

# 審査の結果の要旨

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## 博士論文題目 Title of Doctoral Dissertation:

### Adoption and impacts of certification standards for oil palm and cocoa smallholders in Ghana

Cocoa and oil palm are the major industrial crops produced in Ghana. Their production and export has played a significant role in the Ghanaian economy, with pre- and post-independence governments enacting multiple policies and interventions to promote their cultivation. This has in turn stimulated their expansion both in terms of area and output. Currently, Ghana ranks as the 2<sup>nd</sup> largest producer of cocoa and the 8<sup>th</sup> largest producer of oil palm in the world. Cocoa is almost completely produced by smallholders that either specialize in cocoa production or produce it jointly with other crops. Conversely, oil palm is mostly produced in hybrid systems consisting of large core plantations surrounded by hundreds or even thousands of smallholders that are either contractually linked to the core plantation (i.e. scheme/outgrowers) or cultivate and sell it independently (i.e. independent growers). Due to the large smallholder involvement in both cocoa and oil palm production, these crops are major sources of rural livelihoods and have been associated with positive socioeconomic outcomes related to income generation, poverty alleviation and food security.

However, the production of both cocoa and oil palm has been linked to many negative environmental and socioeconomic impacts such as land use change/deforestation, pollution due to the extensive use of fertilizers and agrochemicals, unfair compensation practices, and land tenure conflicts, among others. In response to these negative sustainability impacts, oil palm and cocoa certification has gained traction as a means of ensuring their sustainable production and guaranteeing mutual benefits across their value chains in Ghana. Certification standards are largely voluntary, and entail the strict adoption of socially and environmentally responsible production practices. Currently, various sustainability standards have targeted the two sectors, including UTZ, Fairtrade, Rainforest Alliance, Organic and Roundtable on Sustainable Palm Oil (RSPO). This reflects global certification trends that have been largely driven by changing consumer preferences and behavior, partly due to rising living standards and concerns about food safety and the environmental/social consequences of agricultural production.

There is a growing interest regarding the extent of the possible economic, social and environmental impact of certification, especially for smallholders. Certification is expected to improve the farmer incomes through increased yields and premium payments, while ensuring environmental sustainability. However, evidence about the impact of certification is mixed, with some studies reporting positive impacts and others reporting low-to-no impacts. However, many of these studies are limited or not robust in terms of methodology, and the selection of variables, crops and geographical contexts.

This thesis therefore aims at assessing the adoption and impacts of certification standards for oil palm and cocoa smallholders in Ghana. The specific objectives include:

- 1) To understand the perceptions of the main stakeholders involved in oil palm and cocoa value chains towards certification, as well as the existing connections in the context of certification
- 2) To analyse the promotion and adoption dynamics of farmer participation in certification programmes
- 3) To establish certification adoption impact on farm productivity, multidimensional poverty, income, and food security
- 4) To provide policy recommendation to enhance the adoption and impacts of certification for smallholders in Ghana

A mixed method approach was employed using data obtained through an institutional analysis, expert interviews (33 respondents) and household surveys (608 respondents) in two areas of cocoa and oil palm production. The expert interview respondents were identified through an institutional analysis and represent organisations with different engagement in cocoa and oil palm certification such as government ministries, civil society, research and the private sector. Their interviews were analyzed

through content analysis to identify the major themes regarding the drivers, impacts and future options of oil palm and cocoa certification in Ghana. For the household surveys the identified cocoa study site is located in the Assin district of Ghana and the oil palm site in the Mpohor district. Respondents in each site included certified cocoa/oil palm farmers (treatment group), uncertified cocoa/oil palm farmers (control group 1), and food crop farmers (control group 2). The household surveys were analyzed through descriptive statistics, mixed effect probit regressions, and propensity score matching estimation.

For (1), the expert interviews suggest that premiums are the major drivers of certification adoption among smallholders, especially in the cocoa sector. Consumer demand also drives certification adoption among smallholders and large companies in both sectors. Farm productivity, income generation and reduced environmental impacts are the major impact associated with certification adoption. However, the high cost of certification due to direct and opportunity costs are the major barriers to certification adoption, followed by heavy documentation, bureaucracy and lack of farmer capacity.

For (2), certification is promoted using varied targeting approaches including buyer-led, farmer-led and intervention-based targeting (for cocoa) and mill-led and intervention-based targeting approach (for oil palm). Apart from the intervention-based approach, profit motives are a dominant feature of promotion activities. The mixed effect probit regression analysis indicates that the age of the household head, livestock ownership and ownership of information access devices positively influences cocoa smallholders' decision to adopt certification schemes on their farms. Surprisingly, education of household head has a negative relationship with adoption. Livestock ownership, which is an indication of wealth, positively influences the decision to adopt certification, suggesting that wealthier and better-endowed households tend to be more likely to adopt certification. Ownership of information devices (e.g. phone) positively affects farmers' decision to adopt certification, as this also implies better access to information which is a critical aspect of the successful implementation of certification standards. In addition, farmers also experience the challenge of high input cost and low premiums, which is a major disincentive for sustained adoption.

For (3), the propensity score matching estimations suggest that certified cocoa farmers are better-off than uncertified cocoa farmers in terms of household income (by GHC 3,638.71,  $p < 0.01$ ), cocoa income (by GHC1572.48,  $p < 0.01$ ), per capita income (by GHC1259.56,  $p < 0.01$ ), yield (by 81.74 kg/ha,  $p < 0.01$ ), food security (Food Consumption Score) (by 2.12 points) and multi-dimensional poverty. However, certified farmers have lower consumption as compared to uncertified cocoa farmers. Estimations between "certified cocoa farmers vs. food crop farmers", as well as "uncertified cocoa farmers vs. food crop farmers" also show similar impact trends. Similarly, certified oil palm farmers are better-off compared to uncertified oil palm farmers in terms of household income (by GHC5,741.80,  $p < 0.01$ ), oil palm income (by GHC2,430.97,  $p < 0.01$ ), per capita income (by GHC2400.71,  $p < 0.01$ ) and multi-dimensional poverty compared to uncertified oil palm farmers. However, there is no significant difference between certified oil palm farmers and uncertified oil palm farmers in terms of consumption expenditure and food security.

For (4), considering the results obtained, certification can be a promising avenue to enhance social, environmental and economic livelihoods of farmers. However, efforts should be taken to a) improve smallholder targeting approaches, b) improve premium design, c) Improve yield gains, d) Enhance income diversification for smallholders, e) Include crop diversification in certification guidance and principles, f) Explore the feasibility of a nationally mandated approach to certification to harness the potential of certification to catalyse progress across multiple SDGs.

Portions of Chapter 5 have been published as a joint paper (International Journal of Agricultural Sustainability) by the student (Eric Dompheh), PhD supervisor (Alexandros Gasparatos), and an external collaborator (Richard Asare). Portions of Chapter 3-5 will have also been submitted for joint publications between the three authors. In all cases the student undertook the majority of the research activities, in particular designing the research approach, collecting the data, analyzing the data and writing the original versions of the manuscripts. The supervisor provided feedback and recommendations throughout these activities.

This committee unanimously agreed to award the degree of Doctor of Sustainability Science.

よって本論文は博士（サステナビリティ学）の学位請求論文として合格と認められる。

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