



The Impact of Organic Cotton Farming on the Livelihoods of Smallholders

Evidence from the Maikaal bioRe project in central India



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Related documents on organic cotton farming

This study is part of a research project on organic cotton that the Research Institute of Organic Agriculture (FiBL) implemented in collaboration with Maikaal bioRe (India) Ltd.

Within the same research project, the following documents on organic cotton have been developed:

- **Organic Cotton Crop Guide**
A reference manual for extension workers and organic farmers.
- **Organic Cotton Training Manual**
Transparencies and didactic material to facilitate trainings.
- **Soil Fertility Training Manual**
A set of transparencies for training on soil fertility in organic cotton.
- **Organic Cotton Project Guide**
A guide to support designing and setting up organic cotton projects.
- **Producing Organic Cotton: A Toolkit**
A CD containing the above documents and other tools for extension.

Free downloads of these documents are available from the website www.organiccotton.fibl.org. Hard copies can be ordered from FiBL (www.shop.fibl.org).

The documents and their Hindi versions are also available from the International Competence Centre for Organic Agriculture in India (www.iccoa.org).

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The relevance of organic cotton

Cotton farming provides livelihood for many million smallholders in developing countries. Over the last decades, many cotton farmers have been facing declining cotton yields despite increasing application of chemical fertilizers and pesticides. Increased input costs and decreasing marginal returns have lead many cotton farmers into indebtedness.

In order to improve the ecological and socio-economic sustainability of cotton production, several organic cotton projects were recently initiated in Asian, African and South-American countries. With some large textile brands and retailers expanding their sales of organic garments, the demand for organic cotton fibre has substantially increased.

While the ecological benefits of producing cotton organically are evident, only few data are available on the actual impact the conversion to organic farming has on farmers' livelihoods. The lack of reliable data, especially on yields, production costs and incomes, presently hinders a wider dissemination of the organic cotton production system in the South.

The organic cotton research project

To investigate the economic viability of organic cotton farming and the impact on the livelihoods of the involved farmers, the Swiss Agency for Development and Cooperation (SDC) and the WWF Switzerland mandated the Research Institute of Organic Agriculture (FiBL) to conduct a detailed study on organic cotton farming in the Maikaal bioRe project in central India.

The Maikaal bioRe project in the Narmada Valley of Madhya Pradesh produces organic cotton since 1991, and now involves more than 1500 smallholder farms. The project provides the farmers with extension services, organizes the organic certification and purchases the cotton with a 20% price premium. Processing and trade of the cotton fibre are handled by Maikaal's Swiss partner Remei AG.

Over a period of two years, an Indo-Swiss research team collected and compared agronomic data of 60 organic and 60 conventional farms. These data were complemented with socio-economic information gained in interviews.

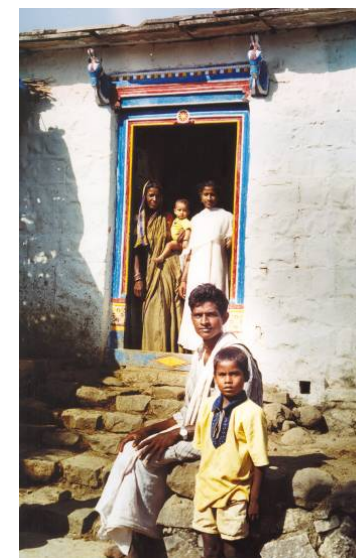
This executive summary presents the main results and conclusions of the comparison study. Further, it analyses the potential of organic cotton farming for rural development.



Profiles of adopters

On the average, organic farmers in the study are of higher socio-economic status (caste affiliation, education, housing, land holding, agricultural production means etc.) than conventional farmers. A main reason for this is that initially wealthier farmers joined the project who had the capacity to bear the risk of conversion ('early adopters').

On the other hand, an increasing number of very poor farmers participate in the Maikaal bioRe project. Many of them were heavily indebted and deprived of most resources when they decided to join the project. Adoption of organic farming enabled them to get out of the cycle of indebtedness, as organic farming allowed substituting external inputs through man power and getting a better price for the produced cotton.



Changes in the farm profile

Average labour availability and cattle holding were higher in organic farms. It is generally assumed that conversion to organic agriculture requires more labour (for compost preparation, home preparation of pest management items, maintenance of inspection documents etc.), and cattle dung plays a more important role in organic farms. Hence, this could be both a cause and an effect of conversion.

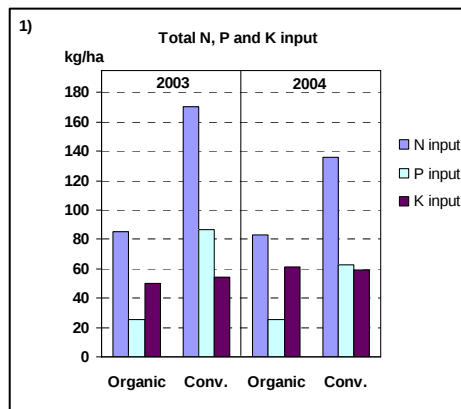
Cropping patterns are similar in organic and conventional farms, with slightly higher proportions of soy bean and less chilli cultivation in organic farms. However, organic farms maintain a more diverse crop rotation in the cotton fields, and intercropping with pulses is more common. While an increasing number of conventional farmers cultivated genetically modified cotton varieties (Bt-cotton), these are not used in organic farms.

On the average, more organic farmers prefer to continue the cotton crop in the winter season instead of uprooting it for cultivating wheat. This could partly be due to the organic price premium that is presently only paid for cotton. Marketing of the rotation crops with an organic price premium could thus contribute to maintain a diverse crop rotation, which is conducive to organic nutrient and pest management.

Economic performance

Labour and material inputs

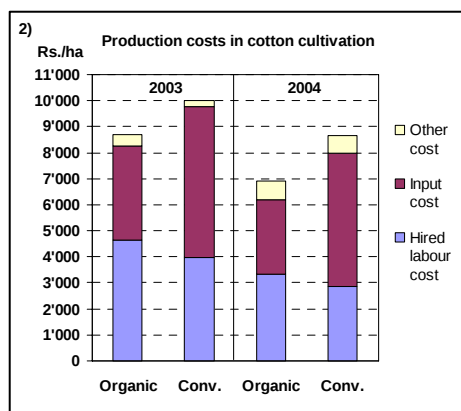
Surprisingly, total labour inputs were not significantly higher in organic cotton fields. While organic farmers invested more time for weeding, they required less time for pest management. Average application of organic manures was almost double in organic cotton fields. Overall inputs of nitrogen and phosphorus (of manures or natural mineral fertilizers) were about half compared to conventional cotton fields (Figure 1).



Production costs

Variable production costs were 13-20% lower in organic cotton (Figure 2). This is mainly due to 40% lower costs for inputs (seeds, manures, organic pest management items). The requirement for taking up loans is thus far less in organic farms.

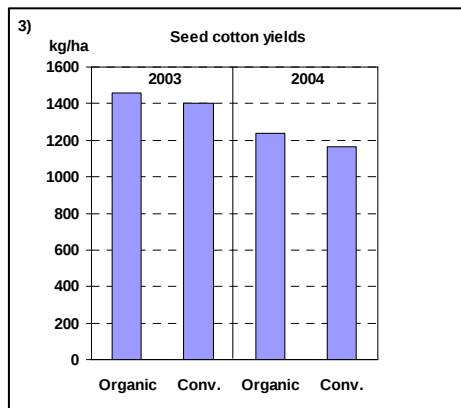
If opportunity costs of farmers' own labour are included in the calculation, overall production costs were 15% lower in organic cotton fields.



Yields

It is a striking result that average cotton yields in organic fields were not lower, but even 4-6% higher in the two years of observation, though this difference is statistically not significant (Figure 3).

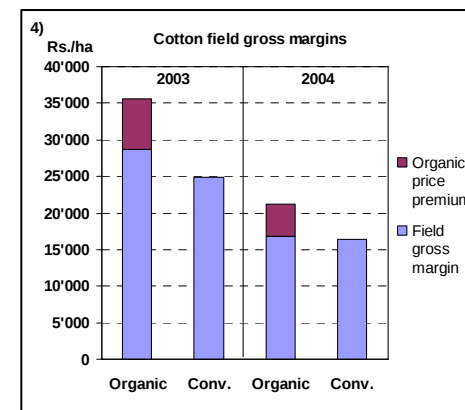
It can be excluded that the higher productivity is due to differences in the farm sample, such as better land, better access to irrigation or different production patterns.



Gross margins in cotton

Due to slightly higher cotton yields, the 20% organic price premium and lower production costs, gross margins in organic cotton fields were 30-43% higher (Figure 4).

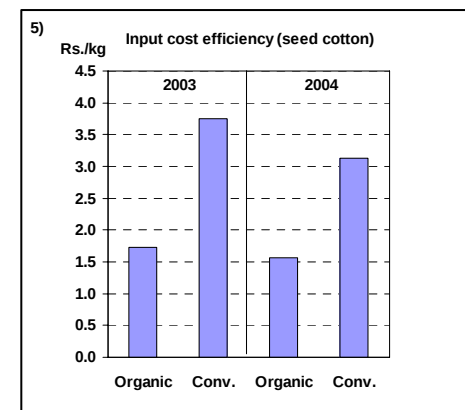
Even without organic price premium organic cotton farming would have achieved higher gross margins in the two years of observation. However, the price premium is needed also to compensate for costs of conversion and for yield drops in rotation crops.



Efficiencies

Per kg of seed cotton harvest, the organic farms in the study required slightly less labour and considerably less nitrogen (of manure) than conventional cotton farms. Input costs to produce 1 kg seed cotton were about half (Figure 5).

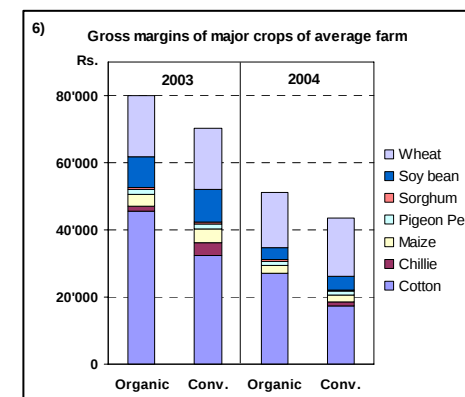
However, in the average of the two years, organic farms required 6% more irrigation water per kg seed cotton (in total 3'400 litres/kg).



Economic impact on the farm

Average yields as well as production costs of most rotation crops were slightly lower in organic farms. Nevertheless, the total gross margin from major crops of an average farm is about 15% higher in organic farming (Figure 6).

If part of the rotation crops could be sold with an organic price premium, incomes of organic farms would further increase.



Impact on natural resources

Most of the interviewed organic farmers stated that the capacity of their soils to absorb and retain water has increased after conversion to organic management. Many observed that they need less rounds of irrigation and that the crops can longer sustain periods of drought. However, the comparison of water retention capacity in soil samples of organic and conventional cotton fields has not shown a significant difference.

Average irrigation water application was even slightly higher in organic cotton fields. This could be due to better access to irrigation, or due to more intense cropping.



While most organic farmers observed that their soil has become softer and more fertile due to organic management, soil organic matter contents were only negligibly higher in organically managed cotton fields. Phosphorus and potassium contents were slightly lower in organic cotton fields, while levels of boron – an important micro-nutrient – were significantly higher. Organically managed fields showed less soil salinity and acidity than conventional fields.

Risk aspects and vulnerability

As organic cotton farming involves less production costs and generates higher incomes, farmers are less prone to become indebted. In addition, there are some indications that the risk of crop failure due to drought or pest damage is lower in organic cotton fields. Similar observations have been made in other studies, but to prove this further research would be needed.

Vulnerability of cotton farms – both for organic as well as for conventional farms – is highest when it comes to changes in cotton world market prices. Organic cotton projects could reduce the effect of drops in cotton prices by guaranteeing minimum purchase prices, and by developing organic marketing options for the main rotation crops.

In the long term, conversion to organic farming could significantly reduce vulnerability of farm households as the additional income enables them to invest in better irrigation systems (e.g. drip irrigation) and to diversify their income sources (e.g. dairy farming or small-scale businesses).

Obstacles and challenges ahead

According to interview results, the biggest obstacle in converting to organic cotton farming seems to be the initial drop in yields, resulting in lower incomes during the first 1-3 years of conversion. To reduce yield declines, it is important to ensure sufficient application of organic manures.

While progress in organic production methods allowed achieving cotton yields that are on a par with those in conventional farms, yields of most rotation crops are still lower. This shows that efforts to improve production methods and extension services should be expanded to the rotation crops.

Farms that do not strictly adhere to the organic standards are a serious threat to the credibility and the economic stability of organic cotton projects. An analysis of the profiles of farms that were excluded from the Maikaal bioRe project due to the use of prohibited inputs shows that they are far wealthier than the average. A well-functioning internal control system and cultivating a spirit of coherence are crucial to prevent opportunistic behaviour.



Conclusions for agricultural and development policies

Altogether, organic cotton farming can significantly contribute to improving the livelihoods of smallholders as it generates higher incomes and involves less risk. At the same time, it allows a more sustainable management of natural resources.

To further improve the performance of cotton based organic farming systems, efforts in developing production methods and in improving marketing options are needed, especially for the crops grown in rotation with cotton.

The research results show that organic cotton farming, in the medium and long term, does have the potential to be an economically sound business proposition also for marginal farmers. It is thus important to find suitable approaches to enable poor farmers managing the hurdles of the conversion period. Competent training on farm management, technical advice during the conversion period and appropriate models for financing costs of conversion are crucial in this.

Further research is required to explore what conclusions from central India can be transferred to other regions, and to other cropping systems.