



Voluntary sustainability standards, participation in global value chains and the livelihoods of mango farmers and farmworkers in Ghana

Rexford Akrong

Global value chains allow producers from developing countries to upgrade their production standards and add value to their production. Accessing these value chains implies improved welfare of farmers and farmworkers incorporated into these value chains. Despite the benefits of global value chains (GVCs), smallholder mango farmers' participation in these value chains remains low. This low participation is attributed to the limited ability of Ghanaian mango farmers to comply with sustainability standards that govern participation in these value chains. These standards serve as new trade barriers that defy the principles of trade liberalisation. It is, therefore, necessary for a policy change to ensure increased participation in GVCs by mango farmers in Ghana. Ghanaian trade policies should focus on adapting existing sustainability standards to suit the Ghanaian context to enhance the compliance of smallholder mango farmers with these standards. This can increase Ghana's mango exports and improve the country's foreign exchange. These context-specific trade standards can enhance South-South corporation and regional integration, thereby accelerating endogenous development in the Global South. Given that Ghana heavily depends on agriculture, this move can greatly affect the development path. This paper descriptively explores the context and benefits of introducing changes to trade policy and sustainability standards in agriculture.

This essay is based on research funded by a STEG [Ideas for Transformation \(I4T\)](#) grant. I4Ts are brief and largely non-technical essays utilising country-specific expertise to identify a specific policy distortion, market failure, or other similar opportunity to promote inclusive growth and development in a particular country or context.



UKaid
from the British people

CENTRE FOR
ECONOMIC
POLICY
RESEARCH

CEPR

STRUCTURAL TRANSFORMATION
AND ECONOMIC GROWTH

INTRODUCTION

Despite the challenges faced by the agricultural sector of developing countries, it remains the mainstay of these countries. Categorically, this sector is the main source of livelihood for a significant proportion (63%) of the population while contributing more than 15% to the gross domestic product (GDP) of countries in Sub-Saharan Africa (SSA) (Pasquali et al., 2021). However, the ascendancy of the neoliberal theory and liberal philosophies, and their associated policies has led to a significant restructuring of global trade, investment and production, further leading to the modernisation of agriculture and certification of agricultural production (Amanor, 2019). Before this, the agricultural sector of SSA countries was characterised by subsistence or semi-subsistence production systems that relied on indigenous technology. These have further contributed to the increasing integration of farmers into global value chains (GVCs).

According to Jha and Yeors (2019), a GVC is a system where the components of a final output/product are conceived, designed, produced, procured and processed in different parts of the globe before being assembled at a specific destination for ultimate consumption, which may again have a global market. For instance, mangoes produced in Ghana are processed in the United Kingdom and consumed by people in other parts of Europe. More specifically, GVCs include a set of actors linked in a sequence of activities, from bringing a product in its raw material form to the final consumer. In agriculture, the activities include upstream activities, mainly the production of farm produce and downstream activities, which include processing. According to Lim (2021), participation in upstream activities is more common among developing countries, whereas the developed countries mainly undertake downstream activities. This disparity in GVC participation is attributed to the differences in the levels of technological advancements, and financial and technical capacities. However, developing countries can capitalise on this trend and increase exports of agricultural products to the Global North, thereby increasing their participation in GVCs and consequently experiencing a positive change in the gross domestic product and employment (Lim, 2021). Specific benefits accrued to participation in GVCs include higher prices for farmers, which translates to increased incomes, longer employment contracts and higher wages for farmworkers.

Participation in GVCs and reaping the associated benefits requires compliance with product standards popularly known as voluntary sustainability standards (VSS). Exports from developing countries to developed ones are increasingly governed by sustainability standards that claim to certify production conditions' social and environmental sustainability to verify compliance with

GVCs. Thus, compliance with VSS results in agricultural certification. It is noteworthy that compliance with these standards or participation in certification schemes are voluntary because a government, or similar governing institution, does not mandate them (Komives and Jackson, 2014).

Since the reduction in the use of tariffs, VSS, which represent significant non-tariff measures, have increasingly gained the interest of economists due to their effects on trade, socioeconomic outcomes and structural transformation (Lim, 2021; Santeramo and Lamonaca, 2019; Oya et al., 2017). Theoretical perspectives on the effects of certification on trade indicate that voluntary or compulsory certification can either be a barrier or a catalyst to trade. Certification becomes a non-tariff barrier when participation in GVCs is threatened for farmers who do not have the technical and financial capacity to bear costs associated with restructuring their agronomic practices to comply with certification standards (Amanor, 2019). On the other hand, certification reduces information asymmetry and transaction costs while improving productivity and product quality, thereby enhancing farmers' participation in GVCs and their ability to maximise gains from agricultural production and trade.

Despite the benefits associated with participation in GVCs and other high-value market chains (HVMCs), mango exports from Ghana remain low. About 70% of the mangoes produced in the country end up in the domestic markets (WACOMP, 2020). This implies a loss of opportunity for mango farmers and farmworkers to maximise gains from mango production and trade, specifically, from participation in GVCs. Meanwhile, the country could leverage its comparative advantage in mango production and trade, given its bimodal mango season and its proximity to the EU markets (Ghana's largest mango market where certification is required), to increase its export volumes.

Zakari (2012), Eghan (2017), WACOMP (2020), and Akrong et al. (2021) have attributed Ghana's inability to expand its share of mangoes in GVCs and HVMCs to the inability of mango producers to meet the strict quality and quantity requirements of the export markets, which impedes their ability to participate in certification schemes. Whereas countries like China have compulsory certification schemes (Wang, 2022), Ghanaian agricultural exports are mainly governed by voluntary certification (Fiankor et al., 2020). In horticultural production in the Global South, the GlobalGAP certification and the Organic certification are the most common certification schemes available to small-, medium-, and large-scale farmers. The GlobalGAP certification is the most important standard in Ghana's mango subsector and it is becoming increasingly difficult to access the EU market and other high-value market chains, including industrial processors and supermarkets without this certification (Annor, 2018).

The GlobalGAP certification scheme hinges on a set of Good Agricultural Practices (GAP) (such as pesticide and fertiliser use) that ensure compliance with public food safety requirements and encompass other factors such as traceability, workers' health and safety, animal welfare, and farm management practices (Subervie and Vagneron, 2013). The standard was formed by a union of European retailers in 1997 and became a compulsory requirement for suppliers in the European Union in 2005. This threatened to exclude horticultural producers from high-value export horticulture markets (Humphrey, 2008) if they could not adhere to these markets' strict requirements (Holzapfel and Wollni, 2014). Depending on their initial situation, farmers would need to make significant adjustments to their farm management and production to be eligible for certification. These adjustments include investments in fixed inputs, such as infrastructure equipment, including storage and sanitary facilities (Asfaw et al., 2009). These may pose a significant financial burden on poorer farmers. It is expected that these challenges would impede smallholder farmers' adoption of certification schemes. Yet, Fiankor et al. (2020) report an exponential surge in farmers' certification, especially in the case of GlobalGAP certification.

Additionally, public standards, which are proxied by the number of sanitary and phytosanitary measures notified to the World Trade Organization, increased by approximately 400% between 1995 and 2015 (Ehrich and Mangelsdorf, 2018). The increase in the number of adopters of voluntary GlobalGAP certification grew by approximately six folds in the mid-1990s and 2011 (Swinnen, 2016). According to Flachsbarth et al. (2020), the adoption of GlobalGAP certification is mainly driven by increased access to information and a high level of infrastructural development. This implies that farmers in developing countries, fraught with limited access to information and a low level of infrastructural development may be involuntarily excluded from certification schemes.

Farmers in Ghana are not spared from the challenges that smallholder farmers in the Global South face. In the case of certification, only about 35% of smallholder farmers in Ghana have a valid GlobalGAP certificate as of 2020 (WACOMP, 2020). However, this is an upward shift from the 2017 estimates where only 105 out of about 8,000 registered producers had a valid certificate (GlobalGAP, 2017, Grumiller et al., 2018). This low rate of certification among mango farmers in Ghana implies a loss of opportunity to be integrated into GVCs. The need to certify to access high-value markets suggests research questions about how certification can affect access to export markets and the livelihoods of farmers and farmworkers.

In this essay, we answer the following research question: how can voluntary sustainability standards be adapted to reflect specific climatic, geographical and technological circumstances in

Ghana? To answer this question, we provide a high-level discussion on how voluntary sustainability standards inform participation in global value chains and affect the livelihoods of mango farmers and farmworkers in Ghana. In the following section, we explore the current policy context and existing research on certification schemes in Ghana and the developing world. In section 4 we explore how revising standards could potentially impact trade and welfare outcomes. There after we outline some factors of consideration for the plausibility, feasibility and implementation of a change in policy in Ghana. Finally, we discuss the limitations and opportunities of adapting sustainability standards to suit the Ghanaian and African context before concluding with ideas for future research.

POLICY CONTEXT

Ghana's mango value chain is mainly dominated by upstream activities, with the country's exports being predominantly fresh mangoes. This situation is noteworthy to be synonymous with many countries' agricultural value chains in the Global South. Exports from these countries are generally low due to stringent requirements in the international markets. In developing countries like Ghana, voluntary sustainability standards limit exports of horticultural products, thereby reducing trade gains for farmers and traders at the micro-level and the country's ability to reap high foreign exchange from horticultural trade.

Even though public standards regulate international trade, private or voluntary sustainability standards are more common than public standards in global agricultural trade. The significant effect of voluntary sustainability standards on the integration of Ghanaian mango farmers into GVCs calls for policy action. The Government of Ghana and governments of many developing countries have a trade-off to address in their efforts. On one hand, standards and auditing systems need to be upgraded and enforced to meet rigorous international standards. On the other hand, sustainability standards must be tailored to fit the context of developing countries whilst still meeting the standards of international buyers. This needs to acknowledge the limited financial and technical capacities as well as socio-cultural and economic factors that may hinder the adoption of voluntary sustainability standards and participation in export markets in developing country contexts.

The government of Ghana's efforts towards enhancing trade through promoting the adoption of voluntary sustainability standards by farmers have been minimal. Rather, efforts to enhance compliance with private standards have largely emanated from the private sector.

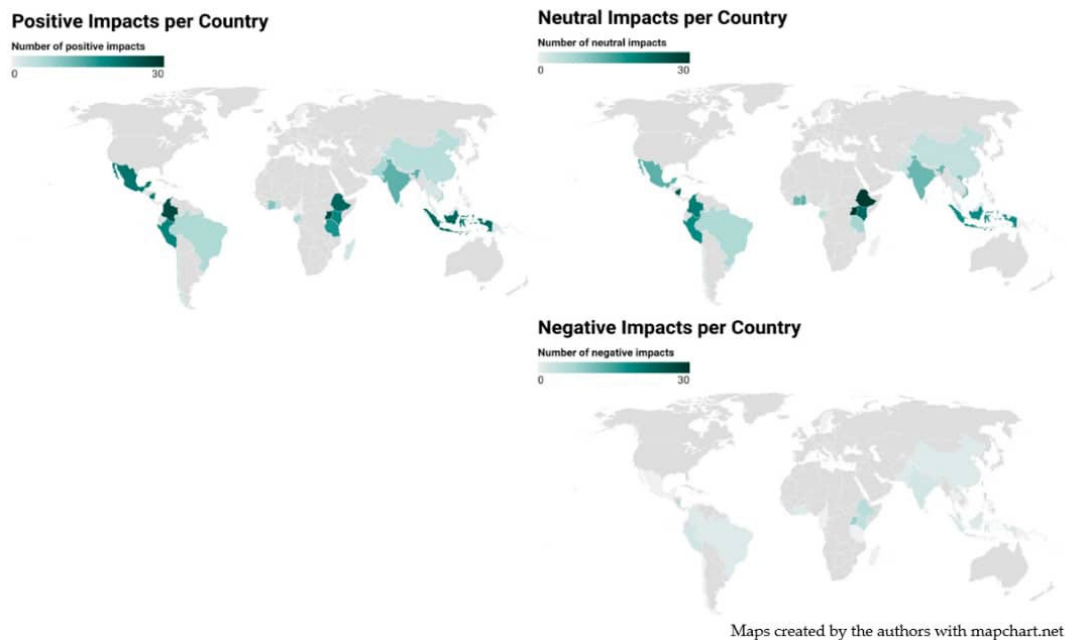
Recognised efforts include training and capacity development programmes organised in the 'Southern Belt' of mango production in Ghana (Greater Accra, Eastern, and Volta Regions) by private stakeholders in the mango value chain (i.e., mango processors including HPW, Blue Skies Limited, and Bomarts), USAID/TIPCEE (now replaced by ADVANCE). Efforts by the government that indirectly affect compliance include agricultural extension services. Although reports by WACOMP (2020) show that these efforts have increased both the quality of mangoes produced, and participation in certification schemes, it has been reported that some mango farmers (about 70 farmers) drop out of certification schemes due to inability to afford certification costs. According to Annor et al. (2018), farmers' compliance rate is below the threshold. This low compliance has been attributed to a lack of access to farm credit, high cost of farm inputs and high costs of hired labour according to a case study (Annor et al., 2018) and an endogenous switching regression model (Kleeman et al., 2014) - both using Ghanaian farm level data.

In developing countries, the use of indigenous agronomic practices and the employment of household labour which are relatively cheaper, continue to persist. This raises the need to make significant policy changes to ensure an increase in access to export markets by mango farmers in Ghana, especially smallholders who dominate mango production in the country. In a recent comprehensive review, Marx et al. (2016) canvas research that has been conducted on VSS from different academic disciplines. Marx et al. (2016) finds that previous studies on voluntary sustainability standards have mainly focused on their impact on return on investments (Kleeman et al. 2014) and the welfare of agricultural households (Chiputwa et al., 2015; Jena et al., 2017). The studies found differences in the impacts of voluntary sustainability standards across products, types of standards and countries, as presented in Figure 1. Some found positive effects, and others found negative and no effects. Marx et al. (2016) show that the studies reviewed reveal 94, 93, and 9 positive, negative and neutral environmental impacts, respectively. For the socio-economic impact of the studied VSS, 111 positive impacts and 118 neutral impacts are found, in contrast with 22 negative impacts which are mainly related to increased costs linked to obtaining certification. Figure 1 presents the impacts of VSS across different countries. The figure shows that developing countries record most of the impacts of VSS, with positive and neutral impacts being more common than negative impacts.

This indicates the roles of context-specific factors that mediate the impacts of certification. It also implies that there are differences in the characteristics of products and countries. Therefore, there is a need for new trade policies that consider these sustainable local contexts and can improve access to export markets and other HVMCs by small-scale horticultural producers. In essence, a

one-size-fits-all standard might not work in different contexts, thereby impeding the ability of such trade policies to achieve their desired outcomes.

Figure 1: Impacts of existing certification schemes



Source: Marx et al. (2022)

POLICY IMPACT OF ADAPTING VOLUNTARY SUSTAINABILITY STANDARDS

The limitations associated with "imported" or "imposed" voluntary standards regarding the inability of farmers to comply, necessitate the development of contextually appropriate policies. We predict that local farmers would easily understand these contextual voluntary sustainability standards, thereby enhancing compliance. Further, the local voluntary sustainability standards should be designed to ensure that the quality and quantity of fruits and vegetables produced meet export markets' quality and quantity requirements. Moreover, these locally devised voluntary standards can be harmonised with international standards to promote the acceptance of local certification schemes globally. This move will promote efficiency in public standard-setting institutions since the neoliberal theory posits that a move towards privatisation increases efficiency (Harvey, 2005). The new standards will benefit the households of farmers and farm workers. This is because localised voluntary standards will ensure that farmers meet the demands of domestic

HVMCs such as processors and supermarkets, and the export market which require high-quality mangoes.

Further, these revised standards can ensure South-South trade since countries in the South have homogenous agricultural production and trade characteristics (Mukasa et al., 2017) and have less stringent requirements (Moisé, 2013). In the context of Africa, such standards will benefit from regional integration initiatives such as the African Continental Free Trade Area (AfCTA) since farmers will be more competitive owing to their increased productivity and quality. Compared to the imported voluntary sustainability standards, a higher number of farmers would be able to meet the localised voluntary sustainability standards which are less likely to be associated with the need for restructuring of agronomic practices that increase costs. This, in turn, would imply a significant increase in the intensity of participation in domestic HVMCs and export markets. The increase in adopters of contextualised certification schemes will increase employment and better working conditions for rural farmworkers and will, hence, result in social mobility. This policy change will contribute to United Nations sustainable development goals one, two and eight addressing poverty, hunger, and employment.

PLAUSIBILITY, FEASIBILITY, AND IMPLEMENTATION

This policy change is feasible because Ghana has both indigenous and exotic technologies that can be adopted at a relatively lower cost to ensure that farmers have increased productivity and produce high-quality mangoes (Asuming-Brempong et al., 2016). Before adopting neoliberal policies, the agricultural sector was characterised by sustainable agricultural practices by using indigenous knowledge and technology that were economically viable, socially just and ecologically sound. Consumers in developed countries and some developing countries have become increasingly aware of the need to protect the environment and are advocating for ecological friendly production practices that hitherto existed in developing countries. To that effect, it should be easy for farmers in developing countries to restructure their agronomic practices to suit context-specific standards that meet the requirements of buyers who purchase products produced under conventional and organic systems. The involvement of the government of Ghana to adapt global sustainability standards to suit the Ghanaian context can attract access to agricultural credit from rural banks, the country's agricultural development bank, now known as ADB Bank. This can reduce the credit constraint that small-scale farmers face.

Further, the government already has a standard-setting institution known as the Ghana Standards Authority, which has received international recognition in Africa and developed countries. This organisation has the technical capacity to assist in redesigning standards that would meet the requirements of buyers in the EU. Given that European organisations such as the German Corporation for International Cooperation (GIZ) are already collaborating with farmers to build the latter's capacity to meet the standards, domestic standard-setting bodies in Ghana can leverage this existing relationship to promote the acceptance of the contextualized standards in the EU countries. These new standards could be enforced through a public-private partnership between standard-setting bodies in Ghana and certification bodies such as the GlobalGAP and Fairtrade.

Agricultural extension officers and other third-party certification bodies can perform audits to ensure that these adapted standards meet international standards, and that farmers adhere to all necessary procedures required by these new standards. This will ensure that the adapted standards do not compromise the quality of fruits and vegetables being exported from the country. Also, Ghana has a good bilateral relationship with the European Union; thus, it should be plausible for the country's trade ministry to negotiate with foreign trade ministries to accept Ghana's sustainability standards, thus certification schemes emerging from Ghana. Socially, consumers in the country are more conversant with indigenous production standards; thus, adapting sustainability standards to suit the local context is more plausible. Also, there are farmer-based organisations that, through collective action, can come together to collectively ensure checks and balances in the implementation of voluntary standards. These checks are necessary to ensure group certification since the failure of individual farmers to comply can impede the renewal of certificates.

LIMITATIONS, OPPORTUNITIES AND NEXT STEPS

Currently, there are no competing ideas for adapting sustainability standards to suit the Ghanaian and African contexts at large. However, the political nature of sustainability standards can impede the implementation of this proposed policy change. A major question is whether the EU or other international organisations would be willing to accept adapted quality standards. The existing perceived corruption in the African system and the perceived weakness in Africa's standards-setting bodies can lead to mistrust in the certification processes. Nonetheless, private audit firms can always be consulted or contracted by importers from developed countries to ensure that farmers strictly adhere to the newly introduced sustainability standards.

Even when they are not accepted by developed countries, adapted standards can be highly valuable in facilitating trade in developing countries. Cases in Vietnam indicate that their adapted standards do not meet the requirements of the EU (Nguyen and Jolly, 2020). Consequently, acquiring the VietGAP certificate does not guarantee access to the EU market. However, such a certificate enhances access to domestic high-value markets while increasing Vietnam farmers' competitiveness in high-value markets in countries in the Global South. Regarding adapted standards, evidence from China indicates that the development of the China Compulsory Certificate (CCC) has tremendously increased China's imports (Wang, 2022). This indicates that adapted standards can facilitate South-South trade which is equally beneficial to developing countries.

Further, compared with standards set by developed countries, standards set by developing countries are not regarded as barriers to trade by other developing countries. This presents an opportunity for structural transformation in Ghana and other developing countries. Specifically, the predicted increase in the adoption of standards by agricultural producers could increase agricultural productivity and upgrade farm labour from unskilled to skilled labour. Further, we expect an increase in the country's industrialization drive since the increased supply of agricultural outputs would lead to increased downstream activities such as processing. For example, in Ghana, industrial processors are a major high-value market to mango and pineapple farmers in Ghana, especially certified farmers.

There is a need for high-level research on the effects of standards set by developing countries on trade and other socioeconomic outcomes. Also, there is the need for rigorous research on the spill-over effects of the intensification of South-South trade which is regulated by sustainability standards. Favourable spill-over effects on developing countries could increase the reliance of developing countries on South-South trade for foreign exchange earnings while reducing exports to developed countries. This could induce organizations in developed countries to accept the standards in developing countries since firms in these countries would lose monopoly.

Specifically, it is important to perform a micro-level analysis to understand drivers of certification among horticultural producers and their immediate spill-over effects. This requires rigorous applied econometric techniques to predict the immediate and end-point effects of certification accurately and understand the role of context-specific factors in mediating the impact of certification on sustainability dimensions (i.e., economic, social, and environment). The immediate effects include intensity of participation in high-value markets (volumes to trade or exports), reduction in decent work deficits and farmers' adoption of climate-smart agricultural

practices. End-point effects, on the other hand, relates to increased household income, reduced environmental pollution and degradation and, increased in skilled labour.

On the political front, questions emerge about how voluntary standards defy neoliberal principles, intensify the loss of autonomy of the farmers, and make them dependent on exotic modes of production. Other political questions that require high-level analysis include redesigning context-specific certification standards preferred by local producers while meeting the standards of domestic and international buyers. This move can be elucidated by applying stated or revealed preference methods to design certification standards and randomised control trials (RCT) to test the plausibility of these designed standards. These methods would include presenting the most desirable attributes of the standards to farmers to elucidate their willingness to pay for specific attributes of the standards.

References

- Akrong, R., Mbogoh, S. G., & Irungu, P. (2021). What factors influence access to and the level of participation in high value mango markets by smallholder farmers in Ghana? *Heliyon*, 7(3), e06543.
- Amanor, K. S. (2019). Global value chains and agribusiness in Africa: Upgrading or capturing smallholder production? *Agrarian South: Journal of Political Economy*, 8(1-2), 30-63.
- Annor, P. B. (2018). GlobalGAP standard compliance and profitability: a case study of smallholder pineapple farmers in Akuapem South of Ghana. *International Journal of Agricultural Management and Development*, 7(2), 165-177.
- Asfaw, S., Mithöfer, D., & Waibel, H. (2009). EU food safety standards, pesticide use and farm-level productivity: The case of high-value crops in Kenya. *Journal of Agricultural Economics*, 60(3), 645-667.
- Asuming-Brempong, S., Owusu, A. B., Frimpong, S., & Annor-Frempong, I. (2016). Technological innovations for smallholder farmers in Ghana. *Technological and institutional innovations for marginalized smallholders in agricultural development*, 369. DOI 10.1007/978-3-319-25718-1_19
- Chiputwa, B., Spielman, D. J., & Qaim, M. (2015). Food standards, certification, and poverty among coffee farmers in Uganda. *World Development*, 66, 400-412.
- Eghan, D. (2017). Access to Export Market for Mango Farmers in the Manya District of Ghana. *Journal of Economics and Sustainable Development*, 8(12), 2222-2855
- Ehrich, M., & Mangelsdorf, A. (2018). The role of private standards for manufactured food exports from developing countries. *World Development*, 101, 16-27.
- Fiankor, D. D. D., Flachsbarth, I., Masood, A., & Brümmer, B. (2020). Does GlobalGAP certification promote agrifood exports? *European Review of Agricultural Economics*, 47(1), 247-272.
- Flachsbarth, I., Grassnick, N., & Brümmer, B. (2020). The uneven spread of Global GAP certification (No. 858-2020-005).
- GlobalG.A.P. (2017): Statistical Database. <https://database.globalgap.org>.
- Grumiller, J., Arndt, C., Grohs, H., Raza, W., Staritz, C., & Tröster, B. (2018). Strategies for sustainable upgrading in global value chains: The Ivorian and Ghanaian mango sectors (No. 25/2018). Policy Note, Austrian Foundation for Development Research (ÖFSE).
- Harvey, D. (2005). The neoliberal state. In *A brief history of neoliberalism*. Oxford University Press.
- Holzapfel, S., & Wollni, M. (2014). Is GlobalGAP certification of small-scale farmers sustainable? Evidence from Thailand. *Journal of Development Studies*, 50(5), 731-747.
- Humphrey, J. (2008). Private standards, small farmers and donor policy: EUREPGAP in Kenya.
- Jena, P. R., Stellmacher, T., & Grote, U. (2017). Can coffee certification schemes increase incomes of smallholder farmers? Evidence from Jinotega, Nicaragua. *Environment, Development and Sustainability*, 19, 45-66.
- Jha, P., & Yeros, P. (2019). Global agricultural value systems and the South: Some critical issues at the current juncture. *Agrarian South: Journal of Political Economy*, 8(1-2), 14-29.

- Kleemann, L., Abdulai, A., & Buss, M. (2014). Certification and access to export markets: Adoption and return on investment of organic-certified pineapple farming in Ghana. *World Development*, 64, 79-92.
- Komives, K., & Jackson, A. (2014). Introduction to voluntary sustainability standard systems. In *Voluntary standard systems* (pp. 3-19). Springer, Berlin, Heidelberg.
- Lim, S. (2021). *Global Agricultural Value Chains and Structural Transformation* (No. w29194). National Bureau of Economic Research.
- Marx, A., Depoorter, C., & Vanhaecht, R. (2022). Voluntary Sustainability Standards: State of the Art and Future Research. *Standards*, 2(1), 14-31.
- Moisé, E., Delpuech, C., Sorescu, S., Bottini, N., & Foch, A. (2013). Estimating the constraints to agricultural trade of developing countries. *Organization for Economic Co-operation and Development (OECD)*.
- Mukasa, A. N., Woldemichael, A. D., Salami, A. O., & Simpasa, A. M. (2017). Africa's agricultural transformation: Identifying priority areas and overcoming challenges. *Africa Economic Brief*, 8(3), 1-16.
- Nguyen, T. A. T., & Jolly, C. M. (2020). Global value chain and food safety and quality standards of Vietnam pangasius exports. *Aquaculture reports*, 16, 100256.
- Oya, C., Schaefer, F., & Skolidou, D. (2018). The effectiveness of agricultural certification in developing countries: A systematic review. *World Development*, 112, 282-312.
- Pasquali, G, A Krishnan and M Alford (2021), "When trade shifts South: New upgrading prospects for horticulture suppliers in the Global South", VoxEU.org, 01 July
- Santeramo, F. G. & Lamonaca, E. (2019). The effects of non-tariff measures on agri-food trade: A review and meta-analysis of empirical evidence. *Journal of Agricultural Economics*, 70(3), 595-17.
- Subervie, J., & Vagneron, I. (2013). A drop of water in the Indian Ocean? The impact of GlobalGap certification on lychee farmers in Madagascar. *World Development*, 50, 57-73.
- Swinnen, J. (2016). Economics and politics of food standards, trade, and development. *Agricultural Economics*, 47(S1), 7-19.
- Wang, X., Zhang, X., Meng, D., & Kaiser, H. M. (2022). The Effects of Product Standards on Trade: Quasi-Experimental Evidence from China. *Australian Economic Review*.
- West Africa Competitiveness Programme (WACOMP) (2020). Cluster diagnostic study on mango and pineapple. Final Report 2020. https://wacompghana.org/wp-content/uploads/Combined-Pineapple-mango-Fruit-Diagnostic-Study_Final-Report-.pdf.
- Zakari, A. K. (2012). Ghana national mango study. With the support of the PACT II program & the International Trade Centre (Geneva), 57.