

Extended Abstract

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Paper/Poster Title	Sustainability Standards and their Socioeconomic and Environmental Effects
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Abstract prepared for presentation at the 98th Annual Conference of The Agricultural Economics Society will be held at The University of Edinburgh, UK, 18th - 20th March 2024.

Abstract	200 words max
<p>Voluntary sustainability standards promise to make commodity crop production more sustainable by improving agricultural productivity whilst conserving on-farm biodiversity. However, it is still unclear whether sustainability standards can achieve this goal, as the empirical literature has mainly focused on assessing their effects on either socioeconomic or ecological outcomes and studies that assess both simultaneously are limited. Therefore, in this study, we take an interdisciplinary approach to understand the effects of sustainability standards on both socioeconomic and ecological outcomes related to biodiversity and ecosystem health and explore potential underlying mechanisms. We use representative household data from 812 cocoa-producing households randomly sampled from the five largest cocoa-producing regions of Ghana and ecological data based on a subset of 119 cocoa farms. Our results indicate that sustainability standards have a significant positive effect on cocoa yields, net cocoa income and return to land, the farm's shade tree crown cover and shade tree diversity. However, these standards also exhibit slight negative effects on the farm's biological predation rates, bird abundance and richness and acoustic sound diversity. Reasons for our results could be that certified farmers adopt more agricultural practices and intensify their farms more, which increases yield but has slightly negative effects on biodiversity and ecosystem health.</p>	
Keywords	Sustainability Standards, Trade-Offs, Ecological Economics, Biodiversity Conservation
JEL Code	Environment and Development Q56 see: www.aeaweb.org/jel/guide/jel.php?class=Q
Introduction	100 – 250 words
<p>Agricultural commodity crop production is a major contributor to today's biodiversity crisis (Wurz et al. 2022). At the same time, in developing countries, it is connected to several socioeconomic challenges such as low prices and low productivity, which leads to poverty among smallholder farmers (Wessel and Quist-Wessel, 2015). In response to these challenges, voluntary sustainability standards have emerged with the aim to make food production systems more sustainable (Milder et al. 2015). Sustainability standards are sets of social, economic and environmental criteria that define agricultural</p>	



practices in ways that could increase productivity whilst reducing its ecological impacts and supporting rural livelihoods (Milder et al. 2015). If farmers comply, they are promised to receive benefits such as price premiums, market access, training and agricultural inputs (DeFries et al. 2017). The extra costs involved in these alternative supply chain processes are carried out mostly by consumers of developed countries that are increasingly concerned about the sustainability of food production (Tscharnktke et al. 2015).

However, it is not clear if sustainability standards can reach their goals because the current literature has extensively explored sustainability standards' effects on single sustainability dimensions (Hardt et al. 2015; Pico-Mendoza et al. 2020; Meemken et al. 2021; Sellare et al. 2020) and studies addressing several dimensions are limited (Hagggar et al. 2017; Vanderhaegen et al. 2018). Therefore, this study aims is to investigate the effects of sustainability standards on socioeconomic as well as on-farm ecological outcomes and to explore potential underlying mechanisms.

Methodology

100 – 250 words

We use representative household data from 812 cocoa-producing households that were randomly sampled across 46 communities in the five largest cocoa-producing regions of Ghana. We use ecological data based on a subset of 119 cocoa farms that were selected from 18 communities across four regions.

Using the endogenous switching regression (ESR) method, we analyze the effects of sustainability standards on socioeconomic outcomes such as cocoa yields, net cocoa income and return to land and ecological outcomes such as shade tree crown cover, shade tree diversity, biological predation rates, bird abundance and richness and acoustic sound diversity.

In a more explorative approach, we use probit, ordinary least square and generalized linear models to test associations between sustainability standards and cocoa prices, farmer training, selected agricultural practices and ground herbaceous cover.

Results

100 – 250 words

The results of our ESR regressions strongly indicate that sustainability standards have positive effects on cocoa yield, net cocoa income and return to land. Additionally, we find small positive effects on shade tree crown cover and slightly negative effects on biological predation rates, bird abundance and richness and acoustic sound diversity.

Based on the findings of our explorative approach, we find that sustainability standards are associated with an increased number of training, yield enhancing agricultural practices as well as small increases

in prices. We also find that sustainability standards are associated with applying more agrochemical inputs and less herbaceous ground cover, indicating increased intensification.

Discussion and Conclusion

100 – 250 words

Our results indicate that sustainability standards have a significant positive effect on the socioeconomic indicators and are associated with neutral to slightly negative effects on the ecological indicators. Our findings could be explained by the fact that certified farmers receive more training and have better access to agricultural inputs. Therefore, they adopt more agricultural practices that enhance their yields. Furthermore, more training on for example farm business management, as well as receiving price premiums, explains higher net cocoa income and returns to land. However, increased use of agrochemical inputs and less herbaceous ground cover could explain lower values for the selected ecological indicators.

While sustainability standards seem to be supporting farmers concerning their livelihood aspects, they need to make sure that these do not come at the expense of on-farm biodiversity and ecosystem health.