Title: A comparative study on changing socio-economic trends and attitude of organic farmers in Jhabua, Madhya Pradesh, India.

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Abstract:

India has the world's second-largest hectarage land dedicated to organic farming. However, considering total cultivated land available in India is 154 million hectares, organic farming accounts for only 4.76 million hectares. For India to achieve SDG 12 (Sustainable consumption and agricultural production) and SDG 15 (Land use and ecosystem) goals, it will need to extensively promote organic and regenerative farming techniques. For this, a key underlying factor is the integration of nature-based solutions with organic farming techniques. India has world's 2nd largest cattle herd population, with estimated 79% of 307.5 million living on farms, a key contributor for organic farming. In this research paper, we investigate the long-term impact between organic and conventional farming at the socio-economic level, as well as the changing attitude and collective mindset within communities adopting the two farming practices. This comparative research study was conducted in Ranapur Block, Jhabua District, Madhya Pradesh, where similar types of crops and land parcels are managed by farmers.

Introduction:

The green revolution of India gained momentum starting in the late sixties in Northern India. It rapidly spread across the country and became the de facto agricultural practice in Jhabua, Madhya Pradesh (MP) by the early seventies. The key crops grown in Jhabua are Maize/Corn, Pulses (Urad Dal), Soybean, Wheat and Cotton. The local economy is largely agrarian, with over 70% of the population directly involved in farming. As per National Bank for Agriculture and Rural Development (NABARD), over 80% of the farmers are classified as Small and Margin Farmers- SMF (farmers with less than 2 hectors of agricultural land), including 29% having less than 1 hector (2.5 acres) of agricultural land (Source 1). The 1.03 million population of Jhabua is largely tribal, and around 50% of the population is classified as living below the poverty line. Jhabua has a cattle-population of over 650,000 which closely supports the SMF community. This has helped farmer gain additional benefits of generating sufficient natural fertilizers, as part of the traditional integrated regenerative farming practices.

In 2013, organic farming techniques started gaining interest within local MP farmers, and gradually conventional farmers started switched their farming practices. This has been a slow transition due to local political, and agribusiness influence. MP today accounts for approximately 40% of organic produce in the country, exporting approximately 500,000 tons of certified organic agricultural produce, contributing approximately Rs. 2683 crores to the local economy. Jhabua is one of the eight organic focused districts in MP (out of 55 districts in MP) and pioneers the way forward as a model district for other blocks and regions to adopt.

Ranapur block in Jhabua district has been a relatively late adoption block of organic farming, it was only by 2019 that farmers here started to take active interest in understanding the benefits. Since then, approximately 10% of farmers have switched to organic farming. In addition, certain elements of regenerative farming such as dug well for water, compost as fertilizer, inter cropping, reduced manual tillage, crop rotation are also being adopted. Farmer livelihood improvement organizations such as MPSRLM and ASA have played an active role in building technical knowledge, providing practical training and identifying financial support for small-marginal farmers to make this transition under respective Self-Help Group programs. Having completed four years of transition in Ranapur, a research study was conducted to assess what is the socio-economic impact and behavioural changes between conventional farmers and the newly converted organic farmers.

Methodology:

Rampur block was taken as the area for assessment, as both organic and conventional farms co-exist. The change in agricultural practices has been relatively new. Prior to 4 years all participants surveyed followed conventional farming techniques. The

economic conditions and agricultural variances (such as weather, soil etc.) can also be considered consistent for both the experimental group as well as the control group.

The survey was conducted by using, 'purposing sampling technique', in four different neighbouring villages of proximity 5 square kilometres. The total sample size of survey was N= 40 farmers, equally distributed between organic and conventional farming techniques. The average age of the sample surveyed is 41 years, with an age deviation of 20%. In addition, 4 Focus Group Discussions (FGDs), with an average of 20 members in each FGD were also conducted at different villages. This helped us gain broader understanding of how socio-economic changes are being accepted across both farming communities. The entire study was conducted during a single period, ensuring external factors within the farmer community remain consistent, irrespective of the agricultural technique being adopted.

Findings:

Agricultural Practices:

The average land parcel for most farmers in Jhabua, MP is 1.5 hectares, thereby classifying them as small and marginal farmers (SMFs). All farmers identified in Ranapur Block for the survey now cultivate multiple crops including maize/corn, Pulses (urad dal etc.), soybean, groundnut and wheat.

Farmers in Ranapur Block were initially introduced to the idea of switching from conventional practices (*Paramparik)* into organic farming *(Jaivik) techniques in* around 2018-19. It was only during Covid months with imposed lockdown that some farmers and families started to take a more serious assessment of the transition. Conventional farmers use chemical-based pesticides, urea, phosphates and other fertilizers to help grow local produce. Due to this, crops have become dependent on periodic spraying of chemicals to ensure growth of plants. The consistent spray of chemicals, the soil has gradually become hard and non-porous. Earthworms' survival rate is low because of excessive chemical deposits in the soil. Common farmland birds such as sparrows and robins, which typically supported soil aeration, are now spotted in much reduced numbers. 100% of the conventional SMF surveyed now rent tractors on hourly basis to help till the land after each season adding to farming costs. Intercropping techniques are not being followed due to differences in the chemicals used etc. Only 20-25% of conventional farmers adopt intercropping as part of their crop planning.

In comparison, the organic farmer uses various natural fertilizers and pesticides formulations including *Panch Patti Kada* (five leaves brew) made of locally procured plants and leaves from *neem, seetafal, dhatura, kaner, nirgundi,* cow urine, cow dung, *mahua* flower, green manure and farm waste etc to increase soil nitro content.

Similarly, organic pesticides include neem oil, garlic and chilly extracts. This is often undertaken as a community activity, bringing in a sense of joint responsibility. Often farmers collectively make a vermicompost pit, which provides sufficient earthworm supply for the organic farmer community. In addition, ASA partially provides free organic non-GMO seeds, as part of promoting organic farming initiative. Inter-cropping is commonly followed by all organic farmers (over 80% organic farmers) with maize, wheat farming done along with legume vegetables and plants like beans, peanuts, cowpeas *(rongi)*, basil, coriander, mint, chillies, or floricultural products including marigold, chrysanthemum and jasmine.

At the community level ASA's natural resource management (NRM) model focuses heavily on land and water resource management including supporting organic farmers in building check dams, dug wells, dohas, and bore wells to achieve higher yields consistently. Organic farmers have also benefited from ASA's efforts to establish better market linkages. These connections have allowed farmers to secure premium prices for their organic produce, improving their income and market access.

The average increase in earning per acre under organic farming per season is approximately Rs 12,000, as compared to conventional farming. With typically two crop cycles in a year as common practice, additional income through increased inter-cropping, and higher wholesale market prices (exhibit 3), the organic farmer can achieve substantial increase in financial savings from two to three years onwards, when compared to the conventional farmers.

Food and Health:

100% of conventional farmers complained that the food grown now does not taste as good as when they were younger. A women farmer complained, "We know we are eating chemicals, but there is no choice. The corn we grow and eat daily does not taste sweet". Another notable comment by a farmer was, "We don't have the stamina, like before. Our kids have repeated asthma and diarrhoea problems". Over 40% of the conventional farmers women interviewed had reverted to outdoor defecation practices. In comparison, 90% of the organic farming community who continue the new practice of using the toilet for defecation.

There was a noticeable reduction in medical spending. Typically, each trip to the local doctor costs approximately Rs 800-Rs. 1000 including tests, medicines and other charges. Families adopting organic farming felt that medical expenses have come down by 15%, and there are fewer trips to the doctor during rainy season.

Expense pattern:

Money earned through farming practices, money transferred from family members who have migrated and borrowing from financial institutions/money lenders are the three most important sources of funds for both communities.
For conventional farmers, purchase of pesticides and fertilizers, farming equipment (seeds, tractor rental etc.) were the two most important spend areas for conventional farmers. The third significant area of expenditure is marriage. Expenses during a wedding can be between Rs 500,000-700,000, mostly borne by the groom's family.

Organic farmers were able to reduce fertilizer costs by adopting nature based solutions. Repayment of loans, health expenditure, children's educational expenses and household expenses are the remaining significant categories (see exhibit 1). It is noteworthy that for organic farmers the importance of healthcare, children's education and household expenses show increase by 8%, 10% and 15% respectively. Similarly, loan repayment importance has gone down in spend priority, signifying lesser dependency due to reduction in loan size.

Family Size:
The number of children and surplus income are the two key factors that play pivotal role in farmers' short term outlook towards organic farming. Survey suggests, conventional farmers have an average of 5.5 children per household, while organic farmers have an average of 3.2. This difference in number of family members could possibly create a more conservative mind set for the conventional farmers family, where in they prefer migration to cities rather than switching to organic farming and having to manage the risk of lower crop yield during the initial period? This aspect needs to be explored further, including how farmers with large families can convert to regenerative organic farming.

Education:
95% of farmers interviewed have studied till 5^{th} grade. All farmers interviewed want their children to complete minimum 12^{th} standard. Both girls and boys are now going to school, and parents are encouraging girl education till 12^{th} grade as an accepted norm, perhaps due to the extensive "*Beti Bachao, Beti Padhao* (transl. Save Daughter, Educate Daughter)" programme by the Government of India. High school proximity remains a major concern, being more than 7 kms away for many villagers. The lack of low-cost hostel facility, and poor local body support to the community were additional concerns.

The family aspiration that children to study beyond 12^{th} varied between different farming communities. 65% of conventional farmers expressed interest of children going to larger towns in district such as Jhabua, where colleges are present. In comparison 90% of the organic farmers interviewed wanted children to try and go to

college. “I want that at least they (children) should complete high school. If they do well, they can go to college in the city and get a good job. If they don’t do well, I will teach them organic farming.” This is a changing mind set commonly emerging from organic farmers. Children to become a teacher, or a doctor was the most cherished profession for both communities. 55% of conventional farmers and 70% of organic farmers wanted children to come back to continue farming practices, though they know that this would be the default option if other opportunities don’t work out.

Migration pattern:

A key factor that underlines migratory pattern is the family size. Farmers with larger family size have an increased tendency to migrate permanently, for longer period of time. This is seen predominantly in conventional farming communities, with 10.5 members. Comparatively, organic farmer family size was smaller at 7.2. On an average over 3-4 men from conventional farming families would migrate, in comparison to 2 men in organic farmer families. The woman migration pattern remained near same for both communities at average of 2. In organic farmer families, the migration to larger towns was short term, only during leans months to bring in additional income. Children migration was twice as high in conventional farming families, perhaps due to longer and more distant migratory pattern.

Changing attitude:

It typically takes the conventional farmer 3 years to fully convert to organic farming and achieve the same level of yield. During this period farmers are faced with income hardships and social criticism from conventional farmers. “You must be poor, who cannot afford urea and pesticides”.

Post transition period, organic farmers expressed increased confidence and self-assurance. A potential reason for this is due to increasing savings and earnings. During the FGD’s conducted within conventional farmers, there were more social concerns expressed, from water shortage, poor health conditions, need to migrate etc. 45% of conventional farmers surveyed suggested interest to migrate to organic farming practices. In comparison 100% of organic farmers wished to continue this practice in future.

ASA’s sustainable agricultural practices, particularly regenerative organic farming, have contributed to organic farmers increased understanding of mitigating climate change. This includes reducing the use of harmful chemicals and fertilizers, promoting soil health, and ensuring the efficient use of water resources.

Conclusion:

The overuse of conventional farming has brought about its own challenges. The small

and marginal farmer community is most impacted by increased agricultural costs and reduced earnings over the last decade. Spraying of chemicals and consuming the produce has also led to poor health conditions, increased migration pattern and lower education and professional expectations from children.

It is seen that organic farming combined with intercropping and regenerative best practices provides an effective way out to improve living standards of farmers. The organic farming socioeconomic cycle (exhibit 2) clearly suggests that if small and marginal farmers are able to take the risk and make the 2–3-year transition from conventional to organic farming, they are able to make major inroads in regard to their earnings, saving and health conditions. This has a ripple effect on their outlook towards children's education, city migration, climate change and overall attitude to life and creates vibrant communities, thriving on collaboration.

Two underlying issues that need to be addressed to help farmers transition to organic farming are increase in awareness and targeted campaigning within conventional farmer communities about *Jaivik* farming. This could be through a more structured transition plan, government and corporate subsidies to change farming practices. Organic farming promoting institutions such as ASA should evaluate impact-based financing schemes and green bonds with reduced interest rates for organic farmers, especially during transition years.

Another underlying issue is the large family size of conventional farmers, who are not able to take the 2-3 years reduced income risk during transition into organic farming. Given its benefits, Madhya Pradesh State government, MPSRLM and ASA need to plan alternative rural livelihood opportunities during the critical early period, as part of organic farming transition scheme.

Successful organic farmers should be given cash award and facilitation by the state government and SDG focused corporates. This will help in achieving a faster transition within the farmer community.

Exhibits:

1. Exhibit 1: Key expense areas: Importance level
2. Exhibit 2: Organic Farming: Socio Economic Cycle
3. Exhibit 3: Comparative wholesale market prices for various crops, July 2024

References: (to be completed)

Early organic farming practices:

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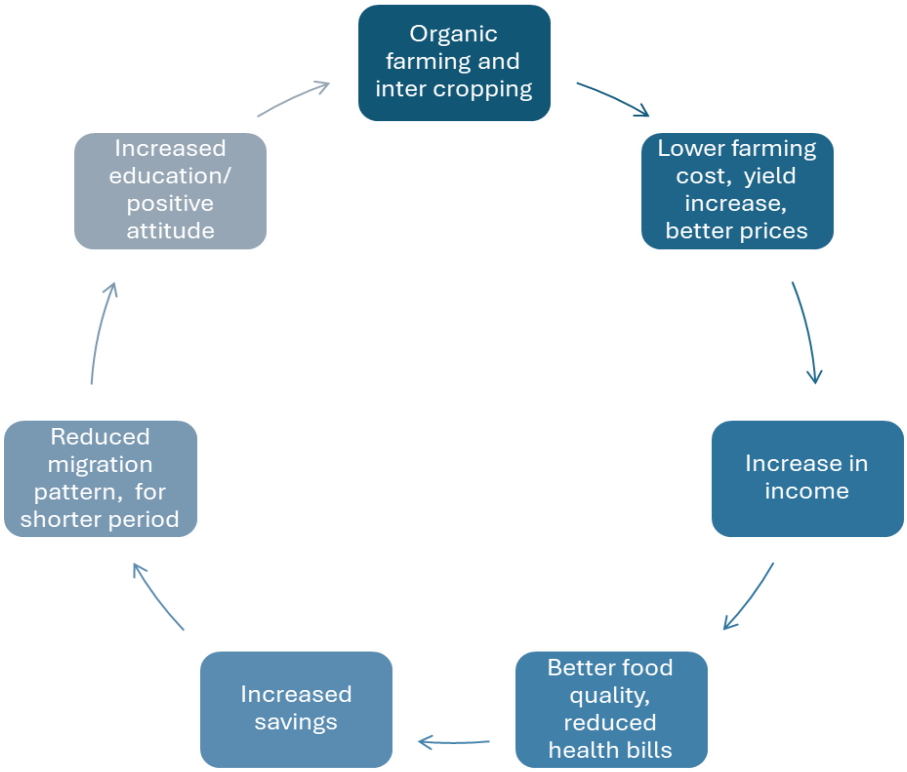
Exhibit 1: Key expense areas: Importance level

Spend category	**Conventional Farmers Group: % of people who consider it important**	**Organic Farmers Group: % of people who consider it important**
	Weightage	**Weightage**
Pesticides/Fertilizers	100%	NA
Farming needs (seeds/tractor)	100%	100%
Wedding (social event)	85%	85%
Health	75%	83%
Loan repayment	70%	60%
Children Education	50%	60%
Household/Home Improvement	40%	55%

Exhibit 2: Organic Farming: Socio Economic Cycle



Organic Farming: Socioeconomic cycle

Exhibit 3: Comparative wholesale market prices for various agricultural crops, July 2024

Crop Type	Conventional Farming Rs. /Quintal	Organic Farming Rs. /Quintal	Increased value-%
Grain- Maize	Rs. 1800-2000	Rs. 2000-2200	+ 10%
Pulses- Urad Dal	Rs. 6500-7000	Rs. 7500-8000	+ 13%
Legumes- Soybean	Rs. 3500-4000	Rs. 4000-4500	+12%

Research pictures:

Figure 1: Author with organic farmers

Figure 2: 94 years-farmer and freedom fighter sharing thoughts

Figure 3: Children of organic farmers-growing wealth. Note compost tent in background

Figure 4: Concerned conventional farmer

Figure 5: Conventional farmers meeting

Figure 6: Happy organic farmer ladies in meeting

Figure 7: Conventional SHG farmers after meeting

1Picture 8: Aarav with Albert sir

2: Picture 9: Aarav with research guides: Albert Rozario (centre) and Pritesh Jain (left)