



COMMITTEE ON COMMODITY PROBLEMS

INTERGOVERNMENTAL GROUP ON TEA

TWENTY-FIFTH SESSION

Guwahati (Assam), India, 31 January–2 February 2024

CHANGES IN THE GLOBAL TEA TRADE NETWORK

Executive Summary

This document describes the evolution of global patterns of tea trade between 2005 and 2020. Based on a network analytical approach, it is shown that most countries traded tea with more partners in 2020 compared with 2005. Especially on the export side, the structure of the tea trade network appears to have undergone some decentralization, in which trade became relatively less concentrated in individual trade hubs. Rising population and per capita income in low- and middle-income countries, generally lower import tariffs, greater harmonization in maximum residue levels in tea, product valorisation and changes in consumer preferences, are among the factors that underpinned the expansion in trade. This trend is likely to persist over the next decade, offering additional opportunities for the industry.

Suggested action by the Group

The Group is invited to:

- Take note of the findings on the evolution of connectivity and structural changes in the global tea trade network.
- Discuss the factors that contributed most to the increase in trade links, with possible implications for the industry and policy actions.
- Consider the reasons behind the emergence of large tea re-exporting hubs.
- Provide guidance on what factors are likely to determine the growth in tea trade over the next decade.

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I. INTRODUCTION

1. At its Fifteenth Session, the Intergovernmental Group on Tea (IGG/Tea) urged the secretariat to continue producing information products on the evolution of the global tea economy, with the objective of improving market transparency and access to information. In response to the Group's request, the secretariat produced this document (CCP:TE 24/3), which examines the global patterns of tea trade between 2005 and 2020, based on a network analysis approach. This analysis complements the information contained in the current market situation report (CCP:TE 24/2) by taking a more long-term view on the global trade of tea. The paper enriches the analysis of tea price developments and quantities of tea traded, focusing on the connectivity of countries among each other through the trade of tea and structural features of the tea trade network.

2. The tea sector is a key driver of socio-economic development, representing a major source of employment and income for millions of families, including in Least Developed Countries (LDCs). One key characteristic of tea is that smallholders are responsible for 60 percent of world production. Over 9 million tea farmers in the four main tea-producing countries, China, India, Kenya and Sri Lanka, are smallholders. Global tea production amounts to around USD 18 billion annually, while the value of total tea trade is estimated at around USD 9.8 billion, accounting for an important source of export earnings. Over the past decades, the global tea industry has seen rapid growth, with a remarkable rise in the number of consumers globally, particularly among emerging economies and low- and middle-income countries.

3. Global trade of tea expanded by 1.1 percent annually from 2005 to 2020. In Kenya, the world's largest tea exporting country, exports rose by 2.3 percent over the examined period. Exports from other key African suppliers, Uganda and Rwanda, increased faster, respectively by around 4 percent and 5 percent annually, but volumes remained relatively small. In Asia, shipments from key exporting countries, China, India and Viet Nam, increased by around 2 percent. On the import side, increasing purchases were recorded over the 2005-2020 period. Imports by Pakistan, currently the world's largest tea importing country, rose by 5 percent annually. Among other key importing countries, imports in Egypt rose by nearly 2 percent on the back of increasing domestic demand and conducive international trade agreements, while in the United States of America, import volumes over the examined period held relatively steady. By contrast, imports in the United Kingdom of Great Britain and Northern Ireland and in the Russian Federation declined slightly.

4. More recently, the transformation of domestic markets in low- and middle-income countries has contributed to structural changes in the tea trade network. For example, strengthening domestic demand for tea in India has contributed to the shift of a primarily export-driven tea industry in the country to one in which around 90 percent of production is destined for local markets (Arya, 2013; Langford, 2021).

II. CONNECTIVITY IN THE GLOBAL TEA TRADE NETWORK

5. The analysis of the connectivity and structural features of the global trade of tea is based on a network approach. Network analysis comprises a set of techniques that are applied to analyse complex systems. In trade analysis, network measures are often used to describe and visualize patterns and structure of trade and the relative position of countries in the network of trade. The results help characterise long-term changes that shape trade structures and support the design of evidence-based

decisions. The network measures used for the analysis in this paper are defined in Box 1. The underlying data and data handling are described in Box 2.

6. An important feature to describe the connectivity of countries among each other are trade links. Countries can be connected through imports and/or exports of tea. A country has high connectivity in the tea trade network if it has many trade partners from which it sources tea (imports) or to which it exports tea (exports).¹

Box 1. Network measures applied in this paper

Trade links: Trade links represent import or export flows of tea between countries. The number of links indicates the number of countries with which a specific country trades.

Connectivity: Connectivity Index is measured by the number of trade links normalized by the total number of theoretically possible links. The index is bounded between 0 and 1 and the higher the index, the more countries are connected directly with each other through imports or exports of tea.

Hubs: The structure of the tea trade network in terms of hubs is determined based on the network indicator “betweenness”. In this paper, betweenness is calculated based on trade links that have been weighted with the value of tea traded through them. High values of this index identify countries that are trade hubs.

Source: Adapted from FAO 2022. *The State of Agricultural Commodity Markets 2022. The geography of food and agricultural trade: Policy approaches for sustainable development.* Rome, FAO. Definitions and underlying methodology for the indicator calculation can be found in Jafari, Y., Engemann, H. and Zimmermann, A. 2022. *The evolution of the global structure of food and agricultural trade: Evidence from network analysis.* Background paper for *The State of Agricultural Commodity Markets (SOCO) 2022.* Rome, FAO.

Box 2. Data used in the analysis

The network measures are calculated using data on international bilateral trade of tea from the FAOSTAT database. Tea includes the FAOSTAT item “tea leaves” that comprises the HS codes 090210 (Tea, green; not fermented, in immediate packings of a content not exceeding 3 kg), 090220 (Tea, green; not fermented, in immediate packing of a content exceeding 3 kg), 090230 (Tea, black; fermented and partly fermented tea, in immediate packings of a content not exceeding 3 kg), and 090240 (Tea, black; fermented and partly fermented tea, in immediate packings of a content exceeding 3 kg).

All network measures are given for three-year averages centred around 2005 and 2020, further referred to as 2005 and 2020 only. After excluding countries with missing data, a harmonized dataset of 116 countries is used for the calculations. The sample of 116 countries accounts for more than 90 percent of the global tea trade, except for exports in 2020 for which a coverage of the total value of trade in tea of 82 percent was reached. The trade data includes re-exports.

7. Overall, the connectivity of countries in the tea trade network increased between 2005 and 2020. At the global level, the number of export links increased by one-third in this time period (Figure 1). On average, countries exported to more other countries. Figure 2 shows the evolution of connectivity based on export and import links at country level. Although the maps do not reveal any

¹ The analysis of connectivity in this paper builds only on trade links and ignores the actual value or quantity of tea traded through these links. A country can have high connectivity (many trade partners) in terms of links, but trade only a small value or quantity of tea with these partners.

drastic changes in the patterns of trade, some countries strengthened their connectivity. For example, Türkiye developed more export links, and Brazil, Canada and China strengthened their import connectivity between 2005 and 2020. A closer look at the data shows that, in fact, most countries increased their connectivity in terms of exports and/or imports (Figure 3). At the global level, there were on average seven more trade links in 2020 than in 2005 per country included in the sample. The exporting countries with the most trade partners are China, India and Sri Lanka. Canada and the United States of America are leading in terms of import connectivity. The United Arab Emirates showed one of the strongest dynamics in increasing both export and import connectivity, reflecting its increased relevance as a major trade hub.

8. The increase in the overall connectivity levels can be attributed to several drivers that have helped facilitate the development of trade routes – including rising per capita tea consumption in low- and middle-income countries, changes in consumer preferences towards innovative tea products such as organic tea and specialty teas, generally lower import tariffs on tea, greater harmonization in maximum residue levels in tea, the implementation of regional trade agreements, declining international tea prices in real terms, and better transportation and distribution systems.

9. Lower import duties, including as a result of the increased number of trade agreements, have been conducive to boosting trade flows of tea over the period 2005-2020. In China, for example, while the Most Favoured Nation (MFN) applied duty rate did not change from 2005 to 2020, imports under Preferential Trade Agreements from LDCs contributed to boost trade network of most imported black tea². In Egypt, the lower MFN duty rate, going from 5 percent in 2005 to 2 percent in 2020, along with free trade agreements for Arab Mediterranean Countries (Agadir Agreement), the European Union and the Common Market for Eastern and Southern Africa (COMESA), also contributed to a significant expansion in the country's tea trade network. In particular, free duty rates under COMESA favoured imports from Kenya over other main suppliers. In Morocco, the MFN duty rate for green tea³, representing the bulk of total tea imports, went from 25 percent in 2005 to 2.5 percent in 2020, with China continuing to represent the main origin. Reductions in MFN duty rates from 2005 to 2020 for most traded tea varieties were seen in Malaysia, in African countries, including Ghana, Guinea, Mauritius, Rwanda and Tunisia, and in the South American countries of Peru and Colombia.

10. In general, the proliferation of regional trade agreements also contributed to increase the global tea trade network. In Africa, regional trade agreements include COMESA, the Economic Community of West African States (ECOWAS) and the Southern African Development Community (SADC). In Asia, Preferential tariffs for the Association of Southeast Asian Nations (ASEAN) countries increased the trade network of tea in Indonesia, the Philippines and Myanmar.

11. Figure 4 shows the distribution of connectivity at global level. In 2005, export links were highly concentrated (left-hand panel). Most countries exported to very few trade partners (left tail of the distribution), few countries had many trade partners to which they exported (right tail of the distribution). In 2020, the distribution of export connectivity was much more balanced. Fewer countries had low connectivity (left tail) and many countries had developed more export links (the distribution shifted rightwards). As only few countries have a comparative advantage in producing tea, which is mainly derived from natural conditions, export connectivity will remain relatively concentrated in favour of these countries. However, new trade links have emerged or strengthened, which are characterised by countries that import tea and process it into higher value products for export. For example, the European Union, the United Arab Emirates and the United Kingdom of Great Britain and Northern Ireland re-exported a combined 138 540 tonnes of tea in 2020 as value added products, fetching a high export price.

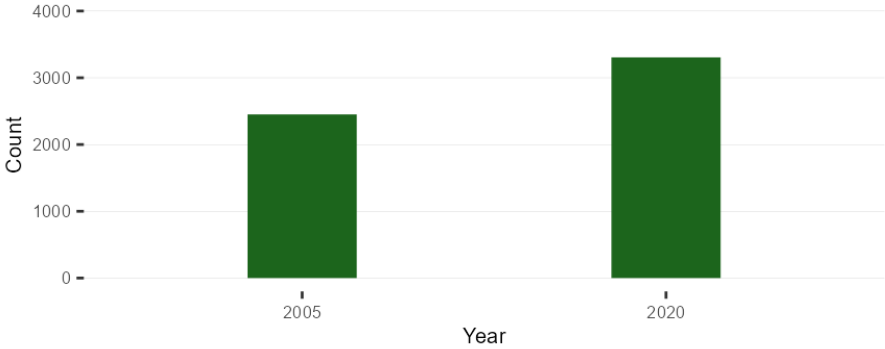
12. This is different on the import side (right-hand panel of Figure 4). In 2005, import connectivity was also relatively concentrated, although to a lesser extent than export connectivity. Most countries had an average import connectivity of around 20 percent (maximum of the

² Other Black tea (fermented) and other partly fermented tea, HS 09024090.

³ Other Green tea (not fermented), HS 090220.

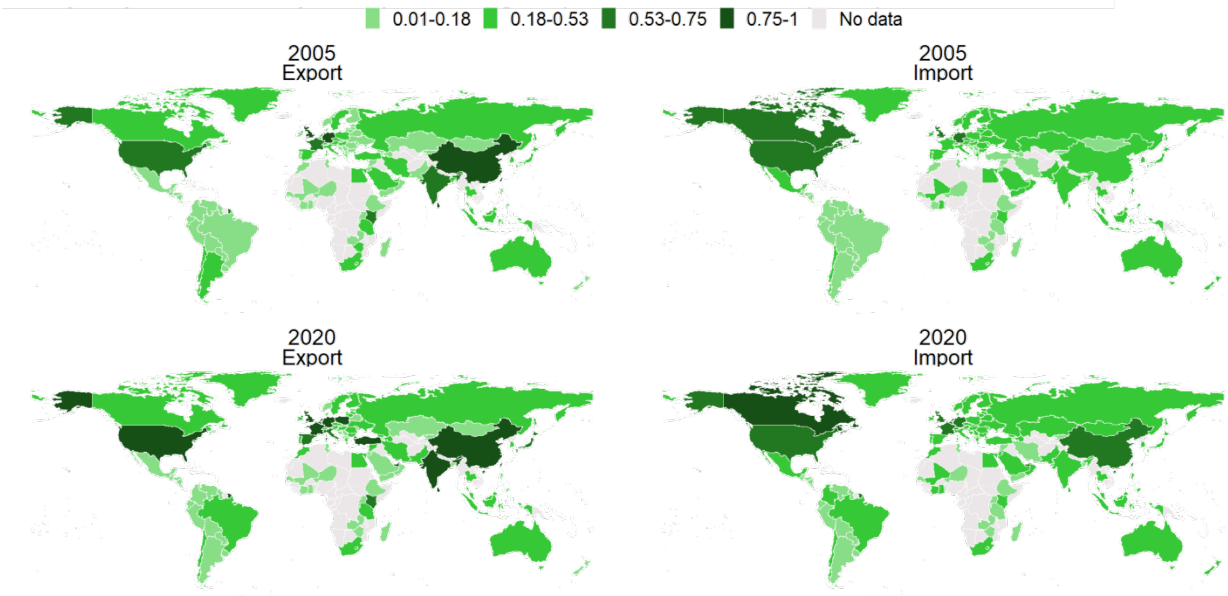
distribution). Very few countries imported tea from many different trade partners (right tail of the distribution). In 2020, most countries still had an import connectivity of around 20 percent, but the distribution had shifted to the right. More countries imported tea from a greater variety of trade partners, indicating structural changes on the import side, with a more diversified and resilient sector.

Figure 1. The evolution of trade links, world, 2005 and 2020



Source: Based on data from FAOSTAT

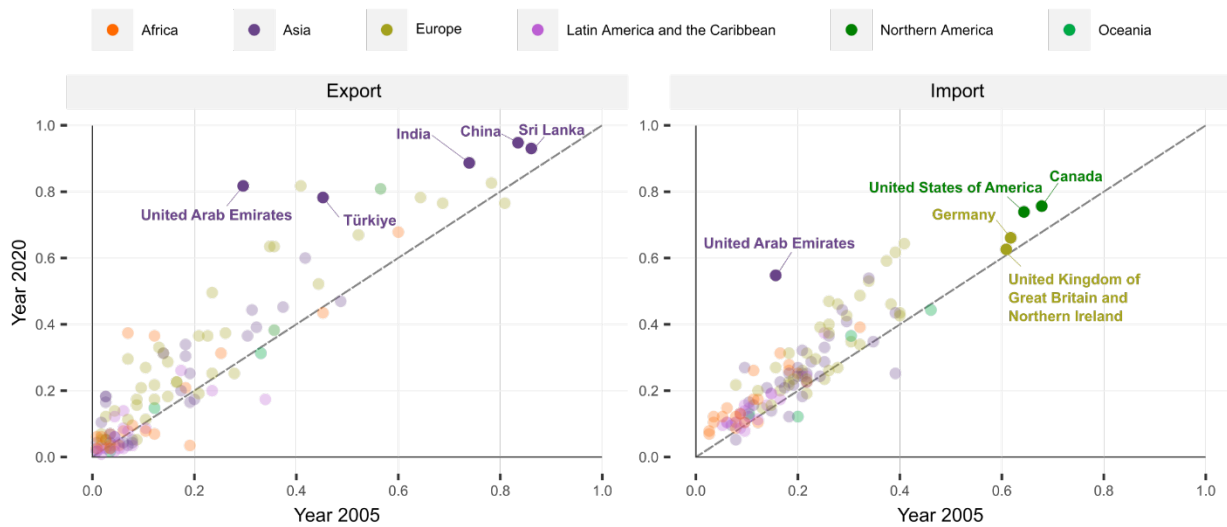
Figure 2. Connectivity based on trade links by country, world, 2005 and 2020



Note: The darker the colour, the greater the connectivity of a country to the global tea trade network.

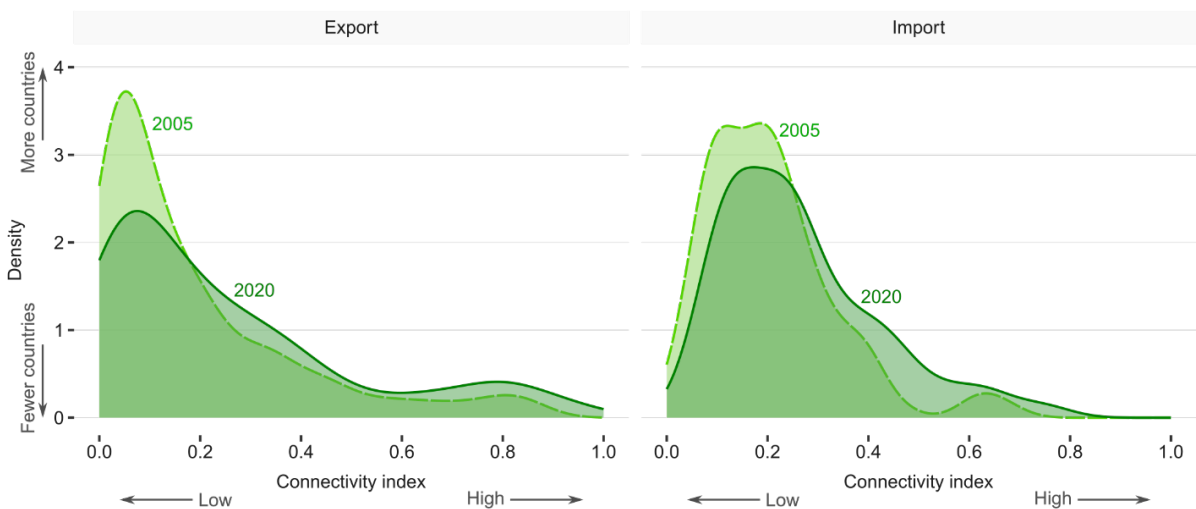
Source: Based on data from FAOSTAT. Conforms to map no. 4170 rev. 19 United Nations (October 2020).

Figure 3. Evolution of connectivity based on trade links, by country, 2005 and 2020



Source: Based on data from FAOSTAT

Figure 4. Distribution of connectivity across countries, 2005 and 2020



Source: Based on data from FAOSTAT

III. STRUCTURE OF THE TEA TRADE NETWORK AND REGIONAL TRADE

13. One way to show the structure of a trade network is by identifying trade hubs and their location within the global network. In this paper, trade hubs are identified based on the network measure “betweenness” (see Box 1), where countries with high betweenness indices are closely connected with many other countries, and the value of tea traded through these connections is relatively high.

14. Figure 5 shows major trading hubs of tea for exports and imports. When looking at exports, the tea trade network expanded and decentralized between 2005 and 2020. While major exporters with many export links such as China, Sri Lanka and Japan were in the centre of the network in 2005, they have shifted away from the centre, and their relative weight within the network has decreased in 2020. These observations are in line with the finding from Figure 4 that showed that export connectivity was

more evenly distributed in 2020 than in 2005, driven by the emergence of new hubs that specialise in re-export of high valued tea products.

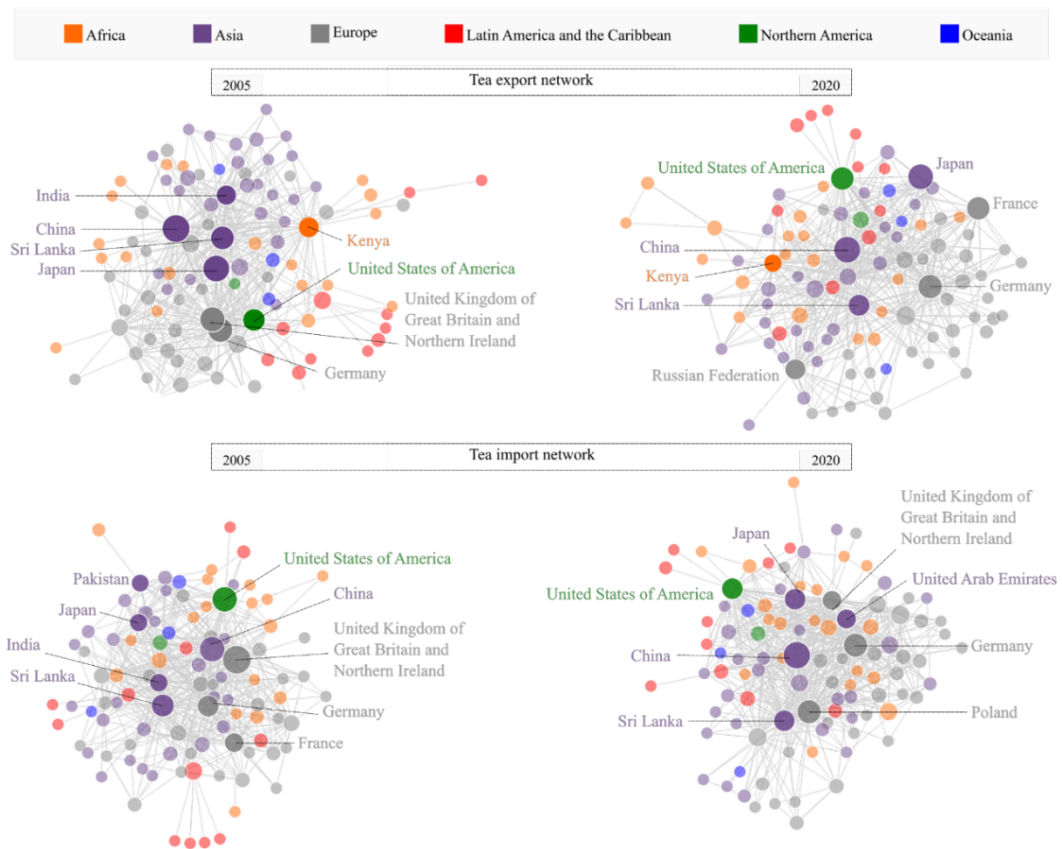
15. In terms of imports, the network does not appear to have changed a lot between 2005 and 2020, and the decentralization as described in Figure 4 is less obvious when looking at the relative locations of countries in the network.

16. Figure 6 shows the shares of intra- and interregional trade in five regions in 2010 and 2020, based on trade value. Changes in these shares were most dynamic in Africa. A larger share of exports from the continent was destined for other regions in 2020 than in 2010. Africa also sourced a larger share of imports from other regions in 2020 compared with 2010, as their imports of packaged products have gone up. As consequence, the share of intraregional exports and imports decreased. In 2010, around 70 percent of African exports were destined for other regions and this share had grown to around 80 percent in 2020. While around 55 percent of African tea imports were sourced from within Africa in 2005, this share had declined to around 40 percent in 2020. Greater efforts can be made to reverse this trend by boosting per capita demand of tea in domestic markets in Africa.

17. Intraregional exports and imports of the Americas also declined between 2010 and 2020, but to a much lesser extent in terms of percent point change. In general, around 80 percent of Americas exports stay in the region, around 75 percent of its imports are sourced from other regions. The share of inter- and intraregional exports of Asia remained almost constant, with intraregional exports accounting for around 45 percent and interregional exports for 55 percent of all exports. The share of interregional imports into Asia increased from around 30 percent in 2010 to 40 percent in 2020. The share of intraregional exports and imports in Europe slightly increased in the same time period.

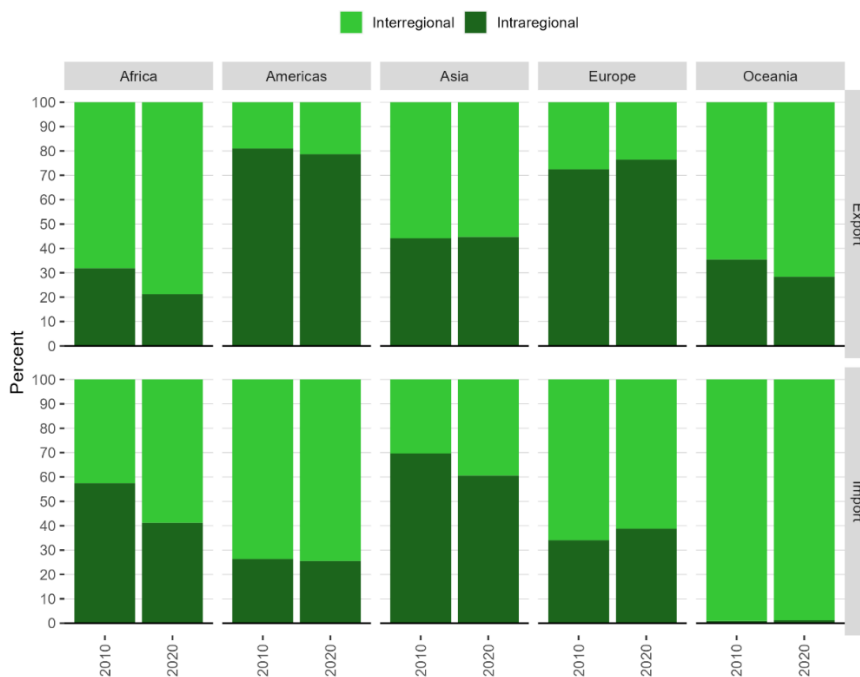
18. In many traditional exporting countries, per capita consumption of tea is increasing (see, for example, CCP:TE 22/CRS 3). More of the total tea production is consumed domestically and the share of exports in domestic production decreased or changed little between 2010 and 2020 (Figure 7). In Indonesia, it declined from almost 60 percent to 35 percent from 2010 to 2020. Similarly, in Kenya, the share of exports in own production declined sharply, from 90 percent in 2010 to 73 percent in 2020, pulled down by the outbreak of the COVID-19 pandemic. Exports recovered in 2021, raising the share up to 83 percent. In China, the share of exports in production also declined, by more than 8 percentage points, boosted by a dynamic internal demand. India recorded a slight decline from 2010 to 2020 as well. In Viet Nam, the share of export in production remained at around 70 percent. Only in Sri Lanka and Uganda, the share of exports in production increased, although moderately.

Figure 5. Tea trade network and main players, exports and imports, 2005 and 2020



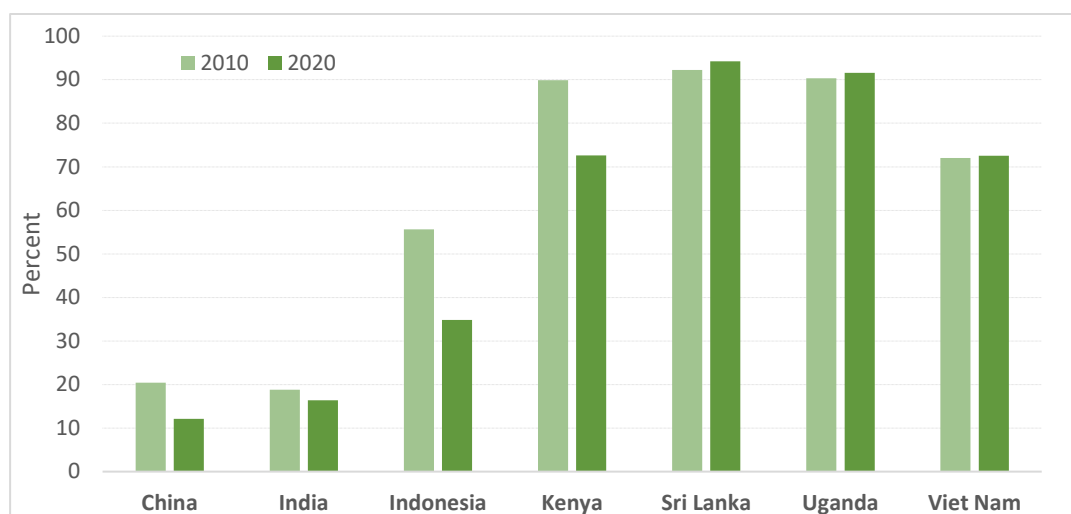
Source: Based on data from FAOSTAT

Figure 6. Inter- and intraregional trade of tea, 2010 and 2020 (based on trade value)



Source: Based on data from FAOSTAT

Figure 7. Shares of exports in domestic production, selected countries, 2010 and 2020 (based on quantity)



Source: FAO/EST

IV. SUMMARY AND CONCLUSIONS

19. This document describes the evolution of global patterns of tea trade between 2005 and 2020. Based on a network analysis of trade flows, it was shown that the connectivity of tea trading countries among each other increased, with most countries trading with more partners in 2020 than in 2005. This is probably driven mainly by a sustained increase in global per capita tea consumption, especially in low- and middle-income countries. More connectivity led to a more balanced distribution of trade links globally, with stronger decentralization processes on the export than on the import side, and a more resilient sector.

20. Results of the analysis also underscored some regional developments, with Africa's share of imports from other regions expanding in 2020 compared with 2010. Also, a larger share of the continent's exports was destined for other regions during the same period, hinting at the growing role of African producers in the global tea market. Strong expansion in per capita tea consumption in low- and middle-income countries offers the largest opportunities for the industry. A closer monitoring and better understanding of these markets could provide new insights and solutions for prospective marketing and long-term trade strategies. On the other hand, with mostly saturated markets in high-income countries, opportunities still exist in developing and expanding specialty teas, with a focus on product innovation.

V. REFERENCES

Arya, N. 2013. India Tea Scenario. *International Journal of Scientific and Research Publications*, 3(7).

Langford, N.J. 2021. From: 1445-1 to Local Tea Markets: The Changing Political Economy of Tea Production within India's Domestic Value Chain. *Development and Change*, 52(6): 1445-1472. International tea prices, as measured by the FAO Tea Composite price, a weighted average price index for black tea, which includes crush, tear, curl (CTC) and Orthodox teas, remained firm over the last decade.