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Interlinkages Between Agri-Food Trade and the SDGs at the Global, Regional and Local Level

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ABSTRACT

This study is a structured review on the interlinkages between agri-food trade and the SDGs in the environmental, social and economic dimensions to identify any missed opportunities that agri-food trade could positively impact the SDGs and provide policy guidance for the missed opportunities at the global, regional and national levels. A great deal of diversity in the papers at the global level, and papers at the regional level are similar, but there is additional analysis on promoting regional markets and value chains. Papers at the local level are product-specific to emphasise how the trade of specific agricultural commodities would affect the achievement of particular SDGs in question. There is a concern regarding whether agri-food trade can promote sustainability and the attainment of the SDGs. This is particularly important given that gains from trade are not entirely equitable. Questions relating to concrete innovations, policies and behavioural changes that can ensure systemic transformations remain critical and need to be addressed.

1 | Introduction

Agri-food trade, mainly involving the international exchange of agricultural products, is important in addressing the challenges of global food security (Smith and Glauber 2020; Mary 2019). This notwithstanding, there are concerns about the extent to which trade is interlinked with sustainability and more specifically the sustainable development goals (SDGs). An increase in agri-food trade can undermine the SDGs related to the environment such as climate change, biodiversity loss and natural resource degradation. Gatti et al. (2021) argued that trade could have devastating effects on the environment as it may encourage agricultural extensification and threaten forest cover. Mausch et al. (2020) also showed how increased trade can lead to environmental degradation and social inequality.

Agri-food trade could be useful in promoting the SDGs. The World Bank (2018) argues that economies that are involved in agri-food trade are more likely to grow quickly, innovate, boost productivity and ensure better living standards and higher incomes. Lee et al. (2012) provide the advantages of trade through participation in global value chains and argue that trade encourages economic growth and lowers poverty. Trade is thus likely to provide better jobs, lower product prices and stimulate the growth necessary to alleviate poverty. Therefore, international agri-food trade has an important role to play in promoting sustainable development at the global, regional and local/

country-specific levels (World Bank 2018). However, effective policy measures are needed in preventing or limiting the damage to ecosystem because of expansion in agricultural trade and production due to trade liberalisation.

This paper provides a structured literature review on the relationships between international agri-food trade and sustainability to better understand how agri-food trade is promoting or deterring the achievement of SDGs. There are many studies linking agri-food trade with sustainability, but studies exploring the nexus between agri-food trade and the list of SDGS categorised in the three dimensions of sustainability—environmental, social and economic—is rare. Huan-Niemi et al. (2022) conducted a scoping exercise on the possible linkages between international agri-food trade and the SDGs according to the different dimensions of sustainability. Dangles and Struelens (2023) assessed literature published between 2017 and 2021, whereby the research results are supporting only the achievement of SDG 2 without examining the rest of the SDGs. Meanwhile, El Bilali et al. (2021) explored the academic literature to assess the nexus between agri-food systems and the SDGs, but not focusing on agri-food trade. The FAO (2019) has provided practical and interconnected actions with the aim of transforming food and agriculture to propel achievement across the SDGs, primarily targeting decision-makers responsible for integrating the goals and targets of the 2030 Agenda for Sustainable Development into national policies and programmes. The main motivation of this paper is to examine the interlinkages between agri-food trade and the SDGS in an effort to identify any missed opportunities that agri-food trade could foster a positive impact on the SDGs as well as to provide some policy guidance for the missed opportunities at the global, regional and national levels. Accordingly, the analysis is structured at the global, regional and local levels to provide a wide-ranging overview of the relationship between agri-food trade and the SDGs. Specifically, this paper identifies the most analysed countries or regions and the types of issues that have emerged. While papers at the global level emphasised the implication of agricultural trade and sustainability for all countries in the world, the regional papers focused mainly on regional blocs including Asia, Africa and Europe; meanwhile, local-level papers are country-specific studies examining the interlinkages between the trade of certain agri-food commodities and the SDGs.

Overall, we observe that the relationship between agri-food trade and the SDGs has been tackled in various ways. At the global level, specifically, we find a great deal of diversity in the papers. At the regional level, the studies are similar to those at the global level, but there is additional analysis on promoting regional markets and value chains that could contribute to the SDGs in the economic and social dimensions. Studies at the local level are product-specific to emphasise how the trade of specific agricultural commodities would affect the achievement of particular SDGs in question. One important conclusion that we make is that profound systemic transformation is required to ensure that agri-food trade can effectively contribute to the attainment of the SDGs. And to ensure this occurs, there are open questions about the type of innovations, policies and behavioural changes that need to be addressed.

2 | Materials and Methods

Two online scientific databases (i.e., Scopus and Web of Science) were used in the search for the relevant literature to support this study. The terms used in the search were 'Sustainable Development Goal' and 'trade'. These specific words were included in the articles' title, abstract or keywords. The search was restricted to studies in English or with some information available in English. From the databases, the initial search yielded 3774 articles (Figure 1). The online software package (Covidence) was used to exclude duplicates while retaining relevant studies. After excluding 989 duplicates, 2785 articles remained as studies to be investigated in the systematic literature review. The initial screening is based on the title and abstract, but studies with conflicting outcomes were discussed among different reviewers. This screening resulted in 2618 articles being excluded. The remaining 167 articles, covering all the relevant journal articles published until the end of August 2021, were screened more in-depth by the reviewers to analyse the relationship between international trade and the SDGs.

Two different searches were executed (see Figure 1)—the broad 'systematic search', which resulted in 167 journal articles and the narrow 'expert search', which resulted in 57 journal articles—by the interdisciplinary researchers involved in this study. The 'expert search' was based on the different disciplines and expertise of the researchers and executed through the Google search engine for policy papers and grey literature along with Google Scholar for additional journal articles searched after August 2021. Therefore, the 'expert search' was a more focused search to complement the 'systematic search' to include specific and current topics together with journal articles that were not captured by the broad 'systematic search' as well as to find policy papers and grey literature to support the policy guidance for the missed opportunities in agri-food trade that could positively impact the SDGs. A total of 13 references from grey literature were used for the in-depth analysis.

In this study, the 'direct' and 'indirect' linkages between the 17 SDGs and international trade are analysed and classified into the environmental, social and economic dimensions (see Figure 2). If a specific SDG is mentioned explicitly in an article, it is considered a direct linkage. If a specific SDG is not mentioned explicitly in an article, but the keywords relating to the SDGs are mentioned in an article (e.g., growth and poverty), it is considered an indirect linkage. The linkages are considered as positive outcomes if agri-food trade facilitates the achievements of the SDGs, and the linkages are considered as negative outcomes if agri-food trade hinders the achievements of the SDGs. In exploring the link between global value chains and the SDGs, it is considered a direct linkage if a specific activity (e.g., palm oil production) is directly affecting the SDG either with positive outcomes (e.g., income generation and employment) or negative outcomes (e.g., land grabbing and poor housing conditions). If a specific activity (e.g., deforestation due to land clearing for palm oil production) is indirectly affecting the SDG with a negative outcome, it is considered an indirect linkage. This approach was used to identify the missed opportunities in agri-food trade that could positively impact sustainability, defined in terms of the SDGs.

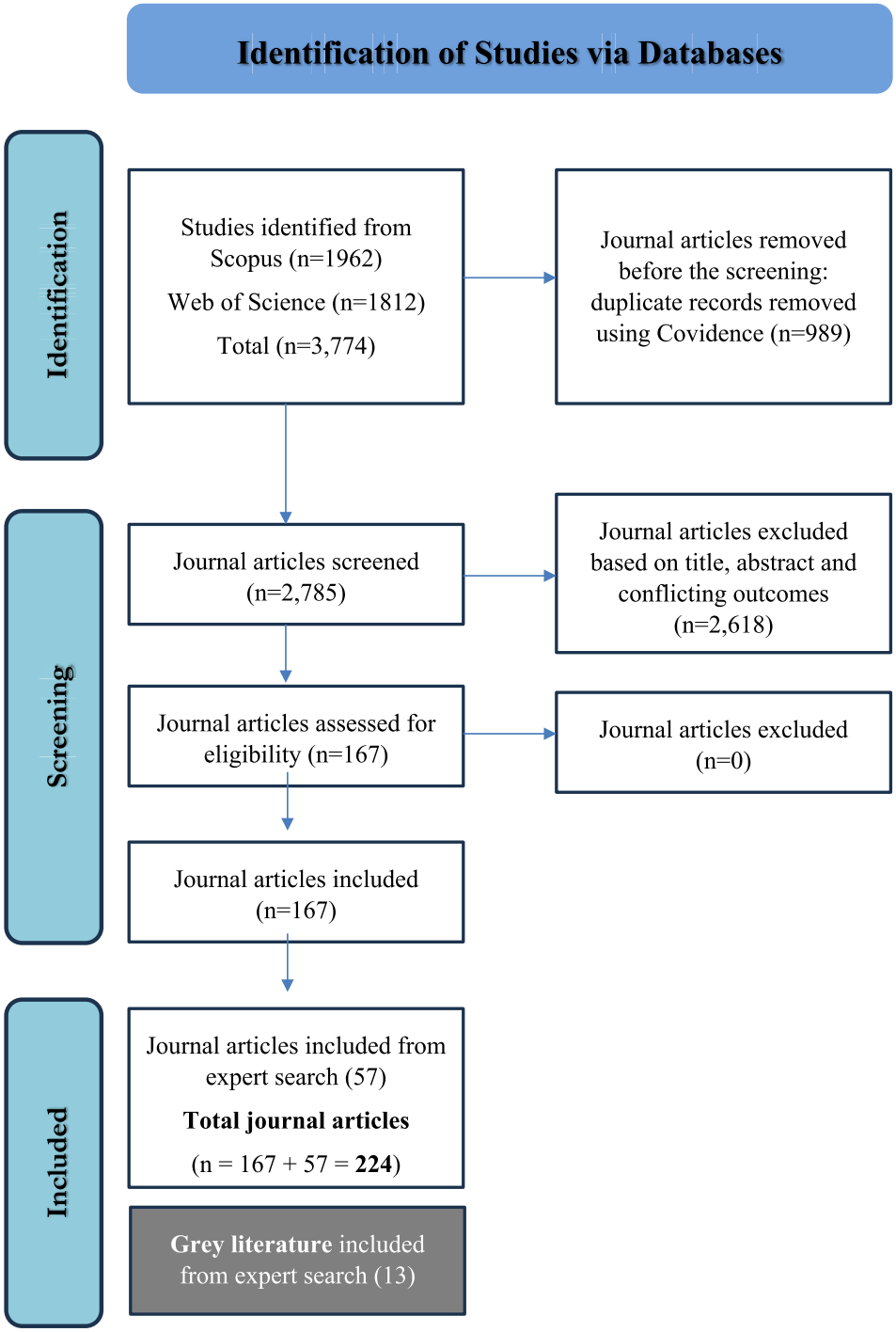

FIGURE 1 | Systematic literature review—PRISMA flow diagram.

3 | Results

3.1 | Spatial Distribution and Interlinkages of Traded Agri-Food Products With the SDGs

This section presents the results of the 224 journal articles reviewed in this study (see Appendix A for the full list of papers reviewed). The analysis is structured at the global, regional and local levels and classified into different agricultural products that are explicitly stated in the journal articles, which include seafood and fisheries, fresh fruit and vegetables and other tropical commodities. Table 1 is listing studies at the global, regional and national levels that are examining the interlinkages between the trade of certain agri-food commodities and the related SDGs. The listed studies are especially chosen from the 224 journal articles to emphasise how the trade of specific agricultural commodities would affect the achievement of particular SDGs in question. The majority of the studies with 121 papers are at the global level, overall emphasising the implication of agricultural trade on sustainability with different linkages to the SDGs (both positive and negative outcomes). Meanwhile, the rest of the studies are either regional papers or local-level papers pertaining at the country level divided into regions such as Europe (20 papers),

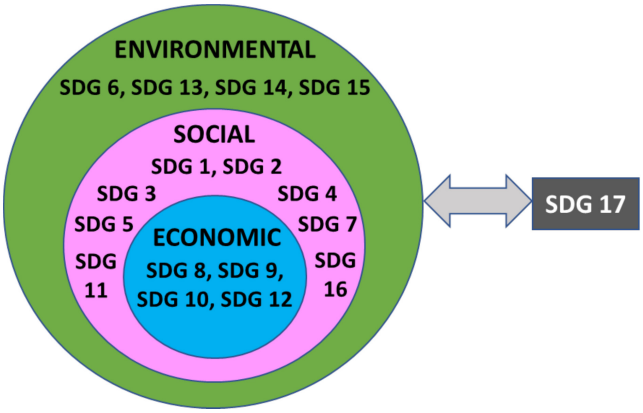

FIGURE 2 | The Sustainable Development Goals (SDGs) are classified into the three dimensions of sustainability according to the 'planetary boundaries' concept.

Africa (30 papers), Asia (42 papers), North America (5 papers) and Latin America (4 papers). There is only one paper each for the Mediterranean and Oceania region. Therefore, many papers are mainly dealing with regions and developing countries located in Africa and Asia.

At the global level, the papers reviewed have discussed various aspects of international agricultural trade and the SDGs. Most of the papers focused on the areas of ***economic development and growth*** (Downing et al. 2021; Montanía et al. 2021), economic ***policies and governance*** (Skerritt and Sumaila 2021; Sumaila et al. 2019), ***livelihood and well-being*** (Downing et al. 2021; Skerrit and Sumaila 2021) and ***biodiversity*** (Wu et al. 2021; Skerritt and Sumaila 2021; Cisneros-Montemayor and Sumaila 2019; Costello et al. 2021; Asche et al. 2015; Sumaila et al. 2019). The papers reviewed can be linked both directly and indirectly to SDG 1 (no poverty), SDG 8 (decent work and economic growth), SDG 13 (climate action), SDG 14 (life below water) and SDG 15 (life on land).

The issues reviewed at the regional level are similar to those of the global level, although the studies found were mostly about the European Union (EU), Africa and Asia. The issues studied relate to markets and value chain (Ezirigwe et al. 2021), economic development and growth (Lerner et al. 2021), trade-related economic policies and governance (Lerner et al. 2021; Corrado et al. 2020), food and nutrition security (Ezirigwe et al. 2021), livelihood and well-being (Corrado et al. 2020; Penca et al. 2021), biodiversity (Penca et al. 2021) and emissions and pollution (Corrado et al. 2020). The reviewed papers have linkages to SDG 1 (no poverty), SDG 2 (zero hunger), SDG 3 (good health and well-being), SDG 6 (clean water and sanitation), SDG 9 (industry, innovation and infrastructure), SDG 12 (responsible consumption and production) and SDG 16 (peace, justice and strong institutions).

Studies at the local level typically focus on particular agricultural products (such as crop-livestock systems, sugar, palm oil, coffee, coconut, cotton, milk, pineapple, pomelo and rapeseed) and relate to economic development and growth, economic policies and governance (Nhlengethwa et al. 2021; Valdivia et al. 2017; Bacon et al. 2008), livelihood and standard of living and impacts on ecosystem services (Ayompe et al. 2021). These studies have linkages to SDG 1 (no poverty), SDG 2 (zero hunger), SDG 4 (quality education), SDG 8 (decent job and economic growth), SDG 11 (sustainable cities and communities) and SDG 15 (life on land).

3.2 | The Interlinkages Between Trade and the SDGs

3.2.1 | Findings From the Literature Review

Although trade can influence sustainability in many different ways, our discussion focuses on the SDGs and specifically on three dimensions: environmental, social and economic (see Figure 2). The SDGs are classified according to the 'planetary boundaries' concept that involves Earth system processes and contain environmental boundaries (Stockholm Resilience Centre 2017). This concept is defining a 'safe operating space for humanity' as a precondition towards sustainable development for the international community, including governments at all levels, international organisations, civil society, the scientific community and the private sector. This framework is based on scientific evidence that human actions since the Industrial Revolution have become the main driver of global environmental change. Figure 2 is showing that social and economic dimensions are seen as embedded in the environmental dimension, thus implying that the environmental aspects are the most important followed by the social aspects and finally the economic aspects, embedded in the social and environmental dimensions. Each of the dimensions consists of separate topics related to the economic, social and environmental issues reviewed in the literature and associated to the different regions (see Figure 3).

i. Economic dimension (*markets and value chains*, *economic development and growth and policies and governance*);

ii. Social dimension (*food and nutrition security*, *labour and employment and livelihood and well-being*);

iii. Environmental dimension (*biodiversity*, *GHG emissions*, *pollution*, *deforestation and renewable energy*).

Concerning the economic dimension, the interest is mainly on the extent that trade can directly contribute to the SDGs focusing on *economic development and growth* (152 papers), *policies and governance* (38 papers) along with *markets and value chains* (14 papers). A good starting point for this discussion is the conventional classical trade theories, which emphasise the importance of capital accumulation, specialisation and division of labour in facilitating trade between countries (WTO 2018). Trade liberalisation is treated as a critical engine for economic growth. A direct link to the SDGs can be the effect of agri-food trade that enhances economic growth (SDG 8) as well as the transfer of technology, knowledge and innovation (SDG 9), the reduction of inequalities (SDG 10) and the facilitation of responsible consumption and production via sustainable value chains (SDG 12). The WTO (2018) study provides an explanation on how trade enhances economic growth by emphasising the advantages of improved purchasing power of consumers and the

TABLE 1 | The interlinkages of traded agri-food products with the SDGs.

	Global level		Regional level		Local level	
Agri-food products	**Direct linkage**	**Indirect linkage**	**Direct linkage**	**Indirect linkage**	**Direct linkage**	**Indirect linkage**
Seafood and fisheries						
Seafood	2, 8, 14	1, 8, 10, 12, 14				
Fisheries	1, 2, 8, 14	1, 8, 9, 10, 12				
Small-scale fisheries			9, 11, 14	3, 8		
Fresh fruit and vegetables						
Pomelo					8, 10	1, 9
Pineapple						1, 8, 9
Tropical commodities						
Coffee			1, 9, 16	8, 10		1, 2, 4, 8, 9
Sugar					8, 9, 11, 16	3, 4
Coconut					8	9, 10
Palm oil	15	1, 4, 5, 6, 7, 11, 12, 16			1, 8, 11, 15	13, 16
Cereals						
Rice	13	15			1, 2	
Oilseeds						
Soybean	8, 12, 15	2, 6, 13				
Rapeseed					7, 13	9
Others						
Cotton						2, 8
Milk					8, 10	1, 2
Agricultural goods			1, 2, 3, 6, 12	8, 9, 13		
Crop-livestock systems					1, 8	2, 6, 10, 12, 15

(Continues)

TABLE 1 | (Continued)

Agri-food products	Global level: Direct linkage	Global level: Indirect linkage	Regional level: Direct linkage	Regional level: Indirect linkage	Local level: Direct linkage	Local level: Indirect linkage
Supporting literature	Asche et al. (2015), Cisneros-Montemayor et al. (2020), Cisneros-Montemayor and Sumaila (2019), Corrado et al. (2020), Costello et al. (2021), Downing et al. (2021), Kumar et al. (2019), Montania et al. (2021), Skerritt and Sumaila (2021), Sumaila et al. (2019), Wu et al. (2021)		Corrado et al. (2020), Ezirigwe et al. (2021), Lerner et al. (2021), Penca et al. (2021), Weersink et al. (2021)		Ayompe et al. (2021), Bacon et al. (2008), Chiputwa and Qaim (2016), Chiputwa et al. (2015), Doliente and Samsatli (2021), Hoang et al. (2021), Hoang and Tran (2019), Meemken et al. (2017), Nhlengethwa et al. (2021), Shumeta et al. (2018), Valdivia et al. (2017), Whitfield (2017)	

Note: The numbers represent the Sustainable Development Goals (SDGs), and the SDG numbers are colour-coded according to the environmental, social and economic dimensions.

competitiveness of domestic firms. The study discusses the advantages of firms exploiting economies of scale to enhance their productivity, which ultimately increases production and consumption. Ali et al. (2021) showed how trade liberalisation policies stimulated technological innovation in many Asian countries. Artuc et al. (2019) discussed gains from trade and found evidence of a trade-off between the income gains and the inequality costs, which arises because trade tends to exacerbate income inequality.

Concerning agri-food trade, Alharthi and Hanif (2020) found that the blue economy (fisheries production and fishing) played a direct and positive role in the economic growth of the South Asian Association for Regional Cooperation (SAARC) countries. Borsellino et al. (2020) conducted an extensive literature review and also found positive, although indirect, spillover effects of agri-food trade on economic growth. This finding was consistent for specific agricultural products. Chiputwa and Qaim (2016) found similar indirect positive effects of certified coffee trade on economic growth in Uganda. Lee et al. (2012) also show that global value chains of agri-food products promote economic growth and poverty reduction.

Under the social dimension, the studies reviewed focus largely on *livelihood and well-being* (122 papers), *food and nutrition security* (24 papers), followed by *labour and employment* (1 paper), accordingly. The studies relate to how trade directly or indirectly affects social challenges such as hunger, food security, healthy lives, well-being or labour issues and employment. Through its effects on economic growth and development, trade could lead to a reduction in poverty (SDG 1), mainly through increased incomes and welfare (Bhagwati and Srinivasan 2002). However, there could be some adverse effects if, for instance, trade is accompanied by protectionist policies leading to a decline in the efficiency of labour and the competitiveness of local firms (Bhagwati and Srinivasan 2002). Ge et al. (2021) also showed how an open, rules-based trading system and the creation of a transparent, undistorted production and investment environment are critical to improving food and nutrition security (SDG 2), especially in developing countries. Bacon et al. (2008) and Chiputwa and Qaim (2016) indicated how trade impacts food security through participation in certification or standard schemes, thus increasing household caloric and micronutrient consumption (SDG 3). Feyaerts et al. (2020) argued that trade, through participation in global value chains, could create jobs; however, noted that the development and expansion of global value chains can compete with local value chains for labour (e.g., during harvest) thereby leading to adverse outcomes.

For global value chains in the social dimension, Ayompe et al. (2021) found palm oil production to be an important tool for job creation. The contribution of palm oil production and trade to employment has also been confirmed by Downing et al. (2021). Yameogo and Omojolaibi (2021) also explored the link between trade openness and employment and found a positive impact in Sub-Saharan Africa. In response to campaigns by trade unions and NGOs to enforce labour standards, leading companies in the floricultural value chain in Kenya and Uganda have improved employment conditions, as pointed out by Kaplinsky and Morris (2018).

FIGURE 3 | Analysis of agri-food trade in the different dimensions of sustainability and region.

Most of the studies under the environmental dimension focus on *biodiversity* (94 papers), *GHG emissions*, *pollution and deforestation* (23 papers), followed by *renewable energy* (10 papers), respectively. The main emphasis is on the extent to which trade directly or indirectly affects SDG 6 (clean water and sanitation), SDG 13 (climate actions), SDG 14 (life below water) and SDG 15 (life on land). There is no denying that trade has an impact on the environment through a variety of routes, including input use, production, processing, packaging and transportation. The focus of the literature is mainly on the extent to which continued and sustained trade can be harmful to the environment. According to the 'gain from trade hypothesis', trade openness through the technique effect (indicates the changes in individual industries' pollution intensity) facilitates technology transfer across countries promoting energy efficiency, while the scale effect has a direct linkage with the well-known 'pollution haven hypothesis' (Ali et al. 2021). Singh et al. (2018) demonstrated how the global trade of fish products contributed to ocean acidification and illegal and overfishing, thereby decreasing biodiversity. Sumaila et al. (2019) and Kumar et al. (2019) focused on harmful fishing and fuel subsidies and the extent to which they affected biodiversity. Another important issue related to the agri-food trade and biodiversity nexus is the negative impacts of the hydrocarbon industry on life in oceans. Agricultural production is heavily reliant on fossil energy, thus large amount of fossil fuels is required to power heavy farming machinery, process foods, refrigerate foods during transportation, produce packaging materials and manufacture chemical fertilisers and pesticides as well as raw materials for petrochemical industries that produce plastics, chemicals and other essential products needed in agri-food trade. Heat gain from anthropogenic climate change, coming largely from fossil fuels and the resulting sea-level rise and ecosystem collapse, is an existential threat to biodiversity (Andrews et al. 2021). Ali et al. (2021) examined how trade openness affects greenhouse gas emissions in the Asian region over the 1990–2015 period. They found that the goals of environmental sustainability could be attained if the pace of national output growth was accompanied by environmental regulations and clean technology improvements when framing comprehensive trade policy.

3.2.2 | Global Level

At the global level, the literature exploring the relationship between international agricultural trade and SDGs has explored various issues, which cut across all three main dimensions: economic, social and environmental. The papers exploring the ***economic development and growth*** issues include the papers by Downing et al. (2021) and Montanía et al. (2021). Downing et al. (2021) focused on the trade in rubber and palm oil in Southeast Asian countries, soy production in Brazil and logging in South Pacific Island states to explore the cross-sector effects of production for trade with China. They showed the extent to which trade in these products affected economic growth and development in most countries, using a telecoupling framework that tracks spillover effects to other sectors as well as other scale effects. The study (linked to SDG 15—life on land) further emphasised that existing social and environmental regulations are insufficient to sustain the production of these products. Thus, more efficient regulations, policies or laws are required (link to SDG 16—strong institutions) to manage their production, distribution and transnational equality issues. Montanía et al. (2021) focused on soybean production and showed how its exports boosted the economies of major exporting countries like Brazil and minor

exporting countries like Ukraine and Paraguay. Relating to the production of soybean to the pressure on natural resources (mostly land use), Montanía et al. (2021) argued that government involvement is required in the development of collaborative strategies between countries that have higher levels of land-use changes involved in its production and export policies. They predicted that the high geographical concentration of exports could affect land-use changes. They also argued that the mismanagement of soybean trade will significantly affect producers and exporters within the soybean production and trade system and could compromise the fulfilment of the SDGs. The discussions showed that soybean export could be enhanced to promote decent work and economic growth (SDG 8) as well as the promotion of responsible consumption and production (SDG 12). The studies also emphasised the importance of collective action (SDG 17—partnerships for the goals).

With regards to the papers discussing ***economic policies and governance*** issues at the global level, Skerritt and Sumaila (2021) and Sumaila et al. (2019) are the most comprehensive articles on the link between fisheries and harmful subsidies provided by governments; therefore, it is important to eliminate harmful subsidies for fisheries through a multilateral trade agreement under the mandate of the World Trade Organization (WTO). They showed that the lack of a clear metric for measuring the potential scale effects was a huge stumbling block. Skerritt and Sumaila (2021) also discussed the extent to which harmful fisheries subsidies, through their effects on overfishing, which undermines the breeding of fish population that can lead to the nonattainment of SDG targets related to reducing poverty (SDG 1), providing nutritious foods (SDG 2) and securing livelihoods (SDG 8). It is important to note that most of these effects are not direct outcomes of the paper reviewed, respectively, and are based on association without proving the causality in these interactions. Sumaila et al. (2019) explored a similar issue by providing estimates of the scope, amount and level of subsidisation in the fisheries sector. They showed that while the increase in fisheries subsidies has halted compared to previous decades, the bulk of harmful 'capacity-enhancing' subsidies, particularly those for fossil fuels, has increased as a proportion of total subsidies. They make the case that failure to remove such subsidies will give the impression that fisheries subsidies would undermine sustainability, poverty alleviation and food and nutritional security. They further argued that the subsidies, no matter how small, would be more effective in being redirected towards beneficial forms of support that do not potentially undermine the sustainability of fish stocks. They conclude that for the benefit of marine ecosystems (i.e., both current and future generations of people), the WTO must be supported to reach a meaningful agreement to discipline subsidies that lead to overcapacity and overfishing. They also argue that harmful subsidies could be reoriented towards fisheries management and technological improvements in fishing approaches, a shift from subsidies based on the cost of fishing (fishers' own capital) or the conditional provision of subsidies based on fisheries' environmental performance.

On the issue of ***biodiversity***, Skerritt and Sumaila (2021), Sumaila et al. (2019), Cisneros-Montemayor and Sumaila (2019) and Costello et al. (2021) have sought to understand the implication of international trade on the sustainability of fish products. Costello et al. (2021) showed how the WTO was in a better position to deliver on SDG 14 (life below water) by reforming global fisheries subsidies to enhance fisheries biodiversity.

Downing et al. (2021) and Skerritt and Sumaila (2021) also explored some ***livelihood and well-being issues*** in global trade. Downing et al. (2021), in their discussion on how trade deals are done and who must be included in their development, emphasised that previous strategies were limited to a few beneficiaries and that there was a need to emphasise large-scale effects. Relying on the case of the effect of reforestation programmes in China on countries supplying forest and agricultural commodities to China (mainly rubber and oil palm), they showed that the sustainability progress in China from reforestation is cancelled out by the ***deforestation*** and cross-sectoral impacts from abroad. They also provided narratives of supporting economic development from commodity production abroad through the benefit distribution of socioecological forest systems. We find many mixed effects—where processes that support the achievement of SDGs exist but are overshadowed by counterproductive processes. Livelihoods are affected because the bulk of the products they focus on are produced by smallholder farmers.

The missed opportunities in agri-food trade that could positively impact the SDGs would be the inclusion of smallholder farmers in global value chains. The issue is how smallholder farmers can get access to global markets by participating in global value chains. There are limited studies on assisting smallholder farmers to be included in value chains and access international markets with higher revenues. Participation in certification or standard schemes have increased household caloric and micronutrient consumption because participation in global value chains have increased household income, thus allowing more expenditure on food and better nourishment (Bacon et al. 2008; Chiputwa and Qaim 2016), therefore promoting food and nutrition security (SDG 2—zero hunger).

Contract farming between smallholder farmers and agro-industrial companies can influence production decisions through agreements by specifying market obligations such as value, volume, quality and price as well as provide specific inputs to farmers, thus reducing farmers' production constraints from market imperfections (Swinnen and Maertens 2007). Contract farming could increase farmers' income, stabilise prices, enhance market access, enrich food quality and safety and improve traceability for food retailers (Gómez et al. 2020; Guo et al. 2007; Hoang et al. 2021). Governments can support the related high costs in encouraging smallholder farmers to participate in contract farming through capacity building and training programmes (Arias et al. 2013).

3.2.3 | Regional Level

The trade and SDGs-related issues discussed here mimic those of the global level. Concerning the economic dimension of ***markets and value chains***, Ezirigwe et al. (2021) discussed trade in general agricultural goods and navigating the realities of food security in African markets within the context of the COVID-19 pandemic. The study showed how trade in agricultural products can be critical in addressing SDG 1 (no

poverty), SDG 2 (zero hunger), SDG 3 (good health and well-being) and SDG 12 (responsible consumption and production). They showed that while the pandemic provides an opportunity for governments to strengthen their commitments, it raised questions about the ambitious efforts to deliver the SDGs by 2030. They recommended that African governments need to maximise intra-African trade with investments in agricultural biotechnological infrastructure to close the gap between the targets and the realities. More specifically, they discussed advances in modern biotechnology where the current focus is on genetic engineering or modification. They argue that in the area of plant biotechnology, crops have been modified to survive climatic issues such as drought or frost; to remain fresh for a longer period thereby obviating post-harvest wastages; to resist insects and diseases; to tolerate herbicides, allowing farmers to spray weed killers on fields without damaging crops, and enhance their nutritional qualities.

For the economic dimension of ***growth and development*** as well as ***policies***, the study by Lerner et al. (2021) explored the issue of unfair trade practices by investigating the drivers of the differences between farm-gate and free-on-board (FOB) prices in the most important Arabica coffee-producing countries worldwide: Brazil, Guatemala, Colombia, Honduras, Peru and Ethiopia. The study examined the literature on governance in agri-food chains, with a focus on each country's domestic market. The findings showed that heterogeneity in infrastructure and institutions are key explanatory factors; i.e., (i) the better protection of property rights, (ii) the better access to electricity and (iii) the better quality of roads, the lower the difference between farm-gate and FOB prices, i.e., the lower the inefficiencies, the fairer the prices paid to coffee farmers. They further indicated that these differences lead to the introduction of intermediaries in the coffee supply chain, and the generation of transaction costs, which reduces the margin that coffee farmers receive generally. Thus, actions aimed at reducing these inefficiencies (reducing transaction costs), which include enhancing the quality of infrastructure and those aimed at lowering the need for intermediation, are needed to bring more transparency and lower transaction costs, thereby contributing to SDG 1 (no poverty), SDG 9 (industry, innovation and infrastructure) and SDG 16 (peace, justice and strong institutions).

Penca et al. (2021) analysed the fish market in the Mediterranean region to map the drivers and feedback loops that keep fisheries in an unsustainable trajectory as well as review the key innovations in support of the sustainable small-scale fishing sector. They sought to understand how the biodiversity of fisheries can be sustained and how the negative effects of the current market structure on the livelihood of small-scale fishers can be mitigated. On the issue of addressing the negative effects of the existing market structures on small-scale fishers, they discussed various ***governance interventions*** including the shortening of the value chain, innovation in the distribution channel, diversification in the type of product offered, promotion and education regarding small-scale fisheries products, label and brand development and the empowerment of small-scale fisheries communities through improved leadership, ownership, cooperation and coordination. Since better access to markets creates more opportunities for innovation, enhancing infrastructure, enabling the functioning of communities and product development, these discussions are the focus of SDG 9 (industry, innovation and infrastructure), SDG 11 (sustainable cities and communities) and SDG 14 (life below water).

The papers of Penca et al. (2021) and Corrado et al. (2020) both had environmental dimensions related to ***biodiversity*** as well as ***emissions and pollution***. Penca et al. (2021) indicated that the drivers and feedback loop to keep fisheries in an unsustainable trajectory are directly affecting the attainment of SDG 14 (life below water). Corrado et al. (2020) compared the environmental performance between imports and domestic activities—imports are a key contributor to resource depletion, human toxicity, ocean acidification and freshwater ecotoxicity.

The missed opportunities in agri-food trade that could positively impact the SDGs would be environmental provisions in regional trade agreements (RTAs) that are effective in deterring damage to the ecosystem because of trade liberalisation, for example, limiting deforestation. Abman et al. (2024) found that the inclusion of specific provisions aimed at protecting forests and/or biodiversity almost entirely offsets the net increases in forest loss observed in similar RTAs without such provisions, especially for tropical, developing countries with greater biodiversity. Due to trade liberalisation that can spur environmental degradation, the inclusion of these environmental provisions limits agricultural expansion, hence reducing deforestation that can help to achieve SDG 15 (life on land). However, enforcement of environmental provisions often depends on the political will of the signatory countries and may lack robust monitoring mechanisms. Furthermore, current environmental provisions are often broad and may rely on the commitment of partner countries to implement specific measures.

The EU's new regulation (EU Deforestation Regulation—EUDR) to curb EU markets' impact on global deforestation and forest degradation can help in enforcing the environmental provisions in RTAs. The EUDR requires companies trading in cattle, cocoa, coffee, oil palm, rubber, soya and wood to conduct extensive due diligence on the value chain to ensure the goods do not result from recent deforestation, forest degradation or breaches of local environmental and social laws. The EUDR includes strict penalties for non-compliance, thus enhancing the accountability of companies operating within EU markets (European Commission 2024). This would assist the enforcement of environmental provisions as well as monitoring mechanisms in RTAs such as the Economic Partnership Agreements between the EU and the African, Caribbean and Pacific (ACP) countries. However, the obligations of the EUDR are postponed for 1 year due to major implementation and technical issues: EU member states, non-EU countries, traders and operators raised concerns that they would not be able to fully comply with the rules if applied at the end of 2024 (European Council 2024). For example, companies will have to purchase from large producers that can afford the means to prove the 'due diligence' on the supply of deforestation-free commodities, therefore bypassing small producers and hindering an objective of the EUDR, which is protecting local communities. Furthermore, the European Commission needed more time to conduct benchmarking and classification of countries into 'low risk', 'standard risk' and 'high risk' on deforestation along with a well-functioning electronic system to register the 'due diligence' information (Jones

Day 2024). This additional time would help traders and operators around the world as well as the European Commission to implement the rules smoothly and effectively without undermining the objectives of the EUDR.

3.2.4 | Local Level

The local-level papers focused on a variety of agricultural products such as cotton, sugar, palm oil, coffee, rice, coconut, pomelo and pineapple. For the studies related to the economic dimension of ***economic development and growth***, Ayompe et al. (2021) explored the sustainability of the palm oil trade by focusing on the social impact, rather than the environmental impact that appeared to be predominant in the literature. The results, for Malaysia and Indonesia, showed several positive (income generation and employment) and negative impacts (in terms of conflicts, land grabbing and poor housing conditions). They argued that the ongoing initiatives to make the palm oil sector sustainable have focused mostly on the environmental effects, but there is a need to pay more attention to related social impacts. Therefore, to make palm oil production sustainable and to meet the SDGs, for example, no poverty (SDG 1), zero hunger (SDG 2), decent work and economic growth (SDG 8) and promoting responsible consumption and production (SDG 12), the negative social impacts of the palm oil trade need to be addressed.

Nhlengethwa et al. (2021) showed that infrastructural investment was a precondition for developing countries to sustain the pace of development and achieve the SDGs. They explored how agricultural water infrastructure development affected sugar production in Eswatini. They showed that previous economic growth and sugar export values are the two critical determinants of agricultural water infrastructure investments in Eswatini. They also argued that it can be safely construed that higher incomes as well as terms of trade for sugar can improve spending on water investments for agriculture, and this was important because an increase in investments in water infrastructure may then help spur economic growth. More generally, infrastructure investment including water, electricity, information technology and transport can be directly linked to SDG 8 (decent work and economic growth), SDG 9 (industry, innovation and infrastructure) and SDG 11 (sustainable cities and communities). Such investments in infrastructure can promote ***economic growth*** and improve the depth of infrastructure.

For the studies related to livestock in addressing ***growth and development*** as well as ***economic policies***, Valdivia et al. (2017) explored the policies required to enhance semi-subsistent crop-livestock systems in Kenya. They argued that high levels of poverty and resource degradation persist in African agriculture, and an important way of achieving the SDGs is through a better understanding of these issues and addressing them. They proposed a semi-subsistent crop-livestock system, where smallholder farmers produce both crops and livestock primarily for their own household's consumption, but also a portion of their produce is traded in local markets. It is a mix between subsistence farming (where all output is consumed by the family) and market-oriented agriculture (where the majority of produce is sold). They showed that adopting a strategy that stimulates rural development, increases farm size to a sustainable level and reduces distortions and inefficiencies in input and output markets could lead to a sustainable development pathway and achieve the SDGs for rural households dependent on the crop-livestock system. Therefore, improving the semi-subsistent crop-livestock system can be argued to contribute directly to reducing poverty (SDG 1) and improving work conditions and economic growth (SDG 8) in rural areas.

Bacon et al. (2008) relied on data from Nicaragua to find out whether sustainable coffee certifications are enough to secure farmer ***livelihood*** and promote fair trade. They showed that small-scale coffee farmer families have supplied global markets for centuries, and their continued survival depends critically on continued production. They also showed that the exporting status of the farmers had affected the jobs they generated as well as the taxes that they paid, both of which were critical to the attainment of the SDGs. The findings suggested that households that are connected to 'Fair Trade' cooperatives experienced several positive impacts in education, infrastructure investment and monetary savings. However, several important livelihood measurements such as low incomes, high emigration and food insecurity persist among small-scale producers. They recommend that implementing sustainable coffee certification, as a way of enhancing production through fair-trade and livelihood improvement, is likely to contribute to reducing poverty (SDG 1), zero hunger (SDG 2), quality education (SDG 4), gender equality (SDG 5), improving decent work and economic growth (SDG 8) and improving industry, innovation and infrastructure (SDG 9).

Chiputwa and Qaim (2016) investigated smallholder coffee farmers in Uganda—certified under Fairtrade, Organic and UTZ—to analyse the effects of certification on ***food security and dietary quality***. They showed that certification increased calorie and micronutrient consumption mainly through higher incomes and improved gender equity, increased women's control of coffee production and monetary revenues from sales. They concluded that certified households in Uganda tend to be better off compared to noncertified households in terms of farm size, income levels and infrastructure conditions. Chiputwa et al. (2015) compared the impacts of three sustainability-oriented standards—Fairtrade, Organic and UTZ—on the livelihoods of smallholder coffee farmers in Uganda. They showed that Fairtrade increases per capita consumption expenditures by 30% and reduces the likelihood of being poor by 50%, guarantees a minimum support price, which increases the average price received by farmers and reduces downside risk. They further showed that Fairtrade cooperatives receive a premium, which they use for investments in infrastructure and training programmes. Meemken et al. (2017) also found organic and fairtrade to have positive effects on total consumption expenditures, education, nutrition and gender equality in Uganda. Shumeta et al. (2018) investigated how coffee cooperative membership affected food security among coffee farm households in Southwest Ethiopia. The results revealed that cooperative membership has a positive and significant effect on staple food production (maize and teff) and facilitated technological transformation via increased utilisation of fertiliser and improved seeds. Certification and cooperative membership can promote the attainment of SDG 1 (no poverty), SDG 9 (industry, innovation and infrastructure) and SDG 16 (peace, justice and institutions) through increased production and its accompanying effects.

Doliente and Samsatli (2021) showed that the lengthening of rice ***value chains***, due to shifting patterns of global trade and booming economies of major rice-producing nations, hampers cost-effective and efficient rice supply. They advocate for the need to operate value chains that can eliminate hunger through affordable food production and accommodate the co-production of high-value commodities while maintaining sustainable ecosystems. Using a model that addresses multiple issues, including optimising value chain planning, design and operations for efficient and sustainable food provision with integrated production of energy, fuels and chemicals, they showed that rice value chains will result in the lowest costs and GHG emissions. They also showed that streamlining value chains can prompt the country to be 100% rice self-sufficient without additional farmland expansion and potentially reduce retail prices. The model appeared to be potentially useful to many rice-producing countries (e.g., in Sub-Saharan Africa and Latin America) seeking to be 'fully' rice self-sufficient, but are constrained by food insecurity, biodiversity loss, limited farmlands and climate change. Streamlining value chains could contribute to attaining SDG 1 (no poverty) and SDG 2 (zero hunger).

Hoang and Tran (2019) estimated the financial benefits of the coconut ***value chain*** and the comparative advantage of coconut (against rice and pomelo) in Vietnam. They reported that pomelo fruit obtains the strongest competitiveness, coconut has the medium competitiveness and rice has the weakest competitiveness. They also showed that coconut is the most stable while rice is the most sensitive to climate and market changes. They suggested that farmers should convert rice crops into pomelo and coconut crops for more effective economic and sustainable benefits. They indicated that this conversion should take into account the soil transferring costs and the initial cultivation costs of pomelo and coconut crops. Based on the evidence that coconut production poses stronger competitiveness and its price is more stable, it would enhance some economic benefits including decent work and growth (SDG 8) and promoting responsible production and consumption (SDG 12).

Govereh and Jayne (2003) explore synergies between cash crops and food crops in Zimbabwe and show that intensive household engagement in cotton production produced higher yields compared to yields from noncotton and marginal cotton production. The study suggested that the potential spillover benefits for food crops through participation in cash crop programmes are important to consider in the development of strategies designed to intensify African food crop production. They argued that intensifying cotton production can be important in the sustainability discussion through an increase in income for farmers' ***livelihood*** thereby critical in addressing the issues of hunger (SDG 2) and decent work and growth (SDG 8).

Whitfield (2017) explored new pathways to agricultural production drawing evidence from fresh pineapple exports in Ghana. The author argued that this category of exporters represents a path to capitalist agricultural production that can be conceptualised as capitalism from the outside, where capital flows to the countryside rather than accumulation occurring from above or below the agrarian economy. The new pathways identified include attempts by farmers to upgrade their production activities by introducing new products, diversifying markets to reduce risk and relying on a portfolio of related products that include not necessarily higher-value products but a large range of products with different specifications and of different values, including lower-value products. They argued that these reforms, accompanied by institutional support, can enhance the attainment of SDG 1 (no poverty), SDG 8 (decent work and growth) and SDG 9 (industry, innovation and infrastructure). Farmers will get new opportunities to enhance their incomes, production, products and also be able to access ***diversified markets***.

The missed opportunities in agri-food trade that could positively impact the SDGs would be the improvement of food safety systems to increase the ability of African countries to export to high-value global markets (World Bank 2022; Jaffee et al. 2020). The costs associated with unsafe food consumed domestically in African countries, though difficult to estimate due to the lack of data, are likely much higher than trade-related costs (Jaffee et al. 2020). Efforts by African governments to strengthen food safety systems for improving the quality of exported food products can eventually improve the food safety of domestically consumed products, thus promoting the achievement of SDG 3 (good health and well-being).

Food industry associations in developing countries can play a role in helping to coordinate inspections and other food safety compliance activities to lower costs, and governments can work with industry associations to support small-scale producers in complying with food safety standards (Mbithi 2019). Improving consumer education and strengthening domestic demand for food safety standards could also be an important avenue to increase incentives for food system actors to supply safe foods not only for the high-value exports market, but also for the huge domestic market.

4 | Discussion

This paper provided a structured review and mapping of studies for exploring the relationship between international agri-food trade and the SDGs. The review focuses on identifying the types of issues that have emerged at the global, regional and local levels. Using the Scopus and Web of Science academic databases, a total of 224 papers were found to have explicitly explored various issues related to agri-food trade and the SDGs.

Generally, the papers have tackled the subject of sustainability in an encompassing way. We find great diversity in the papers classified at the global level. These studies approached sustainability from the perspective of enhancing economic growth and development, promoting economic policies and governance regimes in agri-food systems, enhancing the livelihood and well-being of (smallholder) farmers, protecting biodiversity, minimising GHG emissions and pollution and providing food and nutrition security. These issues are related particularly to SDG 1 (no poverty), SDG 8 (decent work and economic growth), SDG 13 (climate actions), SDG 14 (life below water) and SDG 15 (life on land).

While the focus of the studies at the regional level is similar to those at the global level, we find one important addition, which is the analysis of promoting regional markets and value chains.

This is vital in developing markets and agri-food systems in Africa and Asia. The development of regional markets and value chains is found to be important in addressing the issue of poverty (SDG 1), hunger (SDG 2) and responsible consumption and production (SDG 12).

For the local (country-specific) level papers, we found them to be product-specific and focused on crops such as crop-livestock systems, sugar, palm oil and coffee. Most of the discussions focused on how international trade in specific agricultural products could be used to address the issues of poverty (SDG 1) and hunger (SDG 2), promote decent work and economic growth (SDG 8), foster infrastructure improvement (SDG 9) and strengthen institutions (SDG 16).

An important issue in the literature review is the interactions between trade and SDGs are based on association, without empirical evidence from these interactions. Without proving the causality in these interactions, for example, increased economic growth may be a result of other policies and act as a cause for increased trade and not the other way around. The impacts are seldom quantified, even if the impacts are measured, they are measured with different methods, making it difficult to compare the impacts from the interactions between trade and SDGs (Huan-Niemi et al. 2022). Effective implementation of SDGs in agri-food trade requires a multifaceted approach, including policy coherence, stakeholder engagement and practical application of knowledge. The trade-offs among various SDGs in the different sustainability dimensions further complicate this relationship, necessitating integrated strategies that address multiple goals simultaneously to achieve the SDGs in a holistic way. An example of a trade-off cited in Gadhok et al. (2020) is the fact that expanding agricultural production to meet global demand can lead to deforestation and loss of biodiversity; therefore, increasing palm oil production often results in significant environmental degradation, impacting ecosystems and carbon storage (environmental dimension). However, the expansion of palm oil production has contributed to income generation and employment (social dimension) in Malaysia and Indonesia (Ayompe et al. 2021). Therefore, environmental provisions for agri-food trade that are effective in deterring damage to the ecosystem because of expanding trade and agricultural production would help to achieve the SDGs in a more comprehensive way.

More generally, the required transformations needed at the global, regional and local levels can be multifaceted, interconnected, and subject to evolution over time. Instead of separating the required transformation based on the different levels of our analysis, we attempt to enumerate a few factors based on the reviewed literature. For instance, one transformation that could be critical for the attainment of the SDGs is technological and institutional innovations in agri-food systems (Barrett et al. 2020). Over the past century, these have brought dramatic advances in human well-being worldwide in various ways. Investments in renewable energy, particularly in solar parks and hydrogen production, are gaining momentum in Namibia and other regions. Namibia is positioning itself as a leader in low-cost green hydrogen production (technological innovation) due to its abundant solar resources. The Namibian government is actively promoting public and private partnerships to leverage private sector expertise and resources (institutional innovation), which anticipates $9.4 billion in investments to produce hydrogen using solar energy (Green Hydrogen Organisation 2024) and eventually expand to include a terminal for producing ammonia (a key ingredient for fertilisers production). This would enable Namibia to be self-sufficient in producing fertilisers that are needed for agricultural intensification, thus creating agri-food surplus to be traded in the region.

Climate-smart agriculture (CSA) has been introduced as a transformative approach aimed at managing the existing relationship between agricultural systems and climate change. The CSA strategy is designed to achieve a triple set of objectives, encompassing the sustainable enhancement of productivity and income levels, adaptation to climate change and the mitigation of greenhouse gas emissions. Another transformation is the significant improvement in infrastructure that can support both livelihood and trade in agri-food. The setting up of cross-sectoral, multilevel and multiactor governance and institutional frameworks within the agri-food and trade systems are vital for the transformations. These structures serve as bridges that transcend the traditional institutional boundaries of agriculture, public health, education and development planning, aiming to establish sustainable agri-food systems beyond the constraints of continuous economic growth.

While the papers selected may not entirely be exhaustive because of the keywords used, we find limited discussion on SDG 5 (gender equality), SDG 7 (affordable clean energy) and SDG 10 (reducing inequalities). While it is not difficult to argue that these SDGs may not directly be related to international agri-food trade and sustainability, the specific cases of advancing gender equality, promoting the reliance on affordable clean energy and addressing the issue of inequalities may be important. For instance, when considering the case of gender equality and general inequality, the case of international agri-food trade provides a more compelling case in properly understanding the heterogeneities in how the gains can be shared—in terms of wages, consumption and welfare as well as the quality of jobs available. Particularly for agri-food trade, these issues are murky because of the dynamics concerning land (and asset) ownership, ownership rights and the level of female empowerment in agriculture. Gender transformative models are needed to emphasise gender norms and power relations that promote the leadership of women in agricultural trade that can address the challenges of gender inequality in agri-food trade. Examples include fostering a physical and sociocultural environment that supports learning and empowerment for women, public awareness campaigns to promote women's access to education, land titling programmes and agricultural extension services targeted at women farmers and access to finance for women entrepreneurs.

5 | Conclusion

One important conclusion that we make from the review is that some profound systemic transformations are required to enhance the interlinkages between agri-food trade and the SDGs. For instance, in the case of many developing countries and given the limited studies on affordable clean energy, we argue that investments in sustainable infrastructure for renewable energy are required to meet the green energy transition in the agricultural

sector along with agri-food trade that is currently dependent on fossil fuels. Namibia is an excellent example for making the transformation to produce green hydrogen as a low-cost renewable energy to replace fossil fuels. Similarly, in the case of gender equality, we propose various gender transformative models that emphasise gender norms and power relations that promote the leadership of women in agricultural trade. Finally, to address inequality in general, policies that promote fair trade and strengthen smallholder farmers, especially in terms of access to markets, credit and technology, will be critical in enhancing the achievement of the SDGs. For many low, middle and high-income countries, coordinated partnerships or collaborations relevant to agricultural trade that brings together governments, civil society and the private sector may be required.

Finally, there is a concern regarding whether agri-food trade can promote sustainability and the attainment of the SDGs. This is particularly important given that gains from trade are not entirely equitable. Accordingly, questions relating to concrete innovations, policies and behavioural changes that can ensure systemic transformations remain critical and need to be addressed. Future research could study new perspectives in understanding sustainability within the agri-food trade system to deal with the complexity in the trade-offs between SDGs and the ambiguity in attaining the SDGs in a holistic way.

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Data Availability Statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

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Appendix A

Journal Articles Included From the 'Systematic Search'.

	Author	Paper
1	Adedoyin et al. (2021).	The alternative energy utilization and common regional trade outlook in EU-27: Evidence from common correlated effects. *Renewable and Sustainable Energy Reviews*, *145*, 111092.
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5	Akshalova et al. (2020).	World trade organization and the renewable energy sources cases: How to achieve the SDG7? *Journal of Advanced Research in Law and Economics*, *11*(4), 1087-1094.
6	Alawin, M., & Oqaily, M. (2017).	Current account balance, inflation, industry and sustainable development in Jordan. *Revista galega de economía: Publicación Interdisciplinar da Facultade de Ciencias Económicas e Empresariais*, *26*(3), 45-56.
7	Artuc et al. (2019).	Trading off the income gains and the inequality costs of trade policy. Journal of International Economics, 120, 1–45.
8	Alexeew, J., Bergset, L., Meyer, K., Petersen, J., Schneider, L., & Unger, C. (2010).	An analysis of the relationship between the additionality of CDM projects and their contribution to sustainable development. *International Environmental Agreements: Politics, Law and Economics*, *10*(3), 233-248.
9	Alharthi and Hanif (2020).	Impact of blue economy factors on economic growth in the SAARC countries. *Maritime Business Review*, *5*(3), 253-269.
10	Ali et al. (2021).	Dynamics of international trade, technology innovation and environmental sustainability: evidence from Asia by accounting for cross-sectional dependence. *Journal of Environmental Planning and Management*, *64*(10), 1864-1885.
11	Aluko, A. O., & Odularu, G. O. A. (2019).	Understanding the Impact of Strategic Change Management on the Maritime Crude Oil Transportation Industry in Nigeria. *The Review of Black Political Economy*, *46*(2), 130-151.
12	Alvarado et al. (2021).	Ecological footprint, air quality and research and development: The role of agriculture and international trade. *Journal of Cleaner Production*, *288*, 125 589.
13	Andersen, P. H., & Esbjerg, L. (2020).	Weaving a strategy for a base-of-the-pyramid market: The case of Grundfos LIFELINK. *Business Strategy and the Environment*, *29*(8), 3687-3701.
14	Andrews et al. (2021).	Oil, fisheries and coastal communities: A review of impacts on the environment, livelihoods, space and governance. *Energy Research & Social Science*, *75*, 102009.
15	Andronova, I., & Sakharov, A. (2019).	G20 Contribution to the trade-related sdgs implementation1. *International Organisations Research Journal*.
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30	Chaudhary and Brooks (2019).	National Consumption and Global Trade Impacts on Biodiversity. *World Development*, *121*, 178-187.
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32	Cisneros-Montemayor and Sumaila (2019).	Busting myths that hinder an agreement to end harmful fisheries subsidies. *Marine Policy*, *109*, 103699.
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74	Kumar, P., Singh, R. K., & Kumar, V. (2021).	Managing supply chains for sustainable operations in the era of industry 4.0 and circular economy: Analysis of barriers. *Resources, conservation and recycling*, *164*, 105215.
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78	Laryea and Fabusuyi (2021).	Africanisation of international investment law for sustainable development: challenges. *Journal of International Trade Law and Policy*, *20*(1), 42-64.
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86	Mary (2019).	Hungry for free trade? Food trade and extreme hunger in developing countries. *Food Security*, 11(2), 461-477.
87	Martinico-Perez et al. (2018).	The Socio-Economic Metabolism of an Emerging Economy: Monitoring Progress of Decoupling of Economic Growth and Environmental Pressures in the Philippines. *Ecological Economics*, *147*, 155-166.
88	Mausch et al. (2020).	Colliding paradigms and trade-offs: Agri-food systems and value chain interventions. *Global Food Security*, 26, 100439.
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91	Mikhnevich, S. (2020).	Pursuing Balance: Analysis of the PRC's Implementation of Trade and Investment SDGs in Cooperation With Leading Partners From the Least Developed Countries. *International Organisations Research Journal*, *15*(1), 7-30.
92	Monkelbaan (2017).	Using trade for achieving the SDGs: The example of the environmental goods agreement. *Journal of World Trade*, *51*(4).
93	Montanía et al. (2021).	The role of the leading exporters in the global soybean trade. *Agricultural Economics/Zemedelska Ekonomika*, *67*(7).
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98	Nansai, K., Kondo, Y., Giurco, D., Sussman, D., Nakajima, K., Kagawa, S., Tohno, S. (2019).	Nexus between economy-wide metal inputs and the deterioration of sustainable development goals. *Resources, Conservation and Recycling*, *149*, 12-19.
99	Nasir, M. A., Canh, N. P., & Lan Le, T. N. (2021).	Environmental degradation & role of financialisation, economic development, industrialisation and trade liberalisation. *Journal of environmental management*, *277*, 111471.
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