When Dragons Fly Across the Woods - The Impact of Chinese FDI on East Africa's Commercial Forestry Sector

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1. Introduction[1]

Chinese Foreign Direct Investment (FDI) in Africa has drawed academic discussions since the early 2000s and has seen an exponential growth after the 2010s. Its context can be explained by the analytical framework of "push" and "pull" factors developed by Calvo et al. (1993) and Fernández-Arias (1996). On the "push" side, Chinese policymakers are continuously seeing African countries as strategic partners under the global geopolitical environment and therefore putting out favorable policies to encourage domestic companies to 'Go out', integrate, and support the broader Belt and Road Initiative and related countries (Warmerdam & Van Dijk, 2013). Apart from political reasons, the economic push factors cannot be neglected: China is experiencing a major economic transformation, showed by slowed economic growth and slack demand from domestic markets and consumers (Xinhua, May 5th, 2025). Over-competition within domestic companies and increased cost of labour during the Global Value Chain (GVC) shift also forced many to look for oversea markets with large potentials and buying powers, which is best represented by Africa and its leading economies such as Kenya, Tanzania, and Nigeria. Meanwhile, on the "pull" factors, African leaders and many internal organizations such as African Union (2024) and UNIDO (2025) have been strengthened the importance of Africa's self-industrialization through more diversified and sector-focused industrial plans. In doing so, it is suggested that more active and targeted investment promotion policies should be initatived by African countries in attracting but also managing capitals and innovations into targeted sectors by FDI and local SMEs (Anyawu, 2006; Dupasquier & Osakwe, 2006; Van der Ven, 2018). Finally, the advantages of resource-rich and abundant young populations' growth also made significant pull effects that attracts FDI to transfer its global value chain centers to Africa (Obeng, Mwinlaaru, & Ofori, 2022).

Chinese investment is often seen in economically-strategic (for both China and Africa), resource heavy, or development-focused sectors such as agro-processing, infrastructure building, mining, energy, among other. Scholars have been often seen analyzing the flow of Chinese Foreign Direct Investment (CFDI) into these sectors and advising policymakers to better evaluate the impacts of CFDI in its industrial and economic transformation strategies. However, there is one sub-sector that is often undervalued but unique due to its cross-over between agriculture and manufacturing, which is commercial forestry. There are a few reasons. First, the growth and recovery rate of commercially-mature trees (oftern between 7-10 years) is significiantly slower than other agricultural products, which requires capital inputs in early investment for delayed return, and can take use of land resources for a long period of time. Second, commercial forestry requires a lot of labour and manufacturing capacities in managing, harvesting, transporting, and finally processing into varieties of products from rubber, resin to timber, electricity poles, wood panels, and furniture. Each end product involves a large value chain and serves different markets locally, regionally, and globally. Finally, the distinction between commercial forestry and other purpose of forestry, such as protection forestry and agro-forestry has always been in a blur, causing social and enviornmental debates across different continents. China, India, and Malaysia are regarded as the three largest buyers of timber from Asia, with China accounting for 60-70% activities in some Central and West Africa and export tropical woodsalmost exclusively to China, accounting for as high as a number of 90%.

[1] Section 1 (Introduction) to Section 2 (Theretical Framework) are reused from the assignments for the course 4391 and course 3105 for the preparation of this research paper.

In East African countries such as Tanzania, Uganda, and Kenya, the story looks a bit different. Due to the climate and geological landscape difference, there are no major tropical wood suitable for processing and encouraged commercially-feasible species such as pine and eucalyptus to grow. Further data shows that forest lands, on average, cover 37% of the total land area in East Africa (FAO, 2024). The management and utilization of forest resources contributes to 3% of GDP and provides additional income and job opportunities for at least one million people in each country (Kyeyune et al., 2018; Kalumanga et al, 2018; Chisika & Yeom, 2021). It was understudied, not only because of the informality of forestry-related jobs, low value of production technology and local products required for these species, but also because of the existence of illegal export activities and trade value loss, despite less in volume and attention compared to other West African countries (Mwangi et al, 2018). Therefore, in recent years, East African governments also hope to better regulate and industrialize its commercial forestry sector, where high quality trees can be planted and processed locally and sold to high-value market to increase the sector's economic contribution and competitiveness in the global timber value chain. These large standing forestry land also give hope to policymakers as an additional stream of revenue through multi-million carbon-credit projects. Ambitions like such can be recognized from recent national policy paper such as the Kenya Vision 2050 or announcement by Uganda and the Green Climate Fund (FAO, Oct 29th, 2025).

Chinese investment has been entering East Africa's commercial forestry sector since 2015, as the author's one-year fieldwork and sector involvement found. Chinese Foreign Direct Investment (CFDI) in the forestry sector has the following characteristics: Strong private investment (Aggregate total of $300mln USD in Uganda and Tanzania), fast industrialization (Factories and all required machineries can start full operations within one year of establishment), labour intensive (requires at least 300-400 workers in each factory per shift and 2-3 times more in upstream forest planting, managing, harvesting, and haulaging), and resource demanding (Need est. 205,000 hectres of forested lands per year requires to meet full production capacity). Academia from different subjects has been trying to unpack the social, economic and environmental impacts of CFDI and no conclusive statement can be made. Some stated that CFDI can bring in capital, new technologies, and less political conditions than Western-led investment, which sped up industrialization and economic growth and encouraged FDI spillovers through competition, imitation, and labour mobility (Nawaz et al, 2025; Darko & Xu, 2024; Borojo et. al, 2021). While other econometric analyses saw no difference between CFDI and other sources and believed that the economic growth is restricted, as CFDI invests in resource-heavy and export-oriented sectors (Wethal, 2018; Megbowon, 2019). Some praised the job creation by Chinese factories in addressing the high unemployment rate in Africa and increasing people's income (Lu & Liu, 2018), while others found that local employment by CFDI is still informal, temporary, and unfair (Cook et al., 2019). Finally, some saw the incentives and actions of CFDI in forestry resources preservation and susbtainable management (Kaplinsky et al, 2003), while others accused them of extracting land resources from locals and ignoring pollution and deforestation issues (Mbatu & Otiso, 2012).

Therefore, this study contributes to the debate and provides field-collected empirical evidence by exploring this research question: *What is the impact of Chinese FDI on the commercial forestry sector in the context of East Africa?* The following structure will be followed. First, I will set the ground by breaking down key concepts, such as definitions of the forestry sector, economic impacts, FDI linkage and spillover effects in the context of local and global value chain, as well as different characteristics of CFDI. Next, I will explain how these theories apply to the commercial forestry sector, particularly in the region of East Africa, where CFDI is actively involved. I will then present the use of mixed qualitative methods in the studied areas and how

they guide the process of data collection and analysis. By This study is believed to use strong sector examples to close the gaps in Political Economy (i.e., The China Effect in Africa), Global Business and Trade (i.e., Source of FDI, spillovers, and Africa's role in Global Value Chain), and Forestry studies (i.e., Industrialization and Commercialization). The results will offer policymakers and practitioners field evidence and suggestions on how to understand and utilize CFDI for their industrial and economic development goals.

2. Theoretical framework

2.1 Framing the discussion: Concepts and definitions

According to IUFRO (2000), forestry is the practice of creation, conservation, management and utilization of forests. It includes branches from silviculture (composition, growth, and quality control of planted forests), forestry management, to different utilization purposes, including protection forestry, agro-forestry, recreational forestry, and commercial forestry. When using the term 'forestry' in this study, it is referred to as commercial forestry because it is where the most industrial planning of this sector happens in East Africa and serves the interests in studying the relationship between commercial investment from Chinese players and economic impacts.

In regard to economic impacts, Watson et al. (2007) and Li et al. (2019) highlighted the importance of defining the terminology before assessing the outcomes of economic activities, as it affects what data are being analyzed and how the outcomes can be interpreted. For example, according to Li et al (2019), 'economic contribution' only shows the static nature of economic activities, such as the share of an industry to national GDP. It is static and does not consider the changes to other sectors or players caused by this additional factor. Therefore, it usually uses a descriptive set of input and output data (I-O model), resulting in conclusions of economic contribution. On the other hand, 'economic impact' emphasizes the net change caused, such as how much investment is brought into the industry and how long it stays and flows into other parts of the value chain. It can be reflected in Computable General Equilibrium (CGE) Analysis or econometric analysis, such as using Difference-in-Difference to record the effect of changes.

However, neither economic contribution nor economic impact can sufficiently show how 'better off' the local people are (Li et al., 2019). That would use the concept of 'economic benefits'. It requires a higher level of analysis of social welfare and non-economic values, which often guides cost-benefit analysis (CBA) under the implementation of a new economic activity. Therefore, due to practicality, this study uses 'economic impact' as it highlights the changes, if any, of CFDI's activities to other value chain players and local economies. It also intentionally captures socio-economic and environmental aspects to some extent, without having to balance more factors that determine 'economic benefits'.

2.2 FDI in SSA: Sources, Characteristics, and Global Value Chain (GVC)

After defining economic impacts as net changes both within and outside of the sector, it is important to break down the definitions of linkages and spillovers of FDI (Morrissey, 2012). Foreign businesses, after setting up in the host country, could cause 'forward linkage' where they directly supply to downstream wholesalers or the customer markets (Park & Tang, 2021). When they source raw materials and services from upstream local suppliers, on the other hand, it is called 'backward linkage' (Amendolagine et al., 2013; Hansen, 2014). Forward and backward linkages together created a vertical value chain of the sector. Apart from vertical effects, linkages may also occur horizontally and benefit local firms across different sectors, and it is called

spillover and the latter do not often pay the gains for the former (Demena, 2017). It is commonly appeared that FDI causes fiscal and consumption linkages through taxes paid to different levels of governments and workers consuming in local economies pumped by these tax inputs. However, those linkage effects are often proved overestimated by empirical studies and cannot gaurentee transformational changes to the sector or the economy depending on the quality of governance, level of corruption, fiscal planning and so on (Hirschman, 1981 & 2013; Kragelund & Carmody, 2016). It is therefore linked to the next statement that linkages do not necessarily lead to positive spillovers, as they require several mechanisms to emerge and co-work with each other (Javorcik, 2004; Morrissey, 2012; Demena, 2017; Park & Tang, 2021), which is especially true in Sub-Saharan Africa (SSA).

Evidence has shown few linkages, leading to fewer spillovers in Africa for a number of reasons. First of all, it is caused by the 'enclave effect' (Hansen, 2014; Kragelund & Carmody, 2016), where foreign firms in Africa often source raw materials, machines, and management staff directly from their own countries and produce inside an enclosed zone. This concept is often compared with a common form of aggregation in Africa and developing countries, that is, Special Economic Zones (SEZ) or industrial zones led by foreign investment. Opinions on these SEZ vary, with some advocates for its effect of attracting more FDI, creating linkage and high-value production, while others criticize its separation and even segregation from the domestic economy. However, Kiesel and Dannenburg (2023) conducted a literature review with hundreds of SEZ examples around the world and found that it is not dichotomic between enclavistic or integrative natures. Instead, it depends on dimensions of different characteristics, such as levels of spatial integration, factor mobility, and firm- and institutional-related embeddedness within and outside of the zones.

This physical and spatial characteristics of FDI zones also reflect a non-physical 'global production networks' theory in global value chain studies. Farole & Winkle (2013) pointed out that the disadvantageous position of SSA's domestic sectors in the GVC also limits the ability of spillovers. In many cases, due to the separation of GVC by large multi-national corporations (MNCs), factories in SSA are only needed for parts production outsourcing, involving the upstream extraction of raw materials and primary processing. Although African policymakers are promoting themselves as being 'integrated' into the GVC to absorb global standards, these GVC-oriented firms may also create barriers for FDI spillovers because of low incentives to invest in local R&D and supply. Even if they do, management of local factories can have little influence to change due to the structure and standard of supply set by global stakeholders and buyers. Therefore, scholars such as Gereffi &Fernandez (2010) and Barnes et al. (2017) summarized successful practices and suggested that joint ventures rather than isolated foreign and local firms, market-seeking rather than resource-seeking, local supply upgrading rather than global sourcing, and longer-term rather than short-term contracts are more likely to deliver spillovers.

These best practices also bring out debates on whether traditional or non-traditional FDI sources can bring more positive spillovers (Andres, Nunnenkamp, & Busse, 2013). Traditional FDI sources in Africa are considered Western-led, from European countries or the United States. They have been present in Africa for a long time and are characterized by its MNC stakeholder structures and experience in the separation of global labour and resources, restraining spillovers. However, on the other hand, it may face more due diligence checks from its large number of stakeholders and civil society to engage in labour protection and local community building, causing positive spillovers. Meanwhile, non-traditional FDI, especially privately-owned companies from BRICS countries such as China, can have a leaner ownership structure and more aggressive merging and acquisition strategies by integrating local companies to ensure its domestic domination in a shorter period (Bertoni, Elia, Rabbiosi, 2013). Despite these moves of local integration and spillovers, it is also questioned whether these spillovers by non-traditional FDIs are sustainable

once the dominance is established and acquisitions are finished, and if there are any external forces that can check and balance their activities towards future spillovers. Finally, there are also voices (Wadha & Reddy, 2011) that reject using sources of FDI as a standard for spillovers and argue that it is only affected by which stage of development these FDIs are at, scale of production, and foreign market strategies (Resource-seeking, Efficiency seeking, assest seeking, or market seeking by Dunning 1977).

2.3 FDI in SSA: Transmission channels, Absorptive Capacity, and Governance

If the above factors (e.g., Setups of aggregation zones, GVC positions, and sources of FDI) are largely externally-driven factors that affect levels of FDI impacts, the following mechanisms could be intrinsically determined. By studying more than 30 developing countries and using meta-analysis, Denema (2017) suggested that although the overall FDI input results in positive spillover gains, the results are different for different FDI host countries by its significance and directions. And these can be explained by three main spillover transmission channels. Imitation, which allows domestic firms to imitate the products or processes of operations. Worker mobility, where local workers who used to work for these foreign companies move to another domestic firm or establish their own factories. Lastly, competition which pushes local ones to adapt to new technologies or resources to compete with the presence of foreign firms. These three transmission channels may counter affect with each other and are each determined by the heterogeneity of technology level, absorptive capacity, and geographical proximity of the host country and local firms. According to Narula and Marine (2003:23), absorptive capacity is defined as 'the ability to internalize knowledge created by others and modify it to fit their own specific applications, processes and routines'. Only companies with relatively high technology skills, absorptive capacity and willingness to train their staff can achieve imitation spillovers. Meanwhile, geographical proximity, just as the example of the last section's discussion, may bring contradictory results where it could encourage competition between local and foreign companies by more frequent information and knowledge exchange, but also could possibly reduce that through strong intellectual protection or spatial isolation (Jordaan, 2005)

In the case of SSA, scholars of public policy also found that there are tensions between government's investment promotion actions to incentivise these spillover channels, verus policies to stimulate local SMEs' growths and their perceptions and response towards the effectiveness of FDI spillovers (Biggs & Manju, 2006; Girma, 2005; Jordaan, 2005; Demena, 2017; Wethal, 2018; Van der Ven, 2018). For example, local businesses may not be given policy incentives or resources as used by FDI and compete with FDI resources that received taxation exemptions. Second, when they do receive equal incentives as FDI, the disadvantages of local SMEs in production volume and size further enlarge the cost difference and reduce its competition with FDIs. Third, although SMEs intend to recruit locals from FDI companies, the absorptive capacity varies and the pay gap also limits highly-skilled workers' movement to local firms without the government's talent development policy towards keeping talents for local companies (Morrissey, 2012; Demena, 2017). Fourth, when workers do move from foreign to local firms to imitate or innovate business and technology, they are in a less competitive position since they are away from the technology frontiers led by these FDI, causing high transaction costs to access these technologies (Diallo, Saliou, & Luan, 2018). Finally, local companies also have weaker informal and private governance networks than foreign firms (Amendolagine, Amadou, Coniglio, Prota & Seric, 2013). The policy measures in regulating FDI *vis-à-vis* local companies by investment promotion agencies are not consistent, as they are often absent or influenced by the private favoritism relationships with foreign firms due to cross-cultural unfamiliarities and mistrust towards local players (Wethal, 2018). Therefore, these authors all highlighted that policymakers often know *who and what* FDI to attract but are not able to know

how to best absorb and maintain the FDI while balancing it with the development of local businesses to create stronger spillovers.

2.4 Chinese Foreign Direct Investment (CFDI) in SSA

Built on the understanding of FDI mechanisms, this section turns to one specific and popular FDI, that is, Chinese FDI (CFDI). CFDI in SSA is characterized by its sources, sectors, and different development stages. They have been generally divided into state-owned enterprises (SOEs) and privately-owned enterprises (POEs). However, this division is not rigid as there are further differences by size (Gu, 2009) and by backgrounds (Warmerdam & Van Dijk, 2013 & 2014). The majority of Chinese POEs in Africa are SMEs working in sectors such as retail, wholesale and agriculture that are managed in family structures, and a few multinational corporations (MNCs) focus on mining, building, and heavy manufacturing, often have soft ties with state-backed capital and management or began investing in Africa under national initiatives such as BRI. Furthermore, scholars also pointed out the specific legal ambiguity of Chinese investments due to the complex capital backgrounds and ties with local governments (Gu, 2009; Warmerdam & Van Dijk, 2013 & 2014; Cook, et.al, 2018), as many firms are not registered, mismatched under official data, or merged with local businesses in order to gain business permits. It is emphasized that studying FDI in Africa, especially CFDI, should take into account these heterogeneities (Gu, 2009; Demena, 2017). Therefore, during the data collection in the following sections, this study will pay special attention to understanding different stages and strategies of Chinese businesses, and see how they influence and are reacted to by local actors.

Current literature on CFDI uses different levels of analysis, from macro level (e.g., Social, cultural, economic, legal, environmental, and institutional impacts), meso level (e.g., Country-, regional- and local-level development), to micro level analysis (e.g., Individual experiences). From a macro level, global datasets are used for a group of African countries' data on CFDI inflow/stock in a country and use regression to analyze its relationship with variables across the years, such as GDP, industrial development, and import/export performance (e.g, Nawaz et al, 2025; Darko & Xu, 2024; Borojo et. al, 2021; Kodzi, 2023; Adekunle et. al, 2019; Lin & Xu, 2019). Results varied from moderately negative to positive correlations. For example, some believed the positive impact of CFDI on GDP growth, employment rate, and therefore the take-off of industrialization. Compared to global MNC brands, Global South investments are often simpler in shareholding structures and more efficient in decision-making. However, others stated that this growth is canceled out because the participation of Africa's manufacturing goods in the GVC by CFDI is in non-competitive sectors such as the low value added raw material, which cannot transform the domestic economy. Furthermore, CFDI's enclave effects and Chinese-led management are so strong that products are meant to be exported and staff are trained for short-term purposes, causing unsustainable economic and talent development. In summary, Chinese FDI reflected findings in general FDI mechanism limitations.

Another angle from macro-level analysis focuses on the capability of governance in SSA towards CFDI (e.g., Adanhounme, 2018): For example, unstable power supply, which is crucial for industrial growth in both local or Chinese manufacturing facilities, and corruptive activities of Chinese businesses such as illegal timbering and permitting, causing damage to Africa's environment and unequal access to resources. In contrast, Tang (2021) and Ofsofu et al. (2022) pointed out that Chinese businesses, despite their private ties with local officials, actually have a positive socio-economic impact by giving back to the community via building infrastructure, schools, and medical clinics that create positive externalities. However, they did acknowledge the contextual difference between Chinese firms in resource-rich and resource-poor countries and called for industrial and regional-level investigations (Chen, Dollar, & Tang, 2018). Finally,

different from the above studies, there are also normative discussion led by scholars (e.g., Lee, 2018) who reject the idea of 'methodological nationalism' that sees CFDI as a unique form of investment that works differently in Africa's development as well as 'structural determinism' that any source of foreign investments can affect the course of economic transformation than national governance.

Looking at meso-level studies, Kodzi (2023) and Lin & Xu (2019) compared specific sectors, such as construction and light manufacturing in three to five administrative or political regions of SSA countries. These studies used Principal Component Analysis, descriptive statistics with sectoral and country-level information, and case narratives to see whether there is a correlation between manufacturing value added and CFDI inflow, as well as the influence of other determinants such as the activities within Special Economic Zones (SEZ), road connectivity and local employment as enablers of increasing industry linkages. The results found a negative to cautiously positive 'China effect' on local industry participation, as linkages were not sufficiently created in the selected industrial regions and will only work under the stimulation of individual countries' policy in local firm support, SEZ management, and workforce development. These studies have the intrinsic limitation of small sample size and predictive power, since the regional selections were intentional. But they contributed to the contextual understanding and inspired this study to apply this method in other sectors and settings, which will be explained in the methodology section.

Finally, micro-level studies are reviewed using qualitative interviews of businesses in one SSA country (Wolf, 2025; Landry & Chen, 2021; Kragelund & Carmody, 2016). The results are somewhat similar, showing that CFDI has limited knowledge and technology transfer in the labour-intensive sectors. However, it is difficult to achieve structural spillovers due to the policy environment, absorption capacity, as well as uneven development in different sectors and regions. The authors suggested more independent and active planning from policymakers. However, no studies have been found yet that combined methods of analysis and used mixed sources of data to triangulate insights from econometric panel data analysis, cross-country comparative analysis, as well as qualitative interviews and documents. This will be reflected in the methodology section in explaining my own research method.

2.5 CFDI and Commercial Forestry: Why does it matter? And why East Africa?

After summarizing previous research on CFDI impacts, this section turns to CFDI in one sector - commercial forestry. There are a few reasons why this sector was chosen for this study. First, commercial forestry has always been used as case study in forestry journals to demonstrate the dominance and impact of private and foreign investments on forestry resources. According to the International Institute for Environment and Development (2015) and the Forest Trends Report (2014), 75% of timber products in Africa are exported to China. Chinese-owned businesses account for 60% to 70% of logging activities in Central and West Africa such as Congo and Gabon. In particular, the tropical redwood in West Africa has been 90% exported by Chinese businesses to China, causing environmental and economic debates.

Second, commercial forestry is identified as a key sub-sector in Tanzania, Uganda, and Kenya, as appeared in the national industrial development strategy for resource-based sectors (e.g., Tanzania Ministry of Industry and Trade, 2025). These three countries planted large size of commercial forests on public lands due to the geographical and climate proximity, as opposed to other tropical trees in Central and West Africa (Kyeyune et al., 2018; Kalumanga et al, 2018; Chisika & Yeom, 2021). These trees have strong suitability for value-added products such as plywood and other engineered wood products. Moreover, the commercial forestry value chain

and its variety of products influenced people's livelihood from planting, growing, harvesting, haulaging, to processing, selling, and building. It is estimated to have created more than one million direct and indirect jobs and 2-7% GDP in each of the countries (FSC, 2025).

The sector witnessed a strong inflow of CFDI following four trends (Biggeri, Ferrannini, & Yang, 2018). These trends are assumed to lead to changes in linkages and spillover dynamics in East Africa's economy. First, Chinese factories in East Africa are almost all greenfield investments whose owners used to have experience in the same sector in China, bringing in networks and technology. They are therefore focused on local integration rather than seeking infrastructure and machinery. This mode of entry by FDI is considered more likely to create positive spillovers (Fortanier and Moons, 2011). Second, CFDI differs from previous investments by Western-owned plantation and processing companies in productivity and machinery cost-effectiveness. Third, CFDI's processing and product standards increased the market price of roundwoods and, accordingly, the income of value chain players from growers, transporters, brokers and factory workers. Fourth, due to export restrictions by governments in Kenya, Uganda, and Tanzania on primary timber from 2023, small Chinese investors who entered for extraction are forced to leave or are being replaced by established large Chinese corporations who plan for long-term integration of the entire value chain and production expansion.

There has been abundant research that explained CFDI in Africa's forestry sector but mainly focused on macroeconomic trends of the Sino-Africa balance of trade (Assembe-Mvondo, 2020; Huang et al., 2013; German, 2012) or impacts of CFDI's timbering on environment, legality, sustainability and livelihood (Cook, 2019; Freeman & Xu, 2015; Mbatu, 2012), such as employment, education, and land ownership (Putzel et al., 2011; White et al., 2006). Some acknowledged positive effects of CFDI in forestry by its employment and poverty reduction, as tree plantations are the main economic assets of smallholder growers. However, it is alerted that CFDI's high demand for roundwood caused farmers to grow and harvest trees at an unsustainable pace. Its price-setting power at processing and market demand makes offerings to farmers and other suppliers unfavorable. However, those studies mainly focus on the impact on the upstream forestry side. There was no study found that further investigated CFDI's influence once it reaches the manufacturing side. After all, it is believed that the fastest growing employment created by CFDI is at factories, with a scale of 200-500 workers per shift (Huang & Sun, 2013). This gap may be caused by the lack of transparency and information access in these manufacturers, which this study hopes to address and find out about workers' opinions on CFDI and its economic impacts.

2.6 FDI policies in East Africa: Comparisons and commonalities

In almost all studied papers and their policy suggestions, governments' incentives are regarded as the most important enablers for FDI development and spillovers when it comes to upstream (such as property protection of public and private forestry lands), processing (such as production standards and labour protection), and downstream (such as providing financial incentives, capacity building for local wood processors (Chisika & Yeom, 2021; Kalumanga et al., 2018; Katsvanga & Mudyiwa, 2019; Kyeyune, 2018; Luukkanen et al., 2006; Mishenina & Dvorak, 2022; Mwamfupe et al., 2022; Mwangi et al., 2018; Ng'Andwe et al., 2017; Popoola et al., 2020). However, a few academic gaps are identified when it comes to understanding how these policy measures play out, the differences, and responses from FDI players in East Africa.

First of all, although governments always announce in the national strategies that there are plans to attract foreign investment and boost economic growth, there are in fact no policy reports or academic research found that explicitly demonstrate the concrete measures (e.g., infrastructure,

IP rights, access to finance, etc.) in Kenya, Tanzania, and Uganda, leaving investors with a blur. The investment promotion agencies' structure, scopes of responsibility, and synergies with other governmental agencies like the Ministry of Trade and the Customs department are also unclear, creating uncertainty for foreign investors' confidence in the effectiveness of these benefits (Banda, 2015). Second, even if the governments announce investment promotion measures, there are no evidence that these measures are not sector-focused (Massyn, Bezuidenhout, Kleynhans, & Ewert, 2021). These authors suggested that a potential risk of generic investment promotion without prioritizing some sectors and disincentivizing others, is that FDI might flow into traditional and resource-rich sectors such as oil and mining, which may not create the largest spillovers to local sectors. Third, in East African countries, the functions and objectives between investment promotion agencies (IPA) and export promotion organizations (EPO) are not clearly defined or even combined, such as KenInvest in Kenya, Tanzania Investment Centre, and Uganda Investment Authority. More existing papers are also found focusing on the measures and institutional requirements for export promotion, due to the general sentiments of in developing export-driven industries and advantages (Mogendi Ongeri & Onkoba Ongeri, 2025). This inclarity also results in dilution of limited institutional capacities in designing FDI incentives and empowering current foreign investments. Apart from these commonalities, East African countries are found differently with their attitudes towards foreign investments, and it is affected by factors such as the political structures and previous history with FDI-aggregated sectors, which largely aligned with the underlying overall business environment, such as GDP per capita, trade openness and labour force (Bosire, 2019). In turn, foreign investors also tend to make investment decisions based on the information about ease of doing business from experiences or networks with existing investors in the country.

Finally, looking into the forestry sector, there are multiple government departments in East Africa that are involved in the management of the forestry sector and its commercial activities, such as the National Forestry Services, Ministries of Industry, Water, Trade, Labour, and National Taxation Authorities. However, although there are mentions about the need for Public-Private Partnership in sustainable forestry management (Cheboiwo, Nasroun, Mwamakimbullah & et al., 2018), there is an absence of discussion on who is responsible for private investment incentives and regulations, especially within the manufacturing and value-addition side of the value chain. Therefore, there is also no empirical studies on what economic, social, and environmental changes of CFDI should react to based on these investment regulations and how these interactions among CFDI, local stakeholders, and government departments result in policy implementation and economic spillovers.

2.7 Problem Statement

The above sections discussed key definitions such as commercial forestry, economic impacts, and debates on FDI sources, Global Value Chain positions, spillovers, transmission channels, as well as absorptive capacity through which FDI spillover effects are enabled and can take place. Next, the characteristics of Chinese FDI were explained, together with common angles that scholars use to analyze the role and impacts of CFDI. Finally, the concepts are combined in the context of CFDI in commercial forestry and demonstrate the limited understanding of government policies in attracting and regulating this sub-sector and investment activities.

Therefore, inspired by the discussions and gaps above, this study would like to apply a meso- and micro-level lens of analysis, where sectoral and region-specific cases within three East African countries are used to capture some commonalities but also maintain some level of heterogeneity of differentiated political, socio-economic, and business contexts. As the objective of this paper is to provide evidence-based policy advice for East African authorities and

practitioners, the paper will explore the following research question: *What is the impact of Chinese FDI on the commercial forestry sector in the context of East Africa?* Combining assumptions and findings from the above literature debates, the following hypotheses are raised:

- ***Hypothesis 1****: CFDI in East Africa's commercial forestry sector has a positive short to mid-term impact, especially on employment and income generation.*
- ***Hypothesis 2:*** *CFDI can strengthen linkages with commercial forestry upstream actors (Growers, contractors, foresters, machinery producers) but the spillovers are weak.*
- ***Hypothesis 3:*** *CFDI can only make positive spillovers to downstream actors (local processors, factory workers, buyers) of commercial forestry when transmission channels, governance quality, and absorptive capacity are all met.*
- ***Hypothesis 4:*** *Privately-structured, locally integrated, and high-end market-driven CFDIs in commercial forestry are more likely to create positive spillovers.*
- ***Hypothesis 5:*** *CFDI in East Africa's commercial forestry sector will have a negative long-term impact if social and environmental aspects are not well managed by the government.*

3. Methodology

The study designed a mixed-method approach to explore answers to the above research question and hypothesis. The mixed methods are qualitative in nature as there are first-hand interviews, observations, as well as second-hand fieldnotes collected by other researchers. A forestry geospatial information system developed by Global Forestry Watch was used as the supportive method to monitor visible changes around Chinese factories such as the size of factories, infrastructure, tree coverage, etc. There are a few reasons why this study did not opt for quantitative methods, such as econometric analysis between CFDI and economic growth indicators. First of all, as the above literature review showed, quantitative analysis using panel data can only show the correlation of these indicators, but cannot identify the mechanisms through which certain CFDI indicators can or cannot lead to spillover and other economic outcomes. Second, Chinese factories in Africa are often not transparent in terms of data such as their size of investment, number of employees, and revenues. It is therefore practically difficult to access these quantitative data. Similarly, the FDI spillovers are also hard to quantify, as forestry and up- or downstream sectors in East Africa are often informal, with limited economic and social development indicators recorded to conduct a strongly data-supported regression analysis. It is believed that only through in-depth interviews and observations can we understand the incentives and reasons behind why different value chain players think CFDI can make economic impacts or not.

In the following sub-sections, it will be firstly explained the choice of studied regions. Then, the data collection tactics and process will be elaborated before the data analysis method and a short explanation on the use of AI tools.

3.1 Data Collection Methods

Before research design and data collection started, there were two preparation scoping trips to Tanzania and Uganda conducted by the researcher. By referring to national forestry reports and the GIS system (See Figure 1), the regions of research were identified based on the concentration of commercially planted sites (Ojoatre, Zhang, Yesuf, et al. 2023) and cross-checked with local research correspondents' knowledge. In Tanzania, the commercial forestry resources are concentrated in the Southern Highlands, centered in Iringa Province.

Mafinga is a small town in Iringa famous for timber production, near which is the largest commercial forest in Tanzania, Saohill, covering 50,000 hectares. 75% of its 60,000 population in Mafinga works directly or indirectly for the timber and wood processing sector, from growing, harvesting, haulaging, to woodyards selling, brokering, and carpentering. It is estimated that there are 30 Chinese-owned processing factories aggregated in this region, accounting for more than 60% of the total wood processing sector. In Uganda, on the other hand, from the West to Central part of the country locates the largest commercial plantations grown by the National Forestry Service, owned by large private plantations or scattered tree growers. Around 15-20 Chinese processors are located in this side of the country doing some level of planting, harvesting, and largely primary and secondary processing. Finally, in Kenya, the commercial resources are located in the central to western highlands of the rift valley, which are currently majority owned by the government. Therefore, there are 5-10 Chinese processors mainly importing timber from Uganda due to the government restrictions on logging activities and limitations on loggable resources. However, Kenya is a popular regional end market for processed wood products, as well as a choice for Uganda's products to be exported through Mombasa harbours to other African and global markets.

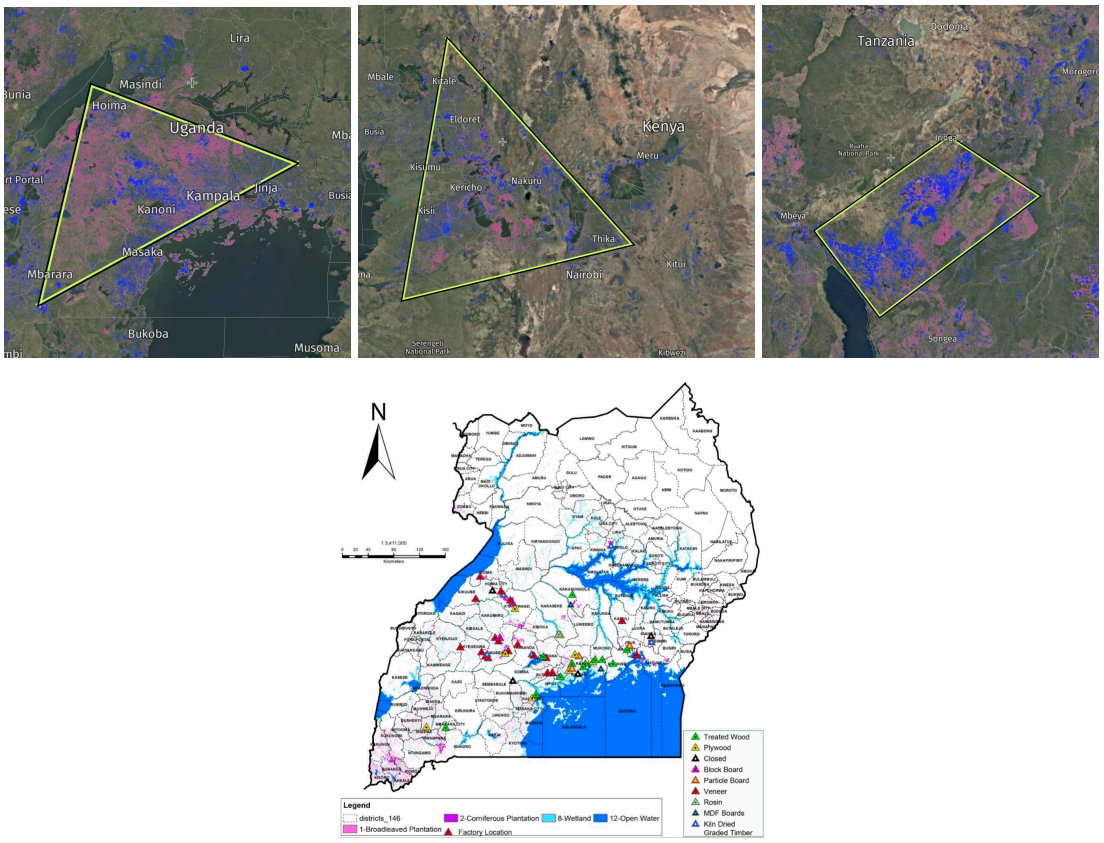

Figure 1: Top left to right: Forested regions in Uganda, Kenya and Tanzania. Pink - Tree cover loss; Blue - Tree cover gain. Source: Global Forestry Watch, 2025. Bottom: Regions of commercial plantations and processing factories. Source: Uganda National Forestry Agency, 2025

The initial research design planned to use proportional representatives in focus groups and first-hand interviews across heated forestry regions in the three countries, with even distribution of players across the value chain. However, the preparation trips showed the practical difficulties in doing so. First of all, the time and budget constraints of the research do not allow for collecting data from scattered geographies. Second, it was soon realized that there were

language barriers to using Kiswahili as an interview language in Tanzania. By speaking only English, the researcher may only reach certain profiles of interviewees. Third, it is easier to find interviewees from the proximity of Chinese processing factories, where transportation, broking, and primary processing happen, thus canceling the possibility of even distribution of value chain players due to the random sample selection. Lastly, the researcher being Chinese may also pose risks and research bias on what interviewees are willing to share about Chinese businesses and their impacts. Taking these practical barriers and potential research biases into account, the following data collection plan was made:

3.2 Data Collection Process

In total, the research data collection process took three months and received valid data from 65 participants. 34 participants are from Tanzania (52.3%), followed by 18 from Uganda (27.7%), and 13 from Kenya (20%). Although this is not evenly distributed among the three studied countries, it practically reflects the research capacity and will be explained below by acknowledging the representativeness in the research findings.

There are 10 first-hand interviews conducted by the researcher during her field trip in July 2025 in the Southern Highland region of Tanzania and in Uganda. Interview questions are based on a questionnaire structure, although not strictly followed (See Appendix 2) to understand what impacts are perceived by local players when it comes to CFDI. To avoid leading questions, the interviewees will only be asked after they agree that they have noticed the appearance of Chinese investment. They will then be asked whether certain changes have been experienced, and if so, under which categories (such as income, skills and technology, education, businesses, land resources, community, etc.). These elements are inspired by previous studies on the transmission channels of spillovers (Demena, 2017; Morrissey, 2012), most impacted socio-economic elements of commercial forestry, and mechanisms of CFDI impacts (Warmerdam & Van Dijk, 2013 & 2014; Cook, 2019; Freeman & Xu, 2015; Mbatu, 2012; Putzel et al., 2011; White et al., 2006; Huang & Sun, 2013). Finally, they are encouraged to suggest what has been done by the governments in managing CFDI and improvements should be made by both CFDI and governments for the development of the sector. This is inspired by the discussion on the private sector and public sector's roles in affecting FDI effectiveness (Chisika & Yeom, 2021; Kalumanga et al., 2018; Katsvanga & Mudyiwa, 2019).

There are 36 second-hand interview notes and focus groups composed of 20 people in total. These are done by seven key research correspondents. They are respectively a researcher based in the field, a local entrepreneur, a quality controller, a certificator, and programme staff from a charitable foundation. The reason for using second-hand interviews and inviting correspondents to conduct these interviews is that they have years of experience within the studied regions, have proficiency in local languages, and/or are able to build trust with local actors. Finally, by not controlling which participants can be included as interviews, profiles of participants can be randomized as much as possible without selection bias by the researcher.

Apart from intentional interviews or second-hand fieldnotes, the researcher was also able to conduct informal ethnographic observation in the regions from both 'inside' and 'outside' (See Figure 2). This is an advantage of this research compared to other industrial studies, because the researcher was allowed to enter Chinese factories in Tanzania and Uganda due to her professional role and understand their businesses, operations, as well as workers involved to a detailed extent. Interactions among the local workers and their Chinese managers were observed, together with the entire process chain from log sourcing, manufacturing, and training. During the factory visits, the researcher also observed economic activities outside where

commercial forestry and CFDI happened. For example, the researcher stopped by where factory workers have lunch, vendors selling branches for burnwood, timber centers for loading and trading, and local shops for wood products or furniture. The purpose of the observations is to hear conversations and opinions without intervening so much that participants feel uneasy or power dynamics. Physical signs where CFDI could influence their socio-economic livelihood were also carefully noted, such as the location and conditions between working and living areas, written rules of production safety and health, invoices and receipts signed to upstream suppliers, and announcement boards where monthly payment slips and benefits are published.

Figure 2: (Top left) A worker operating on a Chinese-imported & export technology certified machine; (Top middle) Workers outside the factory gate, installing the new announcement of Operatioanl Saftey & Health rules; (Top right) A quality controller interviewing workers in a Chinese factory; (Bottom left) Local research correspondents interviewing a small tree grower woman; (Bottom right) Roadsize vendors, where there may be restaurants or local wood workshops and sellers

3.3 Data Analysis Methods

After these qualitative data are collected, this study uses multiple coding methods to analyze them (Saldaña, 2021). Since the interviews only followed the structure of a question list and given that the research question is rather explorative and open-ended, the researcher paid close attention to the following lenses in the first round of coding. For example, Emotions (i.e., How they feel about the entry of CFDI, facial expressions during these topcis), Descriptions (i.e, Words they use to describe the CFDI), Processes (i.e, How the value chain process and change trajectory are explained), Values (i.e., Their personal opinions on CFDI and what defines good economic and industrial development), Narratives (i.e, Personal stories and relationships), Evaluations (i.e., How they assess the impact of CFDI and governments in the past, and directions of the future). These lenses are also applied in observation coding, with the latter paying more attention to the physical environment (e.g., factory environment, locations, infrastructure), items (e.g., equipment, manuals, posters), and interpersonal conversations and relationships (e.g., signs for hierarchy, community members, colleagues).

After organizing the fieldnotes based on the above lenses, the second round of coding required finding common themes across categories found in interviews and observation. It is then cross-checked with the support of a forestry-sector GIS system, which was quantitatively

data-driven but qualitatively visualized the density of activities and geographical (e.g., location of factories, community, commercial plantation resources, etc.) changes over the years, as well as types of commercial forestry activities. It serves as triangulated evidence for the perceived impacts of CFDI on the commercial forestry value chain by research participants. More details and reflections will be explained in the following sections.

The study strictly follows the AI guideline by BoE. ChatGPT as an AI tool was occasionally used in providing short summaries of academic papers for the researcher to determine the relevancy of the paper for this research subject and proceed with reading and accuracy checks. It serves only as a supportive tool by which the author always refers back to the original papers for understanding the concepts and nuances. No AI tool was used for writing or producing quoting in this study. English proof-reading tool, Grammarly, was only used after the paper was written in the end to check spelling or grammatical mistakes. No tone suggestions or content generation functions by Grammarly were used in this study.

4. Results

Before getting directly into the research topic and interview questions, some contextual background was asked first in the interviews. Among the 65 research participants, the known gender ratio[2] is 70% male and 30% female. This shows the nature of commercial forestry being labour-intensive from upstream timbering to processing, which is dominated by male workers. Women do participate in factory production, but mostly take up roles in non-labour heavy work such as layering and gluing veneers, or office work (HR, Admin, Finance). On the plantation side, however, participants reported that there are more women as they are the facto caretakers of small plantations as part of family land assets, and there is not many heavy labour work required after trees are planted and until they need to be harvested. The age distribution is rather even, spreading from 23 years old to up to 70 years old. However, one interviewee mentioned that teenagers and young adults are the main beneficiaries of the opportunities created by Chinese factories.

When asked if they are aware of the emergence of Chinese investment in this sector over the years, at least 90% of participants answered yes[3]. They got to know the Chinese factories because they or someone they know has engaged with Chinese wood businesses or worked in Chinese factories. To the researcher's surprise, these participants who are aware of CFDI all expressed somewhat positive overall impressions, despite some concerns raised. The details of the interviews are summarized in the following sections.

4.1 Employment and Income

The most direct and commonly mentioned impact of CFDI in the commercial forestry sector is the increase of income and employment opportunities, and it fits into the economic linkage model: On the forest side, tree growers' income increased because they rent lands or sell over-stocked trees to Chinese factories. Loggers and brokers' jobs are created to cut and transport these logs to Chinese factories for processing. As one person in the focus group said,

[2] Gender ratio is calcultated from all first-hand interviews and some second-hand interviews, given that the gender information was not all recorded by the researcher's correspondent in their interviews and focus groups.
[3] This is influenced by the researcher and her correspondents's researched regions and sample selections, given the data collection happened in areas close to Chinese operations. Interviewees who live 90-100km away from any Chinese wood factory tend to answer negatively.

> *Ten years ago, when there was no Chinese investors, the roundwood prices were so low. Who do we sell them to? It's either for self-use or sold to make sawn timbers or poles. After Chinese came, this price definitely grow over the time. Some fluctuations, yes, but growing price nonetheless. [July, 3rd, 2025]*

On the factory side, "*Yoults (Women and boys)*" were able to find jobs in the factories doing primary processing or services, which many said, for example, "*enabled them to pay for houses, food, schools, and transport" [July 3rd, 2025]*. On the downstream, wholesalers and other sellers of building materials' revenue were also boosted because of the increase in local wood board production and reduced costs.

However, a few challenges were mentioned and observed despite the visible positive changes. First, because of the supply-demand imbalance of timber, Chinese factories have the price-setting power by controlling market demand. One tree farmer said:

> *We had no choice but to sell these trees to the Chinese at unfixed and low prices so that we could at least earn some money than nothing. We cannot wait for trees to stand there on our land for too long without bringing some income. [July 4th, 2025]*

Second, it is precisely because unemployed populations flew to these low-skilled and informal job opportunities to supply to Chinese processors, that more people are sharing the slices of the cake. Therefore, the *de facto* income level per capita created by CFDI may not increase significantly when it trickles down to the farmers' end. One woodyard owner whose logs are stocked before sending off to factories said:

> *Yes, you can see that the Chinese gave us job opportunities and places to sell the logs. Without these opportunities, unemployed guys will just wander around and cause crime and robbery. But now that they take up these jobs, it's not always good - They sometimes stand in front of my woodyard or threaten to burn the logs if we do not use their broking and give them service costs. Even if we can just sell directly from the yard to the factory. Why are we keeping this system? Governments are just relieved that these guys found jobs. But it is not regulated and is negative to my life. [July 24th, 2025]*

They suggest the government make stronger regulations on market prices and offer formal jobs by supporting the value chain of industrialized factories. The capacity of CFDI in creating employment is far from enough to replace the government's role in addressing the high number of unemployment in any region.

Finally, many interviewees complained that the opportunities and compensation for high-skilled workers are small in Chinese companies. Despite the government's role in controlling foreign workers to local workers quota, almost all roles at decision-making levels, such as directors, factory managers, and technicians, are occupied by Chinese. It is supported as seen in the researcher's observation note:

> *In Factory A which employs around 400 workers in one shift, 3-4 locals are taking the role of supervisors. Around 5-10 locals work as HR managers, assistants, interpreters, or procurement managers in the*

> *office. During lunch break, you can always find more Chinese management staff in the office than locals. When I asked the Chinese owner, he said the local workers' productivity is an issue and he always needs Chinese to monitor them. He said they always pay reasonably based on market price vis-à-vis other Chinese factories, and can offer higher pay and promotions to well-performed workers. Although the promotion pattern and pay structure is unclear. [August 8th, 2025]*

These findings offered an explanation from East Africa's commercial forestry sector and reflected the impacts and characteristics of CFDI in creating many jobs but different income-generating effects based on roles in the value chain (Lee, 2018; Hansen, 2014). Interviewees suggested that to improve it, Chinese investors should have more commitment to training and salary increase, build trust, and have long-term talent development plans. This is related to the points made on skills and technology in the next paragraph.

4.2 Skills and Technologies

Interviewees who have worked with or worked in Chinese factories all speak highly about the positive impacts of Chinese technologies used in wood processing. As compared to local or Western imported machinery, Chinese machines are cheaper, faster to learn, and easier to fix. One local factory manager who has bought machines from Chinese factories said:

> *Me and other local workers learnt many skills to operate these industrial machines - Wheel loaders, fork lifts, debarkers, peelers, hot pressing, etc. Those skills were not here before Chinese investment's entry. When I buy second-hand machines from them, they also have Chinese mechanics nearby to help you with repairs and maintenance. [August 8th, 2025]*

However, although these machines are often quickly imported to East Africa and installed by these greenfield companies who had experience in China, he continued by pointing out an issue of standardization and localization of these technologies:

> *[…] But their machines and production manuals only use Chinese. I strongly suggest they use translated manuals so workers don't have to go to Chinese technicians everytime for fixing. This is on top of the language barrier between locals and Chinese workers as well. The fixing parts are also imported from China. So we always have to pause production for parts to arrive and then get repaired. When this happens, some production lines may be stopped and workers go home. [August 8th, 2025]*

Finally, when the researcher visited a forestry training centre funded by the Swedish Development Agency in Tanzania, the teachers and students there had a different perspective. Although they acknowledge processing technologies from China in today's forestry sector and know that these local skills are needed, Chinese companies are not putting enough effort in training and recruiting these people. It also showed that private sector players and investors know the best and are the closest to technology frontiers than any development agency in determining requirements and demand for local labourers (Diallo, Saliou, & Luan, 2018). As supported by a trainer in the centre:

> *There is a mismatch. Obviously we don't have the most advanced machines as Chinese ones for training, but we teach courses at the training center in carpentering, forest management, as well as machine operations. When our students go for internships or interviews at Chinese factories, they are equipped with skills but often not regarded by Chinese factories as high-skilled. Because they think these students cannot work on advanced machine processing. So they only offer lower-skilled salaries. Our students also feel unappreciated for the pay and missed opportunities. Chinese factories should open up more courses here that match their needs or give people opportunities to learn on site. [August 9th, 2025]*

4.3 Fiscal Contribution and Global Trade Position

Another effect of CFDI activities is that it improved the global balance of payments and competitiveness of East Africa's timber by increasing export earnings and substituting imports, which reduces hard currency expenditures such as US dollars (Demena & Van Bergeijk, 2024). Although these direct macroeconomic impacts appeared in the literature review, it is not expected that they are felt by interviewees personally. For example, as a local sawn timber mill owner explained it and resonated with the above theory:

> *Tanzania used to import Engineered Wood Products like veneers and plywood. They could have been made locally instead of costing us foreign currency. After local production by Chinese investment, it reduced reliance on imported wood products and generated taxes to local and country-level governments. Furthermore, the export market opened up by the Chinese for secondary processed timber products also boosted revenues for Tanzania wood. These are definitely good to us. [August 15th, 2025]*

Moreover, apart from the trade balance improvement in the timber sector, the fiscal contribution by CFDI to local, regional and national levels is also commonly mentioned. It is especially significant when local and regional economies rely on the forestry sector, and it resonates with the theory that the public authorities are more incentivized to provide public good services for foreign investors (Hanafy & Marktanner, 2019). Like one local community member in Tanzania, who does not have a strong connection with the forestry sector, said:

> *The taxes Chinese investment paid can be felt in our lives. Roads are getting better, and our living standards in the community are also improving. If our community's overall income is improving, we are going to all more eager to pay the taxes and know that our money is changing our community for the better. [July 23rd, 2025]*

However, the above views are rather optimistic. The doubts are given whether the participants' answers are showing the full picture. East Africa's timber has overall been primary and export-oriented. Some people in the focus groups mentioned during group discussion that a substantial volume of high-value production is still carried out in China rather than in East Africa, and thus do not change the *de facto* position or price in the global timber value chain, which improves local interviewees' businesses. It is also observed and collectively identified by focus groups that CFDI which is: a) no longer having connections with subsidiaries in China; b) looking to produce high-end products locally and export to advanced markets, are more likely to create

local linkages. This aligns with previous studies on Chinese-owned greenfield investment in Africa and their linkages effects (Fortanier and Moons, 2011). Many interviewees suggest that the government should nudge CFDI towards these directions and reward them with more favorable taxation exemptions if they manage to keep value additions in the country. This will be further expanded in the discussion section.

4.4 Spillover Channels and Absorptive Capacity

The above three sub-sections described economic impacts that are directly linked with the entry of CFDI in the commercial forestry sector. What about its spillover to other sectors and players? There is one factor that is found determining all the other channels of spillover in the studied context and sector, which is competition.

Competition is regarded as a long-term transmission channel for spillovers, which sometimes determines the level of imitation and worker mobility (Demena, 2017) and it is proven accurate in this study. CFDI in East Africa's commercial forestry has the characteristics of oligopoly (Glass and Saggi, 2002), owned by 10-20 Chinese companies that controlled 70-80% market share of mid- to high-end wood panel products. It discourages and redirects local companies from competition. The high-capex machines of Chinese factories also created barriers for purchasing and learning. Therefore, as indicated in 4.2, it makes it difficult for internal workers, let alone other external local players to imitate. Because of the internal networks and salary standards set by CFDI indicated in 4.1, the worker mobility is also limited. An owner of a local sawmill said,

> *[...], if any, it is about more people attracted to join the Chinese factories or internal staff move between Chinese firms. I don't see anyone yet who worked for Chinese and come out confidently thinking that, oh, they can completely duplicate the Chinese business model and open up their own factories. They know it is not possible at this stage, capital wise and technology wise. [September 22nd, 2025]*

Furthermore, due to the high installed production capacity, CFDI has a large demand of roundwood and therefore is able to set a competitive price for the logs and change the dynamics of other buyers of timber, such as local workshops and firewood sellers, causing negative pecuniary spillover (Viner, 1931). It is more significant for the actors in close proximity to Chinese factories, which also aligns with Jordaan's theory (2005) that closer geographical proximity brings more competition. Another respondent with a local sawn timber mill in Uganda responded:

> *[…] Even if we are doing okay now, the local businesses would most probably die out in 5 years' time. There's no point of transforming. The forest resources are the main issue. The replantation is so slow, and we can't compete with the speed of Chinese in dominating these tree resources. I cannot promise the farmers with that price and big volume demand. Eventually, most trees will be bought by Chinese or the land will be concessioned by Chinese to meet their demand. [September 22nd, 2025]*

Another interpretation from the conversations shows that the absorptive capacity of local firms on Chinese technologies is low. However, the interviews showed that it is not due to low ability to identify and transform knowledge, but rather, low market-driven incentives to upgrade these

technologies. This aligns with the suggestions from Demena (2017) that we should distangle absorptive capacity from technology gaps. As one respondent explained:

> *The largest composition of local and regional timber markets in East Africa are lower-grade products. Chinese can sell to large clients in construction sectors or big wholesalers in the urban areas. But we target everyday clients, those who need sawn timber for building their own houses. Why do we have to use more expensive machines? It's not that I don't know that these machines exist and they will improve my productivity. But we are comfortable with using low-cost fabricators for lower-grade products, which actually bring me higher revenues. [September 21st, 2025]*

An alternative for the above challenges is for those who are near CFDI and who feel the direct crowd-out effect to opt for mergers and acquisitions or joint venture with Chinese firms. One example found during the field trip in Tanzania is that a sawn timber and pole company merged with a Chinese firm. They use existing low-capex facilities to cut and dry the logs on their site as primarily processed goods. Then, Chinese companies also benefit from lower transport costs by purchasing semi-processed logs from the local partner and from more efficient use of their own production sites. But again, it is due to the aggregation effects between the domestic and Chinese factories in Tanzania, which is less so in Uganda and Kenya. Therefore, it is interesting to see that geographical proximity not only shows whether there exists competition as a spillover transmission channel within a country and, but also the feasibility of solutions and scale of spillover in comparative studies of different countries. Some suggestions on this will be explained in the discussion section.

This section also cautiously rejects common FDI and absorptive capacity literature that is often uses global panel data or data from European countries, suggesting that governments should attract FDIs that fertilize spillovers instead of being too advanced that surpass the curve for FDI absorption and learning (Girma, 2025; Farkas, 2012). Instead, for SSA countries, since the market segmentation and product diversification is yet to mature, it seems only natural to encourage a healthy development of all segments of businesses, from highly advanced to low-cost ones. They should be able to be given equal regulations to choose to compete or not compete with CFDI, whose role is still important in absorbing mid to high-end market demand as the middle-class buyers in Africa are growing.

4.5 Livelihood and Natural Resources

The final discussion on CFDI impacts is regarding the social and environmental externalities. As explained in the theoretical framework, the capacity and focus of this research did not allow for a deep dive study on all factors related to non-economic impacts of CFDI in forestry. There were also no previous academic frameworks or models found that provided methodology for understanding non-economic spillovers in forestry development, apart from climate and forestry protection perspectives. However, a few questions were designed in the focus group and interviews to understand the meaning of forestry beyond being economic commodities.

On one hand, interviewees all recognized that livelihood of local communities has been, on some level, positively changed since the Chinese investment joined. As compared to other foreigners setting up businesses, Chinese investors tend to be more hands-on and diligent - They often choose to live inside the factories ,which are located rather remote from urban regions.

Therefore, they also share and see the same challenges as experienced by locals and would sometimes decide to improve it using their own resources, causing positive externalities. As one female community member in Njombe, Tanzania said:

> *Most people I know are now able to find a job in the timber sector or in the supporting sectors such as food services and transportation. We also benefited from the improved infrastructure like roads, electricity, schools funded by the Chinese in wood processing […] Social interactions between locals and foreign investors from different cultures are also changed. More families are considering sending their children to study in China because they believe it can bring better job opportunities once they return home here, to get a well-paid position in a Chinese company […] Yes, there are many things that Chinese businesses can do better, but they are very different than other european investors, you know? I think it is a good thing for us to have them here. There were massive changes in the past ten years or so. It inspired us to imagine what we can do differently as well, not just technologies - but also the standards, the process, and the mindset. [August 19th, 2025]*

However, while they were positive about the short-term improvement of livelihood, some remain concerned about the long-term risks. The reasons are threefold. First of all, since commercial forestry in East Africa relies on a limited number of species (i.e., Pine, Eucalyptus). There is a risk of environmental degradation and loss of biodiversity due to monoculture plantations. During the observations in the field, it is seen that Chinese companies choose to give back seedlings for agricultural goods or different tree species to the small tree growers for replantation. However, interviewees also suggest that Chinese investors take further steps to incentivize a faster pace of replantation and learning about good planting and management practices. For example, after the trees are harvested, the land left with roots should be given rotations instead of slash burning of the remains.

Second, from the community land planning perspective, some said that the houses and factory infrastructure built by the Chinese are *"not strong enough for us to use when these factories leave" [July 9th, 2025]*. They suggest that the structures of these buildings should be more durable so that once the Chinese factories leave one day, the buildings can be converted to schools or other factories. Related to this, some were worried about a sustainable habitat and the displacement of local communities from ancestral lands, impacting resource availability for future generations. They advocate CFDI to provide a more thoughtful land planning and concession acquisition package when engaged with local communities and offer other housing options to relocated communities.

Finally, the high-prcoessed wood boards and mass-produced furniture pieces by CFDI also raised discussions on the impacts to local culture and lifestyles. As one young man in Kenya said:

> *We used to build our own houses, make our own furniture from wood. But now, African homes are replaced by mass-produced timber products. How would local carpenters' practices survive in the future, if the mass-produced prices are getting lower than handcrafted ones? Who will remember and continue these traditional practices? The government should make sure these people are not forgotten and*

Chinese factories respect traditional practices and leave room for their development. [August 17th, 2025]

5. Discussion

This study began by examining the economic impacts of emerging Chinese investments in the commercial forestry sector in three East African countries: Kenya, Tanzania, and Uganda. Literature has been investigating this phenomenon but from different angles, such as the general FDI theories (i.e., Source of FDI, Linkages and Spillover, Spillover transmission channels, Absorptive capacity), Global Value Chain theories (i.e., Competitive Advantages, Division of labour and resources), to China-Africa political economy theories and forestry development theories. Therefore, drawing on triangulated data from interviews, observations, and GIS information in a specific sector and targeted regions, the research managed to provide a meso- to micro-level analysis that gives evidence for the following hypotheses and previous academic theories. Overall, the findings

Hypothesis 1*: CFDI in East Africa's commercial forestry sector has a positive short to mid-term impact, especially on employment and income generation.* The first hypothesis is fully supported. The commercial forestry sector is highly labour-intensive and therefore the inflow of CFDI and their speed of setting up operations offer thousands of jobs for a community or region in a very short period of time. Moreover, it was not only the employment size and income generated at the individual and community level. Manufacturing skills and advanced wood processing technologies were also introduced into the East African markets. At a national level, locals also experienced direct changes, in that CFDI production significantly decreased the import of wood products which can then be replaced by locally produced ones. It led to a stronger balance of trade for regional and global exports, and the benefits trickled down to local producers due to the reduced costs of processing materials. However, research participants also show cautious optimism towards the lack of high-paid opportunities and high-skill training of Chinese technologies, which is believed to prevent the long-term development of local labour. Therefore, while job creation numbers are a key indicator of CFDI impacts, future research may look more into the job quality and conditions at Chinese factories, which remains a gap in existing forestry studies - Although they have appeared in other labour economics papers, it has yet reached any conclusion on if there is unique CFDI mechanisms in working conditions, labour relationships compared to other sources of FDI in Africa and the policy advice on how to improve them (Luukkanen et al, 2006; Ekman, 2013). This would require more in-depth data collection in the field.

Hypothesis 2: *CFDI can strengthen linkages with commercial forestry upstream actors (Farmers, foresters, contractors, machinery), but the spillovers are weak.* Looking at the first half of the hypothesis, it is partially supported by the field data. Upstream players in this value chain gain revenue because CFDI has a large demand for commercial forest resources. They can, however, only source and request harvesting and planting services from local players, due to legal restrictions on foreign workers operating on natural resources. However, there are two reasons that the linkages may be broken or insufficient. First, the level of linkages is highly affected by geographical proximity. As the road infrastructure in the three East African countries was limited - especially for those in rural regions where the majority of forests are located - Chinese factories may only work with farmers within a radius of 50km. While resources within this radius can be exhausted very quickly due to the demand and limited replantation, the farmers outside the radius may still have an overstock of trees. This mismatch breaks down the linkages and displaces some upstream players from CFDI benefits. Second, it was indicated that the

price-setting power of CFDI also caused negative pecuniary effects, with some farmers having to sell or rent out their lands at low prices. This is also added on top of the fact that more upstream players are crowding into the sector, splitting the shares of income growth.

In the second half of the hypothesis, it is difficult for this study to examine the full spillover effects because there are insufficient data collected with upstream players who are not directly related to commercial forestry. This was indeed a research bias that was predicted because of the choice of research areas being intensively commercialized by the presence of CFDIs. On one hand, it was later suggested by other research correspondents and participants that at least 70% of commercial plantations outside of these CFDI hotpot areas flow into the informal value chain. The informal sector is characterized by inconsistency on both the supply and demand sides and highly unregulated value chain players. It would be beneficial for future research to unlock these areas, understand the mechanism of the informal commercial forestry sector, and explore the option (if any) of positive economic impacts spilled over from the formal value chain led by foreign companies.

On the other hand, the spillover effects on the upstream actors have not yet been explored the other use of forestry, such as agro-forestry or protection forestry as defined in the theoretical framework. Interviewees have flagged that although there are no tropical forests in the region, some logging activities by CFDI are very ambiguous, as there are inclarity on the land ownership and purpose of use. They may be getting very close to or even overlap with communities' ancestral lands, natural forests or protected areas. Questions should be asked: Are commercial forestry activities affecting households' other agricultural use of plantations? How are commercial forestry activities influencing natural forests and what is the impact? According to the GIS report (See Figure 3), it can be found that the forest coverage loss was rising and the areas align with the intensively processed areas by CFDIs since their entry in 2025. However, studies (Doggart et al., 2020; Mwangi et al., 2025) also indicated that more than 81% of tree loss is actually caused by agricultural activities and cultivation, due to increased population. In the future, it is worth investigating the impact of single CFDI commercial forestry activities, controlled by forestry activities (e.g., Protection or agriculture) and ownership of forestry lands (e.g., private lands vs public lands). It can be done through econometric studies that conceptualize commercial forestry and identify clear indicators that distinguish CFDI activities from others. It is also suggested that CFDI has the responsibility to work with tree growers and other upstream players, whether or not they are linked directly to commercial resources, with capital and technologies (e.g., better and cheaper seedlings for replantation, fire prevention trainings, etc.) to improve country-level forest preservation and prevent negative externalities and public good tragedy.

Figure 3: From left to right - Tree cover loss over the years; Tree-loss by dominant drivers; Biodiversity intactness. Source: Global Forest Watch

Hypothesis 3: *CFDI can only make positive spillovers to downstream actors (local processors, factory workers, buyers) of commercial forestry when transmission channels, governance quality, and absorptive capacity are all met.*
Hypothesis 4: *Privately-structured, locally integrated, and high-end market-driven CFDIs in commercial forestry are more likely to create positive spillovers.*
Hypothesis 5: *CFDI in East Africa's commercial forestry sector will have a negative long-term impact if social and environmental aspects are not well managed by the governments.*

The last three hypotheses are highly connected to the findings. Hypothesis 3 and 4 are both supported. CFDI in East Africa's commercial forestry sector follows the competition-driven spillovers model by Kaufmann (1997) and Glass & Saggi (2002). It has the characteristics of resource and market dominance that hinder competition for tree resources, thus limiting the price advantages for different grades of timber products when competing in CFDI's product markets. The imitation channel is also hard to achieve if workers face language and knowledge barriers in operating Chinese-imported machines and local players are also not incentivized to use Chinese machines due to the high costs. Finally, worker mobility has not only been observed in this first phase of sector development, where higher-skilled workers are flowing into CFDI companies than domestic firms, before embodies the absorptive capacity and offering better prices in recruiting these workers (second phase), and transferring these technologies to domestic firms (third phase). In this process, policies of domestic investment promotion and SME development from the government, such as taxation benefits and credit financing, were also missing which could have encouraged innovation and technology adaptation. Future research is suggested to continue monitoring this trend and studying what enabling factors are most effective in transition into the second and third strands of development.

CFDI businesses that can create the strongest spillovers are found to have the following characteristics. First, it does not have a complex structure like a multi-national corporation thatlinked back in China or with other global shareholders. Family owned or private businesses often make decisions on site when it comes to raw material sourcing and service procurement with local partners, creating direct linkages. They are more likely to integrate in the full value chain in the country or in the region from upstream supply to downstream markets. Second, when regulations are in place, CFDI that conducts secondary processings in the country and targets high-end markets are regarded as most likely to create spillovers. It encourages domestic firms to transfer to complementary products and services, as CFDI would move away from lower to middle end markets and encourage product diversification, giving more options for domestic firms as a response to limited absorptive capacity for high-tech products. Future research may investigate the effectiveness of leveraging these two characteristics to promote stronger sectoral spillovers.

Finally, the fifth hypothesis assumes that governments' efforts in imposing socially, economically, and environmentally driven regulations and legislations determine the long-term success of the sector. However, this study argues that in a sector and region where it is dominated by a specific group of foreign investors, the role of CFDI cannot be underestimated. It is regarded as equally important as governments and sometimes more effective in taking up the responsibility and accountability for positive spillovers, as opposed to common research findings (Chisika & Yeom, 2021; Kalumanga et al., 2018; Katsvanga & Mudyiwa, 2019; Kyeyune, 2018; Luukkanen et al., 2006; Mishenina & Dvorak, 2022; Mwamfupe et al., 2022; Mwangi et al., 2018; Ng'Andwe et al., 2017; Popoola et al., 2020).On the CFDI side, Chinese investors are suggested to build stronger and more sustainable infrastructure for future uses by local communities, to prioritize local skilled employment, labour rights, adhere to environmental laws, and engage in more socially responsible programmes for the communities. On the government side, research participants

call for policy promotion for CFDI to engage in long-term business by rewarding tax exemptions for socio-environmentally friendly projects.

Interestingly, since the field trip for this study happened right before the election period in Tanzania and Uganda, the incentives for research participants to call for government actions on CFDI increased. Some commented that they only feel their opinions valued by public officials when they need to satisfy the voters. For example, the authorities responded much faster during elections when they received complaints about Chinese illegally logging in the forests or when conducting Operational Health and Safety inspections in the factories. Otherwise, research participants do not trust that the public authorities have the incentives to plan for long-term sector strategies and offer a stable and transparent policy environment. Instead, they expect long-term changes coming from Chinese investors themselves when they see the commercial incentives to do so. An example of this is when CFDI would like to produce wood products targeting the European export market. Compliance requirements, such as the FSC label, push businesses to improve their factory environment and labour welfare in a given period of time. Otherwise, they are not eligible to get the label that is mandatory for accessing the market. It also requires traceability of trees as raw materials made for these markets and sustainable management of forests, adding another layer of incentives to improve upstream spillovers. Future studies could further explore the effectiveness of these global market compliances in improving FDI spillovers.

6. Conclusion

To conclude, the field evidence in this study shows an overall positive attitude from local players towards CFDI on its economic impact in the commercial forestry sector in East Africa. This contradicts the pre-assumption of the author and makes the study lean towards the positive side of literature debates on the topic of CFDI in Africa. Granted, due to the micro- to meso-level lens of analysis, the results and policy suggestions may not be applicable to other settings and are subject to the selection of sectors and countries. Despite that, many findings may still offer insights for practitioners and researchers to better understand and implement FDI policies in Africa. Below listed a few more limitations and suggestions of research angles that were yet covered in the bandwidth of this study but can be approached with additional values.

First and foremost, both this study and the literature have anchored abundant evidence that in Africa, it is important to know how to attract FDI, but also equally important, if not more, to know how to manage FDI relationships and incentivize them to stay in the country and leverage for broader economic spillovers. Local actors also believe that the conditions for improved CFDI performance are based on the fact that CFDI investors are here to stay. Overall, it is already known that outward FDI looks to emerging markets, such as East Africa, for factors macroeconomic stability, transparency, steady policies, and predictable institutional qualities (Mohanty, Sethi, & Dash, 2024; Banda, 2015). However, there is a gap in the current knowledge of the author on how these measures have been carried out, and if there are evidence-based studies that compare the competitive advantages of East African markets' FDI policies with other African regions or countries. Within the three studied East African countries as well, there is no comparative study on the differences of each country's investment promotion policy. More often than not, it is also confused with or overshadowed by the export promotion schemes and thus the sharing of government budgets and public resources (Massyn, Bezuidenhout, Kleynhans, & Ewert, 2021). Some studies are showing a good direction by studying the different national branding strategies for investment promotion, but a structural and up-to-date understanding of African markets, especially the East African countries, is needed.

Next, following the last section in the discussion regarding the role of CFDI and government, it sheds light on the importance of understanding the ownership as well as the perceived ownership by the public on the development of certain sectors. As evidence shows, in East Africa's commercial forestry sector, CFDI owns the majority of businesses and in certain regions, the economy relies on its single economic commodity. Questions may be asked: To what extent does a country's sectoral development depend on its FDI players? What's the long-term impact of this dependence? Another angle of research could also look at the relationship between political systems and FDI impacts. This is briefly mentioned by respondents in this study that, despite the similar colonial history, Kenya, Uganda, and Tanzania developed very different political systems after independence. Therefore, public perception of the ruling governments and, respectively, the governments' attitudes and bureaucratic measures towards foreign investment also differ. For example, there was an increasing negative sentiments and directives issued in Tanzania that restricts foreign businesses from Kenyan and Chinese traders, perceived as competition to local small businesses. Future research may also choose to uncover these phenomena by exploring questions such as: How does trusts towards regional and national-level authorities and perceptions on FDI shape the actual spillovers from FDI? Finally, this study did not step into the discussion on regional economic treaties such as the East Africa Community (EAC). So far, the research has looked into the three countries separately. However, it is important to understand whether the EAC is perceived as a communal economy and if individual countries' investment promotion policies create more synergies in attracting FDI and aggregating FDI spillovers, or competition that dilutes the spillovers of foreign investment in each single economy. Last but not least, academic research can also explore the perspectives from the other side of the relationship. That is, how do existing Chinese investors and potential outward investors respond to East Africa's investment environment differently? What kind of policy can be most effective in incentivizing spillover creation, specifically for CFDIs that are privately owned? These questions may require researchers to have insider conversations with Chinese businesses in Africa, which are often non-transparent in their decision-making and investment activities. However, once approached, it can offer invaluable insights for policymakers and practitioners with a more comprehensive understanding of Chinese FDI as an increasingly important source of FDI in Africa.

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Appendix 1: Research participant list

Source	#. of the interviewee	Profile	Region / Country
First-hand interviewee	1	Male, 62, Factory Manager of a local sawn timber factory	Mafinga, Tanzania
	2	Male, 29, Owner of a local sawn timber factory	Mafinga, Tanzania
	3	Male, 37, Operation Manager of a local company	Mafinga, Tanzania
	4	Male, 21, Tour guide	Iringa, Tanzania
	5	Male, 50, Forestry Manager of a DFI-funded forestry training center	Mafinga, Tanzania
	6	Male, 45, Forestry Manager of a DFI-funded plantation company	Mafinga, Tanzania
	7	Female, 23, Housewife/Farmer, Ex-worker at a Chinese factory	Mafinga, Tanzania
	8	Male, 53, Accountant	Mafinga, Tanzania
	9	Male, 35, Operation Manager	Mafinga, Tanzania
	10	Male, 34, Interpreter/personal assistant of a Chinese factory	Kampala, Uganda
Second-hand interviewees	11-19	Entreprenuers of local timber mills, contractors	Kampala, Uganda
	19-25	Owners of local nurseries	Kenya Tanzania
	26-46	Small tree growers (majority are women above 50+) , community members and leaders	Kenya Tanzania
Second-hand focus group	46-65	Factory workers in Chinese factories	Uganda Tanzania

Appendix 2: Interview questionnaire

Dear sir or madam,

Good day! My name is Jessie Chenjia Yan. I am a researcher from the International Institue of Social Studies, majoring in Development Economics.

You are invited to participate in a research paper titled "*The impact of Chinese Foreign Direct Investment on the forestry sector in East Africa"*. By answering this questionaire, you are giving consent to use your experiences and opinions in the paper. However, your individual details will be strictly protected and not disclosed to anyone. You can also choose to not answer questions. The research is independent and not funded by any individuals, organizations, or companies.

The questionnaire will be disseminated with the help of Mr. Yuda. For more details or updates on the research, you can reach out to Mr. Yuda, Whatsapp +255786344198 or Jessie, Whatsapp +310625572191.

Thank you.
Jessie Chenjia Yan
29th July, 2025

Name: _____
Age: _____
Gender: _____
Occupation: _____
Town/City/Region/Country: _____

1. Do you, or anyone you know work in the timber/wood processing sector?

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2. Are you aware of the appearance of Chinese businesses in the timber/wood processing sector?

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3. If yes, how did you know about Chinese businesses in the timber/wood processing sector?

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4. Do you or anyone you know worked or is currently working in a Chinese timber/wood processing business?

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5. If so, how would you describe your impression of Chinese businesses in timber/wood processing?

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6. To what extent do you think the following aspect(s) of your work and life are affected since the entrance of Chinese businesses in timber/wood processing?

- Income:

- Skills and technology:

- Education:

- Business:

- Livelihood:

- Land and resources:

- Community:

- Others:

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7. What would you suggest Chinese businesses can do to improve the above?

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8. What would you suggest the government can do to improve the above?

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9. In the long-term, how do you think Chinese businesses in timber/wood processing are affecting the furture development of your work, life, or your region/country?

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10. How would you describe a good development of the timber/wood processing in your region/country?

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