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Build-back-better from COVID-19 with sustainable agri-food supply chain in developing countries

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Introduction

The novel COVID-19 pandemic has been detrimental not just as a health crisis but also an economic and a humanitarian crisis. The nationwide lockdowns due to the spread of COVID-19 has forced developed and developing countries to halt their economies. With respect to its impact on the global food system which also considers the pre-and post-production of food as well as its distribution and consumption interrelationship with political, social and environmental dimensions, this economic slowdown has greatly affected the progress towards achieving the 2030 Sustainable Development Goals (SDGs) .

From an economic standpoint, a recent UNCTAD report remarked on the vulnerability of developing countries facing exacerbated food crisis, describing that the restrictions on movement due to the pandemic have slowed down economic activity, potentially affecting food production and reducing food supply – endangering food crisis through both supply-side and demand-side channels (UNCTAD, 2020b).

The pandemic's confinement measures and logistical disruptions limits the mobility of workers to perform their duties to operate food production. Workers are not able to farm and harvest their produces, and movements of produces along the supply chain are delayed. This affects sustainable development on many fronts; i) income instability for farmers, ii) with lower income, their access to nutrition is reduced which risks their food insecurity, iii) farm owners' access to farm inputs are limited which affects their production, iv) supply chain delays also risks food wastes, v) food wastes affects the environment as the inputs used to produce and harvest have essentially gone to waste and that rotten food itself produces methane, a greenhouse gas more potent than carbon dioxide, and vi) greenhouse gas generally affects human health.

The impacts caused by COVID-19 on agri-food supply chain and the food system in entirety demonstrates precisely the dire need to advance the 2030 Sustainable Development Goals (SDGs). Recovery strategies must therefore be targeted to pursue goals that also reflects 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.¹ This crisis has in fact re-enforced the interdependence of the world, where the response to the pandemic cannot be de-linked from the SDGs and that it requires a stronger collective multi-stakeholder approach to achieve the common global goal.

The main argument of this paper is to elucidate the long-standing causes of concerns caused by agri-food supply chain and how COVID-19 aggravated this. Based on these concerns, this paper also presents several recommendations on how to facilitate sustainable agri-food supply chains. The issues raised here are especially important on the side concerning developing countries as almost one-third of the world's exports in agri-food products come from developing countries.² 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. Therefore, the case to

¹ UN 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 track towards the SDGs. This 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/>

² Authors' calculations based on UNCOMTRADE data source

promote sustainable agri-food supply chain is particularly strong for developing countries development aspirations.

Based on the 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 those who produce them and does not contribute to the negative impact on the environment.

Lastly this paper provides plausible recommendations on post-COVID-19 provisions for sustainable agri-food supply chains in developing countries, by paying particular attention on the use of sustainability standards as a tool to foster transparency and traceability along the supply chain.

Voluntary Sustainability Standards (VSS)³ are widely used today to govern environmental, social and ethical issues in global supply chains. Today, there are over 270⁴ 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.

In that regard, this paper is structured with a flow that firstly highlights the impact of COVID-19 on the global supply chains in chapter 1. Chapter 2 then discusses the long-standing causes of concern in agri-food supply chain, followed by its aggravated impact due to COVID-19 in chapter 3. The proceeding chapter 4 illustrates the opportunities of turning to sustainable development to redress COVID-19 in developing countries.

These opportunities have been supported with recommendations in chapter 5 in order to facilitate sustainable agri-food supply chain in developing countries. These recommendations consider a policy response to ascertain sustainability criteria throughout the agri- food supply chain, the extend to which farmers are most affected by the COVID-19 shock, the need to strengthen global cooperation especially where international trade is concerned, promote economic growth for developing countries and most importantly, the transformation of conventional agri-food supply chain towards a more sustainable pathway.

³ 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.

⁴ The number of VSS in the Standards Map database is constantly increasing. See www.standardsmap.org for the most up-to-date information

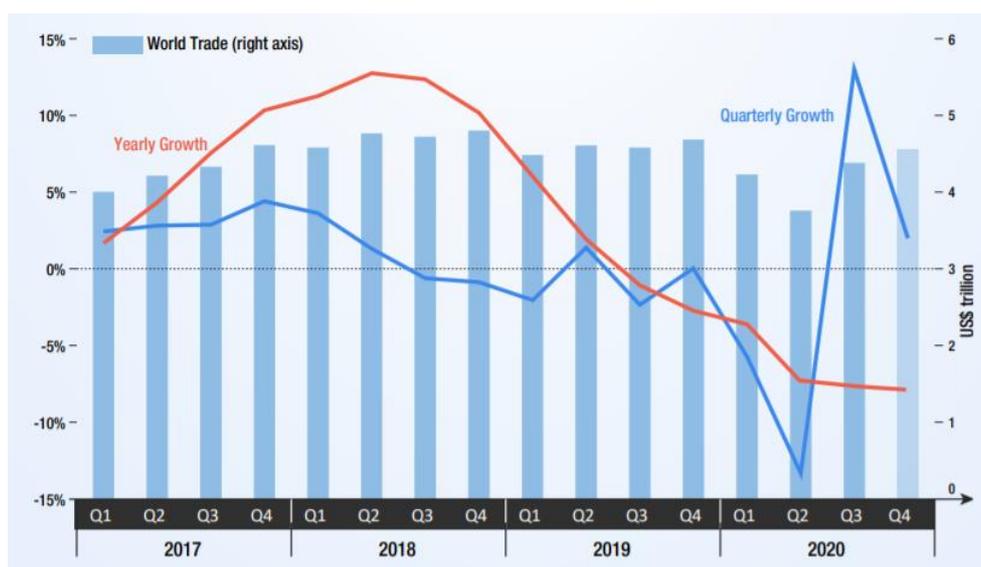
1. COVID-19 impact on global supply chains

The traditional view of international trade that each country produces and offers services that are exported as final products to consumers abroad have shifted to a more agile operation known as the global value chains (GVCs). GVCs 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. Even more than before, 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.

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% 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% on a year-over-year basis (see Figure 1 – UNCTAD, 2020).

The World Trade Organization (WTO) expects world trade to fall by 13 to 32% by 2020,⁵ while UNCTAD predicts around 20% for the same year.

Figure 1: A step down in Global trade in goods. Source: UNCTAD: Global Trade Update (2020)



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

1.1 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 the operation line throughout the supply chain. Limits on mobility of people have reduced the availability of seasonal workers for planting and harvesting in the food supply chain sectors in many countries.

⁵ Data retrieved from the trade forecast press conference: remarks by DGA Azevedo. https://www.wto.org/english/news_e/pres20_e/pr855_e.htm

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*).

1.2 Protectionism temptation

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. Giordani, Rocha and Ruta (2016) found that protectionist-prone policies alone were responsible for an increase in global food prices by 13%, on average. This measure is 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. Long-standing causes of concern for developing countries in agri-food supply chains

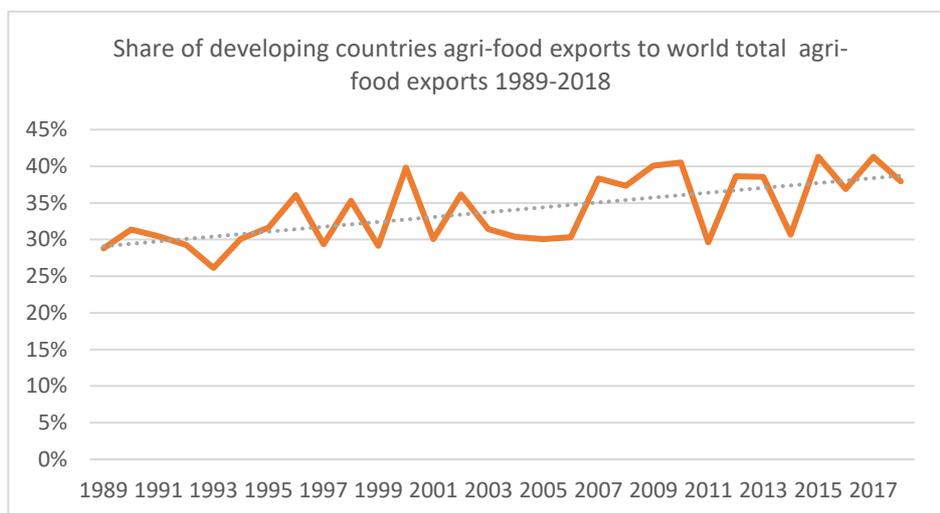
Agri-food global supply chains witnessed a rapid and profound changes in the last decades, including a strong increase in agri-food trade and a consolidation of supply chains (Dequiedt, 2018). These changes will have a huge impact on smallholder farmers- positive if they are able to participate to the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

The diversification, differentiation and improvement of agriculture in developing countries is critical for the growth of the poorest countries and for poverty eradication. Increasing production and export of agricultural products can be an effective way of reducing rural poverty in developing countries. The case for promoting agricultural exports is quite strong.

2.1 Economic value of agriculture and agro-based manufacturing exports

Since the early 90s, developing countries accounted for almost one-third of the world's exports in agri-food products. Even with ups and downs in the share of their agri-food exports, evidences have illustrated a clear upward trend of developing countries participation if agri-food value chain.

Figure 2: Share of developing countries agri-food exports to world total agri-food exports from 1989 to 2018. Data 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% improvement in transport and trade-related infrastructure quality has the potential of increasing developing countries agricultural exports by 30% (Moisé, 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 3 shows the share of agriculture in GDP in 2019 where most African countries topped the charts – Sierra Leone (57.4%), Guinea-Bissau (52.5%), Chad (42.5%), Niger (38.2%), Mali (37.3%), Kenya (34.1%), Ethiopia (34%), Burundi (29%), Sudan (28.4%), Benin (27%) and Malawi (25.5%). Uzbekistan's share of agriculture in GDP also points slightly over 25%.

Figure 3: Share of agriculture in GDP in 2019. Source: Author calculations using World Bank Data

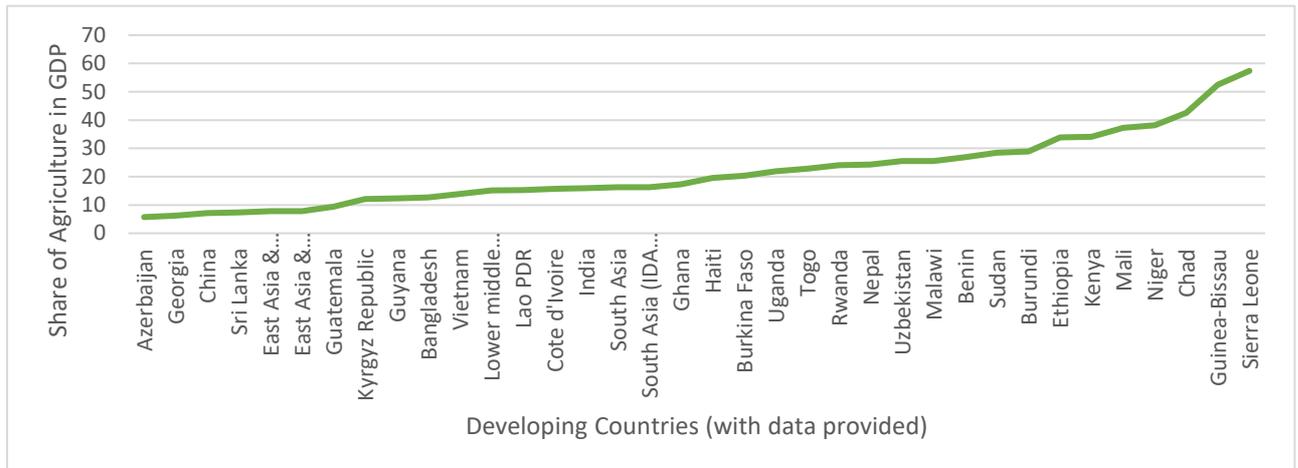
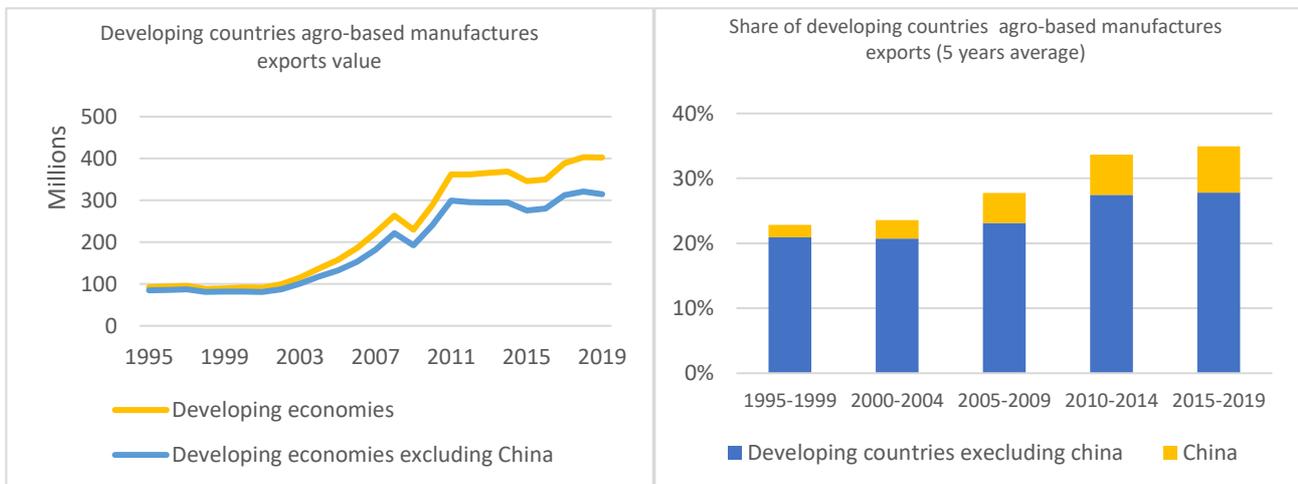


Figure 4 shows the integration of developing countries in the agro-based manufacture value chain. In 2019, the value of their exports was about 28% of the world's exports, excluding China; China alone accounted for around 7% of the world's export. In value terms, in 2019, developing countries agro-based manufacture exports was approximately 310 US dollars.

Figure 4: 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.

2.2 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.⁶

Figure 5 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 5: Share of agriculture in GDP vs GDP per capita in 2015. Data Source: World Bank

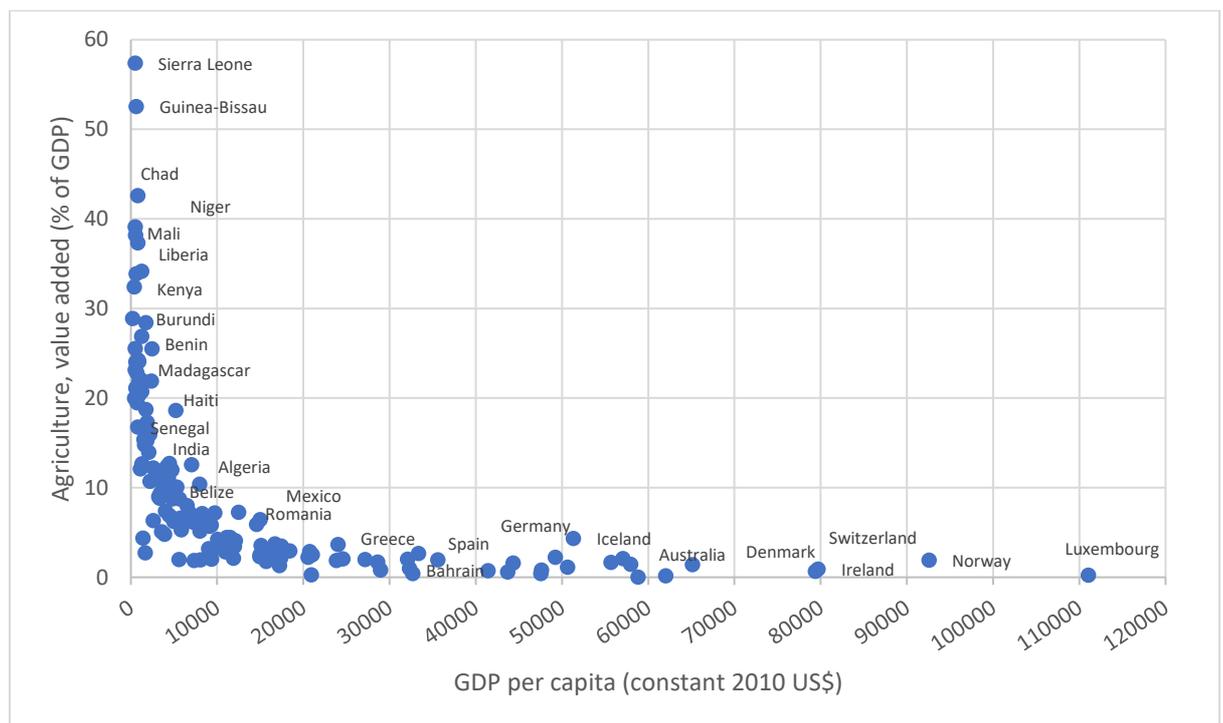
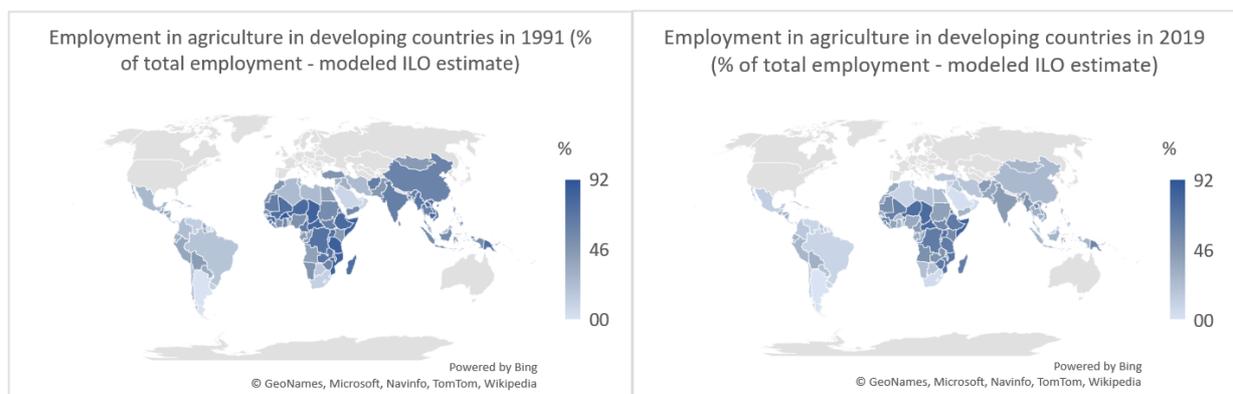


Figure 6: Employment in agriculture in developing countries in 1991 and 2019. Data Source: Authors' calculations based on UNCOMTRADE data



⁶ 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>

By comparing the percentage of the population employed in the agricultural sector in developing countries, between 1991 and 2019, it is apparent that agriculture 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. Through this analysis, female employment in agriculture in low income countries is about 62 % and 44 % in lower-middle income countries, but just a mere 18 % of agricultural employment in upper-middle income countries are female. Equivalent to male employment in agriculture, an average of 56 % and 36 % represent low income and lower-middle income countries respectively, and only 23 % 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.

2.3 Wages

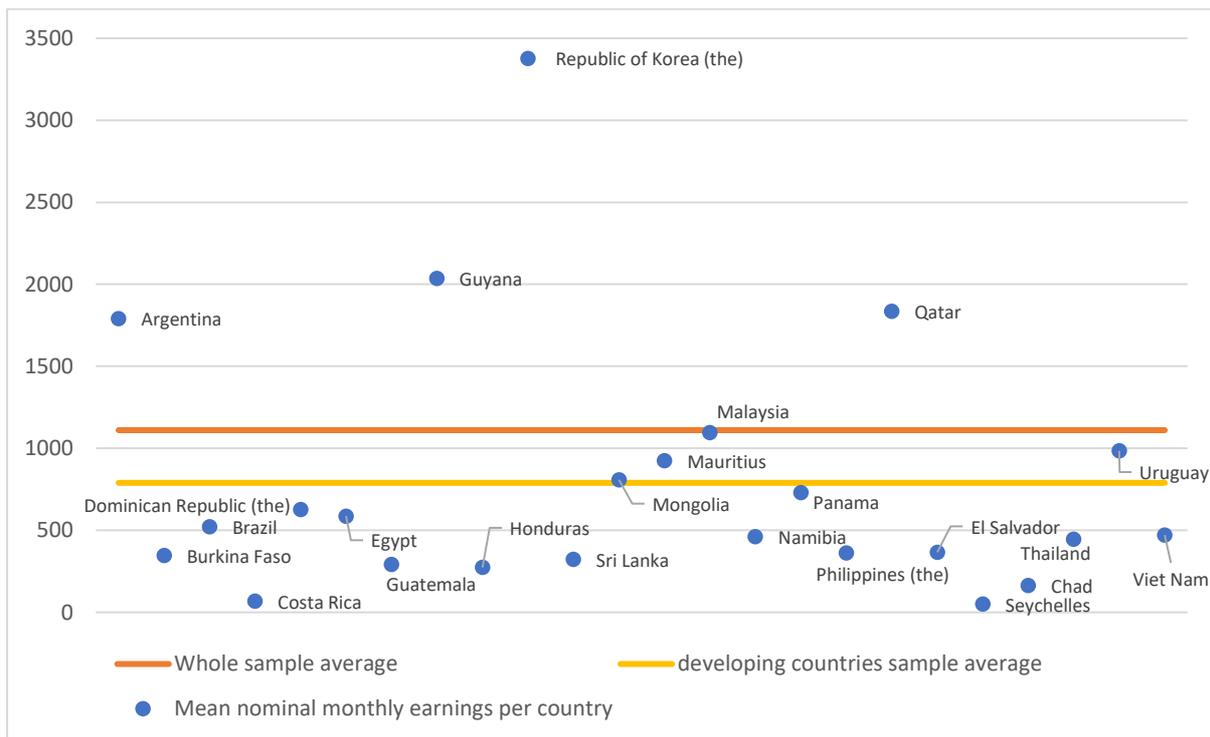
Despite playing an important role in national economies and providing a link with the global structures of agriculture and trade, many agricultural workers engaged in the sector in developing countries are characterized by precarious working conditions and little or no social protection (ILO, 1996). 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, as the population continues to grow fast and cultivated land expands. Given the high population growth, the agricultural workforce is projected to continue swelling in the foreseeable future before it starts to decline (Christiaensen and Brooks, 2019).

However, the wage elasticity in agricultural sector in developing countries is a rather source of concern. Even if millions of workers are active in agricultural production worldwide, their wages often place them on the 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. As countries become more affluent with the idea that agricultural earnings are generally low, which also contributes to low productivity, their workforces shift out of agriculture into more stable and higher-paying jobs. This pattern of structural transformation is evident historically in high-income countries but is also unfolding in low-income countries.

Figure 7 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 2018⁷.

⁷ Figure 7 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 countries that are Austria, Bulgaria, Czechia, Estonia, Greece, Italy, Latvia, Lithuania, Luxembourg, , New Zealand, Norway, , Poland, Portugal, Romania, Slovakia, Slovenia, Sweden. In addition to economies in transition include Azerbaijan, Bosnia and Herzegovina, Belarus, Georgia, Kyrgyzstan, Republic of Moldova, Serbia, Ukraine.

Figure 7: Mean nominal monthly earnings of employees in agriculture for selected countries in 2018 (2017 PPP \$). Source: Authors' calculations using data from ILO statistics.



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 as innovative incentives to effectively produce more with lesser 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.⁸ All these shortcomings are not attractive for younger generation who are more likely to give up farming altogether. This puts the long-term viability of the agricultural sector where some supply chains are in doubt.

2.4 Global Food Systems

With regards to the access to food, the UN World Food Programme's latest data shows that the food insecurity of 135 million people was categorized as crisis level or worse⁹. 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 slightly off-balance, having one side of the globe with 800 million people who are suffering from chronic hunger¹⁰ and on the other side with 2.8 million people dying each year as a result of obesity and overweight¹¹. A paradox of global hunger, despite being the food producers

⁸ <https://www.weforum.org/agenda/2020/06/sustainable-supply-chains-covid-19-era/>

⁹ Read the full article on COVID-19 will double number of people facing food crises unless swift action is taken <https://www.wfp.org/news/covid-19-will-double-number-people-facing-food-crises-unless-swift-action-taken>

¹⁰ <https://news.un.org/en/story/2019/07/1042411>

¹¹ <https://www.who.int/news-room/facts-in-pictures/detail/6-facts-on-obesity>

themselves, smallholder producers in the rural areas of developing countries are disproportionately at risk of food insecurity due to their low incomes.¹²

Food systems in general, have also been affecting the planet with its significant contribution to climate disruption that threatens the world. Food systems, which also considers the side effects beyond just the food production factors, have been calculated to contribute up to 29% of all greenhouse gas emission; livestock contributes 14.5% of all anthropogenic greenhouse gas emissions, of which 44% is in the form of methane (UN, 2020). Food systems activities tend to undermine biodiversity, contributing to the mass extinction of species, ecocide, soil loss, land degradation, air pollution, greenhouse gas emissions etc. The effect of food systems are 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.

External factors affecting the food system will also require systematic changes within the agri-food supply chains. Food system activities largely include production methods, processing, market access, consumption patterns and handling food wastes, thereby affecting the workers and other stakeholders operating in the agri-food supply chains. Therefore, the precision of the agri-food supply chain should be studied relative to the food system rather than in silos.

However, identifying ways to change and improve the entire food system may pose innumerable challenges as food systems are more complex- politically, ecologically and socially. As an entry point for change, thriving in sustainability in agri-food supply chain will improve the production side of the food system, through which this paper is focused on and especially pertinent in developing countries.

3. Aggravated impact of COVID-19 on agri-food supply chains in developing countries

COVID-19 pandemic has placed unprecedented stresses on agri-food chains, with bottle necks 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.

Confinement and the consequent delays of movement of goods harm developing countries that depend mostly on agriculture. For example, up to 70% 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% of the total fresh produce exports capacity (OECD, 2020).

¹² <http://www.fao.org/news/story/en/item/1268059/icode/>

3.1 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 CO₂ (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.

3.2 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 further environmental hazard.¹³

In Kenya, contract farmers that supplies to processing and exporting companies through a binding arrangement, decreased by nearly 50% 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.

3.3 Risk food insecurity

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.

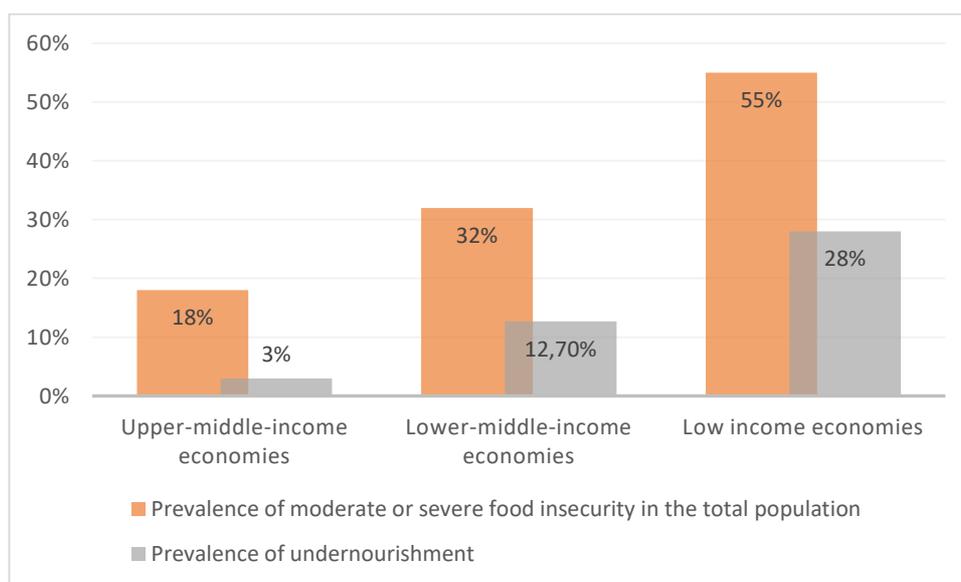
¹³ To learn more about methane on the rise, visit <https://www.epa.gov/lmop/basic-information-about-landfill-gas>

Panic-buying and food stockpiling by consumers, and national trade-related policy responses to the pandemic, especially any limitations on exports may result in price spikes and increased price volatility. This crisis is particularly damaging for low-income, food-deficit countries.

Furthermore, many low-income developing countries are also dependent on imports for their food consumption. These countries spend 37% 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% 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). 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 (UN, 2020). Data gathered from FAOstats as illustrated in Figure 8 shows that low income countries were already facing high prevalence of undernourishment – 28%. Additionally, 55% of the population faced severe or moderate food insecurity.

Figure 8: Prevalence of severe, moderate food insecurity and undernourishment in the total population (%age, 2017-2019 average). Source: Authors’ calculations using data from FAOstats.



The UN World Food Programme’s latest data shows that the food insecurity of 135 million people was categorised as crisis level or worse.¹⁴ The number of people who are acutely food or nutrition insecure will rapidly expand.

On the side of agri-food chain, 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 (UN, 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

¹⁴ Read WFP article from April 2020 on how COVID-19 will double number of people facing food crises unless swift action is taken <https://www.wfp.org/news/covid-19-will-double-number-people-facing-food-crises-unless-swift-action-taken>

income impact child labour.¹⁵ 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.

Given these negative effects pre- and post-COVID-19, and its double-edge sword circumstances in developing countries, such as the need to promote developing countries' exports in order to protect the livelihoods of the large population of the world's poor and vulnerable communities, one critical solution is the dire need to transform agri-food supply chains.

4. Shifting to sustainable agri-food supply chains

The argument made to foster sustainable agri-food supply chain in this paper has a wider economic intention that can be maximized as trade and development 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 are 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.

From an agricultural, trade and policy setting perspective, this paper identifies four key areas that can be perceived to ameliorate the situation of agri-food supply chains in developing countries.

4.1 Social dimension: Strengthening social protection 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 markets.

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.

¹⁵ https://cocoainitiative.org/wp-content/uploads/2020/04/ICI_Lit_Review_Income_ChildLabour_15Apr2020.pdf

4.2 Environmental dimension: Addressing food losses and protecting natural resources

One third of the food produced globally for human consumption is lost or wasted along the supply chain.¹⁶ Losses are even higher in Africa: between 30% and 50% (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.

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.

4.3 Economic dimension: Fostering 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.

¹⁶ Evidence found in <http://www.fao.org/food-loss-and-food-waste/flw-data>

5. Recommendations

The importance of agri-food exports confirms that importance of this sector as a key component of export growth strategies for developing countries. This sector covers a wide range of technical levels, employ many thousands of people and make use of both simple and sophisticated processes. A typical food system considers several critical components – storage, pre- and post- distribution, packaging, transport, animal feeds, farm chemicals such as pesticides and fertilizers, all of which are particularly essential to maintain the flow of the agri-food supply chain. Therefore, any lack thereof will disrupt the production and distribution of the food supply.

The main motivation for the current paper is to address the long-standing causes of concern deriving from agri-food supply chain that have become even more acute post-COVID-19. This analysis calls for a dire need to push forward an agenda that promotes firstly sustainably produced food products and secondly, economically and mutually benefitting agreement to move goods across border, especially for developing countries.

Since the economic shock hit by COVID-19, it has considerably worsened the shortcomings of countries that are economically reliant on agriculture. As this paper has shown, a common characteristic evident in countries with economies most reliant on agriculture is poverty. Thus, more attention should be emphasized on ‘the how to facilitate’ sustainable agri-food supply chain:

5.1 Aligning national goals to the SDGs: Leveraging sustainability standards as a common trade tool

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 center 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 of 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 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 more prominent with the use of VSS.

The number of VSS for agriculture is double to that of other sectors 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 i.e forestry. 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).

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.

5.2 Linking social protection in agricultural settings in order to support farmers

In the effort to strengthen a nation's social protection system mentioned before, a stimulus facility typically safety net programs are especially vital for farmers in developing countries who are already challenged by the informal nature of their work. Farming, to a large extent is a seasonal activity which means that a season miss will affect their income for the entire year.

Hence, there is scope for developing countries' governments to designate farmers, 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.

5.3 Harmonize global coordination along supply chains

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% (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

financially and nutritionally secure the livelihoods of the large poor population and vulnerable communities.

5.4 Enhance market competitiveness in agri-food supply chains

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) incentivize the uptake of sustainability standards 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 sustainability standards in the context of multi-lateral trade agreements.

5.5 Develop local sustainability capacity building programmes

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 and knowledge-gain programmes can be used to direct human resources 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.

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