



National Industrial Development Strategy: Shaping the Future of Value Addition in Vanuatu

2018 - 2022



UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION

Department of
INDUSTRY



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FOREWORD



We have good reason to be proud of Vanuatu. It is one of the most culturally diverse countries in the world and witnessed tremendous economic development over the last decade. It is now a premier destination for tourism, a vibrant financial centre, and a reputable source of unique, high-quality products such as coconut oil, sandalwood oil, kava, tamanu and nangae oil, organic coffee, cocoa, and albacore tuna.

The challenge is now for our country to strengthen value addition by expanding the nascent industrial sector in a manner that is both sustainable and inclusive.

Fortunately, we are not starting from scratch. As the new National Industrial Development Strategy 2018-2022 shows, our industrial capabilities – as defined by economic complexity – are growing faster than some other countries in the region such as Solomon Islands or Papua New Guinea and getting closer to those of Fiji. Building on these capabilities and addressing priority policy barriers we can progressively move up the value chain to reach a target of 10% manufacturing value added in GDP by 2022.

Achieving this ambitious target will require a concerted effort from all stakeholders, involving the whole-of-government, private sector as well as international financial institutions.

I am confident that under the leadership of our government and with the support of our new Industrial Development Council, bringing together government and private sector representatives, we will deliver on new National Industrial Development Strategy and achieve greater prosperity for all our citizens.



Honorable Bob Loughman MP
Deputy Prime Minister and Minister of Tourism, Trade, Industry, Commerce and Ni-Vanuatu Business

ACKNOWLEDGEMENTS

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The target audience is policymakers, the private sector, the donor community, independent analysts and other development stakeholders.

The report was completed by Whiteshield Partners, a global public policy and strategy advisory firm, originating from the Harvard and OECD communities. Whiteshield Partners leveraged its knowledge mapping intellectual property to deliver the project. Anthony O'Sullivan, Partner with Whiteshield Partners, led the project supported by Nadia Klos, Senior Associate, Elena Balter, Senior Economist and Roy Amos Pakoasongi, independent Local Consultant.

The National Industrial Development Strategy could not have been completed without the unfailing support of the following people: Acting Director General George Borugu for his support and guidance in terms of overall policy direction; Noel Kalo for his leadership in the review process since 2016 up to the closing of the project; Lazarus Aising for his tireless assistance in collecting data, coordinating interviews and ensuring the smooth advancement of the project; James Tatangis and his team for successfully coordinating the financing of the project; Director of Industry, Jimmy Rantes for his general supervision while doing his studies overseas; Anders Jönsson for his expert advice to the project team; Christine Kapalu and her team in coordinating administration and traveling arrangements; Flaviana Rory, Donalyne Naviti and Margaret Alilee for logistic support of meetings and stakeholder participation in the consultation process; Provincial Officer Keith Antfalo and his team for their support and cooperation in the consultation with the provinces; Andrew Baha for driving the team around Port Vila and the provinces during the consultation, and the whole DoI team for being helpful and supportive in a million ways.

We would like to acknowledge government agencies, NGO's, the private sector and international partners who participated in the consultation and formulation process.

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Executive Summary

Vanuatu is a country with unique characteristics and rich diversity...

Vanuatu is an archipelago with 278,000 inhabitants spread over 83 islands across 12,250 km² of the Pacific Ocean. With over 100 distinct languages, it is one of the most culturally diverse countries in the world – and its tropical islands, volcanic landscapes, untouched rainforests and consistently warm weather make it a premier tourism destination in the heart of South Pacific. Abundant agricultural resources, moderate wages, and English and French speaking labour force offer great potential for industrial development and related services.

...with untapped potential for economic growth

Starting from a low base – with just 3.8%¹ of manufacturing value added as a % of GDP – Vanuatu has untapped potential to move up the industrial value chain. Economic complexity, a measure of manufacturing capability, is growing faster in Vanuatu than in neighbouring countries such as the Solomon Islands or Papua New Guinea, and is moving closer to Fiji. By addressing priority policy barriers, namely with targeted skills, infrastructure, trade and investment policies, the country can hope to achieve a target of 10% manufacturing value added in GDP by 2022.

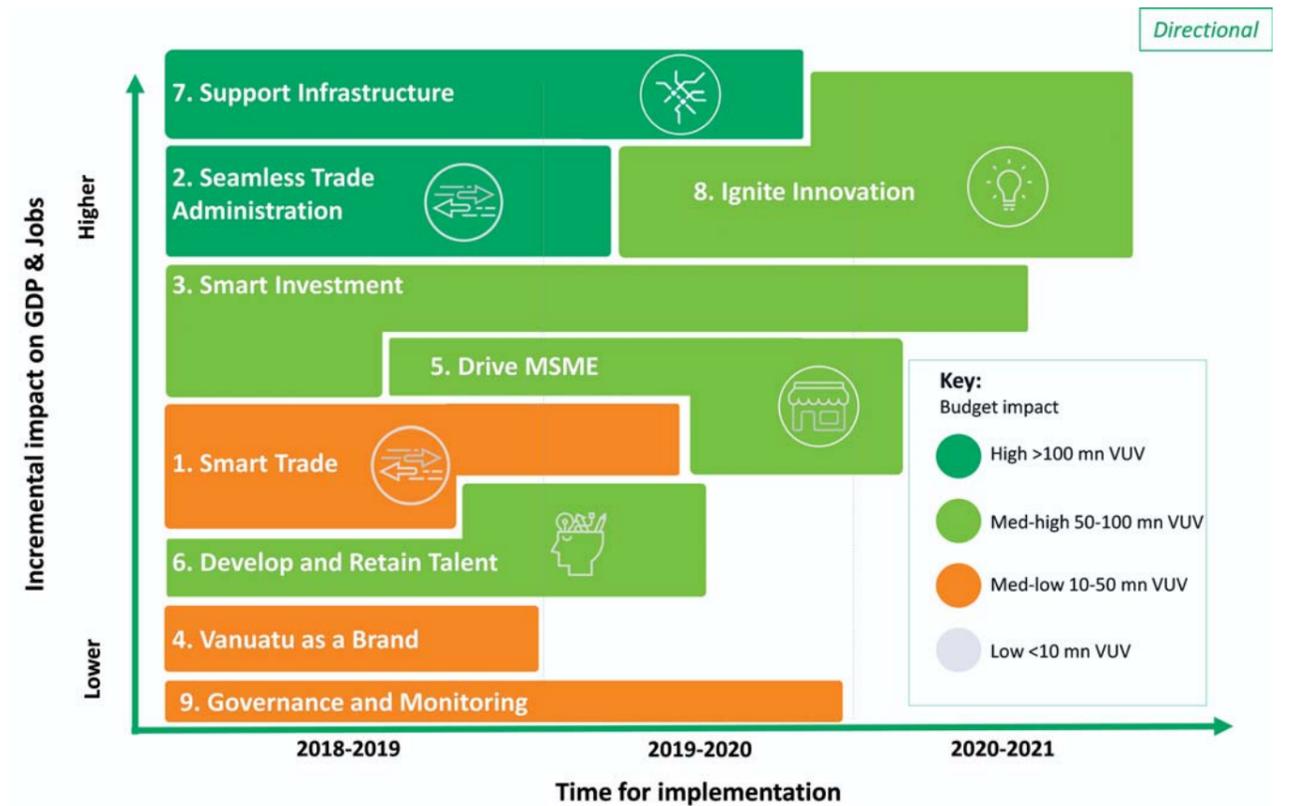
The national industrial vision is to fully unlock Vanuatu's capabilities to compete in niche markets with outstanding quality of products and services at premium prices in a sustainable and inclusive manner

Building on its comparative advantages in animal, vegetable and other food products, as identified through the Whiteshield Partners Sector Prioritisation Index, Vanuatu can expand its industrial base by solidifying, strengthening, and gradually expanding its core capabilities to spill over to other sectors and establish the foundation for value-adding structural transformation. The skills, market knowledge, and methodological expertise involved in growing and processing coconuts, tamanu nuts and sandalwood could underpin, for instance, the nascent cosmetics industry.

¹ World Bank, 2015

Figure 1:
Nine core programmes for National Industrial Development Strategy 2018-2022

Source:
Whiteshield Partners



The Vanuatu Agribusiness Prioritisation Index prepared for this report indicates that locally grown primary products with greatest value-added potential include: fish for processing, coconut, tamanu, and sandalwood for oil extraction, coconut for paste and powder, and different fruits for juice concentrate.

To achieve the industrial vision, a series of policy barriers must be addressed at the vertical and horizontal levels

At the vertical level, policy constraints mainly involve different product sectors within agribusiness. For instance, rapid and effective resolution of land ownership rights is fundamental to the future development of the coconut, cocoa and coffee based sectors. At the horizontal level, policy barriers relate to trade, investment, skills, support of micro, small and medium sized enterprises (MSMEs), infrastructure and innovation.

The proposed five-year industrial strategy comprises 9 programmes and 35 projects to unlock Vanuatu's full value-adding potential

Nine programmes, containing 35 projects or initiatives, should help Vanuatu address remaining horizontal and vertical barriers and unlock its full potential for industrial development (see Figure 2).

A few initiatives to highlight include:

- Launch a "Made in Vanuatu" brand and "Buy Vanuatu" network targeted at the thriving tourism sector and niche export destinations.
- Develop an "Export Toolkit" for SME's in Vanuatu looking to grow internationally.
- Develop and expand vertically integrated cooperatives to all relevant agribusiness sectors.
- Ignite incremental innovation through a government sponsored innovation fund that co-invests in viable product and service ventures.
- Support investments that place an emphasis on renewable energies, replanting and recycling to promote sustainable industrialisation.
- Prepare Vanuatu for manufacturing 4.0 by further investing in digital infrastructure and the associated skills to harness digital technologies.
- Launch a flagship incubator for 100 local and foreign entrepreneurs to accelerate industrial entrepreneurship.

Implementation of the strategy should start immediately

Implementation of the strategy will be driven by a newly formed Industrial Development Council bringing together business and government decision makers to take stock of progress and steer the direction going forward. A number of "low hanging fruit" projects can begin immediately, such as the development of an export toolkit for SMEs or the launch of a "Buy Vanuatu" network targeted at the tourism sector. Once the Council of Ministers has adopted the new industrial strategy, additional budget will need to be secured for medium to longer term projects, such as the launch of the innovation fund and the incubator.

Approach and Analytical Framework

The development of National Industrial Development Strategy 2018-2022 was conducted over 4 months, between end of August and end of December 2017. It followed an analytical framework structured around six steps (see Figure 1):

Step 1: Assessment of Vanuatu's economic situation and market dynamics: leveraging both internal and external sources, a review of Vanuatu's economy was conducted with a particular focus on the industry and taking into account the demand / supply structure and development of relevant markets.

Step 2: Mapping of Vanuatu's productive capabilities: revealed comparative advantage (RCA), product complexity index (PCI), product-market space, and value chain analysis were applied to identify the country's core capabilities to help it move up the value chain.

Step 3: Leveraging Vanuatu's capabilities: based on the analysis conducted in steps 1 and 2, a general Sector Prioritisation Index, as well as an Agribusiness Prioritisation Index were developed, combining Vanuatu's comparative advantage and the intrinsic attractiveness of potential products / services for the country along each step of the value chain.

Step 4: Identifying priority policy barriers: this step served to map out pivotal vertical and horizontal structural and policy constraints that should be addressed for Vanuatu to capture and develop the potential already inherent in the capabilities of its economic structure.

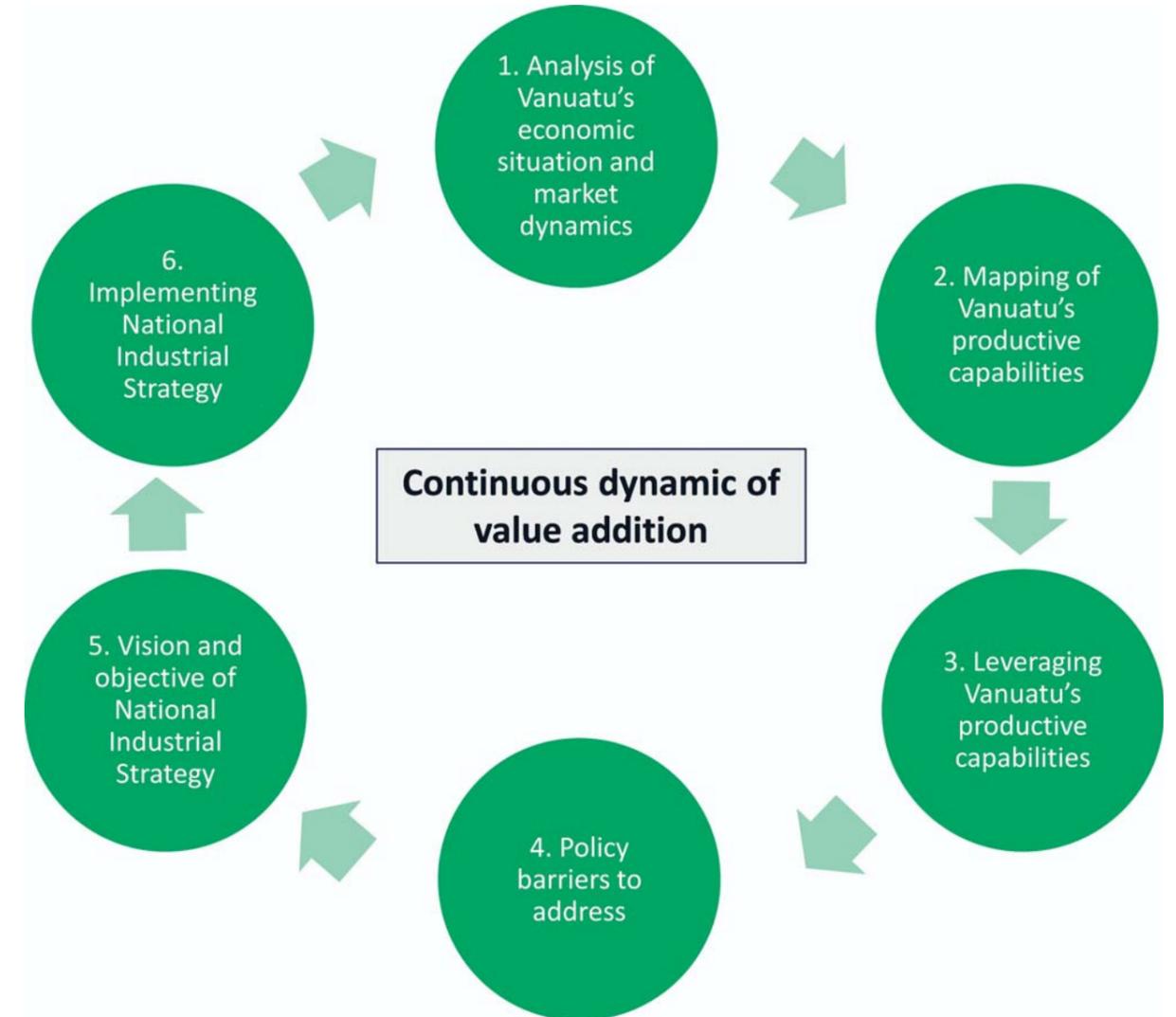
Step 5: Development of vision and objectives of National Industrial Development Strategy: this step grouped and organised the measures needed under 9 programmes and 35 supporting projects that would impact industrialisation, GDP and jobs by 2022.

Step 6: Development of a roadmap and governance to implement National Industrial Development Strategy: a detailed plan of actions was developed for each of the 9 proposed programmes, including concept overview, impact analysis, key actions, timeline, roles and responsibilities, budget and key performance indicators. An overall governance for the Industrial Strategy was also defined.

The implementation of steps 1 through 6 were supported by a series of public and private sector consultations and workshops held between September and November 2017, focusing on the islands of Port Vila, Santo and Malekula and Tanna. A validation workshop for the concept of the National Industrial Development Strategy was organised with public and private sector stakeholders in Port Vila on 14 November 2017.

Figure 2:
Analytical framework for National Industrial Development Strategy 2018-2022

Source:
Whiteshield Partners





Introduction
to Vanuatu

1 Vanuatu is a country with unique characteristics and rich diversity

Vanuatu has unique characteristics that should guide its industrial strategy

Located in the South Pacific, Vanuatu has all the benefits and constraints of a small island developing state. With one of the smallest populations in the world scattered across 83 islands, the economy is driven by agriculture and tourism owing to high levels of fertile land as well as agricultural and maritime endowments (see Figure 3).

While Vanuatu's abundance of natural resources provides a solid platform to move up the processing value chain, the small size of the economy, weak transport and energy infrastructure and high overall cost of doing business are among the weaknesses that must be addressed (see Figure 4).



Coconut trees at dawn in Malekula island

Figure 3:
Snapshot of the Vanuatu economy

Source:
Whiteshield Partners

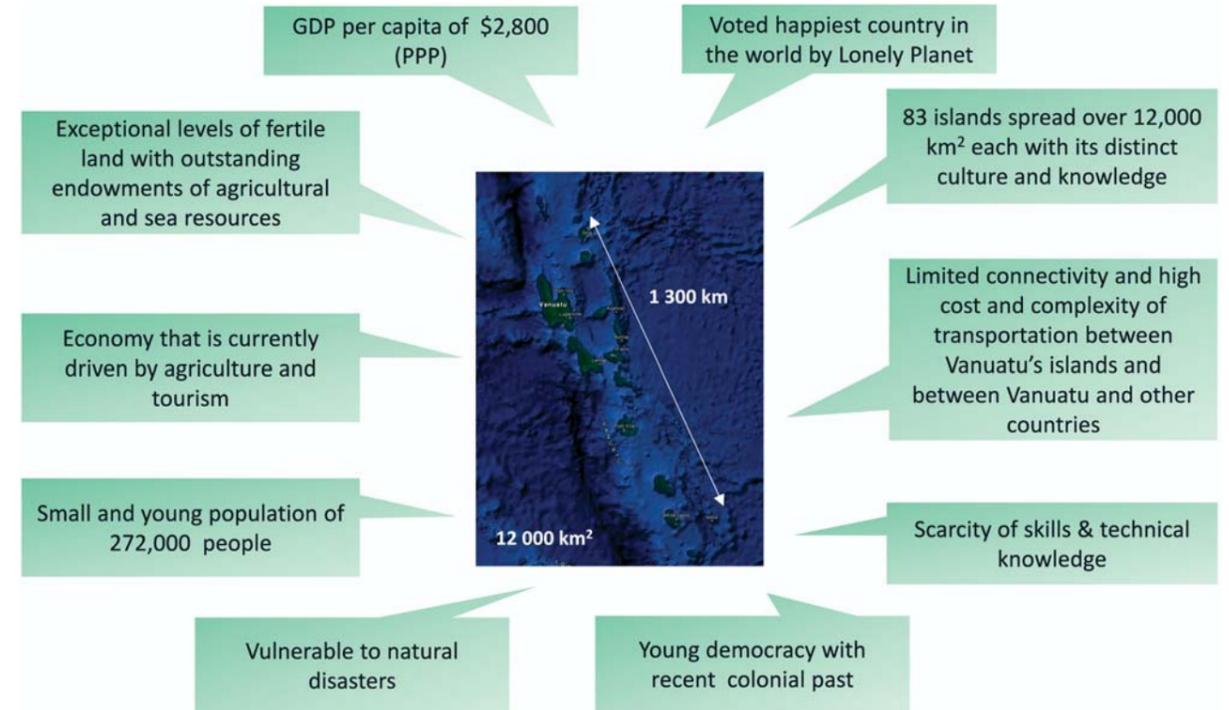
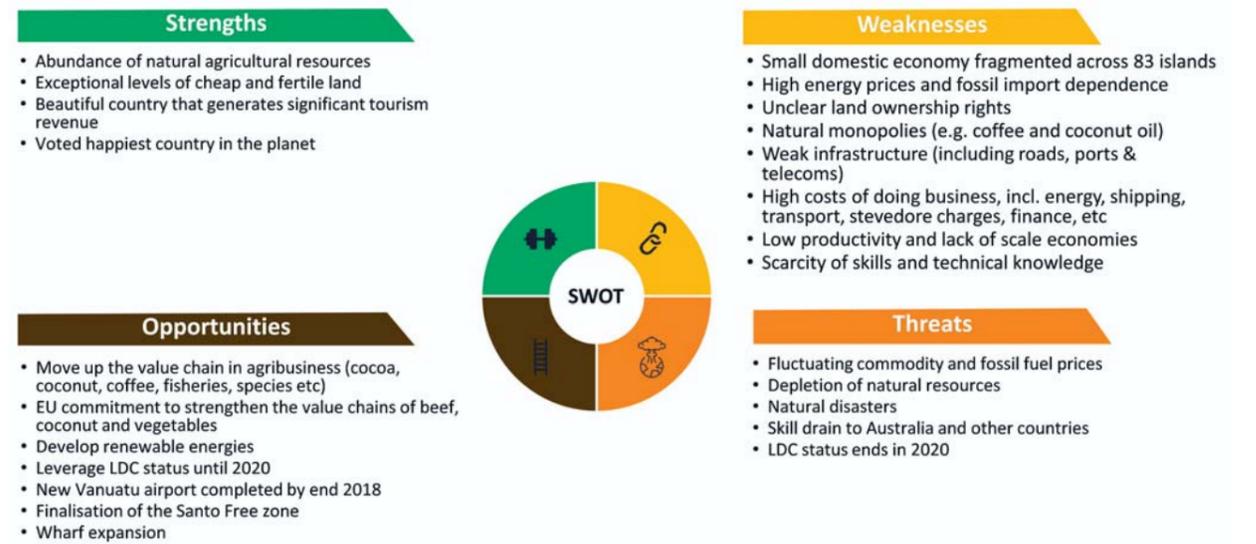


Figure 4:
SWOT analysis of Vanuatu's economy

Source:
Whiteshield Partners



The economy is still highly dependent on commodities and subject to volatility

GDP growth has stagnated at around 2%² over the last five years with a sharp drop experienced in 2015 due to Cyclone Pam, while Foreign Direct Investment (FDI) has continued to be volatile, oscillating between 10 and 60 million USD annually³ over the last decade (see Figure 5).

According to the IMF, economic growth of 3-4% in real terms is likely to continue in the short term, reflecting the end of reconstruction and recovery⁴. Booming external demand for kava, one of Vanuatu's most important cash crops, and copra prevent a more pronounced slump – highlighting as well how vulnerable the economy is to external factors.

Manufacturing value added, at around 4% of GDP in 2015⁵, is well below neighbouring islands such as Fiji (see Figure 6).

Consumer price inflation is modest, at around 1%⁶, due to a conservative monetary policy. This, coupled with external debt under 30%⁷ of GDP, keeps lending interest rates relatively low for such an exposed economy. This makes Vanuatu's risk profile, in particular given that it is often seen as one of the most vulnerable countries in the world to natural disasters, relatively modest. CPIA macroeconomic management credit rating is 4 (on a scale from 1-6), higher than the average for East Asia and the Pacific.

Figure 5: GDP growth and net FDI inflows 2003-2016

Source: Whiteshield Partners

Data: World Bank, 2016 FDI estimate – based on growth rate in national data (VIPA)

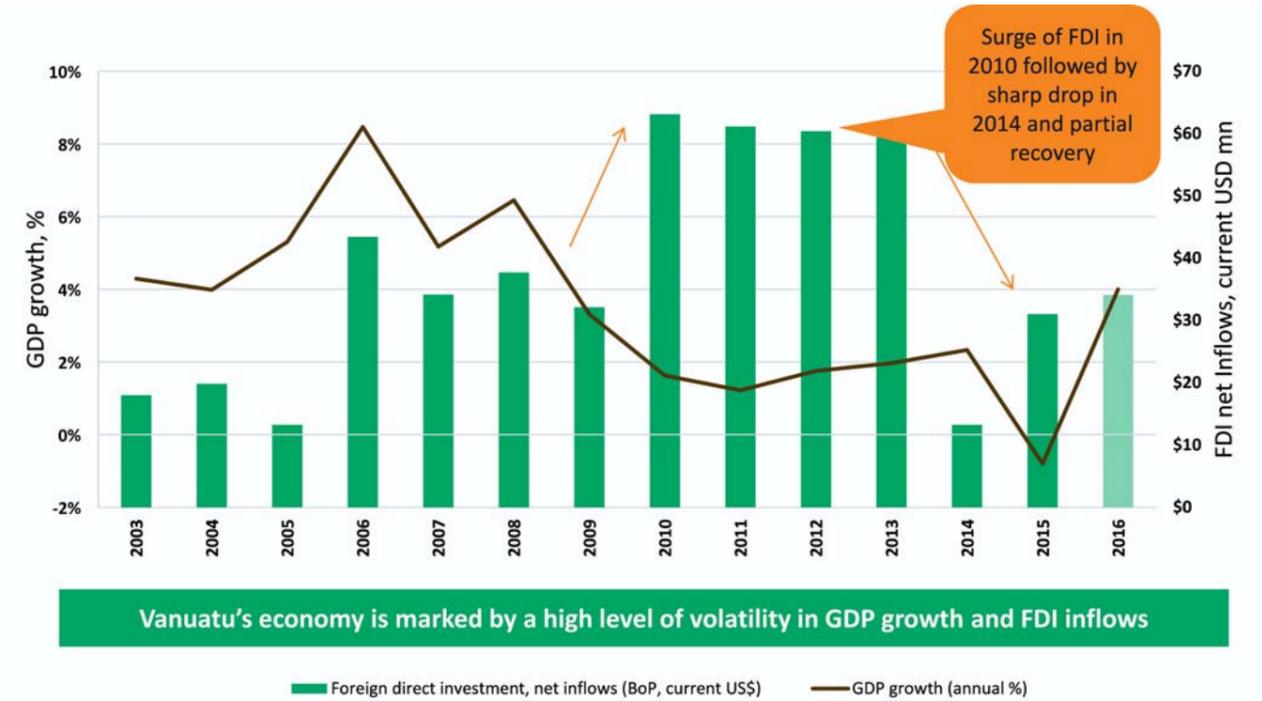
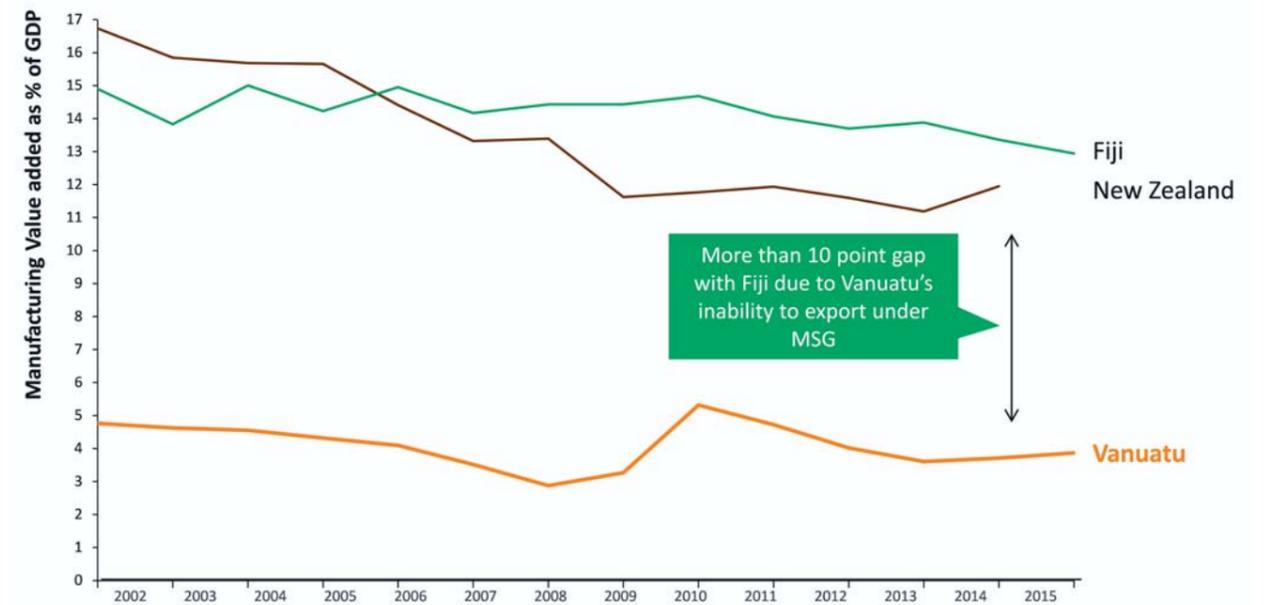


Figure 6: Manufacturing Value Added for Vanuatu and peer countries 2002-2015

Note: 2015 data point for Vanuatu is estimated based on National statistics office data growth rate

Source: Whiteshield Partners

Data: World Bank, National Statistics Office for 2015 data point estimate



2 World Bank, 2003-2016
 3 World Bank, 2003-2016
 4 CIA Factbook 2017
 5 World Bank, 2003-2016
 6 World Bank, 2016
 7 World Bank, 2016

In this trade dependent country, external imbalances are mounting but manageable...

At close to 100% of GDP⁸, Vanuatu's trade, is essential to the economy. The country is highly import-dependent, in particular oil and manufactured products and industrial equipment, while its exports, largely commodities, remain subject to external shocks. For the past decade, this has resulted in a negative trade balance, with a steep drop due to reconstruction in 2015 – similar to other countries in the region.

Exports are dominated by a few commodities, along with some trade relay and ship upgrading, with little value-added, while imports are significantly more sophisticated (see Figure 7 and Figure 8).

Non-fillet frozen fish and scrap vessels are the two largest export product categories⁹. Vanuatu is a WTO member and ratified the Pacific Island Countries Trade Agreement PICTA in 2005. It is also a member of the Melanesian Spearhead Group, whose FTA has entered a second phase. Both agreements will be extended to services, with significant potential for Vanuatu. An Economic Partnership Agreement with the EU has shown little effect so far, but the potential could be explored further.

The current account deficit remains modest, at 9% in 2017¹⁰, as outbound reconstruction payments on the services account slow, service exports (largely tourism) increase, and seasonal remittances – the second largest source of foreign exchange after tourism – from temporary workers in Australia and New Zealand continue to grow. Donor inflows still underpin the economy, but these will fall as reconstruction finishes. The local currency has seen real devaluation against most leading currencies over the past decade, which should provide some relief and, as this strategy aims to support, additional opportunities to expand exports and gradually build underlying trade competitiveness.

Volatile FDI inflows are concentrated in a few sectors

Net FDI inflows, at around 5% of GDP over the last 5 years, fluctuate strongly. This is slightly lower than other countries in the region, and a far cry from South and East Asia overall.¹¹

The potential of FDI outside of tourism, retail, and primary sectors remains largely unexplored. Vanuatu has a welcoming offer for foreign investors, with no income or capital gains taxes, straightforward regulations, and a substantial degree of financial freedom compared to other countries in the region.¹²

Figure 7: Breakdown of Vanuatu's exports and imports by country, average 2009-2014

Note: High levels of imports and exports with Poland are related to trade in upgrade ships, vessels and tug boats

Source: Whiteshield Partners

Data: BACI Comtrade, Vanuatu Statistics Office, World Bank

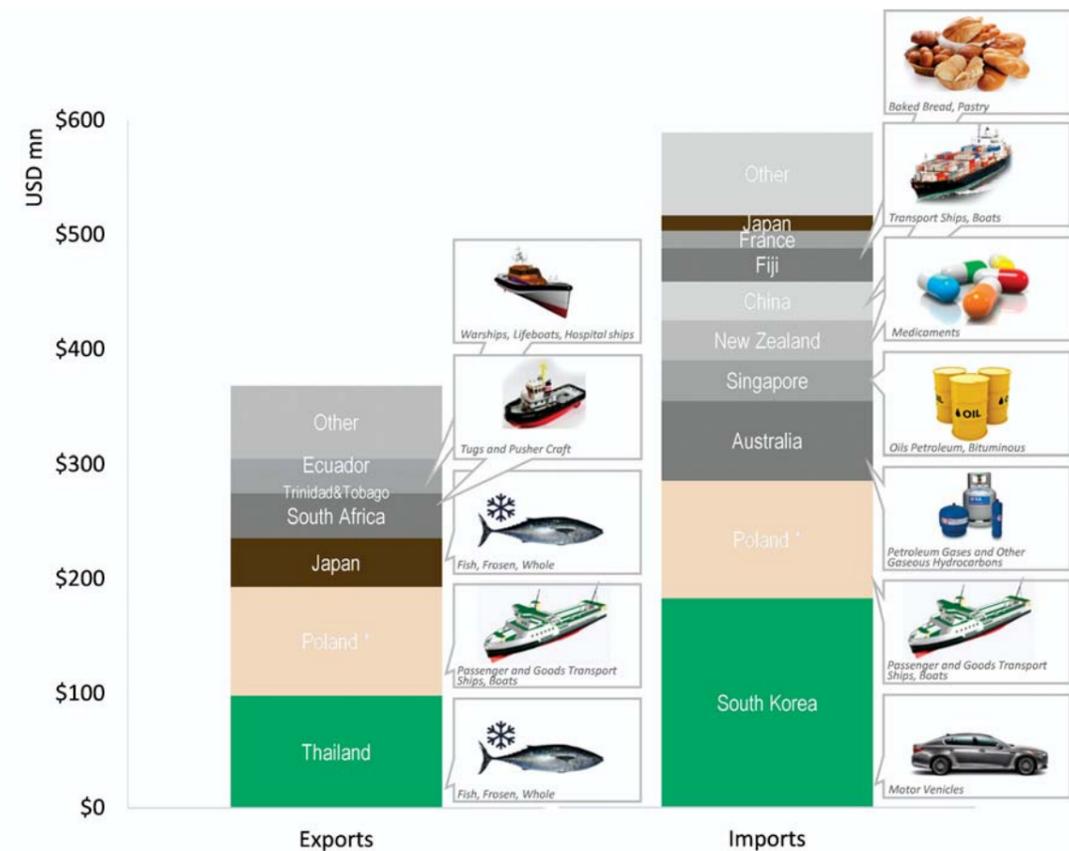
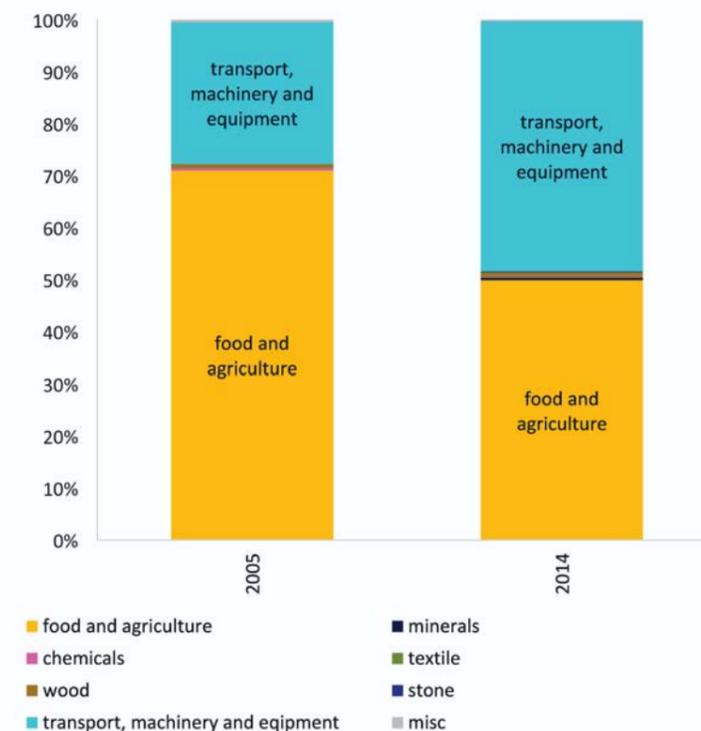


Figure 8: Breakdown of Vanuatu's exports and imports by sector, 2005 and 2014

Note: includes passenger and goods transport, ships, boats and tugs, lifeboats

Source: Whiteshield Partners

Data: BACI Comtrade, World Bank



8 World Bank, 2014
 9 www.atlas.mit.edu
 10 World Economic Outlook, 2017
 11 World Development Indicators, World Bank 2017.
 12 Note that the OECD has classified Vanuatu as a tax haven.

Yet Foreign Direct Investment (FDI) contributes minimally to the growth of manufacturing value added. Most of it flows into services, particularly wholesale or tourism, and only a fraction flows to the primary sector and processing activities (see Figure 9).

The economy relies on the primary sector and tourism

Agriculture, forestry, and fishing – in particular small-scale agriculture – provide a living for 50% of the economically active population and make up 80% of goods exports, while tourism and, increasingly, niche offshore financial services are growing mainstays of the economy. Services, at 60% of GDP¹³ and 10% of employment, is the most important source of income. Tourism is a leading light of the economy, with growing potential as a new cruise ship terminal and an upgraded airport increase capacity.

A small industry sector caters largely to the local market, hovering at around 9% of GDP – significantly below East Asia, neighbouring Fiji, and Pacific islands overall¹⁴.

A leading feature that influences all economic activities is geographical remoteness – not only compared to the rest of the world, but also domestically, between constituent islands. This radically increases transaction costs and makes exporting manufactured goods particularly daunting in the face of competition from countries with significantly more established productive capacities.

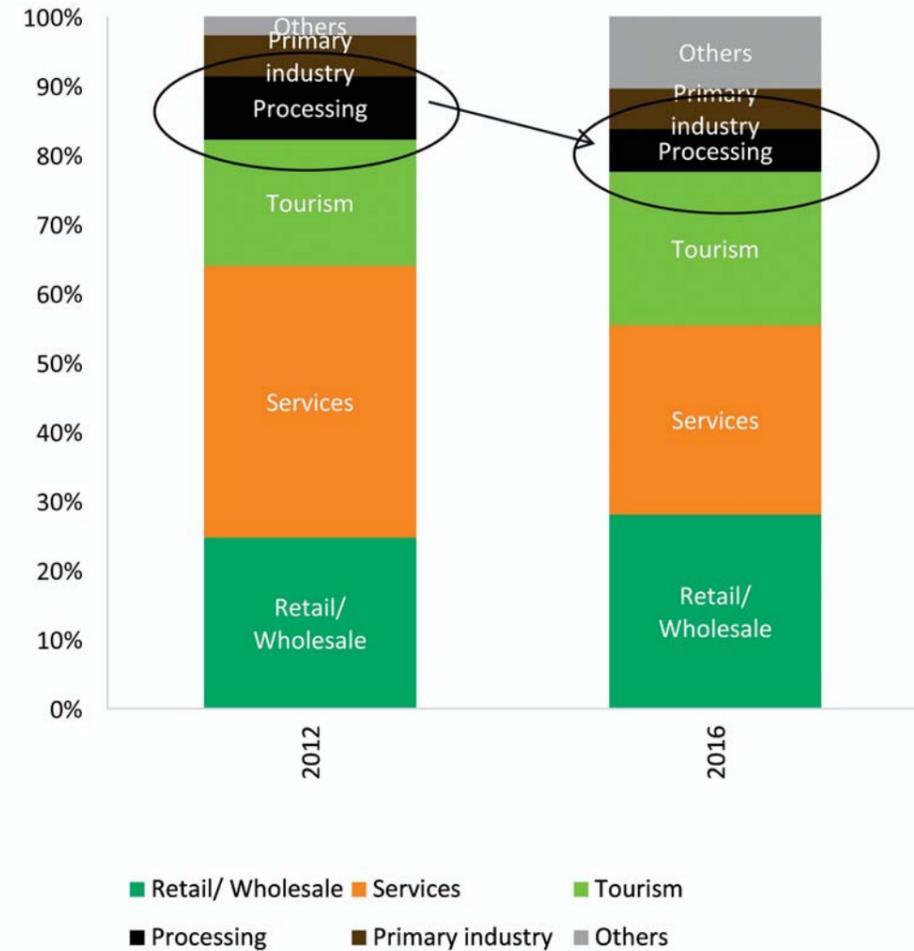
This results, inter alia, in disconnected domestic supply chains. Due in part to transport costs, for instance, the two major beef producers do not really compete directly, but operate in separate markets (Santo Meat in the north part of the archipelago; Val Pacific in the south), with separate suppliers, customers, and export targets. Geography, coupled with the nature of current economic activities, lead to weak linkages both within and between sectors – reducing potential positive spill-over effects and capacity accumulation.

Figure 9:
Breakdown of Vanuatu's FDI inflows 2012 and 2016

Note:
includes passenger and goods transport, ships, boats and tugs, lifeboats

Source:
Whiteshield Partners

Data:
Comtrade, World Bank



¹³ CIA Factbook 2017
¹⁴ World Development Indicators, World Bank, 2017.

Size and limited opportunities for skills development constrain the labour market

Vanuatu, as is the case with most Pacific Island countries, faces a range of labour market challenges – including the size of its economy, limited employment opportunities, and a looming youth bulge slated to enter the labour market over the next decade. Labour force participation rates for the working age population is relatively high at approximately 70% in 2013 according to ILOSTAT, but wages are low and most employment opportunities considered vulnerable. The regional differences are stark, with many of the more remote islands seeing high levels of poverty and prevalence of subsistence agriculture – with livelihoods hit hard by frequent natural disasters from cyclones and volcanic activity.

Government education expenditure is well in line with regional benchmarks, and while recent reforms have seen primary enrolment rise even in rural areas and secure near-universal literacy, low education levels also impede industrial development. Only 55% of the country’s children enrol in secondary school, far less than neighbouring Fiji (see Figures 10 and 11). Approximately 5% of the population has graduated from universities, and higher education opportunities are limited¹⁵.

Only a small campus of the University of the South Pacific supplies tertiary education, while a few donor-funded vocational and continuing education centres supply the medium technical skills that are essential to industrial development.

Figure 10:
Literacy rate in 2015,
% of people ages 15
and above, Vanuatu
vs peer countries

Source:
Whiteshield Partners

Data: Unesco

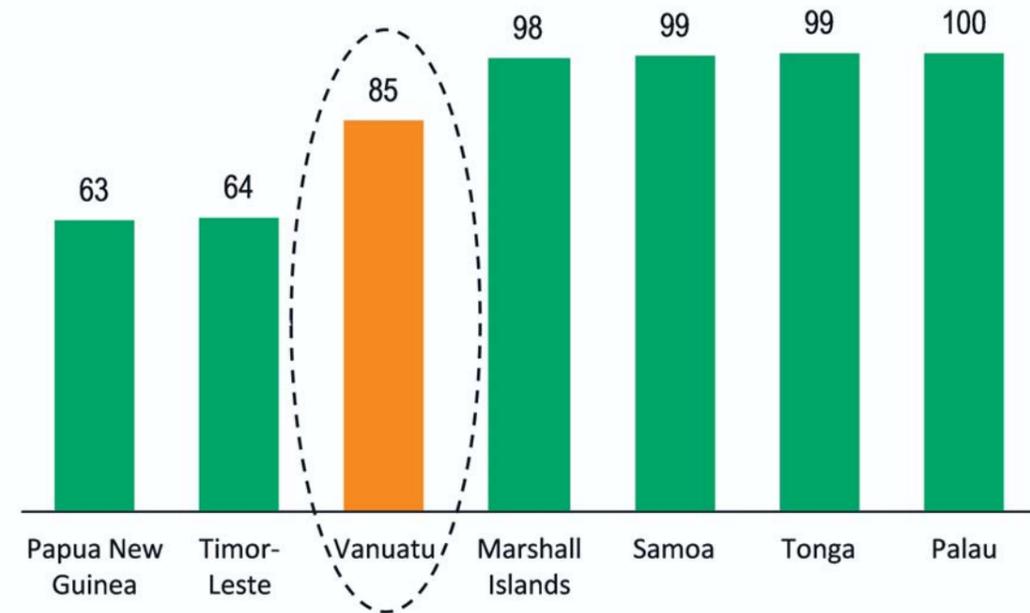
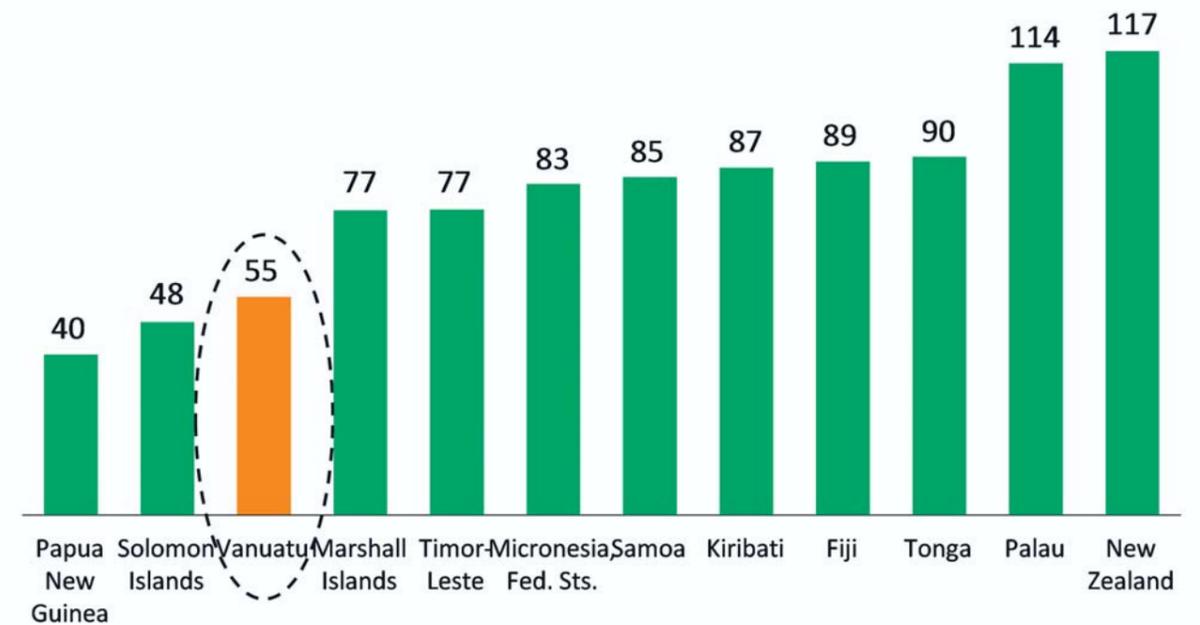


Figure 11:
Secondary school
enrollment 2015 or
latest available,
% gross, Vanuatu vs
peer countries

Source:
Whiteshield Partners

Data: Unesco



¹⁵ UNESCO, 2015

Connectivity remains slow and costly...

ICT penetration also lags behind, especially in rural areas. 60% of the population have mobile telephony subscriptions, but less than a quarter report regular internet access – far below regional benchmarks (see Figure 12) (Source: World Bank 1998-2016).

... and capacity utilisation is still limited

Manufacturing companies use less than half of installed plant capacity, which may offer additional opportunities – for instance through sharing logistical services (see Figure 13).

Some of this inefficiency results from to the high costs and low reliability of shipping and transportation. The Government, the major shareholder in port infrastructure, should take concrete measures to review its contracts to improve efficiency, reduce delivery time, and cut costs and waste. With a lower cost structure for warehousing and logistics, the export market opportunities should grow substantially.



Mobile telephony stand at Port Vila airport

Figure 12: Share of internet users 1998-2016, Vanuatu vs peer countries

Source: Whiteshield Partners
Data: Worldbank

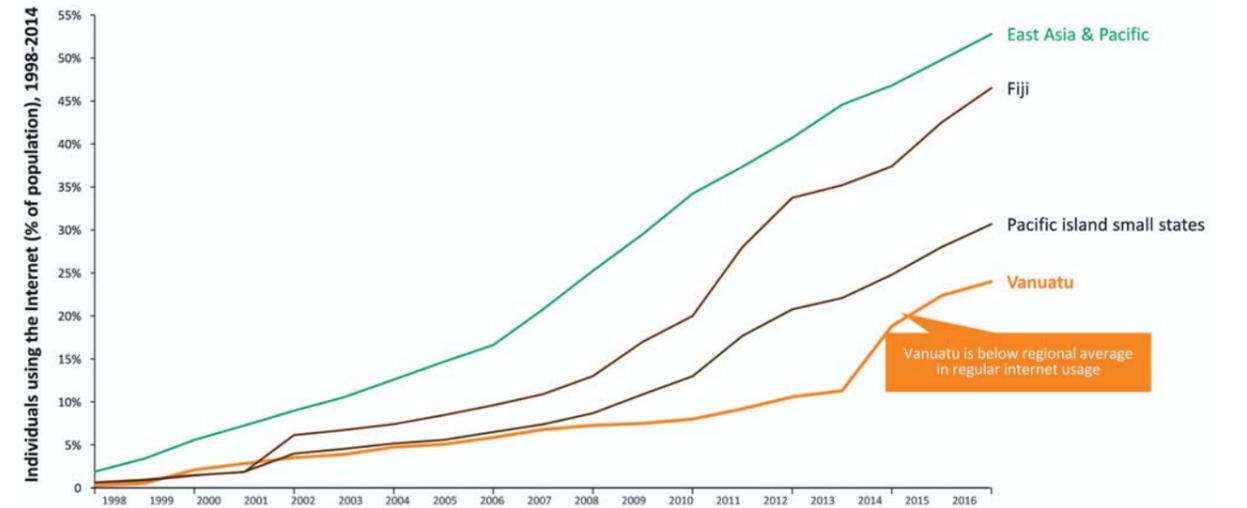
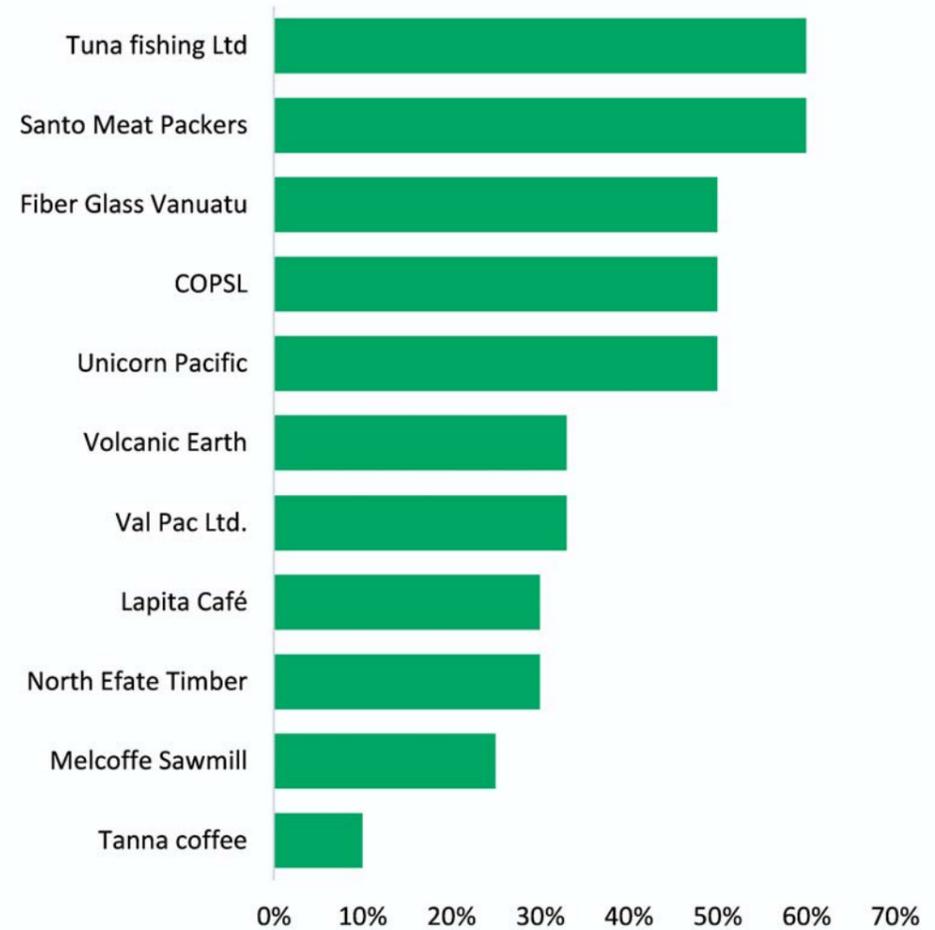


Figure 13: Plant capacity use rate among leading manufacturing companies in Vanuatu

Source: Vanuatu National Industrial Programme 2011, Company interviews



The overall business climate has improved

Business regulation in Vanuatu has improved overall. In the 2017 edition of the World Bank Doing Business Report, Vanuatu ranked 83rd in the world – ahead of Fiji (97), Samoa (89), and Tonga (85)¹⁶. Getting credit, paying taxes, and resolving insolvency are comparatively straightforward, while complying with export regulations, enforcing contracts, and dealing with construction permits are more costly and cumbersome (see Figure 14).

Electricity still remains relatively unreliable, comparatively expensive (more than a 1000% of income per capita) and time consuming to secure (120 days – only four countries in East Asia and Pacific region take more time)¹⁷.

The first industrial policy did not reach the objectives of achieving economic diversification and raising manufacturing value-added

The first industrial policy, which came out in 2011 with the objective of raising the value added of Vanuatu’s fledgling manufacturing sector, had four priorities:

- Increase economic diversification and domestic value added;
- Enhance linkages and spillovers across economic sectors;
- Create an enabling environment for the private sector;
- Improve the merchandise trade balance.

While there were some achievements - such as the expansion of copra processing in Efate and Santo - the previous section has shown that Vanuatu has largely remained an import dependent economy that continues to rely on tourism and commodity exports. Table 1 below outlines some of achievements and challenges of the country’s first industrial strategy.

Figure 14: World Bank Doing Business Index, Vanuatu 2017

Source: Whiteshield Partners

Data: Doing Business 2017, East Asia and Pacific

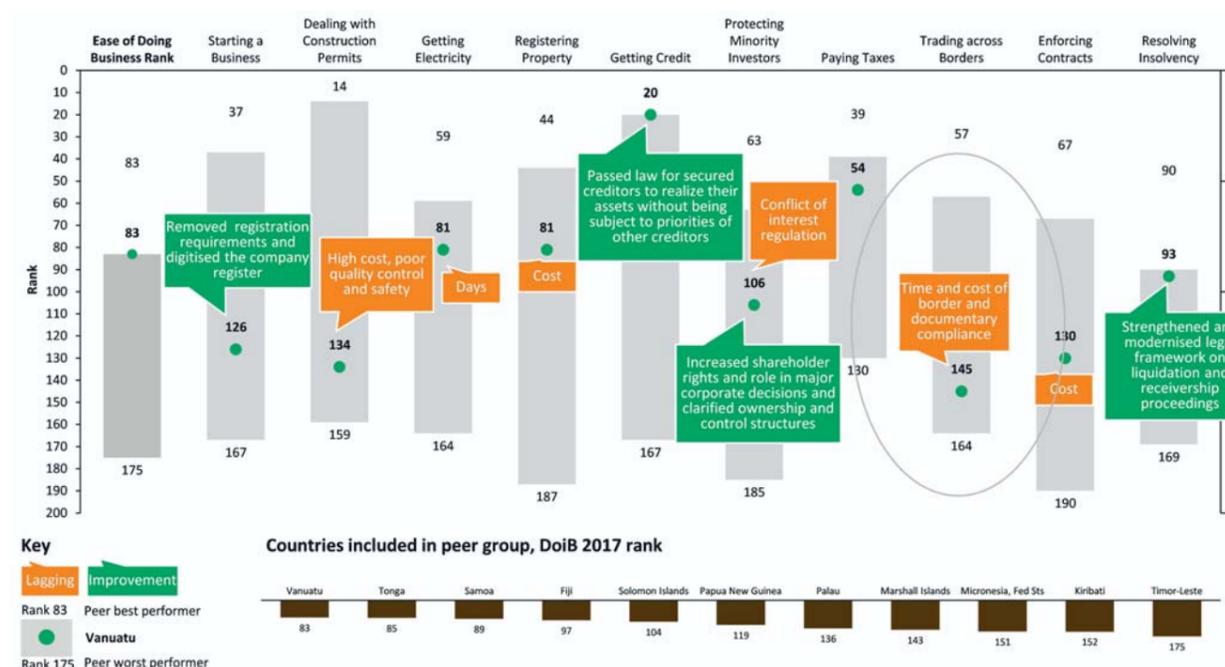


Table 1: Priorities of Vanuatu’s first National Industrial Programme for 2011

Source: Whiteshield Partners Vanuatu National Industrial Programme 2011

Priority area	Achievements	Challenges
<p>Improve economic diversification and domestic value added through enhancing the productivity, competitiveness and the capacity of manufacturing sector to move up the value chain</p> <p>PAA 2.3; 4.5</p>	<ul style="list-style-type: none"> • Increase in establishment of coconut oil processing plants on Efate, Santo, Epi • Production of some new coconut products 	<ul style="list-style-type: none"> • Limited coordination of NIP and lack of private sector involvement • No significant foreign direct investment • Horizontal barriers of land reform, infrastructure, skills not addressed
<p>Enhance linkages and spillovers among economic sectors</p> <p>PAA 2.3; 4.1; 4.3</p>	<ul style="list-style-type: none"> • Associated demand for vegetables, root crops and fruits from local businesses • Growth of retail, accommodation and tourism sectors 	<ul style="list-style-type: none"> • Lack of investment in telecommunications, transport and energy to encourage spillovers • No proactive push for the tourism sector to source Vanuatu products
<p>Create an enabling environment for the private sector as the main engine for economic growth and enhance its productivity, capacity utilization and trade capacity</p> <p>PAA 1, 1.4</p>	<ul style="list-style-type: none"> • Improvement of the business climate 	<ul style="list-style-type: none"> • Limited legal and advisory support for SMEs under development • Poor access to finance • Lack of dialogue with private sector
<p>Contribute to the improvement of the merchandise trade balance and balance of payments through enhancing Vanuatu’s exports, based on the country’s comparative advantage</p> <p>PAA 1.1.1, 1.5; 2; 4.3</p>	<ul style="list-style-type: none"> • New coconut products are being exported (copra and virgin coconut oil) 	<ul style="list-style-type: none"> • Exports still largely commodity based • Coconut exports are not capturing the full value of the raw materials

16 Doing Business 2017, East Asia and Pacific
17 Doing Business 2017, East Asia and Pacific



Vanuatu's
productive
capabilities

2 Vanuatu's productive capabilities bear untapped potential

Vanuatu's economic complexity has untapped potential that could translate into higher GDP per capita

Productive capabilities, and cultural knowledge with commercial applicability, drive the structural change needed to sustain healthy levels of economic growth. Economic Complexity, put forward by Hausmann and Hidalgo¹⁸, has proven to be one of the most promising approaches to measure and analyse these capabilities and design measures that may help enhance them and turn them into sources of comparative advantage. Armed with data to assess productive knowledge, policy makers can recognise different development paths and address capability gaps based on the stage of development. This serves to understand how best to support economic diversification: the more the country has knowledge and capabilities needed to produce a specific product or service, the higher the chances that it can diversify in that direction.

Whiteshield Partners has extended the complexity approach by aligning global level information on product complexity with trade in services data, incorporating geographic and demographic indicators, and conducting in-depth sector analysis and analysis of business constraints to identify policy options that will help move up the value chain.

The productive capabilities inherent in Vanuatu's current economic complexity is a good start, ranking above Solomon Islands and Papua New Guinea, but below comparable economies such as Samoa and Fiji (see Figure 15).

When comparing economic complexity with GDP per capita, Vanuatu demonstrates untapped potential: GDP per capita has the potential to increase by at least 100% at current levels of complexity (see Figure 16).

Figure 15: Economic Complexity Index for Vanuatu and peer countries 1998-2014

Note: Economic Complexity is a reflection of a country's productive knowledge - See Hausmann & all

Source: Whiteshield Partners

Data: BACI Comtrade, World Bank

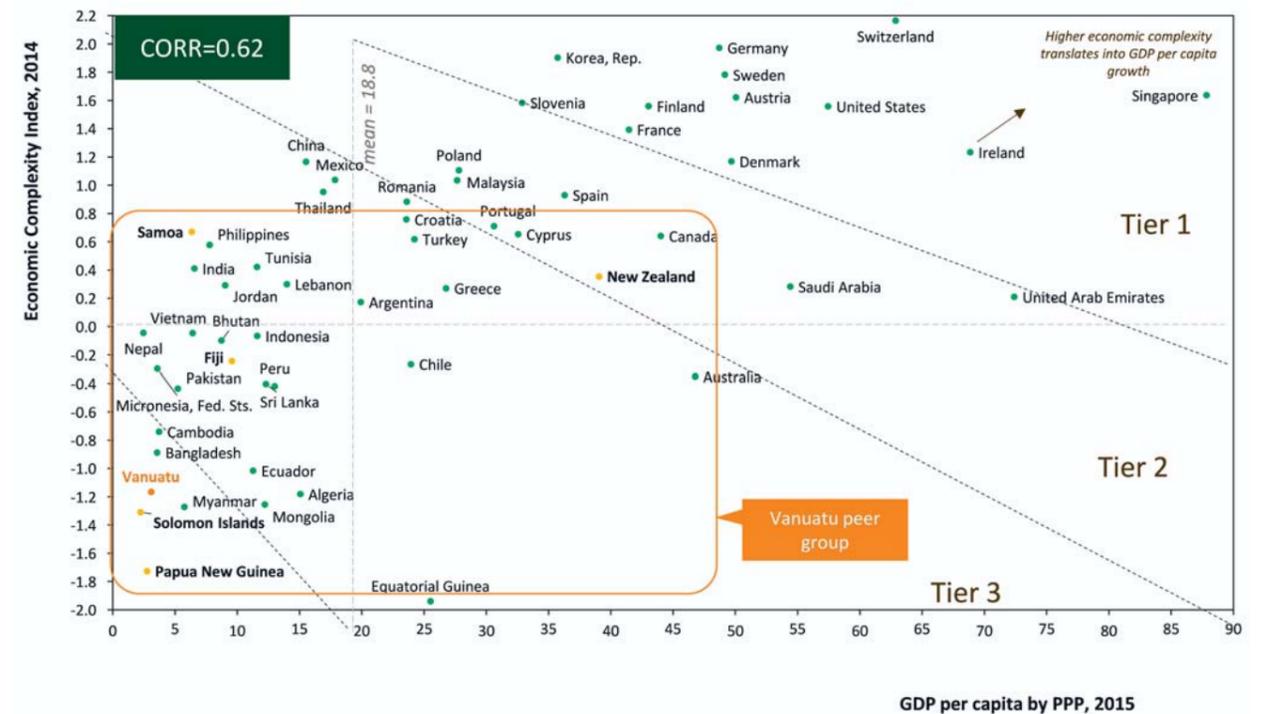


Figure 16: Economic Complexity Index 2014 vs GDP per capita 2015. Vanuatu vs peer countries

Note: Correlation coefficient and means are based on dataset of 172 countries

Source: Whiteshield Partners

Data: BACI Comtrade, World Bank



¹⁸ Hausmann, Hidalgo et al. (2011), "The Atlas of Economic Complexity", Harvard, MIT. Note: According to the authors calculations, the Economic Complexity Index accounts for 15.1 percent of the variance in economic growth during the 1996-2008 period vs. the World Governance Indicators combined including government effectiveness, regulatory quality, rule of law, voice and accountability, political stability or control of corruption which only account for 1 percent. ECI also has a 0.75 percent correlation coefficient with GDP growth.

Vanuatu's focus on primary production and processing captures only a fraction of the value chain. Production and primary processing of the coconut, for instance, represents only 20% of the total value that could be captured through advanced processing, manufacturing, extension into more complex products (e.g. soaps, shampoos, cosmetics) and marketing to end customers (see Figure 17).

Relatively low levels of complexity, coupled with remoteness, translate into fragile levels of trade competitiveness.

Vanuatu can further capitalise on its existing capabilities

The previous section discussed Vanuatu's level of economic complexity, which in turn reflects the level of capabilities in the economy. The main thrust of the country's value added strategy in this report is to understand and improve processes for accumulating and enhancing these capabilities; and for allocating them to their most productive use.

Exporting frozen tuna fillets, for instance, requires a range of capabilities – especially given the plethora of challenges involved in locating, processing, preserving, packaging, selling and shipping the product to multiple destinations. Capabilities in tuna fishing and processing range from ship-building, to locating tuna using the latest technologies, to primary processing, cooling, storage, packaging and distribution (see Figure 18).

Not all of these capabilities are equal. Some, such as processing, preservation and packaging of fish, involve skills that can be used in a wide range of products. Others, such as operating deep sea oil exploration equipment, are more specific and have limited value for other economic activities. The product space helps visualise these differences: products located in densely populated parts involve commonly needed capabilities, while those in remote parts of the space are more specific, with limited application to the rest of the economy.

Figure 17: Overview of the coconut value chain

Source: Whiteshield Partners based on secondary research and interviews

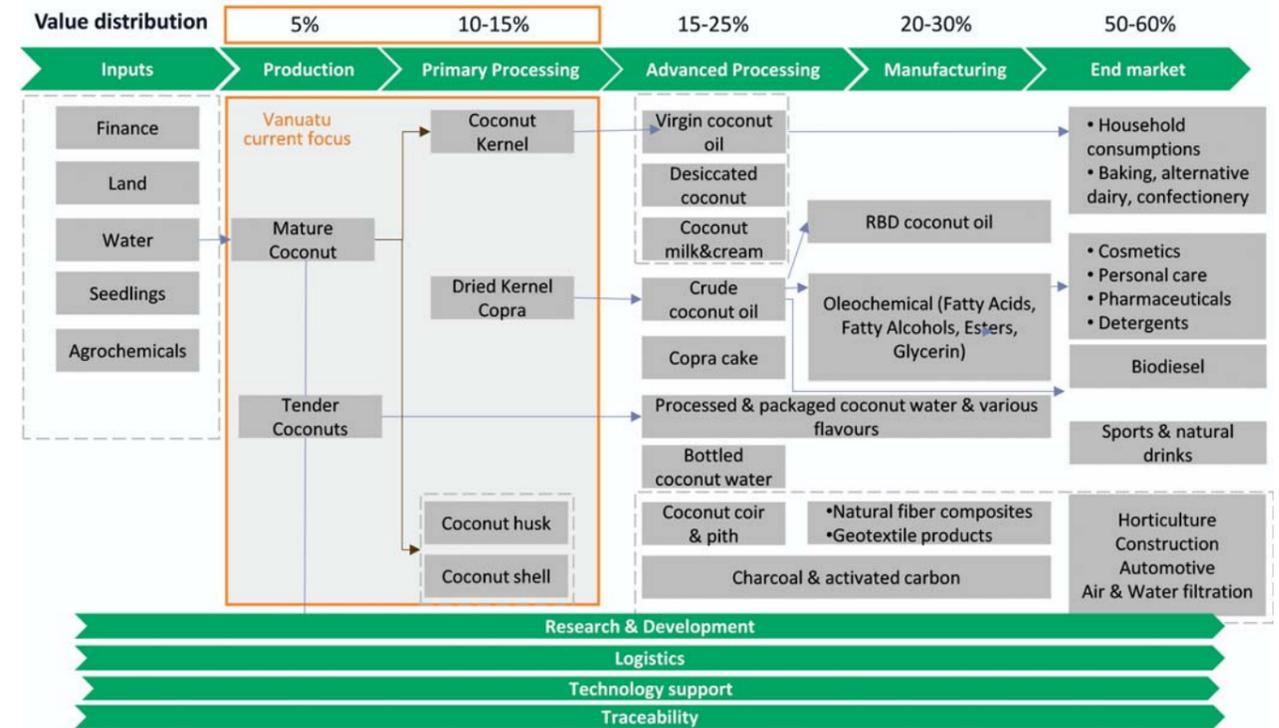
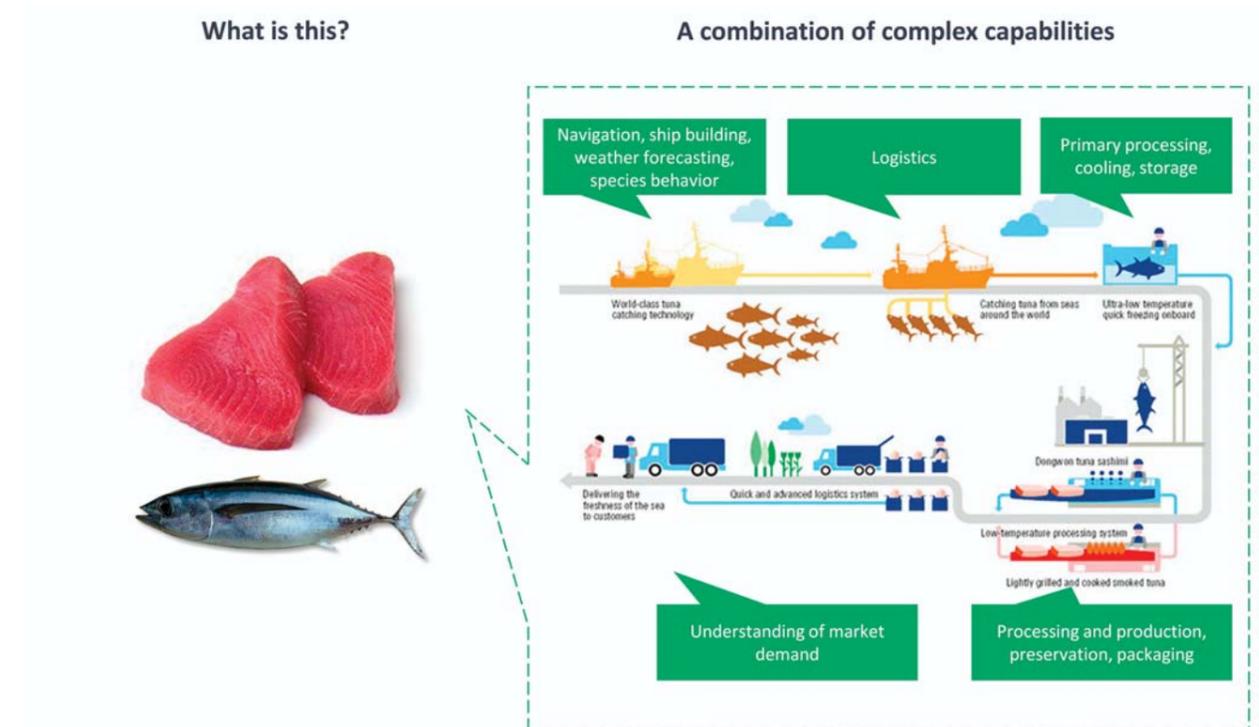


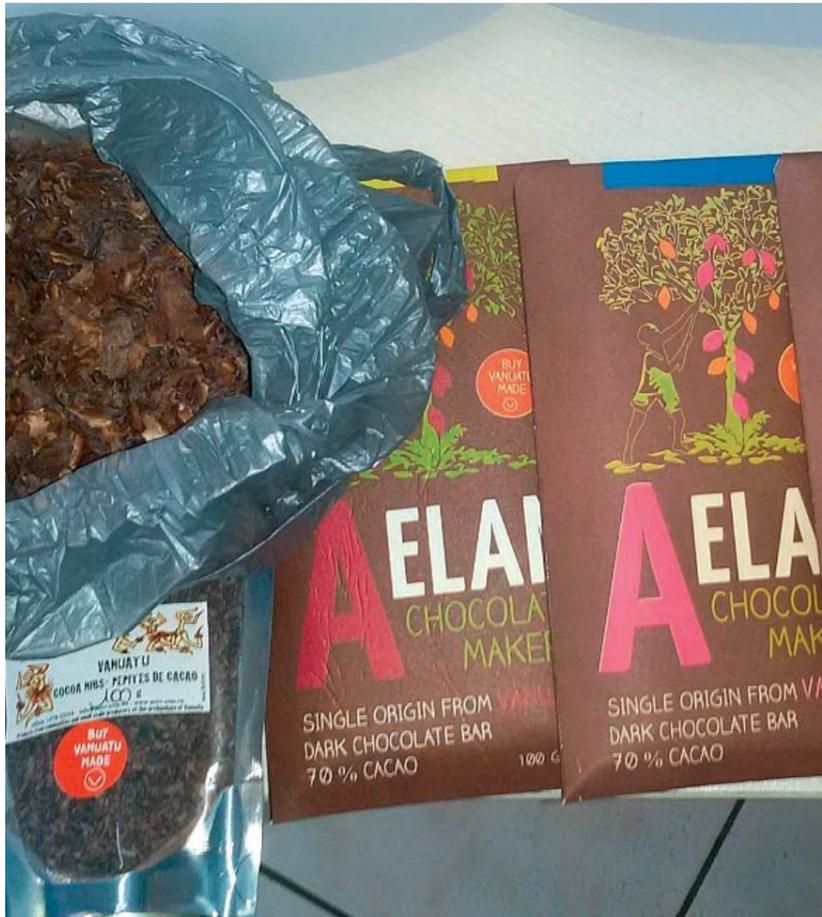
Figure 18: Example of complex capabilities associated to simple products

Source: Whiteshield Partners <https://korean-products.com>



This implies that products located closer to the centre of the product space are more complex and involve capabilities that can be used in a range of other economic activities¹⁹. Countries with revealed comparative advantage (RCA), which indicates that the economy exports more than the global average of that product, in such products would have a better base to diversify into new and higher value-added products, compared to those with RCA in products at the periphery. Figure 19 shows the product space for Vanuatu in 2005 versus 2014. The larger dots indicate the products where Vanuatu enjoys RCA – especially in food and agriculture with 17 discrete product groups, as well as wood and wood products. The underlying productive capacities may allow diversifying into nearby products (on the graph such products are linked).

Food and agriculture products are normally located on the periphery of the product space, meaning that while it is relatively easy to start producing other goods within the sector, it is rather difficult for the country to move from food and agriculture to other sectors.



Organic chocolate produced in Port Vila

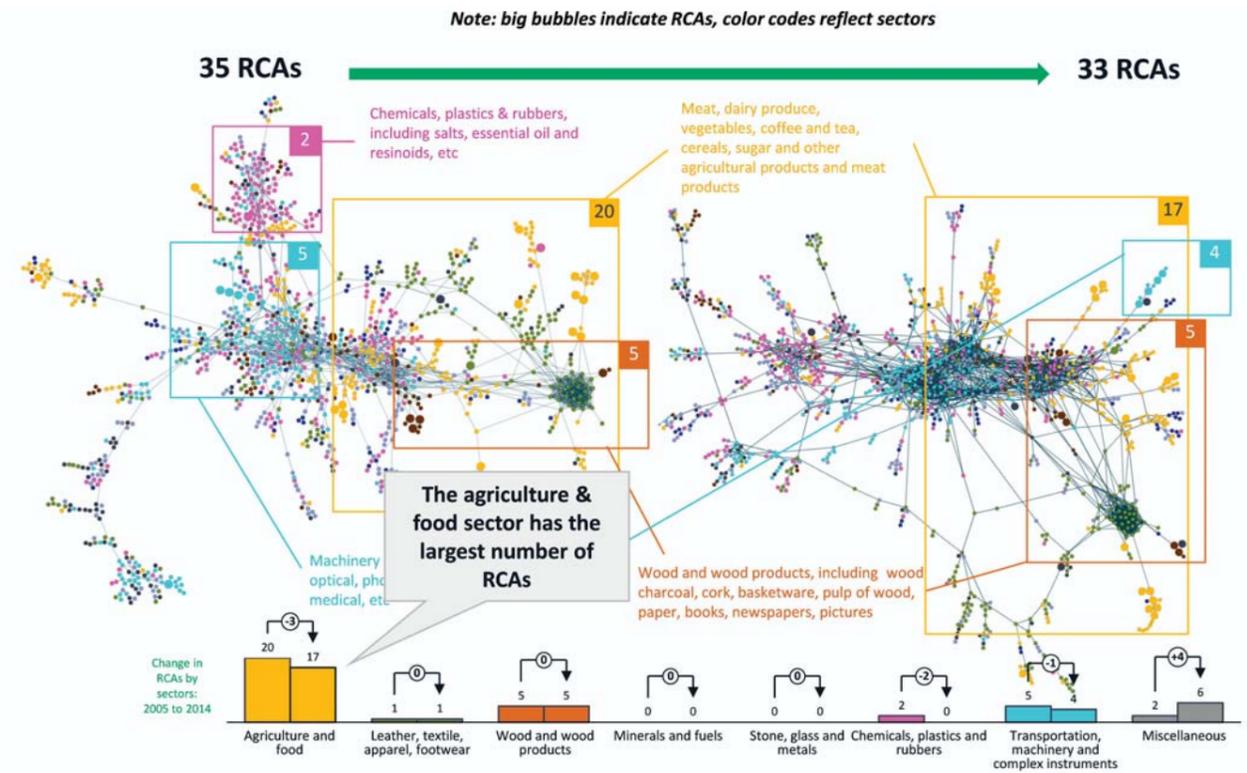
¹⁹ Note: the products here and below are 4-digit product categories. The sectors are 1 or 2 digit category names.

Figure 19:
Product space for Vanuatu 2005 and 2014

Note:
RCA is Revealed Comparative Advantage.

Source:
Whiteshield Partners

Data:
BACI Comtrade



Vanuatu's geography and demography favours animal, vegetable and food products

Adding social, demographic and geographic indicators helps nuance the analysis, with focus on agribusiness. Larger red circles on the chart below indicate geo/demographic variables for which Vanuatu compares well - high share of young (0-14 ages) and rural population, high average annual temperature and low level of temperature fluctuations - and link them to products (see Figure 20). This shows that Vanuatu's demographic and geographic characteristics are propitious for processing of many animal and vegetable products. The country should nurture and develop new capabilities to move up the value chain in these existing products.

Vanuatu already has a revealed comparative advantage in several products to which its demographic and geographic characteristics are amenable, including cocoa beans, fish, coconuts, nuts, oil seeds, crops flours and meals, coffee, plants for perfumery, etc.



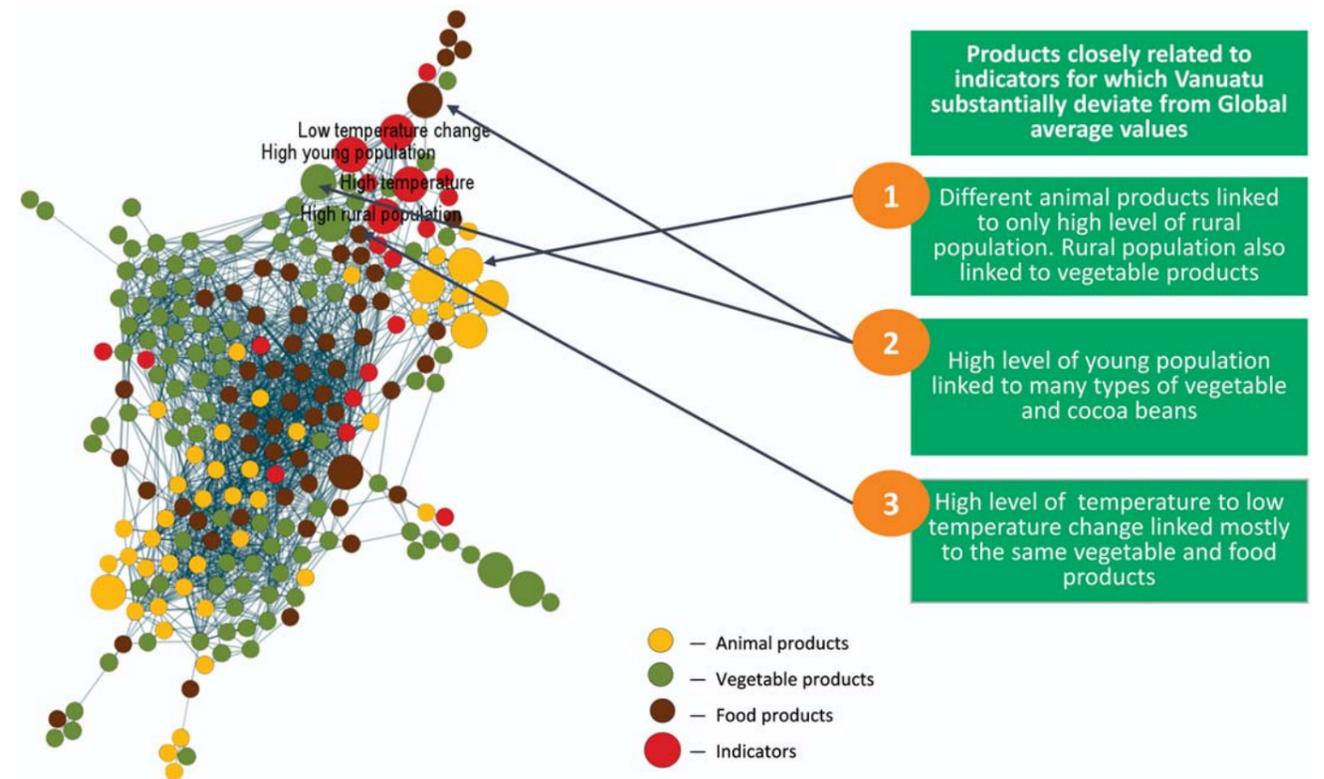
Scented oils produced in Vanuatu

Figure 20: Linking geographic variables with the product space for Vanuatu 2014

Note: RCA is Revealed Comparative Advantage. Geographic and demographic indicators, which characterize the state of a country, are considered as a special kind of "products" and added to the export matrix. If an indicator for a country deviates from the worldwide average of this indicator significantly (the normalized indicator is more than 0.68 or less than -0.68), then this country has Revealed Comparative Advantage (RCA) on it.

Source: Whiteshield Partners

Data: World Bank, BACI Comtrade





Leveraging
Vanuatu's
capabilities

3 Leveraging Vanuatu's capabilities: diversification and value addition

Existing capabilities may serve as a base for diversifying into new products within existing sectors...

Vanuatu can use its geographic and demographic characteristics and current advantages to build capabilities in other related and more complex areas, such as processed vegetable products, dates, figs, pineapples, avocados, tobacco, legumes, and sugar products (see Figure 21).

Thus, existing capabilities may serve as a base for the development of new, higher value added capabilities in the medium term and new product opportunities. For instance, having revealed comparative advantage in roughly squared wood, wood sawn, densified wood, wood ornaments and basketwork makes it relatively easy to start producing veneers and sheets for plywood, wood continuously shaped along the edges, paper and paper packaging. If Vanuatu builds capabilities to produce veneers, paper, paper packaging and shaped wood it will have a further spill-over effect with many more potential products linked to only those two groups, such as fuel wood, wooden packaging items, household and sanitary paper, and labels.

In agriculture and food sectors, existing capabilities could serve as a basis for moving into crustacean fishing and processing as well as baked goods. This in turn would foster capabilities useful for sugar confectionary, cereals, jam based products, ice-creams and drinks (see Figure 22).



Organic coffee produced, processed and packaged in Aore island

Figure 21: Matching Vanuatu products with geographic and demographic characteristics 2014

Note: table of linkages between products and indicators is based on the proximities between them.

Source: Whiteshield Partners

Data: World Bank, BACI Comtrade

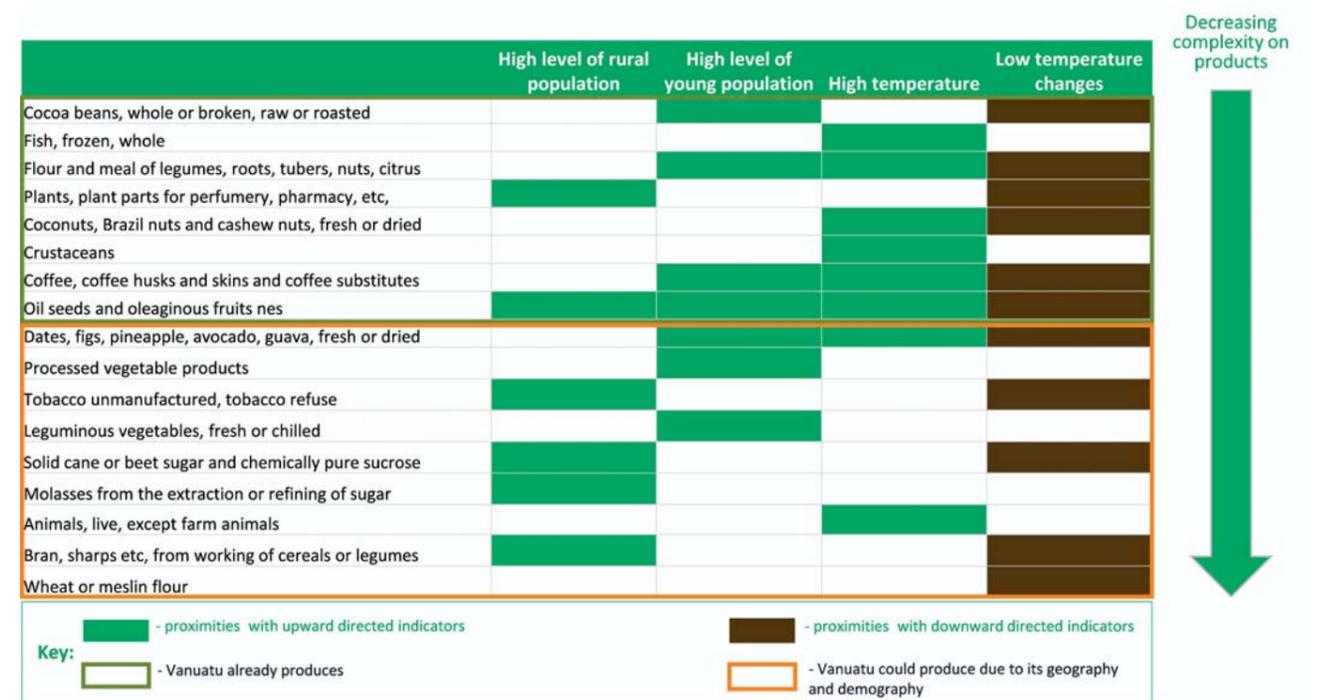
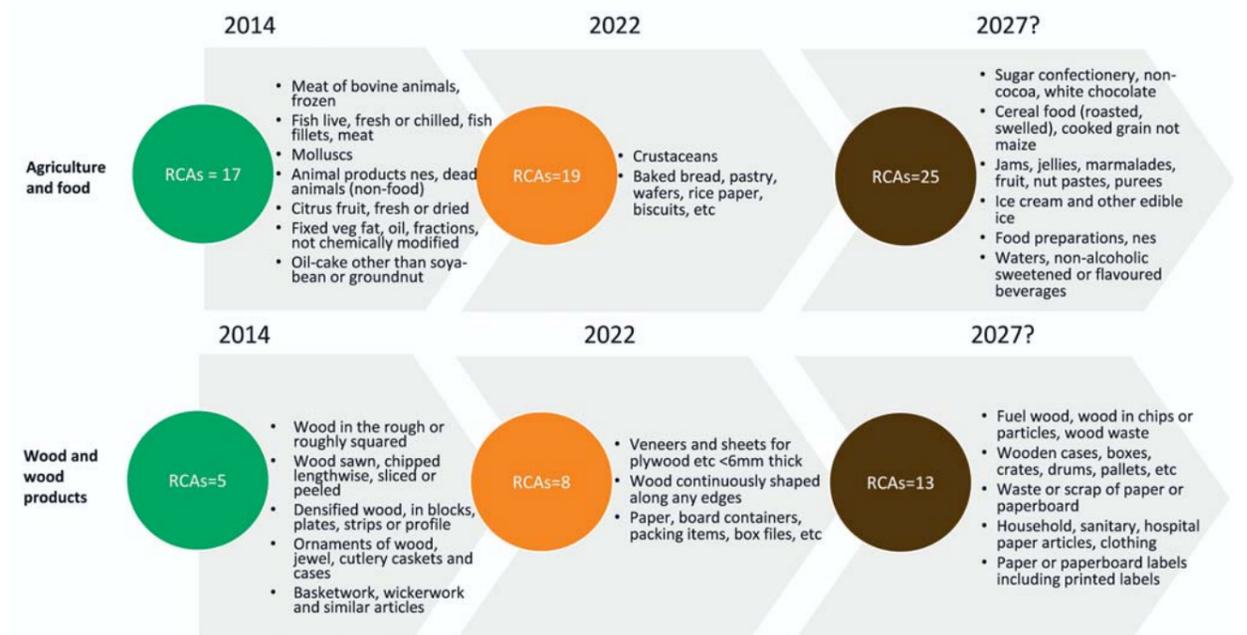


Figure 22: Product opportunities for Vanuatu 2014-2027

Note: RCA -number of products with Revealed Comparative Advantage.

Source: Whiteshield Partners

Data: BACI Comtrade, World Bank



... as well as new sectors with spill over potential

Vanuatu's strengths in agriculture and food demonstrate productive capabilities for, inter alia, breeding and selection, fishing, freezing, pressing, and milling. These can also be useful for other products, such as footwear and headwear, leather goods, pharmaceuticals and furniture production (see Figure 23).

Hence, breeding, selection, storage and freezing, required in production of meat of bovine animals, where Vanuatu has an RCA, is also required to produce edible offal of domestic animals and semi-finished meat products (see Figure 24).

The desiccation process required for already established dried citrus fruit production, can also be applied in production of jams, marmalades, jelly and sugar confectionary.

Pressing and refining processes for coconut oil production are needed for production of soaps, margarines, cosmetics and pharma products.



Vanuatu soap manufactured with local agricultural products

Figure 23: Core capabilities and spill-over effects to adjacent industries in Vanuatu 2014-2027

Source: Whiteshield Partners

	Core Capabilities (RCAs)	Examples of Industries Influenced	Cross-Industry Product Examples
Agriculture and food	<ul style="list-style-type: none"> Breeding and selection Fishing Freezing Pressing Refining Milling 	<ul style="list-style-type: none"> Footwear and headgear Raw skins, leather Furniture Pharmaceutical products 	<ul style="list-style-type: none"> Leather boots Coconut mattresses Antibacterial products Cosmetics
Wood and wood products	<ul style="list-style-type: none"> Pressing, bending Sawing, planing Slotting Drying Steaming, impregnation Chemical treatment 	<ul style="list-style-type: none"> Instruments Building Transportation Furniture 	<ul style="list-style-type: none"> Wooden ships Wooden houses Seats, tables Hammers, shovels, planes
Transportation	<ul style="list-style-type: none"> Engineering Shipbuilding Navigation Insulation 	<ul style="list-style-type: none"> Electronic Equipment Machinery & Instruments Construction Textiles 	<ul style="list-style-type: none"> Water turbines Flow control systems Sails

Figure 24: Linking capabilities, know-how, and product opportunities for Vanuatu 2014-2027

Source: Whiteshield Partners

	RCA	Key Capabilities	Product Opportunities (examples)
Agriculture and food	Meat of bovine animals, frozen (PCI=-0.96)	<ul style="list-style-type: none"> Breeding and selection Storage and freezing 	<ul style="list-style-type: none"> Live bovine animals (including specialized breeds) Edible offal of domestic animals Meat semi-finished products
	Citrus fruit, fresh or dried (PCI=-1.25)	<ul style="list-style-type: none"> Storage and freezing Desiccation 	<ul style="list-style-type: none"> Jams, jellies, marmalades, fruit, nut pastes, purees Sugar confectionery
	Coconut (copra) oil and its fractions (PCI=-1.79)	<ul style="list-style-type: none"> Cold, hot pressing Refining 	<ul style="list-style-type: none"> Coconut mattresses Pharmaceutical products (antibacterial) Soap, margarine Cosmetics
	Cocoa beans, whole or broken, raw or roasted (PCI=-2.71)	<ul style="list-style-type: none"> Pressing Fermenting, Storage, Alkali treatment 	<ul style="list-style-type: none"> Cocoa paste, butter, fat, oil Cocoa powder, unsweetened Chocolate and other foods containing cocoa
Agriculture, food and wood	Fish: live, frozen, fresh, fillets. Molluscs (-1.64< PCI <-1.12)	<ul style="list-style-type: none"> Fishing Navigation Primary processing, cooling, preservation 	<ul style="list-style-type: none"> Crustaceans Ice cream and other edible ice Fish meal for human consumption Fresh or chilled meat of bovine animals, edible offals Sausages, similar products of meat, fish etc
	Coffee, coffee husks and skins and coffee substitutes (PCI=-1.96). Vanuatu has RCA in this product	<ul style="list-style-type: none"> Plant growing, treatment of trees Wet processing, fermenting, milling Roasting 	<ul style="list-style-type: none"> Dried nuts Cereal food (roasted, swelled), cooked grain not maize
	Wood in the rough, wood sawn, densified wood (-2< PCI <-0.7)	<ul style="list-style-type: none"> Pressing, bending Sawing, planing Slotting Drying Steaming, impregnation Chemical treatment 	<ul style="list-style-type: none"> Wooden cases, boxes, crates, drums, pallets, etc Household, sanitary, hospital paper articles, clothing Paper or paperboard labels including printed labels

The analysis suggests that machinery, electrical instruments and transportation, as well as animal products, metals, stones, glass and food could be attractive products, while IT, telecom and travel would be high-potential services for the country (see Figure 27).

Vanuatu's Agribusiness Prioritisation Index hones in on animal, vegetable and food products (Figure 28). Similar to the Sector Prioritization Index, this Index is based on two dimensions: intrinsic attractiveness and attractiveness for Vanuatu. A product is considered to be attractive for Vanuatu if it has high and growing revealed comparative advantage score, high opportunity gain and high rate of exports growth. It is considered to be intrinsically attractive if it has high complexity, low ubiquity (i.e. uniqueness relative to other countries), low ubiquity growth rate, high share of the product in global export and high rate of the global export growth.



Organic nuts and cookies processed and packaged in Port Vila

Figure 27:
Vanuatu Sector Prioritization Index 2014

Source:
Whiteshield Partners

Data:
BACI Comtrade,
World Bank, OECD
Stat

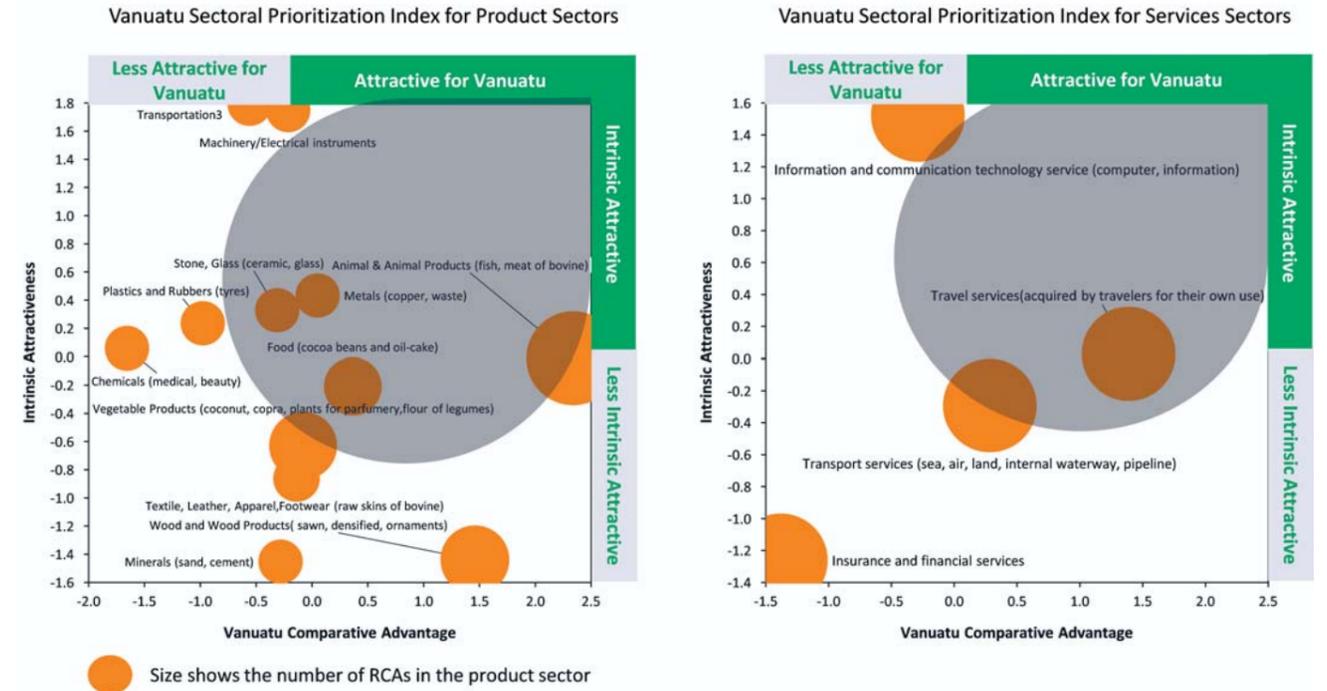


Figure 28:
Overview of the Agribusiness Prioritization Index

Source:
Whiteshield Partners

1. Vanuatu Comparative Advantage

Question	Indicator	Definition	Source
• What are the product current comparative advantages in Vanuatu? How they has changed in 2009-2014??	• RCA	• RCAs in 2014	• BACI (Comtrade) Export data
• How the production level has changed in 2009-2014 in Vanuatu?	• Growth of RCA	• Growth of the RCA in 2009-2014 CAGR	
• What is the future potential of the products?	• Export growth	• Growth of product export in 2009-2014 CAGR	• Opportunity gains
	• OG		

$$\text{Vanuatu Comparative Advantage index} = \frac{(nRCA_{2014} + \text{Growth of } nRCA + \text{Export growth})}{3} \text{ if } OG=0 \text{ and } \frac{(nRCA_{2014} + \text{Growth of } nRCA + \text{Export growth} + OG)}{4} \text{ otherwise}$$

2. Intrinsic attractiveness

Question	Indicator	Definition	Source
• How complex are products?	• PCI	• Product complexity Index	• BACI (Comtrade) Export data
• How many companies export the products? How this number of companies has changed in 2009-2014?	• Ubiquity	• Number of countries with RCA	
• What is the level of competition? How this level has changed in 2009-2014?	• Growth of Ubiquity	• Growth of the Ubiquity in the 2009-2014 CAGR	• Share of the product in the world export
	• Share of Product		
	• Global Export Growth	• Growth of the share of the product in the world export 2009-2014 CAGR	

$$\text{Intrinsic attractiveness} = \frac{(\text{Weighted PCI} - \text{Mean of Ubiquity} - \text{Growth of Ubiquity} + \text{Share of Sector in the Total Export} + \text{Global Export Growth of Sector})}{5}$$

All variables are normalized using this formula:

$$z = \frac{x - \mu}{\sigma}$$

μ = Mean
 σ = Standard Deviation

Agricultural products for which Vanuatu already has a revealed comparative advantage that also scored high on the index are oil cake, frozen fish, and animal products. High-potential new products include feathers, down, bird skins, wheat, sponges, animal fat and oils, glycerol, and gluten (see Figure 29).

The Agribusiness Prioritisation Index points to new animal, vegetable and other food products with attractive trade perspectives

Most attractive for Vanuatu products in the animal sector are fresh and frozen swine meat, salted, smoked, and dried meat, live horses, donkeys, pigs, poultry meat, bristle, brush making hair, whey, milk, cream and cream products, including cheese and curd (see Figure 30).



Poultry meat processing factory in Port Vila

Figure 29:
Vanuatu Agribusiness Prioritization Index -most promising products 2014

Source: Whiteshield Partners

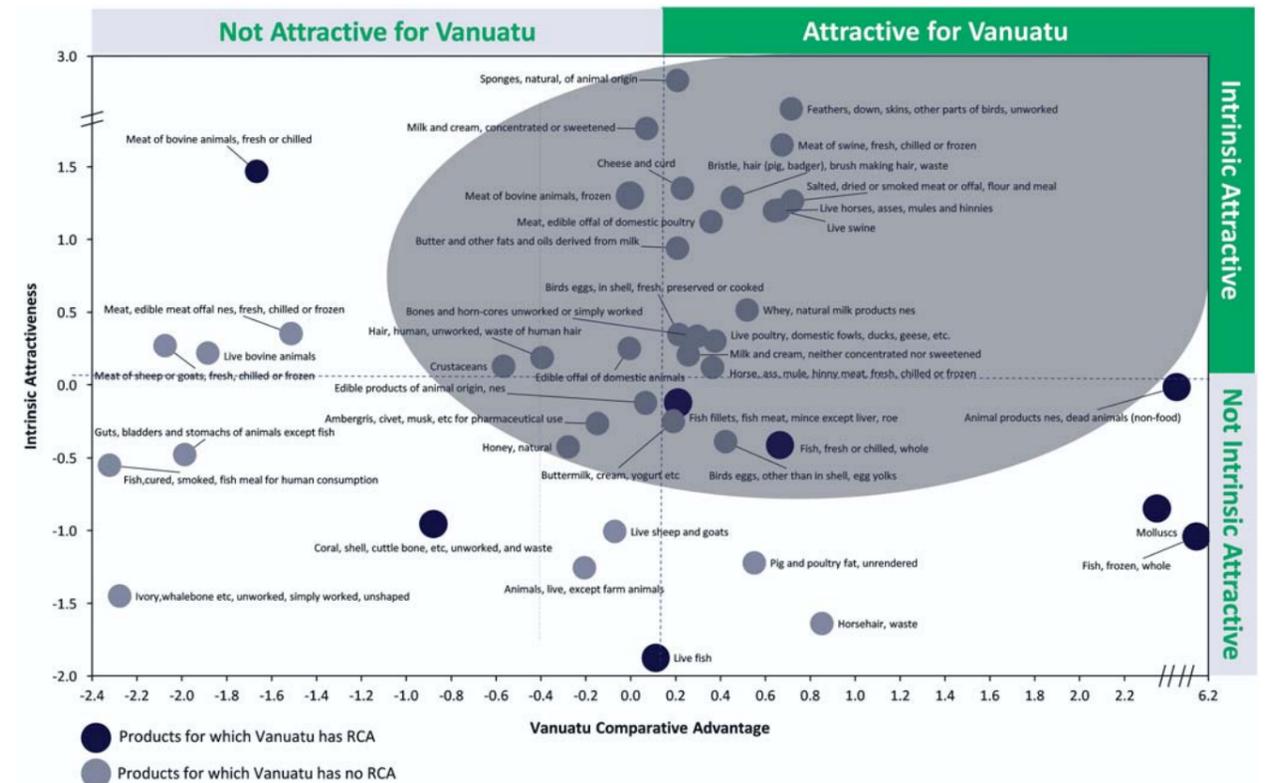
Data: BACI Comtrade, World Bank, OECD Stat

HS1996	HS name	Vanuatu Comparative Advantage				Intrinsic attractiveness						Total Index	Ranking	
		RCA	RCA Growth	Export Growth	OG	Vanuatu Comparative Advantage	Share of product	PCI	Ubiquity*(-1)	Growth of Ubiquity*(-1)	Global Export Growth			Intrinsic attractiveness
2306	Oil-cake other than soya-bean or groundnut	0.13	5.33	6.27		5.60	0.01	-0.44	-1.12	-0.15	1.22	-0.22	3.67	1
303	Fish, frozen, whole	12.67	0.05	0.16		6.15	1.59	-0.94	-3.26	0.54	-0.21	-1.04	3.48	2
511	Animal products nes, dead animals (non-food)	-0.06	3.51	3.82		3.46	-0.50	0.46	-0.85	0.57	0.29	-0.02	2.35	3
505	Feathers, down, skins, other parts of birds, unworked	-0.14	0.22	0.16	1.82	0.71	-0.54	2.03	1.16	0.75	2.36	2.64	2.29	4
1001	Wheat and meslin	-0.14	0.22	0.16	0.49	0.24	4.48	0.62	0.36	0.69	0.06	2.84	2.10	5
509	Sponges, natural, of animal origin	-0.14	0.22	0.16	0.41	0.21	-0.76	0.94	2.10	7.42	-3.50	2.83	2.07	6
1506	Animal fat, oil, fractions not chemically modified nes	-0.14	0.22	0.16	1.90	0.74	-0.72	1.54	0.96	0.38	2.56	2.15	1.98	7
2304	Soya-bean oil-cake and other solid residues	-0.14	0.22	0.16	1.07	0.45	2.49	0.37	1.43	0.68	0.20	2.36	1.91	8
1520	Glycerol (glycerine), glycerol waters & glycerol lyes	-0.14	0.22	0.16	0.92	0.39	-0.71	1.28	0.56	1.11	2.52	2.17	1.75	9
1109	Wheat gluten	-0.14	0.22	0.16	2.48	0.95	-0.61	2.41	1.43	-0.15	0.25	1.52	1.69	10
2303	Starch, sugar, brewing & distilling industry residues	-0.14	0.22	0.16	1.54	0.61	-0.11	1.62	1.09	0.16	1.26	1.83	1.67	11
1503	Lard stearin, oleostearin & oils, natural tallow oil	-0.14	0.22	0.16	1.88	0.74	-0.75	1.25	1.36	2.06	-0.35	1.63	1.62	12
203	Meat of swine, fresh, chilled or frozen	-0.14	0.22	0.16	1.71	0.67	2.31	1.66	0.82	-0.98	-0.21	1.65	1.59	13
2004	Vegetables nes, prepared, frozen	-0.14	0.22	0.16	1.49	0.60	-0.03	1.20	1.43	1.04	0.04	1.67	1.55	14
1505	Wool grease and fatty derivatives (including lanolin)	-0.14	0.22	0.16	1.77	0.70	-0.73	1.41	1.29	1.17	0.26	1.56	1.54	15
2003	Mushroom, truffle, prepared or preserved, not vinegar	-0.14	0.22	0.16	1.51	0.60	-0.65	1.08	1.43	1.95	-0.39	1.56	1.48	16
210	Salted, dried or smoked meat or offal, flour and meal	-0.14	0.22	0.16	1.83	0.72	-0.25	1.71	1.16	0.48	-0.33	1.26	1.35	17
103	Live swine	-0.14	0.22	0.16	1.67	0.66	-0.28	1.99	1.09	0.16	-0.33	1.20	1.27	18
1501	Lard, other pig fat and poultry fat, rendered	-0.14	0.22	0.16	1.96	0.77	-0.71	2.31	0.69	0.29	-0.20	1.08	1.26	19
101	Live horses, asses, mules and hinnies	-0.14	0.22	0.16	1.61	0.64	-0.51	1.43	0.96	1.26	-0.51	1.20	1.25	20

Figure 30:
Vanuatu Agribusiness Prioritization Index -animal sector 2014

Source: Whiteshield Partners

Data: BACI Comtrade, World Bank, OECD Stat



In the vegetable sector, the most attractive additional products include soy beans, oats, sunflower seeds and oil, barley, rape and colza seeds, lettuce, chicory, rye, maize, pepper, pimento, capsicum, grape, and vegetable saps (see Figure 31).

In the other food sector, high-potential products are starch, sugar, brewing materials, prepared and frozen vegetables, mushrooms, truffles, chocolate, cocoa powder, butter and paste, fermented beverages, malt extract, tapioca, and sausages (see Figure 32).

The analysis from the Sector and Agribusiness Prioritisation Index, which reveals where Vanuatu has specific comparative advantages, is particularly important in light of Vanuatu's likely graduation to a Developing Country in 2020. Anticipating its graduation – and associated loss of preferential market access – Vanuatu should focus on value addition to products in which it has the greatest revealed comparative advantage (RCA) such as processed fish, cocoa or pepper.



Black peppercorn produced in Santo

Figure 31:
Vanuatu Agribusiness Prioritization Index -vegetable sector 2014

Source:
Whiteshield Partners

Data:
BACI Comtrade,
World Bank,
OECD Stat

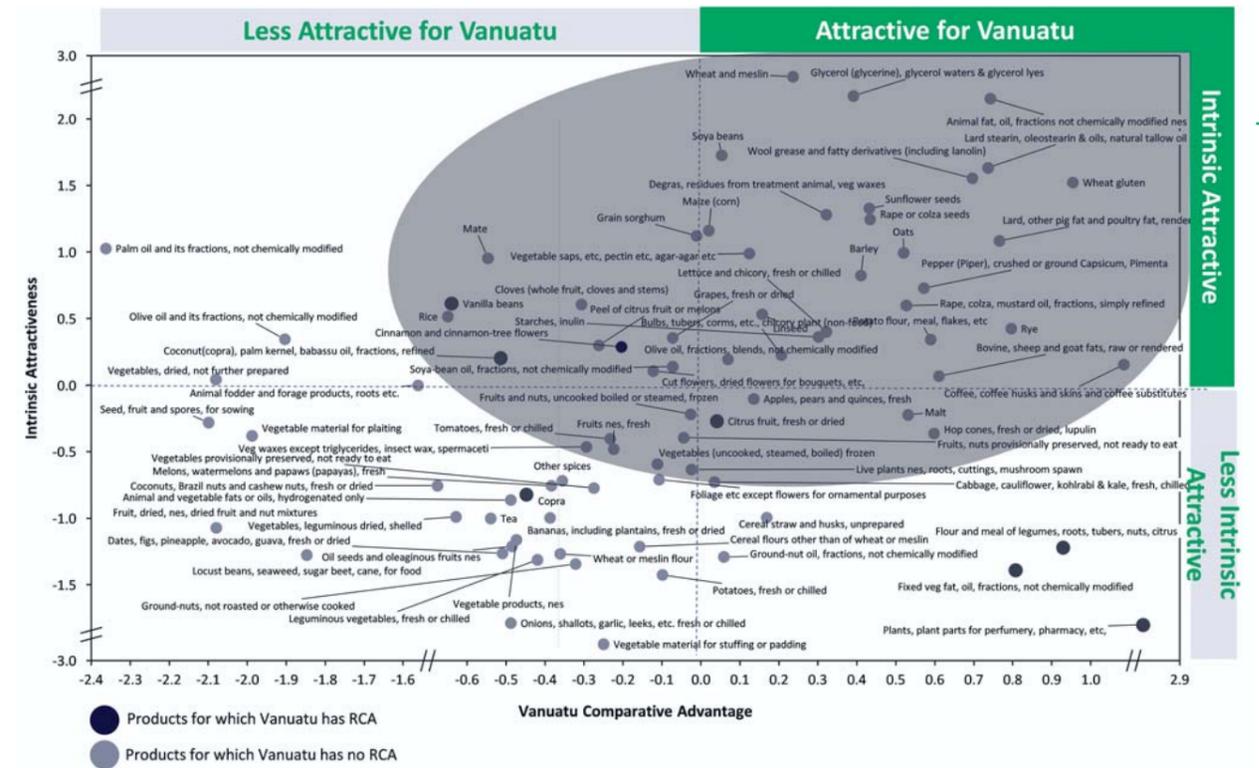
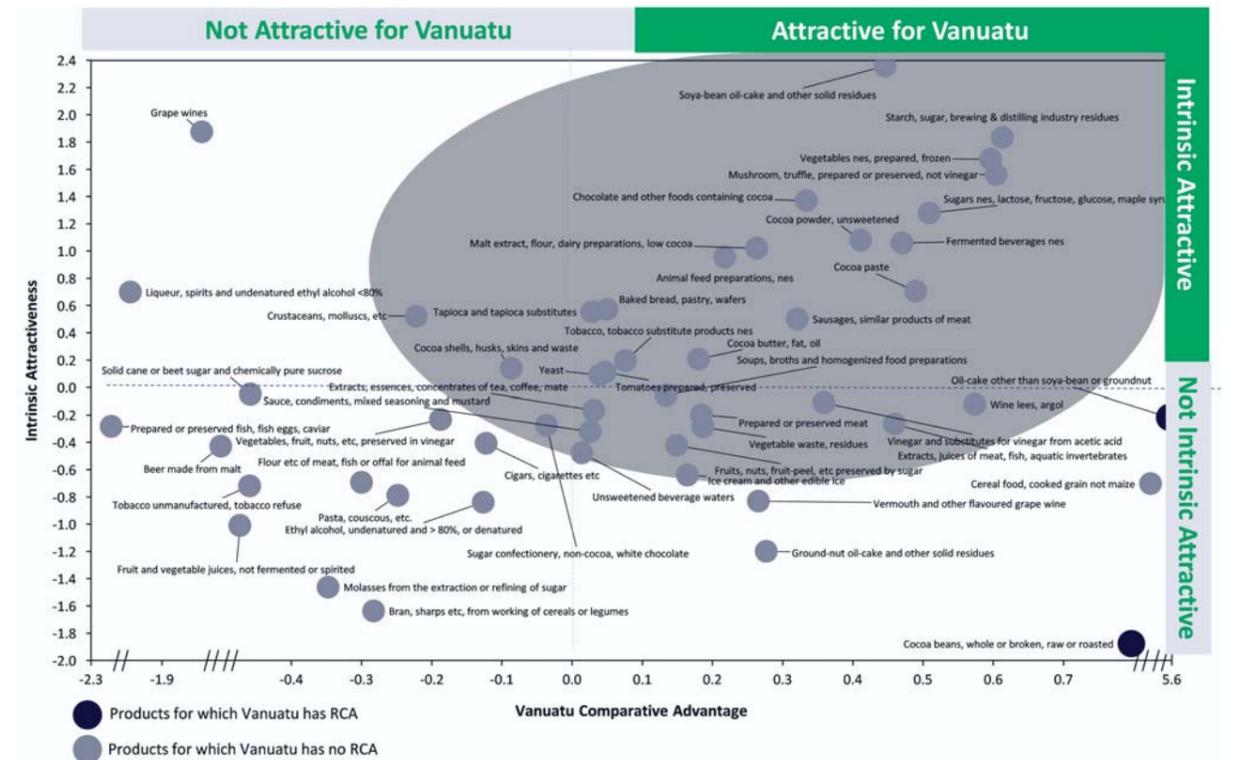


Figure 32:
Vanuatu Agribusiness Prioritization Index -other food sector 2014

Source:
Whiteshield Partners

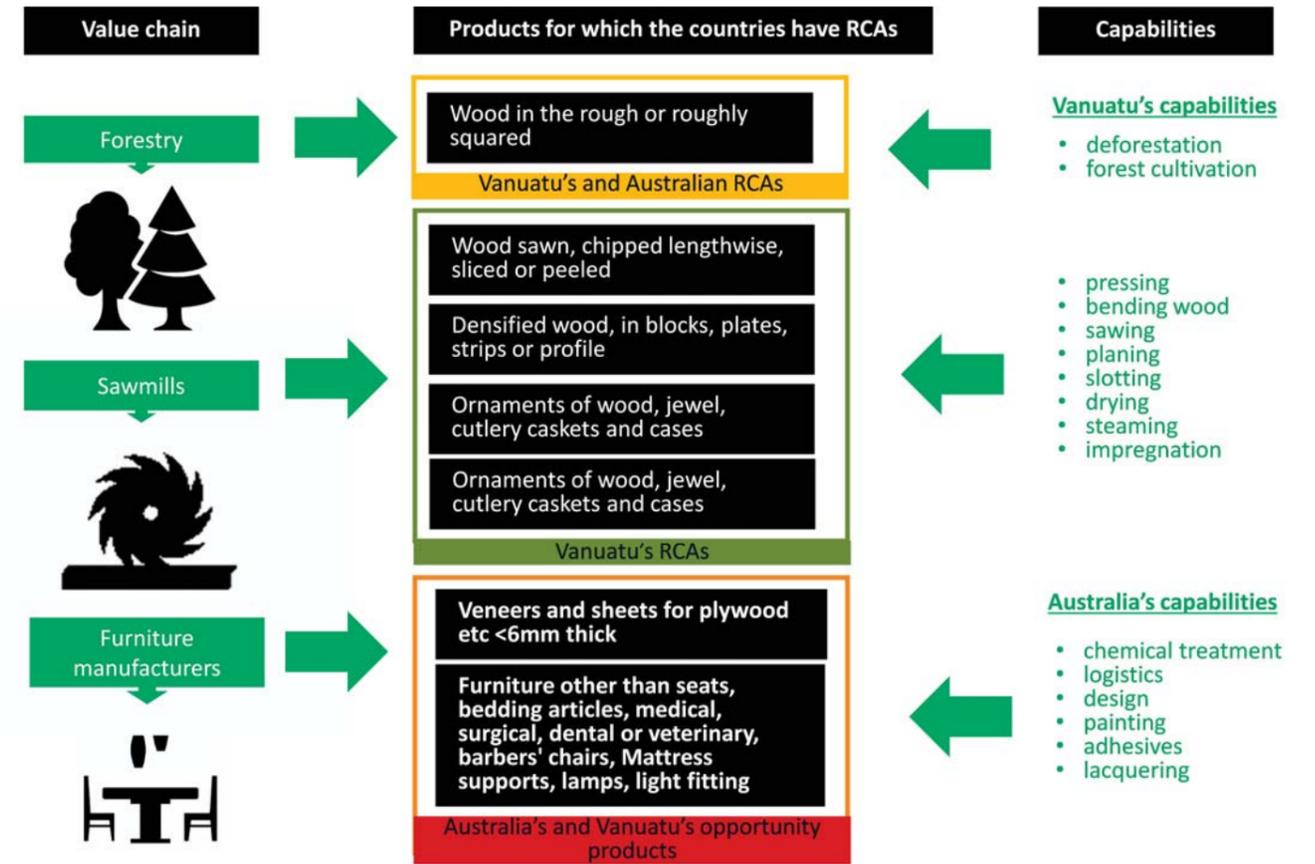
Data:
BACI Comtrade,
World Bank,
OECD Stat



Leveraging synergies in capabilities with other countries can also yield benefits for Vanuatu

Moving up the value chain, Vanuatu can combine its capabilities with those of other countries to yield mutual benefits. Consider the case of the furniture value chain between Vanuatu and Australia (see Figure 33). Vanuatu has capabilities in forestry and sawmills, some of which are also available in Australia. Gaining access to Australia's capabilities in furniture manufacturing, through activities such as chemical treatment, logistics, design, painting, adhesion and lacquering will allow Vanuatu entrepreneurs to explore products such as veneers, plywood sheets, simple furniture items, mattress supports, lamps, and light fittings.

Figure 33:
Overview of the furniture value chain
Source:
Whiteshield Partners





Policy challenges
to address

4 Vanuatu sector-specific and horizontal challenges to market development

Vanuatu must address a range of vertical policy barriers to fully unlock the potential of some key existing products

The vertical level analysis in this report has covered key products that comprise the bulk of Vanuatu's current production and exports such as coconut, cocoa, coffee, kava, tamanu, nangae, peanut, fish, and furniture. This section lists some examples and potential measures (see also Table 2).

Coconut

Vanuatu currently captures a fraction of the value-added potential of coconut. Coconuts in Vanuatu are currently used mainly for copra production and some copra oil production while the rest being wasted. Yet each part of the plant has multiple uses and most of them are commercially viable. For instance, husks can be used for rugs, ropes, brushes, pellets, insulation, and soil cover; coconut shells - for decorative elements, musical instruments, household goods, and furniture; palm tree trunks - for windows, carpentry, furniture, and musical instruments; leaves - for woven elements and roofs; roots - for beverages, herbal medicine, and dye; meat - for baked goods and animal fodder; and oil - for a wide range of cosmetics and food (see Figure 34).

Action to consider: Launch a Total Value Production (TVP) initiative to raise awareness of coconut opportunities and train potential investors and entrepreneurs regarding opportunities to add value to local production of copra, coconut oil, and the coconut husk, shell, tree and roots. The TVP initiative could further build on the professional cooperative model to pool resources for training and investment.

Cocoa

As in the case of coconut, Vanuatu exports most of its cocoa beans in a raw form, failing to capture most of the potential value. Significant capital requirements, uncertainty over land ownership rights, and intense international competition make it difficult for Vanuatu to compete in higher value-added segments. However, some opportunities are within reach, such as cocoa butter and niche, high quality, branded chocolate combined with other Vanuatu products (e.g. pepper, ginger).

Action to consider: Target foreign direct investment (FDI) to develop and expand cocoa processing, including expansion into cocoa butter and niche premium organic chocolate mixed with other Vanuatu ingredients. Consider joint ventures with existing local firms.

Figure 34: Overview of coconut product applications

Source: Whiteshield Partners



Table 2: Overview of challenges and opportunities for key Vanuatu products

Note: The references under each activity refer to actions in the roadmap that is detailed in chapter 6

Source: Whiteshield Partners

Sector	Key facts	Key challenges	Proposed activities
 <p>Coconut</p>	<ul style="list-style-type: none"> 27,000 tons of copra exported a year (90% of coconut production) 6,000 metric tons of crude coconut oil exported 2016 Sourced from Northern provinces 	<ul style="list-style-type: none"> Need for significant replanting Land ownership uncertainty is disrupting investments Limited transformation into copra oil and virgin coconut oil (VCO) Many parts of the coconut are being wasted 	<ul style="list-style-type: none"> Launch a Total Value Production (TVP) initiative for coconut involving training, finance, awareness raising with leading local and foreign investors Consider restrictions on the export of copra in order to expand local processing Aim for organic certification <p>H.3.3 H.3.4 H.3.5</p>
 <p>Cocoa</p>	<ul style="list-style-type: none"> 2,000 tons of cocoa beans harvested annually Exported in raw form Some experiments in making chocolate (Activ cooperation) Sourced from Northern provinces 	<ul style="list-style-type: none"> Need for significant replanting Land ownership uncertainty is disrupting investments Difficult to achieve a scale in chocolate making that is competitive on global markets 	<ul style="list-style-type: none"> Follow Activ lead & encourage expansion of premium organic chocolate including mixing with other Vanuatu ingredients Target foreign investment in this specialised field and with a view to exporting cocoa butter Aim for organic certification <p>H.3.3 H.3.4 H.3.5</p>
 <p>Coffee</p>	<ul style="list-style-type: none"> Vanuatu is capturing the full value of the coffee bean from seed to export >1,000 certified organic farmers trained Excellent product quality 	<ul style="list-style-type: none"> Limited production capacities Very limited competition 	<ul style="list-style-type: none"> Support the further development and expansion of coffee farmer training and organic certification Aim for further organic certification <p>H.3.3 H.3.5</p>

Coffee

Coffee is one of the few products where Vanuatu captures the full value of the commodity – from growing beans to packaging, branding and retailing. More than a thousand Ni-Vanuatu farmers have recently been certified to produce organic coffee. While the quality of coffee produced is excellent, production and export volumes are limited, due to limited investment in capital equipment, uncertainty around land ownership and insufficient numbers of trained farmers.

Action to consider: Leverage the professional cooperative model to expand farmer training and investment in the production and export of coffee.

Tamanu and nangae nuts

Current production fails to meet the strong demand for tamanu and nangae oil in Europe and the USA. The main constraints seem to be lack of investment into larger scale production.

Action to consider: Promote foreign investment into nangae and tamanu nut plantations, potentially in joint ventures with tamanu & nangae nut farmer cooperatives.

Peanuts

Vanuatu boasts vast supplies of high quality peanuts but very little transformation.

Action to consider: Promote cooperative investment into capital equipment to develop and package higher value specialty peanuts (e.g. mixed with spices) and peanut butter.

Fish

Vanuatu's waters have among the richest Albacore tuna stocks in the region, but a large part of the fresh fish that is caught is directly exported for processing to neighbouring states such as Fiji, Papua New Guinea or China.

Action to consider: Limit the granting of any new fishing licenses to investors that commit to value added processing of the fish in Vanuatu, including frozen and canned fish.

Kava

Due to particularly favourable soil and climate conditions, Vanuatu boasts among the highest quality kava in the world. However, kava production, which is currently restricted by law to Ni-Vanuatu citizens, is fragmented, costly and barely able to meet local demand.

Action to consider: Consider opening investment in Kava to joint ventures with foreign companies to help rationalise and expand production; sponsor research into methods for preserving kava juice to meet rising international demand.

Table 2 continued:
Overview of challenges and opportunities for key Vanuatu products

Note:
The references under each activity refer to actions in the roadmap that is detailed in chapter 6

Source:
Whiteshield Partners

Sector	Key facts	Key challenges	Proposed activities
 <p>Tamanu and nangae nuts</p>	<ul style="list-style-type: none"> Strong demand for tamanu & nangae oil in Europe & USA Current supply of nuts is not meeting demand 	<ul style="list-style-type: none"> No tamanu nangae nut plantations – they are currently collected from the wild 	<ul style="list-style-type: none"> Promote nangae & tamanu nut investment in new potential in joint ventures with newly formed tamanu & tamanu nut farmer cooperatives Information campaign with land owners <p>H.3.1 H.3.5</p>
 <p>Peanuts</p>	<ul style="list-style-type: none"> High quality and vast supply of peanuts 	<ul style="list-style-type: none"> Very limited transformation to peanut butter 	<ul style="list-style-type: none"> Promote cooperative investment in capital equipment for peanut butter Discuss JV opportunities with international investors <p>H.3.1 H.3.5</p>
 <p>Fish</p>	<ul style="list-style-type: none"> Rich stocks of Albacore tuna 17,000 tons per year of allowable catch beyond 12 nautical miles 74 long line fishing boats operating beyond 12 nautical miles 	<ul style="list-style-type: none"> Fishing licenses sold to China Limited connection of fishing activity with local markets No local production, processing, and exports of thereof 	<ul style="list-style-type: none"> Upgrade the wharf infrastructure to allow offloading of fish Launch public-private partnership for a new fish processing plant Form a vertically integrated fishing cooperative involving a joint venture with a foreign fishing company Conduct feasibility study for investment into an aluminium canning facility <p>H.3.1 H.3.4</p>
 <p>Kava</p>	<ul style="list-style-type: none"> Kava farming is currently restricted to Ni-Vanuatu citizens Growing demand for Kava in the USA 	<ul style="list-style-type: none"> Fragmented supply Limited quantities available for exports Fresh kava cannot be exported Certification standard required 3-5 years to grow a kava plant 	<ul style="list-style-type: none"> Sponsor research into long conservation kava juice Consider opening investment in Kava to joint ventures with foreign companies to help rationalise and expand production <p>H.3.2 H.3.1 H.3.5</p>
 <p>Furniture</p>	<ul style="list-style-type: none"> Rich supply of timber wood for furniture 	<ul style="list-style-type: none"> Skill drain Foreigners issued work permits to make furniture Competition from fruit picker scheme with Australia 	<ul style="list-style-type: none"> Restrict “fruit picker” opportunities only to unskilled Vanuatu citizens and impose a worker visa policy restricted to importing higher end skills (managers, trainers, specialists, technicians etc) Sponsor research into the treatment of coconut wood timber for furniture <p>H.6.1 H.6.1 H.6.3</p>
 <p>Tourism</p>	<ul style="list-style-type: none"> Tourism currently represents approximately 40% of the economy 	<ul style="list-style-type: none"> Very limited purchase of local Vanuatu products 	<ul style="list-style-type: none"> Form a “buy Vanuatu” network among major tourist operators <p>H.4.1</p>
 <p>Spices</p> <p>Link to horizontal policy</p>	<ul style="list-style-type: none"> Spices pepper, vanilla, turmeric, ginger, chilli 	<ul style="list-style-type: none"> Fragmented supply through small holders High cost of production 	<ul style="list-style-type: none"> Promote FDI to help expand production volumes and ensure export level quality <p>H.3.3</p>

Wood furniture

Vanuatu has vast and rich supplies of high quality timber, but the wood furniture industry is still nascent. Existing furniture manufacturers face a skill gaps and skill drains from schemes encouraging labourers to work abroad (such as Australia's fruit picker scheme).

Action to consider: Fund research into the treatment of coconut wood timber for furniture and expand vocational training opportunities in furniture manufacturing.

Tourism

The tourism sector bears considerable potential as a source of demand for value added products and services from the local economy.

Action to consider: The government and tourism sector should partner to launch a "Buy Vanuatu" network that encourages further purchase of locally produced goods and services. Moreover, through this "Buy Vanuatu" network the major tourism investors in the country can provide valuable insight on how to enhance competitiveness of products and services they elect not to purchase.

Table 2 summarises some of the sector challenges and proposed actions.

The country must also address horizontal barriers to economic development

Beyond the vertical sector / product barriers to moving up the value chain, there are a number of horizontal market barriers that must be addressed.

A first set of horizontal issues relate to different aspects of regulation. While the business regulatory burden is low and financial freedom pronounced, partly in due to the island's status as a regional center for offshore finance, unresolved land property rights problem is likely to stymie consolidation and capital deepening in agriculture – essential not only for productivity overall, but as inputs to the manufacturing activities this strategy proposes to nurture.

A second set of issues relate to infrastructure and skills. Although there is substantial forthcoming investment into port and air infrastructure, the time and cost involved in exporting and importing goods could be cut further. The country still has limited, slow, and often inordinately expensive internet access, reaching only a fraction of the population clustered around the capital.

Moreover, education levels remain modest – and employees with tertiary qualifications are hard to come by. The booming offshore financial sector, for instance, has to resort to importing qualified labour at world-class salaries. As company surveys confirm, lack of medium and high-tech (i.e. tertiary graduates) skills are another binding constraint to many potential economic activities. The nascent vocational training system does not produce the skills

Table 2 continued:
Overview of challenges and opportunities for key Vanuatu products

Note:
The references under each activity refer to actions in the roadmap that is detailed in chapter 6

Source:
Whiteshield Partners

Sector	Key facts	Key challenges	Proposed activities
 <p>Beef</p>	<ul style="list-style-type: none"> High quality grass fed beef 	<ul style="list-style-type: none"> Limited volumes Disconnected supply chains between existing producers 	<ul style="list-style-type: none"> Form a cooperative of beef producers to pool storage and transportation Promote FDI to help expand production volumes and ensure export level quality <p>H.3.1 H.3.3</p>
 <p>Beer</p>	<ul style="list-style-type: none"> Main national brands are Tusker and Nambawan 	<ul style="list-style-type: none"> Very limited value added All inputs are currently imported 	<ul style="list-style-type: none"> Work with established manufacturers to identify any parts of the value chain that can be processed in Vanuatu (e.g. experimenting with local fruits and commodities, labelling)
 <p>Water/juice</p>	<ul style="list-style-type: none"> Abundant supplies of fruits Natural water sources 	<ul style="list-style-type: none"> Scale economies in fruit production & distribution Possible contamination of natural water sources 	<ul style="list-style-type: none"> Promote FDI to help expand production variety (with new mixes and brands), boost volumes and ensure export level quality <p>H.3.3</p>
 <p>Sandalwood</p>	<ul style="list-style-type: none"> Vanuatu has second best variety of sandalwood in the world (after India) High international demand for sandalwood oil >700,000 sandalwood trees <p>Link to horizontal policy</p>	<ul style="list-style-type: none"> Limited production of sandalwood oil 	<ul style="list-style-type: none"> Form a cooperative of sandalwood farmers to invest in production of sandalwood oil Restrict export of sandalwood logs <p>H.3.1 H.3.2</p>

that the private sector needs – or would need if they would invest in other industrial activities.

There are also classical market failures at play. These include information externalities, whereby entrepreneurs thinking about, for instance, processing fish simply do not know if such a venture would be profitable or not. This prevents the entrepreneurs from investing, which hurts the entire economy: if the pilot entrepreneur is successful, a whole new, exporting sector may emerge. And if not, then that sends a signal to entrepreneurs, investors, and policy makers to focus their efforts elsewhere.

Another common market failure is co-ordination externalities. These occur when an entrepreneur is not able to invest as he cannot possibly co-ordinate all the different pieces that need to fall into place – from infrastructure, regulation over suppliers and service providers to transport costs and service quality. Even if fish processing would make commercial sense, entrepreneurs will be reluctant to take the step given the uncertainty around everything from supplies over transport costs to product standards for trade.

A third market failure involves training externalities. In a sector with a tight labour market, entrepreneurs will underinvest in staff training to make up for the risk that, once trained, competing firms will poach the talent they just invested in. The case for public subsidies for on-the-job training is solid and one of the most valuable investments that Vanuatu should make, as we propose in our programmes.

Finally, a market that does not exist will, by definition fail. As is the case in most lower-middle income countries, for instance, the market for business services is underdeveloped – and non-existent for specialised, sophisticated services such as manufacturing upgrading. In these cases, public policy should try to gradually build up functioning markets through subsidies, public procurement standards, and regulations.

Action to address these horizontal barriers will not be enough to overcome the market failures that impede entrepreneurial exploration of new industrial activities, however. For that reason, this strategy also proposes concerted but carefully calibrated and monitored vertical measures targeting high-potential products for moving up the value chain – mostly by acquiring, adapting, absorbing, and spreading foreign technology and know-how.

A comprehensive set of policy measures to address Vanuatu's vertical and horizontal market development are incorporated in the proposed industrial strategy detailed in the next section.



National Industrial Development Strategy vision and objectives

5 Vision and objectives of the National Industrial Development Strategy

Vanuatu should strategically expand its productive capabilities...

The analysis in the preceding sections shows that Vanuatu has underlying capabilities that, if leveraged in the right manner, can help put the country on the right path to value addition. There are many economic activities that may be possible by using or slightly expanding these capabilities, such a processing kava into powder that is a similar capability that can be extended to processing cocoa into powder.



Value added processing in Vanuatu with Kava powder

But this is not easy. The business climate, while comparing well by regional benchmarks, still stymies development. The most important stumbling blocks may be politically difficult to address, such as land reform – resolving uncertainty around land titles could encourage much needed consolidation and capital deepening in the low-productivity agricultural sector.

Policies should address three main areas:

- Remove binding constraints: through a dialogue with the private sector, continuously identify constraints to development and act to remove or mitigate them;
- Mitigate for the costs incurred by lacking factor conditions or business climate – through targeted subsidies and other instruments;
- Actively support sector competitiveness to support private initiatives to diversify the economy or move up the value-chain as proposed in our analysis.

To this end, a vision and strategy has been formulated that is supported by concrete policy programmes and projects to help unlock Vanuatu's full industrial potential.

Figure 35: Vanuatu vision and strategy for industrial development 2018-2022

Source: Whiteshield Partners

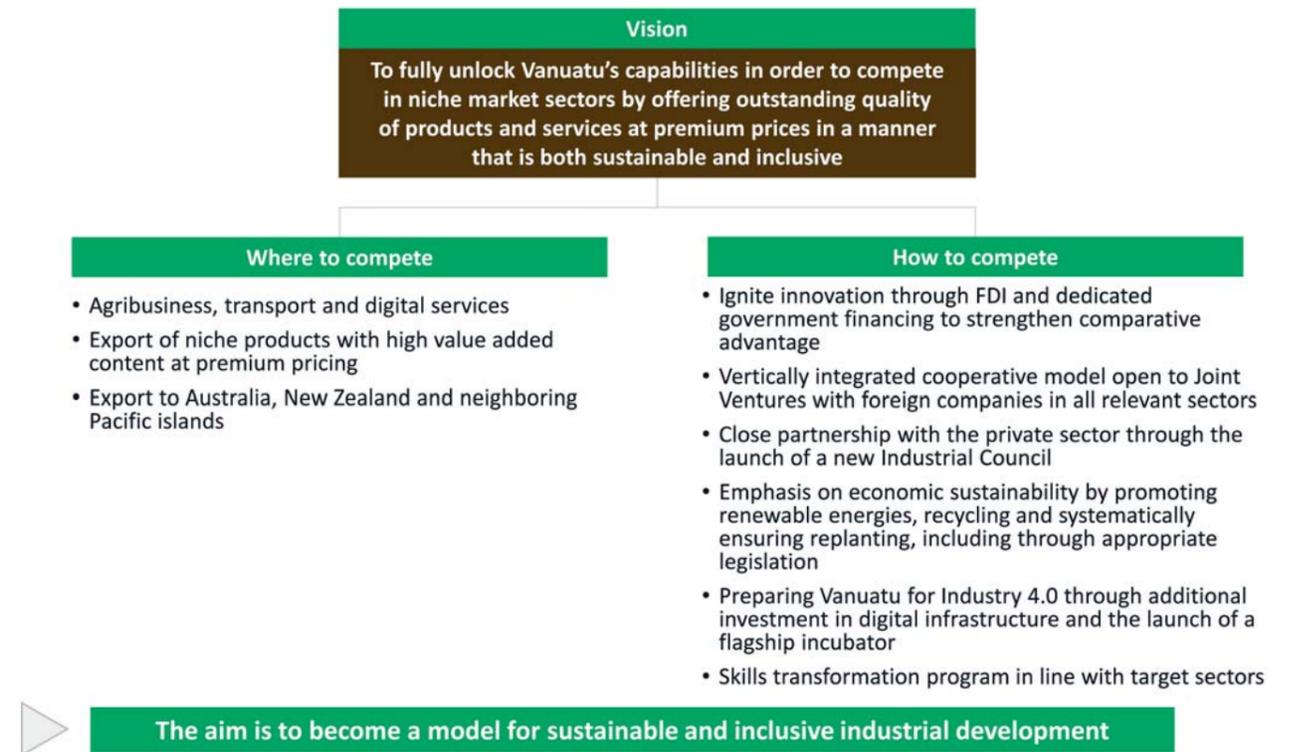
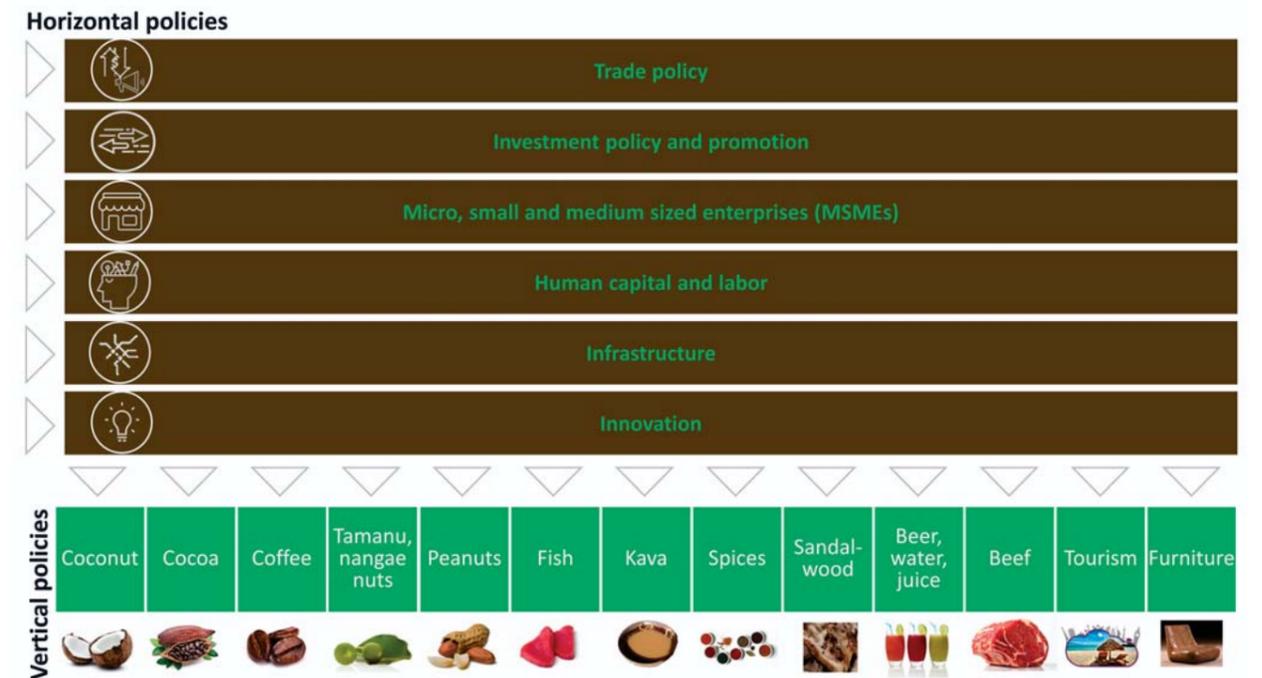


Figure 36: Horizontal and Vertical policies to achieve Vanuatu industrial vision in 2018-2022

Source: Whiteshield Partners



... supported by an industrial vision that focuses on niche markets

Vanuatu's industrial vision is to unlock the country's capabilities to compete in niche markets with outstanding quality of products and services at premium prices in a sustainable and inclusive manner.

Vanuatu will compete in agribusiness, supported by more effective transport and digital services, and export to neighbouring markets, including Australia, New Zealand, selected Asian countries and other Pacific islands. To enable this development, the country will attract targeted FDI and take concerted measures, using Government and donor funding, to ignite innovation in agribusiness, to support vertically integrated cooperatives, especially through joint ventures with foreign investors bringing expertise and technology, to strengthen supply chains and access to markets, to boost technical skills, as well as to invest in energy sustainability and infrastructure development (see Figure 35).

There are a number of vertical and horizontal policy barriers for Vanuatu to address in order to achieve its industrial vision (see Figure 36).

Vertical policies remove or mitigate sector-specific challenges, such as training of farmers to process organic coffee or addressing land reform to encourage further investment in cocoa and coconut plantations.

Horizontal policies cut across sectors and include areas such as trade, investment, micro, small and medium-sized enterprises, human capital and labour, infrastructure and innovation.



Implementing
the National
Industrial
Development
Strategy

6 National Industrial Development Strategy: 9 programmes and 35 supporting projects

This industrial strategy proposes 35 projects grouped under nine overarching programmes

- Smart Trade;
- Seamless Trade Administration;
- Smart Investment;
- Vanuatu as a Brand;
- Drive MSME;
- Develop and Retain Talent;
- Support Infrastructure;
- Ignite Innovation;
- Governance and Monitoring.

Each programme has a different level of impact and timeframe in contributing to implementing the National Industrial Development Strategy (see Figure 37).

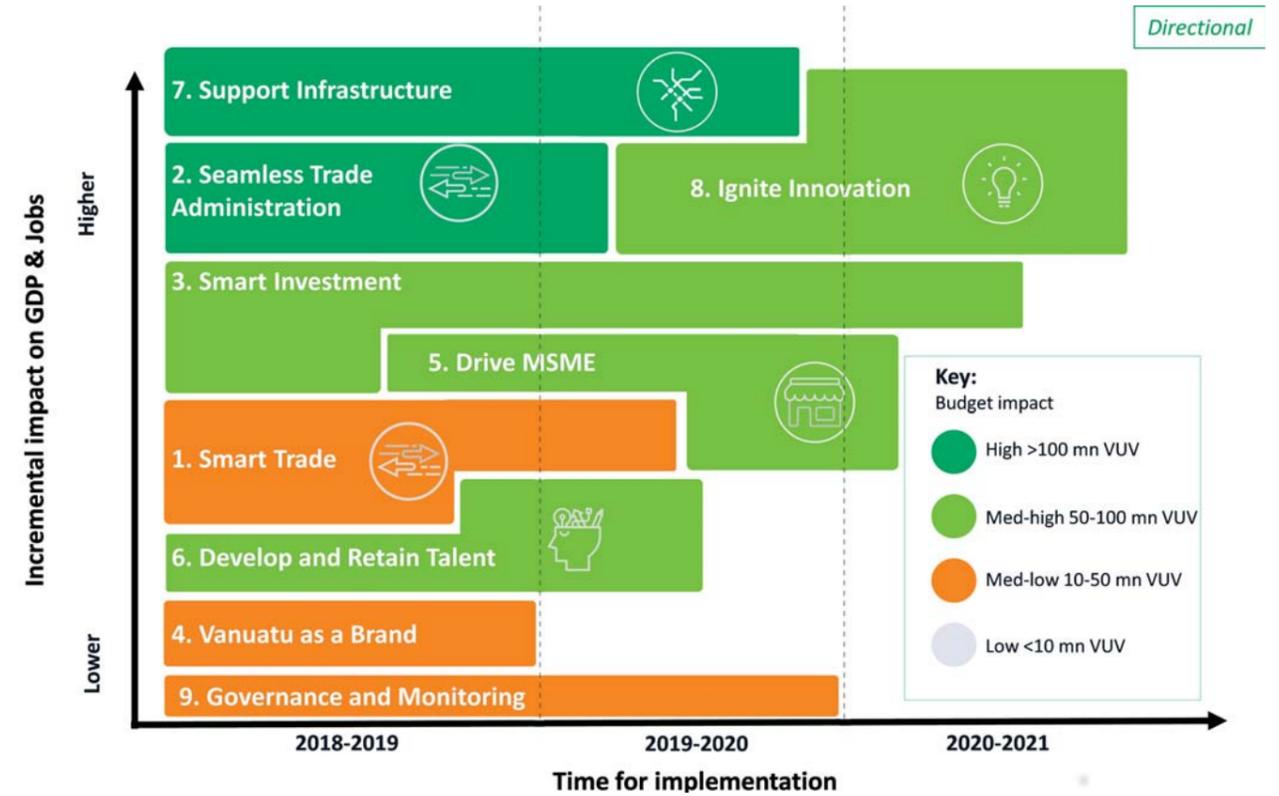
The next section describes each programme, related projects and implementation arrangements.

Trade

Trade policy is particularly significant for small and remote economies. Yet value-added trade is hampered by unclear and inconsistent duty exemptions on imports, unsustainable export of strategic commodities, weak product standard certification support, and limited support for infant industries. Through a first “Smart Trade” programme that pro-actively addresses these issues, Vanuatu will aim to reinforce product standards and support infant industries, while reducing the cost of regulatory compliance.

Figure 37
Timing and impact of nine core programmes for National Industrial Development Strategy 2018-2022

Source: Whiteshield Partners



Programme 1: Smart Trade

The “Smart Trade” programme foresees measures to optimise trade policy and practice to facilitate diversification in industrial activities and related services and supplies (see Figure 38). Led by the Ministry of Tourism, Trade, Industry, Commerce and Ni Vanuatu Business in collaboration with the Department of External Trade and the Bureau of Standards, it involves four projects:

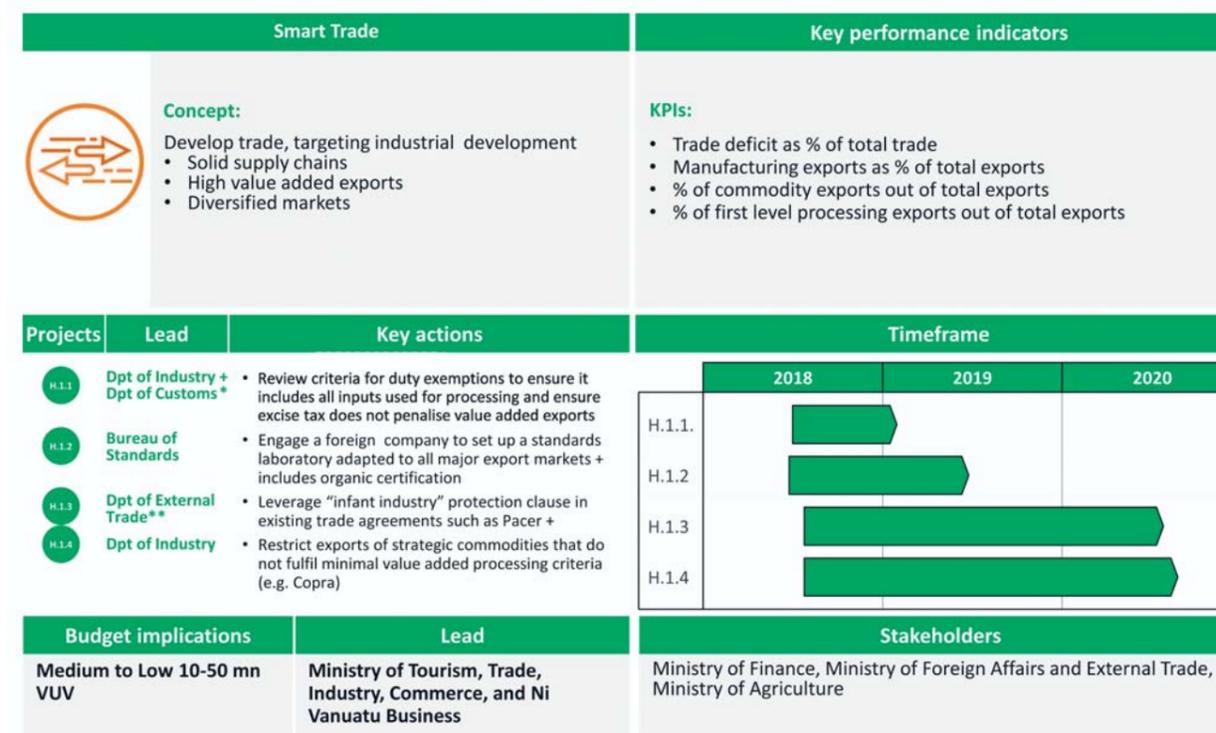
1. Review trade agreements customs regulations to ensure that all inputs necessary for processing and unavailable locally be exempt from import duties and set up a procedure whereby entrepreneurs that need inputs can apply for such exemptions according to simple, transparent criteria.
2. In collaboration with the Vanuatu Bureau of Standards (VBS), invite a specialised company to offer laboratory and related technical services to certify product standards across the archipelago. The laboratory should have the authority to certify local producers with the most commonly required certifications in target export markets, including FSANZ / Pacer Plus, EU and North America.
3. Employ, in a transparent fashion tied to strict performance criteria, the temporary “infant industry” protection clause in existing trade agreements to provide temporary (2-5 years, with support gradually decreasing and annual renewal based on strict export competitiveness criteria) protection for emerging Vanuatu companies moving up the value chain in very targeted areas such as chocolate processing.
4. Put in a place a review process for exports of strategic commodities beyond certain volumes that do not fulfill minimum local processing value added threshold in order for the country to move up the value chain and create new productive capabilities. Identify actions in collaboration with investors to boost higher value added investment in processing of commodities.

Complementing trade policy measures, trade administration must be improved, namely the time, cost and complexity of customs administration as well as the speed and cost of port logistics.

Figure 38:
Smart Trade programme overview

Note:
* Ministry of Finance, ** Ministry of Foreign Affairs

Source:
Whiteshield Partners



Programme 2: Seamless Trade Administration

The Seamless Trade Administration Programme aims to reduce time, complexity and cost of exports and imports, especially for manufactured products. It includes four projects (see Figure 39).

1. Accelerate efforts to streamline customs licensing, permits, and biosecurity procedures, and introduce a single window, based on recommendations in the World Bank time release study²⁰.
2. Turn the new Lapetasi and Santo wharfs, supported by the Bauerfield and Pekoia airports, into hubs for the Pacific by marketing their advantages and offering competitive cost and service conditions for operators.
3. Transform the emerging Santo special economic zone and wharf into a model of customs administration and port logistics to compete with Port Vila.
4. Explore feasibility of a public-private partnership to design and build a dedicated wharf for fish offloading and adjoining fish processing plant.

The Programme will be led by the Ministry of Tourism, Trade, Industry, Commerce and Ni Vanuatu Business in collaboration with the Department of Customs and Department of Public Works.

Investment

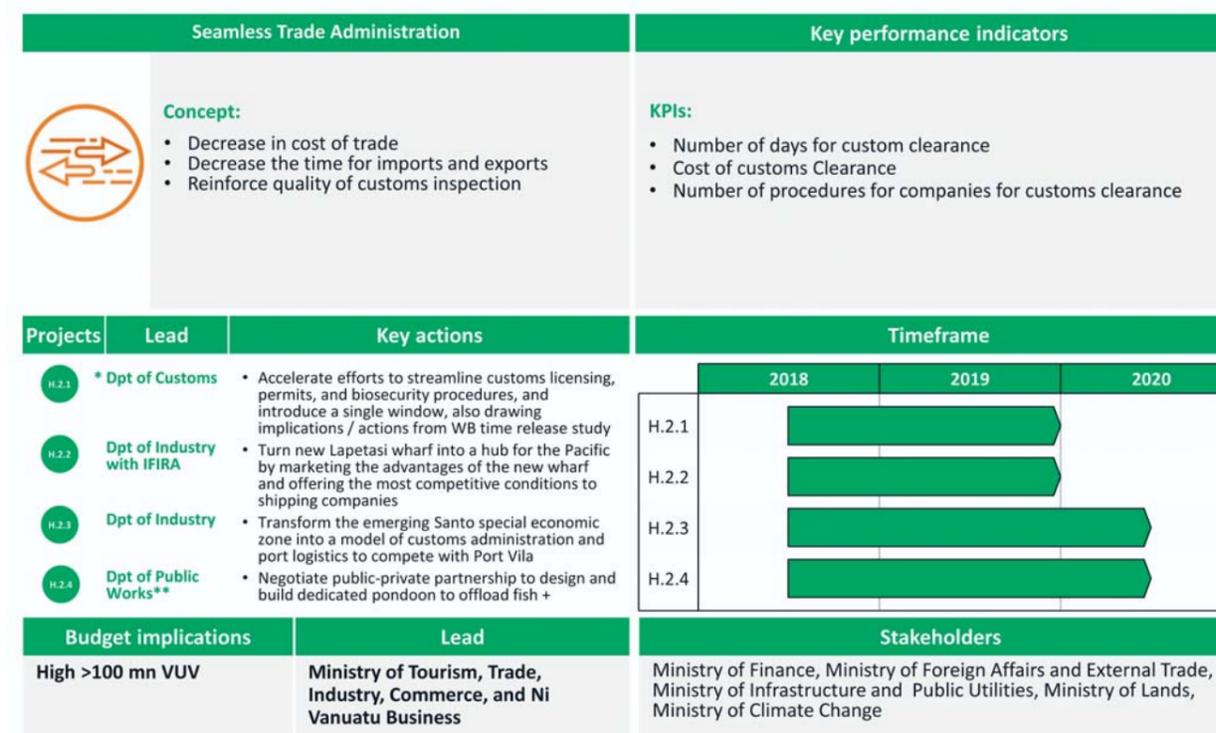
Foreign Direct Investment (FDI) is a critical vehicle for Vanuatu to absorb technology, build value-adding skills and compete on international markets. However, as seen in the first part of this report, FDI inflows into Vanuatu are small overall and negligible in the manufacturing sector. Challenges to address in attracting more and better FDI include:

- Continued uncertainty over land ownership and property rights;
- Complex licensing procedures;
- Limited open investment opportunities due to "Reserved list" for Ni-Vanuatu citizens;
- Deficits in skills and infrastructure;
- Understaffed and underfunded investment promotion agency (IPA).

Figure 39:
Seamless Trade Administration programme overview

Note:
* Ministry of Finance,
** Ministry of Infrastructure and Public Utilities

Source:
Whiteshield Partners



²⁰ Time Release Study – Processing times, World Bank, 2017.

Programme 3: Smart Investment

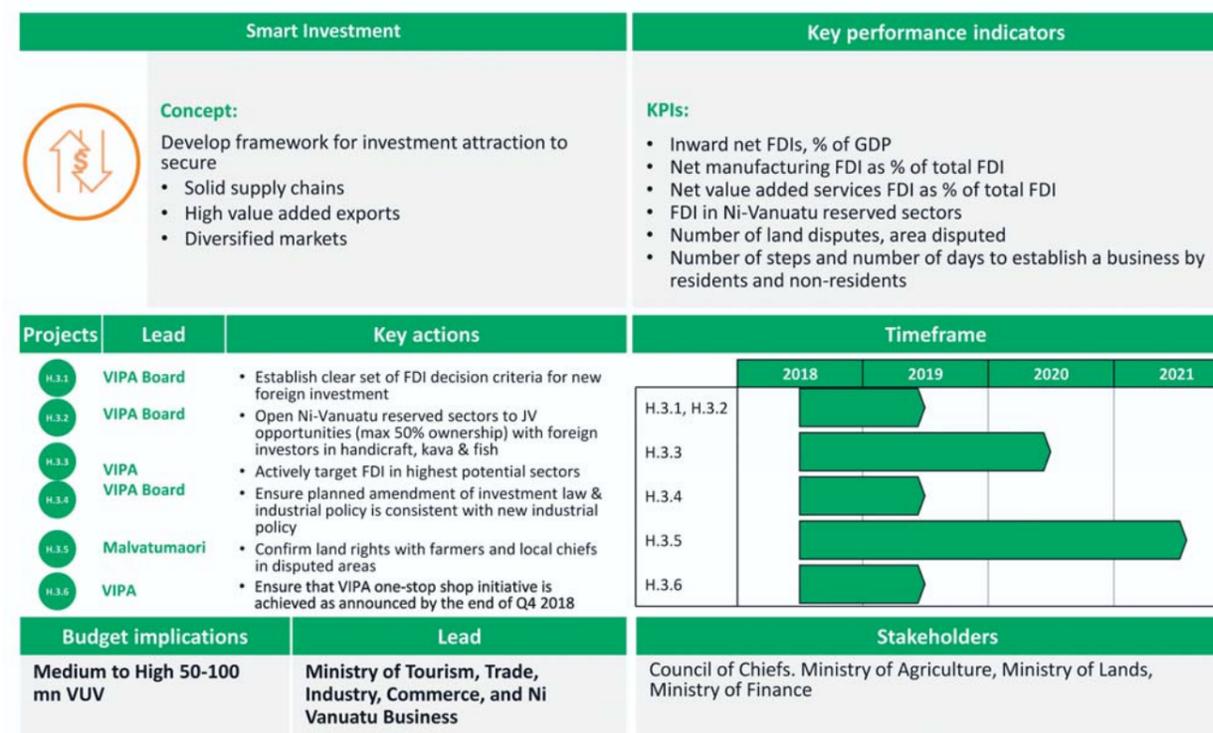
The proposed Smart Investment programme targets investment attraction efforts at strengthening supply chains, adding value to local inputs through processing, transferring technology, and opening new markets (see Figure 40).

Led by the Ministry of Tourism, Trade, Industry, Commerce and Ni Vanuatu Business, this programme includes six projects:

1. Establish criteria to assess the potential social and economic return of new investment projects, including product diversification, job creation, value added potential, skills development, and linkages.
2. Open Ni-Vanuatu reserved sectors such as handicrafts, kava and fisheries (within 6 nautical miles of mainland) to joint ventures with foreign investors (possibly restricting foreign ownership to 50%).
3. Create and manage sector and company databases to actively target potential foreign investors in high-potential sectors.
4. Ensure current planned amendment of the investment law is consistent with the new industrial policy.
5. Clarify land rights with farmers and local chiefs in disputed areas.
6. Ensure that the VIPA one-stop shop initiative is achieved as announced by Q4 2018 and increase funding where necessary.

Figure 40:
Smart Investment programme overview

Source:
Whiteshield Partners



Programme 4: Vanuatu as a Brand

Beyond investment policy and promotion, Vanuatu currently lacks a distinct recognisable character drawing affinity towards the country as a manufacturing center and tourism destination: there is no established country brand and the capital city does not provide an attractive first point of entry for investors due to poor urban planning and related infrastructure.

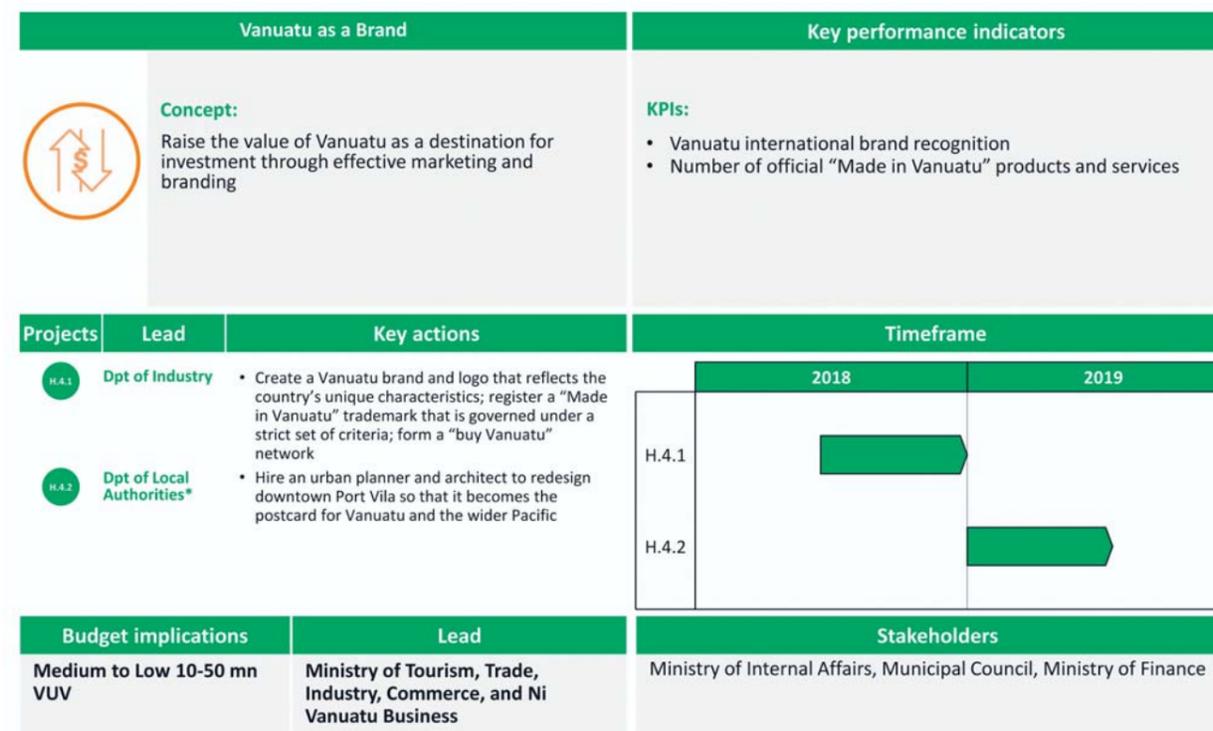
The "Vanuatu as a Brand" programme involves first creating a country brand and logo that reflects its unique characteristics. The new Vanuatu brand should be supported by a "Made in Vanuatu" trademark subject to strict criteria, and reinforced by the "buy Vanuatu" network, especially in the tourism industry (see Figure 41).

First impressions count. Beyond creating and nurturing its country brand, Vanuatu will aim to hire an urban planner and architect to redesign downtown Port Vila so that it becomes the postcard for Vanuatu and the wider Pacific.

Figure 41:
Vanuatu as a Brand programme overview

Note:
* Ministry of Internal Affairs

Source:
Whiteshield Partners



This programme will be led by the Ministry of Tourism, Trade, Industry, Commerce and Ni Vanuatu Business in collaboration with the Department of Local Authorities (for the part related to Port Vila).

Micro, Small and Medium sized Enterprises (MSMEs)

Micro, small and medium-sized enterprises, the foundation for sustainable and inclusive growth and investment in small, developing economies, face substantial constraints, including:

- Skills gaps;
- Lack of market intelligence;
- Limited and costly access to finance largely related to perceived commercial risk;
- Poor linkages between companies and with foreign investors;
- Disjointed, fragmented supply chains;
- Insufficient economies of scale and pooling of resources;
- High regulatory and logistical costs of trade;
- High regulatory burden.

Programme 5: Drive MSME

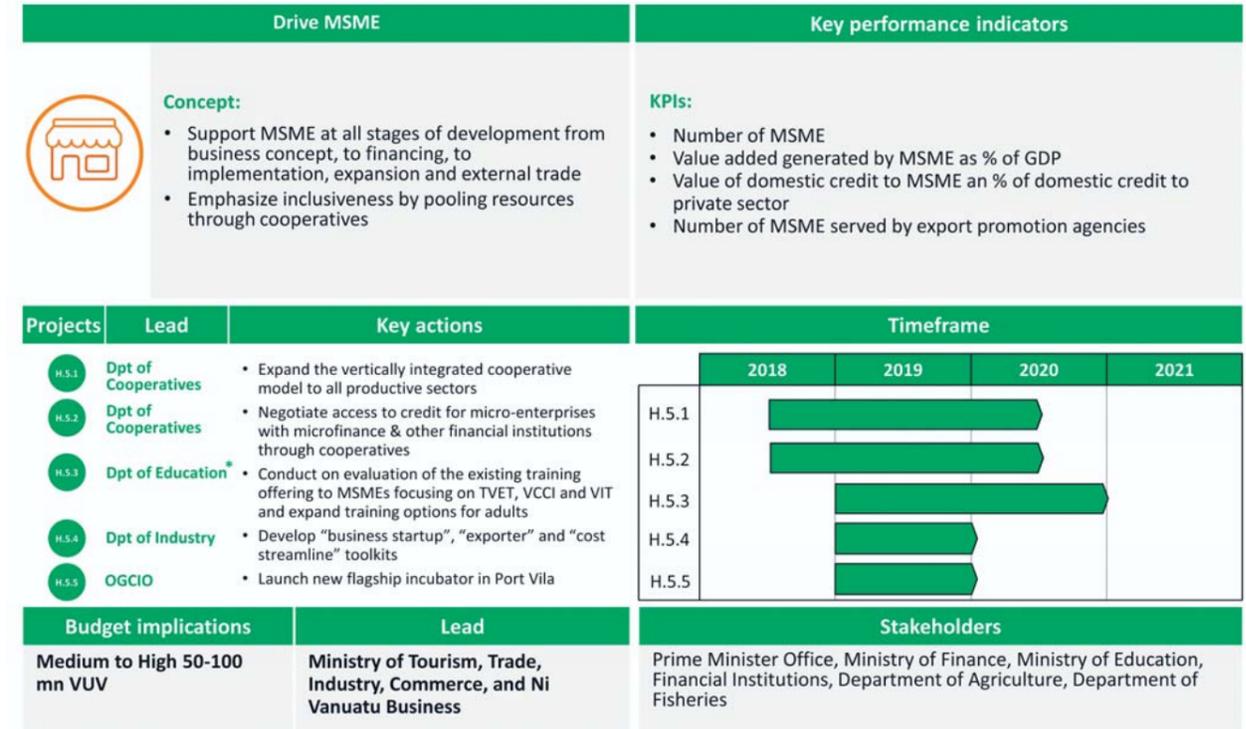
Building on the existing policy framework for SMEs²¹, the proposed programme “Drive MSME” aims to address some of these challenges through the following actions (see Figure 42):

1. Expand the vertically integrated cooperative model to all productive sectors of the economy leveraging best practices from the handicrafts and other relevant sectors (see Box 1). Consider the strategic use of public procurement to encourage development of productive capabilities.

Figure 42:
Drive MSME programme overview

Note:
* Ministry of Education

Source:
Whiteshield Partners



²¹ Accord International Management Services Inc.; Micro-, Small and Medium Enterprise (MSME) Policy and Strategy For Vanuatu, April 2011.

2. Negotiate access to credit for micro-enterprises with microfinance and other financial institutions using cooperatives to lower credit risk and provide the necessary guarantees.
3. Evaluate and reform the existing training offering to MSMEs focusing on TVET, VCCI and VIT and expand training options for adults.
4. Develop “business startup” and “exporter” toolkits including sector specific knowledge basic to connect with international market opportunities.
5. Taking into account that startup companies require access to office space, high speed internet connectivity and opportunities for partnerships, launch a new flagship incubator in Port Vila that can house at least 100 foreign and local entrepreneurs that contribute to the industrial policy; negotiate a self-financed fibre cable connection with one of the leading telecom operators.

The “Drive MSME” programme will be led by the Ministry of Tourism, Trade, Industry, Commerce and NI Vanuatu Business in collaboration with the Department of Education and OGCIO.

Education, skills and labour

Developing the right skills and fostering a vibrant labour market are vital to the success of National Industrial Development Strategy. Measures should concern not only schooling but also adult education and other measures ensuring that the work force have the skills that industry requires.

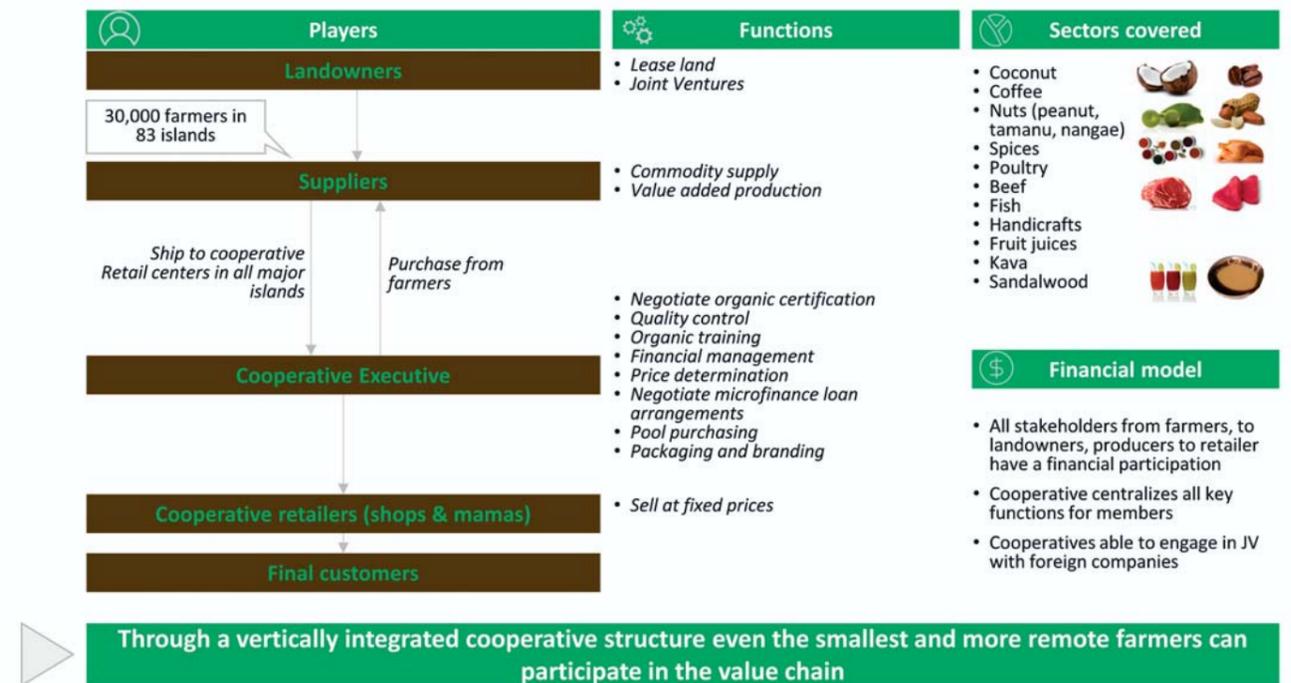
Due to its remoteness and small population, Vanuatu faces serious challenges in educating and retaining talent:



Straw hats produced by the WEAV cooperative

Illustration Box 1: Overview of the Vertically Integrated Cooperative Model

Source:
Whiteshield Partners



- Existing educational institutions are too scarce and lack resources, in particular qualified trainers;
- Low rates of secondary school attendance;
- Visa policy does not place emphasis on attracting foreign talent;
- Insufficient support for companies that invest in worker training (public-private partnerships for skills development for instance).

Programme 6: Develop and Retain Talent

The “Develop and Retain Talent” programme sets up a system of positive reinforcement to develop a pool of skilled labour, starting with more relevant and higher quality training and better labour market regulation. It has six projects (see Figure 43):

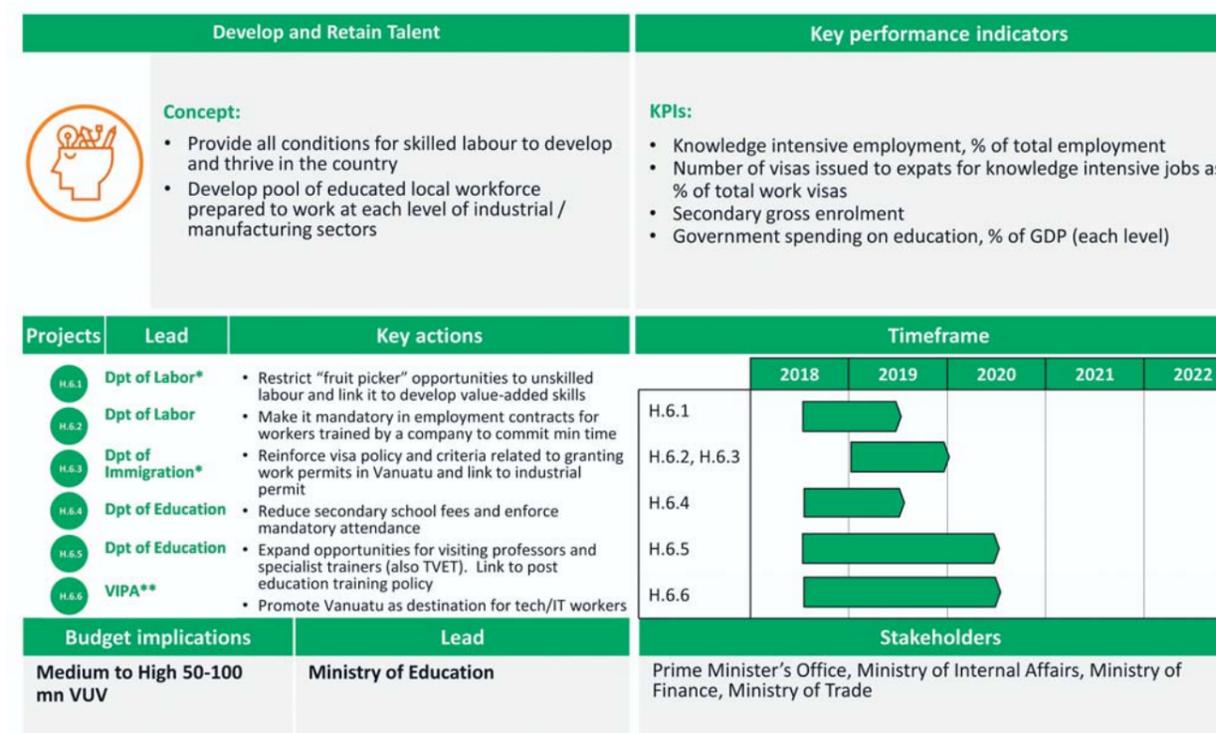
- Renegotiate “fruit picker” scheme so that it provides real opportunities to unskilled Vanuatu citizens to develop value-adding skills;
- Encourage the development of public-private partnerships to train workers through targeted government subsidies. Make it also mandatory for employer to grade workers according to different category of skills or capabilities and award them according to this different grade system;
- Review visa policy and criteria related to granting work permits in Vanuatu with a view to attracting value-adding skills (managers, trainers, specialists, technicians etc);
- Reduce secondary school fees and make school attendance mandatory for all children, increasing secondary enrolment to at least 80% of the age cohort;
- Expand opportunities for visiting professors and specialist trainers in Vanuatu educational institutions and for bright Ni-Vanuatu students to study abroad;
- Promote Vanuatu as destination for technology and IT freelance professionals and involve them in educational activities.

The programme will be led by the Ministry of Education in collaboration with the Department of Labor and VIPA.

Figure 43:
Develop and Retain Talent programme overview

Note:
* Ministry of Internal Affairs, ** Ministry of Trade

Source:
Whiteshield Partners



Infrastructure

Transport, energy and IT infrastructure enables trade, investment and the development of manufacturing. Vanuatu has challenges in all aspects of infrastructure, exacerbated by its geography. For example:

- Internet penetration and speed severely constrain the networking and knowledge creation that will underpin industrial development – in 2016, only 1.6% of the population had fixed broadband access²²
- Transport is limited, time-consuming, costly and inefficient, including domestic inter-island connections.
- High costs and unstable supply of electricity supply for manufacturing.

Programme 7: Support Infrastructure

Led by the Ministry of Public Utilities, the Ministry of Trade, Tourism, Industry and Ni-Vanuatu Business and the Ministry of Health, the program to support infrastructure involves four projects (see Figure 44):

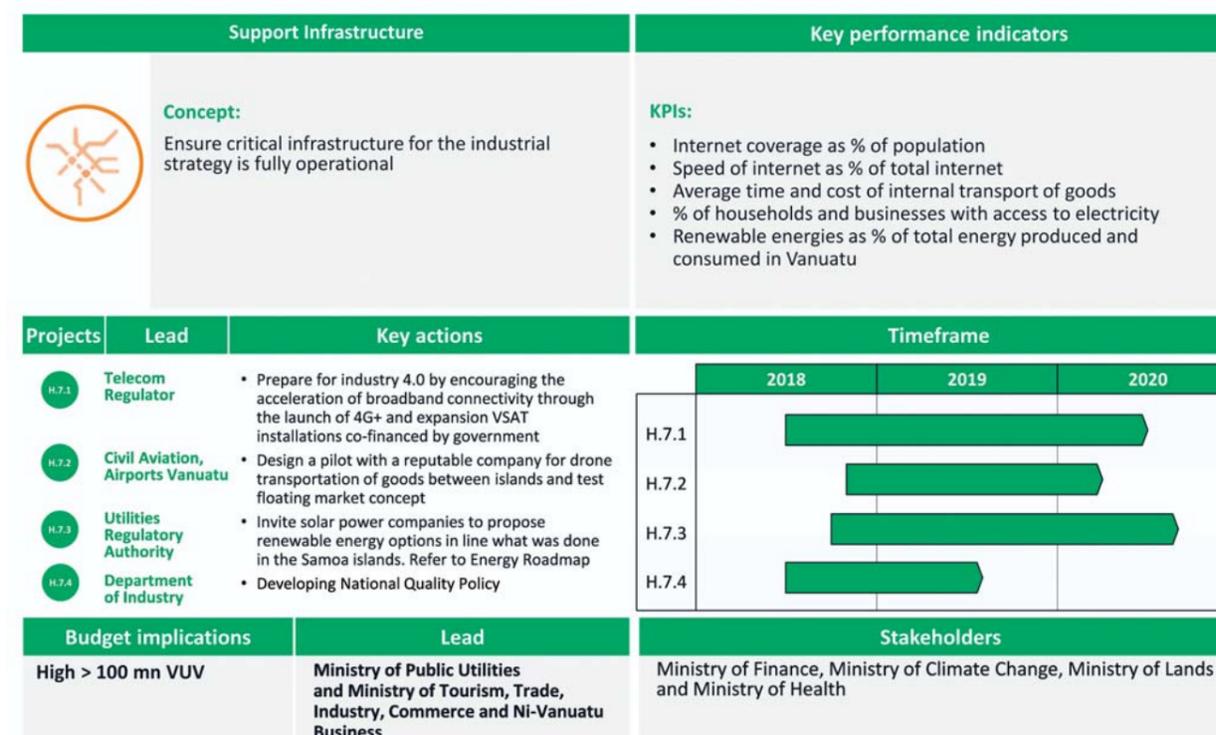
Vanuatu’s programme on infrastructure will be also be supported by the initiative on Quality Infrastructure Policy. It will cover issues of metrology, standardization, accreditation, conformity assessment, and market surveillance that together form the Quality infrastructure system. The effective operation of this system is a requirement to enhance the quality, safety and environmental soundness of goods, services and processes, both for the effective operation of domestic markets and to enable access to foreign markets.

1. Improve, through concerted implementation of the 2016 Universal Access Policy, broadband connectivity through the launch of 4G+ and expansion of VSAT installations through government guarantees and co-financing.
2. Design a pilot with a reputable company for drone transportation of high value / low volume goods.
3. Invite solar power companies to propose renewable energy options in line what was done in the Samoa islands.
4. Work in partnership with the Vanuatu Bureau of Standards and UNIDO to develop a National Quality Policy

Note that additional actions related to infrastructure are included in the trade programmes already cited.

Figure 44:
Support infrastructure programme overview

Source:
Whiteshield Partners



22 ITU

Innovation

Fostering different forms of innovation would help Vanuatu build and strengthen its niche positioning, raise prices and compete on international markets. However, there are low general levels of public and private spending on R&D, gaps in protection of intellectual property and generally low levels of absorptive capacity and awareness of opportunities for innovation among entrepreneurs.

Starting from a limited base, there are a number of opportunities for enterprises in Vanuatu to engage in incremental innovation by combining their talent and other assets, including acquiring and adapting technologies from abroad. For instance, fresh preservation packaging could be adapted for a new fresh kava juice product with export potential, and chemical treatment methods could harden coconut tree wood to be used in new furniture (see Illustration Boxes 3 and 4). Even in developed countries, most of the innovation-related productivity growth comes from absorbing and adapting existing technologies: in the US, 50% of IT-related productivity growth accrued to the retail sector alone.

Programme 8: Ignite Innovation

The Ignite Innovation programme aims to tap the full potential of innovation opportunities in Vanuatu. It has two projects (see Figure 45):

1. Set up an innovation fund to co-finance strategic research projects involving multiple consortia members with strong potential for commercial application in activities with higher value added, such as:
 - Treatment of the coconut timber wood for the furniture industry;
 - Development of long conservation kava juice.
2. Raise awareness of IPR registration and ensure IPR enforcement through additional well-trained staff and resources for the Vanuatu Intellectual Property Office.



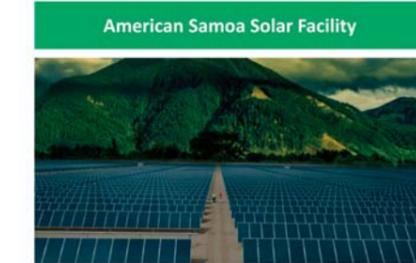
Solar power facilities at Irikiki Island Resort

Illustration Box 2: Solar power and drones transport

Source: Whiteshield Partners; Data: National Geographic, 02/2017

Tesla Solar Power Generation and Storage Tau Island in American Samoa

Key facts
<ul style="list-style-type: none"> • Completely replaced diesel power generation with solar • \$8 mn project, funded by the U.S. Department of Interior and the American Samoa Power Authority (ASPA). • 5,328 solar panels, generating 1.410 megawatts of electricity • 6 Megavats of technologically advanced storage sufficient to supply energy to the island for 3 days without sun • Recharges within 7 hours of sunlight • Capability of withstanding Category 5 hurricane winds



Rwanda cargo drones airport

Key facts
<ul style="list-style-type: none"> • Cargo drone routes capable of delivering urgent and precious supplies to remote areas on a massive scale • The project is a collaboration between different partners led by Afrotech, École polytechnique fédérale de Lausanne (EPFL) and the Norman Foster Foundation • 3 meter wingspan drones with ability to carry 10 kg across 100 km



Figure 45: Ignite Innovation programme overview

Source: Whiteshield Partners

Ignite Innovation			Key performance indicators			
 <p>Concept: Create a sustainable comparative advantage for Vanuatu by sponsoring incremental innovation</p>			<p>KPIs:</p> <ul style="list-style-type: none"> • Spending on R&D as % of total cost • Share of researchers in total employment • Number of patents, trademarks and designs registered • Number of IP related cases considered in court 			
Projects	Lead	Key actions	Timeframe			
H.8.1	Dpt of Industry	<ul style="list-style-type: none"> • Set up an innovation fund to support strategic research projects that demonstrate strong value added potential through incremental innovation, including process innovation that enhances competitiveness. Consider also linking some government procurement to innovation • Raise awareness of IPR registration in specific sectors such as handicrafts and ensure IPR enforcement through additional well trained staff 	2018	2019	2020	2021
H.8.2	IPR Office		H.8.1	[Progress bar from 2018 to 2021]		
Budget implications		Lead	Stakeholders			
Medium to High 50-100 mn VUV		Ministry of Tourism, Trade, Industry, Commerce, and Ni Vanuatu Business	Ministry of Finance			

It is important to note that incremental innovation in Vanuatu will be also depend on the development of diagnostic laboratories and related facilities for agro-industrial research and innovation.

The programme will be led by the Ministry of Tourism, Trade, Industry, Commerce and NI Vanuatu Business.

Governance and monitoring

Inclusive governance and rigorous monitoring are central to effective implementation and continuous improvement. During the first National Industrial Policy of 2011, private sector engagement as well as monitoring and evaluation of results was insufficient.



Private sector consultation for the new National Industrial Development Strategy

Illustration Box 3:
Examples of incremental innovation in Vanuatu

Source: Whiteshield Partners



Illustration Box 4:
Potential for innovation in the cosmetics industry using local Vanuatu products

Source: Whiteshield Partners

Coconut	Tamanu and nangae nuts	Cocoa	Sandal wood	Vanilla	Volcanic ash
Essential and carrier Oil Water	Essential and carrier Oil	Oil Absolute	Essential Oil: isovaleric aldehyde, santene, santenone	Vanilin	Peloid
<i>Skin softening and moisturizing, relaxation and invigoration</i>	<i>Soothing and smoothing of dry skin and sunburn</i>	<i>Aroma ingredient Antibacterial Antioxidant Anti-aging Circulatory</i>	<i>Skin rejuvenation and complexion improvement</i>	<i>Aroma ingredient</i>	<i>Soothing, antiinflammation</i>

Branded cosmetics production

Capabilities:

- Stabilization
- Blending properties
- New molecules
- Delivery systems
- New smells
- Production ...

Programme 9: Governance and Monitoring

Drawing lessons from the implementation of the first industrial strategy of 2011, the last programme serves to:

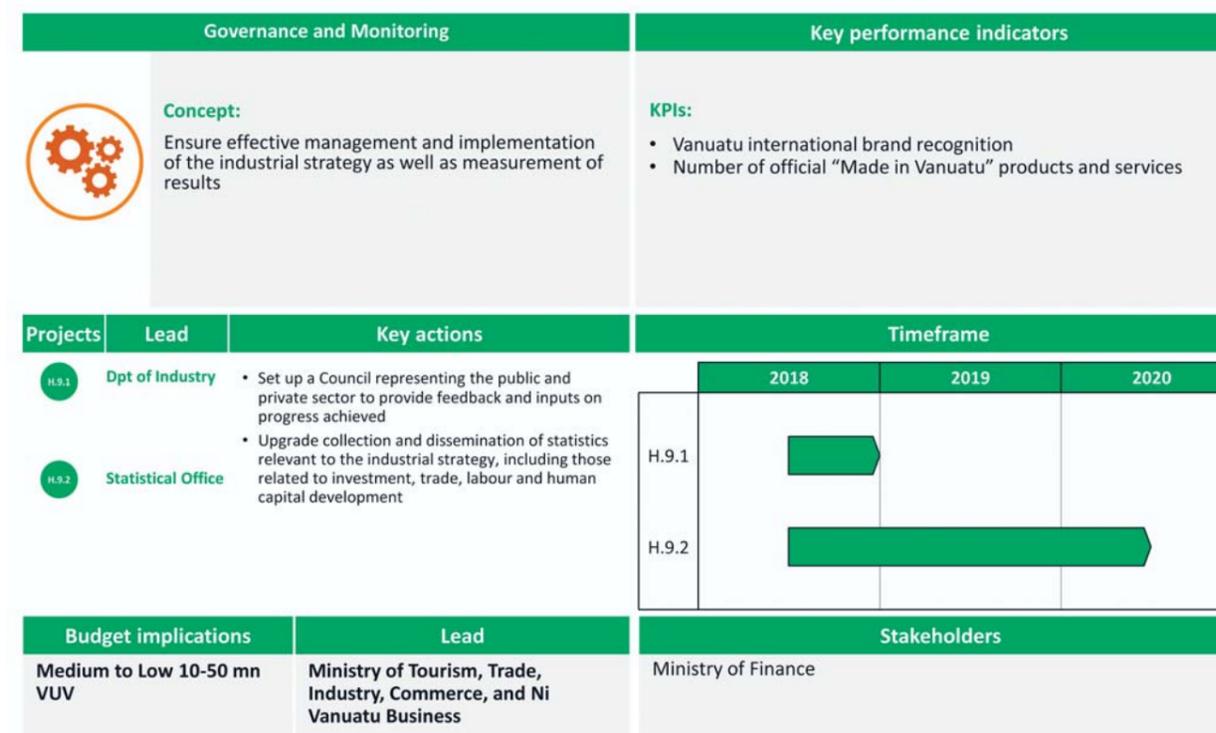
- Engage the private sector on a systematic basis, both in individual projects, overall co-ordination, and oversight;
- Systematically involve and coordinate the roles and contributions of different Ministries and government organisations;
- Define set of accessible and representative indicators to track progress and impact at the project, programme, and aggregate level; and
- Improve the accuracy and availability of statistics.

Two projects are involved (see Figure 46):

- Set up an National Industrial Development Strategy, with subsidiary bodies and a strong Secretariat, representing the public and private sector to monitor and guide the implementation of the industrial strategy and define the way forward;
- Set up a multi-level monitoring and evaluation process with a series of industrial policy monitoring indicators, distinguishing policy inputs, outputs and outcomes and linking them to overall impact on socio-economic development.

Figure 46:
Governance and Monitoring programme overview

Source:
Whiteshield Partners



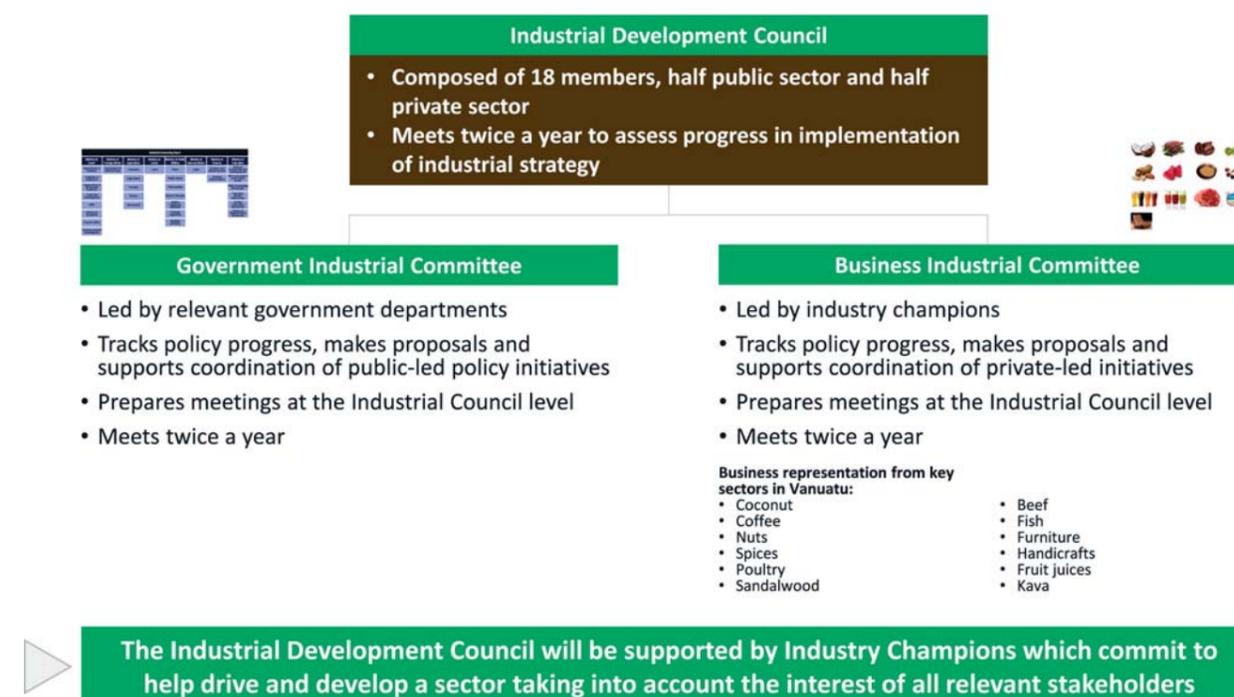
Set up a new Industrial Development Council

Implementing the National Industrial Development Strategy will require co-ordination across the board. On the Government side, Vanuatu needs to align and co-ordinate the actions of over 30 agencies across 9 ministries – as well as those of regional and local governments, including in remote areas.

In addition, the National Industrial Development Strategy requires a strong and consistent engagement with the private sector as well as the flexibility to respond to an evolving market landscape.

Figure 47:
Overview of the new Industrial Development Council

Source:
Whiteshield Partners



The proposed Industrial Development Council involves a high-level co-ordination body with representatives from both the private and the public sector. Chaired by the Prime Minister, it brings together eight ministries and private sector representatives twice a year to assess progress and set priorities for the short-term.

Two committees will feed into these biannual meetings. The Government Industrial Committee brings together senior officials from within the government twice a year to review progress in detail and decide on issues that should be brought to the attention of political representatives in the Council (see Figure 47 and 48).



Public-private consultation for the NIDS led by Acting Director-General for Ministry of Tourism, Trade and Ni-Vanuatu Business, George Borugu

Figure 48: Overview of Government Industrial Committee Governing Board

Note:
*Ministry of Tourism, Trade, Industry, Commerce, and Ni Vanuatu Business

Source:
Whiteshield Partners

Government Industrial Committee Governing Board								
Ministry of Trade*	Ministry of Foreign Affairs	Ministry of Agriculture	Ministry of Lands	Ministry of Infrastructure & Public Utilities	Ministry of Internal Affairs	Ministry of Finance	Ministry of Education	Ministry of Climate Change
Department of Industry	Department of external trade	Livestock	Land	Ports	Labor	Customs and Inland revenue	National Scholarship and Training Board	Meteorology & Geo-hazards Department
Chamber of commerce		Agriculture		Public Works		Customs Improvement	Nat'l curriculum & Assessment Board	Department of Energy
Cooperatives & Ni-Vanuatu business		Forestry		Civil Aviation			Policy & Planning Directorate	Department of Environmental Protection & Conservation
Trade Development Division		Fishery		Airports Vanuatu			Education Service Directorate	National Disaster Management Office
VIPA		Biosecurity		Utilities Regulatory Authority			Tertiary Education Directorate	
Bureau of Standards				Telecom regulation			Finance & administration directorate	
Vanuatu Tourism Office				Maritime Authority			Qualification Authority	
Department of Tourism								

Relevant department heads should meet twice a year and review progress in implementing the action plan and inform the newly formed Industrial Development Council

Table 3: Involvement of the key government stakeholders in the National Industrial Development Strategy

Source:
Whiteshield Partners

Program	Government of Vanuatu	Prime Minister's Office	Ministry of Trade	Ministry of Foreign Affairs	Ministry of Agriculture	Ministry of Lands	Ministry of Public Utilities	Ministry of Internal Affairs	Ministry of Finance	Ministry of Education	Ministry of Climate Change	Industrial Business Council
1. Smart trade	Informed	Informed	Responsible	Accountable	Accountable	Accountable	Accountable	Accountable	Accountable	Accountable	Accountable	Accountable
2. Seamless trade administration	Informed	Informed	Responsible	Accountable	Accountable	Accountable	Accountable	Accountable	Accountable	Accountable	Accountable	Accountable
3. Smart investment	Informed	Informed	Responsible	Accountable	Accountable	Accountable	Accountable	Accountable	Accountable	Accountable	Accountable	Accountable
4. Vanuatu as a brand	Informed	Informed	Responsible	Accountable	Accountable	Accountable	Accountable	Accountable	Accountable	Accountable	Accountable	Accountable
5. Drive MSME	Informed	Informed	Responsible	Accountable	Accountable	Accountable	Accountable	Accountable	Accountable	Accountable	Accountable	Accountable
6. Develop and retain talent	Informed	Informed	Responsible	Accountable	Accountable	Accountable	Accountable	Accountable	Accountable	Accountable	Accountable	Accountable
7. Support infrastructure	Informed	Informed	Responsible	Accountable	Accountable	Accountable	Accountable	Accountable	Accountable	Accountable	Accountable	Accountable
8. Ignite innovation	Informed	Informed	Responsible	Accountable	Accountable	Accountable	Accountable	Accountable	Accountable	Accountable	Accountable	Accountable

Accountable Responsible Consulted Informed

For each of the 9 programmes and associated projects the strategy has clearly defined departments that are accountable, responsible, consulted or informed (see Figure 49).

The Business Industrial Committee mirrors the government structure from a business perspective, bringing in not only established companies and business associations, but also entrepreneurs and actual and potential foreign investors.

The new Industrial Development Council will include all government units and private sector representatives under one umbrella, helping to ensure tighter co-ordination and monitoring of National Industrial Development Strategy.

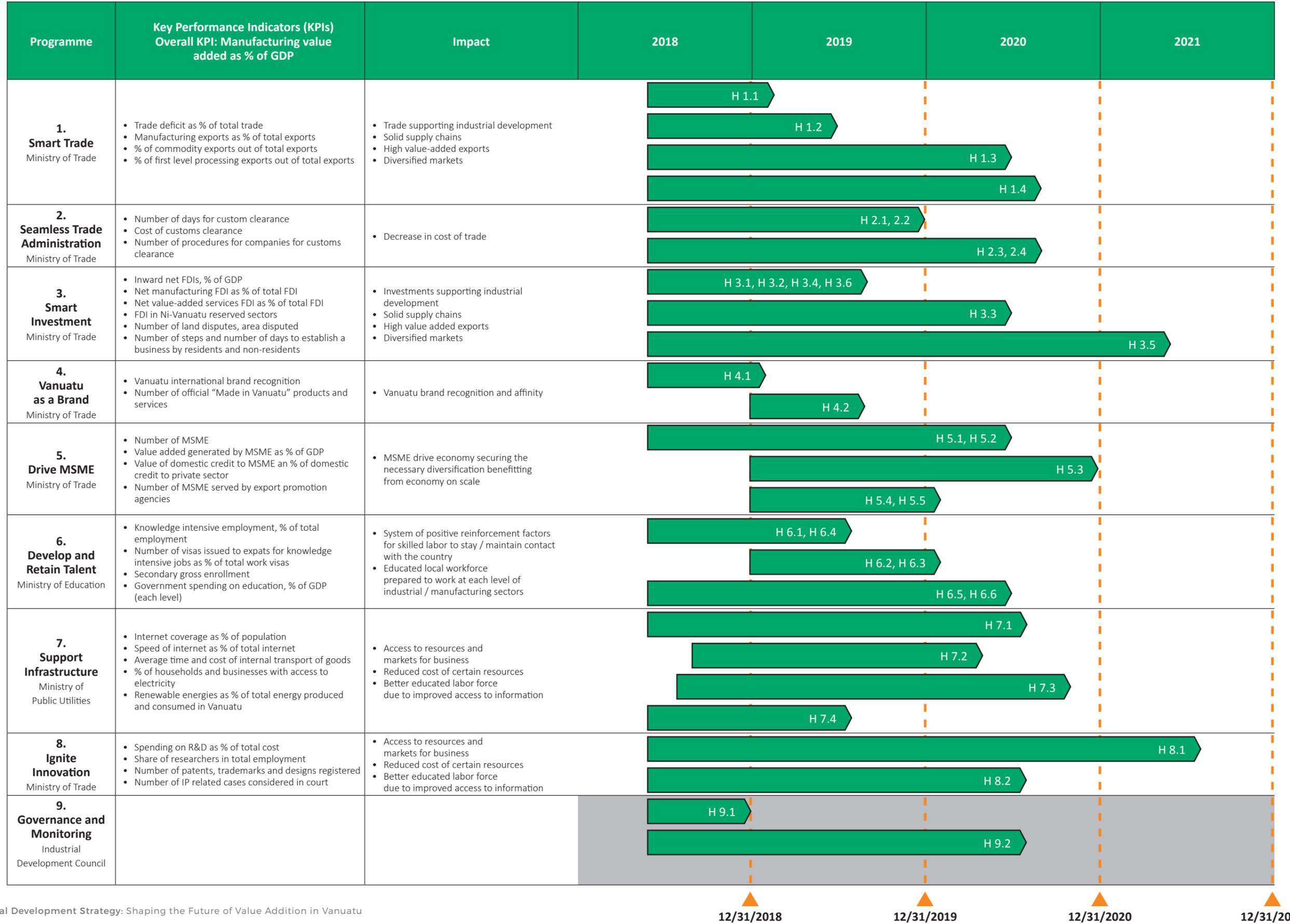
Timeline and Monitoring process

The timeline for this industrial strategy is ambitious, involving 35 projects which are mainly concentrated over the next 5 years (see Figure 49).

Implementing the strategy requires careful and continuous monitoring and evaluation at multiple levels. First, at the level of the projects and individual actions and decisions, officials should be held accountable not only at the output level, with indicators such as number of companies supported and events carried out, but also in terms of linking those outputs to the outcome and impact level. At the level of programmes, clear KPIs should reflect the outcome level. For instance, for programme 1, Smart Trade, outcome KPI's should look at the trade balance, the share of manufactured exports, and export sophistication (or level of value added through processing, technology, or branding). Through a regular process feeding into the oversight discussed above, these should also reflect a clear contribution to the impact level, or the structural transformation towards a higher-value added, sustainable production structure in the economy.

Figure 49:
Implementation
plan for National
Industrial
Development
Strategy

Source:
Whiteshield Partners



Conclusion

Vanuatu's industrial development vision is to fully unlock its capabilities to compete in niche markets with outstanding quality of products and services at premium prices in a sustainable and inclusive manner. Building on its comparative advantages in animal, vegetable and other food products, Vanuatu can expand its industrial base by solidifying, strengthening, and gradually expanding its core capabilities so that they can progressively spill over into other sectors and establish the foundation for value-adding structural transformation.

To achieve the industrial vision, a series of policy barriers must be addressed at the vertical and horizontal level. At the vertical, or activity-specific level, these constraints mainly involve different product sectors within agribusiness. For instance, rapid and effective resolution of land ownership rights is fundamental to the future development of the coconut, cocoa and coffee based sectors. At the horizontal level, policy barriers relate to trade, investment, skills, MSMEs, infrastructure and innovation.

Nine core programmes and 35 projects are proposed to deliver on the National Industrial Development Strategy. Involving both the private and public sector, these programmes cover trade, investment, MSMEs, infrastructure, skills, innovation, country branding and governance.

Delivering on this industrial strategy requires not only high-level support and co-ordination across the whole-of-government, but also strong engagement with the private sector. The proposed new Industrial Development Council, with representatives from both the public and private sector, will ensure effective governance and implementation of Vanuatu's National Industrial Development Strategy 2018-22.

Appendices

Appendix 1: Acronyms

MSME	Micro, Small and Medium-sized Enterprises
SME	Small and Medium Enterprises
IFC	International Finance Corporation
FDI	Foreign Direct Investments
GDP	Gross Domestic Product
MSG	Melanesian Spearhead Group
LDC	Least Developed Country
CPIA	Country Policy and Institutional Assessment
WTO	World Trade Organisation
PICTA	Pacific Island Countries Trade Agreement PICTA
FTA	Foreign Trade Agreement
ILOSTAT	International Labour Organisation
VC	Value Chain
CAGR	Compound Annual Growth Rate
MVA	Manufacturing Value Added
ECI	Economic Complexity Index (Hausmann, Hidalgo et al. 2011)
OG	Opportunity Gain
HS	Harmonized System (standardized system of names and numbers to classify traded products)
VUV	Vanuatu Vatu
PCI	Product Complexity Index (Hausmann, Hidalgo et al. 2011)
PC	Contribution to Processing Sector Index
RCA	Revealed Comparative Advantage (Balassa 1986)
nRCA	number of Revealed Comparative Advantages, regional level
R&D	Research and Development
TVP	Total Value Production
JV	Joint Ventures
VCO	Virgin Coconut Oil
NTB	Tariff Barriers to Trade
WDI	World Development Indicators
UNESCO	United Nations Educational, Scientific and Cultural Organization
EU	European Union
OECD	The Organisation for Economic Co-operation and Development (OECD)
VBS	Vanuatu Bureau of Standards
FSANZ	Food Standards Australia New Zealand
Pacer Plus	Pacific Agreement on Closer Economic Relations (PACER) Plus
IPA	Investment Promotion Agency
VIPA	Vanuatu Investment Promotion Authority
TVET	Technical and Vocational Education and Training
VCCI	Voluntary Control Council for Interference by Information Technology Equipment
OGCIO	Office of the Government Chief Information Officer
ITU	International Telecommunication Union
VSAT	Very Small Aperture Terminal
IPR	Intellectual Property Rights

Appendix 2: Methodology

Key concepts

There are three basic principles behind the theory of Economic Complexity²³:

Products are combinations of a large number of factors, including regulations, different forms of physical capital, organisations and human capital. We cannot measure them all explicitly, but we refer to them all as 'capabilities'.

Countries have some of these capabilities and lack the others.

Countries produce products if they have all required capabilities.

The Diversity of a country, i.e. the number of products exported by the country with Revealed Comparative Advantage (RCA)²⁴ is the first important measure of the capabilities it possesses.

Products also differ in the number and type of capabilities required to produce them. For example, in 2011, both Pakistan and South Korea have approximately the same number of RCAs. However, we expect that they produce products that require different sets of capabilities. Thus, it is reasonable for each product to look at the number of countries, which produce it. This is the second building block of the analysis called Ubiquity (the number of countries, which have RCA in this product). We can expect that products, which require a small set of capabilities (for example, meat and milk products) will be exported by many countries. At the same time, X-ray machinery requires very complex technologies possessed only by a minority of countries.

Moreover, capabilities often overlap. If a country can produce X-ray machinery, it is also likely to produce other kinds of machinery and equipment. On the other hand, if it exports bananas, it will probably also export mangoes, but not cars.

But what about exporting diamonds? If the production of diamonds required many different capabilities, we would expect that countries that have these capabilities are also able to produce many other different things. But this is not true: all exporters of diamonds have low diversity. Thus, we conclude, that ubiquity of this product is low not because it is complex, but rather because it is rare.

Summing up all these considerations, we expect that countries possessing many capabilities are able to produce many products that can only be produced by a few other countries, which in turn are also well diversified.

²³ Source: C. Hidalgo, R. Hausmann (2009) "The building blocks of economic complexity", Harvard University, Cambridge, C. Hidalgo, R. Hausmann et al (2011): "The Atlas of Economic Complexity", Harvard, MIT

²⁴ Definition of RCA is taken from Balassa (1986): RCA of a country C in product P equals to the share of this product in C's total exports divided by P's share in total world exports. It is considered that a country has RCA in product P, if its RCA in P is above one.

We end up with a recursive process when diversity of countries and ubiquity of products are recursively corrected by one another. On the first step, we examine how many products the country exports with advantage. On the second step, each of these products is weighed by its ubiquity. The resulting indicator is then corrected by diversity of countries that also have RCA in these products, and so on. The process converges, and the resulting two indicators – the Economic Complexity Index (ECI) for countries and Product Complexity Index (PCI) for products – are the outcome measures of various capabilities embedded in the production process.

Capabilities of a country can be mapped on a Product Space, a graph, which visualizes world trade in terms of proximities between products. Proximity between two products A and B is a conditional probability of a country to have RCA in product A if it has RCA in product B²⁵. On the Product Space, two nodes (products) have an edge between them if their proximity above 0.5, or if the edge was forced by the Maximum Spanning Tree algorithm. Thus, products form clusters based on the underlying capabilities.

²⁵ Note: If a pair of products require similar institutions, capital, infrastructure, or technology, they are likely to be produced in tandem. Thus, they will have high proximity.

Technical summary

Export data for the global level Economic Complexity analysis was taken from the UN Comtrade database²⁶. Analysis covered 180 countries and economies²⁷ and 1215 products classified by HS 1996 4 digit codes.

The definition of Revealed Comparative Advantage (RCA) of a country *c* in product *p* is the following (Balassa, 1986):

$$RCA_{cp} = \frac{X_{cp}}{\sum_c X_{cp}} / \frac{\sum_p X_{cp}}{\sum_{c,p} X_{cp}} \quad (1)$$

where X stands for the value of export.

We say that country *c* has RCA in product *p*, if $RCA_{cp} \geq 1$

The world export structure is represented by matrix M_{cp} :

$$M_{cp} = \begin{cases} 1, & RCA_{cp} \geq 1; \\ 0, & otherwise. \end{cases} \quad (2)$$

To estimate Economic Complexity Index, two simple measures of Diversity and Ubiquity were introduced:

$$Diversity = k_{c,0} = \sum_p M_{cp} \quad (3)$$

$$Ubiquity = k_{p,0} = \sum_c M_{cp} \quad (4)$$

Diversity of country *c* stands for the number of products, in which the country *c* has Revealed Comparative Advantage. Ubiquity of product *p* is the total number of countries, which have RCA in product *p*.

The measure of Economic Complexity is obtained via recursion by correcting Diversity and Ubiquity by each other:

$$k_{c,N} = \frac{1}{k_{c,0}} \sum_p M_{cp} \cdot k_{p,N-1} \quad (5)$$

$$k_{p,N} = \frac{1}{k_{p,0}} \sum_c M_{cp} \cdot k_{c,N-1} \quad (6)$$

After inserting (6) in (5) we obtain:

$$k_{c,N} = \sum_c \tilde{M}_{cc} k_{c,N-2}, \text{ where:} \quad (7)$$

$$\tilde{M}_{cp} = \sum_p \frac{M_{cp} M_{cp}}{k_{c,0} k_{p,0}} \quad (8)$$

The process converges after a few iterations, and the quantitative measure of Economic Complexity is given by the eigenvector \tilde{k} of matrix \tilde{M}_{cc} corresponding to the second largest eigenvalue. By the definition of eigenvector, \tilde{k} can be found from the equation:

$$\tilde{M}_{cc} \times \tilde{k} = \lambda \tilde{k}, \quad (9)$$

where λ is eigenvalue of \tilde{M}_{cc} , associated with \tilde{k}

When $k_{c,N} = k_{c,N-2} = 1$ we have a trivial vector of ones associated with the largest eigenvalue. This vector is not informative, so the eigenvector \tilde{k} , associated with the second largest eigenvalue of \tilde{M}_{cc} , is chosen as an indicator of economic complexity. After standardisation of \tilde{k} , we obtain Index of Economic Complexity (ECI):

$$ECI = \frac{\tilde{k} - \langle \tilde{k} \rangle}{stdev(\tilde{k})}, \quad (10)$$

where $\langle \tilde{k} \rangle$ is the mean and $stdev(\tilde{k})$ is the standard deviation of \tilde{k} .

Index of Product Complexity (PCI) is obtained calculated in the same way as ECI by transposing matrix M_{cp} and considering eigenvector \tilde{p} , associated with the second largest eigenvalue of the matrix M_{pp} :

$$PCI = \frac{\tilde{p} - \langle \tilde{p} \rangle}{stdev(\tilde{p})}, \quad (11)$$

where $\langle \tilde{p} \rangle$ is mean and $stdev(\tilde{p})$ is standard deviation of \tilde{p} .

Product Space is a graph with nodes representing exported goods. Two nodes have an edge between them if their proximity is above 0.5. Also, in order to guarantee connectedness of the graph, we use the Maximum Spanning Tree algorithm to add some more links even though their proximity is below 0.5 Proximity between two products *p* and *p'* is the minimum of two conditional probabilities - the probability to have RCA in *p'* if there is RCA in *p* and vice versa. Conditional probabilities are estimated based on frequencies in the RCA matrix:

$$\phi_{pp'} = \frac{\sum_c M_{cp} M_{cp'}}{\max(k_{p,0}, k_{p',0})}, \text{ where} \quad (12)$$

M_{cp} is the matrix of Revealed Comparative Advantages, *c* is the number of the country, $k_{p,0}$ and $k_{p',0}$ are ubiquities of products *p* and *p'* respectively. The minimum probability (maximum of $k_{p,0}$ and $k_{p',0}$) is taken to avoid the asymmetry in conditional probabilities. For example, if product *p* is much more rare (has lower ubiquity) than *p'*, the conditional probability $P(p'|p)$ will

²⁶ Source: <http://comtrade.un.org/db/>

²⁷ Note: Economies like Hong Kong and Taiwan regions

be much higher than $P(p|p)$, though distance between products should be symmetrical by definition.

Based on Proximity matrix (formula [12]), Product Space was constructed by following algorithms:

1. 'Skeleton' of the graph: Maximum Spanning Tree algorithm was used to construct connected graph with $(n-1)$ edges with the maximum total proximity (n - number of products). 'Tissue' of the graph was obtained by adding to 'Skeleton' all links between products with proximity above 0.5
2. Force algorithm for graph layout to separate clusters of products.

Geocapability Mapping approach

Geographic and demographic factors influence the export competitiveness and the economic development. For instance, high altitude and rural population help explain export competitiveness for certain agricultural products like goats, sheep, tea and organic vegetables, buffaloes and yaks.

Geocapability Mapping approach as a supplement to the Economic Complexity approach helps to reveal products whose development, production and export can be facilitated by the geographic/demographic features of the country.

Geographic and demographic indicators, what characterize the country's geographic and demographic features, can be considered as a special kind of "products" and added to the export matrix of products.

If an indicator for a country deviates significantly from the worldwide average, then this country has a distinctive feature - an analog of Revealed Comparative Advantage (RCA) - in the corresponding geographic or demographic characteristic. It is called Indicator Revealed Comparative Advantage.

Indicators can deviate from the average in the upward or downward direction, thus the set of indicators are duplicated using one copy for each direction.

Downward direction: for example, if the annual temperature is much lower than the worldwide average, the indicator "Annual temperature low" for this country is assigned 1, else 0.

Upward directed indicators: for example, if the annual temperature is much higher than the worldwide average, the indicator "Annual temperature high" for this country is assigned 1, else 0.

Indicator Revealed Comparative Advantage (IRCA) of a country c in indicator p

$$IRCA_{cp} = \frac{X - X_{cp}}{std(X_{cp})}$$

where X stands for the value of indicator,

X_{cp} - the average value of indicator p for all countries

$std(X_{cp})$ - the standard deviation of indicator p taken over all countries.

For the calculation of proximity matrix, we use the M_{cp} matrix of binary IRCA's:

For downward directed indicators,

$$M_{cp} = \begin{cases} 1, & IRCA_{cp} \leq -1; \\ 0, & otherwise \end{cases}$$

For upward directed indicators

$$M_{cp} = \begin{cases} 1, & IRCA_{cp} \geq 1; \\ 0, & otherwise \end{cases}$$

Geocapability Mapping approach in the case of Vanuatu was applied to Agribusiness sector, thus the further analysis includes the initial data and calculations only for products of animal, vegetable and food sectors. The RCAs, the M_{cp} matrix and the Diversity for these products are calculated as in the Economic Complexity approach. The RCAs, the M_{cp} matrix for products are complemented correspondingly by the IRCA matrix and the M_{cp} matrix for indicators. The Ubiquity for each products and indicator and the Proximity Matrix are calculated as in the Economic Complexity approach. Product Space was constructed using the Economic Complexity algorithm.

Sector Prioritization Index Methodology for Products

Vanuatu attractiveness:

$$nRCA = \frac{\sum RCABin_i}{n}, \text{ where}$$

- $RCABin_i = 1$ if $RCA \geq 1$ and 0 otherwise for the product i included to the sector
- n - total number of products in the sector

$$\text{Share of Sector} = \frac{\sum VExport_i}{VExport}, \text{ where}$$

- $VExport_i$ – Vanuatu Export of product i included to the sector
- $VExport$ – total sum of Vanuatu Export

$$\text{Sector Growth} = \left(\frac{\sum VExport_{i2014}}{\sum VExport_{i2009}} \right)^{1/5} - 1, \text{ where}$$

- $VExport_{2014}$ – Vanuatu Export of product i included to the sector in 2014
- $VExport_{2009}$ – Vanuatu Export of product i included to the sector in 2009

$$\text{Vanuatu Comparative Advantage Index for Product Sectors} = \frac{nRCA_{2014} + \text{Share of Sector} + \text{Sector growth}}{2}$$

Intrinsic attractiveness:

$$\text{Weighted PCI} = \frac{\sum PCI_i * GExport_i}{\sum GExport_i}, \text{ where}$$

- PCI_i – Product Complexity Index for product i included to the sector
- $GExport_i$ – Global Export of product i included to the sector

$$\text{Share of Sector} = \frac{\sum GExport_i}{GExport}, \text{ where}$$

- $GExport$ – total sum of Global Export

$$\text{Sector Growth} = \left(\frac{\sum GExport_{i2014}}{\sum GExport_{i2009}} \right)^{1/5} - 1, \text{ where}$$

- $GExport_i$ – Global Export of product i included to the sector

$$EU MVA = \frac{\sum EUMVA_{si} * GExport_i}{\sum GExport_i}, \text{ where}$$

$\frac{z-\mu}{\sigma}$, $EUMVA_{si}$ – EU Manufacturing Value Added of ISIC sector s to which the product i belongs

$$\text{Growth of EU MVA} = \left(\frac{\sum EU MVA_{i2014}}{\sum EU MVA_{i2009}} \right)^{1/5} - 1$$

Intrinsic Attractiveness for Product Sectors = the product i belongs

$$\text{Intrinsic Attractiveness for Product Sectors} = \frac{\text{Weighted PCI} + \text{Share of Sector} + \text{Sector Growth} + \text{EU MVA} + \text{Growth of EU MVA}}{5}$$

All variables are normalized using this formula: $\frac{z-\mu}{\sigma}$, where

- z – indicator
- μ – mean
- σ – deviation

Sector Prioritization Index = (Vanuatu Comparative Advantage Index for Product Sectors + Intrinsic Attractiveness for Product Sectors)/2

Sector Prioritization Index Methodology for Services

Share of Vanuatu service sector i in Vanuatu export and share of global service sector i in global export were defined using the following Worldbank indicators:

- Communications, computer, etc. (% of service exports, BoP)
- Insurance and financial services (% of service exports, BoP)
- Transport services (% of service exports, BoP)
- Travel services (% of service exports, BoP)
- ICT service exports (% of service exports, BoP)

$$\text{Vanuatu Sector Growth} = \left(\frac{\sum \text{Vanuatu Share of Sector}_{i2014}}{\sum \text{Vanuatu Share of Sector}_{i2009}} \right)^{1/5} - 1$$

$$\text{Global Sector Growth} = \left(\frac{\sum \text{Global Share of Sector}_{i2014}}{\sum \text{Global Share of Sector}_{i2009}} \right)^{1/5} - 1$$

Vanuatu Comparative Advantage Index for Services Sectors =

=(Vanuatu Share of Sector + Vanuatu Sector Growth)/2

Intrinsic attractiveness for Services Sectors = (Global Share of Sector + Global Sector Growth)/2

All variables are normalized using this formula: $\frac{z-\mu}{\sigma}$, where

- z – indicator
- μ – mean
- σ – deviation

Sector Prioritization Index = (Vanuatu Comparative Advantage Index for Services Sectors + Intrinsic Attractiveness for Services Sectors)/2

Agribusiness Prioritization Index Methodology

For each product of animal, vegetable and food sector were calculated following indicators based on export data and Economic Complexity statistics:

Vanuatu attractiveness:

- RCA
- Growth of RCA (2009-2014 CAGR)
- Growth of Vanuatu Product Export (2009-2014 CAGR)
- Opportunity Gain

Intrinsic attractiveness

- PCI
- Ubiquity
- Growth of Ubiquity (2009-2014 CAGR)
- Global Share of Product
- Global Export Growth

Opportunity Gains measures how much a location could benefit in opening future diversification opportunities by developing a particular product. Opportunity gain quantifies how a new product can open up links to more, and more complex, products. Opportunity gain accounts for the complexity of the products not being produced in a location and the distance or how close to existing capabilities that new product is.

$$OG_{cp} = \left[\sum_{p'} \frac{\varphi_{pp'}}{\sum_{p'} \varphi_{p'p'}} (1 - M_{cp'}) PCI_{p'} \right] - (1 - d_{cp}) PCI_p, \text{ where}$$

$$d_{cp} = \frac{\sum_{p'} (1 - M_{cp'}) \varphi_{pp'}}{\sum_{p'} \varphi_{p'p}}$$

Vanuatu Comparative Advantage Index=(RCA + Growth of RCA + Growth of Vanuatu Product Export)/3 if OG=0 and (RCA2014 + Growth of RCA + Growth of Vanuatu Product Export + OG)/4 otherwise

Intrinsic attractiveness=(PCI - Ubiquity - Growth of Ubiquity + Global Share of Product +Global Export Growth)/5

Sector Prioritization Index = (Vanuatu Comparative Advantage Index + Intrinsic Attractiveness for Services Sectors)/2

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