delhi and Jaipur several times to attend Organic Farming workshops, still has only 20% of his total land pledged for certified Organic. His wife, a village *mahila mandal pradhan*, when asked several times why they had not converted their entire land, merely commented- '*Sara Organic karenge toh bhukhe mar jaayenge*' (We will starve if we converted everything).

**Comparison of pre- and post-conversion cost, revenue and profit of Organic farmers (Certified and Transitional),  
disaggregated by size of land holding**

*Table2 : Details of Certified Organic Farmers*

*Certified Organic Farmers (All figures in Rs. per hectare terms)*

Size of landholdings	No. of farmers	Pre conversion			Post conversion			Pre conversion and Post conversion			
		Average cost	Average revenue	Average profit	Average cost	Average revenue	Average profit	Difference in average revenue		Difference in average profit	
								t ratio*	p value**	t ratio*	p value**
small and marginal	9	68080.00	253222.22	185142.22	74222.00	193333.33	119111.00	1.99	0.04086	2.165	0.031144
medium and large farmers	66	27368.8	105350.13	76587.4	29534.6	64292.75	34758.15	2.498	0.00743	2.5234	0.006963

NB: small and marginal: less than 2 hectares. Medium and large : greater than 2 hectares No. of farmers = 75

*\*Conducted paired t test for difference of means.*

*\*\*p-values are for one tailed test*

*Table 3: Immediate post conversion decline in average cost, average revenue and average profit*

*Certified Organic Farmers (All figures in percentages of the initial figure)*

Category of farmers	Average cost per hectare	Average revenue per hectare	Average profit per hectare
Small and marginal	-9.02	23.65	35.66
Medium	-7.91	38.97	54.61

Note: Positive figures indicate a percentage decline

*Table 4 : Details of Transitional Organic Farmers*

<b>TRANSITIONAL ORGANIC (All figures in Rs./hectare)</b>											
Category of farmers	No. of farmers	Pre conversion			Post conversion			Pre conversion and post conversion			
		Average cost	Average revenue	Average profit	Average cost	Average revenue	Average profit	Difference in average revenue		Difference in average profit	
								t ratio*	p value**	t ratio*	p value**
Small and marginal	71	353004	1061205	708201	300915	710243	409328	7.2880	1.859E-10	6.429	6.72625E-09
Medium (includes large)	19	135138	578689	443551	105601	343671	238070	3.0535	0.00786	2.712	0.013279838

\*conducted paired t test for difference of means

\*\*p values for one tailed test

*Table 5: Immediate post conversion decline in average cost, average revenue and average profit*

*Transitional Organic Farmers (All figures in percentages of the initial level)*

Category of farmers	Average cost per hectare (%)	Average revenue per hectare (%)	Average profit per hectare (%)
Small and marginal	14.76	33.07	42.2
Medium	21.87	40.61	46.33

Note: Positive figures indicate a percentage decline

Note: small and marginal: less than 2 hectares; medium more than 2 hectares

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We were able to isolate the fluctuation resulting from conversion from other competing factors, since the grower group we worked with was receiving assistance from an NGO (which largely remedies their certification costs) and since we collected data on the farm business income immediately pre and post conversion, which largely mitigated the effect of premium pricing and inflation.

The above tables show that the fall in levels of profit and revenue post conversion is significant for both transitional and certified Organic farmers. In fact, to understand the change in profit and revenue due to conversion to Organic Farming, we have presented the counterfactual- the details of Inorganic Farmers (Table 5). But before comparing the Inorganic Farmers with Transitional Organic Farmers (who converted in the last 3 years), we need to confirm if, 3 years ago, the two groups were indeed comparable.

Three years ago: We conduct a two-tailed t-test assuming unequal variances (corresponding f-test was conducted to check for equal variances which was rejected due to a high value of F-statistic):

$$H_0: \mu_1 - \mu_2 = 0$$

$$H_1: \mu_1 - \mu_2 \neq 0$$

$\mu_1$  = population mean of the revenue of sampled inorganic farmers

$\mu_2$  = population mean of the revenue of sampled transitional Organic farmers

The null hypothesis is not rejected even at 10% level of significance. So the difference between the mean per hectare profit of the inorganic and transitional Organic farmers three years ago was not statistically significant. A similar test was conducted for revenue across two categories of farmers and the same result was derived as above. *Hence, we conclude that pre conversion the two groups of farmers were, on average and on the basis of revenue and profits, comparable.*

Current year: Now, we proceed to compare the cash flow of the Transitional Organic farmers vis a vis the counterfactual- the Inorganic farmers, in the current year. Similarly as above, we define  $\mu_1$  and  $\mu_2$ , and formulate our hypothesis, to conduct a two-tailed t-test assuming unequal variances (corresponding f-test was conducted to check for equal variances which was rejected due to a high value of F-statistic).

The null hypothesis is not rejected even at 10% level of significance for revenue data. So the difference between the mean per hectare revenue of the inorganic and transitional Organic farmers as of today, are not statistically significant.

But, for the profit data, the two tailed test allows us to reject the null hypothesis at 10% level of significance. So 3 years after conversion per hectare profit of the inorganic and transitional Organic farmers is found to be different, and this result is statistically significant.

For both these tests, we have taken the revenue and profit of the Inorganic and Transitional Organic Farmers as a whole, i.e., for all the farmers.

Table 6 :Details of Inorganic Farmers (All figures in Rs. per hectare terms)

Category of farmers	No. of farmers	3 years ago			Now			3 years ago and now		3 years ago and now	
		3 years ago			Now			Difference in average revenue		Difference in average profit	
		Average cost	Average revenue	Average profit	Average cost	Average revenue	Average profit	t ratio*	p value**	t ratio*	p value**
Small and marginal	68	148765	531553	382788	183508	629990	446483	-13.893207	1.04594E-21	-9.3785693	4.0358E-14
Medium	12	70837	421303	350466	85007	473510	388502	-6.079364	3.98402E-05	-4.689678	0.00033055

\*conducted paired t test for difference of means\*\*p values for one tailed test

Table 7: Inorganic Farmers (All figures in percentages of the initial figure)

Category of farmers	Change in average cost per hectare(%)	Change in average revenue per hectare (%)	Change in average profit per hectare(%)
Small and marginal	23.35	18.52	16.64
Medium	20	12.39	10.85

Note: Positive figures indicate a percentage increase

Table 8: Transitional Organic farmer details, 3 years ago and now

Category of farmers	No. of farmer	Pre conversion(3 years ago)			Now		
		Average cost	Average revenue	Average profit	Average cost	Average revenue	Average profit
Small and marginal	71	353004	1061205	708201	347903	869571	521668
Medium( includes 1 large)	9	135138	578689	443551	111237	414011	302774

Table 9 : Current per hectare revenue comparison

<b>t-Test: Two-Sample Assuming Unequal Variances</b>		
	<b>Certified organic</b>	<b>Inorganic</b>
Mean per hectare revenue	396561.318	604713.1951
Hypothesized Mean Difference	0	
t Stat	-2.582832921	
P(T<=t) one-tail	0.005594808	

Table 10 : Current per hectare profit comparison

<b>t-Test: Two-Sample Assuming Unequal Variances</b>		
	<b>Certified organic</b>	<b>Inorganic</b>
Mean	297990.203	435980.6714
Hypothesized Mean Difference	0	
t Stat	-2.299229604	
P(T<=t) one-tail	0.011603314	

Comparing tables 5 and 7, we may conclude that the average profit increases for both categories of inorganic farmers, but falls for both categories of Organic farmers. Also, the difference in profits of inorganic farmers is significant between then and now. In other words, a segment of farmers who were otherwise comparable with their peers 3 years ago, converted to Organic Farming while their peers did not. And currently, the profit shows a clear decline, while the farmers who did not convert are enjoying clearly higher net returns. Also tables 9 and 10 show that the difference between the current per hectare revenue and profit of the certified organic and inorganic categories is significant (at 5% level of significance) indicating that not only profits decline immediately upon conversion, but also do not quite recover to their pre conversion levels.

This, in addition to the data on Certified Farmers, clearly indicates that conversion has an adverse impact on the farm level revenue and profit in the short term, both in an absolute sense, and when compared to a ‘control’ group of farmers who did not convert to Organic.

In concluding this section, it should be noted, that this adverse impact is not related to the logistical issues described in section 2- it is an inherent, systemic difficulty associated with the process of Organic conversion. The 3 year gestation period is a well-established practice that is considered to help new farmers gather know how on Organic Farming, and will therefore stay in place for the foreseeable future. Also, the fall in productivity is a well-known inherent problem observed in Organic Agriculture that is yet to be resolved.

There is no direct steps at the farm level, or any degree of maturity in the market that seems to be able to do away with these issues. Government subsidies or bridge loans seem to be the only effective way in this regard.

## 5. Medium term outcome- shock and after?

It is clear from the preceding analysis that farmers entering Organic Farming tend to have a high Mean cost per hectare compared to their peers, and this conversion actually helps in cutting costs for the farmers who convert. At the same time, these farmers suffer a fall in terms of revenue and profit immediately post conversion, which is more difficult to be absorbed by poorer farmers.

The NGO, as far as its stated goals, makes no discrimination on the basis of landholdings, and this contention is supported by the average landholding (=1 hectare) of the 377 farmers who converted in 2011 in Theog block (comparable to the Average size of operational landholdings in Shimla district = 1.13 hectares (source: Directorate of Agriculture Census, 2005-06, HP)). However, the average land held by one group of 209 certified farmers (Phase II) was 3.38 hectares, and another group of certified farmers (Phase I) the average land held by 45 farmers was 4.69 hectares. These data have been retrieved from sections of the internal audit data made available to us by the NGO, and represents virtually the entire operation of the NGO in block Theog, Shimla. Clearly, we see a rise in the average landholding, from the state wide average for recently converted farmers to nearly 4 times this average for farmers who have been certified for 3 years or more. To further analyse this pattern, we tested for difference in proportions in the sample farmers surveyed, and the results are briefly presented in Tables 8 and 9.

Table 11 :TESTING FOR DIFFERENCE IN PROPORTIONS (across all three categories)

<b>Category</b>	<b>Transitional Organic no. of farmers</b>	<b>Certified Organic no. of farmers</b>	<b>Inorganic no. of farmers</b>	<b>Total</b>
small and marginal	71	9	68	148
medium(includes 1 large trans org and cert org each)	9	66	12	87
Total	80	75	80	235

Null hypothesis: Equal proportion of small and marginal farmers in all three categories, i.e,  $p_1=p_2=p_3$  (where  $p_1$ = proportion of small and marginal farmers in transitional Organic,  $p_2$  and  $p_3$  similarly for certified Organic and inorganic categories)



Table 12:TEST OF DIFFERENCE IN PROPORTIONS SUMMARY

TESTING FOR DIFFERENCE IN PROPORTIONS BETWEEN			Chi squared statistic	Significant or not
Certified Organic	Transitional Organic	Inorganic	123.0544831	Significant
Certified Organic	Transitional Organic		91.30221	Significant
	Transitional Organic	Inorganic	0.499557913	Not significant
Certified Organic		Inorganic	82.52	Significant

The significant difference in proportion of small farmers between the inorganic and certified Organic categories provides some evidence in favour of the fact that small landholders are not making up a sufficiently large portion of the Organic Farming community who have chosen to stay inside the system. In the presence of consistent government policies and NGO presence over the last few years, and the similarity in proportion of small holders between the recently converted “Transitional Organic” category and the ‘Inorganic’ category, we seem to find some indication that although all classes of farmers tend to convert to Organic Farming, only medium and large farmers can sustain and absorb losses in the face of the fall in productivity that results from a turn to Certified Organic agriculture(in the short to medium run), making this process unsustainable for the poorer farmers. Of course, this analysis is not sufficient to draw such a conclusion nor can it test for statistical significance for such a hypothesis. It will in fact be interesting to see the behavior of the same farmers we have interviewed 3-5 years from now to check if the poorer farmers are indeed dropping out.

## **6. Conclusion**

From the above set of results we can discern a remarkable situation for Organic Farming in Himachal Pradesh.

As expected, the cost of cultivation varies significantly between farmers and a number of farmers do explore alternatives outside chemical based agriculture. In our survey, we have observed that this switch pays off, since farmers who convert to Organic Farming are rewarded with a lower cost of cultivation immediately. However, conversion itself can and usually does lead to adverse effect on revenue and profit on a short to medium term (1-3 years). Although, Organic yields tend to come back to the pre conversion levels, 3-5 years post conversion (Table 10), farmers who were economically worse off *ex ante* are not necessarily in a situation to absorb the shock long enough to stay inside the ambit of Certification. But then,

given the evidence of what we have called the 'short term shock', why do farmers enter certified Organic at all, when practicing Organic Farming minus certification would have been much less restrictive and not necessarily less remunerative?

This question cannot be empirically answered with our data, but there are a number of indications why such farmers enter Certification to begin with. Besides agreeing on the efficiency of the outreach efforts of the NGO and an increased awareness, many of the respondents asserted that the Agricultural Extension Offices had not helped them significantly with the technical know how vital for a new entrant in Organic Farming. The NGO is the agent that tries to fill up this void.

According to a number of experts, Organic farming is primarily knowledge intensive, and a strong network of extension service is critical for new entrants to Organic agriculture<sup>7</sup>. From undertaking regular camps in the villages and spreading information on Organic Farming and government policies and subsidies surrounding it, to arranging workshops and fairs for Grower Groups, the NGO's proactive role facilitates dissemination of knowledge related to Organic Farming. It is this know-how that the farmers who convert to Organic Farming need badly.

In fact, other than this know-how, there seems to be little economic motive for farmers to stay on inside the ambit of Certification, with its associated stringent requirements about inputs. This is all the more true since premium pricing, as of now, varies from sporadic to absent. While larger farmers can still persist with certification in expectation of benefits in the long term when soil yields stabilize and market imperfections will give way, smaller landholders have neither the patience nor the means, in general, to do so.

All the more, once the techniques of Organic Farming becomes clear to them, if the farmers drop out they have the option to mix and match Organic practices with application of chemical insecticides and fertilisers from time to time, just like Mr Kuldeep Bhandari, who had never entered Certified Organic Farming before 1998, although he has been practicing principles of Inorganic and Organic Farming in tandem as early as 1972. In fact in Himachal Pradesh, Organic Farming has been practiced over generations before Inorganic inputs made a head way during the heydays of the Green Revolution, and it is commonplace to see a number of people drawing on both Organic and Inorganic processes. It is in fact supported by long term research, that using Inorganic and Organic farming techniques in tandem can be better for maintaining long term soil fertility<sup>12</sup>.

It should be noted that the rationale of Certified Organic Farming is being questioned here, not the long term Organic Farming potential, since over 3-5 years, profits tend

to converge to their pre conversion levels. For instance, Table 11 shows the change in revenue and profit for farmers who stay with the process for more than 3 years.

*Table 11: Increase between pre conversion and current year (more than 3 years) for Certified Organic Farmers*  
[all figures as a fraction of initial values]

<b>Size of landholdings</b> (Area values in hectares)	<b>Increase in revenue per hectare (%)</b>	<b>Increase in profit per hectare (%)</b>
<b>small (1-2)</b>	69.43	62.71
<b>semi medium (2-4)</b>	67.78	116.47
<b>medium (4-10)</b>	81.58	84.75

While a practice of entering/leaving certification cannot be tagged undesirable per se, it brings us back to the question of whether Organic Certification is indeed utilizing the market mechanism to promote Organic production for the larger farming community. The answer is yes, although the route through which this is happening is somewhat perverse, and this promotion is occurring in spite of market imperfections.

The data is not sufficient for us to predict the future of this relationship between the poor farmers and the institution of Certification, but keeping in mind the increased bureaucratic support being lent to the setting up of certification mechanisms, it brings to question whether this is a wise course of action in absence of logistical support for certified Organic Farming. It should be noted that certification is designed to work by harnessing the powers of market demand and supply, and in absence of these market forces, merely creation of certification standards might end up facilitating conversion and certification of larger farmers over smaller farmers who can afford to enter certification, stay inside the program, and at least in the long term access the international market (in 2002, for instance only 7.5% of the total certified Organic produce was consumed domestically, while around 85% was exported)<sup>8</sup>.

As stated already, there is no direct step at the farm level, or any degree of maturity in the market that can help the situation. To support large scale conversion to Organic Farming as well as rural welfare, we must think beyond Certification as the sole institution to target through our agricultural policies.

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