Sustainable agrofood value chains: A selective literature review from the Global South

Research Working Paper

(NDA Project)

May 2023

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Introduction

Solutions to global food and nutrition insecurity in future pose tough and worrisome questions about the ecological imprint of agrofood systems. Concerns arise from the bidirectional interactions between, on the one hand, the operations and structure of agrofood value chains and, on the other hand, greenhouse gas pollution and environmental degradation. Poore & Nemecek (2018) show that producing food accounts for over a quarter of global greenhouse gas emissions, an average that might be masking highly uneven emissions between countries. Ecological sustainability is thus central to ensuring food and nutrition security in future (Berry et al., 2015).

A sustainable agrofood value chain refers to the "full range of farms and firms and their successive coordinated value-adding activities that produce particular raw agricultural materials and transform them into particular food products that are sold to final consumers and disposed of after use, in a manner that is profitable throughout, has broad-based benefits for society, and does not permanently deplete natural resources" (Neven, 2014, p. vii). In essence, this definition integrates distinct sustainability dimensions in each segment of agrofood value chains. Typical value chain segments are primary production (farming), secondary processing (manufacturing), wholesale, retail trade and consumption (Shukla et al., 2021). Within each segment and its components, analyses should inspect ecological, economic, social and institutional governance dimensions of sustainability (Ikerd, 2011). Through this analytical lens it is possible to outline pathways out of poverty for millions of poor and hungry households in developing countries without any ecological damage to the earth's ecosystem (Neven, 2014).

This working paper is a selective overview of sustainable agrofood value chains with specific reference to experiences of countries in the Global South. As a desktop review, it accessed information through search engines and online platforms. Literature searches targeted academic literature, policy documents, case studies and other grey literature.

The overview is structured around the main segments on agrofood value chains, starting with primary crop and livestock agriculture. Subsequent sections look at agroprocessing, wholesale, retail and consumption. Each section documents and explains the characteristics of a value chain segment and, where feasible, elaborates on conceptual and theoretical approaches used to frame case studies on a specific segment. It also highlights the different stakeholders involved in the food value chain and how these can play a role in poverty alleviation.

Agricultural overview

The recent political and economic turmoil in South Africa has significantly impacted agriculture. This has reduced the quality and safety of food products, affecting the economy of the country. The consequences can be seen throughout the agricultural industry, both in terms of production revenue and population health and well-being. However, farming remains an essential tool for long-term economic growth (World Bank, 2008). South Africa's agricultural

sector is a case of diversified one in the global economy, with subsistence and commercial agriculture producing a wide range of crops. The highly developed commercial farming industry in South Africa, which in 2020 had the best growth rate of all economic sectors at 13.1 per cent, is the backbone of the country's agricultural economy (International Trade Administration, 2021). Primary agriculture contributes significantly to the South African economy despite making up a small portion of the overall Gross domestic product (GDP). The sector is also a notable source of employment, particularly in rural areas, in addition to being a significant root of international currency earnings (Matsei, 2022). Furthermore, its contribution to food value chain through smallholder farmers has massive potential for development if properly promoted.

In comparison to other parts of the African continent, the farming economy in South Africa is diverse with technologically advanced inputs that boost farm yields. Because of its robust agricultural industry, South Africa will be well-positioned to withstand the country's ongoing economic and weather uncertainty (International Trade Administration, 2021). However, the industry is being impacted by several factors, including a steady decline in credit scores, land distribution issues, currency fluctuations, continuous climate problems, and the recent COVID-19 pandemic. Looking at the African context, farming has huge societal and fiscal footprints, with more than 60 per cent of Sub-Saharan Africa's population being smallholder farmers and agriculture accounting for approximately 23 per cent of Sub-Saharan Africa's GDP (Goedde et al, 2019). The large proportion of farming in the GDP also highlights how few African economies have undergone significant economic diversification (OECD-FAO, 2016). Although it varies widely across countries—from less than 3 per cent in Botswana and South Africa to more than 50 per cent in Chad—agriculture accounts for 15 per cent of global GDP on average, suggesting a broad range of economic frameworks.

Given its significance, sub-Saharan Africa's agricultural growth is much more efficient at alleviating food insecurity than economic expansion in non-agricultural sectors. Food production and the wider food value chain are still the main contributors of earnings as well as employment for the majority of people in most Sub-Saharan African countries (Jayne et al., 2021). According to IMF (2012), agriculture contributes over 50 per cent of the overall working population and provides a living for a substantial number of smallholder farmers in rural areas. However, there has been a wider agreement regarding the necessity for swift agricultural sustainability in Africa to speed-up the region's progression and the intensity of long-term economic growth (Mukasa et al., 2017). According to Mpundu & Bopape (2022), growing crops can greatly boost the economy through capital accumulation and job creation, and thus play a crucial part in poverty reduction. Doing so would depend heavily on boosting farmland output and maintaining trade. Recognizing the mutual benefits between the expansion of crop production, downstream value addition, non-farm sectors, in addition to skills training, management, water, sewage disposal and health, and hard and soft infrastructure, necessitates a comprehensive approach that takes into account the entire spectrum of actions necessary to accomplish structural reforms (Jayne et al., 2021).

Notably, performance of value chain remains deficient due to various production and marketing constraints that the farmers must grapple with. A wide range of issues have brought to light the shortcomings in the South African farming segment (GCRF-AFRICAP, 2018). Accessibility of finance, inputs, extension services, and viable markets are some of the challenges that are militating against value chain performance for the smallholder farmers. Southern Africa is also dealing with a variety of problems, including changing agricultural practices, rising populations, urban growth, and global warming (Sikora et al., 2019). These impediments have an influence on food protection, food supply, rainfall patterns, mineral wealth, as well as ecosystems. This has contributed to a high unemployment rate which remains an issue. GCRF-AFRICAP (2018), highlighted that the food value chain is also faced with arising challenges such as higher food consumption by an increasing population to constantly shifting consumer behaviour.

Stakeholders (CSOs, private corporates, public sector)

South Africa agrarian segment is an important economic player, contributing roughly R2 trillion to GDP each year. It has relied on various stakeholders, including private farmers, commercial agriculturists, and state-owned enterprises, all of which have contributed to its economic success over the years. In South Africa, there are numerous agricultural entities, which include corporate entities, national government agencies, start-ups, academic institutions, and research organisations (FAO, African Development Bank Group and CIAT, 2020). The public and private sectors are the major players in this vital sector. The collaboration between these stakeholders in agriculture is vital. According to Mntambo (2021), shortcomings in collaboration and teamwork have harmed sustainable and equitable capital accumulation growth, and, as a result, quality service has suffered. There has also been an increase in violent and disruptive uprisings. While the state is the dominant player, private farmers and cooperatives are also involved; in fact, smallholder farmers cultivate more than 90 per cent of all agricultural land. The general populace segment plays a vital role in the sector by providing subsidies and financial assistance to smallholder farmers. Furthermore, the government operates several state-owned enterprises (SOEs) that specialize in the manufacture and marketing of agricultural commodities, including maize, wheat, and sugar, as well as the livestock sector.

The sustainability and development of farming as one of the food value chain segments depend on various stakeholders. According to Deloitte (2013), the fresh produce production process is comprised of the system of partners who participate in the production, manufacturing, and distribution of food to consumers. Collaborative efforts amongst key parties along the food value chain is more essential than ever as they have backward and forward linkage to segments of the food value chain. This section provides an overview of various stakeholders involved in primary agriculture and how they support both local and worldwide agrarian viability. The agricultural sector of the food industry is made up of involved parties in three stages of production. This includes input providers such as seed, chemical companies, farming equipment enterprises, the industrial farming phase, which incorporates producers, farm

workers, primary commodities producers, and policymakers at the national and local levels. Nation states are charged with creating organisations as well as creating and enacting laws at the microlevel to establish farming practices that are aligned with the country's objectives and goals. Some organisations (e.g., civil society, private companies, research institutes, etc.) are better at implementing these strategies for reasons that deserve further research (Djekic et al., 2021).

However, the sector is dominated by state-owned enterprises, which own 75 per cent of the land under cultivation. These organisations are critical to the development and transformation of South African agriculture. They play an important role in the sector's transformation by providing inputs such as seeds, fertilizers, and irrigation equipment. They also provide grain storage and marketing and distribution services to local farmers. State-owned enterprises (SOEs) are vital to the South African economy (OECD, 2015). In agriculture, the SOEs also help to develop land by transferring it from white landowners to black farmers. The state has a policy of expropriating land and redistributing it to black farmers, who are then permitted to farm and develop it.

Sustainability sphere (ecological, social, economic, institutional)

Food production is a vital part of the economy in several underdeveloped nations, including South Africa. Faming is a key factor in sustaining food security and reducing poverty. However, the agricultural sector is not immune to pressures and challenges that hinder growth and productivity, such as poor access to land, COVID-19, inadequate infrastructure and weak support services. Hence, it is necessary to strengthen resilience and implement efficient farming methods that set minimum standards for sustainable farming. These are production methods governed by law, regulations, and guidelines (GIZ, 2016). The government's response to the agricultural industry's obstacles is critical in determining its ability to sustain growth and reduce poverty (Etim and Edet, 2013). Agriculture is among the strategic economic sectors that will help to accelerate growth and create more jobs, according to the National Development Plan (NDP). The NDP aims to develop an agribusiness industry capable of satisfying the requirements of both domestic consumers and oversees supply chain for value-added goods to achieve this goal. This will require the agricultural sector to modernise and strengthen its links to other industries, such as the manufacturing and services sectors. It will also require the government to work with the private sector to promote a culture of innovation and entrepreneurship in the agricultural sector, as well as strengthen its role in the implementation of the government pro-poor policies.

Several economic changes significantly influence stability, economic hardship, and the long-term viability of food production systems (FAO, 2014). Productivity recovery and community composition promote business systemic reform, whilst climate change negatively impacts food-insecure areas disproportionately, risking agriculture, marine resources, and aquaculture. This raises concerns about how food systems can be improved and supported, given that the current global population of 7.6 billion is projected to grow to 8.6 billion in 2030, 9.8 billion in 2050, and 11.2 billion in 2100 (United Nations, 2017). It also implies that the market for farm

commodities will expand, necessitating the improvement of agricultural output and the revitalization of vital farm inputs, via financial assistance, promoting the use of technology, as well as offering smallholder farmers access to markets. Accelerating land redistribution through the implementation of an extensive land agrarian strategy and the resolution of land restitution claims are two potential ways to enhance the sustainability of agriculture in formerly marginalized countries, particularly in South Africa.

Over the past few years, climate change and disease outbreaks have been threatening the sustainability of agricultural sector. Infestations of pests or diseases also can result in significant reduction in yield in both crops and livestock (Kahan, 2013). Mitigating disease outbreaks between livestock and crop products would help significantly to preserve the functioning of the agricultural system and limiting disruptions in the livestock value chain. In addition, global warming has been shown to have an effect on food safety, specifically on the frequency and severity of food-borne diseases (Gitz et al., 2016). This has a serious implication for the sustainability of the agricultural sector. A sustainable agricultural sector, however, has a lot more to offer than just potential economic growth (Herger, 2020). To promote economic growth and development, the South African government has set ambitious targets for growing the agricultural sector and enhancing the standard of living in rural communities. Government endeavours to promote investment in agriculture, enhance competitiveness, and improve food security to achieve these goals.

Case studies

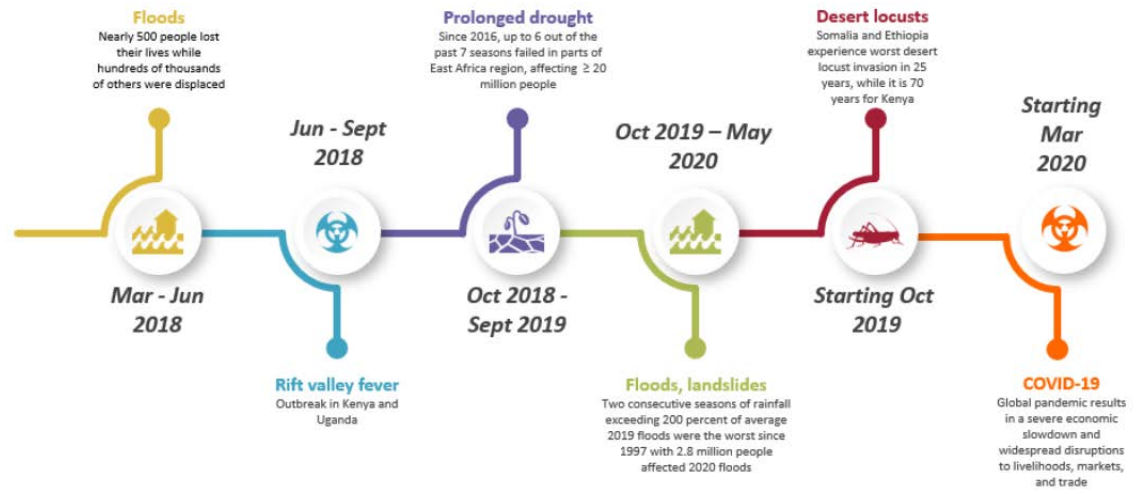
Over the past few years, the agricultural sector has been affected by several disease outbreaks and changing climate conditions. Recently, COVID-19 has had a global impact on agricultural structures leading to higher fresh produce costs and increased livelihood vulnerability (Wegerif, 2021). COVID-19 struck the Eastern Africa subregion at a notably crucial stage, as the economies of several sub regional countries were rebounding from the ramifications of several extreme weather events and extreme rainfall, as well as having dealt with the most devastating desert locust influx in 25 years (FAOb, 2020). Wide-ranging effects of the pandemic were seen in South Africa's agrofood system, which include interruptions to agricultural production, local businesses (primarily for farm households), food import and export flow, and temporarily excess supply for and scarcity of certain processed foods, particularly non-perishables. This was particularly notable in the weeks leading up to and during alert level 5 lockdown (Nywamwanza et al, 2020). According to Siche (2020), the COVID-19 epidemic has had a sizable effect on crops and the farming sector in particular, primarily affecting food demand and subsequently food security, with a sizable substantial implications on marginalized people.

Increased movement restrictions brought on by the spread of the disease make it harder for farmers to get their goods to market or to find workers for the harvest (Siche, 2020). Smallholder farmers were unable to operate and were unable to reach the markets to sell their goods, or purchase seedlings and other factors of production they need. COVID-19-related effects included decreased production and income, as well as job losses. Farmers reported disruptions in input supplies, as well as an increase in input prices. The disruptions were caused

by factors such as transportation constraints, store closures, and a lack of clarity regarding who was eligible to work. This was also exacerbated by the disruptions in Kwazulu-Natal and Gauteng. For instance, following the thievery and damage of machinery and barricades, growers who had been leasing school property in KwaZulu-Natal and Gauteng forced to abandon it.

Figure 1 depicts the most recent shocks impacting agriculture in East Africa over a three-year period. It can be observed from figure 1 that flooding is one of the most common natural disasters that affected people in 2018, where nearly 500 lost their lives, while hundreds of thousands of others were displaced. The flooding has been prevalent in most African countries.

FIGURE 1 | Timeline of recent shocks facing households in Eastern Africa



Source: FAO

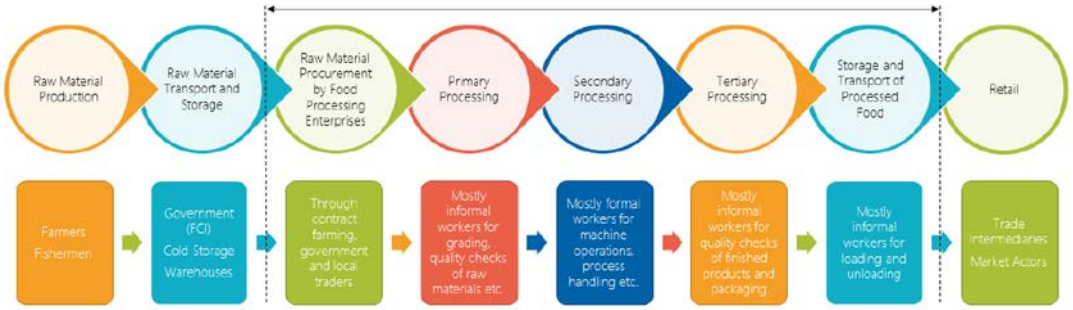
According to IFRC (2021), over the last three decades, the African continent has seen over 2,000 disasters, the majority of which have been caused by extreme weather and climate change, such as malnutrition, water shortages, and severe thunderstorms. These natural disasters endanger the agricultural sector's sustainability as well as the vulnerable population's food and nutrition security. Recently in South Africa, social upheaval in regions of KwaZulu-Natal and Gauteng provinces caused the disruption in the food value chain as the unrest was characterised by the widespread of looting of shops, trucks, and farms. According to a report by the Expect Panel (2021), attempts to destroy sugar cane fields have been made, as have attempts to breach a major distribution centre. According to the report, looters were hell-bent on destruction and their targets included malls, factories, warehouses, distribution centres, as well as farms.

Agro-processing

Theoretical overview

FAO (2014, P. 6) describes sustainable food value chain as "the full range of farms and firms and their successive coordinated value-adding activities that produce particular raw agricultural materials and transform them into particular food products that are sold to final consumers and disposed of after use, in a manner that is profitable throughout, has broad-based benefits for society and does not permanently deplete natural resources". Agroprocessing is the second segment in the value chain. It entails the modification of raw agricultural products through biological and mechanical processes (e.g., milling, de-hulling and shelling), and adjustments or combinations thereof (Hollinger & Staatz, 2015). According to Kubik et al. (2022), this segment is key in the chain as all agricultural products go through processing before consumption.

Food processing value chain



Source: Shukla et al.*, 2021*

In this segment backward linkages play a critical role in the agricultural sector and forward linkages with the retail sector (Shubik et al., 2021). Backward linkages of a product show what other products have contributed to produce a product and forward linkage speaks to how other products can be manufactured, produced, or made using other products (Paduel & Thapa-Parajuli, 2020). The processing sector must utilise backward linkages with civil society groups, primary producers, producer organisations and farmer's groups. In order to generate sales from processed food, it needs to develop strong forward linkages with exporters, wholesalers, retailers, etc. (GK Today, 2015). Due to these linkages, growth and investment in the processing industry has the capacity to generate extensive multiplier effects by creating

demand for agricultural commodities, increase incomes, generate public revenue and create jobs (UNIDO, 2009). The authors argue that these factors have prospects to ameliorate poverty, enhance food and nutrition status, and stimulate economic development.

Agro-processing is important in the food economy, as it "..(i) reduces the seasonality of access to various foods, offering more diversified diets over longer periods of time; (ii) improves the quality and safety of foods, especially if accompanied by investments in dry storage and cold-chain facilities; (iii) reduces post-harvest losses; and (iv) extends the shelf-life of food, making it easier to reach urban areas where a big share of consumers is concentrated. This is particularly essential in cases of perishable nutrient-dense products" (Kubik et al., 2020:6)

Stakeholders (CSOs, Private corporates, public sector)

The role of government is to formulate and enact economy-wide policies that create a conducive environment to stimulate economic growth (Owoo & Lambon-Quayefio, 2018)). In addition, policies formulated must create a favourable enabling environment for business sector and economic development to prosper (Owoo & Lambon-Quayefio, 2018). In 2015, the Kenyan Ministry of Industrialization and Enterprise Development announced a 10-year Industrial transformation programme. The purpose of the programme was to advance the development of industries that will stimulate economic growth. Pillar two of the strategy focuses on creating 1 million jobs by building a secondary processing centre focusing on imports and unlocking the potential of fish processing in the country (MIED, 2015).

Over 50 per cent of Kenya's exports are agricultural commodities. The Kenyan government plans to increase these exports and identify more opportunities. About 16 per cent of exported outputs in Kenya are processed; 84 percent is exported as raw commodities. The plan is to double exports of agricultural products as this has potential to create 110 jobs and stimulate revenue of $600 million. In addition, the programme highlights two flagship projects that the ministry seeks to establish; a food processing centre in the coastal city of Mombasa to process imported agro-based products such oil, rice, wheat, palm, and agro-processing zones in Meru, Nakuru, Kwale and Galana to process locally produced commodities such as mango, peas, cassava, potatoes, mango and passion fruit. These projects have potential to grow the GDP by $300 million and also have the potential to generate 60,000 jobs (MIED, 2015).

According to FAO (2020), the Belize government developed a National Strategy for Agro-Processing and Food Production for Small Entrepreneurs with the Central Farm Agro-processing Unit as a Fundamental Support Framework for 2019 – 2023. The strategy is in line with the priority areas of government to promote stable food systems. The purpose of the strategy is to create a conducive environment for business support and economic growth. Central Farm Agro-processing Units, the Ministry of Agriculture, Forestry and Fisheries and Sustainable Development, small scale producers and agro-processors are the main beneficiaries of the strategy. The strategy emphasizes the need for government to support and provide subsidies, facilitate credit programs and strengthen the need for technologies that are environmentally friendly. Furthermore, the government initiated this strategy to unlock the potential of the agricultural sector. Food and agricultural products make up over 80 per cent of total exports in Belize. The agricultural and food sector in Belize makes a significant contribution to the GDP, creates jobs and stimulates macroeconomic growth and development.

Globally, food chains, and thus agro-processing, are dominated by a few corporates and retailers that control the market (Collier, 2021). In South Africa agrofood production is concentrated in the hands of few large firms (Neves, 2020). However, that is not always the case in other countries in Africa. In Ghana, for example, the industry is controlled by small- and medium-scale companies which function in the informal sector (Owoo & Lambon-Quafeyo, 2017). Ghana's processing sector is a key player in the manufacturing sector, with food and beverages constituting the most substantial share of processed products (Quarterly & Darkwah, 2015). The sector is made up of 97 per cent micro- and small-scale organisations and 3 percent medium-scale processing enterprises (Collier, 2021). This industry mostly processes commodities for the local economy and the commodity processed on a larger scale is cocoa (Collier, 2021). According to Owoo & Lambon-Quafeyo (2017) Ghana's agrofood sector is underdeveloped and small firms experience extreme legal, administrative and bureaucratic challenges. Small-scale firms have few linkages with financial and marketing services due to their size and limited capacity (Owoo & Lambon-Quafeyo (2017)).

Sustainability sphere (ecological, social, economic, institutional)

Economic sustainability means that the food chain must generate profits, create jobs, enhance incomes, generate tax revenues and maintain stable food supply (FAO, 2014). The agroprocessing sector has had a positive economic impact in Africa. In Ivory Coast, the processing sector has been identified as the second largest contributor to formal employment at 14 per cent and the biggest contributor to formal-sector value added, while in 2012 processing firms provided 18 per cent of agribusiness jobs even though they constituted just 4 per cent of all enterprises in the segment (Hebous and Tran, 2017). In Sub-Saharan Africa, agro-processing represents 30 per cent of total manufacturing sector employment, despite accounting for no more than 5 per cent of food economy employment (IFAD, 2021).

According to the Brazilian Food Processors' Association (BFPA), Brazil's agrofood sector generated R$922.6 billion proceeds ($171 billion) in 2021, up by 16.9 per cent from the previous year. The result represents 10.6 per cent of the national GDP (Vendemiatti, 2022). This growth can be attributed to exports with represent 26 percent of the industry's total revenue. The sector is also predicted to grow by 2 percent even if high production cost pressures persist throughout the year (Vendemiatti, 2022). In India, a report by the Ministry of Food Processing Industries (MoFPI, 2021) indicates that the sector currently employs 1930000 people across registered firms and a 5110000 workers in unincorporated enterprises. The sector currently has an employment share of 11.4 per cent and is expected to create jobs for 90 lakh people by 2024 (Shukla et al., 2021).

FAO (2014) says that the term *social sustainability* means that the value chain must be inclusive, follow social norms and traditions, show equability, is equitably distributed along the chain and must benefit the community. Furthermore, social suitability indicates that there is equal treatment of all stakeholders, no unhealthy work conditions, child labour or any infringement of cultural practices. The segment is key in giving women opportunities and helping them to realise their potential. In Sub-Saharan Africa, the processing sector offers economic opportunities for women. Women make up for 83 per cent of overall food processing employment and 72 per cent of food marketing labour force (Allen et al., 2018). In Ethiopia, women dominate the labour force. In 60 per cent of companies, females account for at 50 per cent of all workers, and, in some organisations, formed 70 per cent to 100 per cent of the

labour force. In Ghana an overwhelming majority of workers are women (Kubik et al., 2022). Research conducted by Kubik et al., 2022) revealed that there's no wage disparity when it comes to gender as women and men are paid equally. However, the study does identify unhealthy working conditions in some firms. Findings show that some workers are not covered by the social protection system, are not paid on time, experience physical distress, are required to use of harmful substances during the production process, while some are required to work beyond normal hours.

UN Sustainable Development Goal (SDG) twelve states that sustainable consumption and production patterns are key to sustainable livelihoods currently and for future generations (UN, 2022). The 2022 SDG report identifies unsustainable patterns of production and consumption as the sources of the three catastrophes the planet is facing, namely, climate change, pollution, and biodiversity loss. Food loss is one of the factors that poses a threat to environmental sustainability. According to FAO (2011), food losses in developed nations are soaring at the same degree as the developing states, but in western countries over 40 per cent of the food losses arise at post- production levels while in developed countries, over 40 per cent of food losses are experienced at the consumer and retail stages. The 2022 UN SDG report also indicates that continued food losses further exacerbate hunger across the globe. In 2020, about 13.3 per cent of the global food loss occurred before reaching retail markets. These losses happen during transportation, during farm activities, wholesaling, storage and processing. Food dumped in landfill sites generates 8 to 10 per cent of global hazardous emissions (UN, 2022).

The food industry also uses resources like energy and water during the production. For it to comply with general standards of food safety, it must use clean water for raw material cleaning, cooling and cleaning in the factory (Wattanapinyo, 2006). In Thailand, due to overuse of groundwater and intrusion of saltwater with groundwater for processing purposes, government had to enact certain laws and regulations to prohibit pumping of ground water by processors in Bangkok and its periphery (Wattanapinyo, 2006).

Case Studies

The Sustainable Development Goals (SDGs) emphasize the importance of using renewable energy to ensure sustainability. In communities of Vanuatu, Indonesia and Honduras, agro-

processing activities are undertaken by women and girls by hand. This poses a challenge for struggling food producers and deprived communities in bringing about value added products and generating income from their primary production. In addition, the absence of agro-processing equipment such as graters, grinders, mills, or dryers in off-grid rural communities pushes people to travel substantial distance from their farms to access diesel-powered processing machinery. To address these issues, the Consulting Services Company Village Infrastructure Angels (VIA) and Project Development constructed and executed a plan based in 36-60-month lease agreements with rural communities to speed up access to rural electrification (Vasquez, 2020).

Furthermore, VIA project sought to facilitate access to, community low power solar agro-processing assets (125-500 W), solar home systems (5-10 W per household), and rural electrification. DC Solar together with VIA powered agro-processing machinery maker Project Support Services (PSS) installed a diverse set of solar agro-processing units including a corn huller, rice polisher, maize mill, maize mincer, rice huller, cassava greater, maize thresher, hammer mill and coconut scraper. The main advantage of solar powered processing machinery is that it can be distributed and installed anywhere compared with other low-cost options that are limited to certain locations. This initiative enabled struggling producers to access productive use technology to stimulate the rural economy and enhance efficiency (Vasquez, 2020).

Impact of COVID-19 in rice milling in Mynamaar (Goeb et al., 2021)

Myanmar is one of the biggest exporters of rice globally (USDA, 2020). Rice is the most important staple food in that country (Goeb et al., 2021) A study was conducted to gain deeper insights into the effects of the pandemic on Myanmar rice processing (Goeb et al, 2021). A total of 657 mills were sampled and selected randomly from a list of 1,025 medium and large mills. The sample covered three regions and six areas including Bago, Ayeyarwady and Yangon. Rice millers indicated difficulties with transportation as movement was restricted. They could not access rice production regions, and could not reach farms due to lockdown regulations enforced to curb the COVID-19 pandemic. Findings also showed that millers experienced interruptions in the working hours. Nineteen per cent indicated they had to shut operations for over seven days and 46 per cent decreased their operating time. Reduction in business days led to a reduction of the workforce for 38 percent of rice processors. Twenty-three millers had

to halt operations due to COVID-19. They also experienced reduced overall throughput, declining credit availability and revenues. Results showed that 3 per cent of mills indicated increased daily rice output in August 2020 compared to the previous year, while 51 per cent indicated a year-on-year reduction.

Wholesale trade

This section draws attention to and sheds light on how wholesale trade fits into agrofood value chains in developing countries. Characterising the position of wholesale agrofood trade in value chains is particularly helpful to reveal changes in the contributions of the wholesale segment to the economy and society. Towards this end, this is a selective summary of experiences of how agrofood wholesale is changing in Africa, Asia and Latin America. Country-level experiences synthesised in this overview are purposeful and illustrative, and do not seek to paint a representative picture of the unfolding across the global south.

Before proceeding with the rest of this overview, an abbreviated recap of some definitional controversies in value chains research will be outlined. There is no transdisciplinary consensus definition of value chains but thinking about what a value chain is has progressed from exclusionary conceptions to greater appreciation for an evolving multidimensional concept. The concept 'value chain', according to Reardon (2015), is a hybrid construct which incorporates the useful qualities of a product and supply-side efficiencies. This utilitarian conception of value, constricted to the "use value of food", is free from distributional tensions, including conflicts that centre on profit accumulation along the value chain. In a review of the features of agricultural and non-agricultural value chains, Jacobs and Ngandu (2013) call for a more realistic and meaningful view beyond use-value and efficiency that also ground it in power relations, upgrading and institutional governance. Who retains the power to structure wholesale transactions, for example, is a prominent facet of change at Vietnam's busiest agrofood wholesale market in Hanoi (Gerber et al.,2014) and the wholesale subsegment in Punjab's (India) grain value chain (Sinha, 2018). Dürr's summary of the distributional propositions inseparable from agrofood value chains in the context of 'peasant agriculture' is insightful (Dürr, 2018).

Any useful explanation of the latest developments in the wholesale trade segment of agrofood value chains, ought to underscore at the outset that changes in wholesale trade in developing countries have been going on for decades. Whilst the restructuring of wholesale trade has been constant rather than new, the speed at which this sector is being transformed varies greatly across time and place. In recent decades, however, changes in wholesale agrofood trade take place at a quickening pace and have grown more complex (Reardon 2015; Reardon et al., 2021; Bellemare et al*.,* 2021, Barrett et al*.,* 2022). However, there is a paucity and thinness of independent case studies on agrofood wholesale trade in the global south, except for China,

India and Mexico[1]. The synthesis of agrofood value chain transformations in developing countries by Bellemare et al. (2021), for instance, extensively reviews the evidence on the supermarket revolution, but does not undertake an explicit and in-depth review of restructuring in the wholesale segment except for a few marginal remarks. Reardon et al. (2021) showcase empirical results on agrofood wholesale in Africa showing that the continent lagged behind the transformations in Asia and Latin America, but Africa is catching up to these regions. Evidence from some African countries, despite their late developer categorisation, show the expanding involvement of multinational companies in agrofood wholesale.

In agrofood value chain studies, research on the wholesale segment is intertwined with investigations into transformations in smallholder agricultural regimes, a mode of farming which is still a defining trait of agrofood systems in developing countries. Transformations in wholesale trade of crops and the livestock have been taking place in relation to restructuring of smallholder farming systems. Change in wholesale trade in developing countries must be situated in the relational restructuring of agrofood value chains[2]. Probing developments in one segment of the value chain cannot be divorced from developments elsewhere along the value chain as a whole. Reardon (2015) argues for research spotlights to zero in on this 'midstream segment' of agrofood value chains to transcend the traditional preoccupation with the primary output and final consumption outer ends of value chains. 'Midstream segments' are not only affected by upstream and downstream forces of value chains, but, in turn, also exert far-reaching impacts on the workings of agrofood systems.

Wholesale trade – basic concepts & transformations

Wholesale or wholesale markets denote both a bulk sell-buy transaction as well as the space that embodies this type of trade. Wholesalers refer to bulk selling and buying traders but these need not be large enterprises. Reardon et al. (2021) decouple enterprise size from wholesale trading to showcase the proliferation and prominence of small and medium enterprises (SME) in the wholesale segment in developing countries. What this means for the varied new forms of wholesale concentration and consolidation is an important question for future research.

In the agrofood sector, wholesalers facilitate the movement of crops and livestock from farmers to the final consumers, thus enabling access to food. Wholesale traders thus influence the spatial value of agrofood produce, and this reflects in pricing dynamics and profit margins of products traded in this market segment. Agrofood wholesale is an intermediate subsegment of value chains that overlaps with logistics and bulk storage, particularly produce warehouses and cold storage. This subsegment is often bundled into an amorphous economy beyond the

[1] Reardon (2015), Dürr (2018), Bellemare et al. (2021) and Barret et al. (2022), among other scholars, lament the lack of appropriate data that obstruct the construction of a representative global picture of the wholesale agrofood subsegment. The FAO online database on food value chain industries also records wholesale and retail trade. This database uses the value of domestic expenditures of personal consumption and food consumed away from home (e.g. in restaurants). https://www.fao.org/faostat/en/#data/GFDI

[2] In a series of informative synthesis reviews, Reardon and co-authors, trace the markers that typify the evolution of the agrofood wholesale trading in developing countries (Reardon et al., 2009; Reardon 2015; Reardon et al., 2021).

farmgate (Bellemare et al., 2021), thereby compounding the difficulties in accurately quantifying its economic and social contributions. Historically, the wholesale segment of agrofood value chains took off as unregulated spaces where market actors could sell and buy agrofood outputs in bulk.

The evolution of the wholesale segment can be analysed through a locational lens with a time dimension. This blended locality-temporal lens reveals that wholesale branched out from truckload trading in villages, to trade on the peri-urban edge to the urbanisation of permanent wholesale markets. Truckload wholesaling was unregulated openair trading that did not generate revenue for the municipal authorities. In the rapidly expanding cities, authorities also worried about the reliability and capacity of truck traders to meet the growing demand for food. Furthermore, truckload wholesalers struggled to keep up the seasonal access to highly perishable foods (Reardon, 2015). What is evident from Reardon's retracing of the history of wholesale is a transitional moment when 'scattered truck markets' co-existed alongside state-sponsored municipal wholesale markets in staple grains and occasionally in perishable foods.

Analyses of transformations in agrofood wholesale, similar to the full value chain or other segments of it, usually integrate the *forces* and *facets* of transformation. Among the transformation forces, structural drivers of change dominate because isolated actors or sectors cannot substantially alter the momentum and course of such deep-going change. Moreover, structural change in the socioeconomic sense never happens overnight but results from processes that accumulate over decades. In the list of structural forces that have been instrumental shapers of the wholesale segment of agrofood value chains, faster urbanisation and investments in better infrastructure stand out. Revolutions in logistics, road infrastructure and transportation, altered the "geography and seasonality of farming and value chains to cities" (Reardon, 2015, p. 52), in turn, aiding reconfigurations of agrofood wholesale.

Combinations of demand and supply pressures have shaped the urbanisation of wholesale. On the demand side, new lifestyles and cultural practices promoted through more sophisticated advertising, nurtured urban consumption revolutions (Reardon, 2015). Coupled with the new urban dietary trends, intensified supply-side competition encouraged investments in and adoption of technological and institutional innovations.

Inseparable from the forces that are transforming the wholesale segment are the facets through which changes manifest. All facets of wholesale are undergoing change, but some facets are going through deeper and more far-reaching transformations than others, thus calling for a closer analysis of the uneven changes for each facet.

Illustrative Cases

Market structure, Concentration and Consolidation

Bellemare et al. (2021) emphasise the need to also consider market failure as a facet of agrofood market change but neither the origins nor measures to rectify or counter market failure are examined. Notwithstanding this incomplete conception of market failure, it begs the question as to what the observed failure of markets mean for the wholesale segment. It

implies that even wholesale agrofood markets cannot escape varied forms of market failure, such as 'high profit margins' and market structures that contradict the norms of free competition that typically arise on the supply-side of the market (Bellemare et al., 2021).

Regulatory reforms

Moves to liberalise and deregulate agrofood value chains in recent decades also dominate trade in the wholesale subsegment, creating the impression of 'ruleless' wholesale transactions. In reality, however, fully liberalised wholesale trade does not equate to transacting without rules. On the contrary, agrofood wholesale, whether privatised or operating as state-controlled parastatals, is subject to policies and regulations that govern transactions. Privatised wholesale operates on the premises of regulations rooted in perfectly competitive markets assumptions and principles discussed elsewhere in this report. In this milieu, wholesale actors ought not to face entry-exit barriers, yet these hurdles exist and can be prohibitive. Similarly, full information about products and prices should be accessible at zero 'transaction costs', but this is rarely the case in practice (Bellemare et al.; Reardon et al.). Liberalisation and deregulation involve different sets of institutional arrangements that govern agrofood selling and buying. Self-regulating markets in textbook models of wholesale invoke a frictionless naturalism, in defence of minimalist government interference in markets, yet sellers and buyers always observe definitive norms of trade.

Both parastatal wholesale and privatised wholesale have been subject to regulatory reforms. Studies in the perfect markets' tradition are primarily concerned with how price is determined in a market for agrofood products. Sellers and buyers are 'price-takers' without any individual trader enjoying the power to determine or 'fix' the market price to settle a transaction. In a market free from distortions and other 'inefficiencies', the market price derives from the point where supply is in agreement with demand. Perfect market models usually identify exogenous disturbances that result in price volatility and adjustments to a price which balances demand and supply. Market disruptions and distortions result in temporary price shifts, whereafter prices automatically drift back to 'equilibrium' rather than causing substantial market restructuring (Kikuchi et al.,2016).

Government interventions in markets, including those intended to achieve social welfare improvements, are the main disruptions investigated in studies premised on these axioms. Recent case studies from China, Sri Lanka, Uganda and Tanzania, for example, exploit rich data on wholesale markets in these countries to illustrate typical applications of this approach. Ruan, Cai and Jin (2021) used wholesale pricing data to demonstrate how anti-Covid19 lockdowns in China disrupted the fresh vegetable value chains, where a jump in wholesale prices was followed by price volatility which lasted for approximately 15 weeks after provinces implemented the policy restrictions. In Tanzania, the National Food Reserve Agency (NFRA), a body established by the state, intervened in maize wholesale markets that went beyond the agency's explicit mandates (Pierre, Pauw and Magrini, 2017), destabilising wholesale prices. The ceilings on rice retail prices of Sri Lanka's government did not only impose costs on wholesalers and retailers (Gedaraa, Ratnasiri and Bandara, 2016), but also triggered

asymmetric price transmissions that contradict policy objectives. Even though these studies use sophisticated estimation techniques and methods (econometric models), this methodological approach ignores or dismisses complex conceptual issues, such as how non-state actors shape the workings of markets, market failures that arise from endogenous disruptions and structural changes in markets.

Disintermediation

A stylised hypothesis of economic development is that an increasing distance between farmers and the final consumers opens space for diverse value chain intermediaries. Longer farm-to-fork value chains encourage the proliferation of intermediaries, such as brokers and wholesalers.

How, for instance, has the global 'supermarket revolution' affected the sustainability of traditional wholesale intermediation as a dominant node of domestic agrofood trade? Viteri and Arce (2010) contend that traditional wholesalers have been far more resilient as agrofood suppliers to supermarkets in some big Latin American economies than what sceptics about the 'viability of wholesale' intermediaries highlight.

The supermarket revolution, alongside the explosive growth of fast-food outlets and restaurants, has radically overhauled longstanding modes of agrofood procurement as powerful supermarkets have switched to specialised wholesalers and direct buying from farmers. This switch has radically shortened traditional value chains for perishable fruits, vegetables and meats, shrinking or bypassing conventional wholesale markets (Viteri and Arce 2010).

In Uganda's rice value chain, which is spread across Upcountry producing districts and Kampala, wholesale trade only enters the post-milling segment but wholesalers and brokers located in towns actively operate in rice farming villages (Kikuchi et al., 2016). Alongside rice millers that buy paddy rice in Upcountry villages, some wholesale agents ('specialised rice brokers') also buy paddy rice for milling. Through their intermediation, specialised rice wholesalers and brokers link rice farmers and millers to public markets and wholesalers in Kampala, the capital city. Wholesalers are not only intermediaries in the domestic rice value chain, but also export milled rice.

Kikuchi et al. (2016) highlight that the downstream rice value chain beyond the farm gate is characterised by 'limited government interference' and there is no evidence that a small number of big wholesalers control rice trading and wholesalers that sell rice in bulk to final customers. Furthermore, due to the distance between Upcountry rice mills and wholesale markets in Kampala, brokers and wholesalers that sell rice to Kampala retailers and consumers confront higher transportation costs and related risks. While rice markets in Uganda are highly competitive, as emphasised in Kikuchi et al. (2016), there is clear evidence of heterogeneity among wholesalers. Truck ownership is limited to a small number for large wholesalers. Wholesalers usually rent storage facilities, except for wealthier traders who own shops and storage warehouses.

Dirven & Faiguenbaum (2008) use evidence about changes in wholesale fruit and vegetable trade in Santiago, the Chilean capital city, to trace the past, present and future of this midsegment of the agrofood value chain. While supermarkets increasingly dominate the fruit and vegetables value chain in Chile, there is also evidence that the wholesale subsegment has retained its old intermediation function of linking producers to final consumers.

Figures reported in Dirven & Faiguenbaum (2008) suggest that three wholesale markets in Santiago, namely La Vega Central, Lo Valledor and Mersan account for 95 per cent of all fresh fruits and vegetables traded in terms of tonnage. These wholesale markets differ in historical origin, trading space capacity, physical layout of trader stands, volumes traded, proximity to administrative hubs and trade routes as well as technological infrastructure. For instance, even though La Vega Central is Santiago's oldest wholesale market, it is significantly smaller than Lo Valledor which is also classified as "the largest private market in South America" (Dirven & Faiguenbaum, 2008: 410). In sharp contrast to La Vega Central and Lo Valledor, Mersan was set up in 1997, is situated outside the periphery of the capital city, and predominantly functions as a bulk storage space rather than an active trading space. Investments in state-of-the-art technological upgrades at Mersan have attracted keen interests from European multinational investors in buying this wholesale market. Smaller wholesale markets that are closer to the ports but at a considerable distance from the capital city, are less attractive because they can only handle a fraction of the volumes that suppliers deliver to market. Bulk suppliers of fresh fruit and vegetables, as the analysis by Dirven & Faiguenbaum (2008) suggest, incur lower costs when they sell an entire truckload in one market compared offloading just a portion of available deliveries in smaller wholesale markets.

Bangladesh is the typical developing economy case in which the size of wholesalers and the spatial scale of their operations are functions of structural indicators of development. Wholesale trade of perishable vegetables in Bangladesh, a 2020 case study illustrates, happen in both village markets and large markets located in the administrative centre of districts. While thirty-to-sixty percent of produce from small-farm households, comprising 51-63 per cent of all households in two study districts, are sold in the Dhaka, the country's capital, this occurs through different wholesale trading channels. Village wholesale offers relatively lower producer prices, yet the majority of smallholder farmers sell through this channel. Descriptive statistics show that slightly more than 55 per cent of the farmers participate in village wholesale compared to marginally more than 45 per cent who sell through the central district wholesale market.

The further the farm is from a large wholesale market the less likely smallholder farmers are to sell their produce there. In addition to distance to wholesale trading spaces, road quality and accessibility to market information weigh heavily in where and how smallholders will trade. Group-selling through farmers' collectives is a strategy to lower their wholesale transaction costs in these instances.

The side of a major district highway is a prime location for village wholesale trade, in addition to a reserved trading space at the centre of a village. Prominent demand-side operators in either market category includes retailers, wholesalers and commissioned agents. In the village markets, local wholesalers and commissioned agents also operate as intermediaries or subcontractors of bigger wholesale enterprises that aggregate produce locally for onward selling in district and city markets.

A distinguishing trait of the wholesale subsegment of agrofood value chain is bulk trading to the benefit of both food producers and final consumers. Aggregating the farm outputs of disparate resource-poor smallholders is a classic advantage of wholesale. However, wholesale also refers to more than just transacting large volumes of outputs given the heterogeneity of wholesalers in terms of business enterprise size.

This section has shown that the relational transformation of agrofood wholesale in developing countries has been going on for decades and is continuing at an accelerated pace. Even though transformations in this traditional midsection of agrofood value chains vary across countries due to a country's degree of socioeconomic development and specific types of agrofoods being traded, the patterns of change also display cross-country similarities. Over recent decades, wholesale market structures have continued to consolidate and concentrate due to intensified competition, regulatory reforms and disintermediation.

Retail Trade

Theoretical overview

In the bigger discussions regarding value chains in economic development, retail trade forms part of the notion of chain governance. When the downstream Value Chain has reached the retail trade stage, it is more competitive and has more value-added than the first stage (FAO, 2014). Retail trade is the aspect within the Value Chain that is increasingly regulated by a great number of (global) buyers.

There are four main components which comprise the chain. These are (i) production, (ii) aggregation, (iii) processing, and (iv) distribution (which includes activities such as wholesaling and retailing) (FAO, 2014). In modern day value Chains, retail (trade) is the part that converts the demands of the consumer into distinct requirements for suppliers. The capturing of these requirements is noted in the constant development and demanding product and standards which are intertwined in the supply contracts. It is commonly linked with traceability requirements (FAO, 2014). It is important to highlight that change within the distribution stage, also known as the retail stage of the value chain can either be: (i) harmful, or (ii) create opportunity (FAO, 2014).

The evolution of urban and rural retail trade has evolved since the beginning of the 20th century. According to FAO (2020), urbanization influences the value chain and retail trade by transformation. This occurs when people move away from rural areas, where food is produced, to the cities. This notion emphasizes the importance of food retailing. The tradition of retail

trade is comprised of people who operated with stalls in wet markets as well as small standalone stores. In the beginning, supermarkets only catered for the purchase of dry foods, but as time progressed, they were able to offer a greater variety of products.

Food retail has almost been fully captured by developed countries, while rapidly growing in developing countries (FAO, 2020). However, although urbanization is noted as one of the core reasons for change within the food retail markets, there are also many other drivers that influence the food retail market such as FDI (Foreign Direct Investments) and e-Commerce (FAO, 2020). Another factor that led to change within the food retail markets were the direct changes that occurred in the food service sector. An example of this was how food retailing shifted from the small-scale traditional restaurants to more fast food restaurants (FAO, 2020).

Urbanization, economic growth, globalization, technology enhancements and consumer-needs all influence the value chain as a whole. An increase in wealthy consumers and a growing demanding for better quality of food creates changes in both the retail and distribution sector (FAO, 2020).

As the value chain and market volume become larger, economies of scale as well as food specialization within the retail sectors begins. Large retailers rise and the markets become increasing vertically connected, which indicates the change in modern value chains (FAO, 2022).

Stakeholders (CSOs, private sector and public sector)

Resnick (2017) stated that the urban poor has strongly depended on the informal economy in various African countries. Resnick (2017) mentions two reasons why the Urban Poor has been heavily depending on the informal economy: (i) the Urban Poor purchase their daily essentials from the informal markets because the informal markets are located close by, and (ii) the Urban Poor only makes use of the supermarkets for bulk purchases; however, these bulk purchases only occur periodically. This is highly dependent nature of the underprivileged individuals within the urban setting who rely on the informal markets for their everyday essentials highlights the crucial function the informal economy has in the livelihood of the underprivileged people in urban areas. It simultaneously highlights that the formal economy also plays a role even though the purchases from the Supermarkets occur periodically.

The above-mentioned statement leads to another stakeholder of retail trade, which are the Supermarkets (private sector). As mentioned by Resnick (2017) supermarkets in Africa still form a large component of retail trade. Furthermore, Resnick (2017) states that the very purpose of Supermarkets in the food retail sector remains unchangeable.

The urban poor, more specially, the underprivileged rural smallholder, encounter fewer barriers when selling in the informal markets than if they had to sell through markets within the formal sector (Resnick, 2017). However, some larger agribusinesses try to accommodate those consumers who work through the informal markets. The dependent and embedded

nature of the stakeholders emphasizes that within the retail trade sector, a stakeholder cannot necessarily function on their own (Resnick, 2017).

In order for the stakeholder environment to be more engaging, dialogues need to be put in place. These dialogues will also assist in good governance amongst retailers and other stakeholders (Van Hille and Louw, 2012).

FAO (2014) recorded a practical example of stakeholder engagement, stakeholder dependency and stakeholder embeddedness in the Philippines. A current market facilitator named *NorMinVeggies* connected smallholder farmers to newly established retailers and the other markets (FAO, 2014). As time went by, *NorMinVeggies* increased their membership. These members include foundations, individual farmers, farmer groups, amongst others. The effectiveness of the system catered for both an increase in farmgate pricing which led to an added net income for farmers as well as more benefits for consumers (FAO, 2014).

The case from the Philippines involving the vegetable food value chain (FAO, 2014) shows how Resnick (2017) perhaps over-emphasizes the dependency and needs of the urban poor, while FAO, (2014) shows us the importance of other stakeholders as well. FAO (2014) allows us to see the outcomes of interventions from other stakeholders, which further speaks to the idea that the value chain has a dependent and embedded nature.

Sustainability: Ecological, Social, Economic, Institutional

De Haan and Zimmerer (2020) state that food retailing networks in the informal sector are large and provide nutritiously secure food sources globally. Informal food chains connect both the impoverished rural and urban buyers as well as workers employed by smallholder farmers. This allows those who are food insecure to access affordable food as well as employment (De Haan and Zimmerer, 2020).

The production and distribution of agrobiodiversity through informal markets are a crucial starting point of affordable as well as nutritional meals. Agrobiodiversity also develops resilience throughout the chain (De Haan and Zimmerer, 2020). According to De Haan and Zimmerer (2020), agroecological production and resilience, promotes agroecosystem sustainability throughout the value chain as well. However, although agroecosystem sustainability is being promoted, the practice of agrobiodiversity has constantly been decreasing specifically in the western areas of South America and in other areas of the globe (De Haan and Zimmerer, 2020).

De Haan and Zimmerer (2020) highlight the impact and disruptive effect COVID-19 has had on the informal food value chain within the retail sector. COVID-19 called for stern regulations within the informal food retail industry in western South America. Unfortunately, COVID-19 led to the closure of farm and informal markets and a near-vanishing of urban street traders. There was a need for knowledge-based actions from the government and better communication to secure food accessibility, affordability, resilience and socio-cultural inclusivity within the food retailing sector during the COVID-19 pandemic (De Haan and Zimmerer, 2020).

Kazembe, Nickanor and Crush (2019) note that in urban Africa the food retail market and the advancement of developing tools around the market is not a new topic. However, the incorporation of the food retail market into policy and governance within the informal food retail sector are recent debates (Kazembe, Nickanor and Crush, 2019).

If existing policies adds pressures, restrictions or constraints for the impoverished to access food in the informal markets, policy-makers have to deal with huge implications. The policies should not prevent or be a hinderness for low-income individuals to access food for their households (Kazembe, Nickanor and Crush, 2019). If current strategies from the government poses implications, it might make it more problematic for low-income individuals to depend on the mobility and proximity of the informal retail markets (Kazembe, Nickanor and Crush, 2019). Different governance strategies/models pose different problems of food accessibility and affordability for the impoverished (Kazembe, Nickanor and Crush, 2019).

To ensure economic sustainability throughout the Value Chain, more focus should be directed to each segment of the value chain. The 'added value' is required to have a constant positive output after each segment, especially if the segment is expected to change (FAO, 2014). FAO (2014) mentions two exceptions, namely, actors which are civil society organisations and well as the public sector. Because of their social role, they may facilitate the upgrading of the Value Chain without having any value added. This could also be seen as sustainable if the government continues to make funding available.

Inclusivity within the value chain leads to social sustainability. All actors/stakeholders within the value-chain should have equal access to resources, the market and the right to partake in decision-making, not only within the retail trade, but throughout the value chain. For the retail trade sector to remain environmentally sustainable, environmentally friendly practices need to occur such as: (i) reducing the water and carbon footprint, (ii) having a positive impact on biodiversity, (iii) reducing food waste and (iv) preventing the release of harmful toxins.

Case Studies

The De Haan and Zimmerer (2020) study focuses on the triggers that COVID-19 caused for the informal food value chain. COVID-19, which, according to the authors, worsened food insecurity across the globe. Furthermore, it is worsened by the policies which are drawn up by the NGOs and the interventions by Non-Government Organisations (NGOs), government, and the other aid agencies. However, De Haan and Zimmerer (2020) noted that the pandemic posed a huge threat because informal food chains were interrupted and there were limited efforts made by the stakeholders to ensure that the informal food chain was made resilient.

De Haan and Zimmerer (2020) note that in some countries in South America such as Peru, Colombia, Ecuador, and Bolivia, the informal food chains' functions consist of both the biodiversity of food as well as agriculture. According to De Haan and Zimmerer (2020), the production and distribution of agrodiversity across the informal sector are important as they allow for low-cost nutritional food.

Furthermore, De Haan and Zimmerer (2020) highlight a series of disruptors which occurred during COVID-19 that influenced the food chain. One area was the location of the retail markets such as vendors that catered to large vulnerable groups. In South America, informal household groups rely largely on informal food markets due to the fact that food is accessible, but there are also varieties of food to choose from. The COVID-19 pandemic led to a hard lock-down and strict regulation on food retailing which, in turn, led to the closure of farmer markets, informal markets and to the near-disappearance of urban vendors.

According to Resnick (2017), the informal economy has been playing a lengthy, vital role for the urban poor in relation to food security. Even though supermarkets have been expanding in the region, the urban poor are still very dependent on the informal markets and street traders for their everyday purchases. The urban poor only make use of the supermarkets periodically for their bulk purchases (Resnick, 2017).

Resnick (2017) notes that in urban Africa, the majority of the food ingredients like meat, fish, eggs and milk that are sold from the informal markets and are bought by those who are impoverished. Approximately 80-90 per cent of milk that is raw is bought from the street traders or retailers who are small-scaled in countries like Côte d'Ivoire, Kenya, Mali, and Uganda. Surveys also show that in 11 African cities, 70 per cent of the urban population constantly purchase their food items from street traders or other informal markets (Resnick, 2017). The current superfood markets in Africa are a huge element of food retail and will continue to be so for the unforeseen future (Resnick, 2017).

The dependency on the informal food sector depends on the wealth of a country. For example, in the South African cities such as Cape Town and Johannesburg, 90 per cent of households purchase their foods from the supermarkets. In Maputo, Mozambique, 23 per cent of households purchase from supermarkets (Resnick, 2017).

Resnick (2017) states that regardless of the important function informal markets play in tackling the food insecurities of the underprivileged individuals in urban areas, the governments situated within Africa have a challenging relationship with the informal sector. Resnick (2017) also argues that many African countries still practice street trading under a colonial-era legislation. What this means is that both consumers and sellers are being penalized).

A study undertaken by AFSUN on food sourcing notes that 70 per cent of households in Southern African cities get their food from informal markets. This figure increased by 25 per cent for cities such as Blantyre, Harare and Maputo (Kazembe, Nickanor and Crush, 2019).

Furthermore, the ADSUN study noted that informal markets which cater for foods play a vital role in many households, especially in the informal settlements. It is not only an important food source but more so an accessible one. Within the informal settlements 97 per cent of households make use of supermarkets. "..However, nearly three-quarters of the informal households shop at the supermarkets on a monthly basis. Close to 50 per cent get their food

from the informal food traders in the open markets, 29 per cent from street vendors and 19 per cent from tuck shops. The informal market is frequently used by over 75 per cent of the households. In addition, some 50 per cent of street vendor patrons and 51 per cent of tuck shop patrons utilize these outlets on an almost daily basis. This buying pattern is typical of households more generally with low and inconsistent incomes…" (Kazembe, Nickanor and Crush, 2019: 466).

In Lusaka, Zambia, a survey conducted by 475 urban households indicated that buyers make use of both modernized and traditional ways of retail trade (FAO, 2020). Approximately 73 per cent of households, where a clear range from those with the lowest income groups to highest income groups were recorded, were making use of modern supermarkets while another 73 per cent of households who visited the traditional markets indicated no difference in income groups (FAO, 2020) As noted by FAO (2020), modern retail outlets were visited once a week and large purchases were made, while the more traditional retail markets were visited frequently throughout the week to purchase any other additional food items.

Consumption

Theoretical overview

In the field of economics, consumption decisions are deemed to be easily predictable based on income and price as individuals are assumed to be profit maximizers (Liu, et al., 2016). However, this is criticised for ignoring non-rational behaviour in individual decision making. Consumption of food is in fact a multidiscplinary subject that can be explained from many perspectives that include cultural, economic, nutritional and sociological disciplines. The study of agrofood consumption from the lens of sustainability brings in even more disciplines as it includes ecological, and climate change issues. As such, there are several theoretical perspectives that can be used to study interventions directed towards achievement of sustainable agrofood consumption.

The consumption stage of the agrofood value chain can be explained through the lens of Malassis' theory of food consumption models which combines the demand capacity of consumers and the capacity of the food systems with social variables like evolution of cultural patterns, urbanisation and household structure (Collantes, 2021). The consumption models explain how food consumption evolves as societies go through various stages of development. The main food consumption models are the traditional systems which are characterised by self-consumption, dominated by producer-consumer actors, where the market is restricted to local exchanges and food with low energy values characterising diets of the poor.

The agro-industrial food system brings about the provision of food through the market as self-consumption disappears while the network of actors becomes longer, thus making the food system more complex because agriculture produces fewer final products and becomes an economic sector that produces intermediate inputs for the agrofood industry (Fonte, 2002).

While the household remains the locus of consumption, trade and distribution become vital as food supply takes place through the market and meals are also consumed outside the home like at the workplace and at restaurants. Fonte (2002) further pointed out that under this system, agriculture loses its connection with nature. Agrofood production is no longer determined by the biological characteristics of the cultivated species and the agro-ecological production processes that take into account territorial and seasonal constraints to ensure sustainable agriculture and consumption. Furthermore, more and more by industrial inputs that contribute to genetic manipulation of nature (Fonte 2002). Present-day agrofood systems are widely believed to be unsustainable and require changes on the consumption side as well as a reduction in demand for resource- and emission-intensive food products. These promote climate change mitigation by helping to accelerate the transition to sustainable agriculture (FAO, 2016). Thus, the drive across the world is an endeavour for consumption and consequently production and the entire agrofood system that operates within both the agro-industrial food system (or the satiety model) and the traditional model which embraces the interconnectedness between food consumption and the environment in which we live.

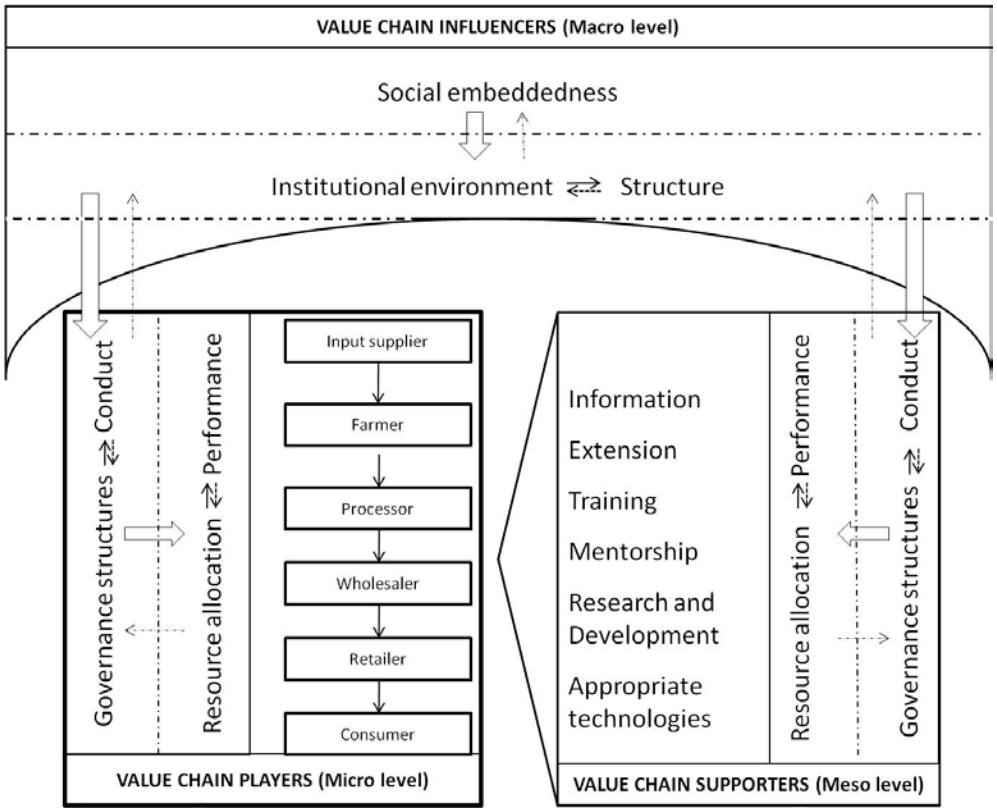
According to El Bilali (2020), the social practice theory (or approach) is mainly employed in agrofood research, focusing on the food systems consumption segment. The social practice theory considers demand and consumption to be the core of transitions in food sustainability that is required to attain sustainable food and nutrition security, given increasing resource scarcity, a rise in population, climate change and ecosystem degradation confronting the world (El Bilali, 2020). The social practice framework is mainly used to analyse consumption patterns. The social practice approach, as argued by Liu et al. (2016), combines social structures and human agency to analyse and understand sustainable consumption questions. Fonte (2002, p. 13) pointed out that consumption is a process comprising different stages that include: "how and where food is acquired, what is acquired, how food is prepared, how and where it is eaten, and how wastes are disposed of". Concurring with Fonte's argument, Warde (2013) stated that eating is a socially complex, elaborate everyday life activity that is understood with reference to its social embeddedness. Consumption of food is rarely given without reference to issues that the choices made in selecting foodstuffs, preparation of dishes and social arrangements made for meals (Warde, 2013). Consistent with Warde's line of thought, Parekh and Klintman (2021) argued that, given their huge potential as drivers of social change, Community Service Organisation (CSO), whose activities are targeted at consumers with the aim to encourage households to consume sustainable agrofoods, can be investigated and enhanced through insights from practice theory.

Key agrofood value chain actors

The agrofood value chain comprises direct actors who add value at each value chain stage who include farmers, buyers and processors, as well as indirect actors. According to Jordaan, Grové, & Backeberg (2014), the agrofood value chain actors also include value chain influencers who stipulate rules and regulations that have to be followed by value chain players (those directly involved in the '*farm to table'*) as well as value chain supporters that provide support structures

to help value chain players abide by the rules and regulations as stipulated by the influencers. Value chain influencers and supporters thus include all actors who provide value chain players with information, training and any other form of support, including helping value chain players to conduct their activities in a manner that meets the set rules and regulations. Figure 1 shows both direct and indirect actors along the agrofood value chain.

Figure 1: Agrofood value chain actors



Source: Jordaan, et al. (2014)

Sustainability (ecological, social. Economic, institutional)

According to FAO (2010), sustainable food is defined as "those diets with low environmental impacts which contribute to food and nutrition security and to healthy life for present and future generations. Sustainable diets are protective and respectful of biodiversity and ecosystems, culturally acceptable, accessible, economically fair and affordable; nutritionally adequate, safe and healthy; while optimizing natural and human resources."

The current agrofood value chain, from production through supply to consumption of food, is ecologically, economically and socially unsustainable because of its inability to meet both current and future human needs, failure to feed everybody satisfactorily, contribution to loss cultural heritage as well as its reliance on high usage of chemicals, fossil energy, and energy inputs, low-cost human work and long-distance transport (Lairon, 2012). It is thus extremely vulnerable to any socio-economic, financial, political or climatic crisis (Lairon, 2012). The current global food consumption, and consequently its production, has dire sustainability impacts on the planet and people's health and wellbeing (Huntjens, 2021). The food system is

considered to be the main cause of water pollution affecting freshwater consumption, terrestrial ecosystem destruction and loss in biodiversity (Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, 2019).

Food safety and quality

An agrofood value chain includes all actions and people that enable an agricultural food product to move from the farm to the consumer. Production, agro-processing, distribution and consumption are the agrofood value segments. Along the agrofood value chain, there are product safety and quality concerns. Food security is intricately connected to food safety and nutrition (WHO, 2022). Food safety, FAO and WHO (2020) pointed out, "is the assurance that food will not cause any harm to the consumer when it is prepared or consumed according to its intended use". Concerns around the safety of food include contamination from inputs like pesticide residue, food additives, product exposure to contamination and sanitation fears of post-handling at various agro-processing and distribution phases administered by different actors along the value chain (Gereffi & Lee, 2009; Dhivya, et al., 2021). For this reason, governments have in place food control systems stipulating food safety standards and regulations to prevent unsafe and poor-quality products from reaching consumers (Dhivya, et al., 2021).

While safety and quality of food are critical in ensuring the health of all people, Hoffmann (2019) acknowledges the complexity of the agrofood system as food safety is both an economic issue and a health issue. Thus, enforcement of food safety requirements can risk excluding some people from the agrofood value chain, particularly those operating at a small scale which makes it impossible for them to adopt the set rules and standards like testing for hazardous substances (Hoffmann, 2019). Therefore, ensuring the health of consumers requires a holistic approach to food safety that includes food monitoring from production to consumption. This calls for the engagement of all major stakeholders including policy-makers, policy implementers, representatives of the private sector, civil society, academics and community representatives (Walker, et al., 2021).

Ensuring the safety and quality of agrofoods call for consumers who are willing to get safe food (whether from buying or own production), and have the ability to store and handle food safely (WHO, 2001; Hoffmann, 2019). However, Zhang, et al. (2016) argued that consumer decisions when buying food are less determined by food-safety concerns alone but are rather constrained by convenience, price of the food and its freshness. In addition, because food consumption is a social practice rooted in specific cultural, political, and established conditions, promotion of sustainable agrofood consumption should be informed by thorough knowledge of consumer behavior in obtaining food and of agrifood supply chain frameworks (Zhang, et al., 2016).

Case studies

Consumer perceptions on source of information on food safety in Beijing, China

Zhang et al. (2016) conducted a study that analysed the extent to which consumers have trust in food management and supervision in Beijing. The study included 400 households randomly sampled from six residential communities with varying income levels (low, middle and high), housing prices and infrastructure and facilities. The survey was undertaken in March 2013. According to Zhang et al. (2016), in Beijing, the source of information on food safety is derived from government more than from non-state actors like the private sector or civil society. Government continues to be regarded not only as the dependable information source but also the food safety supervisor by Chinese consumers, which is in contrast to European consumers who trust non-state players significantly higher, especially CSOs. This is attributed to limited knowledge about NGOs in China, which are also said to be less professional and less developed. Zhang, et al. (2016) further pointed out that the primary strategy of the Chinese government to enhance food safety is by increasing production of food and strengthening the responsibility of bigger businesses in leading national food systems while minimising the function of several smallholders as they are difficult to monitor.

Role of CSOs in encouraging green food consumption culture in China

Leggett (2020) conducted a study to investigate the role of CSOs in changing culture around consumption of green food among Chinese consumer. The study used qualitative analysis of insights from four Chinese environmental NGOs' microblogs in 2013. The insights were further investigated through interviewing consumers, green food producers and representatives of international NGOs and Chinese NGOs as well as participant observation in Beijing over a period of three months in 2016. Leggett (2020) found that consumption of green food in China is increasing due to the work of CSOs. Leggett (2020) acknowledged that Chinese government entities made efforts to resolve health and environmental challenges in agrofood sector by supporting improved sustainability in large-scale farming during the previous decade to promote consumption of green food. However, formal institutional voids neglect small-scale farmers and consumer trust as well as domestic consumption. The study found that CSOs have assisted in meeting the voids left by the state related to small-scale farming and consumer trust by establishing interpersonal relationships between producers and consumers via Community Supported Agriculture, farmers' markets, collective buying and family connections. The connections are established both online using social media such as Weibo and through offline networks.

Role of CSOs in driving social change through promoting sustainable food consumption in Sweden

Parekh and Klintman (2021) took a departure from focusing on attitudes of consumers and behavioural change in sustainable consumption research and applied the four integrative social practices of eating, the provision of food, food preparation, planning of meal occasions, and artistic judgments of taste to study the contribution of CSO work that targets households. The main focus of the in-depth interviews was on the selected CSOs that have programs that

explicitly address consumption of food by private consumers in Sweden. The analysis showed that CSOs in Sweden engage in a varied range of activities that range from collaborations with the private sector, political lobbying to informational drives that focus on society at large. Activities of CSOs were found overall not to always target particular habits, but their activities rather focus on individualistic decisions as channels for change. In line with the practice theory perspective, the authors suggest that CSOs could improve their activities towards sustainable private food consumption by adapting into practice-like approaches through focusing on specific habits, crucial elements of practice, groups of practices as well communities of practice.

Conclusion

This analysis provides insights about various segments of agrofood systems. For a value chain to be sustainable, it has to be stable across all spheres: ecological, economic, social and institutional. Existing evidence shows that the value chain is and easily disrupted by shocks. It is fragile and vulnerable to climate change shocks like unpredictable patterns of weather, floods, water scarcity and decreased soil fertility. The impact is also affecting food prices and worsening the food and nutrition security situation globally. Value chains are also easily disturbed by shocks such as COVID-19. Actions taken by the state including suspension of transportation of goods and other agricultural activities small-holder farmers are impacted more as they lack resources to cushion themselves against these shocks. Institutional sustainability is important to ensure that proper policies and implementation are in place and create a conducive environment, control pricing and promote ethical trade. However, there is limited information about the involvement of civil society organisations in the food value chain.

Food consumption is a multifaceted topic that touches on a range of other subjects. Food safety and quality is the heart of agrofood consumption. This speaks to the food utilisation feature of food security. People must consume a sufficient diet to attain nutritional well-being necessary for them to meet all their physiological needs. Consumption of an adequate diet is at the centre of affordability and health of the population. High quality and adequate diets are costly. High food prices hinder access to adequate food especially for vulnerable individuals and groups that cannot afford it. When people cannot afford adequate diets, they turn to poor diets and this results in negative health outcomes which, in the long run, create problems for the public health system. Huge numbers of illnesses experienced, and deaths recorded across the world that are attributed to unsafe food which have significant impacts on social and economic development (HLPE, 2020). Rapid urbanization and growth of supermarkets are some of the drivers of poor food consumption (Ronquest-Ross, 2016).

Transformation has also been the key concept in the value chain especially in relation to small-holder farmers. Rapid urbanisation and investment in technology are some of the drivers of transformation. Rapid urbanisation has been highlighted as one of the influencers of change within the food retail market. The discussion in this report has also exposed how some concepts are under contestation.

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