



The global value chain: Challenges faced by ASEAN least developed countries

Pushkar Pushp^{*}, Faisal Ahmed

International Business Area, FORE School of Management, B-18, Qutub Institutional Area, New Delhi 110016, India

Received 9 February 2023; Received in revised form 12 April 2023; Accepted 5 May 2023

Available online xxxx

Abstract

We identify seven global value chain (GVC)-related challenges faced by the least developed countries (LDCs) of the Association of Southeast Asian Nations (ASEAN) region. The LDCs face some of the most rudimentary challenges related to trade participation and competitiveness. The challenges identified in the paper have been empirically validated using Fuzzy AHP modelling to decipher the priority weights. The findings reveal that ‘infrastructural and logistical constraints’ is the most imperative challenge followed by ‘limited FDI inflows’ and ‘inadequate development of SME clusters. The remaining challenges include: inadequate aid-for-trade, dismal LDC participation through the RTA/FTA route, lack of robust industrial policy, constraints in value chain upgradation, limited FDI. The study is beneficial for industry and provides useful inputs for policy-making. It helps in ascertaining optimal resource allocation for the purpose of enhancing trade competitiveness and economic development.

© 2023 The Society for Policy Modeling. Published by Elsevier Inc. All rights reserved.

Keywords: GVCs; ASEAN; LDCs; Fuzzy-AHP; International trade

1. Introduction

Global Value Chain (GVC) activities are distributed across different geographies, and usually, lead firm decides on the location of the value-added activities including what to out-source and what to accomplish in-house. In fact, the concept of GVCs involves the entire

^{*} Corresponding author.

E-mail address: fpm20003@fsm.ac.in (P. Pushp).

production process bringing a product from its commencement through production to its end use and beyond (Gereffi & Fernandez-Stark, 2016). Often, high value-added activities like R&D, branding, and design are firm's in-house activities, while assembling or manufacturing activities may be outsourced to labour-intensive locations in developing countries (Cuervo-Cazurra & Pananond, 2023; Gereffi, 2019). Gradually, suppliers in the emerging markets acquire skills, gain knowledge and upgrade to high value-added activities.

The process of upgrading requires structural transformation, economic development, and robust industrial policies (Kuroiwa, 2016). For instance, through a case study of apparel cluster in Torreon Mexico, Bair and Gereffi (2001) analysed how GVC participation and linkages leads to upgrading. Apparel supplier of Torreon entered the chain through assembly stage; however, they acquired the skills to develop expertise in trimming, labelling, and finishing. By 2000, these suppliers became full package suppliers by developing the expertise in exports and distribution. In fact, Azmeh and Nadvi (2014) noted that Asian garment manufacturers who once were the suppliers of lead firms in GVCs are now undertaking several high-value added tasks like design, distribution, and manufacturing. The study has also argued that GVC activities are shaped by the lead firms and several factors including supply-side factors, business environment, fiscal incentives, and trade openness determines the integration and disintegration of location of the GVC.

Today, the least developed countries (LDCs) continue to face rudimentary challenges pertaining to GVC linkages and upgrading. These challenges are related to their socio-economic conditions, infrastructure, logistics, and work environment to name a few (Saslavsky & Shepherd, 2014). Several firms from Asian economies like Hong Kong and Taiwan who once were the supplier to advanced countries have now become trans-national manufacturers and are running their operations in more than one country. A good example is Foxconn, a leading component supplier that now holds a dominant position in the value chain (Buckley & Strange, 2015). On the contrary, Cambodia, an LDC of of ASEAN lacks upgrading in GVC due to several challenges including lack of robust industrial policy, trade openness, and linkages with domestic firms (Keane, 2021).

Though Southeast Asia has transformed itself into a global manufacturing hub and a key player in the GVC architecture, yet the limited participation of its LDCs is worth exploring. This is primarily due to two factors. First, ASEAN as a region is now a part of world's largest regional bloc i.e. Regional Comprehensive Economic Partnership (RCEP). To reap the benefits in terms of knowledge and capabilities, these LDCs must improve their GVC linkages and upgrade themselves in the value chain. Second, the not so diverse portfolio of GVC participation of these LDCs remains a concern. For instance, the LDCs of ASEAN have traditionally specialised in labour-intensive industries e.g. apparel sector by utilising Generalised System of Preferences (GSP). However, in recent times, more capital-intensive sectors like automotive components, and electronics have intended to move their production facilities to these locations. For example, in Cambodia, Japanese firms are shifting their operations due to high-labour cost and labour shortages in the existing operations facility based in China and Vietnam (Kuroiwa, 2014; OECD, 2022).

A study by Shepherd (2016) discussed that GVCs activity is limited in LDCs due to the higher trade cost compared to other developing countries. In ASEAN, three out of ten members are classified as LDC. These countries face some the common challenges related to their weak industrial policy, high trade cost and underdeveloped infrastructure (Kuroiwa, 2016). These challenges limit their ability to upgrade in the GVC. Owing to the importance of GVCs and the challenges faced by ASEAN LDCs therein, it is imperative to study and prioritise these

challenges. In this paper, we identify some critical challenges faced by the three LDCs of ASEAN viz. Cambodia, Myanmar and Lao PDR in GVC integration. For this, we employ a multi-dimensional modelling approach viz. Fuzzy-Analytic Hierarchy Process (F-AHP), to help us decipher the priority weightages. Our study responds to the following concerns, and would help improve policy preparedness and optimal resource allocation:

1. What are the critical challenges that the LDCs of ASEAN face in GVC integration? Since the challenges are rudimentary in nature and deter LDC participation in the GVCs despite being an ASEAN member, it is crucial to decipher their GVC-related challenges.
2. How can we prioritise these challenges for improved resource allocation? The LDCs have limited resources and cannot allocate all resources with utmost immediacy to address the challenges therein. Therefore, the prioritisation of challenges would help the LDCs in understanding the inter-linkages among the challenges and their priority weightages.

This remainder of this paper is divided into the following sections. The second section comprises of a thematic review of the GVC literature. The third section presents a relevant description of the three ASEAN LDCs in the form of country case lets including relevant policy frameworks with suitable examples. In the fourth section, we identify and discuss seven challenges faced by these LDCs in GVC integration. In the fifth and sixth sections, we present a step-by-step analysis and consequently the modelling results using the F-AHP method. The last section includes a detailed discussion and relevant policy recommendations to enhance GVC integration in the LDCs.

2. Literature review

2.1. GVC participation

Low- and middle-income economies aspire to enhance their international trade competitiveness by focusing on increasing their GVC participation. [Kuroiwa \(2016\)](#) has discussed two phases of GVCs led growth, wherein the first phase is participation in GVCs by attracting FDI and the second phase involves upgradation. [Kowalski et al. \(2015\)](#) have highlighted that structural characteristic of a country like market size, level of development, and geography defines its GVC participation. LDCs, however, owing to their labour cost advantages, are well positioned to attract low value-added activities, and upgrading is not an automatic process and remains a challenge for them ([Shepherd, 2016](#)). Interestingly, the lead firms, which are large multinational enterprises, have the authority over core activities and they outsource only low value-added activities in LDCs like commodity outsourcing.

A crucial concern before the low- and middle-income economies has been about value chain upgradation. [Gereffi \(1999\)](#) defines upgrading as an “organisational learning process to improve the functional position”. He explains that upgrading operates at different levels, for example, within factories – moving from small to large orders, cheaper to expensive products; within inter-firm enterprise networks i.e. moving from mass production to flexible products; and, within national economies. The indicators of GVC participation of a country is explained by the extent of backward and forward participation. Backward participation, for instance, calculates the foreign content in the production that is used in gross exports of the country. Forward participation, on the contrary, means domestic content added in the production in gross exports of the country.

The concept of upgrading is a learning process by which firms and economies enhance their global competitiveness. Gereffi (2005) has defined upgrading as the “process by which economic actors – nations, firms, and workers – move from low-value to relatively high-value activities in global production networks”. Humphrey & Schmitz (2002) have classified upgrading into four types viz. process upgrading (doing the tasks more efficiently), product upgrading (moving into higher product lines), functional upgrading (possess new functions), and inter-sectoral upgrading. Pietrobelli and Rabellotti (2006) have argued that the potential of a firm to upgrade is motivated by firm-specific actions and its operating environment. Further, the study highlights that the efficiency of clusters, governance pattern of GVC and, learning and upgrading shaped the firm’s environment.

The development of GVC depends on the firms’ capability to upgrade in the activities that give higher value-added. Mohiuddin et al. (2019) considers Newly Industrialised Emerging Countries (NIECs) like South Korea, Taiwan and Singapore, as an example. He argues that NIECs started participating in GVCs back in the 1970s and became a destination for low value-added activities and were the preferred outsourcing destination for the developed markets, and gradually upgraded themselves. The economic development and robust industrial policies were the key ingredients in the success of NIECs (Mohiuddin et al., 2019). They also highlight that once these economies were industrialised, the low value-added segment activities were shifted to the LDCs like Bangladesh and Cambodia, thus making them the hub of textile production.

Importantly, finding the right way to participate in GVC is a major concern for developing economies (Lee et al., 2020). A study by Naves-Alemán (2011) highlighted the relationship between governance and upgrading. The study noted that in quasi-hierarchical value chain (captive) firms can achieve product and process upgrading but it would be difficult for the firms to achieve functional upgrading. The study was conducted for Brazilian furniture and footwear industry. The study also noted that firms in multichain governance tend to attain both forms of upgrading i.e. product and process as well as functional upgrading unlike in quasi-hierarchical value chain which hinders functional upgrading, multi-chain offers better prospects for upgrading. The findings of the study also reveal that in market-based relationship firms has better opportunity to attain functional upgrading. Though firms of developing countries understand the importance of upgrading in GVC by pursuing high value-added activities, their dependency on buyers and ‘fear of losing the buyers’ often deters their international linkages (Su et al., 2020).

LDCs like Bangladesh and Cambodia specialise in the garment industry (Adnan et al., 2015; Ramdoo, 2015). For many years, this industry was governed by a captive governance structure i.e. suppliers were small and were dependent on the limited buyer (Azmeah & Nadvi, 2014; Gereffi et al., 2005). However, as they specialise in the value chain and upgrade in terms of technological capabilities, the governance structure changes to modular wherein suppliers tend to possess technical capabilities and there is more information flow within buyer and supplier. (Azmeah & Nadvi, 2014).

Profit in the producer-driven chains e.g Automobile, electronics comes from technological advancement and scale of production (Gereffi, 1999). On the contrary, in a buyer driven industry like garments, manufacturers in developed countries face stiff competition from smaller countries. Smaller countries have low-cost advantage wherein they can produce the quality goods at low-cost. In order to remain competitive and get benefit, manufacturers rely on design and marketing (Knutsen, 2004).

Zhan (2021) has discussed about the future transformation of GVCs. The author has highlighted five major forces that would drive the GVCs in the coming decade. These include economic government realignment, the technology revolution, the sustainability endeavour, the

corporate accountability push, and, resilience-oriented restructuring. International policymaking would be based on changing governance structure and the competition between the economic powers. Author has further highlighted that due to rising uncertainty, changing geopolitical scenarios and a complex global business environment, MNEs would restructure their GVCs and they will adopt new modes of business operations. The spillover effect of such manoeuvring would impact LDCs as well. LDCs must realign their business model and formulate policies based on the five forces.

In the paper, Zhan (2021) has also discussed about the growing protectionism among economies. Due to the rise in the number of PTAs and FTAs, value chain regionalisation will grow further in the coming years. Regional Comprehensive Economic Partnership (RCEP), a free trade agreement among ASEAN +5 is expected to benefit LDCs by improved market access, and greater FDI inflow. Moreover, this is for the first time that major powers such as China, Japan, and Korea are the participants in a common free trade agreement. It is expected that RCEP would benefit developing countries as well. For instance, Cambodia's export of electrical equipment, and machinery is expected to increase by approximately 36 per cent to Japan, and around 28 per cent to Korea.¹

Because of digitalisation, MNEs would have very few tangible assets and fewer assets in the foreign location, although the major portions of sales will come from abroad. Digitally advanced MNEs will govern the global value chains and they may displace the traditional MNEs whose presence is physical in different locations and has higher tangible assets in foreign locations. LDCs must overcome the barriers of digitalisation, for example in Laos, only 43 per cent of the population has access to internet. Apart from affordability, there are several other obstacles that needs policy attention for improved digital connectivity such as strengthening legal and regulatory architecture, connecting the education sector digitally. For the first time a programme named 'Khang Panya Lao' was launched by Laos government in collaboration with European Union (EU) and Global partnership for education (GPE) for digital teaching and learning. In Cambodia also, UNDP along with government of Cambodia and Enhanced integrated framework (EIF) has launched 'Go4Ecam' project to support SMEs of Cambodia to go digital.²

2.2. The LDCs of ASEAN

2.2.1. Cambodia

Cambodia has integrated into GVCs in 1989 by facilitating cross-border trade and promoting FDI. In 1994, the country passed a law to treat domestic and foreign investors as equal thus allowing 100 per cent FDI in manufacturing and services sector (Sok et al., 2020). In March 2015, Cambodia embraced the Cambodian Industrial Development Policy 2015–2025 to promote inclusive growth, economic diversification and make a holistic effort toward industrial development. The government has set three targets to fulfil the vision of a successful industrial policy (CIDP, 2015): First, GDP share of the industrial sector to be increased from 24 per cent in 2013 to approximately 30 per cent by 2025. The growth of manufacturing sector to be increased from 15.5 per cent in 2013 to 20 per cent in 2025; second, 15 per cent of all exports by

¹ <https://blogs.worldbank.org/trade/asia-already-highly-open-trade-likely-reap-benefits-further-liberalization>.

² <https://www.undp.org/cambodia/projects/e-commerce-acceleration-and-formalization-msmes>.

2025 should be non-textile goods; and, third, encouraging the formal registration of 80 per cent of small and approximately 95 per cent of medium firms.

Sector-wise, Cambodia's GVC participation is limited to buyer driven industry like textiles and garments, leather, and footwear (Keane & Basnett, 2016) out of which 80 per cent of country's export is of garments. The SMEs of Cambodia account for 70 per cent of the employment and contribute 58 per cent to the GDP (Sok et al., 2020); however, their participation in GVCs remains dismal – and more so, a critical challenge. Cambodia faces some of the most rudimentary challenges including access to electricity. For instance, though the industrial base is concentrated in labour intensive chain, 60 per cent of the factories are involved in Cut-Make-Trim (CIDP, 2015; Mah, 2022). Only a fourth of the factories are operating in functions like embroidery, packaging, and export of finished goods. The industry is unable to weave fibre due to unreliable electricity supply as weaving fibre and extruding yarn required an adequate power supply at low price. Currently the electricity is around 2 times higher than Vietnam and Thailand (CIDP, 2015; Mah, 2022).

In fact, high infrastructure cost, limited access to finance, lack of government support, and high transportation costs are the major challenges faced by SMEs to connect in GVCs (Ung & Hay, 2010). In Cambodia, for instance, the industrial sector is weak and narrow due to simple manufacturing structure and concentration on labour intensive industry like garment and leather (CIDP, 2015). The study noted the reasons behind a weak industrial sector attributing it to informal and missing middle structure, low technology application, weak entrepreneurship and focus on low value-added tasks.

Currently, the Royal Government in Cambodia has planned to modernise its labour-intensive base to become more skill-intensive by promoting GVC linkages, regional integration and cluster development. Three targets have been announced to achieve this objective. These include “transforming and strengthening the industrial structure in the national economy; increasing and diversifying export products; and strengthening and promoting of SMEs” (CIDP, 2015). As outlined earlier, investment in Cambodia is relatively less compared to other developing countries. The key strategy in this development policy also includes attracting FDI for industrial development, strengthening the manufacturing base of SMEs, and improve the legal environment to attract investment (CIDP, 2015).

2.2.2. Myanmar

Myanmar's economy is based on agriculture and natural resources. Like Cambodia, most exports are in the buyer-driven value chain that include garments, agriculture, and labour-intensive manufacturing. Due to unfavourable investment climate and import restrictions, the manufacturing sector has not attracted adequate investments. A study by UNIDO (2017) highlights several challenges faced by Myanmar in the path for industrial development and GVC linkages. These challenges include weak business enabling infrastructure due to financial constraints, logistical challenges, and poor electrical supply. For instance, Bernhardt (2017) found that electricity outage has caused financial loss in the annual sales for many firms in Myanmar. Other bottleneck is lack of finance, which is a major concern for the SMEs in the region. On the similar lines infrastructure in Myanmar lacks global standard for instance, quality of roads and highways are inferior; railway system to promote industrial growth is still at nascent stage.

Industrial development requires a strong legal and institutional framework; however, Myanmar lacks these frameworks. For example, government policy objective for R&D and the intellectual property (IP) laws are ineffective and outdated. In fact, as per the latest global

innovation index ranking, in all the pillars Myanmar performs below regional average of the regions South East Asia, East Asia, and Oceania (GII, 2022).³ Exports and shipments from Myanmar are time consuming because of poor transport infrastructure. A report by ADB (2016) has discussed that approximately 60 per cent of highways in Myanmar are under maintenance and it increases the cost of trade. Moreover, due to Covid-19 and the political situations in the country foreign investment is disrupted in Myanmar. Many foreign companies have withdrawn their operations from Myanmar. As of September 2021, foreign investment in Myanmar dropped by 22 per cent to US\$38 Billion.

Currently, to promote industrial development in the region several economic reforms such as National Comprehensive Development Plan, Myanmar Industrial Development Vision, National Export Strategy, The Industrial Policy Paper, and 12-point Economic Policy are in place. These policies are aimed to promote industrial development and value chain linkages in the region by developing high-skilled human resources and providing employment opportunity, upgrading SMEs capabilities, and promoting integration in value chain networks (UNIDO, 2017).

2.2.3. Lao PDR

Another LDC in ASEAN is Lao PDR which is a land-locked country. A report by ASEAN-JAPAN Centre (2019a) on Lao PDR discussed that the major exports from Lao PDR are agricultural products, timber, and electricity. Laos imported products like fuel, which was costly to produce domestically, and to meet the domestic demands it imports technologically advanced products. The higher value-added products were imported and lower value-added products were exported. As of 2019, a significant share of the workers was employed in the agricultural sector and very little in the industrial sector i.e. around 63 per cent of the workforce are in the agricultural sector and 12 per cent in the industrial sector. The low minimum wage rate and cheap labour productivity prevent Lao PDR to compete with other countries. In comparison with ASEAN members, Lao PDR has a weak GVC participation both in foreign value-added and domestic value-added (Urata & Baek, 2021). The domestic value added by Lao was less than the average across ASEAN, the share was 11 per cent compared to the ASEAN domestic value-added average of 33 per cent. In foreign value-added, the share of Lao PDR was 6 per cent as compared to ASEAN's 36 per cent (ASEAN-Japan Centre, 2020c).

In Lao PDR, transport costs are higher compared to its neighbours, and the cost of logistics is a major challenge to the exporters. Businesses operating outside the SEZs face high transportation and logistics costs (World Bank, 2022a, 2022b). Though Laos' participation in GVC is mostly dominated by commodities, since 2013 the country has diversified its export portfolio and is an exporter of light manufacturing, electronics, and electrical components (World Bank, 2022a, 2022b). However, high labour and transportation cost, small domestic market and difficult regulations creates disadvantages in GVC participation. In fact, this report has also mentioned the importance of expanding agricultural value chain. It will help in creating more employment opportunity in the sector. The construction of Laos-China railways creates an opportunity to facilitate cross-border trade. Moreover, this project has the potential to link the isolated areas of the country with international market. However, to leverage the desired benefits, addressing the logistics and infrastructural challenges along the corridors remains the key.

³ https://www.wipo.int/edocs/pubdocs/en/wipo_pub_2000_2022/mm.pdf.

Laos' New Development Plan, the 9th [NSEDP \(2021–2025\)](#) highlights several guidelines to enhance GVC participation. It outlines SMEs development plans which comes under the priority list of the government. It includes focusing on innovation in SMEs, access to finance, promoting market expansion, and emphasis on developing new entrepreneurs ([NSEDP, 2021](#)). Further, the plan also aims to encourage SMEs participation in value chains so that they can upgrade their technological and innovation skills and productivity. The policy report outlines that to create a better synergy between a large enterprise and SMEs, specific policy would be formulated to incentivize the large firms and SMEs so that value chain linkages can be encouraged. Moreover, to improve the quality of production, lead firms and SMEs should be encouraged to strengthen the communities capacity. Apart from this, the policy highlights several mechanisms such as access to production facilities, international production networks, and funding sources to support SMEs.

2.3. Common challenges in GVCs integration

2.3.1. Inadequate Aid-for-Trade

Aid-for-Trade (AFT) aims to support developing countries and LDCs ([OECD/WTO, 2015](#)). This initiative was launched to mitigate the supply-side constraints faced by the countries of the global South. It aims to ensure that developing and LDCs can get benefit from trade liberalisation. AFT was first launched at the WTO Ministerial Conference held in Hong Kong in December 2005. At the same conference, the WTO task force was created to provide recommendations on operationalizing AFT and link it with the development dimension. It was at the tenth ministerial conference in Nairobi (MC10) held in 2015 that the countries recognised the importance of AFT.

There are five types of activities involved in the AFT agreement. The technical policies to develop trade strategies, trade-related infrastructure policies for the building of roads and ports, productive capacity development to get a comparative advantage, trade-related change checked the cost associated with trade liberalisation and other trade-related needs were made for national development strategies ([Hynes & Holden, 2016](#)). [Gamberoni and Newfarmer \(2014\)](#) have discussed that LDCs require AFT more than the developing countries.

[Lee et al. \(2015\)](#) discussed the need to expand the AFT to LDCs. AFT disbursement constituted \$86 billion between 2011 and 2019. [OECD \(2021\)](#) finds that economic infrastructure represents the bulk of AFT disbursements which amounts for \$25 billion in 2019. [OECD/WTO \(2019\)](#) finds that the top five recipients of AFT from the period 2006 to 17 were Bangladesh, Afghanistan, Ethiopia, Tanzania, and Mozambique which accounted for approximately 40 per cent of the total AFT disbursements. This report also throws some light on the challenges which donor face while AFT disbursement, weak institutional capacity is one of the major constraints. This report further articulates that in the perspective of South-South partnership and lack of regional coordination confines the success of AFT.

None of the ASEAN LDCs was in the top five recipients of gross official development assistance (ODA) in 2018–19. The net ODA received by the LDCs of the ASEAN region is comparatively less than East Asia and Pacific economies which is \$1.5–2 billion for the ASEAN LDCs and \$7 billion for East Asia and Pacific economies in 2019 (see [Fig. 1](#)).

2.3.2. Dismal LDC participation through RTA/ FTA route

The ASEAN free trade agreement (AFTA) was negotiated and ratified with the key focus on trade liberalisation under the Common Effective Preferential Tariff (CEPT) on intra-ASEAN

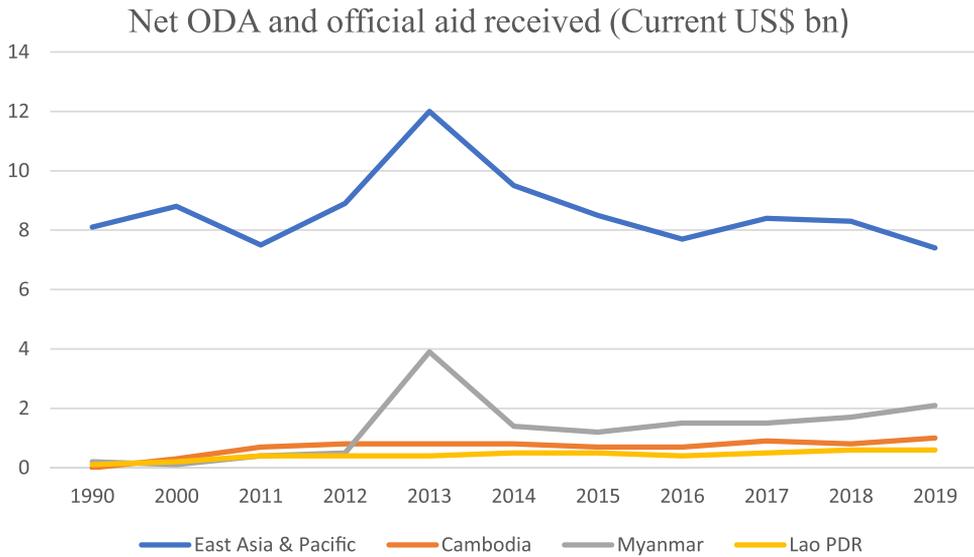


Fig. 1. ODA received by East Asia and Pacific, and ASEAN LDCs.
Source: World Development Indicator.

trade. Apart from intra-ASEAN FTA, ASEAN countries has FTAs with China, Japan, India, South Korea, Australia and New Zealand. Although as a region, ASEAN has FTAs with several countries, however, there is dismal participation of LDCs in mega-regional agreements except for Regional Comprehensive Economic Partnerships (RCEP). [Palit \(2015\)](#) has pointed out that in mega-regional trade agreements, hardly any LDCs participate. He has interestingly mentioned that in RCEP, which is the largest mega regional bloc in the world, LDCs' participation was due to the 'ASEAN+' negotiation framework. Further, in the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CP-TPP), many ASEAN members are part of this RTA, but, none of the ASEAN LDCs is a member of CPTPP. In the context of intra-ASEAN trade between 2007 and 2016, only Singapore, Malaysia, and Thailand have registered positive trade balance, while countries like Cambodia, Lao PDR and Myanmar registered a negative trade balance for most of this period ([Juan, 2018](#)).

Preferential access in RCEP would be advantageous to all these ASEAN LDCs in form of economic benefits and access to major regional markets of developed and developing nations ([Rahman, 2021](#)). However, the participation and positioning of the individual ASEAN economies in the GVC would remain essential to realise the gains from RCEP. Countries like Thailand, Indonesia, Malaysia, and Viet Nam, which have stronger GVC engagement in local and international GVC activities, would be benefited from this agreement. The RCEP will also benefit the ASEAN LDCs, however, for these countries to fully reap the benefits from the pact, they must implement more extensive structural reforms ([Thangavelu et al., 2021](#)).

Most businesses in ASEAN Member States are MSMEs. Around 88.8 per cent to 99.9 per cent of all businesses are dominated by MSMEs in ASEAN ([Lee, 2022a, 2022b](#)). The study also noted that though RCEP is meant to benefit MSMEs more than a large firm, due to low productivity and low export propensity RCEP might benefit a large firm more than MSMEs.

2.3.3. Infrastructural and logistical constraints

LDCs of the ASEAN region are at a competitive disadvantage due to their poor infrastructure and connectivity. Shepherd (2016) has discussed the infrastructure gap between the high and low-income countries, the infrastructure quality is substantially higher in high-income countries compared to low-income countries. UNCTAD (2016) in a report highlighted that poor infrastructure and high trade costs hinder the performance of LDCs.

From a value chain perspective, export supply chains depend on how timely a consignment is delivered. Export lead time is three to four times higher in LDCs. This reduces their ability to participate in GVCs and weaken their export competitiveness. For instance, in Cambodia due to congested road network, there is a delay in transportation (CIDP, 2015). Other infrastructural constraints include the challenges related to social infrastructure i.e. making it easier for people to move from one place to another through development of housing, public transport service, and hospitals. In fact, Sahoo and Dash (2014) argue that lack of a high-quality infrastructure raises trade costs, which lowers competition. There are three conditions to be met when creating infrastructure i.e. capital, willing investors to invest in that capital, and proper project implementation without extra time and cost (Sahoo & Dash, 2014).

Also, Laos has only about 15 per cent of all road networks paved. Poor road network restricts the mobility of goods and people difficult. Due to poor infrastructure connectivity, most of the SEZs are located near the borders which already has proper infrastructure connectivity (Sayavong, 2022). On the similar line, Burgess (2019) highlights that around 60 per cent of Myanmar road remains unpaved. Arvis et al. (2010) found a positive relationship between logistics performance and the share of parts and components in total exports. Further, they have discussed that cost of moving manufactured goods to and from LDCs are 2.75 times higher than the high-income countries. Lead firms are trade cost-sensitive, and they prefer to invest in countries where there is low trade cost (Shepherd, 2016).

To improve the infrastructural connectivity, countries are formulating the policies to improve the existing infrastructure. An example of this is the Laos-China Railways, which connects Lao PDR to the China-led Belt and Road Initiative (BRI) network. This project has the potential to transform Lao PDR from a “landlocked to a land-linked economy” (World Bank, 2020a, 2020b). This corridor can increase the trade flow between China and Lao PDR and will help reduce transport cost. It will reduce the transportation cost between Kunming (China) and Vientiane (Lao PDR) by 40–50 per cent. Similarly, for Cambodia, the development policy includes developing the economic corridors such as Greater Mekong Sub-region and development of cities like Phnom Penh and Koh Kon, and linking them with neighbouring centres such as Bangkok and Ho Chi Minh city.

2.3.4. Lack of robust industrial policy

Ramdoo (2015) has discussed that low-income countries face major bottlenecks in implementing industrial policies due to relatively small domestic markets, supply-side constraints and poor conditions of labour and regulations. The challenges are majorly due to poor business climate, the twin effect of market and government failure, poor infrastructure and non-alignment between donor and government while designing the industrial policy. For instance, around 80 per cent of Cambodia’s merchandise export are of garments which signifies the country’s dependence on a particular sector making it vulnerable to both internal and external shocks. Cambodia’s weak manufacturing capacity and its major concentration on the garment and food processing industry depict the flaw in the industrial policy design (Thangavelu et al., 2019). On the similar lines, Myanmar’s industrial base is relatively weak with around 57 per cent of total

population being employed in agriculture sector (UNIDO, 2017). Industrial policy in Myanmar falls short of meeting the regional or global standards and best practices. There are several laws and legislation that are obsolete, many are draughted but they are not enacted yet. For instance, IP related law are ineffective, and there are more than 70 laws regarding question of the land in Myanmar (UNIDO, 2017).

Both the above researches (Ramdoo, 2015; Thangavelu et al., 2019) argues that there are certain critical factors for better design of industrial policy like the choice of sectors, the incentives for investors, the technological learnings, the linkages with MNEs, facilitation of special economic zones, and fiscal incentives to name a few. LDCs are involved in the task which requires simple technologies, however, to match the skills at par with developing countries they require competitiveness and innovation (Singh, 2016).

2.3.5. Value chain upgradation

Against the backdrop of Covid-19, global export demand reduced drastically and the global supply chains broke down. A country like Cambodia which specialises in the textile and garments sector faced challenges in procuring raw material and intermediate inputs (Keane, 2021). Exports from ASEAN LDCs are not diversified, and it is concentrated in limited markets which include the EU, the US, China, India and Thailand. Nuruzzaman and Tateno (2021) outlines that clothing production in these three countries do not extensively use foreign inputs in exports, and that the value-added in this industry is characterised by the domestic firms. A report by ASEAN-JAPAN Centre (2019b) on Myanmar founds that due to limited international transaction, Myanmar has negligible import of inputs used in exports since 2000. The report also highlights that GVC participation of ASEAN member averages 61 per cent, however, the three LDCs' average participation in GVCs was 25 per cent for Cambodia, 30 per cent for Lao PDR and approximately 40 per cent for Myanmar.

Moreover, all these three LDCs specialise in labour intensive sectors like agriculture, and textile and garments which limits their upgrading trajectory as only low-value added activities are carried out by firms in these countries. To specialise and upgrade in value chain, firms must develop innovative capabilities and should climb up the ladder of upgrading by pursuing high-value added activities like design, branding, having own production houses, technology upgradation so that they can reap the benefits of upgrading in the value chain. For instance, Myanmar which is an agriculture-led economy, should try and develop competitive advantage in agriculture sector by pursuing both upstream activities by introducing superior technologies and increasing the agri-food production, and downstream activities like reducing the logistics cost, advancement in food packaging technology (UNIDO, 2017).

2.3.6. Inadequate SME clusters

SMEs contributions to employment. and GDP in ASEAN LDCs varies from country to country. For example, in Cambodia, the contribution of SMEs to GDP is around 58 per cent (Sok et al., 2020). 99.8 per cent of Cambodia's firms are MSMEs and most of them are medium enterprises (Sok et al., 2020). A report of ADB on Asia SME Monitor (2020) found that MSMEs account for half of the sales of Cambodian firms and 80 per cent of its profit. The report also discussed that in Cambodia, the greatest challenge for SME development is access to finance and electricity. On the similar lines the report articulates that for Lao PDR too, the total number of MSMEs make up 99.8 per cent of the total firms, and a major challenge for MSMEs in Lao PDR is access to markets. They mostly operate locally, are less accessible to the global market, and have an undeveloped digital industry. This report has also touched upon the case of

Myanmar, although the economy grew by 6.8 per cent in 2019, there are significant challenges for SMEs, and these challenges are very similar to Cambodia and Lao PDR, for instance, access to finance, skill development and human capital. As of 2019, there were 70 thousand registered SMEs, and they accounted for 90 per cent of total firms in 2019. Further as per the report, SMEs in Myanmar cannot meet international standards as the firms cannot produce quality products and very few firms take part in the value chains. The participation of SMEs in e-commerce is less because of the dominance of large firms.

Recently, the government of Cambodia has ensured the provisions of adequate clusters, and has identified several locations and zones for manufacturing and linking in the regional production network. For example, Phnom Penh and areas near the Vietnamese border have been identified as zones for manufacturing, while Sihanoukville-Phnom Penh and Kampong Cham Province-North-West industrial corridor will serve as manufacturing development zones, and processing zones for agriculture respectively (CIDP, 2015).

2.3.7. Limited Foreign Direct Investment Inflows

FDI have a favourable impact on the host countries' export performance (Sahoo & Dash, 2014). Due to the Covid-19 pandemic, FDI flows across the world was largely affected (UNCTAD (2020)). The FDI inflow is highlighted in Fig. 2. LDCs have been hit hard due to the Covid-19 pandemic, lockdowns, and border closures. For example, Cambodia, whose GDP depends on tourism, was affected by the halt of international trade. Sauvann and Mallampally (2015) outlines that location-specific factors attract firms to engage in direct investment, but LDCs because of their stagnant GDP and low development rankings cannot attract FDI. For instance, there are three major factors behind limited FDI inflows in Lao PDR viz. lack of skilled labour force, inadequate public and private infrastructure, and logistics and transportation (Suvannaphakdy, 2013).

Due to the small domestic market, LDCs face several disadvantages in international trade. Both in Myanmar and Lao PDR, FDI inflows as a percentage of GDP have shown a drastic fall

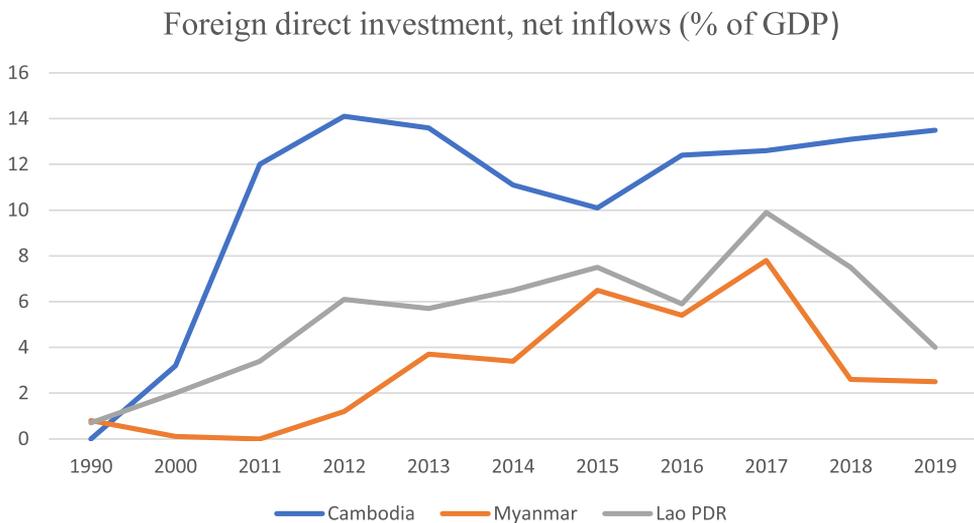


Fig. 2. FDI as a per cent of GDP.

Source: World Development Indicator.

Table 1
Challenges faced by ASEAN LDCs in GVCs integration.

S. no.	Challenges	Source
1.	Inadequate Aid-for-Trade (AFT)	Adhikari, 2022; Gamberoni & Newfarmer, 2014; Lee et al., 2015; Shepherd, 2016
2.	Dismal LDC participation through RTA/ FTA route	Juan, 2018; Lee, 2022a, 2022b; Palit, 2017; Soans & Abe, 2016
3.	Infrastructural and logistical constraints	Bernhardt, 2017; Saslavsky & Shepherd, 2014; Sayavong, 2022; Ung & Hay, 2010; Thavonsouk, 2019
4.	Lack of robust industrial policy	CIDP, 2015; Kaplinsky & Kraemer-Mbula, 2022; Morris & Staritz, 2019; Ramdoo, 2015; Thangavelu et al., 2019,
5.	Constraints in value chain up-gradation	Biswas, 2018; Mah, 2022; Nuruzzaman & Tateno, 2021; Urata & Baek, 2021
6.	Inadequate development of SME clusters	ADB, 2021; Abe & Proksch, 2017; Thangavelu et al., 2021
7.	Limited FDI inflows	Anwar & Nguyen, 2010; Saignaleuth, 2013; Suvannaphakdy, 2013; UNIDO, 2017

(Fig. 2). The common challenges for limited FDI inflow that all these three LDCs face is power supply, poor communication mechanism, poor roads and railways and high logistics costs. To address these challenges countries are formulating policies to attract FDI. Improving the business climate is a pre-requisite to attract FDI. Interestingly, UNIDO (2017) has designed certain recommendation for an improved business climate in Myanmar, by establishment of a more rational governance scheme which can allow investment with increased transparency and efficiency. Moreover, the priority should be to create a stable business environment by providing legal and regulatory certainty, protecting property rights, and ensuring political stability. UNIDO (2017) report has also mentioned that the formation of ‘National Committee for Technology Development and Innovation’ in Myanmar would address the challenges related to ‘lack of technology’ and will promote R&D and innovation.

Based on the thematic discourse, we identify seven challenges that are major constraints for ASEAN LDCs’ integration into GVCs (see Table 1).

2.4. Methodology

We have used the Fuzzy AHP approach for the calculation of the relative importance of distinct challenges used in the study. Fuzzy logic deals with uncertain data and imprecise knowledge. The existing studies have used Fuzzy AHP in various applications like project selections, supplier selection, and risk prioritisation. The relative importance of the challenges was determined by using linguistic variables which are described as triangular fuzzy numbers. It represents the membership function of the triangular fuzzy number in Fig. 3. Saaty developed the AHP method in 1980 to conduct an MCDM problem by examining the pair-wise comparison of decision criteria and to solve complex decision-making problems. However, AHP methods have their limitations (Yang & Chen, 2004). AHP uses a crisp scale of 1–9 for the pair-wise comparison of the criteria and sometimes the uncertainty in human judgement makes this method imprecise (Bakhtari et al., 2021). Fuzzy integration with AHP can improve the preciseness of the problem. Zadeh (1965) proposed fuzzy set theory in 1965 to resolve the ambiguity of human judgement. Fuzzy logic deals with uncertain data and imprecise knowledge. Researchers started integrating the fuzzy sets theory with MCDM Buckley (1985). In the

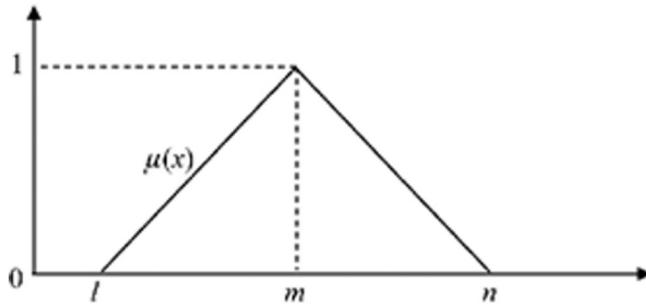


Fig. 3. Membership function for triangular fuzzy number.

present study, F-AHP has been used to prioritise the challenges faced by ASEAN LDCs in GVCs integration.

In this study, we have used the Centre of Area Defuzzification method to convert the fuzzy numbers into crisp values. The key steps used by us are as follows:

Step 1: The decision-making problem in this study is to prioritise various challenges faced by ASEAN LDCs in GVCs. The coding of the challenges has been presented in [Table 2](#).

Step 2: The second step is to decompose the complex problem into a hierarchy with decision elements.

Step 3: We then calculate the weight of the criteria with the help of Triangular fuzzy numbers, and establish a pairwise comparison matrix. A 9-point scale has been used to designate the relative importance of criteria concerning the goal, as shown in [Table 3](#). Fuzzy weights were calculated using a geometric mean method.

To get a pair-wise comparison matrix, a panel of six experts was formed. The method used for the data collection was the Delphi technique. [McMillan et al. \(2016\)](#) has mentioned that "there is no standard method to calculate a panel size for the Delphi Technique; however, the aim of the study and available resources are important". Further, they have discussed that "inviting more participants increases the variety of expertise, but eventually leads to diminishing returns". In this study, we have consulted six experts as a larger group would have been difficult to handle. We then analysed the response after each round.,

Step 4: The fuzzy evaluation for criterion i has been assumed to be (l_i, m_i, n_i) where l represents the lower value, m is the middle value and n is the upper value. We then converted the fuzzy evaluation of every criterion into crisp values using the centre of area method. As done in [Eq. \(1\)](#):

Table 2

Coding of the identified challenges.

Description	Challenges
Inadequate Aid-for-Trade (AFT)	C1
Dismal LDC participation through RTA/FTA route	C2
Infrastructural and logistical constraints	C3
Lack of robust industrial policy	C4
Constraints in value chain up-gradation	C5
Inadequate development of SME clusters	C6
Limited FDI inflows	C7

Table 3

Saaty's crisp scale and fuzzified scale for pairwise comparison.

Saaty's crisp scale	Abbreviation	Judgement definition	Triangular fuzzy scale	Triangular fuzzy inverse scale
1	EI	Equally Important	(1,1,1)	(1,1,1)
3	MI	Moderately Important	(2,3,4)	(1/4,1/3,1/2)
5	VI	Very Important	(4,5,6)	(1/6,1/5,1/4)
7	HI	Highly Important	(6,7,8)	(1/8,1/7,1/6)
9	SI	Strongly Important	(9,9,9)	(1/9,1/9,1/9)

$$W_i = (l_i + m_i + n_i)/3 \quad (1)$$

3. Results

We now discuss the analysis and results of the study.

Through a focus group decision-making, a pair-wise comparison matrix for the challenges was formed (see [Table 4](#)).

We have then calculated the fuzzy geometric mean value ([Table 5](#)).

We have then calculated the fuzzy weight. It is done by adding all the fuzzy geometric mean values together i.e. lower values together than middle values together and upper values together and then calculating the reciprocal of the sum, to find the reciprocal of the fuzzy number the equation is

Table 4

Initial pairwise comparison matrix.

	C1	C2	C3	C4	C5	C6	C7
C1	(1,1,1)	(1/8,1/7,1/6)	(1/6,1/5,1/4)	(1/6,1/5,1/4)	(6,7,8)	(1/6,1/5,1/4)	(1/8,1/7,1/6)
C2	(6,7,8)	(1,1,1)	(1/6,1/5,1/4)	(1/4,1/3,1/2)	(1/6,1/5,1/4)	(1/4,1/3,1/2)	(1/8,1/7,1/6)
C3	(4,5,6)	(4,5,6)	(1,1,1)	(4,5,6)	(9,9,9)	(2,3,4)	(1/4,1/3,1/2)
C4	(4,5,6)	(2,3,4)	(1/6,1/5,1/4)	(1,1,1)	(4,5,6)	(2,3,4)	(1/4,1/3,1/2)
C5	(1/8,1/7,1/6)	(4,5,6)	(1/9,1/9,1/9)	(1/6,1/5,1/4)	(1,1,1)	(1/4,1/3,1/2)	(1/6,1/5,1/4)
C6	(4,5,6)	(2,3,4)	(1/4,1/3,1/2)	(1/4,1/3,1/2)	(2,3,4)	(1,1,1)	(2,3,4)
C7	(6,7,8)	(6,7,8)	(2,3,4)	(2,3,4)	(4,5,6)	(1/4,1/3,1/2)	(1,1,1)

Table 5

Fuzzy geometric mean in fuzzy values (l, m, n).

	L	M	N
C1	0.330860834	0.379938353	0.445305661
C2	0.387084285	0.461289879	0.575205037
C3	2.245648524	2.728217132	3.257002085
C4	1.150410074	1.4723567	1.842184881
C5	0.325340296	0.375784024	0.445305661
C6	1.104089514	1.4723567	1.91947122
C7	2.03393701	2.567258615	3.149220213

Table 6

Fuzzy weight of the challenges.

	L	M	N
C1	0.028439876	0.040174502	0.058767835
C2	0.033272687	0.049332127	0.075910903
C3	0.193029693	0.291766109	0.429832759
C4	0.098886046	0.157459529	0.243116642
C5	0.027965346	0.040187799	0.058767835
C6	0.09490446	0.157459529	0.253316267
C7	0.174831561	0.274552581	0.41560858

$$(l, m, n)^{-1} = (1/n, 1/m, 1/l)$$

On solving this, we get the fuzzy weight (Table 6).

Defuzzification using the Centre of Area method depicted the weight of the challenges using the below equation (Table 7).

$$\text{Centre of Area} = (l + m + n/3)$$

The result illustrates that the top 3 challenges in decreasing order of their standing are: Infrastructural and logistical constraints, Limited FDI inflows, and inadequate development of SME clusters. The overall ranking in order of importance is as follows. The crisp weight along with the challenges are shown in Table 8.

$$C3 > C7 > C6 > C4 > C2 > C1 > C5$$

Table 7

Crisp weights of the challenges.

C1	C2	C3	C4	C5	C6	C7
0.042460737	0.052838572	0.304876	0.166487	0.042307	0.16856	0.288331

Table 8

Crisp weightage of the challenges.

S. no.	Challenges	Crisp weight	Priority
1	Inadequate Aid-for-Trade (AFT)	0.042460737	6
2	Dismal participation through RTA/ FTA route	0.052838572	5
3	Infrastructural and logistical constraints	0.304876	1
4	Lack of robust industrial policy	0.166487	4
5	Constraints in value chain up-gradation	0.042307	7
6	Inadequate development of SME clusters	0.16856	3
7	Limited FDI inflows	0.288331	2

4. Conclusion and policy implications

We have outlined seven challenges faced by ASEAN LDCs in their integration into the GVCs. Further, using the F-AHP modelling technique, the challenges were analysed to find out their priority weightages. The findings of this paper reveal that infrastructural and logistical constraints, limited FDI inflows, and inadequate development of SME clusters require immediate attention followed by other challenges.

Logistics performance is a key factor determining the country's level of trade cost and the ability to integrate into GVCs. High trade cost limits LDCs' participation in GVCs. Measures like improving the road infrastructure and customs clearance procedure should be taken into consideration to reduce the transportation barriers. LDCs rely heavily on ODA and other forms of development assistance. AFT spending on trade policies and regulations can enhance the trade effect (Bhattacharya & Moazzem, 2013). In fact, AFT covers infrastructure development which includes economic corridors, and the building of private sector capacity. This initiative has a significant possibility to decrease trade costs and promote GVC development (Shepherd, 2016).

In fact, Government of Cambodia is working on developing physical infrastructure like access to clean water, transportation, and electricity especially in SEZs. The country is also developing its industrial clusters in line with urbanisation, land-use, and management plan. Moreover, active participation from the private sector for the development of physical infrastructure in SEZ, law on SEZ and developing these zones on international standard, incentive provision for both foreign and domestic firms in these SEZs should be reviewed and implemented (CIDP, 2015). Other efforts which can be implemented by ASEAN LDCs is to develop intermodal transfer. Intermodal transfer is referred as connecting two or more method of transportation for conveyance of goods. Construction of dry ports is one of the examples of intermodal facilities. Dry ports can be a secure inland location to help improve operational efficiency by handling, storing, and custom clearance of freight (UNOPS, 2019). These ports can reduce the transportation time with positive effect. For instance, Malaba dry port in Kenya, reduced the clearance and transportation from Kenya to Uganda from 15 days to 4 days (UNOPS, 2019).

For improving digital infrastructure, ASEAN LDCs must adopt some best practices. They can take an example of Rwanda where government established around 4500 km of fibre-optic broadband cabling, which connects all thirty districts of the country and created around nine regional links to nearby countries. Currently the internet penetration in Rwanda is around 76 per cent. By improving digital infrastructure, Rwanda not only created a conducive business environment but also enhanced its logistics performance index. In fact, Laos has one of the most expensive broadband packages. Investment in digital infrastructure like fibre optics and transmission lines should be the policy priority.⁴

Our study reveals that another key challenge that needs policy attention in these LDCs is FDI in-flows. To examine the characteristics of FDI in the Lao PDR, Saignaleuth (2013) has suggested that the country needs to develop the ability of its local firms and labour skills to absorb the spillover effects from FDI inflows, especially in the manufacturing sector. Policies should be aimed at investing in knowledge and human capital. ASEAN LDCs should take the example from Vietnam and how Chinese investment shifted the country's specialisation from consumer goods to construction and manufacturing. Ho Chi Minh City in Vietnam has invested heavily in

⁴ https://content.unops.org/publications/The-importance-of-infrastructure-for-landlocked-developing-countries_EN.pdf.

infrastructure development, including ports, airports, and road networks. Tax incentives and streamlining the procedures of investment have helped to create a favourable business climate in the city (Ha, 2019).

Moreover, since 2015, expeditious approval for foreign investors is being done by respective departments and local authorities. In addition, development of a one-stop shop service to respond to queries of the investors related to import and export activities in the industrial zones has streamlined the operational procedures. Government of Cambodia has formulated policy on investment highlighting several key aspects including development of SEZs and industrial zones; strengthening SMEs through the provisions of incentives; improving the environment on trade facilitation measures and export promotion; and, enhancing the skill development and innovation capabilities (Ha, 2019). Laos and Myanmar too are following the same pursuit. The recently draughted NSEDP of Laos highlights several policy measures to attract FDI broadly including those which we have outlined for Cambodia.

Yet, another two critical challenges emanating from our finding included inadequate development of SMEs cluster and dismal LDC participation through RTA/FTA route. In fact, the report of ADB on *Asia SME Monitor (2020)* found that in Cambodia, the Industrial Development Policy 2015–2024 has come up with four broad objectives including expanding industrial development to attract FDI, strengthening the linkage between domestic and industrial firms, promoting trade facilitation and proving market information, and coordinating support policies for skill training and human resource development. Kaplinsky and Morris (2016) have explained the importance of a flexible and combined approach to industrial policy. The industrial policy should not be a “one size fits all” approach rather it be tailor-made. Ramdoo (2015) has found that countries like Bangladesh implemented import-substituting industrialisation (ISI) for its pharmaceutical sector and it succeeded. Similarly, for its garment industry, the country implemented export-oriented industrialisation (EOI).

As outlined earlier, MSMEs accounts for almost 90 per cent of business firms in ASEAN. These firms often face challenges in FTAs participation. Chapter 14 of RCEP has a specific focus on SMEs. In fact, in RCEP many of the commitments require technical assistance and capacity building which are supposed to be delivered to ASEAN LDCs (Lee, 2022a, 2022b). However, policy guidelines pertain to SMEs are also formulated in ASEAN Strategic Action Plan for SME development 2016–2025 (SDP, 2015). SMEs development goals of RCEP is in sync with ASEAN SME development plan (Lee, 2022a; b).

SDP (2015) has two pathways for developed and developing members of ASEAN. For all these three LDCs there is an inclusive pathway which will transform the traditional economy structure of these countries through industrialisation to raise incomes. Thangavelu et al. (2021) has found that to utilise gains from trade agreements like RCEP, ASEAN LDCs need deeper structural reforms. For example, in Cambodia majority of labour-intensive industries are in Phnom Penh. Shifting of labour-intensive industries away from Phnom Penh to nearby areas which has capacity to absorb those industries will make Phnom Penh more accessible to nearby provinces. Moreover, by shifting the high value-added activities to Phnom Penh can become a globally competitive city.⁵

One more challenge highlighted by our study is the lack of robust industrial policy. Traditional industrial policies which are aimed to build domestic capacity to compete at global level might not suffice in GVC of developing countries, primarily because GVCs are dominated

⁵ <https://www.khmertimeskh.com/501184698/rcep-can-help-cambodias-exports-to-grow-upto-18/>.

by a lead firm and policy pertaining to them should be uniquely positioned (Milberg et al., 2014; Morris & Staritz, 2019). Morris & Staritz (2019) maintain that policies pertaining to GVC should include suppliers' learning from lead firms by strengthening mutual relationship. Positive relationship with lead firms can enhance the suppliers learning capabilities and overall skill development. Moreover, policies to incentivise lead firms so that local technology transfer can be increased. Development of own lead firms and regional value chains should be enacted. In fact, from the perspective of industrial policy, understanding the conflict of interest between lead firms, suppliers, and government, asymmetrical power relations, and business strategy of the lead firms needs to be understood. Industrial policy should focus on export tax, infrastructure, and local content requirements.

The development of human capital is necessary to participate and upgrade in the regional production value chain, even to participate in low value activities training and education are mandatory and in case of upgrading from low value-added activity to high value-added activity, professional training is required (Shepherd, 2016). Moreover, the shift of labour from low to high-productivity sectors generates benefits through several channels. The first is the demand channel which suggests that labour typically earns high wages in the high-productivity sector which results in high demands, and a shift of demand toward the products which has higher technological content. The second channel is the productivity growth channel which suggests that there exists a positive relation between productivity and output (Kaldor-Verdoorn effect). Third, by accumulating human capital, and last reduced dependency on foreign inputs through the development of its own high-productivity sector (Rada & von Arnim, 2014).

Another key challenge identified in our study is inadequate aid-for-trade (AFT). In AFT, there is an 'Enhanced Integrated Framework' (EIF) which is an exclusive mechanism to support LDCs. It provides support to LDCs in several areas including productive capacity-building, value chain development, and infrastructure building (Adhikari, 2019). Each LDC takes the Diagnostic Trade Integration Study (DTIS) which is the EIF flagship work to evaluate trade opportunities and challenges. Then, institutional support is given to each government to build the institutional structure required to carry out the priorities such as resource mobilisation and policy reforms.

Finally, productive capacity building support is also provided that includes value chain development, infrastructure building and trade facilitation (Adhikari, 2019). This study has revealed several instances wherein the EIF has helped LDCs. For example, Rwanda was provided a full support in 2012 when it took the DTIS and recognises the need to establish cross-border market policy. Another example is Vanuatu, wherein the EIF has provided a support of \$3.15 million, with an additional support of \$15 million from New Zealand government for reconstruction of seafront infrastructure. This seafront was destroyed due to cyclone pam in port villa (see also, Adhikari & Natuman, 2017).

ASEAN LDCs should assess EIF and explore the conditions under which they can reap the advantages. Moreover, state government of all these LDCs should also take ownership to strengthen the partnership with other government and non-government agencies, public-private partnership development, partnership with countries (example outlined earlier Vanuatu taking assistance from New Zealand), with development finance institution, with EIF agency to have a sustainable development (Adhikari, 2019). In fact, UNDP along with the Ministry of Commerce and EIF launched the project "Go4eCAM" in Cambodia which is aimed to provide structural support to MSMEs to go digital, and formalise their business operations to support export readiness.⁶

⁶ <https://www.undp.org/cambodia/projects/e-commerce-acceleration-and-formalization-msmes>.

Not the least, value chain upgradation remains a challenge for LDCs. Upgrading in GVC requires specific policies across industries. For example, availability of skilled human resource in service industry, a robust cold chain infrastructure in agri-food industry, and access to foreign inputs in manufacturing activities is required for GVC upgrading (Bamber & Fernandez-Stark, 2019). On the similar lines, ASEAN LDCs can formulate specific policies based on their sectoral advantage. For instance, Myanmar's economy is agriculture-based, and to upgrade in the value chain its policies should give impetus to increasing the agri-food production, improving cold chain infrastructure, and advancing food packaging technology. The study by Bamber and Fernandez-Stark (2019) outlines that the GVC related policies should cover six key policy areas. It is related to upgrading, skill development, matching the global standards, local firm development, investment strategy, trade, and infrastructure. The study outlines that Fresh Producers Exporters Association of Kenya matches its standard with global good agricultural practices making the country one of the successful exporters of vegetables and flowers in Africa.

In ASEAN LDCs, policy formulation and interventions for GVC upgradation should seek to strengthen the skill set of workers through vocational training and certification. A good example can be seen in Vanuatu, a small island country, that runs programmes for skill development i.e. at the Australian and Pacific Technical College and Technical and Vocational Education and Training for quality training and skill development.⁷ Interestingly, Laos too has received financial support from German government for the construction of the Lao-German Technical College for the development of technical and vocational education in Laos. Moreover, Government of Germany has provided a grant support of 5 million Euro for infrastructure, and for teaching and learning resources. Moreover, export promotion programmes also influence the export performance of the firms. It also supports the knowledge and skills acquisition (Calabrese & Manello, 2018).

Countries must consider that each stage of value-added activity in any sector needs specific expertise. In fact, knowledge-intensive GVC activities need technical expertise, e.g. in fruits and vegetables value chain irrigation technician and quality controller require technical education (Gereffi & Fernandez-Stark, 2016). Therefore, policy-makers must evaluate and provide necessary certification or vocational training course to gain technical expertise based on specific value chain stage. It is therefore imperative that they focus on judicious resource allocation for meeting the challenges related to their country's participation in the GVC. Our paper provides useful policy inputs for systematically addressing such challenges.

Acknowledgement

The financial and infrastructural support provided by the FORE School of Management, New Delhi in completing this paper is gratefully acknowledged.

References

- Abe, M., & Proksch, M. (2017). Supporting participation of Asia-Pacific SMEs in global value chains. *Journal of Korea Trade*, 21(2), 86–106.
- ADB . (2016). (<https://www.adb.org/results/lao-pdr-weaves-renewable-energy-future>).
- ADB . (2021). (<https://www.adb.org/projects/documents/cam-46293-004-pam>).
- Adhikari, R. (2019). Targeting aid for trade for impactful capacity-building in the least developed countries. *Global Policy*, 10(3), 408–412.

⁷ <https://investvanuatu.vu/untapped-potential/government-supportive-policies/>.

- Adhikari, R., & Natuman, J. (2017). *Tourism as a way to lift the pacificout of poverty*. Available from: (<http://news.trust.org/item/20171102154323-vyrjt>).
- Adnan, A. T. M., Rakib, A., & Rahman, M. (2015). Export trend of Bangladesh: The dominance of ready-made garment industry. *Research Journal of Economics, Business and ICT*, 10(1).
- Anwar, S., & Nguyen, L. P. (2010). Absorptive capacity, foreign direct investment-linked spillovers and economic growth in Vietnam. *Asian Business & Management*, 9(4), 553–570.
- Arvis, J. F., Alina Mustra, M., Ojala, L., Shepherd, B., & Saslavsky, D. (2010). *Connecting to compete 2010: Trade logistics in the global economy—The logistics performance index and its indicators*. Washington, DC: World Bank.
- ASEAN-JAPAN Centre . (2019a). *ASEAN promotion centre on trade, investment and tourism, Tokyo, Japan*. (https://www.asean.or.jp/ja/centre-wide-info/gvc_database_paper5/).
- ASEAN-JAPAN Centre . (2019b). *ASEAN promotion centre on trade, investment and tourism, Tokyo, Japan*. (https://www.asean.or.jp/ja/centre-wide-info/gvc_database_paper1/).
- Asia SME Monitor . (2020). *Vol. 1, Country and regional reviews*. Manilla, Philippines: Asian Development Bank. (<http://dx.doi.org/10.22617/TCS200290-2>).
- Azmeh, S., & Nadvi, K. (2014). Asian firms and the restructuring of global value chains. *International Business Review*, 23(4), 708–717.
- Bair, J., & Gereffi, G. (2001). Local clusters in global chains: The causes and consequences of export dynamism in Torreon's blue jeans industry. *World Development*, 29(11), 1885–1903.
- Bakhtari, A. R., Waris, M. M., Sanin, C., & Szczerbicki, E. (2021). Evaluating Industry 4.0 implementation challenges using interpretive structural modeling and fuzzy analytic hierarchy process. *Cybernetics and Systems*, 52(5), 350–378.
- Bamber, P., & Fernandez-Stark, K. (2019). GVCs and development: Policy formulation for economic and social upgrading. *Handbook on global value chains* (pp. 466–482). Edward Elgar Publishing.
- Bernhardt, T. (2017). Myanmar, say hello to the world of global value chains. *Myanmar's integration with the world* (pp. 91–125). Singapore: Palgrave Macmillan.
- Bhattacharya, D., & Moazzem, K. G. (2013). *Least developed countries (LDCs) in the global value chain (GVC): trends, determinants and challenges* (No. 104)Centre for Policy Dialogue (CPD).
- Biswas, R. (2018). The least developed countries: Opportunities and challenges. *Emerging Markets Megatrends*, 167–186.
- Buckley, J. J. (1985). Ranking alternatives using fuzzy numbers. *Fuzzy sets and systems*, 15(1), 21–31.
- Buckley, P. J., & Strange, R. (2015). The governance of the global factory: Location and control of world economic activity. *Academy of Management Perspectives*, 29(2), 237–249.
- Burgess (2019). (<https://www.theigc.org/collections/infrastructure-development-myanmar>).
- Calabrese, G. G., & Manello, A. (2018). Firm internationalization and performance: Evidence for designing policies. *Journal of Policy Modeling*, 40(6), 1221–1242.
- CIDP (2015). Royal government of cambodia. (2015). *Cambodia Industrial Development Policy, 2015–2025*.
- Cuervo-Cazurra, A., & Pananond, P. (2023). The rise of emerging market lead firms in global value chains. *Journal of Business Research*, 154, Article 113327.
- Gamberoni, E., & Newfarmer, R. (2014). Aid for trade: Do those countries that need it, get it? *The World Economy*, 37(4), 542–554.
- Gereffi, G. (1999). International trade and industrial upgrading in the apparel commodity chain. *Journal of International Economics*, 48(1), 37–70.
- Gereffi, G. (2005). The global economy: organization, governance, and development. *The handbook of economic sociology*, 2, 160–182.
- Gereffi, G. (2019). Global value chains and international development policy: Bringing firms, networks and policy-engaged scholarship back. *Journal of International Business Policy*, 2(3), 195–210.
- Gereffi, G., Humphrey, J., & Sturgeon, T. (2005). The governance of global value chains. *Review of International Political Economy*, 12(1), 78–104.
- Gereffi, G., & Fernandez-Stark, K. (2016). *Global value chain analysis: A primer* (pp. 1–34).
- GII (2022). (https://www.wipo.int/edocs/pubdocs/en/wipo_pub_2000_2022/mm.pdf).
- Ha, L. T. (2019). *Chinese FDI in Vietnam: Trends, status and challenges*.
- Humphrey, J., & Schmitz, H. (2002). How does insertion in global value chain affects upgrading in industrial clusters? *Regional Studies*, 36(9), 1017–1027.
- Hynes, W., & Holden, P. (2016). What future for the Global Aid for Trade Initiative? Towards an assessment of its achievements and limitations. *Development Policy Review*, 34(4), 593–619.

- Juan, D. M. M. S. (2018). Premises, perils, and promises of ASEAN integration. *Journal of Developing Societies*, 34(3), 325–350.
- Kaplinsky, R., & Morris, M. (2016). Thinning and thickening: Productive sector policies in the era of global value chains. *The European Journal of Development Research*, 28(4), 625–645.
- Kaplinsky, R., & Kraemer-Mbula, E. (2022). Innovation and uneven development: The challenge for low-and middle-income economies. *Research Policy*, 51(2), Article 104394.
- Keane, J., & Basnett, Y. (2016). Global Value Chains and Least Developed Countries in Asia: Cost and Capability Considerations in Cambodia and Nepal. *Production Networks and Enterprises in East Asia: Industry and Firm-level Analysis*, 259–288.
- Keane, J. A. (2021). Global value chains and least developed countries: Influencing value chain governance and upgrading processes. *The Routledge Companion to Global Value Chains: Reinterpreting and Reimagining Megatrends in the World Economy*.
- Knutsen, H. M. (2004). Industrial development in buyer-driven networks: the garment industry in Vietnam and Sri Lanka. *Journal of Economic Geography*, 4(5), 545–564.
- Kuroiwa, I. (2014). GVC-Oriented Development Strategy: Application to Cambodia. *Inclusive Development in the Era of Economic Integration: Policy Implications for LDCs*, 44–69.
- Kuroiwa, I. (2016). 'Thailand-plus-one': A GVC-led development strategy for Cambodia. *Asian-Pacific Economic Literature*, 30(1), 30–41.
- Lee, C. (2022b). Focus areas and support for small and medium-sized enterprises. In F. Kimura, S. Urata, S. Thangavelu, & D. Narjoko (Eds.). *Dynamism of East Asia and RCEP: The framework for regional integration* (pp. 277–305). Jakarta: ERIA.
- Lee, H. H., Park, D., & Shin, M. (2015). Do developing-country WTO members receive more aid for trade (AfT)? *The World Economy*, 38(9), 1462–1485.
- Lee, K., Malerba, F., & Primi, A. (2020). The fourth industrial revolution, changing global value chains and industrial upgrading in emerging economies. *Journal of Economic Policy Reform*, 23(4), 359–370.
- Lee, C. (2022a). *Focus areas and support for small and medium-sized enterprises*. (in).
- Mah, J. S. (2022). Industrial-led economic development of Cambodia: Implications for low-income developing countries. *Journal of Southeast Asian Economies (JSEAE)*, 39(2), 198–210.
- McMillan, S. S., King, M., & Tully, M. P. (2016). How to use the nominal group and Delphi techniques. *International Journal of Clinical Pharmacy*, 38(3), 655–662.
- Milberg, W., Jiang, X., & Gereffi, G. (2014). Industrial policy in the era of vertically specialized industrialization. *Transforming economies: Making industrial policy work for growth, jobs and development*, 151–178.
- Mohiuddin, M., Rashid, M. M., Al Azad, M. S., & Su, Z. (2019). Back-shoring or re-shoring: determinants of manufacturing offshoring from emerging to least developing countries (LDCs). *International Journal of Logistics Research and Applications*, 22(1), 78–97.
- Morris, M., & Staritz, C. (2019). Industrialization paths and industrial policy for developing countries in global value chains. *Handbook on global value chains* (pp. 506–520). Edward Elgar Publishing.
- Navas-Alemán, L. (2011). The impact of operating in multiple value chains for upgrading: The case of the Brazilian furniture and footwear industries. *World Development*, 39(8), 1386–1397.
- NSEDP. (2021). Available at: (<https://effectivecooperation.org/content/lao-national-socio-economic-development-plan-2021-2025>).
- Nuruzzaman, Syed, & Yusuke Tateno (2021). COVID-19 pandemic and the Asia-Pacific LDCs: Impacts, challenges, gaps and way forward. *ESCAP Working Paper Series, No. ESCAP/WP/12*. Bangkok: United Nations Economic and Social Commission for Asia and the Pacific.
- OECD (2021). (<https://www.oecd.org/aidfortrade/publications/aid-for-trade-key-facts.pdf>).
- OECD/WTO (2015). *Aid for trade at a glance 2015: Reducing trade costs for inclusive, sustainable growth*. Paris: OECD Publishing.
- OECD/WTO (2019). *Aid for trade at a glance 2019: Economic diversification and empowerment*. Paris: OECD Publishing.
- Palit, A. (2015). Mega-RTAs and LDCs: Trade is not for the poor. *Geoforum*, 58, 23–26.
- Palit, A. (2017). Mega-regional trade agreements and non-participating developing countries: Differential impacts, challenges and policy options. *Competition & Change*, 21(5), 417–434.
- Pietrobelli, C., & Rabellotti, R. (2006). Supporting Enterprise Upgrading in Clusters and Value Chains in Latin America. In C. Pietrobelli, & R. Rabellotti (Eds.). *Upgrading to compete global value chains, clusters, and SMEs in Latin America* (pp. 299–330). Washington DC: Inter-American Development Bank.

- Rada, C., & von Arnim, R. (2014). India's structural transformation and role in the world economy. *Journal of Policy Modeling*, 36(1), 1–23.
- Rahman . (2021). (<https://oecd-development-matters.org/2021/01/29/regional-comprehensive-economic-partnership-why-should-it-involve-the-excluded-ldcs/>).
- Ramdo, I. . (2015). *Industrial policies in a changing World: What prospects for low-income countries*. Geneva: Switzerland: International Centre for Trade and Sustainable Development (ICTSD).
- Sahoo, P., & Dash, R. K. (2014). India's surge in modern services exports: Empirics for policy. *Journal of Policy Modeling*, 36(6), 1082–1100.
- Saignaleuth, S. (2013). Characteristics of FDI in Lao PDR and Its Effect on Growth Enterprise Performance (Doctoral dissertation). Graduate School of Economics and Business Administration, Kobe University, Kobe, Japan.
- Saslavsky, D., & Shepherd, B. (2014). Facilitating international production networks: The role of trade logistics. *The Journal of International Trade & Economic Development*, 23(7), 979–999.
- Sauvant, K. P., & Mallampally, P. (2015). Policy options for promoting foreign direct investment in the least developed countries. *Transnational Corporations Review*, 7(3), 237–268.
- Sayavong, Vanxay (2022). Technical inefficiency of the manufacturing sector in Laos: A case study of the firm survey. *Journal of Asian Business and Economic Studies*, 29(4), 314–332.
- SDP . (2015). *ASEAN strategic action plan for SME development 2016–2025*. Jakarta: ASEAN Secretariat.
- Shepherd, B. (2016). *Trade facilitation and global value chains: Opportunities for sustainable development*. Geneva: International Centre for Trade and Sustainable Development (ICTSD).
- Singh, H. V. (2016). New industrial policy and manufacturing: Options for international trade policy. *E15 expert group on reinvigorating manufacturing: New industrial policy and the trade system–policy options paper*.
- Soans, A., & Abe, M. (2016). Bribery, corruption and bureaucratic hassle: Evidence from Myanmar. *Journal of Asian Economics*, 44, 41–56.
- Sok, K., Phim, R., Keo, S., & Kim, V. (2020). *Connecting Cambodia's SMEs to regional value chains: The “bridging gap” and “missing link”* (No. 1150). ADBI Working Paper Series.
- Su, F., Khan, Z., Kyu Lew, Y., Il Park, B., & Shafi Choksy, U. (2020). Internationalization of Chinese SMEs: The role of networks and global value chains. *BRQ Business Research Quarterly*, 23(2), 141–158.
- Suvannaphakdy, S. (2013). *An empirical study of trade and FDI in the Lao PDR* (Dissertation). Hiroshima Shudo University, Graduate School of Economic Sciences, March 2013.
- Thangavelu, S. M., Oum, S., & Neak, S. (2019). SME participation in aSEan and EaSt aSian intEgration Case of Cambodia. *Smesna and Economic Integration in Southeast Asia*, 9–33.
- Thangavelu, S. M., Urata, S., & Narjoko, D. A. (2021). *Impacts of the regional comprehensive economic partnership on ASEAN and ASEAN least developed countries in the post-pandemic recovery*.
- Thavonsouk, L. (2019). The belt and road initiative and the infrastructure development in Laos. In L. Wang, & J. Zhao (Eds.). *The belt and road initiative in the global context* (pp. 45–53). World Scientific: Singapore.
- UNCTAD (2020). *World investment report 2020*.
- UNCTAD . (2016). (https://unctad.org/system/files/official-document/aldc2015d5_en.pdf).
- Ung, L., & Hay, S. (2010). SMEs access to finance in Cambodia. *Small and Medium Enterprises (SMEs) Access to Finance in Selected East Asian Economies. ERIA Research Project Report , 14*, 83–116.
- UNIDO . (2017). *Strategic directions for industrial development summary of industrial development strategy 2017*.
- UNOPS (2019). (https://content.unops.org/publications/The-importance-of-infrastructure-for-landlocked-developing-countries_EN.pdf).
- Urata, Shujiro, & Baek, Youngmin (2021). *Does GVC participation improve firm productivity? A study of three developing Asian countries* (March 31, 2021). ADBI Working Paper 1245.
- World Bank. (2020a). *World development report, 2020*. Available at (<https://www.worldbank.org/en/publication/wdr2020>).
- World Bank. (2020b). *Poverty and shared prosperity 2020: Reversals of fortune*. The World Bank.
- World Bank. (2022a). (<https://thedocs.worldbank.org/en/doc/e2126e24b45be8bbc35f6c6f8374094-0360012022/original/Laos-CEM-Full-Report-ENG-Linking-Laos-Unlocking-Policies.pdf>).
- World Bank. (2022b). *Lao People's democratic republic economic monitor: October 2022*. Washington, DC: World Bank. License: Creative Commons Attribution CC BY 3.0 IGO.
- Yang, C. C., & Chen, B. S. (2004). Key quality performance evaluation using fuzzy AHP. *Journal of the Chinese Institute of Industrial Engineers*, 21(6), 543–550.
- Zadeh, L. A. (1965). Fuzzy sets. *Information and Control*, 8(3), 338–353.
- Zhan, J. X. (2021). GVC transformation and a new investment landscape in the 2020s: Driving forces, directions, and a forward-looking research and policy agenda. *Journal of International Business Policy*, 4(2), 206–220.