

Trade Effect of the European Union Deforestation Regulation (EUDR) on African Coffee and Cocoa Exports to the EU.

Rodgers Mukwaya, United Nations Economic Commission for Africa,

Abstract:

The European Union (EU) has adopted a regulation to address global deforestation, the European Union Deforestation Regulation (EUDR), effective as of June 29, 2023, aims to reduce global deforestation by restricting imports linked to deforestation. This study aims to evaluate the effect of the EUDR on African exports of cash crops included in the EUDR scope - and the welfare impact across Africa.

The study uses the GTAP computable general equilibrium (CGE) model to evaluate the possible trade and welfare effects of the EUDR on African trade and welfare. The increase in production costs due to EUDR compliance are modelled as a decrease in the trade efficiency parameter in the GTAP model for all African countries exporting select cash crops (coffee, and cocoa), to the EU

The results indicate a 24 percent decrease in African exports of cash due to higher EUDR compliance costs for small-scale farmers. The results indicate that the EUDR will result in a net welfare loss of USD 2.0 billion for African countries however, the distribution of these gains will not be uniform across the region.

JEL classification: F13, F14, F17

Keywords: European Union Deforestation Regulation (EUDR); non-tariff measure (NTMs); GTAP model; computable general equilibrium (CGE).

Introduction

The European Union Deforestation Regulation (EUDR), which came into force in June 2023 and will be implemented from 30 December 2025, aims at ensuring that no commodities linked to recent deforestation enter the European Union (EU) market. The EUDR targets seven agricultural commodities linked to deforestation: cattle, coffee, cocoa, palm oil, soy, timber, and rubber. Under the EUDR, importers of agricultural commodities, to the EU will have to prove that no deforestation took place in the production of these commodities. For companies importing to the EU, compliance with EUDR requires strict processes, standardization, and the use of traceability technologies (European Union, 2023). For example, every bag of cocoa or coffee must be traceable back to a specific farm GPS coordinate, with evidence that the plot was not deforested after 2020.

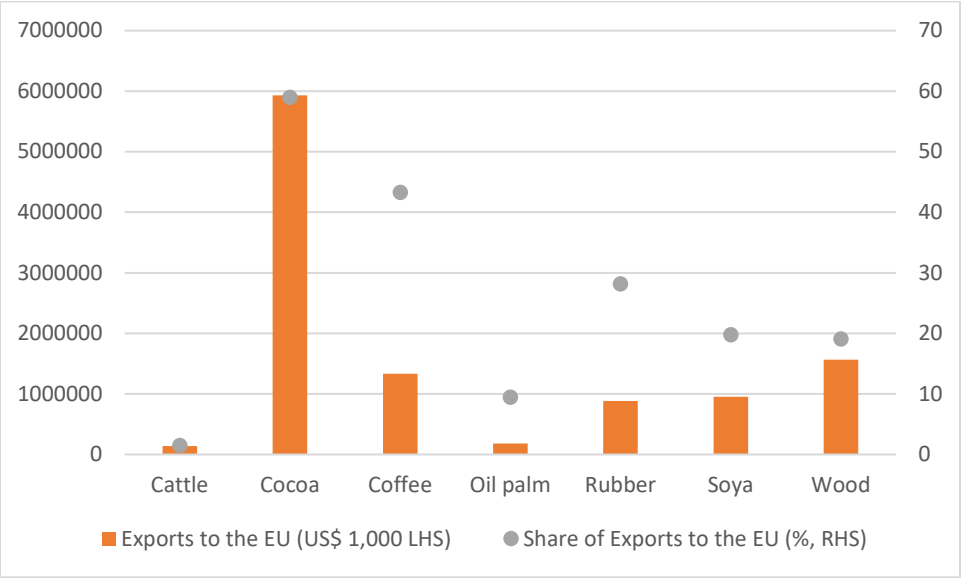
Compliance costs imposed on commodity producers are expected to shift the market supply curve upward due to higher costs, resulting in reduced export quantities. This new market equilibrium will create changes in welfare effects (consumer and producer surplus), with EU consumers facing higher prices while producers will face increased costs of production and reduced volumes of exports. While large producers may be able to absorb the compliance costs because of economies of scale, small-scale producers may not be able to absorb additional costs of compliance. According to Van der Laan, and van Dam, (2025) small farmers will struggle with compliance costs and volatile commodity prices making it difficult for them to meet the EUDR requirements. A study by Fauzi & Mugume, (2024) on coffee smallholder farmers in Uganda and Indonesia finds that the EUDR will lower productivity of smallholder farmers. A study by De Oliveira et al., (2024) analysed the potential implications of the EUDR for different stakeholders in Brazil. They found that commodities produced by a higher share of small holder farmers had a lower probability of compliance with the EUDR given potential operational challenges and associated costs.

In most African countries, agricultural commodities are produced by small scale farmers, for example, in Ethiopia, Africa's largest coffee producer and exporter the crop is produced by 4 million small scale farmers, who produce relatively low yields of 0.68 tons per hectare, which is a third of the yields produced by the large scale, more productive farmers in Latin America (Minten et al, 2015). The difference in productivity between small scale farmers and large-scale farmers implies that the EUDR compliance cost, which is a Non-Tariff Measure (NTM), will have a larger impact on total costs of small-scale farmers relative to large farmers¹. Large scale farmers will be able to spread their compliance costs over higher yields because they are more productive while small scale farmers will be constrained by lower productivity. Indeed, the disproportionate impact of these compliance costs on small scale farmers has already been observed. According to Reuters (2023), importers of coffee to the European Union were scaling back purchases from small farmers in Africa over compliance concerns.

¹ Non-tariff measures are policies (including environmental policies) and regulations, other than tariffs that impact International Trade.

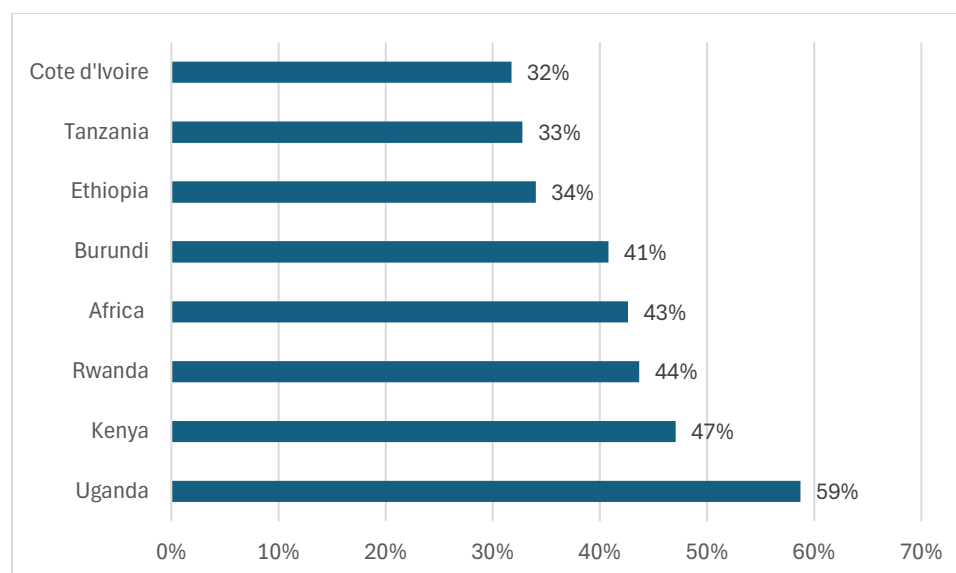
For some African countries, the agricultural commodities targeted under the EUDR are the among the most important exports. Coffee and Cocoa have been the leading exports for countries like Ethiopia, Ghana, Cote d’Ivoire, and Uganda. Additionally, the EU is a significant market for African agricultural commodities. Between 2021 and 2023 Africa exported 43% of its coffee to the EU, with Uganda and Kenya exporting 59% and 47% respectively (Figure 1 &2). Likewise for Cocoa, Africa exported 60% of its production to the EU, with leading producers Cote d’Ivoire and Ghana exporting 69% and 59% respectively (UN Comtrade 2025). Consequently, EUDR costs will have a large effect because of the significance of the European market and the share of the affected commodities in exports. A Commonwealth Secretariat (2025) analysis estimates that sub-Saharan Africa risks losing up to \$11 billion in annual export revenues if countries are unable to meet the regulations requirements.

Figure 1: African Exports to the EU by values and Share (USD, %, 2021-2023)



Source: Authors computation based on data from commonwealth secretariate (2025)

Figure 2: Country distribution of African coffee Exports to the EU by share (% , 2022)



Source: Data from UN Comtrade (2025)

There have been a few studies that have estimated the impact of the EUDR using Computable General Equilibrium (CGE) models. For example, De la Vega, P. (2024) used a CGE model to measure the impact of the EUDR on Argentina and they found that the EUDR would lead to a GDP decline of about 0.5% if compliance is not achieved. Another study by Debowicz & Engeda (2024) examined the impact of the EUDR on Ethiopia using the standard IFPRI CGE model and compared 2 scenarios, in the first scenario the EUDR increased export compliance costs by 10% while in the second scenario EUDR led to a complete stop in Ethiopian coffee exports. They found that in the first scenario, exports declined by 9.5% while in the second scenario exports declined by 18.4%. While the EUDR is expected to have a significant impact on the economy of Africa there have been very few empirical studies on the impact of the EUDR on other African countries. This study attempts to fill the gap in the literature and evaluates the broad economic effects of the EUDR on African exports of coffee and cocoa to the EU.

The paper is organised as follows: the second section provides an overview of the methodology which includes the GTAP model, and the shocks/ simulations applied to the model. The third section presents the results of the simulation and discusses the results. The final section makes some concluding observations.

Model Data and Specification

This study uses the standard GTAP model 7 to evaluate the possible trade and welfare effects of the EUDR on African Countries². The GTAP model is a computable general equilibrium (CGE) model

² Corong, E. L., Hertel, T. W., McDougall, R., Tsigas, M. E., & van der Mensbrugghe, D. (2017). The Standard GTAP Model, Version 7. *Journal of Global Economic Analysis*, 2(1), 1–119. <https://doi.org/10.21642/JGEA.020101AF>

that uses data from the Global Trade Analysis Project (GTAP) to analyze global economic issues. For the simulations, I use the GTAP 11 data base which describes global bilateral trade patterns, production, consumption and intermediate use of commodities and services. The underlying data in the GTAP 11 database refers to a 2017 baseline.

I model two scenarios, in scenario one I assume that compliance costs are not uniform across the world, higher income countries will face lower compliance costs, while lower income African countries will face higher compliance costs. The increase in compliance cost is modelled as a 50% decrease in the trade efficiency parameter (ams) for all African countries, while for higher income countries the increase in costs is modelled as 10% decrease in trade efficiency. The 50% high-cost trade efficiency shock for African producers is a stylized high-cost scenario reflecting the difficulty African farmers may have in meeting EUDR requirements without significant adaptation, for context Debowicz & Engeda (2024) used a 10% export increase for Ethiopia as a moderate case, and a complete export halt to the EU as an extreme high-cost scenario. In the second scenario I assume that all countries face the same compliance costs with no distinction between large scale farmers and small-scale farmers, this is modelled as 10% decrease in trade efficiency for all countries.

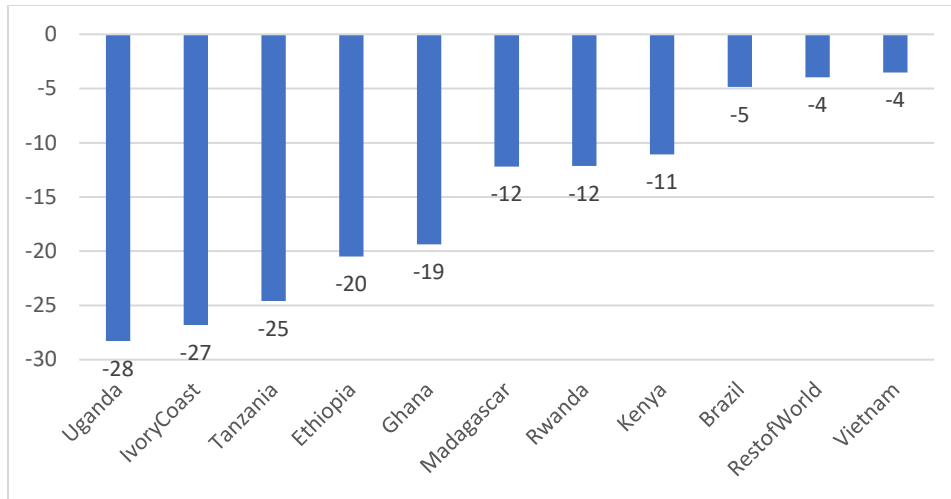
To estimate the impact of the EUDR, I modeled the compliance costs as a shock to the aggregated crop sector (OCR) in the GTAP 11 database. The aggregated crop sector includes Coffee and Cocoa among other crops, which are the largest crop exports by share from Africa to the EU.

Results

Scenario one (50% decrease in the trade efficiency parameter for African countries & 10% decrease for the rest of the world)

Under Scenario one, simulation results suggest that the increased compliance costs of the EUDR will result a decline in exports of agricultural commodities for all African countries by 24%. Additionally, the effect on exports is not homogeneous, Uganda, Ivory coast, Tanzania and Ghana will experience largest declines in exports of 28%, 27%, 25% and 20% respectively (Figure3).

Figure 3: Change in Exports of Cash crops (%)



Source: GTAP simulations

Regarding changes in output, the increased compliance costs of the EUDR would result in a decline in commodity output across all African countries. The effect is heterogeneous across countries with Uganda (22%), Tanzania (19%), Côte d'Ivoire (18%) and Ghana (13%) experiencing the largest declines in production (Figure 4).

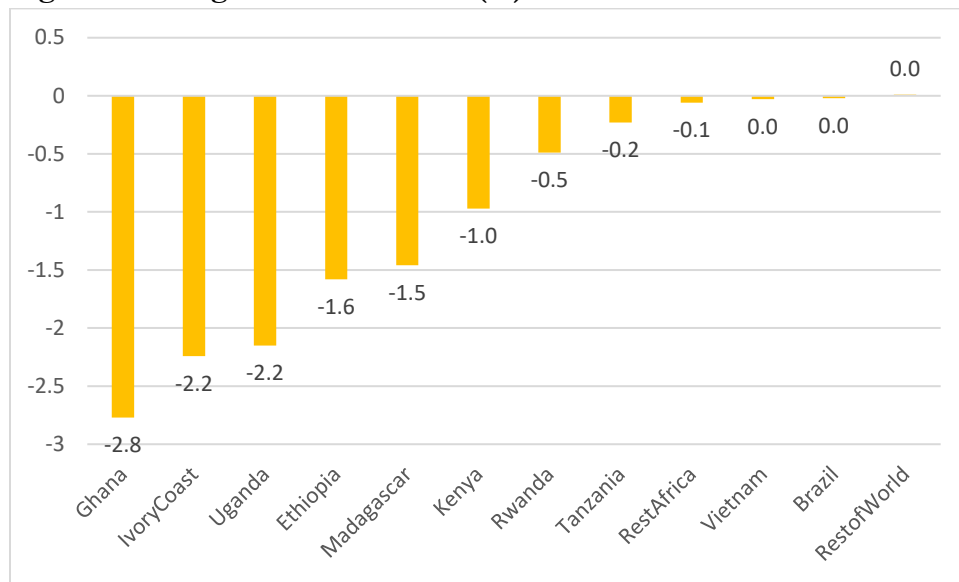
Figure 4: Change in Output of Cash Crops (%)



Source: GTAP simulations

Regarding changes in value of GDP, the increased compliance costs of the EUDR would result in a decline in the value of GDP across all African countries. The effect is heterogeneous across countries with Ghana (2.8%), Côte d'Ivoire (2.2%) and Uganda (2.2%) experiencing the largest declines in value of GDP (Figure 5).

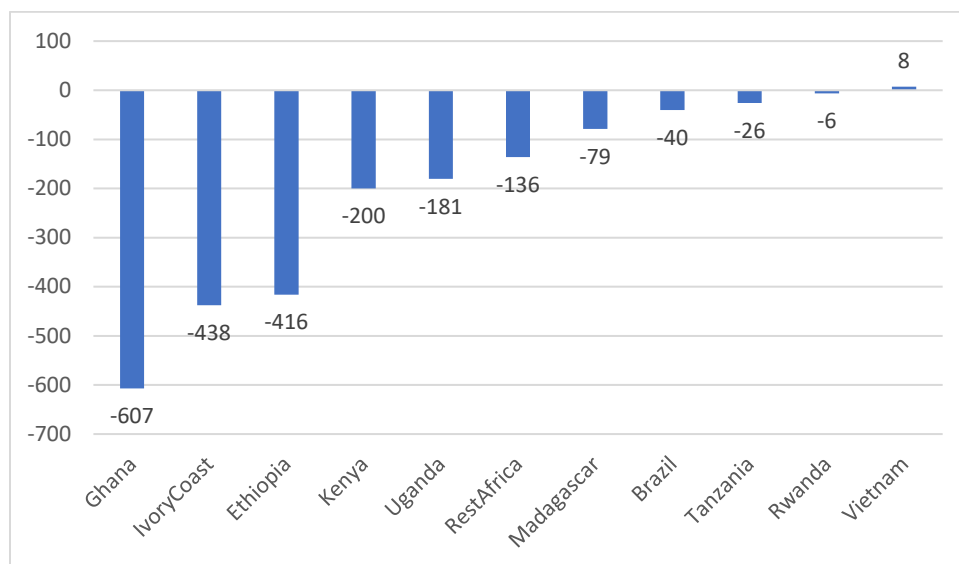
Figure 5: Change in value of GDP (%)



Source: GTAP simulations

Regarding changes in welfare, the increased compliance costs of the EUDR would result in a decline in welfare across all African countries. The effect is not uniform across countries with Ghana (USD 607 million), Côte d'Ivoire (USD 438 million) and Ethiopia (USD 416 million) experiencing the largest declines in welfare (Figure 6). Likewise, the EU will have a welfare loss of USD 2.2 billion. For Vietnam, the EUDR would result in a positive welfare impact.

Figure 6: Change in Welfare (USD, Millions)

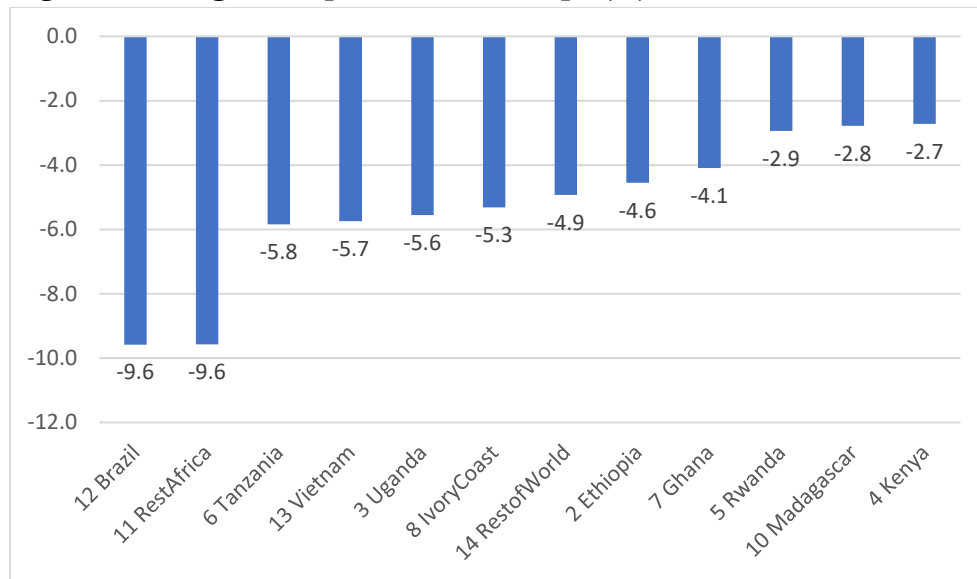


Source: GTAP simulations

Scenario Two (Similar compliance costs for all countries, 10% decrease in the trade efficiency parameter for all countries)

The results suggest that the increased compliance costs of the EUDR under scenario two will result a decline in exports of agricultural commodities for all African countries. Additionally, the effect on exports is not homogeneous, Rest of Africa, Tanzania and Uganda will experience largest declines in exports of 9.6%, 5.8%, and 5.6% respectively (Figure7). Total exports from Africa of cash crops declined by 5.1%. Countries outside Africa, Brazil and Vietnam are among the most affected countries in this scenario.

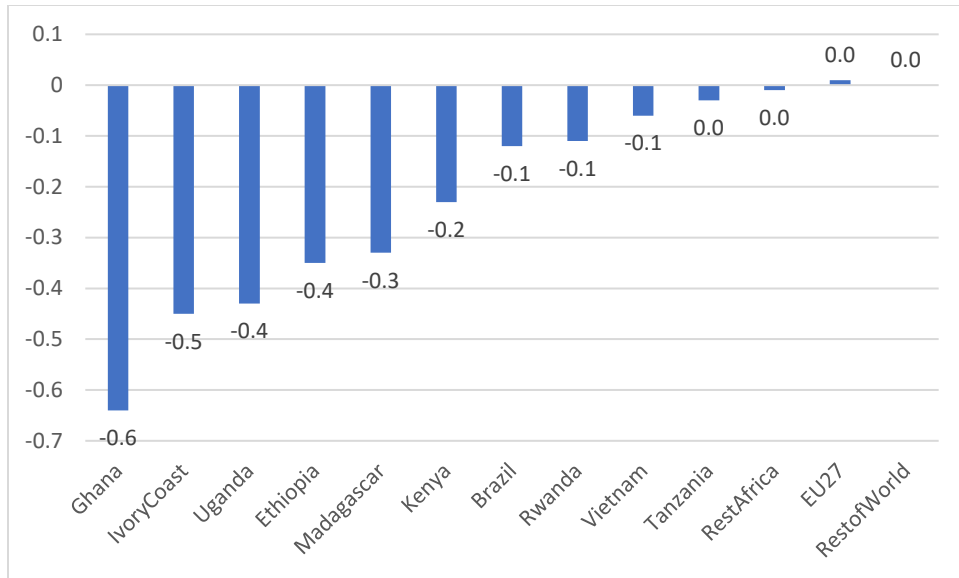
Figure 7: Change in Exports of Cash Crops (%)



Source: GTAP simulations

Regarding changes in value of GDP, the increased compliance costs of the EUDR would result in a decline in the value of GDP across all African countries. The effect is not uniform across countries with Ghana (0.6%), Côte d'Ivoire (0.5%) and Uganda (0.4%) experiencing the largest declines in value of GDP (Figure 6).

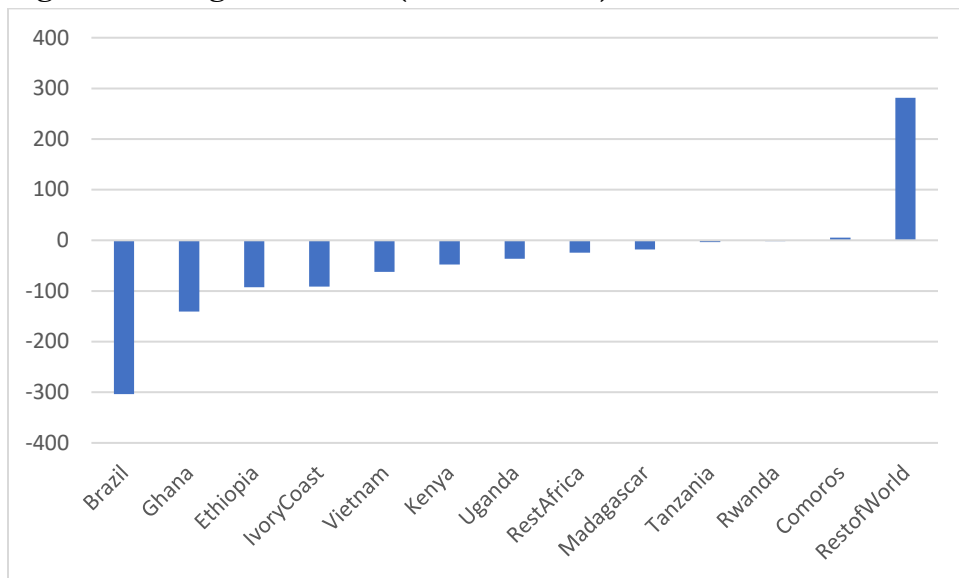
Figure 6: Change in value of GDP (%)



Source: GTAP simulations

Regarding changes in welfare, the increased compliance costs of the EUDR would result in a decline in welfare across all African countries. The effect is not uniform across countries with Ghana (USD 141 million), Ethiopia (USD 93 million) and Côte d'Ivoire (USD 92 million) experiencing the largest declines in welfare (Figure 3). The EU would experience a welfare loss of USD 1.5 billion

Figure 7: Change in Welfare (USD, Millions)



Source: GTAP simulations

Conclusion

In this study the GTAP computable general equilibrium (CGE) model was used to evaluate the possible effects of the EUDR on African trade and welfare. The results from the more extreme scenario one (50% decrease in the trade efficiency for African countries) indicate a 24 percent decrease in African exports of cash due to higher EUDR compliance costs for small-scale farmers. The results indicate that the EUDR will result in a net welfare loss of USD 2.0 billion for African countries however, the distribution of these gains will not be uniform across the region. Likewise results from the moderate scenario 2, show a decline in exports of commodities, value of GDP, and welfare losses for all African countries.

Because the compliance cost is a Non-Tariff Measure, it acts like a fixed cost and small holder farmers will be disproportionately affected by these EUDR compliance costs. Therefore governments, through the development banks, should provide low-interest loans to the smallholder farmers through their cooperatives to cover the costs of compliance. The subsidy would help lower the marginal costs of the farmers.

Training programs offer another tool for the farmers. National farmer training programs on agricultural and conservation practices should be provided to ensure reduced deforestation and increased agricultural productivity. Additionally, the farmers should be trained on how to implement the new compliance tools.

Digital traceability services like GPS mapping, satellite images, and data platforms are essential for proving that products are free from deforestation. Because these services are still scarce and costly, governments can encourage more firms to invest in digital services, by giving temporary tax breaks or cheap loans to digital start-ups. Encouraging digital startups will help reduce the price of traceability services.

Finally, volatility of commodity prices or climate shocks can have a negative effect on compliance, because falling commodity prices will discourage compliance. Governments working with cooperatives can set up contingency funds that can buffer smallholders from negative price shocks

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