



**PRELIMINARY  
GLOBAL VALUE CHAINS ANALYSIS  
REPUBLIC OF MALDIVES**

Male, May 18 2019

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# 1. Why Global Value chains

Maldives under the National Development Plan 2019-2023 plans to transform the country to a prosperous, socially inclusive, climate resilient, equitable and connected island nation by providing access to social services and economic opportunities, promoting social justice, ensuring good governance, safeguarding environmental sustainability and respecting human rights. As a country that is on the verge of graduating to a high-income nation and given the country's strategic geographical location in one of the densest trade routes in the world, there are huge opportunities within the Global Value Chains (GVC) that may untap new areas of competitiveness for the short to medium term.

In the past, the precondition of the competitiveness in a country required huge investments and transformation, largely focused on the structural transformation of the public spheres of the economy. However, in the highly globalized world that we live in today, such preconditions can be accelerated, reduced, shared or even avoided, as globalization has brought about rapid progress in technology, capital mobility and the creation of common global standards, as well as trade liberalization.

As a result, countries do not necessarily need to address all market imperfections through structural transformation but rather can focus on areas with the highest comparative advantage. The most effective way to successfully achieve this in many countries has been to plug into the global value chains. An economy that is integrated with GVCs will be able to create jobs and achieve broad-based development of the

population as well as the development of activities involved in the production of global-level supply, distribution and post-sales efforts. Similarly, from the market perspective, plugging into the GVC increases income in a more productive and sustainable manner while increasing exports and income for that particular economy.

According to the World Bank Report “Pathways to Better Jobs in IDA Countries” (2018), the world’s labor force will grow by 620 million people from 2020 to 2035, and 38 percent will be in South Asia. In addition, the private sector will create nine out of ten jobs in developing countries. Therefore, on the basis of this trend, the inclusive competitiveness of an economy that increases its exports by integrating into GVCs should create jobs in the private sector, which would have a greater impact on reducing poverty than other forms of direct financial assistance. As the world moves towards the fourth industrial revolution with extreme levels of automation and connectivity, it could also potentially change the course of economic development and the distribution of wealth. For this reason, conventional development methods would only be effective if dictated by the ever-changing market or private sector, depending on the needs of the Fourth Industrial Revolution.

Many highly integrated countries on the global value chain recognize the importance of creating productive linkages with other sectors of the economy at the national, regional and international levels, as key drivers of successful economic development. By connecting to GVCs, the productive link not only promotes technological progress, but also offers the potential to improve productivity. The fragmentation of production

in different parts of the world also allows countries to participate in GVCs at different stages depending on the level of technological adaptation, the different levels of industrialization, the skills of the workforce and the situation. As a result, GVCs offer countries the opportunity to adopt a learning experience for their economies and to play a leading role in technology adoption.

Global value chains also promote stronger linkages upstream and downstream with the rest of the economy, which translates into knowledge and technology spillovers to other sectors. At the same time, GVCs also reduce the risk of market shocks for countries, as trade in intermediate goods is less influenced by end-market prices.

Integration into global value chains allows countries to remain in relevant sectors that are market-driven and at the same time to be part of an interdependent global production network. From the point of view of the market or the private sector, integration into GVCs strengthens export growth, which is very important for promoting sustainable economic progress. Many empirical studies have shown that firms linked to the global economy through exports or foreign direct investment (FDI) are more productive than firms serving only the domestic market. The productivity gains of GVCs will increase the competitiveness of enterprises and, at the same time, will be accompanied by wage increases, upgrading of skills and technology transfer. Firms and export-intensive and FDI-related sectors generally enjoy a substantial wage premium and have higher average labor productivity than domestic firms.

## 2. Current economic background in the context of Global Value Chains.

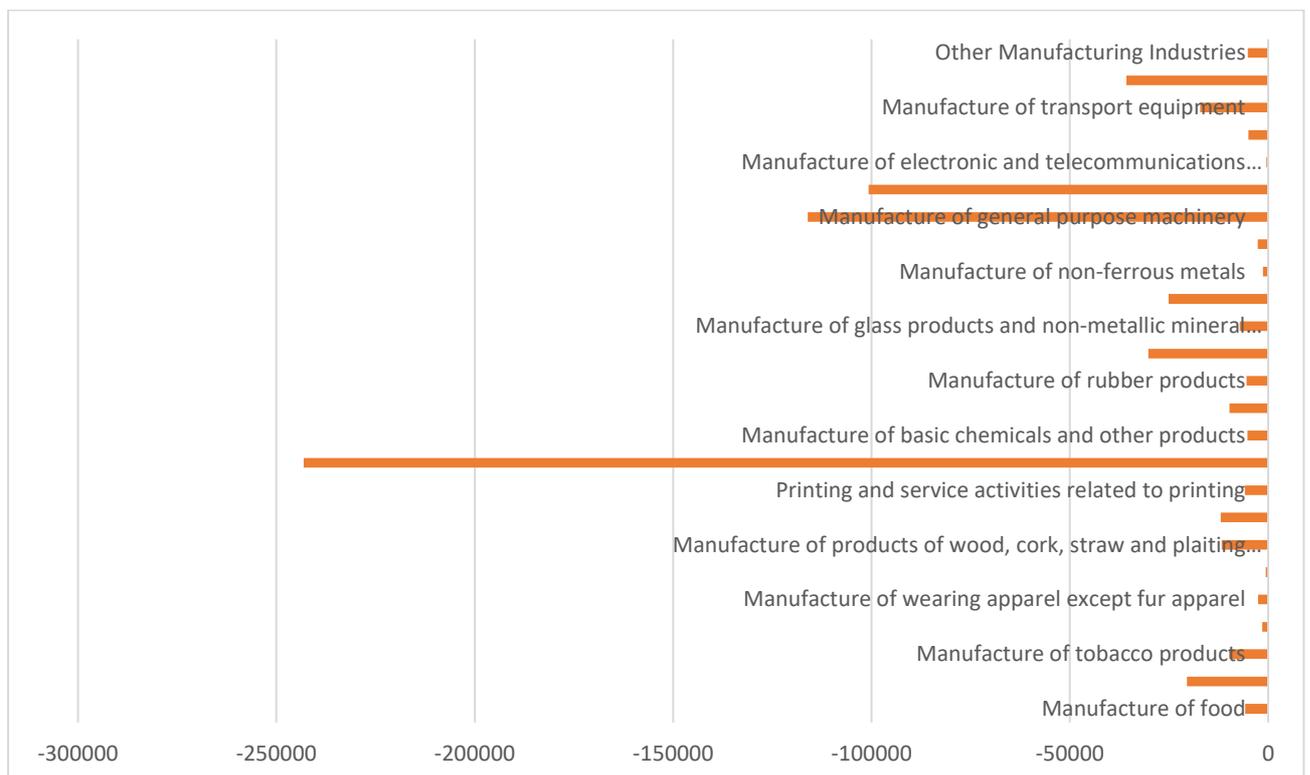
The Maldives economy remains heavily dependent on the tertiary sector dominated by tourism industry, accounted for 67.4% of GDP in 2017, followed by the secondary sector 12.8%, and agriculture and fisheries 5.6%. Total gross tourism receipts contribute 76.6% of GDP, and 32% of government revenues. However, contribution of the tourism industry in GDP has declined recently from 25.6% in 2013 to 19.9% in 2017, with slower growth in tourist arrivals emanating from Asian markets.

The economic growth has also been volatile, mainly due to volatility in growth of tourists and low fishery productivity. The volatile growth of tourists could be affected by global competition in the tourism industry. Also, the industry is highly sensitive to climate related events and global economic crises, especially in the developed world. These factors led the country to remain in the middle-income bracket for 24 years.

Fish and fish products remain as the country's only major export commodities, accounting for about 98% of merchandise exports. However, per capita fishery production has been falling in recent years implying productivity bottlenecks of the fisheries' industry. This has resulted in slower growth in export values (only 2.3% during 2013-2018) which are not keeping up with the pace of import values (10.1% during 2013-2018). The bulk of country's domestic demand is met by imports of consumer and capital goods.

The goods trade deficit remains high and likely to continue unless steps are taken to reverse the pace of fishing production. In services accounts, tourism exports account for almost 90% of the total value of services exports, driving a surplus in the services trade balance. However, the surplus on the services trade balance remains insufficient to fully offset the goods trade deficit. With primary and secondary income accounts remaining in deficit, the current account remains in high deficit at 25.0% of GDP in 2018 and is unlikely to experience a reversal of the trend in the near future.

Figure 1: Trade Balance for Manufacturing Industries in Maldives, 2017, USD million



Source: IsDB staff illustration. Data from Trademap.com

Government external debt nearly doubled to Rf30.8 billion, equivalent to 37.4% of GDP in 2018 due to state-owned enterprises' use of guarantees, pushing debt higher.

Government domestic debt, including domestic guaranteed debt, stood at 34.7% of GDP in 2018. At the end of 2018, total public debt including state guarantees was estimated at Rf59.5 billion, rising sharply to the equivalent of 72.1% of GDP from 61.0% a year earlier. The increasing level of government debt has been driven by growing large infrastructure investments and government expenditure.

Maldives faces trade deficits on many of its manufacturing industries and key products (see Figure 1 and Figure 2). This shows that the country has insufficient production capacity and relies heavily on imports of manufactured goods, which weakens its competitiveness in the global economy. Moreover, the widening of the trade deficit of manufactures demonstrates the growing dependence on manufactured imports. The persistent and growing trade deficit also has negative consequences for economic growth and stability.

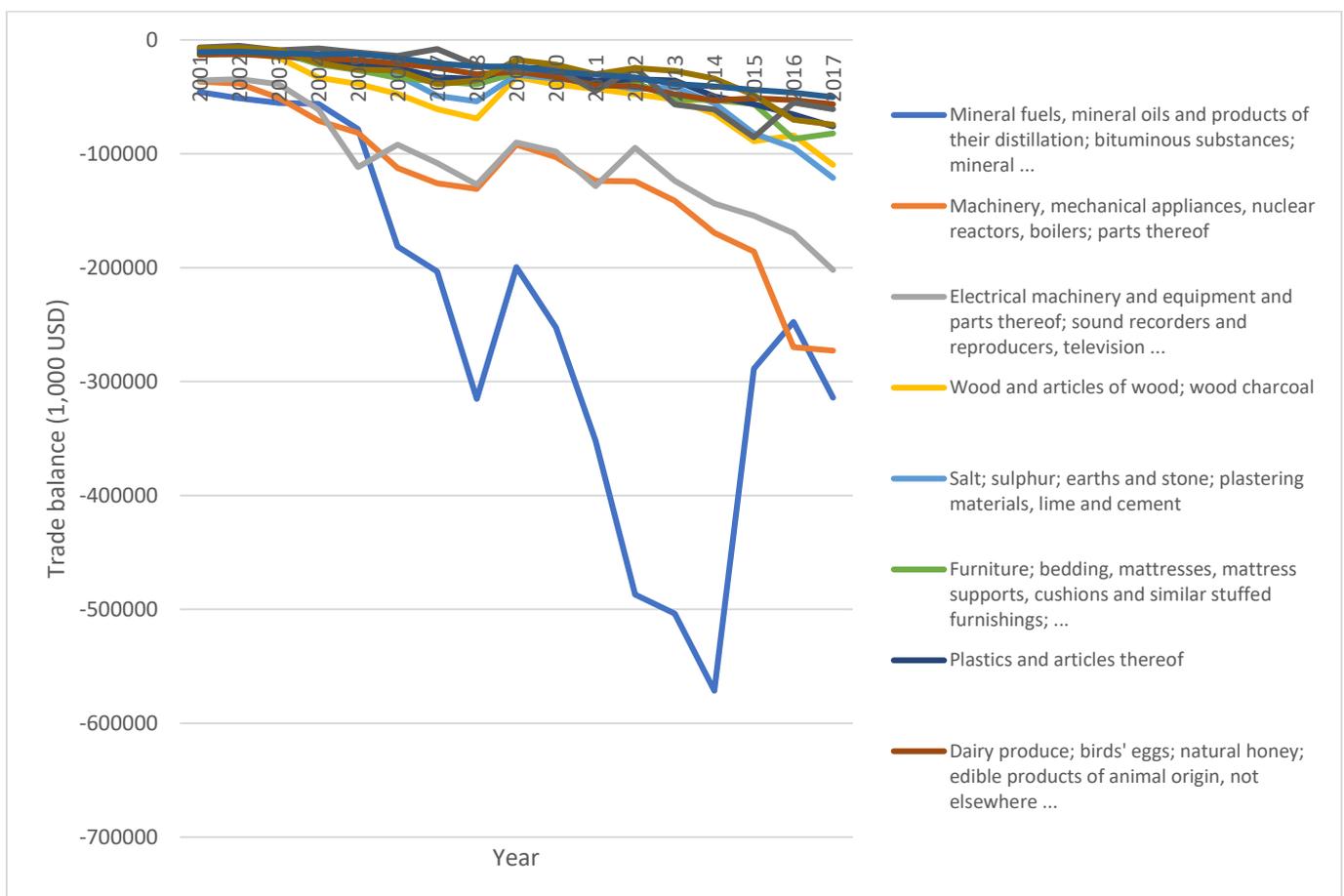
According to estimates by the government of Maldives, the economy needs to add 8,000 new jobs annually to reach full employment. Employment in Maldives is mainly concentrated in the services sector accounting for 72% of total employment in 2016, followed by the industrial sector 18.8% and agriculture sector 9.2%.<sup>1</sup> Structural shift of employment from informal to formal employment has been taking place mainly because of new jobs created in the tourism sector. Public sector jobs account for 40% of total employment. Large wage premiums and other benefits associated with public

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<sup>1</sup> HIES 2016

employment disincentives young job seekers from taking up private sector opportunities. Although overall unemployment rate is 6.1%, youth unemployment is high at 15.3%, with young males being 1.5 times more likely to be unemployed than young females, and 6 times more likely to be unemployed than their adult counterparts. Average monthly earnings for the main job is about \$665.

Figure 2: Top 10 trade deficit products for Maldives (2001-2017)



Source: IsDB staff illustration. Data from Trademap.com

However, one of the main goals of the government of Maldives is to promote and sustain the creation of decent jobs, which will allow the country to move to higher income status. According to ILO's Employment and Environmental Sustainability Fact

Sheets (2017), 20.7 % of the labour force in the Maldives hold vulnerable jobs with the majority of those workers having own-account status. Therefore, based on this trend, the inclusive competitiveness of an economy that increases its exports by integrating into the GVC is required to create jobs in the private sector, which will provide a greater impact on poverty alleviation than other forms of direct financial aid.

### 3. The Global Value Chains Approach to development

To align markets with development programs, it is important to focus on areas that are both promising and competitive and that offer inclusive development solutions. This concept, which can be described as inclusive competitiveness, would allow markets or the private sector to participate actively in a development program that can boost market competitiveness and foster development by creating more inclusive development goals such as the creation of high-quality jobs and the promotion of sustainable export competitiveness.

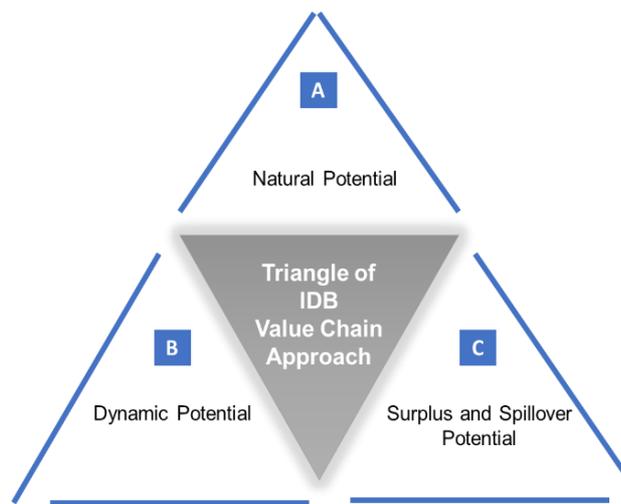
To identify and subsequently develop the sectors with the most potential that Maldives need to focus on to achieve its high development and job creation targets, a new analytical model of "Making Markets Work for Development through Global Value Chains"<sup>2</sup> was utilized. This instrument is a global value chain methodology and a filtering tool to identify sector and product champions of a country. It is based on three criteria (*Figure 3*). The first criterion is the "natural potential" of a country, which takes into account the existing comparative advantage of a country at the industry level. The second criterion concerns the "dynamic potential", included in a prospective approach that identifies and quantifies the competitive advantage of products or goods according to future market conditions. The third criterion measures the potential in

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<sup>2</sup> M. F. S. Hamid, K. I. W. Kane, A. E. Demirhan and A. Khodary, Making Markets Work for Development through Global Value Chains, Islamic Development Bank, 2018.

terms of the effects value add and hence job potential. This "surplus and spillover potential" indicates upstream and downstream linkages, the induced effects that may result from interconnections between industries and optimizes the value added in a specific industry.

*Figure 3: Global value chains' selection toolkit*



*Source: Hamid, M Faiz Shaul, Kane, K, Demirhan, AE, Khodary, A. 2019. Making Markets Work for Development through Global Value Chains: Methodology and tools to identify and measure the highest-potential value chains*

Through this approach, Maldives focuses on the global value chain (GVC) of products for which it has a revealed comparative advantage. This will be achieved over the lifetime of the NDP and beyond through targeted projects and interventions, which can have greater impact, are more coherent and therefore more beneficial for the country.

After this identification and in-depth analysis, GVCs will be analyzed to identify bottlenecks, capacity gaps and product potential across the value chain from the initial

phase of production up to export distribution. The interventions derived from this process will seek to address the aforementioned gaps and bottlenecks in the GVC of the Maldives' leading products / industries.

Better connections to the global market through global value chains will help Maldives's progress towards achieving directly and indirectly the Sustainable Development Goals (SDGs). The development and enhancement of GVCs of the Maldives' product champions will result in: (i) job creation through value addition and market growth, which has direct impact on SDG-8 (decent work and economic growth) and (ii) industrialization with innovations and infrastructure upgrading, which has direct impact on SDG-9 (Industry, Innovation, and Infrastructure). These positive impacts will ultimately raise incomes, improve education, health, and other development indicators, thereby, positively affecting many other SDGs.

By adopting the Sustainable Development Goals in 2015, the development community in general, Maldives in particular, has recognized the need for a paradigm shift to better engage the markets or the private sector by using scarce public resources as leverage for additional private financing. Supporting this new change requires a different approach to getting markets to work for development in the most impacted sectors to foster inclusive and sustainable development in member countries.

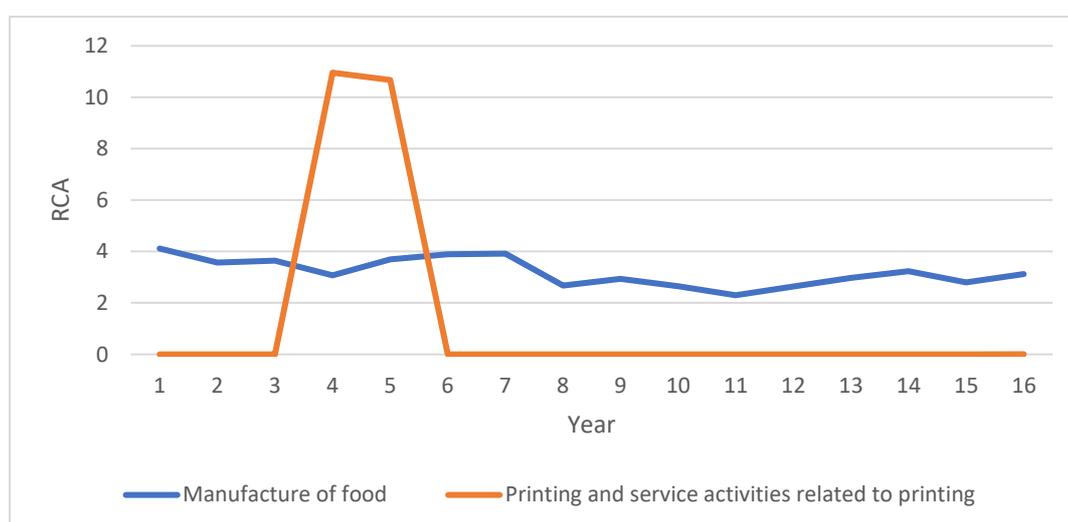
The promotion of global value chains in Maldives would support this program and allow markets to mobilize resources for development. For markets to work in GVC,

globalization and industrialization need to be rethought in a rapidly changing world, due to the changing global economy and the pace and magnitude of technological advances.

## 4. Maldives in the Global Value Chains

The revealed comparative advantage (RCA) index, is used to determine the products at HS2 level in which Maldives has comparative advantage. As shown *Figure 4*, Maldives has very high revealed comparative advantage for Manufacture of food products throughout the period from year 2001 to year 2016. This demonstrates that the industry has a natural and proven potential among Maldives' export products.

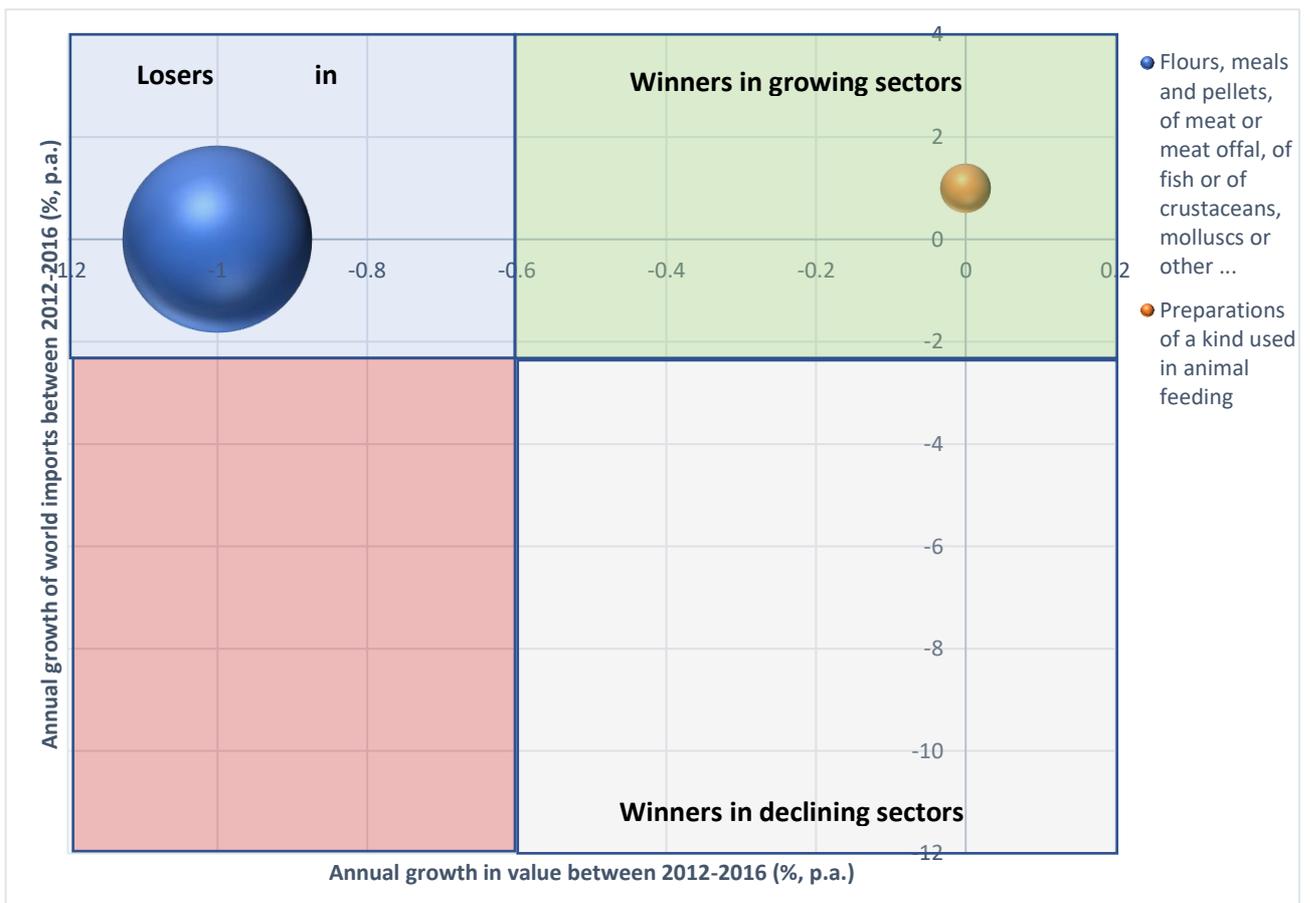
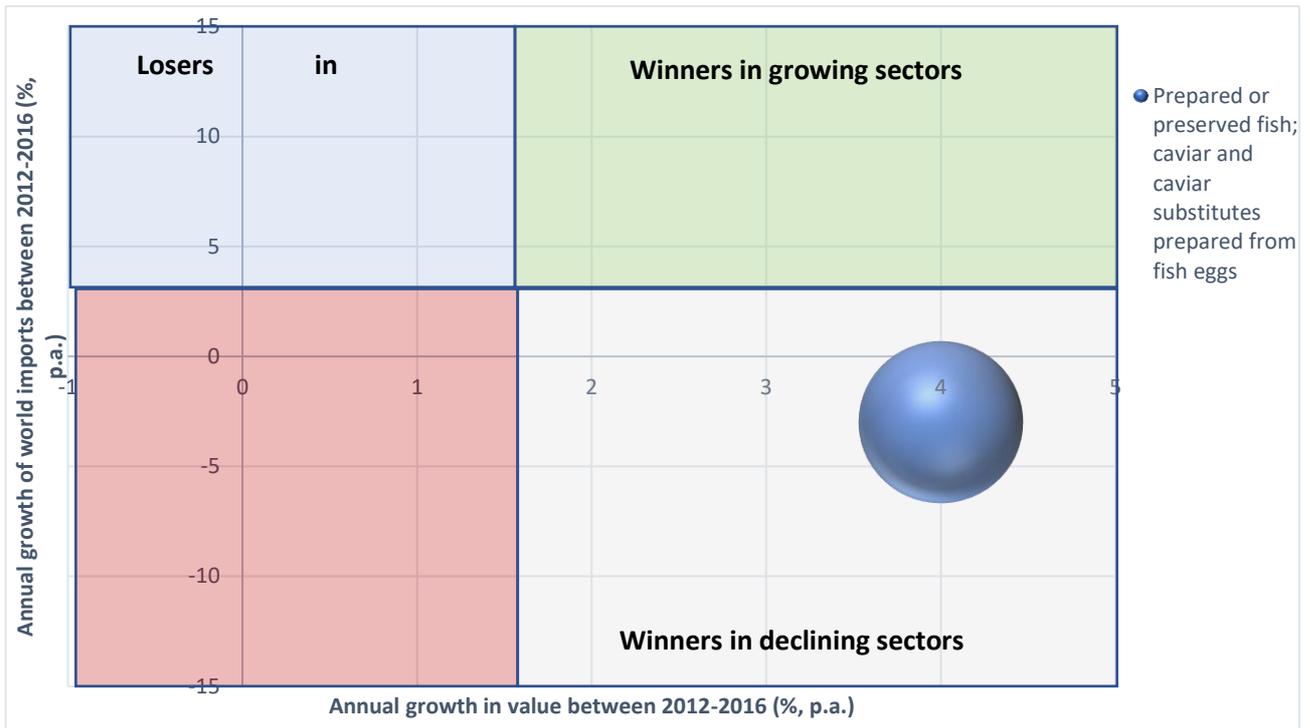
*Figure 4: RCA calculation for manufacturing industries with natural potential for the past 16 years.*



*Source: IsDB staff illustration. Data from Trademap.com*

An analysis of world demand of food/fish shows there is great variation in relevance for global value chains. Fish products such as prepared or preserved fish are winners in declining sectors. Preparation of a kind used in animal feeding are winners in growing sectors while flours, meals, and pellets, of fish are losers in declining sectors, indicating these products are relevant products in the global value chain and can move to the green quadrant if exports grow.

Figure 5: Market potential of Manufacture of food products at HS4 level.



Source: IsDB staff illustration. Data from Trademap.com

At a more disaggregated level, the main exports within 'Manufacture of food – fish', are *Prepared or preserved fish; caviar and caviar substitutes prepared from fish eggs (HS4 products 1604)* and *Flours, meals and pellets, of meat or meat offal, of fish or of crustaceans, molluscs or other (HS4 products 2301)*. The Product Champion Index (PCI) combines demand, supply, trade and resilience indicators into a single index that indicates the HS4 products with the highest potential for trade<sup>3</sup>. The PCI for the main HS4 product within 'Manufacture of food – fish' is computed and summarized in Table 1. Prepared or preserved fish; caviar and caviar substitutes prepared from fish eggs has high PCI.

*Table 1: Product champion index for Fish, seafood and related products at HS4 level.*

Product	PCI
Prepared or preserved fish; caviar and caviar substitutes prepared from fish eggs	0.266667
Flours, meals and pellets, of meat or meat offal, of fish or of crustaceans, molluscs or other ...	0.222832
Animal or vegetable fats and oils and their fractions, boiled, oxidised, dehydrated, sulphurised, ...	0.022801
Cocoa butter, fat and oil	0.019975
Wheat gluten, whether or not dried	0.008547
Extracts and juices of meat, fish or crustaceans, molluscs and other aquatic invertebrates	0.005708
Tapioca and substitutes therefor prepared from starch, in the form of flakes, grains, pearls, ...	0.005683
Other animal fats and oils and their fractions, whether or not refined, but not chemically ...	0.00282
Flour, meal, powder, flakes, granules and pellets of potatoes	-7.4E-05
Lac; natural gums, resins, gum-resins, balsams and other natural oleoresins	-8.1E-05

*Source: IsDB staff illustration. Data from Trademap.com*

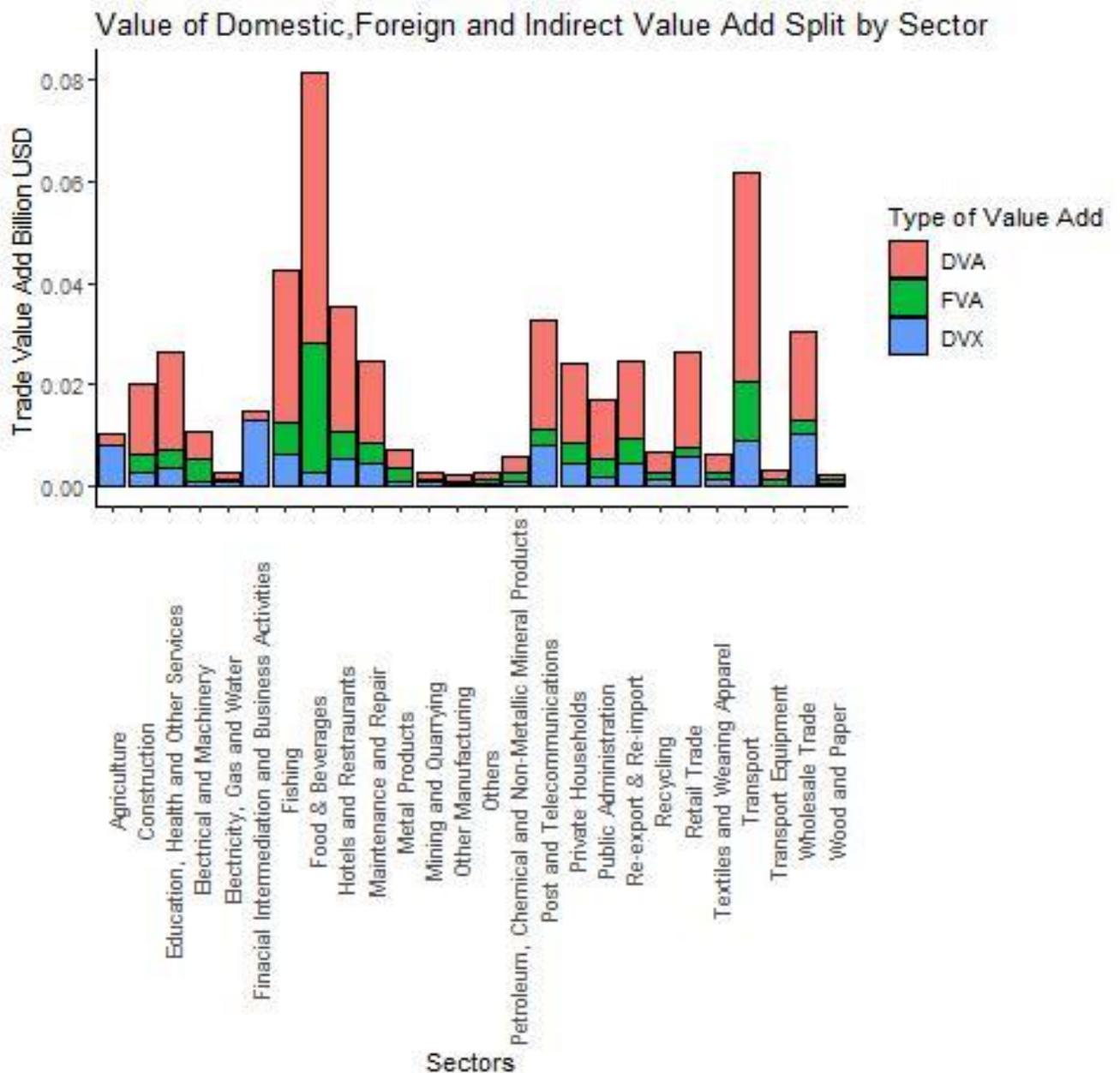
**High PCI**  **Low PCI**

As illustrated in *Figure 6*, the food Industry showed the overall highest value add with strong domestic and foreign value add values, in particular, the food industry is

<sup>3</sup> M. F. S. Hamid, K. I. W. Kane, A. E. Demirhan and A. Khodary, Making Markets Work for Development through Global Value Chains, Islamic Development Bank, 2018.

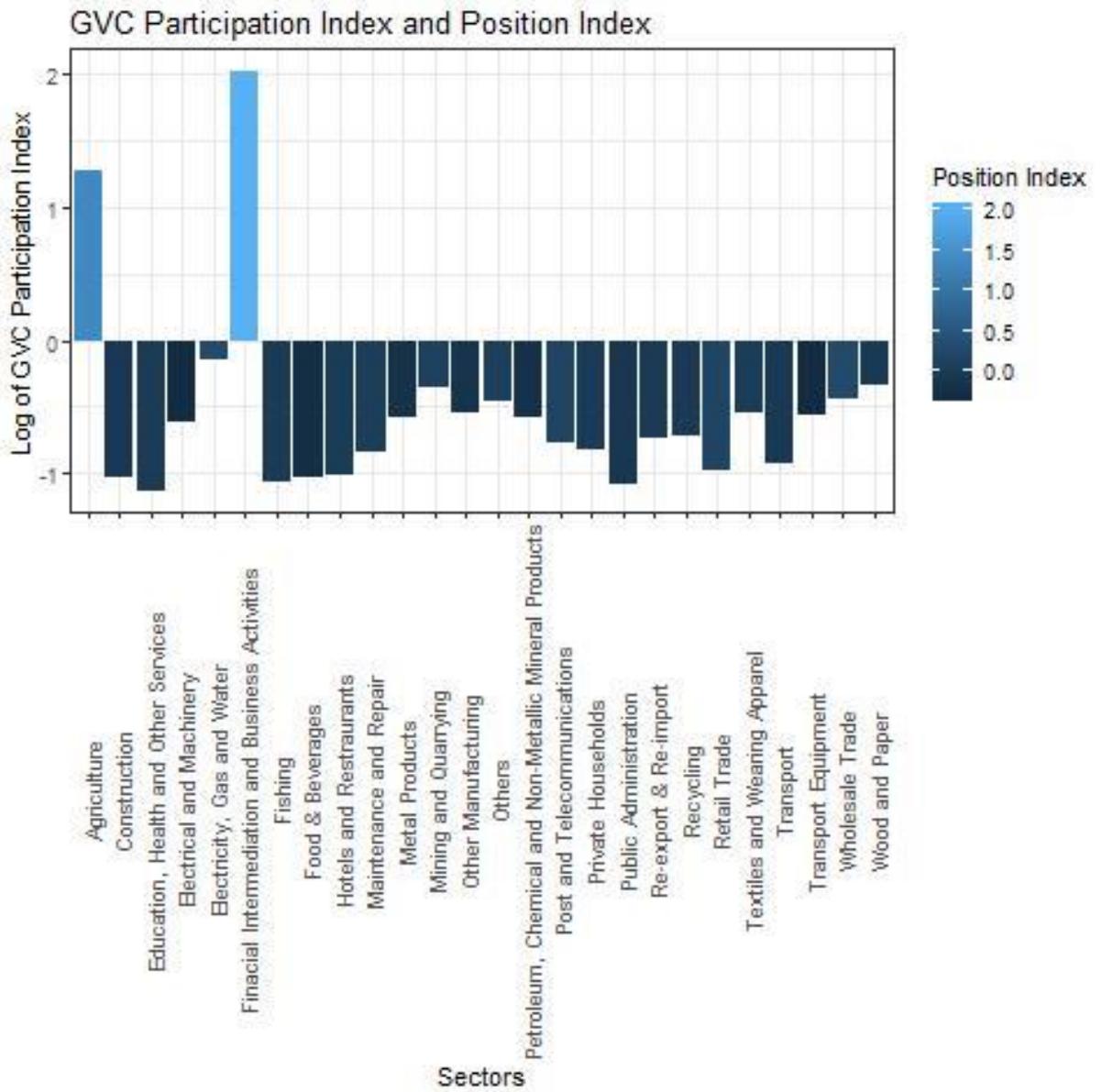
supplied mainly by fishing, which recorded strong domestic value add. The transport sector recorded high domestic value add while other tourism related sectors such as hotels and construction also recorded significant value add. The IT/telecommunication sector also recorded significant domestic value add.

Figure 6: Value of domestic (DVA), foreign (FVA) and indirect (DVX) value add with respect to gross export



Source: IsDB staff illustration. Data from Eroa

Figure 7: Maldives Global value chain participation and position index per sector.



Source: IsDB staff illustration. Data from Eroa

## 5. Strategy to develop the industry champions of Maldives

### a. Industry champions' briefs

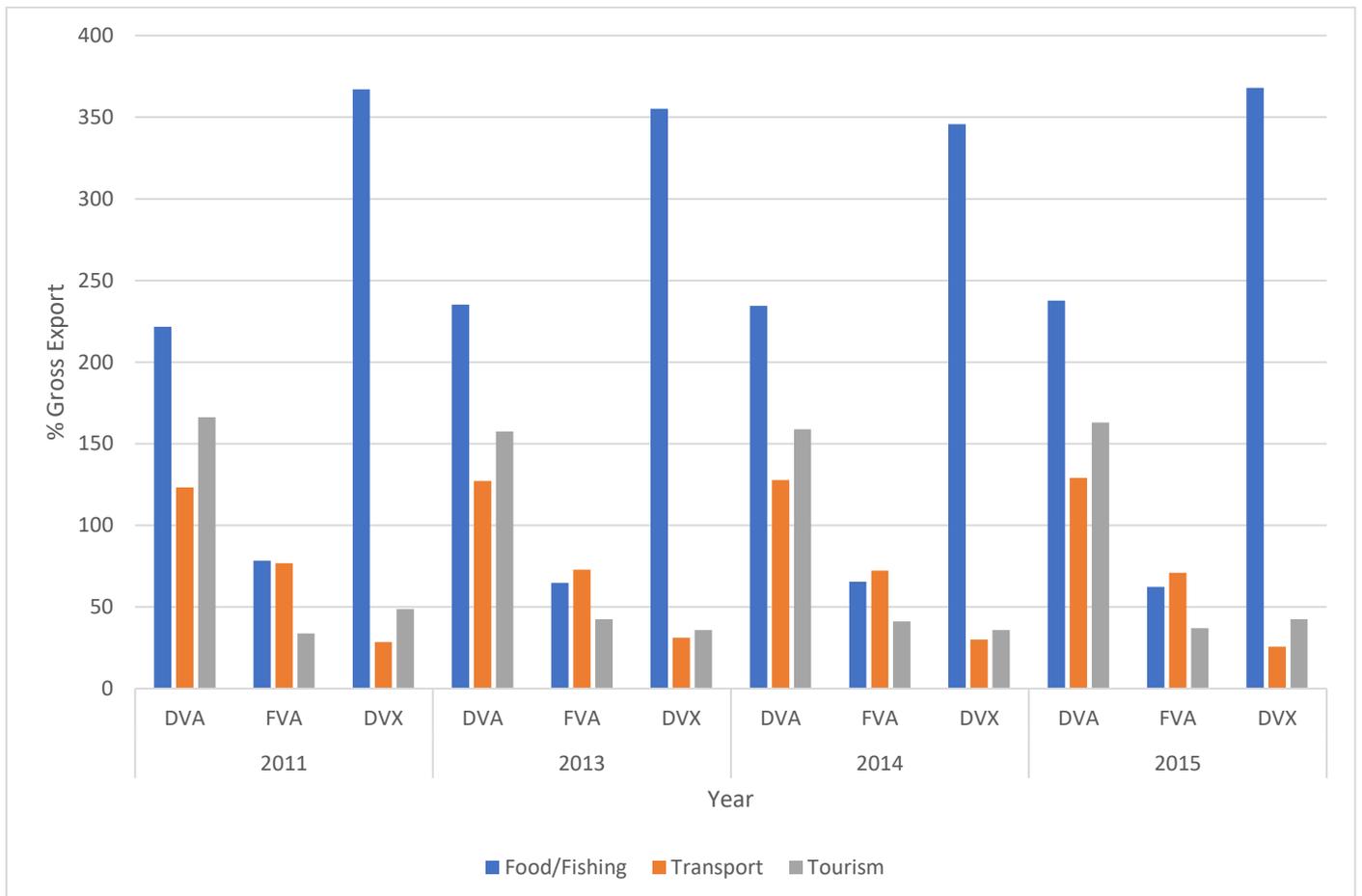
Following consultation with the government of Maldives, three industry champions and a cross-cutting industry were chosen that will catalyze the Maldivian economy: tourism, fisheries, ICT, and transport (transport being the cross-cutting industry).

A value-add analysis in Maldives using the Eora Input-Output Table<sup>4</sup> shows that food/fisheries, transport and tourism industries all have high domestic value added (over 100% of gross exports: seen *Figure 8*). These high domestic value-added values suggest that these industries have high growth potential. Key interventions addressing the critical bottlenecks in the industries' value chains and strategic enhancement of these value chains will promote economic growth with positive spillover effects to the domestic economy. The results of value-add analysis also show that all food/fisheries, transport and tourism industries have high indirect value added, especially food/fisheries with an indirect value added of over 350%. The high indirect value added indicates that there are great opportunities to transfer value add to the country by promoting local transformation of the key competitive industries.

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<sup>4</sup> Eora Input-Output Table used with methodology from M. F. S. Hamid, K. I. W. Kane, A. E. Demirhan and A. Khodary, Making Markets Work for Development through Global Value Chains, Islamic Development Bank, 2018.

Figure 8: Value of domestic (DVA), foreign (FVA) and indirect (DVX) value add with respect to gross export from 2011 to 2015.



Source: IsDB staff illustration. Data from Eroa

#### i. Tourism

Tourism is the mainstay of Maldivian economy. It drives significant service delivery and construction activities to respond to the demands of the tourism sector. The country has formalized the sector since 1983, and several strategic development plans were designed and implemented to grow the sector and redistribute its wealth to the population. It has been the lynchpin of Maldives' global market integration, and this has

come with a side effect that should be mitigated going forward. Given the limited human and production capacity of the economy, the tourism industry has relied heavily on a Global Value Chain (GVC) with high foreign value added to meet its travel services provision requirements, food imports and materials, thereby creating consistent downward balance of payment pressures through increasing import bills and income transfers and dampening the local welfare impact of its tourism industry.

In order to upgrade to a Tourism Global Value Chain (GVC) that enables greater internalization of the Tourism industry's benefits and caters to emerging market trends, the following are imperative considerations:

- **Upstream:** (i) developing higher agricultural and food self-reliance through building reliable local supply chains; (ii) aligning higher education and Technical and Vocational Education and Training curricula to cater to the Tourism and Hospitality Management industry; (iii) enabling online delivery and certification for Tourism industry related technical and vocational training; (iv) decentralizing Maldives to enable Tourism FDI to flow into regions outside Greater Male; (v) establishing regional international airports and ferry transport networks connecting decentralized nodes to nearby tourist islands; (vi) developing and enforcing green tax for waste management and CSR responsibilities; (vii) adapting regulatory, legal, compliance frameworks for transport, food, occupational safety and waste-management for the guesthouse tourism subindustry; (viii) Developing Tourism information management systems to

track employment, demographics and key economic metrics of the industry to enable evidence based policy making for the industry.

- **Downstream:** (i) developing community-based guesthouse tourism that leverages the unique selling point of island living and culture, complemented by internal supply and provision of food and entertainment services.
- **Sales & Distribution:** (i) developing one-stop travel services provisions platforms, (ii) enabling local travel and tour operators in service delivery, (iii) marketing the unique appeal of Maldivian culture and community-based tourism.

Greater domestic integration is of utmost importance to Maldives. Foreign owned island resorts can import their requisite food and beverage, control maritime transport and operate tourist activities. Aside from this horizontal integration, big foreign owned Islands or a conglomerate of them can vertically integrate with foreign suppliers upstream and service providers downstream, leaving little room for any domestic provision. This renders the Tourism industry a cash portfolio for Maldives, primarily contributing to the economy through FDI, as opposed to an investment portfolio with recurrent streams of direct contributions to the local economy. The internalization of tourism benefits should go hand in hand with providing local substitutes that are competitive with foreign options. A non-diligent internalization approach will render the Tourism industry unattractive to FDI due to the erosion of its competitive advantage, meanwhile a demonstrated competitive local supply chain of inputs will attract it. On the demand side, the future for Maldives tourism consists of experiences catered to the diverse market needs and a value chain that is more inclusive of domestic welfare

through integrated value chains that drives up competition and efficiency in an industry currently dominated by resort owners. The advent of guest-house tourism provides a differentiated product for the market seeking to access the beauty and culture of Maldives at a more affordable price while enabling locals to play a more prominent role in the industry.

### Box 1: Smart Island to achieve Tourism 4.0

Comprising around 1,190 small islands in the Indian Ocean, Maldives is home to around 436,330 people in 2017, and famous for some of the world's most beautiful beaches. High-end tourism has propelled the country's strong economic expansion over recent decades. This has helped Maldives gain middle-income status with the highest per capita income in South Asia. Since 1972, the government has been able to turn the dispersion of its islands into an opportunity to develop its tourism industry by converting some of the islands into high-end resorts

However, as an island economy, the country is extremely vulnerable to external economic shocks and the negative impacts of climate change. Due to its small size, the economy is vulnerable to shocks. Tourism has been the main driver of growth, but its importance has also exposed the economy to greater volatility. External developments such as the Asian Financial Crisis of 1997–1998, the Indian Ocean tsunami of 2004, and the 2007–2008 global financial crisis demonstrated how the Maldives' heavy dependence on one sector—tourism—creates underlying vulnerabilities. The impact of the 2004 tsunami was particularly devastating. Financial damage due to the tsunami was estimated at \$470 million (44% of the country's 2004 GDP), excluding the environmental costs, i.e. the value of the topsoil and reclaimed land that was washed out to sea (World Bank 2005).

#### Potential solutions:

**1. Engineering Solutions and Innovative Technological Designs** - Infrastructure damage can be repaired rapidly if the building design accommodates strategic designs to either limit or allow easy repair. Defensive structures, such as sea walls up to 12 meters tall to protect populated coastal areas. Other solutions include massive floodgates up to 15.5 meters tall with channels to redirect or tamper the incoming waves. Japan has also tested vertical structures, essentially tall platforms for people to stand on above the tsunami maximum height.

**2. Computer-generated simulations** to give more insight into what the aftermath of a natural disaster would look like, and how Maldives respond to it. E.g. from a 3D model, planners can learn where the city's most important facilities are placed, so there is no confusion as to where rebuilding should start.

**3. Predictive weather technologies** - Another example is disaster prediction through data analytics to predict the arrival of tsunami and indeed its path as it left a trail of destruction.

**4. E-Promotion** - technology is undoubtedly becoming a key element to not only improve the visitor's experience, but also to enable the visitors to promote the destination through whatever social media channels they prefer. It is important to promote synergy with the IT strategy to incorporate new digital technology in the production of promotional tools and improve the distribution management system and digital marketing.

## ii. Fisheries

Prior to the tourism boom, the Fisheries industry was the leading industry in the Maldivian economy. However, the Fisheries industry, a cornerstone of Maldives' natural potential, has experienced a gradual decline in output and employment over the last two decades, primarily due to missing out on capitalizing on opportunities to steer the industry towards higher value-added activities within the Fisheries Global Value Chain (GVC). The primary bottleneck is the lack of processing capacity needed to sell directly to the final customer. Much of Maldivian fish is exported to Thailand as raw input into its processing system, where substantial value add is captured. Of primary importance is Skipjack Tuna, the demand for which currently outstrips supply due to low vessel capacity, low processing capacity, distribution and storage bottlenecks and low negotiating power for better allocation policy in the Indian Ocean.

Fisheries is one of Maldives' most mature industries with strong linkages with the global markets, promising great foundations for its transformative potential as a leading player in the global industry. The upgrading of the Fisheries Global Value Chain (GVC) is contingent upon the following transformations:

- **Raw material acquisition:** (i) Enabling collective bargaining for better allocation policy terms for coastal members of the Indian Ocean Tuna Commission (IOTC), (ii) Enabling environment and contractual practices for entry of small processors in order to add processing capacity and consolidate supply consistency and channels.

- **Research & Development:** (i) Promoting R&D into and nurturing the parallel growth of the live-bait industry, (ii) streamlining the licensing of fishing vessels and (iii) targeting training and capacity building in fish processing skills.
- **Upstream:** (i) Building processing capacity at scale, (ii) expanding scale of collection facilities and collection boats, (iii) improving onboard fish preservation capacities, (iv) expanding roll-out of carbon monoxide treatment of fish, (v) building storage facilities for fish to keep fresh until shifted to market, (vi) developing quality certification and (vii) removing domestic purchase price floors and purchase guarantees.
- **Downstream:** (i) building linkages with retailers outside of the primary fish export destinations and (ii) marketing to the 'sustainable fishing' niche market and high-end global markets.

The above key upgrading processes will enable Fisheries in Maldives to set the foundations of the transformation to becoming a robust industry that creates sustainable and quality employment, becomes a key contributor to Maldives' growth ambitions and creates a global fisheries brand that is synonymous with quality and sustainable consumption of marine resources while showcasing and safeguarding the cultural significance of Fisheries in Maldives to the world. The subsequent growth and maturity of the Global Value Chain (GVC) will enable upstream R&D to steer the industry towards evolving opportunities in the global markets and preempt further growth and market penetration strategies.

### Smart Agriculture and Aquaculture

The Maldives' archipelagic structure constrains the country's range of economic activities. Agriculture, which has been constrained by a dearth of arable land, and industry, with limited manufacturing activities, have played a minor role in the economy.

While fishing has been the country's second largest foreign exchange earner after tourism and an important employer of Maldivian labor, the declining catch has been exacerbated by the slowdown of the European economy, which is the main market for tuna exports. Meanwhile, agriculture production has been constrained by the availability of arable land, and soil that is not conducive for a whole range of agricultural products.

#### Potential solutions:

1. **Smart farming** - a farming management concept using modern technology to increase the quantity and quality of agricultural produce. E.g. 24/7 Sensors and real-time monitoring to monitor real-time crop and livestock health, soil quality, and weather—tracking sound, sight, or touch to provide constant and consistent observation and information about farms. Precision agriculture and predictive data analytics can improve farming efficiency and compile massive amounts of useful data, it will require considerable analysis to convert the growing amount of big data available to farmers into actionable insights: relevant and usable information that helps them better manage operations.

2. **Smart Fisheries** - selective fishing technologies by developing an air canon that launches a net into a larger fishing net to sample the size and type of fish before they are all caught. Fishers then use the sample to decide if they want to haul in this catch or not, increasing their efficiency. This reduces the conservation issue of 'bycatch' which is when marine species are caught and killed by accident.

3. **Aquaponics and Fish Farming** - Aquaponics is the integration of recirculating aquaculture and hydroponics in one production system. In an aquaponic unit, water from the fish tank cycles through filters, plant grow beds and then back to the fish. The creation of fish farming through aquaponics can serve dual purpose. First, it would support the economy to have adequate amount of fish in times of climate uncertainties and secondly, it helps grow organic plants and vegetables that can be built vertically given Maldives arable land challenge.

Source: IsDB staff recommendations

### iii. Information and communications technology

ICT is the bedrock of any developmental transformation. At the foundational level, ICT can help strengthen public institutions by assuring transparency, efficiency and productivity. Meanwhile, centralized databases and inter-connectivity enable the benefits of knowledge and data sharing, in addition to efficient interdependent government administration and service delivery to the population.

The crucial role of ICT in making distances disappear cannot be overstated for the geographically dispersed Island Nation of Maldives. Aside from the cross-cutting nature of ICT as a support pillar to the developmental aspirations of all sectors, Maldives with its limited population and dispersed land mass can find a natural champion industry in ICT. Currently, Maldives has internet and telephone coverage across the nation that serve as good foundational hardware to launch an ICT transformation, what is however lacking, is the human capacity – or “software”. Skills and capabilities development in ICT can be set in motion, through the online delivery of IT and Computer Science training, allowing talented youth to incubate ICT & programming skills and work virtually for domestic and global firms without the need for centralized infrastructure.

Further Global Value Chain (GVC) development will take shape in the form of emerging niche areas of competitive advantage, potentially; digital marketing, application and software development, Financial Technology (FinTech) and the pioneering of intensive blockchain applications in government administration, e-

governance systems, online education and health delivery, mass electronic payment systems etc. Concurrently, the development of IT parks will drive the inflow and assembly of local talent pools to foster innovative technology startups and benefit from two-way knowledge spillovers with local and foreign operators.

The initial development and upgrading of the ICT Global Value Chain (GVC) is contingent upon the following foundational measures:

- **Upstream:** (i) Introducing cyber laws pertaining to their governance, data and digital privacy, digital transactions security, (ii) initiating the process of Digital ID creation for the population, (iii) promoting an enabling framework for digital transactions, (iv) promoting a framework for digital governance systems to integrate the governance into centralized databases, to enable efficient electronic front-end government services administration and improving the business environment as a first step, (v) formalizing plans for ICT parks to be inclusive self-contained centers that allow symbiotic interfacing between ICT education and ICT service delivery, (vi) developing curricula delivery modes (online as well as traditional education) ranging from ICT literacy to advanced Computer Science skills to align the supply side with the needs of Industry 4.0.
- **Research & Development:** (i) Developing ICT curricula that prepare a labor force of support ICT workers who can take charge of maintaining systems and software architecture, (ii) Creating ICT sector policy that places qualified ICT

professional at the forefront of driving the nascent ICT industry towards the fast-evolving needs of the market.

- **Downstream:** (i) Promoting an enabling environment for connecting the competitive advantages of Maldives ICT industry to Global Value Chains (GVC) and thereby, the demand from abroad (ii) creating online marketing and investment platforms enabling access to services of the IT parks and streamlining FDI into them.

The potential for Maldives to utilize the unique nature of the ICT industry in requiring particularly low initial capital outlay to get off the ground is of particular importance as a key driver of exports in the future, in a nation where the major export driver, Tourism, is heavily infrastructure and FDI intensive. The future growth aspirations of Maldives will need to be complemented by the ICT industry that is low-infrastructure-intensive in nature and has potential to contribute significantly to GDP.

#### iv. Transport

Despite the country's development successes, transport is perhaps the most critical cross-cutting sector that impedes the socioeconomic development of the population. Maldives faces a unique geographic and demographic context with 188 widely dispersed small inhabited coral islands. Ninety eight percent of the consumption is imported; including sand and construction materials. The distribution system is dependent on a network of crafty harbors and small passenger and cargo ships. Without daily supply of goods and commodities and reliable access to the social and

economic amenities in the main islands, developmental progress is stifled. The provision of efficient and equitable inter-island transport is the biggest challenge faced by Maldives.

It is reported that some inhabitants have to travel more than two hours by boat to reach the nearest health center or hospital and more than half of the inhabited islands are not always accessible due to problems with harbors, absence of jetties, impassable shallow waters and impenetrable reefs. In a country which imports 98% of its consumption, transportation of goods by boat or seaplane absorbs a significant share of national income and household expenditures. Reducing logistics costs through provision of modern harbor infrastructure and reliable sea transport services is critical for the development of the economy.

Given the strategic location of Maldives, positioned inside a bustling trade corridor, the transformation of transportation can unlock immense growth potential both as an enabler to all other sectors as well as an export driving sector with Maldives establishing itself as a regional shipping hub by integrating into the transport Global Value Chain. The NDP's decentralization plan driven by spatial analysis will be the foundational factor in determining the strategic locations for the creation of node islands surrounded by an ecosystem of smaller islands interconnected to the node by reliable transport networks. This will enable the clustering of the dispersed population around regional centers, enable access & service delivery and reduce associated logistical costs.

In order to enable the creation and transformation of the transportation Global Value Chain, the following measures are imperative:

- **Research & Development:** (i) building maritime and aviation technical capacity within line ministries, (ii) devising policy and regulations for the transportation of cargo, (iii) creating separate mechanisms for passenger and cargo transportation, (iv) creating sea traffic monitoring and regulation systems, (v) building technical capacity in boat repairing and local manufacturing of boats and (vi) standardization of the fleet of airplanes and boats to enable ease of repair and spare parts sourcing.
- **Upstream:** (i) creating ferry transport channels to and from decentralized node islands, (ii) increasing the capacity of existing ports to reduce traffic backlog and wait times and building new commercial ports for each of the regional nodes, (iii) building commercial harbors for nodes and surrounding islands, (iv) developing mailing systems for parcel and small cargo deliveries across islands and (v) upgrading current fleet of boats to higher speed boats.
- **Downstream:** (i) building a transshipment facility at a strategic global trade corridor determined by spatial analysis, (ii) building airports for regional nodes with licensing for international carriers.

Transport inaccessibility and associated prohibitive costs of transport stifle the connectivity of local markets and the delivery of services. A decentralized model for

Maldives will enable the clustering of the currently dispersed population, connecting them through a well spatially planned transport network, unlocking one of Maldives' greatest impediments to growth. Meanwhile developing a transshipment facility will enable Maldives to integrate to the transportation Global Value Chain and leverage its strategic location.

#### b. Way Forward

IsDB strategy to support Maldives National Development Plan is to promote growth of the country's industry champions through Global Value Chains. The development goal for the strategy is to promote the creation of high quality jobs by improving value add of competitive export industries. IsDB and the government have identified and validated fisheries, tourism, and ICT as industry champions for Maldives with Transport as a cross-cutting industry. The implementation of IsDB Strategy in the NDP is through a Member Country Partnership Strategy (MCPS).

The next steps (see *Figure 9*) are to undertake a complete mapping of the value chains for chosen industries to identify bottlenecks, capacity gaps, and the product's potential in the whole chain from the initial production stage to the export distribution. Hence, relevant interventions will focus on addressing gaps and bottlenecks in the GVC of the country's product/industry champions. This analysis will define the development interventions required to enhance the competitive industries. The identified interventions will determine the projects to be implemented to enhance and support

the GVCs and thus promote the industry champions; which will be an outcome of the MCPS.

The final step is to use an optimal financing approach to fund the MCPS. Resource mobilization and partnerships in financing are critical in the new GVC approach. Attracting private investment in key industries is essential in many cases. The classification of projects based on Expected Return-Impact of GVC allows for the determining of the best suited financing mode for the projects. Private investors can undertake projects with great potential high return and high GVC impact while IsDB can implement projects with low return but high impact. This will help for the optimization of IsDB ordinary resources and direct the Bank towards key projects allowing for better strategies of revenue mobilization efforts. This can help identify which projects are best suited for private investors and which projects should be undertaken as PPPs. It will allow also better partnership with Development partners to coordinate on the financing of specific interventions under the radar the partners.

*Figure 9: Value chain qualitative analysis*



*Source: Adapted from M. F. S. Hamid, K. I. W. Kane, A. E. Demirhan and A. Khodary, Making Markets Work for Development through Global Value Chains, Islamic Development Bank, 2018*