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Build-Back-Better from COVID-19 with the adoption of Sustainability Standards in Food Systems

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Abstract

The advent of the food system is an exemplary phenomenon that industrializes agriculture to secure food availability for the ever-growing population. However, food system activities have been causing negative impacts on the environment and the imbalanced global distribution of food causes food insecurity in many developing countries.

These challenges have been intensified by the COVID-19 pandemic. On the supply side of the food system, confinement measures and logistical disruptions have caused farm production implications. On the demand side, food producers themselves have been severely impacted by further food insecurity and poverty.

This paper aims to firstly highlight the socioeconomic drivers and barriers of trade and globalization in the food systems. Extending from these findings, this paper seeks to promote better and more sustainable ways to operate, produce, trade and handle food along the supply chain – one that does not harm those who produce them and does not contribute to the negative impacts on the environment. The use of Voluntary Sustainability Standards (VSS) in this case have been identified to meet those requirements and also help to foster transparency and traceability in the production of agri-foods.

Key words: Voluntary Sustainability Standards, Food Systems, Agri-food supply chains, COVID-19, Trade and Globalization, Developing Countries

Contents

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Introduction

The impact of COVID-19 has forced many developed and developing countries to halt their economies. The result of this economic slowdown has greatly affected the progress towards achieving the 2030 Sustainable Development Goals (SDGs).

A recent UNCTAD report remarked on the vulnerability of developing countries having to face exacerbated food crisis through both supply side and demand side channels. The report suggested that the restrictions on movement due to the pandemic have slowed down economic activity, potentially affecting food production and reducing food supply (UNCTAD, 2020b).

The supply side of food system ensures the availability, nutritional diversity and accessibility of food for the entire world population, where the facilitation of trade flow allows the specialization of production where it is the most efficient. However, with the disruption of the movement of food caused by confinement measures and logistical disruptions, this pandemic has also introduced protectionism that impacts the import and export of food products, farm production implications that affects food supply productivity and the postponement of climate-related global agenda that could worsen the already devastating environmental situation. The demand side of the food system is typically determined at the national level by consumer responses to changes in national income and prices. It also highlighted a significant amount of pressure required to meet higher quality standards associated with safety, environmental, welfare and ethic, while also keeping food accessibility in check. However, vulnerable communities such as farmers, including those that rely on farms for subsistence needs, and agri-food producers in developing countries, have been challenged with food availability, heavier pressure on food standards and risks of food price volatility caused by the pandemic.

This disruption has confronted sustainable development on many fronts: i) income instability for farmers, ii) with lower income, their access to nutrition is reduced which risks their food security, iii) farm owners´ access to farm inputs are limited which affects their production, iv) supply chain delays also risk food waste, v) food waste affects the environment as the inputs used to produce and harvest have essentially gone to waste and rotten food itself produces methane, a greenhouse gas more potent than carbon dioxide, and vi) greenhouse gases affect human health.

Food systems do not only provide food but also jobs, income, infrastructure, skills (socio-economic outcomes) and ecological services (environmental outcomes) (S Dury et al., 2019). Millions of agricultural workers – waged and self-employed, while feeding the world, regularly face high levels of working poverty, malnutrition and poor health, and suffer from a lack of safety and labour protection.[1] With low and irregular incomes and a lack of social support, many of them are spurred to continue working, often in unsafe conditions such as being exposed to the toxicity and risks of harmful chemicals like pesticides (Damalas et al., 2016) or even being abused,[2] thus exposing themselves and their families to additional risks.

The impacts caused by COVID-19 on agri-food supply chain and more so, the disruption on the entire food system demonstrates precisely the dire need to advance the 2030 Sustainable Development Goals (SDGs). Recovery strategies must therefore be targeted to pursue goals that also reflect the quality of life, especially of the vulnerable stakeholders involved in agri-food supply chains, beyond public healthcare. This is in line with the United Nations push to incorporate the SDGs in the COVID-19 economic recovery strategy.[3] This crisis has in fact re-enforced the interdependence of the world, where the response to the

[1] https://www.who.int/news/item/13-10-2020-impact-of-covid-19-on-people's-livelihoods-their-health-and-our-food-systems

[2] https://www.prindlepost.org/2019/07/farmworker-abuse-and-agricultural-exceptionalism/

[3] United Nations SDGs Framework for Covid-19 Recovery mentions: “Leveraging this moment of crisis, when usual policies and social norms have been disrupted, bold steps can steer the world back on trade towards the SDGs. This

pandemic cannot be de-linked from the SDGs and requires a stronger collective multi-stakeholder approach to achieve the common global goal.

The aim of this research paper is to provide a scope where sustainability standards can play a role in the food systems. With the extensive analyses gathered on the impact of COVID-19 on the food system, this paper seeks to identify the production challenges with regards to the agri-food supply chain sector in developing countries. Developing countries have been selected because of the negative externalities argued with respect to food systems, such as the increase of social inequalities and environmental degradation (S Dury et al., 2019; p17). Thus, by taking this argument into account, this paper regards that food and nutritional security in developing countries, despite being the world´s key agri-food exporters worldwide,[4] cannot be achieved without combating social inequalities and reducing the effects of environmental degradation.

Based on this argument, this paper is focused on better and more sustainable ways to operate, produce, trade and handle food throughout the entire supply chain – one that does not harm producers and does not contribute to the negative impact on the environment. The use of sustainability standards can help to foster transparency and traceability along the supply chain.

Voluntary Sustainability Standards (VSS)[5] are widely used today to govern environmental, social and ethical issues in global supply chains. Today, there are over 270[6] VSS available in the market. Agriculture is the sector most covered by VSS and many food industries today are putting certification schemes at the centre of their sustainability approaches. The analysis from this paper seeks to promote economic growth for developing countries and most importantly, the transformation of conventional agri-food supply chain towards a more sustainable pathway.

This paper has been structured with Section 1 highlighting the socioeconomic drivers and barriers of trade and globalization in food systems; Section 2 presents COVID-19 socioeconomic impact on the supply-side of the food system; while Section 3 indicates COVID-19 socioeconomic impact on the demand-side of the food system, Section 4 focuses on integrating VSS into the food system; and finally, Section 5 will draw conclusions from preceding sections.

is the time for change, for a profound systematic shift to a more sustainable economy, that works for both people and the planet ... The SDGs are vital for a recovery that leads to greener, more inclusive economies, stronger, and more resilient societies." https://www.un.org/sustainabledevelopment/sdgs-framework-for-covid-19-recovery/

[4] One-third of the world´s agri-food exports come from developing countries - Authors' calculations based on UNCOMTRADE data source

[5] The United Nations Forum on Sustainability Standards (UNFSS), describes VSS as ''specifying requirements that producers, traders, manufacturers, retailers or service providers may be asked to meet, relating to a wide range of sustainability metrics, including respect for basic human rights, worker health and safety, the environmental impacts of production, community relations, land use planning and others''. Therefore, VSS are expected to enhance the export potentials from developing countries to developed ones, and at the same contribute to sustainable development by safeguarding public health and safety and ensure consumer, environment, and social protection.

[6] The number of VSS in the Standards Map database is constantly increasing. See www.standardsmap.org for the most up-to-date information

1. Socioeconomic drivers and barriers of trade and globalization in food systems

The profound idea behind the global food systems is often attributed to the Green Revolution. The Green Revolution refers to the renovation of agricultural practices that was triggered in the 1960s in order to match the food demand of the ever-increasing global population.[7] This trend resulted from the introduction of hybrid strains of wheat, rice and corn (maize) and the adoption of modern agricultural technologies in Mexico, India, Pakistan, the Philippines and other developing countries. The worldwide food production per capita has greatly increased since then. Taking cereal production as an example, where the increase between 1961 to 2014 has been measured up to 280 per cent, if this is compared against the total increase of global population (136 per cent over the same period), it is evident that the global cereal production has grown at a much faster rate than the population.[8] This has made the idea of industrializing agriculture more pronounced.

The traditional view of international trade that each country produces and exports final products to consumers abroad has shifted to a more agile operation known as global supply chains. Supply chains became a dominant feature of world trade over the past decades in part due to technological innovations allowing firms to split production processes across countries. Increasingly, trade is determined by strategic decisions of firms to outsource, invest, and carry out activities wherever necessary skills and material are available at competitive cost and quality.

Global trade, in combination with the outcomes of the Green Revolution, has contributed to the specialization and intensification of local food systems across the world targeted to maximize yields with lower costs, thereby increasing profits.The rapid globalization of agri-food supply chain has led to increasingly interconnected food systems, meaning that disruptions in one place can cause synchronous shocks across other regions and sectors (Cottrell et al., 2019).

Agri-food global supply chains witnessed rapid and profound changes in the last decades, including a strong increase in agri-food trade and a consolidation of supply chains (Dequiedt, 2018). These changes will have a huge impact on smallholder farmers: positive if they are able to participate in the global value chain and exploit the opportunities it offers in terms of access to new markets for inputs and/or products; and negative if they are excluded from global value chains because they are unable to meet the requirements for entry. Reaching those markets is often not direct and necessitates intermediaries that are gatekeepers of the global value chain.

The diversification, differentiation, and improvement of agriculture in developing countries is critical for economic growth and poverty eradication. Since agriculture is the dominant source of employment in developing countries, agricultural productivity is in most cases the main determinant of incomes of the majority of the workforce. Low productivity in agriculture is a major reason for the prevalence and persistence of poverty in developing countries, keeping much of the rural population trapped in a vicious cycle of poverty (UNCTAD, 2015). Increasing production and export of agricultural products can effectively reduce rural poverty in developing countries. The case for promoting agricultural exports in this context is thus quite strong.

This chapter aims to elucidate the role of trade and globalization for food system resilience (Dury, S. et al, 2019). Trade has an impact on food and nutrition security given that many food producers and farmers in the rural parts of developing countries are not always nutritionally secure, due to their limited access to food variation. Trade affects food production prices, employment, and public revenues in both developed

[7] The history of the Green Revolution has been summarized here https://www.encyclopedia.com/plants-and-animals/agriculture-and-horticulture/agriculture-general/green-revolution.

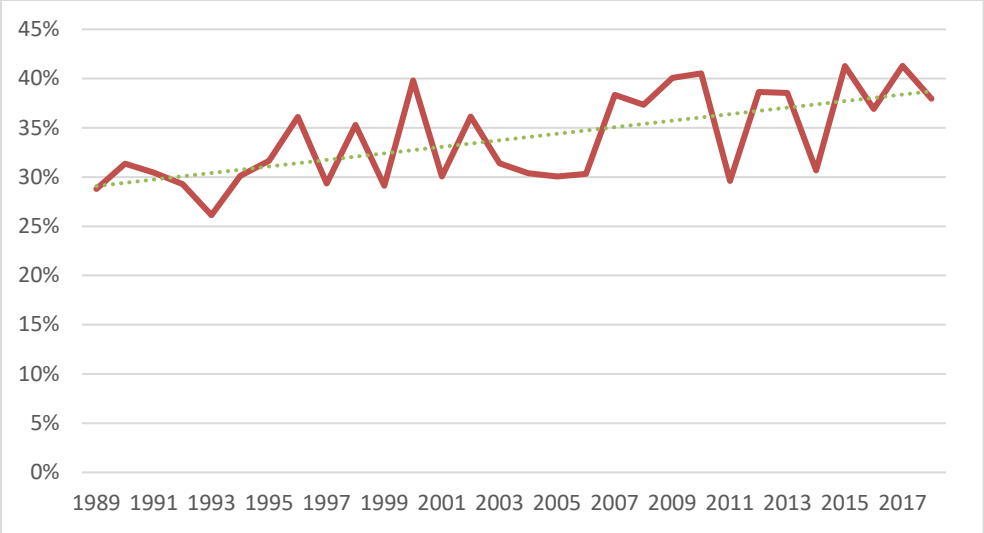
[8] https://ourworldindata.org/yields-vs-land-use-how-has-the-world-produced-enough-food-for-a growing-population

and developing countries. However, the detriments are more severe to developing countries. International trade has grown strongly thanks to the standardization of products and the definition of grades, making it possible to exchange goods globally. Globalization shapes the food environment, in particular through the development of standardized industrial food products and the expansion of supermarkets through companies with a global reach.

1.1 Economic value of agriculture and agro-based manufacturing exports

Since the early 90s, developing countries accounted for around one-third of the world´s exports in agri-food products. Figure 1 shows that even with ups and downs in the share of their agri-food exports, evidence illustrated a clear upward trend of developing countries participation in agri-food value chain.

Figure 1. Share of developing countries agri-food exports to world total agri-food exports from 1989 to 2018

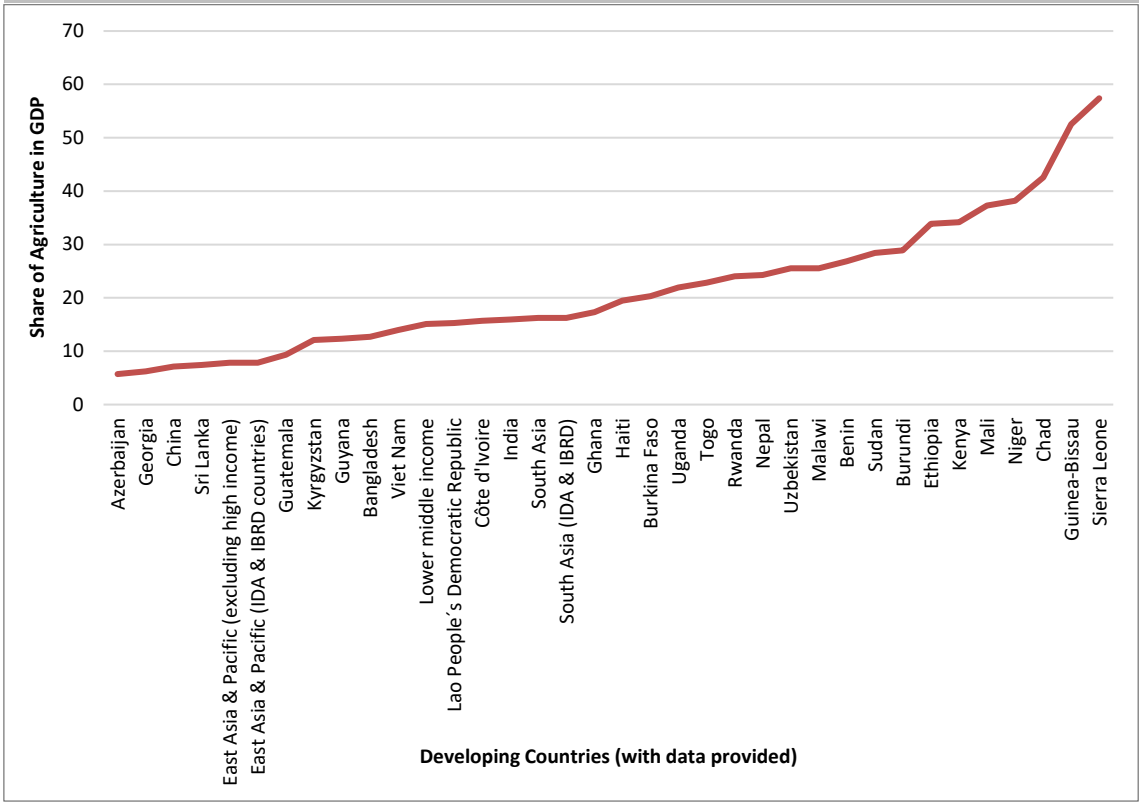


Source: Authors' calculations based on UNCOMTRADE data.

There are however some obstacles in the agriculture sector exports from developing countries, such as the high sensitivity to the quality of transport and trade-related infrastructure. A 10 per cent improvement in transport and trade-related infrastructure quality has the potential of increasing developing countries agricultural exports by 30 per cent (Moïsé E et al., 2013). This highlights the impact of efficient and accessible transport on countries´ capacity to explore market access opportunities for their agricultural products. This also means that shocks impacting the quality of transport and trade-related infrastructure will affect the sector massively.

The economies of many developing countries are based on the exploitation of agriculture and agro-based manufacturing that are correspondingly important in relation to their economic development. Figure 2 shows the share of agriculture in GDP in 2019 where most African countries topped the charts – Sierra Leone (57.4 per cent), Guinea-Bissau (52.5 per cent), Chad (42.5 per cent), Niger (38.2 per cent), Mali (37.3 per cent), Kenya (34.1 per cent), Ethiopia (34 per cent), Burundi (29 per cent), Sudan (28.4 per cent), Benin (27 per cent) and Malawi (25.5 per cent).

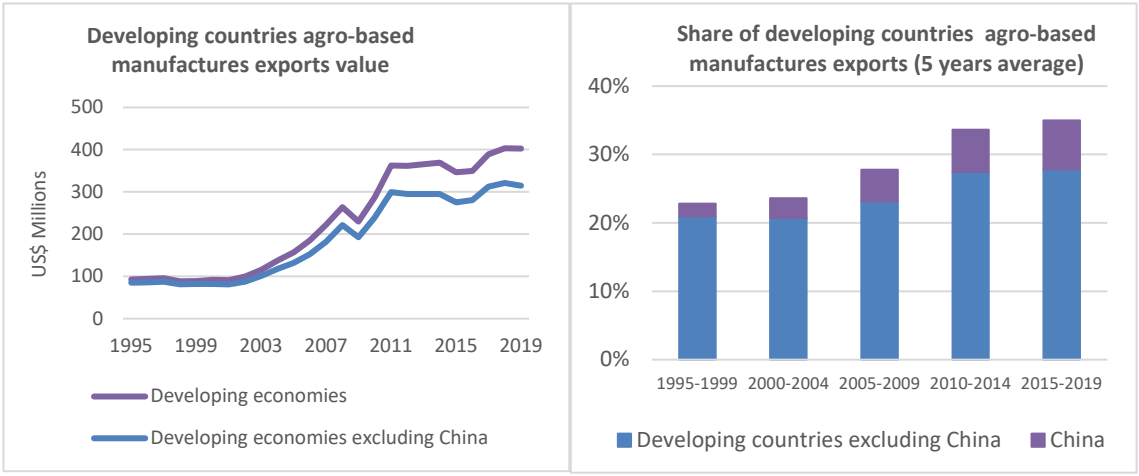
Figure 2. Share of agriculture in GDP in 2019



Source: World Bank Data.

Figure 3 shows the integration of developing countries in the agro-based manufacture value chain. In 2019, the value of their exports was about 28 per cent of the world's exports, excluding China; China alone accounted for around 7 per cent of the world´s export. In value terms, in 2019, developing countries agro-based manufacture exports was approximately US$310.

Figure 3. Developing countries agro-based manufactures exports



Source: Authors' calculations using data from UNCTAD Statistics.

Agro-based manufacturing contributes to the economic strength of an area by increasing the value of the raw materials, either by extending the product life or by converting them into more desirable commodities. In this way, they stabilize the economy by rendering the primary products of the country into more

marketable form. Such products can be sold more steadily, consistently, and reliably over a period, whereas the primary products of agriculture may normally sustain only a limited storage period and are generally seasonal in nature (FAO, 2000).

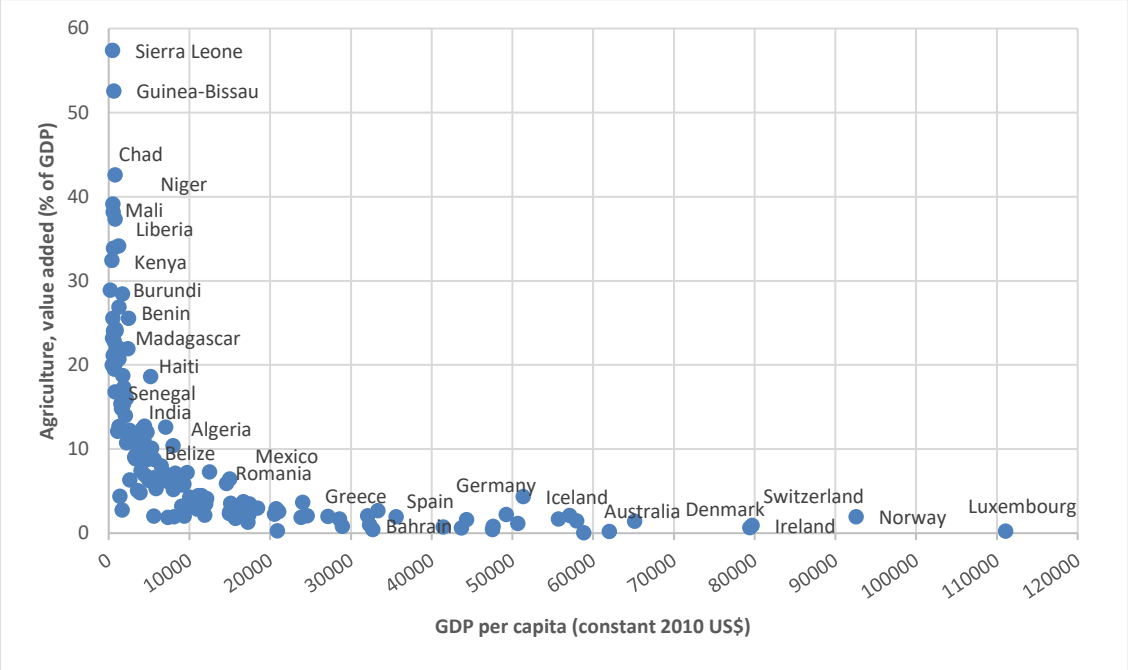
Hence, traditional exports of raw agricultural products from one country to another have been complemented by the intense integration of the global food supply chains. Agriculture and agro-based manufacturing are thus considered as engines for development, allowing for additional and consequential development of other industries that lead, in turn, to overall growth of the community and the country.

1.2 Employment

The International Labour Organization (ILO) estimated that 1.1 billion people are engaged in agriculture and close to half of them (300-500 million) are waged workers, many of whom depend on incomes from jobs in the plantation sector.[9] In Sub-Saharan Africa, agriculture in a broad sense (including pastoralism, agroforestry and fishing) remains the mainstay of livelihoods, with 57 per cent of the active population working in the sector (ILO, 2018). Most of these people are small family farmers, struggling to make a decent living and thereby falling into the vulnerable and working poor category (S Dury et al., 2019).

Figure 4 illustrates the share that the agricultural sector contributes to the total output is high in less prosperous economies, thus conforming that the importance of the agricultural sector in the economy increases as countries get poorer.

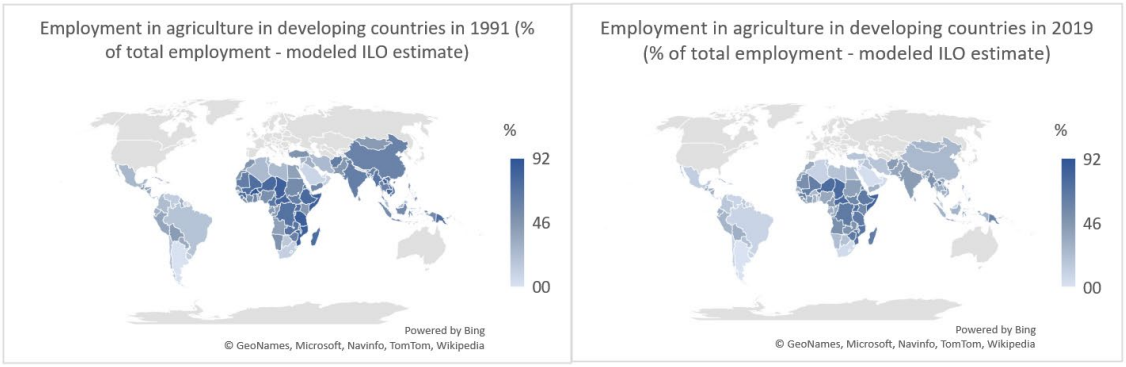
Figure 4. Share of agriculture in GDP vs GDP per capita in 2015



Source: World Bank.

[9] Read ILO full article ´Agriculture; plantations; other rural sectors´- https://www.ilo.org/global/industries-and-sectors/agriculture-plantations-other-rural-sectors/lang--en/index.htm

Figure 5. Employment in agriculture in developing countries in 1991 and 2019



Source: Authors' calculations based on UNCOMTRADE data.

By comparing the percentage of the population employed in the agricultural sector in developing countries between 1991 and 2019, as illustrated in Figure 5, it is apparent that agriculture will continue to be one of the vital sectors for employment in developing countries. Although countries in Asia and Latin America have experienced a decrease in employment in agriculture as they start shifting to industry and service sectors, Africa is still dependant on the agricultural sector as its source of employment.

Parallel to this, gender studies should also be accounted for in agricultural employment. Data gathered from the World Development indicators found that the share of women compared to men employed in agriculture is larger and that they are mostly concentrated in low-income countries. Female employment in agriculture in low-income countries is about 62 per cent and 44 per cent in lower-middle income countries, but just a mere 18 per cent of agricultural employment in upper-middle income countries are female. Equivalent to male employment in agriculture, an average of 56 per cent and 36 per cent represent low income and lower-middle income countries respectively, and only 23 per cent of male employment in agriculture is recorded for upper-middle income countries. However, even with the share of women employed in agriculture is larger to that of men, there still requires justification on whether their employment relies on the informal wage channel. This is also important to take into account because working in the informal sector leaves workers without any protection of labour laws and social benefits.

The Sustainable Agriculture Network for example, laid out eight practical recommendations to guide the agricultural sector towards the creation of decent work conditions,[10] with a shared vision that the creation of optimum employment opportunities within agriculture is an essential driver for rural development and for more equitable and inclusive societies. Income inequalities and the lack of optimum working conditions adversely affect the contribution of the agricultural sector towards the reduction of rural poverty and achieving sustainable development.

1.3 Wages

Despite playing an important role in national economies and providing a link with the global structures of agriculture and trade, many agricultural workers engaged in the sector in developing countries are characterized by precarious working conditions with little or no social protection (ILO, 1996). Nonetheless, the agriculture sector will continue to be a major employer in low-income countries. A decrease in the share of the workforce employed in Sub-Saharan Africa agriculture is still accompanied by an increase in agricultural employment in absolute terms. This is because the population is growing fast and cultivated land is exapnding. Given high population growth, the Sub-Saharan agricultural workforce is projected to continue swelling in the foreseeable future. (Christiaensen and Brooks, 2019).

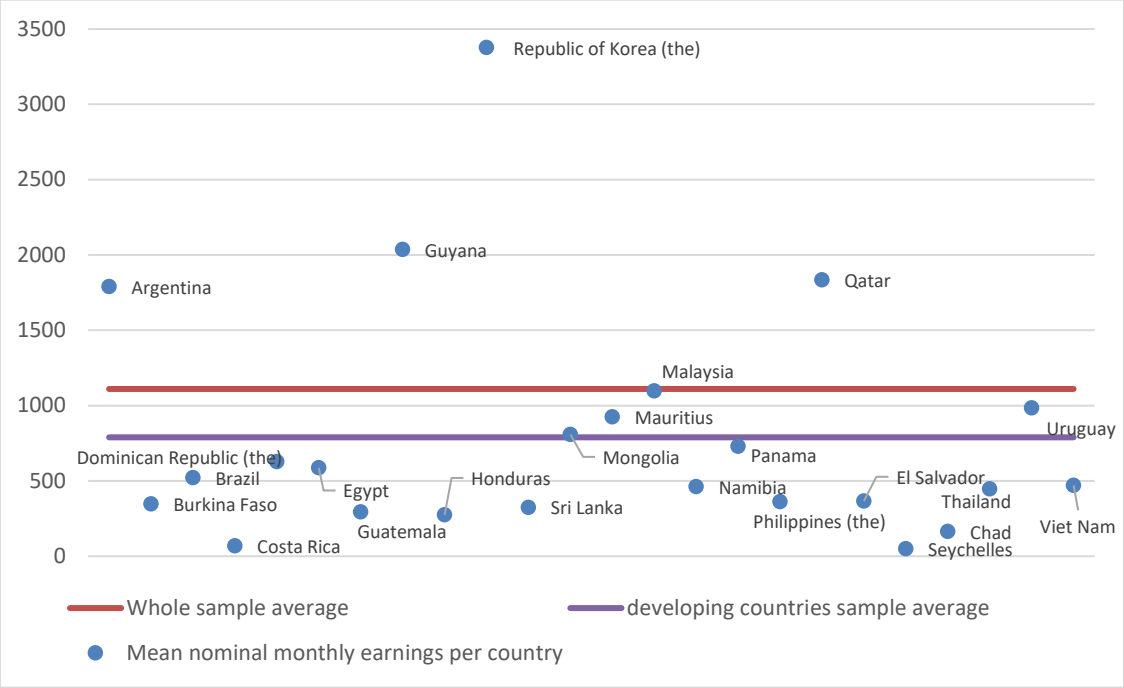
However, the wage elasticity in agricultural sectors in developing countries is a source of concern. Even if millions of workers are active in agricultural production worldwide, their wages often place them on the

[10] Sustainable Agriculture Network (SAN) Protection of worker´s rights. https://bit.ly/3aAPNWi

bottom rung of the rural poverty ladder and even below subsistence level. Work in agriculture tends to be seasonal with labour productivity often low and unpredictable. Through the realization that agricultural earnings are generally low, which also contributes to low productivity, it may be one of the reasons why workforces tend to shift out of rural agricultural activities into more stable and higher-paying jobs in the urban areas. Thus, the rural-urban migration may also contribute to this phenomenon as people consider other livelihood factors in relation to risks, aspiration and socio-economic conditions. For many, migration from rural to urban areas is a way to cope with unemployment, food insecurity, poverty, or vulnerability to climate change. This pattern of structural transformation is unfolding in low-income countries (Christiaensen et al., 2020).

Figure 6 shows that the mean nominal monthly earnings of employees in agriculture, with few exceptions, remains low. This figure plots the mean nominal monthly earnings of employees in agriculture, fishery and forestry for selected developing countries in 2018.[11]

Figure 6. Mean nominal monthly earnings of employees in agriculture for selected countries in 2018 (2017 PPP $)



Source: Authors' calculations using data from ILO statistics.

Incomes also includes that of farmers and food producers, affecting their ability to invest in order to increase productivity. Many technologies are widely available but are not broadly disseminated because of poverty among a major portion of the rural population (S Dury et al., 2019). Against this background, it is also worth noting that technological revolutions have also been arguably the cause of accelerating labour exits out of agriculture in many countries. While this phenomenon may have a larger negative impact on wage labourers in low-income countries and its economy, automations are however celebrated

[11] Figure 6 shows the mean of the sample (for 27 developing countries, as well as the world mean for all countries that have available data (around 52 countries).In addition to the developing countries illustrated in the figure, the whole sample included some developed and emerging countries like Austria, Azerbaijan, Belarus, Bulgaria, Bosnia and Herzegovina, Czechia, Estonia, Georgia, Greece, Italy, Kyrgyzstan, Latvia, Lithuania, Luxembourg, New Zealand, Norway, Poland, Portugal, Republic of Moldova, Romania, Serbia, Slovakia, Slovenia, Sweden, Ukraine.

as innovative incentives to effectively produce more with less effort in more developed and industrialized countries.

Moreover, when producers lose income, there is a greater risk of child labour, forced labour and other human rights abuses in global supply chains. This also means that deforestation could be aggravated as farmers seek more fertile land to increase their earnings.[12] All these shortcomings are not attractive for younger generations who are more likely to give up farming altogether. This puts the long-term viability of agricultural supply chains in doubt.

For this reason, the incomes and social welfare of farmers and food producers can also concern public revenues. These issues are determining factors for a government to invest in the agricultural sector, to implement policies and to regulate the sector.

Public policies can influence the food systems through many tools, such as regulations and laws, investments, subsidies and taxes, information and legitimation or support for actors involved in the food systems (S Dury et al., 2019). While most countries have agricultural policies, few have food policies, or limit these policies to food availability and food safety (HLPE, 2017).

1.4 Food Security

Feeding the world of an ever-increasing population will be a challenge and therefore requires sustainable agricultural practices in order to supply future needs. Land degradation and the limits of land availability, scarcity of resources, such water and phosphorus, and climate change will also determine the future conditions and constraints in food production. Without sufficient adaptation measures, climate change will negatively impact food production in many areas (Lobell et al., 2009).

Food systems in general, have been affecting the planet with its significant contribution to climate disruption that threatens the world. Food systems activities tend to undermine biodiversity, contributing to the mass extinction of species, ecocide,[13] soil loss, land degradation, air pollution, greenhouse gas emissions etc. The effect of food systems is different between developed and developing countries for example, the priority for food systems action in a developing country might be tackling post-harvest losses and use of pesticides, whereas in a developed country, it might be land degradation caused by continuous monocropping, or food waste.

With regards to the access to food, the United Nations World Food Programme's latest data shows that the food insecurity of 135 million people was categorized as crisis level or worse.[14] The number of people who are acutely food or nutrition insecure will rapidly expand. This is especially important to take note given that the discussion of this paper predominantly relates to agri-food supply chain. The global food system is off-balance, having one side of the globe with 800 million people who are suffering from chronic hunger[15] and on the other side with 2.8 million people dying each year as a result of obesity and overweight.[16] Despite being food producers , smallholder producers in the rural areas of developing countries are disproportionately at risk of food insecurity due to their low incomes.[17]

[12] https://www.weforum.org/agenda/2020/06/sustainable-supply-chains-covid-19-era/

13 As a concept, ecocide refers to both naturally occuring processes of environmental or ecosystem decline and destruction of the environment that is caused by human activity. Ecocide damages the ecosystem thereby harming the health and well-being of affected species (including human).

[14] https://www.wfp.org/news/covid-19-will-double-number-people-facing-food-crises-unless-swift-action-taken

[15] https://news.un.org/en/story/2019/07/1042411

[16] https://www.who.int/news-room/facts-in-pictures/detail/6-facts-on-obesity

[17] http://www.fao.org/news/story/en/item/1268059/icode/

Increase trade flows tend to polarize situations with some regions taking an increasing share of the world market, particularly South America, while others are increasingly depending on imports, such as Africa and China (Kastner, Erb and Haberl, 2014). The geo-political context will be a key determinant of how countries cooperate to ensure the global food balance.

2. COVID-19 socioeconomic impact on the supply side of the food system

The supply side of the food system renders the availability, nutritional diversity and accessibility of food for the entire world population, where the facilitation of trade flows allows the specialization of production where it is the most efficient.

As mentioned in section 1.1, developing countries make up about one-third of the agro-food product exports worldwide. However, the COVID-19 pandemic has placed unprecedented stresses on agri-food chains, with bottlenecks in farm labour, processing, transport and logistics, as well as momentous shifts in demand.

Logistical challenges within supply chains, particularly cross-border and domestic restrictions of movement, as well as labour issues on the other hand, have resulted in many job losses. High-value, and especially perishable commodities, such as fresh fruit and vegetables, meat, fish, milk and flowers, are likely to be particularly affected. Restrictions on movement have also prevented farmers from accessing markets and resulting in food waste.

The World Trade Organization (WTO) expects world trade to fall by 13 to 32 per cent by 2020,[18] while UNCTAD predicts around 20 per cent for the same year (UNCTAD, 2020).

Figure 7. A step down in Global trade in goods

Source: UNCTAD: Global Trade Update (2020)

[18] Data retrieved from the trade forecast press conference: remarks by DGA Azevedo. https://www.wto.org/english/news_e/pres20_e/pr855_e.htm

Trade contraction from COVID-19 has been deeper than the 2018 financial crisis. UNCTAD's latest Global Trade Update (released in October 2020) indicated that the value of international trade in goods has declined by about 19 per cent in the second quarter of 2020. Preliminary data for Q3 suggest that global trade growth has remained negative in Q3 with a further decline of about 4.5 per cent on a year-over-year basis (see Figure 7 – UNCTAD, 2020).

Confinement and the consequent delays of movement of goods harm developing countries that depend mostly on agriculture. For example, up to 70 per cent of the population in Kenya depend on income from farms that export fresh produce. During the first weeks of reported cases in Kenya, exporters reported reduced airfreight capacity due to ban on passenger flights which constituted 40 per cent of the total fresh produce exports capacity (OECD, 2020).

With the COVID-19 crisis, fundamental changes in supply chains took place, as follows.

2.1 Confinement measures, transportation, and logistics

Due to health precautions, many companies stopped operating in order to prevent the spread of the virus and to abide the social distancing rules. This greatly affected supply chain operations. Limits on mobility of people have reduced the availability of seasonal workers for planting and harvesting in food sectors in many countries.

Bottlenecks in transport and logistics have disrupted the movement of products along supply chains. Extra checks (e.g. requirements of new and/or additional certificates) at borders translate to delays that are detrimental to perishable goods. There are reports that some countries quarantine trucks and/or drivers, thereby significantly reducing ground fleets (OECD, 2020). Quarantines also apply to ships, which need to stay longer in port as a result, leading to increased risks of produce damage and longer delays reaching markets (*ibid*).

2.2 Protectionism direction

As pandemic measures continue to deteriorate economies around the globe, many governments have also implemented export restrictions that aimed at isolating domestic food markets from global market developments. These measures contributed to reduce global supply, leading to even higher food prices which can be detrimental for developing countries who are already faced with food security challenges.

In the same vein, governments are also pressured to implement protectionist policies and measures on import restrictions which includes tariffs, quotas and various forms of subsidies as a way of saving domestic jobs and enterprises. These restrictions are known to introduce economic distortions and reducing the income of countries and the welfare of citizens.

Although linkages to raising tariffs are more complex, one can also consider their risks to reduce productivity and output, increase unemployment, and raise inequality. This greatly affects supply chains as producers, especially small-scale farmers in developing countries, who are often challenged by having access to nutritious food, have also been hindered from accessing markets to sell their products or even buy essential inputs to operate their productions.

Against this background, there is a clear need to keep trade flowing, both to ensure the supply of essential products and to maintain the cooperation of the global economy.

2.3 Farm production implications

Farm production has been affected by bottlenecks for inputs. The interruption of the production fertilizers by some suppliers due to lack of staff puts in serious difficulty to the manufacturers of raw CO_2 (fertilizers). Other inputs such as seed and pesticides are also affecting farm production particularly affecting smallholder farmers in developing countries as closures of village-based agro-dealers added to the inability

to access affordable inputs for farm production (OECD, 2020). The availability and affordability of agricultural inputs may make these inputs more expensive than what these farmers are accustomed to.

In East Africa for example, the locust infestation is a major concern as locust swarms have already disrupted food production in some countries, and logistics bottlenecks from COVID-19 could impede responses like delaying the provision of necessary means to protect crops. According to the FAO (2020) bulletin on desert locust upsurge report update, an estimated 100,000 hectares had been affected in Ethiopia and Kenya. This could create a food security shock in rural areas as well as potentially drive-up prices for food crops across East Asia, further exacerbating the shock from reduced incomes.

Hence, there is scope for developing countries´ governments to designate suppliers of farm inputs like seed, fertilizers and chemicals, and ploughing serve providers as critical interventions to protect and support farmers through their subsistence needs and ensuring uninterrupted food productions.

2.4 Labour shortages and shutdowns

The agri-food workforce relies heavily on seasonal labour. Labour is needed to undertake plantings, the absence of which will lead to problems with the mid-term supply of certain products, will lead to an increase in prices – harvesting season is imminent for many products and the lack of workers pose a severe constraint that could lead to loss of produce and shortages in the market.

Moreover, perishable goods are affected due to the movement disruption of goods, resulting to massive food wastes as production surpluses decays- releasing methane thereafter, a powerful greenhouse gas contributing to furtherclimate crisis.[19]

In Kenya, contract farmers that supply to processing and exporting companies through a binding arrangement, decreased by nearly 50 per cent in March 2020 (OECD, 2020). Operationally, companies are resorting to laying off casual workers and placing some permanent staff on paid/unpaid leave.

Most of these workers who are already challenged with access to food will risk further food insecurity, not due to the unavailability of food but on the effects of losing income, subsistent needs and more importantly, their livelihoods.

3. COVID-19 socioeconomic impact on the demand side of the food system

Demand is typically determined at the national level by consumer responses to changes in national income and prices. Today, the demand side of the food system renders upon the need to meet higher quality standards associated with safety, environmental, welfare and ethic, while also keeping food accessibility in check.

The need to meet the demand for a growing world population is not a new world food trend. The world population was growing at a 2 per cent annual rate from the sixties to the eighties. Since then, the world population increased by 2.5 billion people, reaching 7.7 billion worldwide in 2019 (European Commission, 2019).

Facilitated through trade, consumption has been growing faster than population in the past two decades, resulting in a rise of consumption per capita which the European Commission (2019) has described two main developments that contributed to this, 1) income growth, which leads consumption towards larger

[19] To learn more about methane on the rise, visit https://www.epa.gov/lmop/basic-information-about-landfill-gas.

quantities and towards high-value products; and 2) changes in consumer preferences, which move in very different patterns and paces, resulting from societal habits, health concerns, and emerging drivers as environmental or climate change matters.

However, this is not the case in developing countries, especially after being affected by COVID-19 crises.

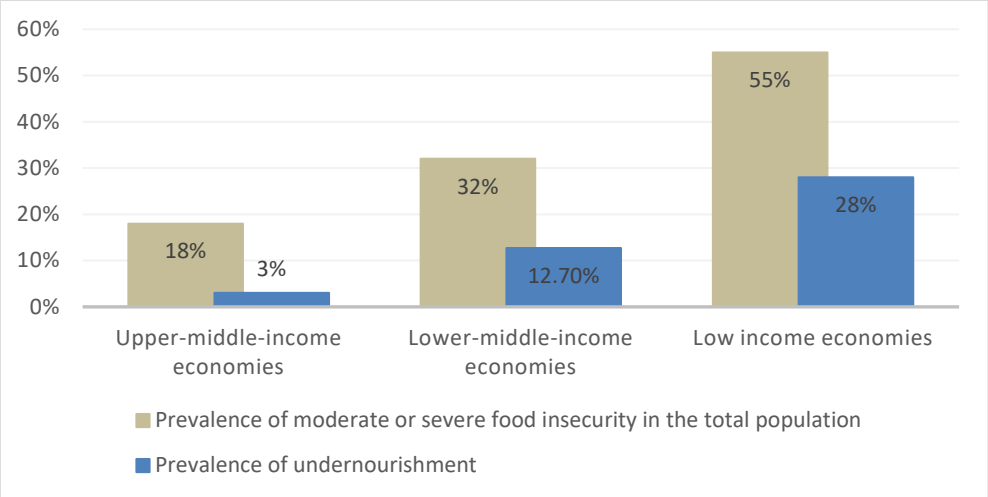
3.1 Food availability

Despite playing an important role in national economies, providing a link with the global structures of agricultural and trade, many agricultural workers engaged in the sector in developing countries are characterised by casual forms of labour, precarious working conditions and little or no social protection (ILO, 1996). With low wages to begin with, and no sick leave or any form of income during the lockdown, these workers are the most vulnerable to food insecurity.

Furthermore, many low-income developing countries are also dependent on imports for their food consumption. These countries spend 37 per cent of the value of their merchandise exports on food imports (UNCTAD, 2020b). For example, in the Caribbean Community (CARICOM), 11 countries import more than 50 per cent of their food needs and food security could become even more challenging if stock of hard currency is depleted, depending on the duration of the pandemic (ibid). Similarly, Nigeria depends on food import for a tenth of its food needs, but the border closures and restrictions on movement have also affected the availability of food in the markets.[20] The challenges posed by the pandemic have thus once again highlighted the relevance of the long-term debate about food security in developing countries.

Prior to the onset of this pandemic, more than 820 million people were already identified as chronically food insecure (United Nations, 2020). Data gathered from FAOstats as illustrated in Figure 8 shows that low-income countries were already facing high prevalence of undernourishment – 28 per cent. Additionally, 55 per cent of the population faced severe or moderate food insecurity.

Figure 8. Prevalence of severe, moderate food insecurity and undernourishment in the total population (percentage, 2017-2019 average)



Source: Authors' calculations using data from FAOstats.

In Mali, a paradoxical situation has been identified where substantial agricultural production was concomitant with the widespread of child malnutrition (Dury and Bocoum, 2012). The authors have hypothesized that child malnutrition, reaching the highest level in this region, is linked to less diversified

[20] https://www.icrc.org/en/document/nigeria-sharp-increase-food-prices-caused-covid-19-raises-fear-hunger

food consumption and probably a lack of care, as a result of an overload of agriculture labour. Thus, the interactions between health, nutrition and agriculture are mutual – agriculture affects health and health affect agriculture, both positively and negatively.

More than 2 billion small producers, farm labourers, rural workers, and their families, who represent a large proportion of the moderately and severely food insecure are affected by this economic shock (United Nations, 2020).

COVID-19 had also been claimed to heighten the risk of child labour in agri-food supply chain. A recent report by the International Cocoa Initiative compared more than 50 studies looking at how changes in income impact child labour.[21] It stated that when household incomes unexpectedly decrease, child labour tends to increase. However, the interplay of income and child labour is complex, and there are numerous other factors to be considered such as market failures, net returns to schooling, local labour market conditions, and family and cultural context, when trying to enhance farmer incomes in order to address child labour.

From these analyses, there is a dire need to link social protection in agricultural settings in order to support marginalized agricultural workers. Social protection systems are vital for farmers in developing countries who are challenged by the informal nature of their work and food insecurity.

3.2 Heavy pressure on food standards

The application of sound principles of environmental sanitation, personal hygiene and established food hygiene practices help to reduce the likelihood that harmful microorganisms that threatens the safety of the food supply, regardless of whether the food is sourced from intensive agriculture, small stakeholders or the wild.[22]

Heavy pressure on food safety standards is not a new phenomenon, considering foodborne diseases being responsible for 420,000 deaths each year, one-third of them in Africa (WHO, 2015).

At the beginning of the pandemic, two-third of the reported cases had previously visited the Huanan seafood wholesale market where live animals were sold close to seafood and meat products, suggesting that the virus was transmitted from animals to humans (Guan et al., 2020; Harapan et al, 2020; Naserghandi et. al., 2020). This could be an indicator given that the suggested cause of the novel SARS[23] outbreak in 2003 was isolated from horseshoe bats (Olaimat AN et al., 2020). However, to date, the impact of the seafood market in spreading COVID-19 is not fully understood (Harapan et al., 2020), and that there is no study that reports COVID-19 spreading via food products (Olaimat AN et al., 2020).

Nonetheless, food service operators were among the first workers in frontline employment sectors experiencing the impact of the COVID-19 pandemic (Olaimat AN et al., 2020), especially because food manufacturing is a sector that does not lend itself to home working.

The Food and Agriculture Organization of the United Nations (FAO) and the World Health Organization (WHO) (2020), proposed that touching food packages or containers that are contaminated could transmit the virus to the mouth, nose or eyes. Therefore, the handling or consumption of food products could represent a risk of infection. To date, all food industry organizations should strictly follow the protocols of Food Safety Management Systems (FSMS) given by authorities based on Hazard Analysis Critical Control Points (HACCP) principles and should be kept updated in response to new pieces of evidence for viruses when required.

[21] https://cocoainitiative.org/wp-content/uploads/2020/04/ICI_Lit_Review_Income_ChildLabour_15Apr2020.pdf

[22] http://www.fao.org/fao-who-codexalimentarius/thematic-areas/COVID-19/en/

[23] Severe acute respiratory syndrome.

According to the World Health Organization, foodborne diseases are caused by contamination of food and occur at any stage of the food production, delivery and consumption chain. They can result from several forms of environmental contamination including pollution in water, soil or air, as well as unsafe food storage and processing.[24]

Industrialisation and lengthening of food chains multiplies the intermediaries and can contribute to an increase in fraud and contamination. The industrialisation of food systems, from production to distribution, brings 'new' risks such as chemical hazards related to the growing and often uncontrolled use of pesticides, veterinary drugs and food additives, whose impact on public health may only be visible and measured in the long term (Figuié et al., 2019). Moreover, industrial food systems generate large amounts of waste and packaging that contributes to environmental pollution and impacts public health.

Large-scale food safety crises can result in systemic crises, since they generate distrust towards actors in the entire food supply chain, and more broadly, toward authorities, within potentially important political and economic consequences.

Therefore, the strain to the heavier pressure for sustainability standards is relatively enacted to the increasing need for retailers and consumers to know the origins and handling of their food product.

According to Accenture´s consumer research, consumers in more developed markets tend to be more fearful of the economic impact of COVID-19 than for their health. From their findings, the outbreak has pushed consumers out of their normal routines by adopting habits and behaviours that many anticipate will continue in the long term. One of the trends is the rise in conscious consumption. Consumers are striving to limit food waste, shop more consciously and buy more sustainable options that have minimal impact on the environment.[25]

These post-pandemic key trends are also becoming evident in food retailers, pointing to food safety, trust and transparency as factors of food sourcing.[26] Demand for organic and sustainable food is on the rise as the pandemic crisis caused consumers to look to healther options to boost their immunity, according to research firm Ecovia Intelligence.[27] Retailers around the world have seen a surge in sales of organic products, with the highest sales growth being reported at online retailers according to the research. From these findings, retailers also see the benefit to enforce sustainability as a key part of their sourcing models.

3.3 Risks of higher food prices

Supply-side disruptions and hoarding are exerting upward pressure on prices (International Monetary Fund, 2020). This is due to the numerous challenges on the supply side, for example the reduction of farming inputs creates shortages in retail outlets, and hoarding behaviour of end-consumers could further contribute to upward spikes on food prices (Swinnen, 2020). Similarly, the ILOSTAT reported that supply chain disruptions and the strong demand from consumers stockpiling have increased the prices of goods (including food) substantially. The food component has increased at a much faster rate globally with an average of 5.5 per cent between August 2019 and August 2020.[28] FAO also reported a sharp increase

[24] https://www.who.int/health-topics/foodborne-diseases#tab=tab_1

[25] https://www.accenture.com/_acnmedia/PDF-134/Accenture-COVID19-Consumer-Behaviour-Survey-Research-PoV.pdf#zoom=40

[26] https://www.specialityfoodmagazine.com/food-and-drink/sustainable-trends-could-shape-the-food-sectors-future-post-covid-19

[27] https://www.specialityfoodmagazine.com/news/organic-and-sustainable-foods-receive-coronavirus-boost

28 https://ilostat.ilo.org/covid-19-is-driving-up-food-prices-all-over-the-world/

in global food commodity prices with the Food Price Index averaged 105.0 points during the month, up 6.5 per cent higher than its value a year earlier.[29]

Increases in food prices can have a major impact on the living standards of lower-income households, which generally spend most of their income on food. Even a small increase can confront the members of such households with difficult decisions.

Since the beginning of the spread of the pandemic in the European continent (mid March 2020), many countries have secured their domestic supply and strengthened their stockpiles by increasing the volumes of imports. This concerns mainly the basic products like flour, soft wheat (in grain), and semolina. The increase was particularly significant in March and April due to high uncertainty on the markets and the decisions to maintain a certain stock capacity of several months´ consumption (International Centre for Advanced Mediterranean Agronomic Studies, 2020). One of the most extreme examples provided in the study is the surge for total grain imports in Albania, with an increase of 140 per cent in March 2020 and 130 per cent in April 2020 compared to their total imports at the same period the year before.

While the prolonging situation of the coronavirus is still uncertain, what can be considered certain is that food prices will continue to increase, not only due to COVID-19, but in addition, the impact of climate change and other environmental impacts on agriculture.

World prices are a useful single indicator of the future of agriculture. Rising prices signal the existence of imbalances in supply and demand and growing resource scarcity, driven by demand factors such as growing population and income or by supply factors such as reduced productivity due to climate change and other shocks.A study from the International Food Policy Research Institute shows that global warming may further increase the prices of corn, wheat, and rice by at least two-thirds by 2050 (Gerald C. Nelson et al., 2010). Depending on the level of warming and economic and population growth, the study predicts that corn prices, adjusted for inflation, will rise by 42 per cent to 131 per cent by 2050. Climate change is expected to diminish rice yields, lifting prices from 11 per cent to 78 per cent. Wheat prices may rise from 17 per cent to 67 per cent.[30] Without mitigation, the threat would increase with time.

The probable increase in the frequency of extreme climate events is likely to render food production more unstable, at least in some parts of the world, thereby increasing price instability on national and international markets.

4. Sustainability of food systems in post COVID-19 era

Drawing from the analyses of the socioeconomic drivers and barriers of trade and globalization in food systems, as well as its impact on the supply side and demand side arising from COVID-19, this paper has been formulated to identify ways to change and improve the food system.

However, tackling the entire food system may pose innumerable challenges as food systems are more complex- politically, ecologically and socially. As an entry point for change, fostering sustainability in the agri-food supply chain will improve the production side of the food system, which is also pertinent in developing countries.

[29] http://www.fao.org/news/story/en/item/1334280/icode/

[30] https://blogs.ei.columbia.edu/2011/03/22/climate-change-to-exacerbate-rising-food-prices/#:~:text=A%20December%20study%20from%20the,least%20two%2Dthirds%20by%202050.&text=Climate%20change%20is%20expected%20to,from%2017%20to%2067%20percent.

The sustainability pathways mentioned though this paper have been targeted at trade and development as an opportunity for developing countries to be equitably integrated into the world economy. Thus, a strategic production component leading towards sustainable trade practices are essential – one that comprehends implementation policies for sustainability at local or national level are not sufficient if transboundary pollution, global resource depletion, erosion of environmental standards is not addressed. While trade was a major channel of global economic disruptions, it also plays a key role in fostering economic recovery from the current COVID-19 crisis (UNCTAD, 2020b). International trade opens bilateral and multilateral coordination which can signal the meaningful concept of sustainability as a global effort.

Conventional production and trading practices can have impacts on sustainable development. At present, more than 150 countries have adopted national strategies on sustainable development (UNCTAD, 2020). In the agri-food sector, food industries are putting certification schemes at the centre of its sustainability approaches.

As a result of COVID-19, there has been an increased interest from retailers and buyers, particularly in developed markets, to obtain a better understanding about where their food product comes from. Certifications and quality standards in this case are important tools to achieve transparency and traceability of the product origins in international trade, especially considering its efficiency to detect any possible causes of diseases.

Sustainability standards are vital instrument for both developed and developing countries to show that the governance of the agri-food sector is taking steps to address sustainability in supply chains and international trade. Mainstreaming sustainability standards can help create more resilient supply chains by emphasizing continuous improvements through its monitoring mechanism, transparency and accountability.

Therefore, certification schemes and more specifically, Voluntary Sustainability Standards (VSS) are essential tools in making the agri-food global supply chains more sustainable. While VSS covers several sectors, agriculture and food products are the most prominent with the use of VSS.

The number of VSS for agriculture is double to that of other sectors combined, and the number of certifications has also intensified, in terms of both the proportion of some certified commodities in their respective markets and the proportion of certified production area.

A major factor that explains the widespread uptake of VSS is the existence of an increasingly large consumer market for certified products, on top of the use to mitigate reputational risks, a way to govern supply chains and industry sector pressure. In relation to trade, VSS certification may expand demand (improve access to importing markets) and the shift towards greater sustainability may be associated with productivity improvements (UNFSS, 2018).

The importance of agri-food exports translates the key component for many developing countries´ export-led growth. This sector covers a wide range of technical levels, employ many thousands of people and make use of both simple and sophisticated processes.

However, the burden of transforming agricultural production to be more sustainable cannot be the sole responsibility of the producers alone, in particular those operating in developing countries. Mainstreaming VSS can help to achieve many fronts aligned to the SDGs. However, in many instances, the financial and resource burden to meet the criteria defined in VSS may pose challenges for smallholder producers in developing countries, who may end up being marginalized from the export market.

Therefore, the need to establish a multi-stakeholder initiative can help institutionalize an infrastructure that facilitates sustainability standards and certification. This collective opportunity can foster, maintain and promote sustainable agri-food supply chains from both top-down and bottom-up approach.

Institutionalization of VSS also requires institutionalization of other more important dimensions, as outlined in the following.

4.1 Institutionalizing farmers and producers´ support systems

On the outset, agricultural interventions and social protection interventions are needed for combatting hunger and poverty among poor smallholder farmers in particular in developing countries. Social protection policies generally aim to reduce socio-economic risks, vulnerability, extreme poverty and deprivation, which helps smallholder farmers depending on social protection policies focus on improving productivity in crops, fisheries, forestry and livestock and improving access to markers.

Social protection can serve as powerful instruments to strengthen people´s access to food, nutrition, and essential services, particularly for vulnerable groups in both urban and rural settings. Social protection programmes can protect food access by increasing purchasing power for those in need.

By linking social protection in developing countries' agricultural settings, agri-food supply chains can build resilience and sustainable rural livelihoods. Climate and economic shocks can affect farmers and their production, while increased food price volatility impact both producers and consumers who don´t necessarily have the means to cope with them. Thus, resilience becomes central to the transition towards sustainable agriculture, and must be addressed in both natural and human dimensions.

In the effort to strengthen a nation´s social protection system, a stimulus facility typically cash handouts and safety net programs are especially vital for farmers who are already challenged by the informal nature of their work.

Hence, there is scope for developing countries´ governments to designate farmers, suppliers of farm inputs like seed, fertilisers and chemicals, and ploughing serve providers as critical interventions to protect and support farmers through their subsistence needs and ensuring uninterrupted food productions.

Furthermore, there is also the need to buffer any effects on food prices. Where affordability is concerned, governments should not only facilitate food distribution systems that ensures food availability for these farmers, but also buy from them as stock up reserves to supply to the population in need. This way, food wastes can be minimised, and farmers are also guaranteed with access to food security.

VSS is a useful tool that aims to eliminate the most egregious practices such as forced labour, human rights violations, and child labour. Going back to section 1.3 about the tendencies of child labour when farmers lose income, there is evidence that certification schemes have reduced the likelihood occurrence of some of these practices, such as child labour (IOB, 2014).

Certain schemes also focus on utilizing price premiums as mechanisms to reinvest in local community programmes. This have led to investments in educational facilities, infrastructure improvements and increased access to water, sanitation and hygiene (IOB 2014, 39).

4.2 Institutionalizing environmental protection

One third of the food produced globally for human consumption is lost or wasted along the supply chain.[31] Losses are even higher in Africa: between 30 per cent and 50 per cent (Deloitte, 2015), and have a negative effect on food security, nutrition, and economic stability. Quantitative losses constitute a physical reduction in the marketable volume and qualitative losses refer to deterioration of nutritional quality, safety or grade.

[31] Evidence found in http://www.fao.org/food-loss-and-food-waste/flw-data

These losses occur mainly at the downstream end of the supply chain, between production and retail stages of the supply chain. Losses at the farm level can be attributed to poor harvest practices and poor handling. Generally, any loss of produce translates to lost production resources, mainly land, water, energy and inputs, which also constitutes loss of income for the various actors in the supply chain and food insecurity. Food losses are thus associated with environmental, social and economic implications.

By linking sustainability measures in this area, one can look at better storage infrastructure and a better disposal method that does not harm the environment, and most importantly better harvest practices and food handling – all of which requires public intervention and training guidance.

Addressing this issue from a social perspective, a mechanism to distribute food to the poor before it turns into unnecessary wastage could also be considered as an aid policy in developing countries.

By curbing food losses, it reduces the production of methane, a greenhouse gas that is even more potent than carbon dioxide, which affects both the environment and human health.

Furthermore, as mentioned in section 1.4, the food systems in general have been taking a toll on the environment as the activities involve typically undermines biodiversity, contributing to the mass extinction of species, ecocide, soil loss, land degradation, air pollution, greenhouse gas emissions etc.

There has been some case-specific evidence that VSS may generate environmental benefits. Most VSS, such as the Marine Stewardship Council (MSC) and the Rainforest Alliance among others, stipulate certain types of practices, such as limited use of agro-chemicals, policies on deforestation, soil conservation, waste, and water management, to control negative environmental externalities arising from value chains (UNFSS, 2016).

4.3 Institutionalizing inclusive economic growth

Ensuring that producers and smallholder farmers have adequate access to, and control productive resources can contribute significantly to reducing poverty and food insecurity in rural areas. Agriculture is the most labour intensive of all economic activities and it provides directly and indirectly a source of livelihoods for rural households. Yet, poverty is still excessively associated with agriculture thus, the need to turn to sustainability can substantially improve decent labour conditions.

There are also opportunities for product differentiation strategies but will require all possible aid for farmers and smallholder producers to explore this. In sectors such as tea and coffee for example, strategies for adding value to such products involve certification (for example, organic produce) or closer links with traders and processors or retailers (for example, compliance to Fairtrade). The process of adding value requires that the identity and distinctiveness of the product be established at the point of origin and maintained as it moves along the value chain. Thus, an improved agri-food exporting calls for better facilitation for market access.

Continuous transparency along the supply chains will help minimize interruptions of the critical flow of supplies and materials and improves overall response speed. Furthermore, transparency contributes to restoring trust and cooperation in the rule-based trading system. It reduces trade costs and can increase trade around 20 to 25 per cent (UNCTAD, 2020b). Governments need to co-ordinate among each other and have a harmonized policy response to ensure that food supply chains continue to function effectively. This may include (not exclusive to):

i. facilitating standard port sanitation procedure
ii. better storage facility and organized food handling instructions
iii. agree on an international protocol for transport workers which reduces any delays, especially for fresh produces
iv. keep borders open international especially for essential goods

This is also a call to strengthen global cooperation where governments can improve and harmonize coordination mechanism as a measure to keep supply chain and movement of food flowing – to secure the livelihoods of the large poor population and vulnerable communities financially and nutritionally.

Developing countries can look at improving its market competitiveness by rethinking value-add global value chain strategies in the wake of this pandemic, such as:

i) incentivizing the uptake of VSS in order to promote sustainable agri-food supplies to the global market
ii) foster tighter and strategic collaboration with its stakeholders to build a collective and innovative infrastructure that would facilitate certification adoption
iii) strengthen south-south knowledge exchange as an opportunity to enhance its power dynamics in the global governance of sustainable development
iv) develop an internationally agreed framework on VSS in the context of multi-lateral trade agreements.

In order to transform markets for producers and consumers to comply with and demand for sustainably produced food, capacity building and awareness programmes should be exercised. Therefore, greater levels of support to provide adequate information should be provided as a public good. Educational programmes can be used to better understand sustainable operations in the agricultural and agri-food manufacturing context. The public mindset must first be changed in order for sustainable supply chains to be viewed as a strategic economic factor.

This can be achievable with an institutionalized multi-stakeholder structure in the public system with a mandate to promote sustainability programmes for agri-food supply chains. Thus, developing a supply chain act/policy and incorporating VSS into them can establish an institutionalized system that should also provide access to capacity building, information, systematic certification infrastructure and the availability of financial resources should be part of the action plan.

Conclusions

This research paper has analysed some of the key parameters confronted by trade and globalization in the food systems. The advent of the food system was mainly to target the ever-growing population by the very idea that industrializing agriculture could feed the majority of the population. Agriculture have become a source of income for a large population in developing countries. However, for the lack of judgement, food system activities are causing negative impact on the environment, which also affects human´s health. Moreover, the imbalance global distribution of food is the cause of food insecurity in many developing countries and that agricultural workers, farmers and producers in developing countries, despite being the key source of food providers, are still struggling with very low income compared to workers of other sectors.

These challenges in the food system have been intensified by the hit of the novel COVID-19 pandemic. On the supply side of the food system, confinement measures and logistical disruptions have caused massive destruction on the global economy. This pandemic has also brought about protectionism ideology that impacts import and export of food products, farm production implications that affects food supply productivity and the postponement of climate-related global agenda that could worsen the already devastating situation. On the demand side of the food system, agriculture workers, farmers and producers are also challenged with food availability, heavier pressure on food standards and risks of food price volatility. These issues are aggravating their already problematic production side of the food system.

Through these analyses, this research paper identified sustainable pathways to firstly reduce the burden of the food system impacted by COVID-19 on farmers and producers and secondly, to mitigate the environmental situation of the food system.

Thus, Voluntary Sustainability Standards (VSS) have been introduced as a tool that could potentially target all three dimensions of sustainable development in the context of food system in developing countries. However, mainstreaming a tool like VSS require multi-actor engagement otherwise it may pose feasibility challenges such as capacity, resource, and finances on farmers and producers in developing countries, which may also result in their market exit.

The proposition to institutionalize multi-stakeholder initiative as described in this research paper will help policymakers identify solutions to ensure sustainability standards are complied across the agri-food supply chain, target feasibility concerns associated to farmers and producers and provide incentives or other mechanisms that would ease their compliance to sustainability standards.

Furthermore, through capacity building programmes targeted to achieve the Sustainable Development Goals (SDGs) in the food system will be able to transform market decisions towards the ideology of sustainability both in the production and consumption side of the food system.

Lastly, this research paper also touched on global cooperation mechanism where trade and globalization are concerned. Through strengthening global cooperation, governments can improve and harmonize coordination mechanism as a measure to keep supply chain sustainable and movement of food flowing, in order to secure the livelihoods of the large poor population and vulnerable communities financially and nutritionally. Global cooperation is also an effective facet to mitigate environmental damages caused by the food system, and thus concludes that the way forward from the COVID-19 era is to embed the SDGs at every corner of the food system.

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