Background Note for the G20 Argentina Presidency 2018
Agriculture and Food Global Value Chains

ITC, OECD, UNCTAD, WBG, WTO

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Introduction

1. Global value chains (GVCs) have changed the nature of production and specialisation around the world[1]. These changes have been most obvious in manufacturing, but similar changes have also occurred in agricultural and food sectors (OECD, 2017a). And changes in international trade in agro-food products are, in turn, having an impact on the agro-food sectors themselves. For example, at the farm or value chain level, GVC participation has a number of spillovers in terms of productivity improvements, production growth, and livelihood improvement[2]. At the aggregate level, involvement in GVCs can be a key driver of economic transformation and sector growth (OECD, 2018a; OECD, 2017b; OECD, 2016a; OECD, 2015a), with some evidence that jobs associated with GVCs have higher productivity (OECD, 2016a). But ensuring that these opportunities materialise involves a range of policies, particularly if these opportunities to participate in and benefit from value chains are to be shared by smaller producers and SMEs.

2. Understanding the new linkages and opportunities from agro-food GVCs is important as countries consider new paths to economic development, participation in regional trade initiatives and further reform of multilateral trade rules. This note highlights some key issues and trends to provide a basis for discussion among G20 members on how agricultural producers and agro-food sector more broadly can get the most from GVC participation[3].

3. This note explores GVCs from both a "top down" and "bottom up" perspective. In the first section, the note takes a "top down" look at GVCs, outlining the trends and patterns of GVCs globally. It examines the role of policies in promoting participation and benefits from GVCs, both in terms of trade policies and domestic policies that condition the impacts and benefits at the national level. Second, the note looks at GVCs from a "bottom up" perspective, focusing on how to make GVCs more inclusive and sustainable, in particular in terms of promoting participation by SMEs and women and exploring the role played by instruments of international economic cooperation in fostering inclusive and sustainable agro-food GVCs.

1. A global view of GVCs: patterns, opportunities and the role of policy

1.1. The evolving food trade landscape: patterns of agro-food GVCs

4. Trade in the agriculture and agro-food sector trade has evolved considerably over time. The first unbundling separated the location of production and consumption resulted in increased trade in final products. The second unbundling saw the fragmentation of production processes across countries, with an increase in trade in intermediates. While some of the drivers are similar to those in manufacturing, there are differences, including the sensitive policy and trade environment for agriculture and food, and changes in nature of demand – in diets and consumption patterns, as well as in preferences related to food quality and safety across countries (including use of certain production practices).

[1] GVCs represent all the activities that take place in transforming raw materials into the product delivered at its end use. Transformation activities include the production, marketing and the delivery of a product (or service) to the final consumer. The fact that these activities are increasingly spread over several countries is what makes these value chains ‘global’.

[2] See, Dedehouanou, Swinnen and Maertens (2013); Colen, Maertens and Swinnen (2012); Maertens and Swinnen (2009); Jaffee and Masakure (2005).

[3] Materials at http://www.oecd.org/agriculture/agricultural-trade/ provide a comprehensive overview of agro-food GVCs and the influences on participation and value creation.

Box 1. Measuring GVC participation and its benefits

Participation in GVCs can be measured in various ways, but two common metrics explore the way that countries, and sectors within countries, engage both through buying inputs and the way that their products are used by others. The most commonly applied approach (Hummels et al. (2001), Koopman et al. (2011)) defines value chain participation in terms of the origin of the value added embodied in exports looking backward and forward from a given country:

- The ‘forward’ looking part shows the extent to which a country’s exports form part of a production process in another country, contributing to that other country’s exports – *selling into* GVCs.
- The ‘backward’ looking part shows the extent to which imports from other countries are used in the production of a country’s exports – *buying from* GVCs.

For agriculture and food sectors, the nature of products traded often means that engagement under the forward indicator (selling into GVCs) is limited, as many products go to straight to consumption in other countries (i.e., foreign final demand), or are further processed in other countries before consumption, but are not used in that country's exports (i.e., they go to foreign final demand through foreign processing sectors but do not get re-exported). So for agriculture and food sectors, measuring the contribution of countries, and sectors within countries, to foreign final demand and not just to their exports, is important.

Measuring the benefits flowing from GVC participation is done through measuring the amount of domestic value added created. Domestic value added represents the domestic returns to the sector’s factors of production – land, labour and capital (plus taxes paid but less subsidies received). Domestic valued added can be measured for the exporting sector but also for all other domestic sectors that contribute value to the exports that flow into GVCs.

5. For agro-food sectors, the initial unbundling was primarily characterised by commodity trading and supported by the development of standards and grades. These developments allowed the mixing of products from different origins in bulk shipments, facilitating their transport and use for final consumption or in other production activities. The second stage saw de-commodification, and an increased importance on how food was produced, supported by developments in contracting and marketing arrangements that helped to build trust among value chain participants (Rhodes, 1993; Royer, 1995; Drabenstott, 1995; Pasour, 1998; Unneveher, 2000; Kirsten and Sartorius, 2002). This resulted in the integration of various agro-food chains with marketing channels and led to an increase in the importance of services both upstream and downstream in the chain. This second unbundling was further driven by innovations in the agro-food sector and importantly through improvements in trade logistics.

6. Most agro-food GVCs still do not cross multiple borders. In 2011, for example, while value added in exports sold as intermediates exceeded that of exports for final demand for the majority of sectors (OECD, 2017a), most of those intermediates were used in the production of final goods destined for the domestic market in the importing country.

7. Countries have different patterns of engagement in agro-food GVCs (Annex I). For agro-food sectors in the aggregate, the most dominant country is China, which has a global reach in both its buying from agro-food GVCs and selling into them – depicted by a wide band of shading across the row and down the column. In contrast, the US has a greater global engagement in selling into agro-food GVCs, but a much narrower and regionally focused buying pattern. Countries in Europe, led by Germany and the Netherlands, engage globally in buying from agro-food GVCs and sell regionally – that is, the European food system buys agro-food value added from across the globe to supply its own regional and domestic markets.

8. Trends in GVC participation indicate that agro-food sectors have increased international linkages over time (2004 to 2014). The changes are not uniform, with some

countries increasing the intensity of the flow of agro-food products (value) within GVCs, and others less so. What has been observed is a strong increase in emerging and developing country involvement in agro-food GVCs – particularly amongst countries in South America and Asia (OECD, 2018a). Developing and emerging countries are also increasingly trading among themselves, leading to greater integration of their agro-food sectors (OECD, 2016b).

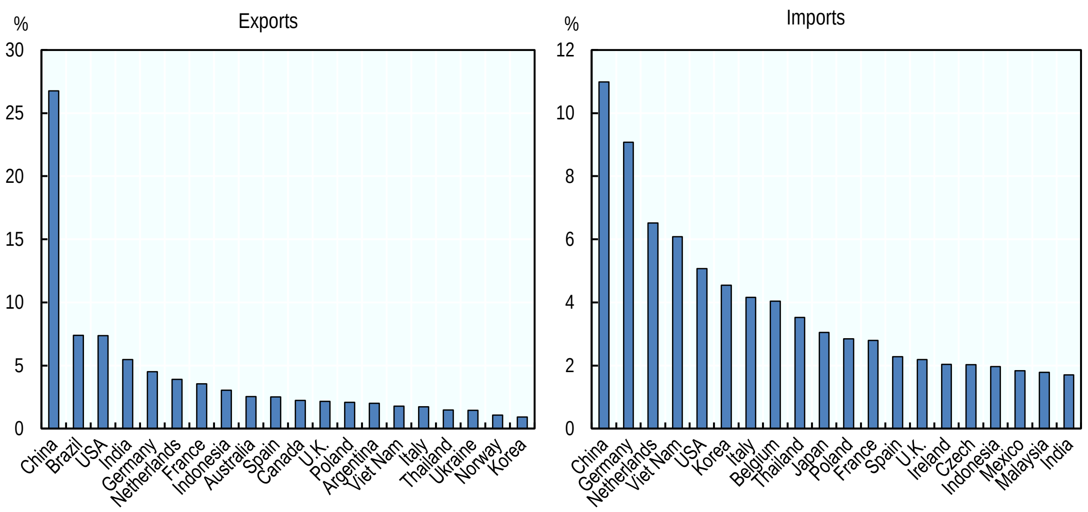
9. Agricultural and food value chains are becoming increasingly centralised around specific hubs, with the ends of the value chains centralised around China, the US and Germany (OECD, 2018a). These countries have driven much of the supply and demand for value added within agro-food GVCs. China, in particular, has emerged as a key player in agro-food GVCs, accounting for the largest increase in the use of agro-food value added for exports (backward linkages) and in the supply of agro-food value added for exports (forward linkages) between 2004 and 2014 (Figure 1). China's share of the growth in agro-food value added traded for use in agro-food GVCs was close to 27% – exceeding the sum of the following three largest contributors, Brazil, the US and India. Many developed countries have also remained significant drivers of agro-food GVCs, even increasing their importance in the GVC network despite shifts in the location of production growth towards emerging and developing countries. Many countries in Europe, for example, have been responsible for significant shares of the growth in trade in agro-food value added between 2004 and 2014.

10. Beyond sourcing and supplying for exports, concentration also remains in buyers of agro-food value added to service domestic consumers (either as final products or as intermediates). For this form of GVC trade, the US is the most central buyer, but the other 'hub' countries are also prominent – China and Germany, along with Japan and a number of EU members. In contrast, the picture for the suppliers of agro-food value added for final demand is diverse, and remained so between 2004 and 2014 (OECD, 2018a).

11. Along with increases in GVC participation, there have also been changes in the complexity of agro-food GVCs (OECD, 2018a). Changes in both the number of sources and types of inputs for GVCs suggest that sectors are increasingly buying from a wider range of suppliers to support production.

Figure 1. Shares of growth in total agro-food value traded with GVCs from 2004 to 2014

Top 20 sellers of agro-food value added as intermediate for other countries' production of exports and top 20 buyers of foreign value added for own production of exports (%)



Note: Exports depict the growth in agro-food value added traded that is used in the production of another country's exports as a share of total growth in agro-food value added used in exports – that is the sellers of agro-food intermediates into agro-food GVCs. Imports depict the growth in agro-food value added imported for use their exports expressed as a share of the total growth in imports of agro-food value added for use in exports – that is buyers of agro-food intermediates for use in exports.
Source: OECD (2018a).

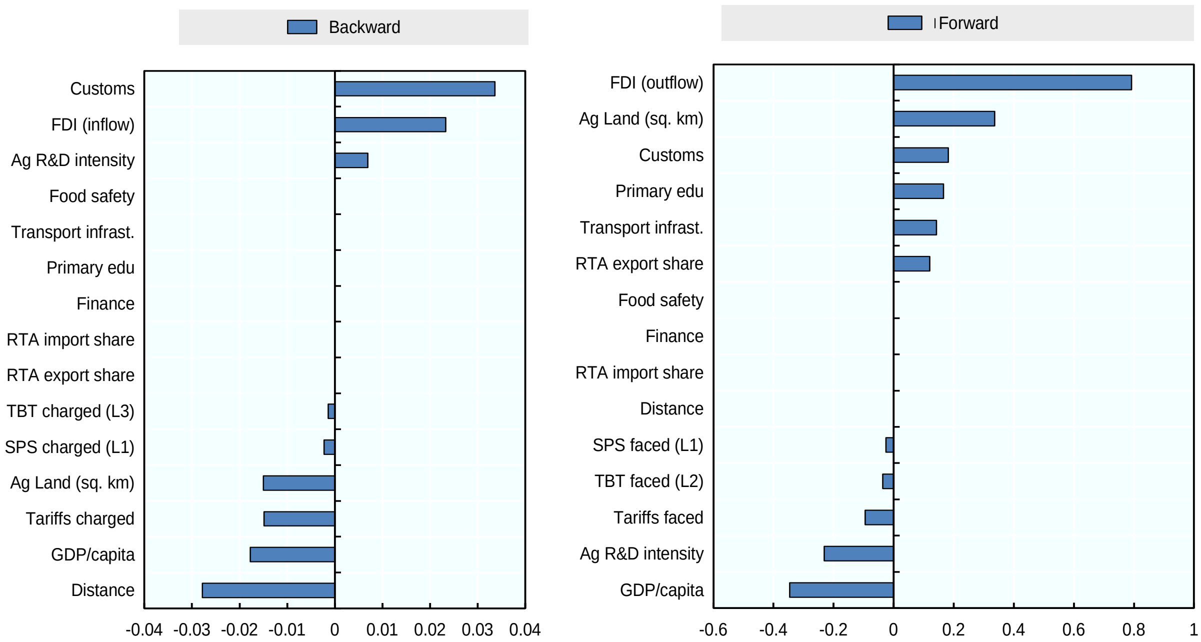
1.2. What determines participation in GVCs?

12. There is considerable variation across agro-food sectors in the extent and manner in which they participate in agro-food GVCs. Some products, especially perishables, have little direct participation; this is the case for paddy rice, raw milk and sugarcane and beet. Participation by these sectors occurs through linkages to other domestic processing sectors. Across agro-food sectors, there is little correlation between forward and backward participation, suggesting an industry-based specialisation at different parts of the value chain as suppliers or users of intermediates. Thus at a country level, sectoral differences in participation imply that part of the country differences in observed in aggregate agro-food GVC participation relate to structural characteristics of the countries themselves – such as climate and geography.

13. However, not all differences are structural. The significant variation within sectors and between countries with similar industry compositions suggests that policy settings are important in determining GVC participation. Many of the factors that underpin trade in general also significantly influence GVC participation in the agro-food sectors (Figure 2).

Figure 2. Factors influencing agro-food GVCs participation

Estimated standardised effects across determinants



Note: Standardised coefficients measure the impact of a one standard deviation increase in the variable.
Source: OECD (2017a).

14. In particular, trade and investment policies are a key influence on GVC participation. Tariffs on imports and those faced on exports reduce a sector's participation in GVCs. Similarly, non-tariff measures (such as sanitary and phytosanitary (SPS) and technical barriers to trade (TBT)) also reduce participation. For each of these, the cost raising effect of trade barriers reduces industry competitiveness and therefore its ability to participate within value chains.

15. In contrast, promoting the agricultural sector's capabilities contribute to greater levels of GVC participation. Transport infrastructure, education levels and agricultural research and development (R&D) are all positively related to participation and domestic value added creation from GVC participation (the effect of agricultural R&D on forward participation is negative, however, likely driven by a link to a greater production of goods for final demand). Other factors such as the ability to meet private standards (proxied through the number of accredited producers) are also important for a subset of countries.

16. Non-distortive agricultural policies are also important in GVC participation. For countries covered by the OECD Producer Support Estimate database, non-distorting support provided either directly to producers or to the sector as a whole has a positive influence on GVC participation.

1.3. Benefitting from GVC participation

1.4. What do we know about the benefits?

1.4.1. Participation and services are important

17. Agro-food GVCs can benefits domestic sectors in a number of ways. They provide opportunities for sector growth from access to new markets and possibly higher returns, but they can also improve sector productivity and growth rates through encouraging producers to improve practices or through technical change embodied in the use of foreign inputs.

18. Research suggests that GVC participation is a significant driver of sector development. Using foreign factors in the production of exports (and production more generally) has a positive impact on domestic added value creation and sector growth (OECD, 2018a). Countries with higher initial backward participation have experienced stronger aggregate domestic value added growth and stronger growth in domestic value added exports compared with those with lower levels of participation. Similarly, access to a more diverse set of imported intermediate inputs also promoted sector growth. Furthermore, for agro-food sectors, selling into GVCs has positive effects on domestic value added creation and exports – be it directly or through other domestic and foreign processing sectors.

19. Beyond participation itself, the way in which participation occurs and the role of supporting industries is important in generating benefits. In particular, using services along the value chain has been found to be is an important driver of domestic value added growth (OECD, 2018a). Increasing service use across the value chain (represented by an increase in the service share of exports – by extension an increase in service use within the domestic production chain) is beneficial for domestic value added growth. This highlights that the development of agriculture and food GVCs is not just about mechanisation and investments to promote efficiency. The 'de-commodification' of output means that it is not only about what is produced, but also *how* it is produced and *how* it gets delivered to export markets or final consumers wherever they may be.

20. This *how* is the service element of the value chain and increasing shares in export value were also found to be beneficial for overall sector growth. This is important when thinking both about sector development and when considering changes in the share of the agro-food sector in the final value of a product. Adding services value means that the agro-food sector's share in final value will ultimately fall. Thus, policies that create conditions where service value is added can increase producer returns in total although the share of the final dollar captured by producers will actually be less.

1.4.2. Agro-food GVCs are also an important source of employment

21. Employment associated with agro-food GVCs in agricultural sectors is significant in some regions (Figure 3).[4] Employment is created through both direct participation in agro-food GVCs from own sector exports, and by supplying inputs to other domestic sectors which in turn export. Across regions, the employment share associated with agro-food GVCs is highest in Europe, and increased between 2004 and 2014 (OECD, 2018a;c). In Europe, the increase in employment in agricultural sectors associated with GVCs has been driven by a mix of further integration of the food system in Europe and the large amount of intra-EU trade, and a move towards a more market oriented sector. Shares of agricultural employment associated with agro-food GVCs in both Africa and Asia are lower (in terms of shares of total payments to labour). This is due to both structural characteristics of a number of countries along with a lack of integration into world markets for others (particularly in Africa). For those with little engagement, it suggests that scope exists for greater participation and possible gains, if these can be done in an inclusive manner (discussed below).

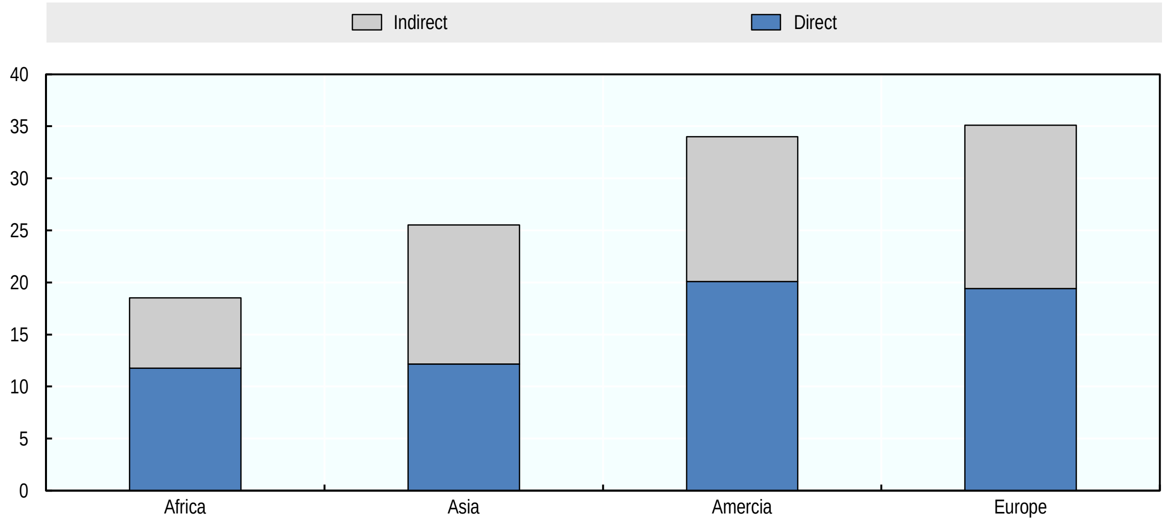
22. Beyond the absolute effects, GVC participation has also been found to have positive effects on labour and producer returns (OECD, 2018a). Having access to competitive foreign inputs and the spillovers from using those inputs has a positive impact on the share of value added captured by the producing industry itself – a larger share of a larger amount. This means higher returns to farmers and domestic food processors. The strongest effects are seen for capital, land and unskilled labour, but skilled labour also benefits. While it is not possible to

4. The figures presented only examine the employment within the 22 agro-food sectors. As such, this analysis excludes the indirect employment created in other sectors from agro-food exports.

tease out further the type of impact on labour – be it more jobs or higher wages – there is nevertheless a positive impact.

Figure 3. Shares of agricultural workforce employed in agro-food GVCs

Share of workforce in value terms, average across regions



Note: Total sector value added weighted averages. Both direct GVC participation and indirect (through other domestic sectors) employment included.
Source: OECD (2018c).

1.4.3. And provide new possibilities for value adding

23. Beyond the effects from participation in GVCs themselves, the unbundling in the production of food across agro-food GVCs is also creating possibilities for different value adding pathways for agricultural sectors (OECD, 2018d). Not all countries can move into downstream sectors to increase value added generation associated with agriculture – that is, not every country will have a comparative advantage in doing the same thing. However, agro-food GVCs mean that agricultural producers can take advantage of the comparative advantage of foreign downstream sectors to grow their sectors and to increase the contribution to total domestic value added derived from the sector. As GVCs require a number of other inputs to underpin trade in more primary products – most often additional service inputs – expanding down the pathway of greater direct exports to GVCs (taking advantage of foreign processing) offers growth in domestic value added in allied industries in an analogous way to that of moving into downstream sectors (OECD, 2018d).

24. Exploring the effects on total domestic value added creation from both exporting direct primary products and moving into downstream sectors suggest that the benefits on offer for countries from either pathway are comparable. That is, when looking at either pathway to generate domestic returns from GVC participation, countries on average appear to capture similar gains in both pathways (OECD, 2018d).[5] For every $1 of agriculture value added exported, the additional gain for a country from 'value adding' activities is the same. This

5 Countries are classified into pathways according to the share of total domestic value added traded in agriculture either directly from the sector itself or indirectly through other domestic sectors. Countries in the direct pathway are those which create most domestic value added through direct agriculture sector GVC participation; i.e., they sell mostly primary products into agro-food GVCs. Countries in the indirect pathway are those which create most domestic value added through indirect agriculture sector GVC participation, selling mostly transformed products into agro-food GVCs.

suggests that countries can grow total domestic value added just as effectively from direct participation without having to do more of the value chain domestically – the underlying premise of value creation in GVCs.

1.5. The role of policy

25. In getting the most from GVC participation, it is important to understand what policies can help create domestic value added and, importantly, which policies can hinder this.

1.5.1. Putting in place the right trade policies

26. Less distortive trade policies have been associated higher domestic returns from participation (OECD, 2017a). Open trade policies in the agro-food sector are necessary to fully capture the benefits of GVCs

Tariffs

27. Protectionist intervention within the agro-food sector has both immediate and long term consequences. First, market access barriers (such as tariffs, tariff quotas, tariff peaks and escalation, and other types of non-tariff measures) limit current gains. The costs from trade policy instruments, including applied tariffs, are amplified as they pass through the multiple production steps associated with GVCs. Trade costs accumulate as intermediate goods are imported and then re-exported further downstream, being transformed through additional processing before reaching the final consumer. In other words, applying tariffs on agro-food products effectively acts as a tax on the income generated from a country's participation in GVCs (OECD, 2017a; OECD, 2018a;b).

28. Moreover, these negative impacts have effects over time, with recent findings suggesting protectionist policies harm development and transformation (OECD, 2018a). For tariffs in particular, increasing levels of protection were found to be harmful for growth in domestic value added over time – i.e., harming, rather than helping, the domestic industries they were designed to protect. Furthermore, agro-food tariffs see a shift in the share of final value to sectors outside agriculture or food as they lead to a greater share being captured by intermediate inputs – domestic and foreign – likely due to the higher costs of these inputs.

29. Given the relatively high tariffs that persist in the agro-food sector, the removal of these border measures would benefit domestic GVC participants, enable the efficient movement of resources among production activities, and create conditions for a more nimble response to unanticipated events.

30. Moreover, it is not just the tariffs charged on goods that are important for domestic value added generation but rather, the use of all forms of foreign value added – from services to other agricultural products – in the production of those exports (OECD, 2016a). Thus policies in other areas of the economy also influence the outcomes for the agriculture sector.

Non-tariff barriers and standards

31. Non-tariff measures, such as SPS and TBT measures, may have both positive and negative economic impacts in the GVC context. On the positive side, robust and science-based arrangements create opportunities for exporters to capture trade and value creation. SPS/TBT regulations and standards in export markets may encourage the adoption of better production practices and the use of technology. Producers that can satisfy these requirements can access new, high-value markets.

32. Conversely, SPS and TBT measures can also constrain value creation if not applied in a transparent and non-trade restrictive manner. Indeed, non-tariff barriers have the potential to act in a similar way on domestic value added creation as tariffs (OECD, 2017a; 2018b;e). In

particular, the frequency of disputes regarding SPS and TBT measures imposed by a country are found to have a negative influence on the total domestic value added gained from exporting agro-food goods (those into GVCs and those which make use of inputs from GVCs). In contrast, reducing trade costs associated with agro-food related NTMs can grow both participation and domestic value added (OECD, 2018e).

33. Not all non-tariffs measures were found to have the same effects, pointing to the mix of trade-creating and diverting effects of such policies. Complex domestic arrangements that create problems for international suppliers negatively affect the domestic value added generated from exports. On the other hand, some technical barriers to trade have a positive effect by creating the necessary rules to underpin trade, creating confidence in markets and supply. Overall, less complex and more transparent and science-based arrangements, that avoid concerns being raised by trading partners, can increase the domestic value added generated in exports (OECD, 2017a)[6].

The trade and investment environment

34. Investment flows, coupled with trade openness, are key elements to value creation from GVC participation. FDI flows are part of the positive influences on domestic value added returns from participation (OECD, 2017a), thus attracting value chain investment is important. Among the aspects making a country attractive for value chain investment or activity, several factors are key:

- The *ease of trading* is a major determinant of lead firms' decision to become active in a particular country (OECD/WTO, 2013). Surveys reveal that both developing country suppliers and lead firms regard transportation costs and delays, and cumbersome customs procedures as major difficulties. Implementation of the Trade Facilitation Agreement, supported by aid for trade, is expected to deliver significant efficiency gains as border controls and redundant procedural requirements will be streamlined, further cutting trade costs and enhancing GVC participation, particularly for perishable agricultural products.
- *Well integrated markets* are attractive for GVCs, integrating regionally through trade agreements (OECD, 2018b,e) and where regional integration has been deeper than multilateral integration, this has often been particularly conducive for value chain activity. Indeed, a number of recent studies reveal that the bulk of international value chain activity evolves around regional hubs, and it has been observed that "the pattern of deep agreements is shaping and is shaped by global value chains" (IMF, 2013). Recent evidence suggests that – through their effect on value chain activity – deep integration can have two effects of particular interest to policy makers (ITC, 2017):
    - Deep regional integration has been found to be correlated with higher value chain activity which in turn contributes to closing the competitiveness gap between small and large firms;
    - Covering different policy areas – and in particular trade and investment - under one legal umbrella has the potential to increase the domestic value added to exports through value chains.

1.5.2. Supportive (and counterproductive) domestic policies

35. While measures affecting market access have direct impact on the economic relationship among actors in the value chain, domestic policies also play an important role in creating enabling environment.

6 The WTO SPS and TBT Agreements set out rights and obligations for WTO Members with a view to ensuring that measures are implemented transparently and with minimal trade distorting impact (WTO 2016). The WTO rules in these areas also encourage harmonized approaches that can minimize the potential disruption to value chains.

36. Governments provide support to the agro-food sector in a wide variety of ways, and domestic agricultural support policies need to be carefully designed to avoid negative effects on domestic value-addition. Market distorting forms of domestic support can destroy value creation in a GVC context. Policy makers have other policy options that will contribute to creating an environment conducive for creating domestic value added. In particular, non-distorting support provided either directly to producers or to the sector as a whole is seen to have a positive influence domestic value added generation. In contrast, the use of distorting support (such and output and input subsidies) has a negative influence on the benefits from GVC participation, highlighting the potential value added losses from protection policies. Indeed, the domestic value added contribution from food and agricultural sectors to total earnings was found to be negative in some instances – due to subsidies paid to certain sectors. These create value added losses captured in the exports of other agro-food sectors. In effect, this shows the cost to downstream industries from subsidies. This also has important implications for policy makers when considering reforms to improve the domestic value added generated from agro-food GVCs. As these ‘taxes’ are more likely to come from inputs sourced from food and agricultural sectors than from services and manufacturing, and given the importance of these industries to agro-food export value added, reforms to limit subsidies and distortions in agro-food sectors are likely to enhance the domestic value added captured through participation in GVCs.

37. The WTO Agreement on Agriculture provides space for governments to invest in the agro-food sector through non-trade distorting interventions, including agricultural research and development, sharing of knowledge and innovation, building new skill sets in marketing and promotion, information and infrastructural support (Dixit 2014). For instance, WTO rules do not limit investments in extension and advisory services that would facilitate the transfer of information and results of research to producers and improve coordination, physical and digital connectivity to local, regional and international markets. Infrastructure services including electricity reticulation, water supply facilities, and infrastructural works associated with environmental programmes would also support the development of capacity for domestic value addition. Government investments in these types of facilities are not subject to limit under WTO rules provided the expenditure is directed at the provision or construction of capital works only and excludes the subsidized provision of on-farm facilities other than for the reticulation of generally available public utilities.

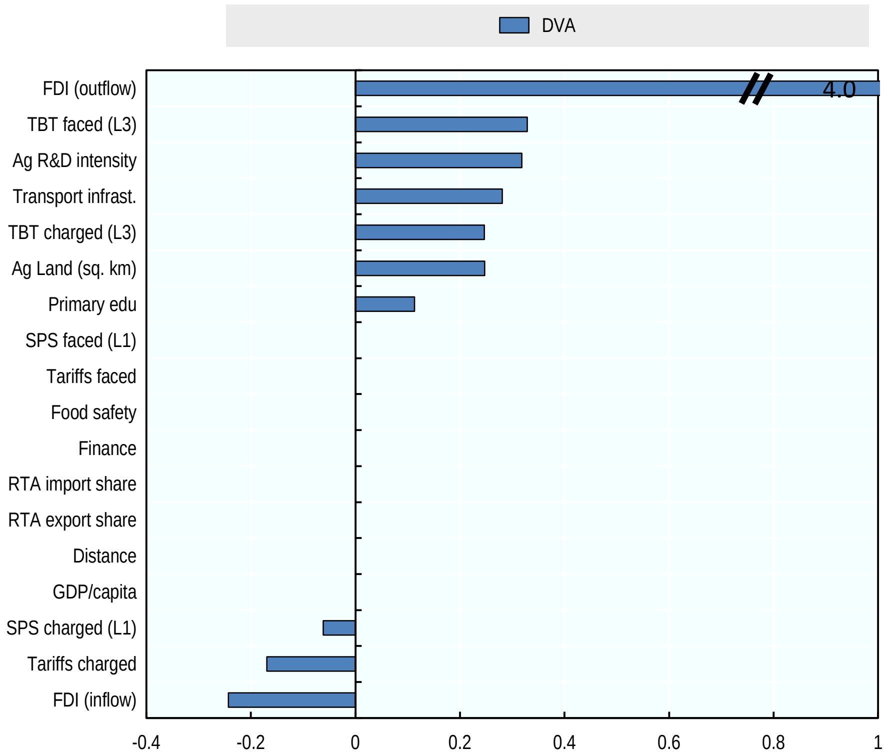
38. Government support to ensure that certain SPS and TBT standards are met, including for example, pest and disease control measures such as early-warning systems, quarantine and eradication, would also contribute to managing risks along the value chain, strengthening the connections and trust among value chain actors. Active participation of public and private actors in international initiatives related to standard setting, include private standards, or certification are also important in reducing costs of trading, yet developing countries are too often underrepresented in international initiatives related to standards and regulations (Jackson and Jansen, 2010).

39. Policies in other sectors will also affect the development of agro-food GVCs and domestic value addition. Physical infrastructure, such as quality ports, roads, railways and airports, plays a key role overall and particularly for economic actors in marginal areas – indeed quality physical infrastructure has been found to have a positive influence on domestic value added creation from GVC participation by agro-food sectors (Figure 5, OECD, 2017a). Telecommunication technology and IT infrastructure that allow consistent access to digital information also enable the co-ordination of complex and dispersed production processes (WTO 2017). Services, such as transport, telecommunications, finance, and insurance, are essential inputs for economic activities and knowledge-based services contribute to value addition by helping differentiate products for specific markets and consumers (Roy 2017). In the agricultural sector, services represent around 25% of the total value-added in traded agro-food products, with restrictions to services trade negatively influencing domestic value added creation in agro-food GVCs (OECD, 2017a).

40. Policies that distort economic incentives lead to friction, inhibit value creation in GVCs and limit opportunities from different value adding pathways. Policies to support the creation of domestic value added in the agro-food sector, therefore, need to be targeted at diverse elements of the agro-food system with a view to supporting the development and sustainability of connections along the value chain. For example, investments in R&D and education are all positively related to domestic value added creation from GVC participation (OECD, 2017a).

Figure 4. Factors influencing the returns from agro-food GVCs participation

Estimated standardised effects across determinants



Note: Standardised coefficients measure the impact of a one standard deviation increase in the variable.
Source: OECD (2017a).

2. Promoting more inclusive and sustainable agro-food GVCs

41. We know that GVCs have the potential to create value and reduce poverty (Maertens et al, 2009; 2011), but not every country or every company manages to enter a GVC. Once integrated, another challenge consists in ensuring that benefits from GVC participation are spread along the value chain and that a range of participants can benefit.

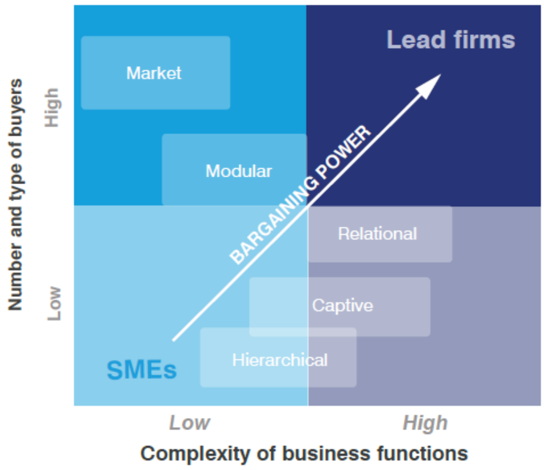
2.1. Promoting participation by SMEs in GVCs

42. For SMEs, being part of a value chain can have major advantages, notably by affording relatively stable access to a potentially large buyer, combined with reduction in information costs. Other advantages include access to finance within the value chain and investment of buyers in technological upgrading or the ability to meet standards and regulations (Fiorini et al, 2018). On the downside, GVC participation can result in an overdependence on one or two buyers, weakening suppliers' negotiating positions, particularly for prices and purchase conditions, such as lead times and quality specifications (Iacovone et al, 2015; WTO, 2014). A recent survey of 1,454 suppliers from 87 countries revealed that nearly a quarter of suppliers

depended on their main buyer for more than half of their production (Vaughan-Whitehead and Pinedo Caro, 2017).

43. Of the five governance structures typically found within GVCs (Figure 6) (Gereffi et al, 2005) – hierarchical, captive, market, modular and relational – captive structures are more frequent in developing countries (Vaughan-Whitehead and Pinedo Caro, 2017). The presence of more captive structures has implications for inclusiveness as modular and relational governance structures are more beneficial for suppliers and provide more opportunities for upgrading (ITC, 2017). For SMEs, being competitive and diversifying buyers can change their value chain relationships away from captive to modular or relational; thus support aimed at helping SMEs to better their bargaining position on entry into GVCs will increase their ability to generate greater benefits and – for some, depending on their sector, over time – to potentially diversify into other agro-food production activities that may change their place in the value chain. In promoting SME inclusion, targeting what global buyers are after in selecting suppliers is important: they are not only driven by cost but look first for quality, followed by delivery (Ho et al, 2010). Aspects like flexibility, reputation and risk also play a role.

Figure 6. Governance structures in GVCs



Source: ITC (2017), SME Guide to Value Chains, Geneva: International Trade Centre.

44. With these aspects in mind, some key requirements and actions needed to promote SME inclusion in agro-food value chains include reducing the costs and barriers associated with compliance with standards and regulations. These are critical for GVC participation (OECD/WTO 2013, ITC, 2017), are imposed by both governments and private firms, and affect every stage of an agro-food GVC. Private standards are often imposed by lead firms on their suppliers to ensure compatibility between products and processes throughout their value chains, and to satisfy high final customer requirements, including regarding environmental and social impact (Guasch, 2007). Social and environmental sustainability standards, including non-governmental initiatives, include SPS measures, but also go well beyond them, while other standards include those relating to management, accounting and logistics (ITC, 2016).

45. In terms of their impact on SMEs, SPS and TBT requirements, for example, can create disproportionate negative impacts on smaller firms, particularly if each importing country puts in place different requirements. Large firms can more easily adapt to new costly requirements, but small firms may be driven out of business if a new restrictive standard is introduced into a market (WTO 2016). Studies have shown that meeting SPS requirements is a greater burden for SMEs and small producers because they entail fixed costs, independent of the size of the farm or exporter. Ensuring that the policy framework enables fair access to value chains for firms of different size is critical.

46. Access to information on standards is often the first bottleneck (ITC, 2015). Modern information tools can play an important role in providing information at accessible costs. Tools like ITC’s Standards Map, for instance, provide information on standards, codes of conduct and audit protocols applied within global supply chains. Similarly, national legal and institutional infrastructure in areas such as metrology, standardization and testing, quality management and conformity assessment (including certification and accreditation) is also very important in determining SMEs' ability to meet relevant standards. Both regional initiatives (see, for example, Delich and Lengyel, 2014) and support – including through Aid for Trade – to the building of modern quality infrastructures can facilitate the integration of SMEs in developing countries in global value chains.

47. For SMEs, meeting delivery time requirements can also be an important feature in determining whether they can participate in GVCs – particularly for a number of perishable agricultural and food products. This largely depends on the time to transport produce to the border and the speed of border processes. Local transport delays and costs in turn are determined by the quality of infrastructure and logistics services. Given the extent of infrastructure gaps, continued international support in the area of infrastructure makes sense[7].

48. Helping SMEs understand what consumers and suppliers want is also important. Overcoming the costs and barrier associated with connecting SMEs to buyers, suppliers and institutions can aid their participation in GVCs. For example, access to market relevant information, including about export opportunities, regulations and procedures, is often a bottleneck for SMEs (ITC, 2015). New digital technologies are revolutionising how SMEs to connect to buyers and suppliers, including the growth of online platform marketplaces (ITC, 2018). The most successful platforms are large global players, often replacing traditional service providers and in potential positions of market dominance.

49. Overall, digital technologies can play an important role in promoting greater inclusion in GVCs, including for smaller agricultural producers (Box 2).

2.2. Increasing participation of women in agro-food chains

50. While research into trade and gender is relatively new and suffers from the lack of gender disaggregated data, there is nevertheless a growing understanding on the impediments to an increasing participation of women in trade.

51. First and foremost, barriers to conducting economic activity, such as limited access to productive resources such as finance and land, effectively impede women from running a business and participating in trade. Other impediments are more trade-specific and include the particular exposure of women to procedural obstacles to trade and the limited access of women to traditional information networks. In both cases, trade facilitation, including supported by aid for trade, has an important role.

52. Evidence from ITC Business Surveys on NTMs reveals that female-owned enterprises do not necessarily report a higher burden from regulations than those owned by men. This changes, however, when it comes to procedural obstacles, which often require personal interaction between firm managers or owners and national officials, with the share of procedural obstacles to trade reported by female-owned exporting firms being higher than for male-owned firms (ITC, 2016). In this context, trade facilitation, including Single Windows and reduced face-to-face trade-related procedures through the increased automation, can reduce obstacles faced by female exporters.

[7] Aid for economic infrastructure in 2015 was US$21 billion, representing roughly one half of total Aid for Trade.

Box 2. Digitalisation and inclusive GVCs

Agriculture and food sectors have a large number of small producers who are often marginalised from GVCs, particularly in developing economies (OECD, 2015b; OECD/WTO, 2017). For these groups, digital technologies can be a significant driver of improved services, and platforms and social media can help isolated groups connect and cooperate. Platforms can decrease coordination constraints related to scale and thus trade costs. They can provide more direct access to information about inputs and products markets, reducing the need for intermediaries, and better aligning production with demand, to reduce risk as well as waste.

Digitalisation can facilitate small producer participation in GVCs both upstream, by providing access to new services that support their competitiveness, and downstream, by helping them to access new markets. For example, smartphones can provide new ways of accessing access agricultural extension and advisory services (AEAS). Such services used to be mostly non-tradable, and required the physical presence of experts; they can now be delivered remotely and across borders.

Digitalisation can also enable better access to services providing small producers with training and information about demand, the quality of goods and their associated prices can allow them to increase their revenues. Moreover, their production processes can be registered within certification schemes, providing information to aid in proving compliance with regulations and allowing traceability to enable goods to be followed all the way to consumers. Such information can allow producers to earn margins based on quality, safety and a range of other attributes (including sustainability of production practices).

Safer trade with lower transactions costs can also be facilitated with digital technologies such as through electronic SPS certification, for example. Preliminary experience with e-certificates indicates that automated certification systems reduce the time spent on processing and transmitting data, leading to increased exports and private sector savings (STDF 2017). Electronic certification also decreases fraudulent certificates and increases transparency, building trust among trading partners and strengthening connections between production nodes. That said, developing countries face a number of challenges (including weak public-public and public-private collaboration, resource constraints, inadequate IT capacity and even the absence of an effective paper-based certification system) in rolling out electronic SPS certification systems. Work under the ongoing STDF ePhyto project offers experiences and lessons to help address such challenges (www.standardsfacility.org/PG-504).

Indeed, while digital technologies can help deliver greater inclusion, assistance – such as through aid for trade – is required to promote the greater inclusiveness of those technologies themselves and address the digital divide.

53. Additionally, women entrepreneurs tend to have smaller, less diverse networks than men and tend to rely more on personal contacts (GEM 2010), making access to market relevant information often more problematic for women. E-platforms can reduce information-specific barriers to trade and there is mounting evidence that women find it relatively easier to conduct trade through new electronic channels. A recent survey conducted by ITC found that the share of women-owned firms doubles when moving from traditional offline trade to cross-border e-commerce (ITC, 2017b). Tailored platforms, like ITC's SheTrades platform also use electronic means to facilitate access to business networks for women.

2.3. International instruments to foster inclusive and sustainable GVCs

54. Enterprises operating along agro-food value chains can make a significant contribution to sustainable development by creating employment and bringing expertise, technology and financing capacities for increasing agricultural production sustainably and upgrading in supply chains. But agro-food GVCs are also associated with risks, including, for example, in relation to: labour rights (e.g., exclusion of agricultural workers from national labour laws, low wages,

dangerous working conditions, high incidence of child and forced labour[8]); sustainable natural resource use (deforestation, water management, curbing global greenhouse gas emissions); and abuse of land rights and land tenure. The sustainable development impact of agricultural investments along the value chain depends on the investors' approach to social and environmental responsibility. For investments to make a positive contribution requires both good governance in host country governments and responsible behaviour by investors.

55. Many overarching principles and guidelines have been established by various international organisations to encourage investors to behave responsibly; Table 1 summarizes those most commonly endorsed, used, or referenced. In addition, there are principles and guidelines that have broader coverage (for example the Guiding Principles on Business and Human Rights; the ILO Tripartite Declaration of Principles Concerning MNE and Social Policies; and the OECD Guidelines for MNEs that aim to ensure that enterprises contribute to sustainable development as well as manage risks associated with their operations and throughout their supply chains [9]); narrower coverage (for example, particular sectors, industries, or crops), or specific purposes (for example, the "Equator principles," which financial institutions use in making loans). Private sector–led initiatives include setting standards, establishment of other relevant principles (for example, ILO guidelines on training and working conditions of rural workers), and accreditation schemes (such as Fairtrade).

2.3.1. Implementing international instruments

56. Ensuring responsible behaviour calls for practical implementation of responsible agricultural investment principles. The present challenge for investors and host governments is how to apply these on the ground in day-to-day decision making.

57. Common and consistent guidance promoted at a multilateral level can help avoid the risk of conflicting or unclear expectations for enterprises, while promoting a level playing field for business globally.

58. The OECD-FAO Guidance for Responsible Agricultural Supply Chains was developed to help enterprises implement existing leading standards for Responsible Business Conduct (RBC) along agricultural supply chains[10]. The OECD-FAO Guidance has been adopted by 48 governments and endorsed by the FAO Director General and covers all enterprises in agricultural supply chains, domestic and foreign, private and public, small, medium and large-scale enterprises, as well as upstream and downstream sectors from input suppliers to production, post-harvest handling, processing, transportation, marketing, distribution and retailing. Areas addressed include human rights, labour rights, health and safety, food security and nutrition, tenure rights over and access to natural resources, animal welfare, environmental protection and sustainable use of natural resources, governance, and technology and innovation. The Guidance calls for enterprises to ensure decent wages and working conditions in their supply chains, prevent abuses of migrant workers and provide training to employees. It asks enterprises to reduce greenhouse gas emissions and ensure the sustainable use of natural resources.

8 http://www.ilo.org/global/industries-and-sectors/agriculture-plantations-other-rural-sectors/lang--en/index.htm

9 Almost 15% of all complaints submitted to OECD National Contact Points on the OECD Guidelines for Multinational Enterprises involve alleged misconduct of companies related to agricultural supply chains.

10 These include the OECD Guidelines for Multinational Enterprises, the Principles for Responsible Investment in Agriculture and Food Systems, and the Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security.

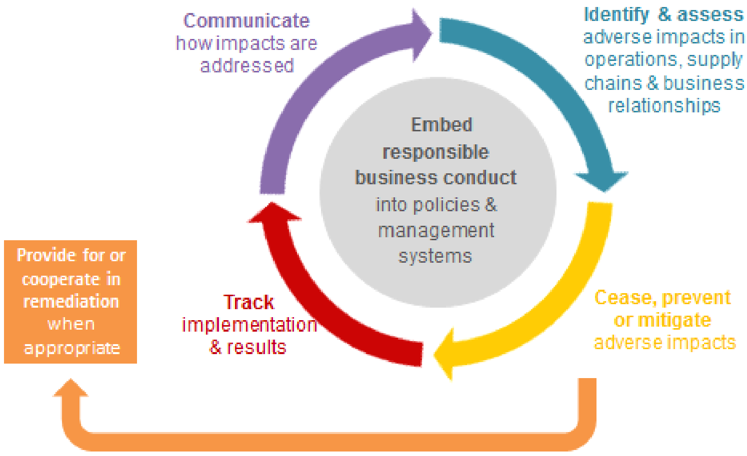
Table 1. Overarching principles or guidelines for responsible agricultural investment specific to agriculture, food and land

Name	Organization	Purpose/structure
Committee on World Food Security, Principles for Responsible Agriculture and Food Systems (CFS -RAI)	CFS (2014)	• Approved by the 41st Session of the UN General Assembly on 15 October 2014. • The principles address all types of investment in agriculture and food systems - public, private, large, small - and in the production and processing spheres.
IFC Performance Standards on Environmental and Social Sustainability (IFC-PS)	IFC (2012)	• IFC requires its clients to apply the Performance Standards to manage environmental and social risks and impacts so that development opportunities are enhanced. • Taken on board by the Equator Principles, and thereby adopted by a wide number of lending institutions.
Food and Agriculture Business Principles (UN FAB)	UN Global Compact (2014)	• Voluntary steps to embrace a set of Food and Agriculture Business Principles and report annually on their progress. • The principles are based on 16 factors: Yield and productivity, workers' rights, optimal use of soil and water, land use and rights, women and gender equality, climate change, managing waste, biodiversity, institutions and infrastructure, protecting children, energy efficiency, health and nutrition, animal and marine welfare, supply chains and trade, small-scale farmers and co-ops; and value chain financing.
OECD-FAO Guidance for Responsible Agricultural Supply Chains	OECD-FAO (2016)	• Guidance for companies in the entire agricultural supply chain. • Covers a wide range of issues, for companies to implement all major international standards (e.g. all covered in this table) to prevent risks associated with issues such as land tenure, decent work, human rights, environment and biodiversity, nutrition and food security as well as governance processes.
Responsible Land - Based Investment: Practical Guide for the Private Sector	USAID (2014)	• Recommendation for best practices related to due diligence and structuring on land-based investments. • Are organized in 5 steps to follow the lifecycle of an investment, from the initial stage of conducting due diligence and assessments, to pre-project community engagement, to negotiating the contract, project operations, and post-project close-out.
Principles for Responsible Agriculture Investment (PRAI)	UNCTAD, FAO, IFAD and World Bank (2010)	• The expected benefit of the PRAI is that their application to agricultural investments will reduce the level of negative externalities and raise the likelihood of positive impacts.
Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in the context of national food security (VGGT)	FAO (2012)	• Voluntary Guidelines to support the progressive realization of the right to adequate food in the context of national food security (Voluntary Guidelines on the Right to Food). • Set out principles and internationally accepted standards of responsible practices for the use and control of land, fisheries and forests.

Source: UNCTAD and World Bank.

59. Importantly, the Guidance offers a framework for undertaking risk-based due diligence to help enterprises identify, assess, mitigate and account for how they address the adverse impacts of their activities (Figure 7). In 2018 a pilot program on the implementation of the OECD-FAO Guidance was launched in which 38 enterprises, investors, industry associations and certification initiatives are currently participating.

Figure 7. Framework for Due Diligence



60. While the OECD-FAO Guidance is aimed at enterprises, governments are encouraged support its implementation through:

- *Regulating* – establishing and enforcing an adequate legal framework that protects the public interest and underpins Responsible Business Conduct (RBC), and monitoring business performance and compliance with regulatory frameworks;
- *Facilitating* – clearly communicating expectations on what constitutes RBC, providing guidance with respect to specific practices and enabling enterprises to meet those expectations;
- *Co-operating* – working with stakeholders in the business community, worker organisations, civil society, general public, across internal government structures, as well as other governments to create synergies and establish coherence with regard to RBC;
- *Promoting* – demonstrating support for best practices in RBC;
- *Exemplifying* – acting responsibly in the context of the government's role as an economic actor, including by observing the OECD-FAO Guidance in its own investment, procurement and government-backed finance, where appropriate.

61. Practical ways forward for both investors and governments have been identified by UNCTAD and the WBG[11], drawing on lessons gained over 6 years of work in the field (Figure 8). These include:

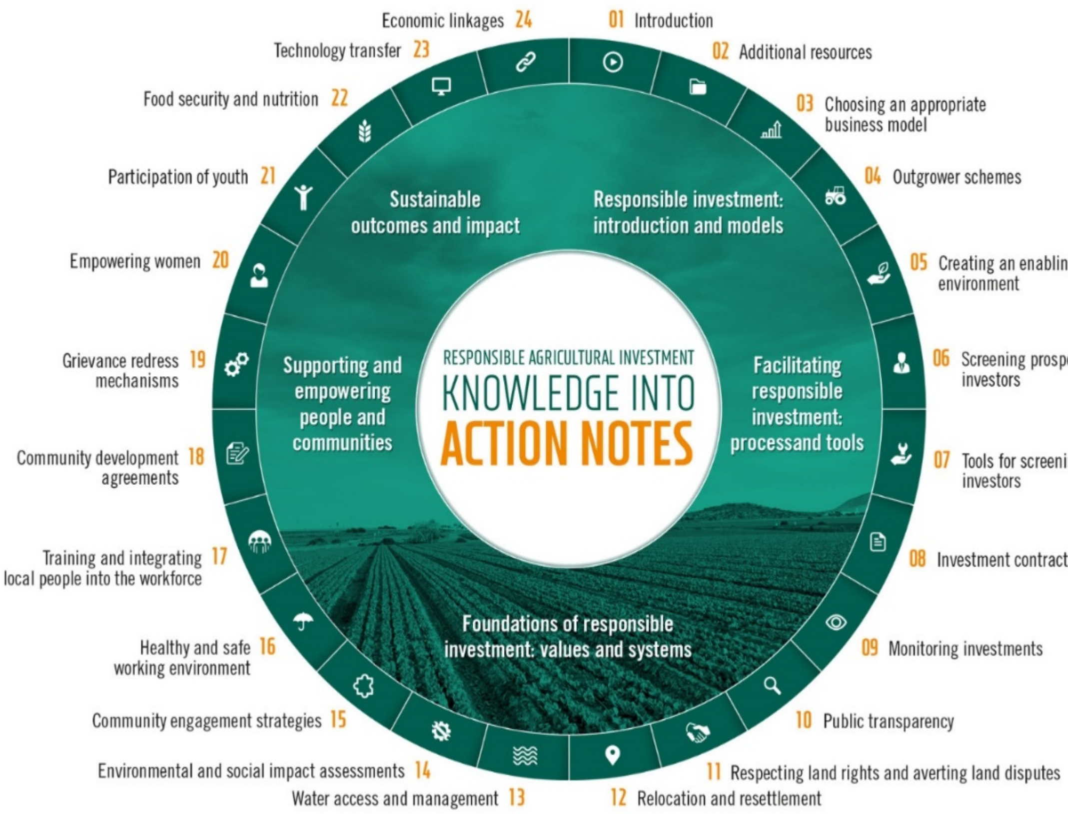
- *Training and integrating local people into the workforce*. Gaps in skills and education can be overcome by dedicated training programs and strategies, e.g., in partnership with universities offering courses in agriculture and agribusiness. Investors should consider prioritizing locals for recruitment and developing induction programs. To ensure that jobs provide decent work, governments should consider embedding commitments to international standards in the investment contract.
- *Creating economic linkages*. The capacity of an investment to generate broader local development should be a key part of screening, with targets for business development and linkages included in local business development plans from the investor.

[11] See the Knowledge into Action Note Series. Further detail is available at : http://www.worldbank.org/en/topic/agriculture/publication/responsible-agricultural-investment

Governments need to assess local capabilities and consider whether public funds should support development of local businesses.

- *Transferring technology*. Governments can support adoption of new technology e.g., by establishing national and regional systems of innovation, involving investors, NGOs, investors and small producer representatives, and by funding initial procurement of new technologies. Investors can collaborate with research institutions such as CGIAR and relevant NGOs. Technologies to be widely adopted need to first be proven under local conditions, with repeated positive results over an extended period.

Figure 8. Key issues in ensuring responsible investment in agriculture



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- *Empowering women, youth and marginalized groups*. Community consultations, land audits, environmental and social impacts assessments, grievance mechanisms, community engagement strategies, community development agreements should offer the possibility for all groups to have a say in decisions. Initiatives can also target specific barriers (e.g., investors have helped women to obtain access to land titles, or promoted adoption of ICT in their business model to attract youth, or developed community development agreements to address the needs of indigenous communities). Participation of women, youth and indigenous groups in outgrower schemes or contract farming arrangements can be facilitated by dedicated training programs or quotas.
- *Respecting rights to land, water and natural resources*. For investors this involves following due process, including due diligence to identify real or potential risks associated with rights to land, water and natural resources; researching the local context and engaging with communities to establish their free, prior and informed consent; conducting land audits; avoiding resettlement and, when unavoidable, conducting it in a

fair, transparent and sufficiently compensatory manner; and assessing, measuring, mitigating and monitoring the environmental impact of investments through ESIAs incorporated into environmental management plans. For governments, this involves improving, or improving the implementation of, natural resource governance frameworks, including land titling and water resource management systems.

- *Appropriate business model*. The business model can determine financial success, social and environmental impact and the extent and manner in which small producers and local businesses are integrated. The most inclusive models employ contract farming or outgrower schemes, often through a "nucleus estate" model in which the investor operates its own estate to train surrounding outgrowers and manage the risk of non-supply. Outgrower schemes can improve small producers' access to finance, markets, infrastructure, and technology; however, associated risks of overdependency, exploitation, side-selling and entrenchment of inequalities need careful management. Most important are fair and transparent pricing mechanisms, robust contractual arrangements, and dedicated programs for integration of marginalized groups. Governments may wish to consider the suitability of the business model as part of their screening procedures.

3. Conclusion

62. To maximise the potential benefits of GVC participation, governments need a mix of domestic and global policy action. Removing barriers to trade in agro-food products – both tariff and non-tariff barriers – and strengthening the broader trade and investment environment enable agro-food GVCs, allow producers of all sizes to participate and help to ensure the greatest gains to the greatest number of participants. Understanding the drivers of benefits from GVC participation shows a clear domestic interest for countries to remove their own distorting trade and investment policies: own tariffs act as an effective tax on exports. However, policies in other countries also matter, and global action is required to take full advantage of the possible benefits from GVCs. To this end, multilateral efforts that are inclusive of all countries and have wide coverage of sectors that reaches beyond agro-food can have a significant potential to deliver benefits to agricultural producers.

63. Global action is also important in ensuring that GVCs are inclusive and sustainable. Agreement on international instruments to help encourage good practice by firms investing in agriculture and food GVCs can play an important role in ensuring that benefits are shared widely and that GVCs are socially and environmentally sustainable. Adoption of guidance for conduct by different supply chain actors, and encompassing these in national regulation will also help. Ongoing dialogue and engagement with stakeholders, including supported by IOs, is critical.

64. To complement global action, steps need to be taken at the domestic level to enable participation, foster the benefits on offer and ensure that agro-food GVCs are inclusive and sustainable. These domestic policy steps relate to agricultural policies that help promote productivity and competitiveness in the sector – including enabling policies and services such research and development, transport infrastructure, removing market distorting forms of domestic support. And while a number of these will help promote inclusiveness and ensure value chains deliver on sustainability and other demands that societies place on the way we produce our food, other steps are needed. Policies that can place SMEs on a more competitive footing can help them take better advantage of GVC participation, and a gender lens can inform ways to promote the greater participation of women in GVCs.

65. Ultimately, in adopting both global and domestic actions, government can help better design policies that promote domestic value added generation through the transformation of international inputs into export products. Policy makers should avoid using distorting trade and domestic policies that will have negative spillover effects on both domestic and export markets and focus on measures that can foster competitiveness and help create domestic value added.

Annex 1: Flows of domestic value added in agro-food GVCs

Note: Shading represents relative size measured in USD millions. The relative intensity indicates the value added flows between countries in 2014. The rows shows how a country sells into GVCs (how its exports of agro food value added are used in other countries' exports); the columns show the source of foreign value added used in a country's own exports – that is, how it buys from GVCs.

Destination: N. S. America

Origin region	Origin	Argentina	Brazil	Canada	Chile	Colombia	Costa Rica	Mexico	USA
N.S. America	Argentina		151	31	##	26	3	22	93
	Brazil	114		##	78	14	7	76	##
	Canada	4	14		54	20	12	116	##
	Chile	18	40	36		7	7	32	##
	Colombia	3	6	50	38		3	13	##
	Costa Rica	0	0	6	2	1		6	60
	Mexico	5	6	##	16	4	10		##
	USA	27	92	##	##	80	71	##	
Asia	Australia	5	7	46	4	1	1	21	##
	Bangladesh	0	1	4	0	0	0	2	9
	China	94	##	##	##	48	43	##	##
	Indonesia	9	61	53	10	2	2	34	##
	India	12	27	112	13	7	3	62	##
	Israel	0	2	6	1	0	1	3	17
	Japan	2	6	31	3	1	1	40	110
	Kazakhstan	0	0	1	0	0	0	0	4
	Cambodia	0	0	3	0	0	0	2	7
	Korea	2	8	29	4	1	1	49	##
	Sri Lanka	0	1	8	11	0	0	3	16
	Malaysia	8	13	46	6	1	1	30	##
	New Zealand	1	4	24	8	0	0	11	79
	Pakistan	1	1	8	2	1	0	6	40
	Philippines	2	4	32	2	0	1	21	##
	Saudi Arabia	0	0	1	0	0	0	0	2
	Singapore	0	1	2	1	0	0	1	7
	Thailand	6	7	60	10	1	1	23	##
	Turkey	4	7	21	2	1	1	6	56
	Viet Nam	2	6	36	6	1	1	16	##
Europe	Austria	1	2	6	2	0	0	5	20
	Belgium	1	3	11	5	0	0	4	24
	Switzerland	3	5	18	3	1	1	8	50
	Czech	0	1	3	1	0	0	3	10
	Germany	6	13	43	11	2	2	25	##
	Denmark	2	2	9	2	0	0	4	23
	Spain	8	28	31	15	4	3	27	88
	Estonia	0	0	1	0	0	0	0	2
	Finland	1	2	5	2	0	0	5	17
	France	8	21	51	15	3	2	27	##
	U.K.	4	8	42	8	2	1	17	112
	Greece	1	1	8	1	0	0	2	13
	Hungary	0	1	3	1	0	0	2	8
	Ireland	1	2	8	2	0	1	4	25
	Italy	5	13	41	9	1	1	16	##
	Lithuania	0	0	1	0	0	0	1	3
	Luxembourg	0	0	0	0	0	0	0	1
	Latvia	0	0	1	0	0	0	1	5
	Netherlands	4	10	25	9	2	3	15	81
	Norway	1	5	14	1	0	0	4	31
	Poland	1	2	65	2	0	0	6	29
	Portugal	1	16	5	2	0	0	3	12
	Russia	2	6	16	2	1	1	19	53
	Slovakia	0	0	2	0	0	0	2	4
	Slovenia	0	0	1	0	0	0	1	2
	Sweden	1	4	10	2	0	0	7	29
	Ukraine	1	2	6	1	0	0	3	18

Destination: Asia

Origin	Australia	Bangladesh	China	Indonesia	India	Israel	Japan	Kazakhstan	Cambodia	Korea	Sri Lanka	Malaysia	New Zealand	Pakistan	Philippines	Saudi Arabia	Singapore	Thailand	Turkey	Viet Nam
Argentina	33	15	##	##	46	8	33	1	4	70	1	##	11	4	39	15	20	##	30	67
Brazil	21	45	##	##	69	17	##	3	16	##	16	##	11	14	19	75	##	##	97	##
Canada	12	36	##	61	41	5	##	1	3	##	38	56	7	8	11	22	41	53	54	53
Chile	5	1	##	6	7	2	58	0	1	64	1	7	4	1	2	2	11	31	15	24
Colombia	5	0	24	1	4	3	45	0	0	40	1	7	3	0	1	1	7	8	3	5
Costa Rica	2	0	19	0	1	1	3	0	0	7	0	4	1	0	0	0	3	2	7	4
Mexico	6	0	51	3	4	1	40	0	0	23	0	5	3	0	2	2	11	10	19	20
USA	71	65	##	##	97	32	##	5	20	##	15	##	56	34	##	74	##	##	##	##
Australia		26	##	##	46	7	##	1	8	##	6	##	##	9	34	25	115	##	15	##
Bangladesh	2		44	7	18	0	4	0	1	8	1	3	0	13	1	3	3	3	29	10
China	##	##		##	##	##	##	71	##	##	121	##	92	##	##	##	##	##	##	##
Indonesia	40	41	##		##	7	##	1	18	##	7	##	26	26	72	30	##	##	49	##
India	40	##	##	##		77	##	3	18	##	71	##	17	##	34	##	##	##	112	##
Israel	2	0	11	0	5		4	0	0	4	0	3	1	0	0	0	4	7	6	2
Japan	10	2	##	15	16	3		2	5	##	1	40	3	3	9	4	##	##	6	97
Kazakhstan	0	0	23	1	1	2	2		0	4	0	1	0	0	0	1	1	1	13	1
Cambodia	1	0	49	1	2	0	4	0		7	0	17	0	0	1	1	8	13	1	51
Korea	12	4	##	23	28	4	##	3	6		1	45	5	1	12	6	64	89	16	##
Sri Lanka	4	2	13	2	19	1	13	0	0	6		3	4	2	0	2	7	5	4	9
Malaysia	47	17	##	85	##	4	##	1	10	##	5		24	9	55	9	##	##	21	119
New Zealand	83	8	##	17	16	1	58	0	2	92	1	45		1	21	9	29	81	9	31
Pakistan	4	87	##	30	23	1	10	0	8	23	12	19	2		3	11	9	27	19	56
Philippines	7	1	##	8	8	2	##	0	1	87	1	45	11	1		4	69	68	6	30
Saudi Arabia	0	0	4	1	2	0	1	0	0	2	0	1	0	0	0		2	1	4	6
Singapore	11	1	36	17	5	0	14	0	2	9	1	52	7	0	9	2		52	2	42
Thailand	36	8	##	70	31	9	##	1	68	131	10	##	21	3	42	11	##		10	##
Turkey	5	2	48	13	9	9	12	2	1	20	1	10	4	1	4	11	16	13		22
Viet Nam	20	5	##	22	51	6	95	1	19	##	1	90	10	3	33	4	##	##	13	
Austria	3	0	25	2	3	2	12	1	0	16	0	3	1	0	1	2	5	4	7	5
Belgium	3	1	52	3	10	5	9	1	0	14	0	6	1	1	2	3	10	15	8	6
Switzerland	7	0	48	3	8	9	20	1	0	14	0	7	2	0	2	6	21	12	9	6
Czech	1	1	16	1	2	1	6	1	0	5	0	3	0	0	0	2	3	4	10	2
Germany	14	2	##	9	19	13	46	3	1	79	1	24	6	1	6	32	34	51	44	34
Denmark	7	2	##	2	3	2	34	1	1	23	0	7	4	0	1	5	8	9	5	20
Spain	12	13	##	11	15	9	46	2	1	57	1	13	4	3	9	12	30	32	35	21
Estonia	0	0	5	0	1	0	1	0	0	1	0	0	0	0	0	1	1	1	1	1
Finland	2	0	61	2	6	9	18	1	0	21	0	4	1	0	1	3	5	5	9	5
France	19	4	##	13	25	15	65	3	4	74	1	29	10	2	9	22	89	54	45	37
U.K.	21	2	##	7	24	8	30	2	1	44	1	20	7	1	4	16	54	39	29	18
Greece	3	2	11	22	2	1	7	0	0	7	1	2	1	2	0	5	3	8	39	2
Hungary	1	0	14	1	2	2	8	0	0	8	0	1	0	0	0	1	3	2	6	3
Ireland	3	0	38	1	3	3	7	0	0	9	0	7	3	0	1	9	9	10	3	7
Italy	14	3	95	7	13	8	35	1	2	32	1	11	5	1	3	7	24	26	42	15
Lithuania	0	1	11	0	1	1	2	0	0	2	0	1	1	0	0	3	1	1	2	1
Luxembourg	0	0	3	0	0	1	1	0	0	1	0	1	0	0	0	0	0	0	0	0
Latvia	0	0	12	0	1	1	2	0	0	3	0	1	0	0	0	0	1	2	2	1
Netherlands	12	2	116	6	13	8	33	2	1	38	1	18	9	1	5	11	33	39	33	27
Norway	4	0	51	3	4	4	22	1	0	20	0	5	2	0	1	2	21	24	9	31
Poland	3	1	39	2	4	4	11	4	0	14	0	5	1	0	1	24	8	9	12	10
Portugal	1	0	14	1	2	2	4	0	0	4	0	1	0	0	0	1	4	4	6	1
Russia	4	9	##	17	20	24	68	26	1	##	7	15	1	3	4	12	18	26	##	20
Slovakia	0	0	7	0	1	1	2	0	0	2	0	1	0	0	0	1	1	1	3	1
Slovenia	0	0	3	0	0	0	1	0	0	1	0	0	0	0	0	0	1	1	1	1
Sweden	4	0	49	4	8	4	17	1	0	15	0	8	1	1	1	5	12	7	10	5
Ukraine	2	12	86	12	19	20	11	2	0	44	0	20	1	10	6	16	6	38	71	9

Destination: Europe

Origin	Austria	Belgium	Switzerland	Czech	Germany	Denmark	Spain	Estonia	Finland	France	U.K.	Greece	Hungary	Ireland	Italy	Lithuania	Luxembourg	Latvia	Netherlands	Norway	Poland	Portugal	Russia	Slovakia	Slovenia	Sweden	Ukraine
Argentina	12	85	20	19	##	##	##	2	5	59	83	7	9	114	##	8	2	11	##	4	161	10	21	4	2	11	7
Brazil	45	##	79	44	##	86	##	5	41	##	##	13	34	76	##	8	8	4	##	63	85	##	110	12	71	50	14
Canada	11	##	27	11	##	34	56	2	5	64	73	6	7	44	##	2	4	1	84	17	16	14	9	4	2	12	5
Chile	5	35	10	5	50	29	22	1	6	38	40	1	3	23	46	2	1	0	##	4	12	6	18	2	1	6	2
Colombia	4	##	10	5	81	9	30	1	11	24	44	1	2	10	50	1	1	0	70	10	6	3	5	1	2	10	1
Costa Rica	1	57	3	1	18	3	8	0	1	8	14	3	1	17	25	1	0	0	93	3	2	3	1	0	0	2	2
Mexico	4	40	15	7	52	9	21	0	1	19	29	1	2	11	26	2	1	1	48	2	5	2	3	1	1	4	1
USA	52	##	##	52	##	##	##	8	23	##	##	13	41	##	##	12	18	5	##	24	70	82	63	16	8	50	27
Australia	13	##	37	29	##	19	28	2	6	##	71	2	8	28	71	2	3	1	##	5	16	5	9	5	2	12	3
Bangladesh	7	35	6	12	50	11	14	1	2	37	11	0	2	3	42	0	1	0	21	1	9	2	2	4	1	5	1
China	##	##	##	##	##	##	##	55	117	##	##	49	##	##	##	51	34	25	##	73	##	118	##	##	90	##	##
Indonesia	21	##	31	21	##	43	##	12	9	98	76	6	15	25	##	4	5	3	##	7	31	13	71	8	7	17	26
India	40	##	74	47	##	54	111	7	15	##	##	15	30	61	##	8	7	5	##	13	68	36	49	15	16	35	31
Israel	3	48	6	4	25	4	8	0	1	17	11	1	2	8	17	0	1	0	50	2	4	2	12	1	5	3	3
Japan	10	28	16	12	91	8	14	1	3	32	25	1	10	31	21	1	4	0	37	4	10	2	8	6	2	7	2
Kazakhstan	4	44	3	2	17	8	3	1	1	10	3	2	1	3	11	2	0	7	12	2	8	1	25	1	0	6	2
Cambodia	2	8	3	4	15	2	4	0	0	10	6	0	1	2	10	0	1	0	8	1	2	1	1	1	0	2	0
Korea	11	26	10	21	81	12	19	1	4	27	23	2	15	9	27	2	3	1	20	4	18	3	13	27	6	8	2
Sri Lanka	2	12	5	3	29	2	4	1	1	11	10	0	2	11	15	1	0	1	14	1	7	1	10	1	1	2	5
Malaysia	13	55	20	15	##	29	38	8	5	50	45	2	13	22	63	2	2	1	##	4	19	4	16	6	3	23	10
New Zealand	5	36	14	5	62	17	11	1	2	25	59	1	3	14	35	3	1	1	61	2	6	3	4	2	1	5	2
Pakistan	6	50	7	8	74	9	26	2	2	33	35	1	4	8	73	3	1	2	31	2	11	15	4	2	5	5	6
Philippines	8	31	11	9	88	8	15	1	4	21	18	0	9	8	29	1	1	0	117	2	8	2	4	3	1	5	1
Saudi Arabia	0	2	1	0	4	1	1	0	0	2	1	0	0	2	2	0	0	0	6	0	1	1	0	0	0	0	0
Singapore	1	3	1	1	9	1	2	0	0	4	4	0	1	3	3	0	0	0	5	0	1	0	1	0	0	1	0
Thailand	14	59	30	16	##	21	23	3	7	55	84	2	10	37	87	2	3	1	##	8	16	4	13	5	2	15	4
Turkey	35	121	34	28	##	21	27	2	4	68	49	7	16	18	##	5	3	2	##	5	48	7	86	7	4	13	74
Viet Nam	11	##	18	14	##	19	76	2	3	62	42	3	7	19	96	4	3	4	##	4	27	12	17	4	6	9	8
Austria		50	79	76	##	27	21	2	5	57	32	3	84	12	##	3	3	2	67	4	44	4	11	24	50	14	14
Belgium	25		32	32	##	56	41	3	11	##	131	4	20	67	118	7	51	3	##	9	39	11	12	6	4	25	3
Switzerland	78	63		19	##	13	26	2	7	112	31	2	11	22	97	2	9	1	35	6	17	3	9	6	5	12	4
Czech	##	35	21		##	16	15	2	6	34	27	1	55	10	91	6	2	2	35	3	##	4	8	98	11	10	6
Germany	##	##	##	##		##	##	20	63	##	##	24	##	##	##	27	53	12	##	56	##	47	53	70	36	##	39
Denmark	23	67	25	20	411		27	6	34	56	##	8	11	58	90	9	2	4	##	61	92	6	9	5	2	##	3
Spain	73	##	121	110	##	##		6	22	##	##	14	48	##	##	23	12	10	##	26	##	##	30	25	12	47	17
Estonia	2	4	2	3	20	20	3		31	5	4	0	2	1	5	13	0	18	7	4	5	1	7	10	0	29	2
Finland	14	42	16	12	##	44	19	34		36	37	3	8	22	40	7	2	6	43	11	31	4	20	4	2	83	4
France	##	##	##	##	##	##	##	8	33		##	20	101	##	##	17	71	6	##	29	##	##	39	33	16	79	32
U.K.	39	##	##	51	##	##	##	7	24	##		9	33	##	##	10	19	4	##	26	82	31	15	11	5	62	7
Greece	13	38	9	16	86	14	12	1	6	29	26		9	9	99	3	1	1	45	3	20	4	9	5	2	7	8
Hungary	##	41	20	53	##	18	13	2	3	33	21	3		11	115	3	1	2	65	2	44	2	10	42	20	7	13
Ireland	7	62	21	8	88	47	16	1	4	48	##	1	5		39	1	2	1	78	3	12	5	5	2	1	15	2
Italy	##	##	##	118	##	101	118	6	18	##	##	23	73	87		18	11	7	##	24	113	36	26	33	40	48	11
Lithuania	4	22	4	8	41	27	5	21	10	13	12	0	4	6	23		0	67	30	6	34	1	10	2	1	21	2
Luxembourg	3	39	2	2	46	12	3	0	0	15	3	0	1	3	10	0		0	17	1	2	1	0	1	0	2	0
Latvia	4	15	3	8	46	28	6	48	16	9	16	0	3	6	8	45	1		18	4	14	1	6	2	1	51	2
Netherlands	##	##	151	121	##	##	131	14	58	##	##	18	79	##	##	23	20	14		54	##	36	36	28	14	99	20
Norway	10	42	15	22	151	##	16	16	42	89	96	4	6	21	21	65	3	17	83		##	3	22	3	1	##	9
Poland	66	##	34	##	##	121	52	17	21	##	113	6	##	70	##	44	4	15	##	11		8	40	58	9	39	59
Portugal	7	42	14	11	65	11	##	1	5	68	34	1	5	19	55	1	3	1	50	4	16		3	2	1	6	1
Russia	24	110	32	34	##	55	46	25	##	58	49	22	24	18	##	33	4	29	##	28	87	11		18	6	42	95
Slovakia	95	18	10	##	##	7	8	1	3	16	12	1	89	4	36	2	1	1	13	1	74	1	4		7	7	3
Slovenia	73	4	6	7	27	3	2	0	0	6	4	0	23	1	78	0	0	0	6	0	4	1	1	7		1	1
Sweden	27	68	26	26	##	##	32	13	84	64	##	3	16	37	69	52	4	10	97	99	72	17	10	7	3		4
Ukraine	26	##	10	19	112	11	##	4	3	74	36	13	26	35	114	20	6	4	##	2	##	46	25	13	2	6	

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