Organic farming: The impact of training on perception, knowledge and adoption

A lack of information about organic farming hinders adoption

The agricultural sector in Indonesia faces several challenges, including food sustainability, environmental degradation and climate change. Growing concerns about the adverse health and environmental impacts of input-intensive conventional farming led to an increasing interest in organic farming. By abstaining from using chemical inputs and by promoting practices such as crop rotation and vegetative buffer zones, organic farming offers the potential to regenerate agricultural land and to counteract biodiversity loss. However, despite various government and NGO initiatives, the adoption of organic farming is still at a very low level in Indonesia.

More widespread uptake of organic farming requires a better understanding of the drivers and barriers to its adoption. Information constraints have often been identified as a key barrier to the adoption of agricultural technologies. Providing farmers with information can increase problem awareness and knowledge of new techniques, both are prerequisites for subsequent adoption. Extension programs and training are a frequently used policy intervention to remove information constraints, to change perceptions about innovations and to promote the adoption of new agricultural technologies.

This policy brief presents the results of a randomized experiment that was designed to evaluate the effectiveness of a three-day hands-on training on organic farming targeted at smallholder farmers. Specifically, the evaluation addresses the effect of the training on

- (i) *perception* of organic farming,
- (ii) knowledge about organic farming,
- (iii) experimentation with and, ultimately, adoption of organic farming.

Policy Brief 6, 2020



Topics

- The effect of training on the perception, knowledge and adoption of organic farming
- Random experiment



The Experiment

The experiment was conducted in two regions on Java: in Tasikmalaya district, West Java Province and in the three districts Sleman, Bantul and Kulon Progo all Yogyakarta Province. Pre and post-intervention data was collected in March and April 2018 and 2019 in 30 villages in Yogyakarta and 30 villages in Tasikmalaya. Respondents were sampled among farmer group members. In total, 1,200 farmers were interviewed, i.e. 20 from each sampled village.

The Training

The organic farming training ('treatment') was randomized at the village level. After the baseline data collection in 2018, respondents in half of the villages (equally split between Tasikmalaya and Yogyakarta) were invited to the training. Control villages did not receive any training. The Indonesian nongovernmental organisation **Aliansi Organis Indonesia (AOI)** designed and delivered all trainings.

The **trainings were participatory** and involved many practical exercises such as the production of organic fertilizer, but also included some classroom sessions on organic principles and on problems associated with input-intensive conventional farming. The trainings were held in the respective villages to minimize travel time for respondents. Per invited farmer, the three-day training implied a total cost of IDR 315k (US \$23). The participation rate was very high, on average 18 out of 20 invited farmers per village participated.

Findings: Perception

Figure 1. Effect of training on perception





The results show that the training changed farmers' perceptions of organic farming. Comparing the treatment with the control group shows that the training increased the share of farmers who perceive farming as 'modern' rather than 'old fashioned' by 8 percent. Further, farmers in the treatment group were 14 percent more likely to think (rightly) that within Indonesia demand for organic products has increased in the past five years. This is promising as it increases the attractiveness of converting to organic farming.

The training also increased the probability that farmers perceive organic farming as more profitable compared to conventional farming. Finally, the training strengthened farmers' awareness of the negative effects associated with conventional farming, which again is a crucial step for future adoption. The probability that farmers think that chemical negatively affect the environment and farmers' health increased by 6 and 7 percent, respectively.

Findings: Knowledge

Figure 2. Effect of training on knowledge



The evaluation shows that the **training was successful in enhancing farmers' understanding about organic farming.** Measuring knowledge served two purposes. First, it allows assessing knowledge gains. Second, it allows measuring the training impact in a way that is not prone to a bias arising from strategic answers by respondents, i.e. if they just reported what they think interviewers want to hear without however understanding. The positive effects for knowledge thus further strengthen the robustness of our findings.

The training increased the probability that respondents knew about the need for a buffer zone between organically and conventionally farmed land by 20 percent. Furthermore, the training caused a 16 percent increase in the probability that respondents knew that the conversion from conventional to organic farming requires some time. This is important as farmers should have realistic expectations about conversion. Training also positively affected farmers' knowledge about the practices that are not allowed in organic farming, such as burning plant residues. Additionally, the training increased the probability that farmers are aware of the existence of organic farming labels by 20 percent.

Findings: Adoption/ Experimentation

Figure 3. Effect of training on adoption/ experimentation



Our findings indicate that **information constraints are a substantial barrier to the adoption of organic farming** as the information provision through the **training increased the uptake and use of organic fertilizer and organic pesticide**. Here, information refers to information about how to use organic practices and why to use organic practices.



Randomized Experiment

In this study, we used a randomized controlled experiment (RCT). Random assignment allows for a causal interpretation of the impact of the training. Simply comparing organic to non-organic farmers or comparing farmers before and after adoption can be misleading as both groups of farmers might not be comparable and as other relevant factors change over time too.

Like in a medical trial, the random assignment in combination with the large sample ensures that both groups are structurally exactly the same. Therefore, any difference in outcomes observed can be causally attributed to the treatment as all other factors have changed for both groups (treatment and control) in the same way.



IndORGANIC

Research Project IndORGANIC

Prof. Martina Padmanabhan Chair of Comparative Development and Cultural Studies (Focus: Southeast Asia)

Dr.-Hans-Kapfinger-Straße 14b 94032 Passau, Germany

Authours:

Prof. Michael Grimm and Nathalie Luck Contact: nathalie.luck@uni-passau.de

Passau, January 2020

Bundesministerium für Bildung und Forschung The training increased the uptake of non-manure fertilizer by 13 percent. It also raised the share of organic pesticide users by 9 percent. Yet, we find no robust evidence that the training also increased the uptake of processed manure. The results are consistent with the focus of the training, which was on practical experience in producing fertilizer and pesticide with the materials farmers typically have at hand.

Hence, some farmers in the training group have started to experiment with and to adopt the methods taught during the training. Given the short observation window between the start of the intervention and the survey of just one year, it is too early to expect full conversion. This will take more time.

Figure 4. Number of new users of organic fertilizer by farmer group



Figure 4 shows how many farmers did not use organic fertilizer during the survey in 2018 but did so during the survey in 2019. Compared to the control villages, there are more treatment villages which count three or more new users among the 20 respondents. On average, the **number of new users was four in the treatment group compared to only two in the control group**. This could be an essential difference as a widespread and continuous uptake of organic farming methods probably requires a critical mass of adopters who support each other and, through their experience, motivate others to start experimenting.

Key Messages

- Information was provided through a three-day hands-on training at a cost of only IDR 315k (US \$23) per farmer.
- The training changed the farmers' perceptions of and particularly their knowledge about organic farming.
- The training increased the share of organic fertilizer and organic pesticide users. For organic fertilizer, the training increased the probability of use by around 12 percent.
- This evaluation is based on a one-year observation window which does not allow to observe full conversion; this will require another one to two years and hence will be subject of a follow-up study.
- The findings from this study can serve policy makers and other stakeholders that look for effective interventions to boost organic farming.