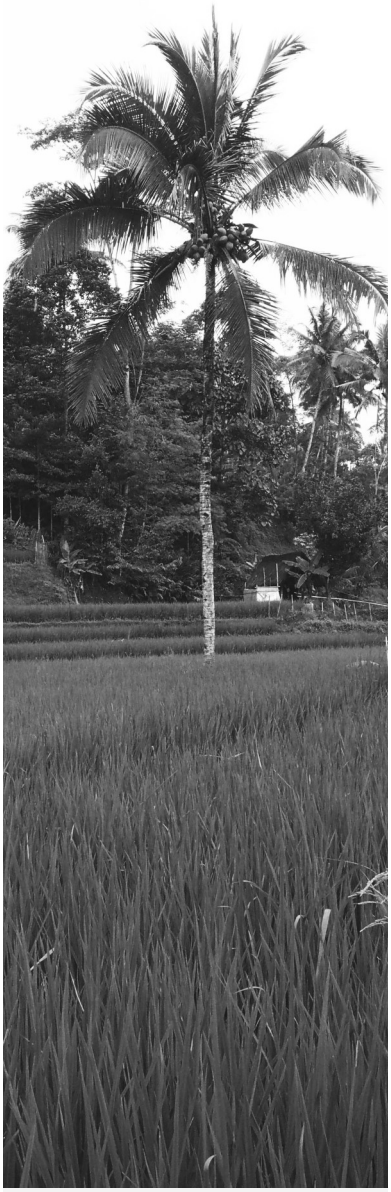
Sustainable Farming Practices in Agriculture – Evidence from Java



Background

The twin-goal of a sustainable intensification of agriculture and poverty reduction has been one of the most difficult challenges in the last decades. The degradation of agro-ecosystems increasingly deprives people of important resources and affects whole communities and their livelihoods. Poor management of land and water resources is gradually reducing the ability of individual farmers and whole communities to make critical investments in order to improve their situations. The potential link between the aggravation of poverty and the degradation of natural resources also raises fundamental questions on poverty reduction, fair income distribution and intergenerational justice (Wollni et al. 2010; Ruben and Pender 2004).

Despite the multiple benefits of Sustainable Agricultural Production (SAP) and considerable efforts by national and international organisations to encourage farmers to invest in SAP, the adoption of technologies and innovations for the sustainable management of natural resources by smallholders is generally limited. This policy brief summarizes the findings from an analysis that aims to determine the factors that are associated with a higher probability of SAP adoption. In the long term, such knowledge is important as it can be used to formulate specific policies and identify target groups to promote the adoption of SAP. This study is part of IndORGANIC, a German-Indonesian interdisciplinary research project that aims to investigate the potential of organic farming in Indonesia in general and in Java more specifically.

Topics

- Uptake of SAP
- Determinants of SAP Adoption

IndORGANIC

IndORGANIC is a German Indonesian transdisciplinary research project that aims to investigate the potential of organic farming in Indonesia in general and in Java more specifically. The project is funded by the German Federal Ministry of Education and Research and based at the University of Passau, Germany. IndORGANIC cooperates with three institutions in Indonesia, the Universitas Atma Jaya in Yogyakarta (UAJY), the Institut Pertania Bogor (IPB) and Alliance Organic Indonesia (AOI). AOI is an umbrella organization for organic agriculture in Indonesia.

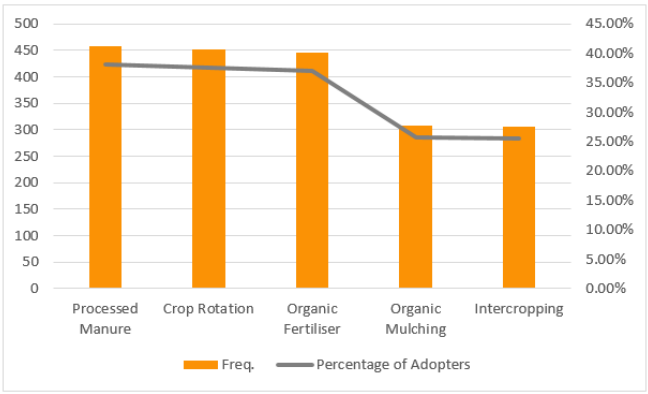
The data used for this analysis was obtained through a survey among 1201 small-scale farmers. The data was collected in the province of Yogyakarta and the district Tasikmalaya, which is part of the province West Java (see Figure 1).

Figure 1. Research Areas in Java

Uptake of SAP

In the survey, farmers were asked about their adoption of sustainable farm practices. The results from the survey reveal that five out of the six most commonly used farming practices are concerned with the preservation and conservation of soil quality. Those practices are processed manure, crop rotation, organic fertiliser, organic mulching and intercropping.

Figure 2. Number of Adopters of Sustainable Agricultural Practices, N=1201



In our sample, 19% of the respondents did not use any of the above listed soil conservation practices (Figure 2). Only four households used all five agriculture practices examined here. Processed manure is the most commonly used practice with a 38.1% adoption rate, closely followed by crop rotation (37.6%) and organic fertilizer (37.1%). However, most of the farmers adopted several of these practices in combination. Among the single practice adopters, crop rotation is most commonly adopted (9%).

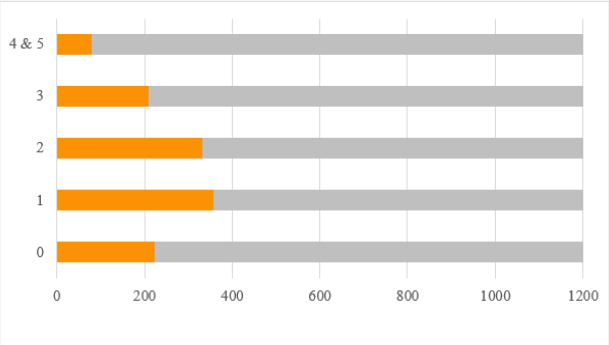
Respondent & Household Characteristics

Most of the respondents in our sample are male (83%), married (97%) and report that farming is their main economic activity (80%). The average respondent is 54 years old and lives in a household with four members. Land size differs significantly in the two research locations, in Tasikmalaya the average land size is 0.49 ha while in Yogyakarta the average land size is 0.26 ha.

Impact of Farmers‘ Main Activity & Assets

The study shows that the number of applied soil conservation practices increases if the respondent’s main economic activity is farming, implying that full -time farmer have access to more knowledge on soil conservation and different farming practices. In addition, some of the soil conserving agriculture practices are considered as labour intensive. Full time farmer may have more resources to adopt those practices.

Figure 3. Number of Soil Conservation Practices Adopted, N=1201



Farm assets like livestock, machinery and irrigation systems also have an impact on the adoption decision. As expected, the availability of livestock is highly significant for the use of processed manure. The availability of technical assets and technical irrigation is equally positively related to the adoption of crop rotation.

Impact of Shocks & Environmental Awareness

Natural shocks like landslides, floods or water shortages have a fundamentally positive impact on the adoption of sustainable farm practices. Possibly, this is due to an increased environmental awareness, a higher sensitivity for environmental factors and a risk diversification. For instance, farms on soil that is more at risk of erosion and thus landslides use more soil conservation practices. Yet, the occurrence of pests has a negative effect on the adoption of sustainable practices. Instead, households that are particularly vulnerable to pests are increasingly turning to chemicals to stop them. Another crucial point in including multiple practices is the farmer’s awareness that his or her own activities affect the environment. This awareness is clearly positively associated with the adoption of sustainable practices.

Impact of Trainings & Markets

Attending trainings on agricultural innovations and practices such as the Upsus Pajale training or System of Rice Intensification (SRI) training has a positive impact on the use of different soil conservation practices but also on the overall number of practices adopted. This underlines the importance of trainings and agricultural education as effective factor in the adoption of sustainable practices. Sales through intermediaries or local markets increase the probability that a farmer adopts intercropping or processed manure. This might be due to reduced market access costs that make resources available for sustainable practices, like reduced transportation costs and the increased sales security. Access to resource-saving markets is therefore relevant for profitable adoption.

Definition:

Sustainable Agriculture (SA) can broadly be defined as an agricultural system that combines a variety of sustainable production practices while at the same time reducing the use of practices that are potentially harmful to the environment. The United Nations Food and Agriculture Organization (FAO) notes that sustainable agriculture consists of five main attributes: it conserves resources, it is biodegradable, technically appropriate and economically and socially acceptable (FAO 2018).

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Impact of Networks

The recommendation of friends regarding cultivation methods does not seem to be very relevant, rather to the opposite, such recommendations seem to reduce the probability of adoption in some cases, maybe because the quality of the advice is low.

Extension workers as an information source have an interesting impact on the adoption decision. Information about cultivation methods have a consistently negative impact on crop rotation, processed manure and organic fertiliser. This might be due to extension workers promoting modified high yielding varieties that are marketed to grow best in combination with chemical inputs. Furthermore, extension workers occasionally have contracts with agriculture corporations that will pay to get their newest varieties promoted. However, this effect reverses when it comes to the impact of information regarding technological innovations in fertilisers, pesticides and machinery. This shows that extension workers play an important role in disseminating sustainable practices even if their action sometimes fails to produce changes in the intended direction.

Policy Recommendations

Full-time farmers are the ones who are most likely to adopt soil conservation practices. Therefore, it is recommended to target full-time farmers that are not dependent on external labour to promote SAP programs.

Farm resources like technical assets and irrigation systems seem to be highly relevant for the adoption of SAP. However, many farmers might be unable to purchase appropriate equipment. The availability of credit and government programs might enhance the availability and improvement of agricultural machinery and irrigation systems. Livestock has a significant influence on the use of manure. Although increasing the number of animals may not be a viable option, the introduction of high-yielding and improved fodder crops may increase animal products, including fertilizer.

The experience of negative natural shocks and the awareness for one's own impact on the environment is also highly significant for the adoption of individual practices. While natural shocks cannot be controlled, education campaigns and programs may be suitable for promoting sustainable agriculture.

The participation in agricultural training such as Usup Pajale and SRI proves to be of high importance suggesting that agriculture training is an appropriate tool to promote sustainable agriculture.

Market access and the associated selling expenses are another crucial factor. Improved infrastructure that facilitates market access could further improve the adoption of SAP. Extension workers are an influential and important information source for the farmers. The content that the extension worker conveys is thereby highly relevant for a successful promotion of SAP.

Sources

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