

Reducing Poverty in Timor-Leste through Stimulating Growth and Structural Change

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Abstract: *This paper discusses Timor-Leste's capacity to engender the conditions for rapid growth and structural change to escape the poverty trap. While natural resources offer the foreign exchange to finance economic progress, Timor-Leste shall have to break out from the Dutch disease to sustain this process. The evidence shows that Timor-Leste is facing a trend fall in cereal yields in the agricultural sector while oil and gas continue to be the prime contributors to its GDP growth. In addition, with the incidence of poverty rising over the last decade and child mortality and life expectancy rates falling very slowly, Timor-Leste is very much stuck in a whirlpool of poverty. The paper presents a stylised framework to assist the Timor-Leste government to engender the conditions that would stimulate rapid growth and structural change in the non-natural resource sectors through a focus on knowledge-based activities targeted at the productive sectors of agriculture and manufacturing in order to save the country from being strangled by the resource curse.*

Keywords: Petroleum, Poverty, Structural Change, Timor-Leste

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1. Introduction

Royal Professor Ungku Aziz's (1964, 1965) legacy as one of the masterminds behind poverty alleviation programmes and economic development of Malaysia can serve as a model for Timor-Leste to creatively adapt its development formulae (Rasiah, Norma & Chandran, 2016). Although Timor-Leste is significantly smaller than Malaysia, both in land and in population, it is endowed with natural resources. Malaysia's successful experience in diversifying exports and to stimulate industrialisation to steer clear of the Dutch disease and fallacy of composition problems shall be important for Timor-Leste.

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The key question facing Timor-Leste is its capacity to translate oil rents under the sea, evolve its non-oil economic sectors and stimulate economic development and poverty alleviation programmes. The strategies shall be different as it is not viable for Timor-Leste to introduce tariffs to stimulate import-substitution industrialisation as its size makes its domestic market irrelevant. Nevertheless, it can pursue some aspects of industrial policy by promoting sectors in which competitive industries can be spawned. Also, Timor-Leste can pursue preferential access to important markets through bilateral relations with the developed countries and the “everything but arms” trading clause with the Economic and Monetary Union of the EU as it is classified under the group of Least Developed Countries (LDCs).

As oil and gas mining is highly capital-intensive it does not create many jobs and hence, contributes little directly to poverty alleviation. A number of key social indicators show that people of Timor-Leste are deeply immersed in poverty. Despite the gradual fall, child mortality (0-5 years) rates are still high with an average life expectancy of 66 years in 2011. Timor-Leste was a colony of Portugal until its invasion and eventual conquest by Indonesia, which ruled the country until 1999 when a bloody civil war forced the occupying power to grant Timor Leste its independence; that preceded United Nations-brokered agreement and peace deal in 2002.

This article deploys some of the instruments and strategies Professor Ungku Aziz had recommended to by the Malaysian government with a particular focus on the development of technological capabilities to tackle poverty. These are outlined and discussed in the first section. The rest of the paper is organised as follows. Section Two provides the theoretical considerations while Section Three analyses economic contribution of key non-oil sectors. Section four examines the knowledge-based activities that are essential to stimulate growth and structural changes. Section Five concludes and summarises the main findings.

2. Theoretical Considerations

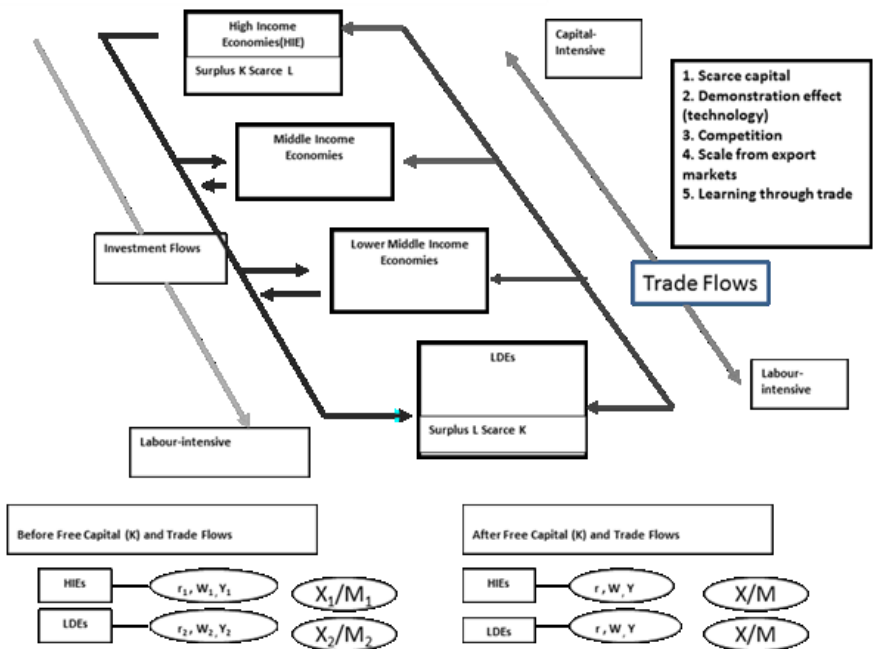
The early economic argument on development focused on specialisation on the basis of static comparative advantage (Ricardo, 1832) and its various adjustments. The persistence of poverty and underdevelopment, especially among the LDCs, led to the introduction of several new theories. Parallel developments that to some extent remained within the neoclassical framework were the Dutch disease (Corden & Neary, 1982) phenomenon and resource curse (Sachs & Warner, 1998). We will argue below that neither of these theories adequately explain underdevelopment and more importantly, offer lessons to free countries from shackles of poverty.

2.1 Neoclassical Economic Convergence Thesis

By dropping the assumption of perfect capital immobility but keeping the immobility of labour would generate the impact Bhagwati (1975) had

observed. Rising inflows of FDI into the LDCs will lower interest rates (r) as the supply of capital in relation to demand will rise while wages (w) would increase in tandem with the increasing demand for workers. Per capita incomes (Y) will eventually equalise across different countries. Free exchange rates are considered to keep balance of payments close to zero in the long run as deficits (when imports $[M]$ exceed exports $[X]$) and surpluses (when exports $[X]$ exceed imports $[M]$) will clear with demand adjustments domestically and abroad (see Fleming, 1962; Mundle, 1963). Hence, inflows of capital from abroad in the absence of impediments to capital inflows and trade will reduce unemployment and at the same time lead to rise in wages. In fact, Krueger (1980) and Belassa (1982) believe that the economic success of Korea and Taiwan was a direct result of liberalisation. This same liberalisation logic has prevailed in several accounts on ASEAN that position Singapore as a high income country while Malaysia, Thailand, Indonesia and Philippines placed in the mid-tier and the transition economies at the bottom.

Figure 1 : Neoclassical thesis of economic convergence



Source: Authors.

However, not only that perfect market conditions do not exist, it also discourages innovations (Schumpeter, 1961). Hence, the arguments of Heckscher (1919) and Ohlin (1933) that under conditions of perfect capital and labour mobility within borders and immobility across borders specialization on the basis of factor endowments will generate the best economic outcomes as a classroom academic exercise. While Keynes (1936) accepted the problems of information asymmetry and market imperfections and called for government intervention to generate full employment, he did not broach effectively the specific strategies essential to stimulate improvements for labour. Instead, any effort to examine the implications of growth for labour would require a full understanding of institutions - both in the participation of labour in the process as well as instruments in place to ensure there is effective distribution of value created between the owners and workers of the means of production. In fact, successful industrialisation was achieved alongside significant improvements in the material conditions of labour in Korea and Taiwan on the back of strong state intervention – a point the World Bank (1993) finally conceded.

2.2 Dutch Disease and Resource Curse

A number of countries have suffered in the past when economic transactions were led by a booming non-renewable minerals sector. While countries such as the Netherlands managed to avoid such overdependence by targeting their agricultural and manufacturing sectors for development, countries like Nigeria has remained dependent on oil and gas. The economic structure of Nigeria in 2010 was not very different than in 1960 (World Bank, 2011). Despite being blessed with natural endowments, Nigeria has become increasingly dependent on petroleum exports while importing large volumes of palm oil.

The argument directed at this flawed strategy development was originally advanced by Corden and Neary (1982). They used a three-sector model - the non-tradable sector (including services), the non-renewable booming tradable sector (minerals) and the renewable tradable but lagging sector to show how it will eventually stunt economic development. The booming sector usually refers to the extraction of oil and gas, but can also refer to all mining of minerals (such as gold, copper, diamonds, bauxite, tin and iron). The lagging sector generally refers to manufacturing, but can also include productive agriculture.

Resource sectors also expose economies to fluctuations in prices. During commodity booms, rising prices would raise exchange rates so as to squeeze out the export-competitiveness of manufacturing. Sachs and Warner (2001) showed that there is little direct evidence that omitted geographical or climate variables or unobserved biases explain the resource curse. Resource-abundant countries are considered to be high-price economies and as a result, they tend to be incapable of supporting export-oriented industries.

While the Dutch disease argument simply nailed the problems of over-

relying on resource-based sectors that cannot be sustained over the long run to raise doubts on the theory of specialisation on the basis of comparative advantage, it did not offer a concrete alternative that countries could use to break out from the conditions of underdevelopment. These theories simply explained why the general theory of comparative advantage and specialisation had departures.

2.3 Fallacy of Composition

The theory of comparative advantage and factor specialisation was criticised by those who saw the falling terms of trade and underdevelopment (Prebisch, 1950; Singer, 1950; Sarker & Singer, 1991). This powerful argument shows how narrow specialisation in low value added primary commodities and light manufactures has trapped several developing economies into a vicious circle of underdevelopment. In so doing what came to be known as the fallacy of composition managed to undermine the relative price theory.

However, the fallacy of composition argument offered no concrete solution apart from suggesting the need to target structural changes into productive economic activities in general, and manufacturing in particular. In so doing, countries that introduced proactive interventionist but with an effective carrot and stick approach executed through an appraisal system undermined the foundations of this argument; Korea and Taiwan are good examples (Amsden, 1989; Wade, 1990). Also, countries that continued to diversify their economic activities so as to shield the balance of payments from price fluctuations managed to use the surplus to support learning and innovation activities (Rasiah, Osman & Alavi, 2000). However, among the countries that only opened their borders to FDI inflows through incentive packages and infrastructure build up without a clear approach to stimulate technological upgrading failed to break out from the low and middle income trap such as Indonesia, Malaysia, Mexico, and Thailand.

2.4 Innovation Capabilities

The emphasis on technology as the driver of economic growth can be traced to Marx (1954) who believed the introduction of capitalist social relations as essential to engender mass production capabilities. While Marx's (1954) focus was on the transition to capital goods production predicated on the argument that competition is essential to stimulate technological change, Schumpeter (1934, 1943) advanced this further by defining the elements of innovation. While the adaptive and incremental nature of entrepreneurial innovation was obvious in Schumpeter's (1961: 161) work, he also discussed the need for large firms to undertake R&D activities to stimulate new cycles of innovation. While the former refers to incremental innovations that entrepreneurs can easily handle, the latter refers to creation of new stocks of knowledge that can only be generated in large R&D laboratories. While Schumpeter subsumed both types of innovation within creative destruction, Nelson and Winter

(1982), and Malerba (2006) used creative accumulation to distinguish the latter from minor innovation activities.

Reinert (1994) showed how it was possible for countries at the bottom of the technology ladder and enjoying very low per capita incomes were able to catch up technologically and eventually develop into high income economies. Indeed, Korea and Taiwan are examples of such economies that started with per capita incomes less than US\$100 in the 1960s to enjoy per capita incomes exceeding US\$20,000 since 2010 (World Bank, 2011). The success stories of Korea and Taiwan are all the more interesting because they lacked natural resources to generate foreign exchange to support their industrial policy initiatives and both countries were essentially LDCs in the 1960s.

While the focus on technological capability building is central to stimulating economic development in Timor-Leste, strategic targeting is important taking into account the country's economic and spatial structure. While at the time of take-off Korea and Taiwan targeted selected industries for development because of the lack of resources and their small size (Amsden, 1989; Kim, 1997), Timor-Leste's tiny size makes the selection issue from the tradable non-oil sectors for promotion even narrower. However, in contrast to critics who claim that the global trading arrangement has rendered industrial policy totally irrelevant (cf Yusof & Nabeshima, 2009), we make the case that several instruments can still be employed to quicken economic growth rates and engender structural changes. However, industrial policy ought to be driven by a conscious initiative to expedite structural changes towards higher value added activities through the introduction of knowledge absorbing, adapting, creating and appropriating policies à la the arguments of evolutionary economists (for example Freeman, 1987; Lundvall, 1992; Nelson, 1993).

Hence, while the Dutch Disease and resource curse arguments provide a powerful rationale to avoid overdependence on oil and gas, they do not explain how the latter (oil and gas) can be used productively to create the endowments essential to establish sustainable economic development in LDCs.

2.5 Alternative Framework

Typical of any LDCs, Timor-Leste is an economy facing severe demand constraints as unemployment and poverty incidence are extremely high while per capita income is very low. Three strands of arguments are important here. The first comes from the contribution of Harrod (1939) and Domar (1946) who made the case that the incremental capital output ratio of less developed economies to be higher than more developed countries. Poorer economies facing severe unemployment will have to invest heavily into developing infrastructure before productivity begins to rise. In other words, development has trajectories that require different emphasis during different phases with capital expenditure expected to grow far more rapidly than output growth in the early phase of growth. Hence, the neoclassical growth model advanced by Solow (1956) will not be useful in modelling early growth trajectories of

poor economies such as Timor-Leste. This will hold even with the new growth model after accounting for embodied technical progress following Romer's (1986) contribution to growth accounting. The attempt to remove technology from the residue estimated using the original Solow (1956) model, even if undertaken effectively, does not address the need for early developers to focus on capital expansion and develop basic infrastructure under circumstances where capital productivity will be low.

We consider that the only route LDCs have is to target potentially successful resources to evolve through the adequate development of domestic capabilities. As Lall (2001) has shown convincingly from the evidence collected from Sub-Saharan countries, countries that developed technological capabilities have performed better economically than countries that did not. Typical of Keynesian arguments, we consider Timor-Leste to be facing severe demand constraints and as such, a liberal policy approach will create an economic equilibrium far from the point of full employment (Keynes, 1936).

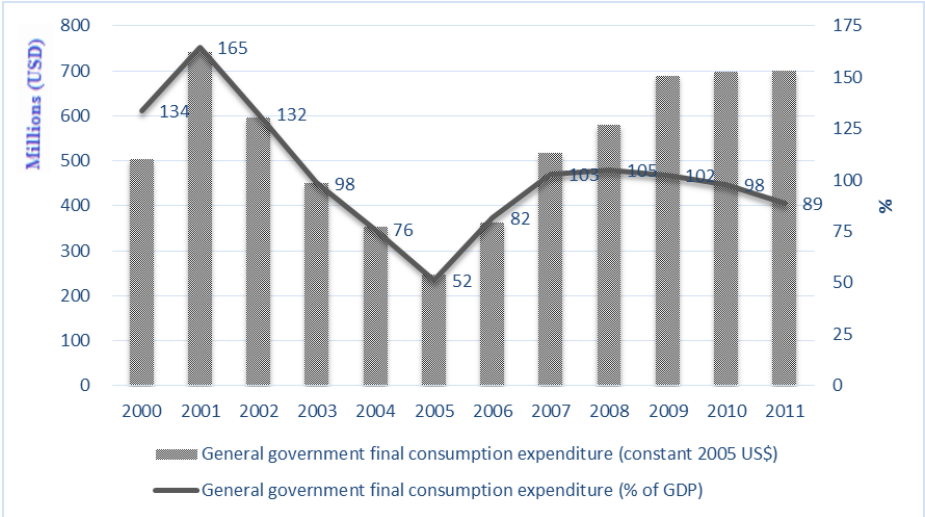
A complementary argument focused on raising agricultural productivity was articulated by Lewis (1954). He and Myrdal (1957) advanced the "two-sector surplus labour" model [modified later by Ranis & Fei, 19961] and Jorgenson (1967)] to explain how differences in economic returns drive movement of surplus labour from agriculture to manufacturing. This process of self-sustaining growth is assumed to continue until all surplus agricultural labour is absorbed in the expanding industrial sector (Lewis, 1954).

It is important for early developers to quickly integrate into the capitalist world system to initiate growth in productive capacities (Kalecki, 1976), which runs contrary to the arguments of the dependency school.²The dependency school called for delinking from the capitalist system because of its "super-exploitation" that underpins the underdevelopment of countries (Baran, 1962; Frank, 1966; Amin, 1976). The underdevelopment thesis explained by surplus appropriation and transfer became popular following the failure of several developing countries to generate significant levels of GDP growth despite increasing exports of agricultural commodities (Singer, 1950; Prebisch, 1950). This came to be known as the Singer-Prebisch fallacy of composition thesis and was predicated on falling terms of trade between agricultural and manufactured products. Sarker and Singer (1991) subsequently found that developing countries had actually substantially diversified exports to include light manufactures and yet, continued to face falling terms of trade. Nonetheless, the fallacy of composition or the Sarker-Singer thesis was avoided by successful exporters who focused on raising value added through technical change and diversification (see Rasiah, Osman & Alavi, 2000).

Figure 2 shows government consumption and its composition in GDP, which demonstrates the underdeveloped nature of the primary and secondary economic activities in Timor-Leste. Government final consumption as a share of GDP has shown a visible fall since 2008 but has remained high. This is

understandable given the severe demand constraint the country has faced in its infantile years. Real government consumption stabilised in 2009-11, which is a positive sign as the other sectors have expanded more rapidly over the period 2008-11.

Figure 2: Government expenditure, Timor-Leste, 2000 to 2011



Source: World Bank (2013).

Third, borrowing from the pioneering work of Keynes (1936) and Kalecki (1976),³ the present study argues Timor-Leste requires a policy framework that focuses on demand management. In doing so, we prefer Kalecki’s (1976) argument that calls for nation states to target technological capability building once development finance meets essential consumption. Drawing from Marx’s (1954) logic of departments 1 and 2 goods, Kalecki (1976) emphasised the gradual reinvestment in capital goods to shift the economy to technology-intensive economic activities. Kalecki observed that employment creation and poverty alleviation can be sustainable in the long run only if the economy continues to be competitive and productive. However, unlike typical economies with sizable population and land mass, Timor-Leste is tiny and hence, the choice of sectors will be much narrower than what Korea and Taiwan pursued to propel their economies to achieved developed status.

While Kalecki’s (1971) analysis remains important, the practical application of his arguments in technological capability terms would benefit from Schumpeter’s assessment of creative destruction and its

institutional extension by Nelson and Winter (1982). Schumpeter (1934: 161) defined innovation to include minor or incremental innovations related to improvements and adaptations to plant layout, machinery and equipment, inventory and quality control systems and product that entrepreneurs can easily manage. However, Schumpeter (1943) focused more on the creation of new stocks of knowledge to support radical innovations that can only occur in large R&D laboratories to spur cycles of innovation. The meaning behind Mark II innovation has its origins in Schumpeter (1943) when he explains the importance of large firms that focus on new stocks of knowledge that trigger cycles of innovation. Despite being located at the bottom of the technology ladder, Timor-Leste can still develop its technological capabilities by focusing on the few sectors where it enjoys either natural or potential advantages.

The development process will inevitably involve the evolution of economic enterprises to show a significant presence rather than one in which they completely dominate the phases. Hence, as firms in Timor-Leste move from simple to complex innovation activities, a number of firms may still specialise on lesser technological capabilities. Also, the task of moving an underdeveloped country from the bottom of the technology ladder will be arduous and daunting with no guarantee that all the efforts will bear fruit.

3. Non-Oil Sectors

While recognising that oil and gas sector plays an important role in financing essential consumption and the development of other sectors, knowledge-driven activities should target non-oil sectors of Timor-Leste. Since the oil and gas based sector is largely developed by the Australians, it is unclear if Timor-Leste will be able to target the sector for downstream processing and the development of a petrochemical industry. Hence, we examine the non-oil sectors associated with renewable resources that can prevent the occurrence of the Dutch Disease in Timor-Leste⁴.

The government, through heavy aid from abroad, has targeted infrastructure development as a major activity and hence, construction accounted for 13% of Timor-Leste's GDP in 2010 (ADB, 2013). Agriculture is the only tradable sector that still shows a strong share of GDP but its share has stagnated over the years.

Timor-Leste recorded an unemployment rate of 3.6% in 2010 (World Bank, 2013). Agriculture (51%) contributed the most to employment among the non-oil sectors followed by services (40.2%) in 2010 (see Table 1). The rural nature of agriculture means that the rural-urban breakdown of employment in Timor-Leste is skewed towards the former (72.1%), while the gender breakdown of employment shows a strong bias towards males (68.1%). The contribution of manufacturing (3.2%) to employment was significantly less than the construction sector (5.6%). The evidence shows that Timor-Leste is still a highly underdeveloped country with a large percentage of the population involved in agriculture and simple services with heavily

underutilised resources in the Keynesian and Kaleckian sense.

Table 1: Non-oil employment structure, Timor-Leste, 2010 (Thousands)

	Rural-Urban			Gender		
	Urban	Rural	Total	Male	Female	Total
Agriculture, forestry, fishing	13 (18.6)	115 (63.5)	128 51.0	88 51.5	40 50.0	128 51.0
Mining & Quarrying	0 (0.0)	1 (0.6)	1 0.4	1 0.6	0 0.0	1 0.4
Manufacturing	3 (4.3)	5 (2.8)	8 3.2	3 1.8	5 6.3	8 3.2
Construction	7 (10.0)	7 (3.9)	14 5.6	13 7.6	1 1.3	14 5.6
Services	47 (67.1)	54 (29.8)	101 40.2	67 39.2	34 42.5	101 40.2
Total	70 (100.0)	181 (100.0)	251 100.0	171 100.0	80 100.0	251 100.0

Note: Figures in parentheses refer to percentage of vertical total.

Source: Calculated from UNDP (2011: 35).

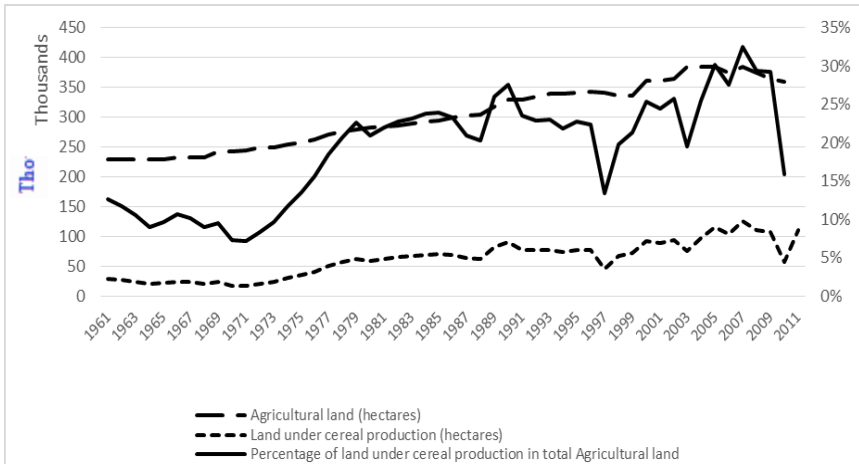
Since construction and utilities in Timor-Leste are non-tradable and non-oil and -gas mining have negligible contribution to the GDP, we focus on agriculture and manufacturing to evaluate the capacity of these sectors to experience rapid growth and structural changes. In addition, we include tourism which, given the natural endowments of the country, can generate foreign exchange to complement the agricultural and manufacturing sector.

Agriculture

The most important non-oil sector is agriculture. Yet, agricultural production in Timor-Leste has shown considerable fluctuations over the period 1961-2011. While agricultural land had continued to grow over this period, land under cereal production fell sharply in 1995-98 and 2011 (see Figure 3). Therefore, although the share of land under cereal production rose from 10.6% in 1961 to 29.2% in 2010, it dropped to 13.4% in 1998 and 15.9% in 2011. Total cereal production rose in trend terms from 1961 to 2012, with two temporary blips in 1997 and 2001. Improvements in production were achieved through the introduction of agricultural machinery, which grew from 1 unit machinery per 100 sq. km of arable land in 1961 to 7 units in 1997. Cereal yield increased from 1,217 kilograms per hectare in 1962 to 2,451 kilograms per hectare in 2010, demonstrating doubling of productivity (Figure 4). Although a contraction has occurred during 1999 (1,555 kilograms per hectare)⁵ to 2009 (1,276 kilograms per hectare) cereal yield rebounded to 2,315 kilograms per hectare in 2009 with a rising trend in the following three years. Whereas crop and food production rose in trend terms over the period 1961-1993 and 1961-1996, livestock production fell sharply over the periods

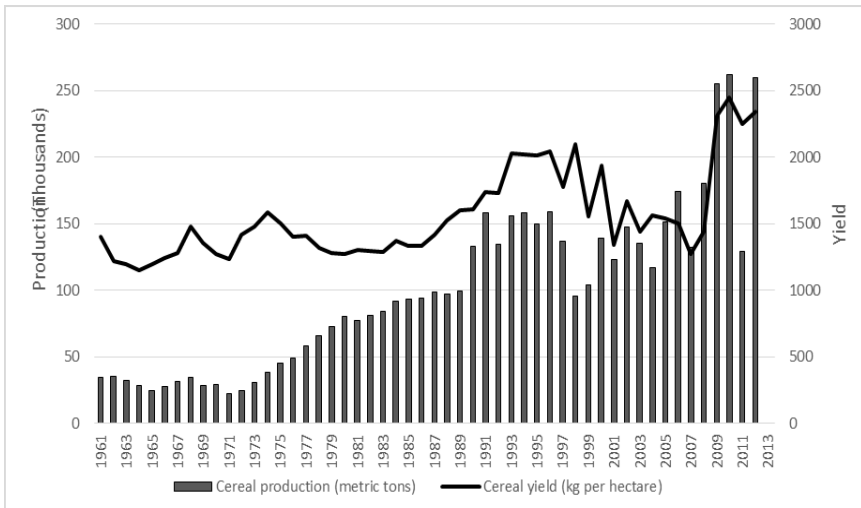
1972-1979, 1992-95, 1997-98 and 2004-05 (see Figure 5). Crop and food as well as livestock production showed a fluctuating and steady rising trend over the period 1999-2009. Despite the general improvement, all three agricultural items are at a significantly lower base than the peak achieved for food in 1993, crop in 1996 and livestock in 1997.

Figure 3: Agricultural land and land under cereal production, Timor-Leste, 1961-2011



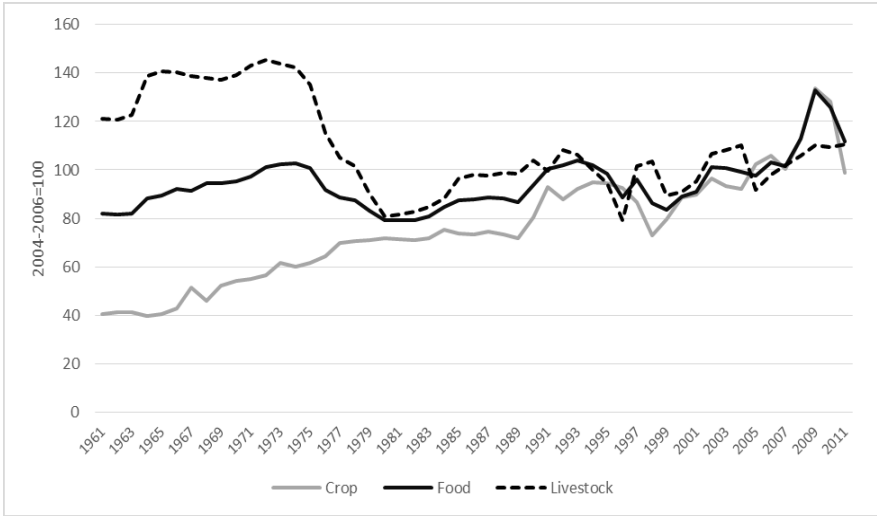
Source: World Bank (2013).

Figure 4: Cereal production and yield, Timor-Leste, 1961- 2012



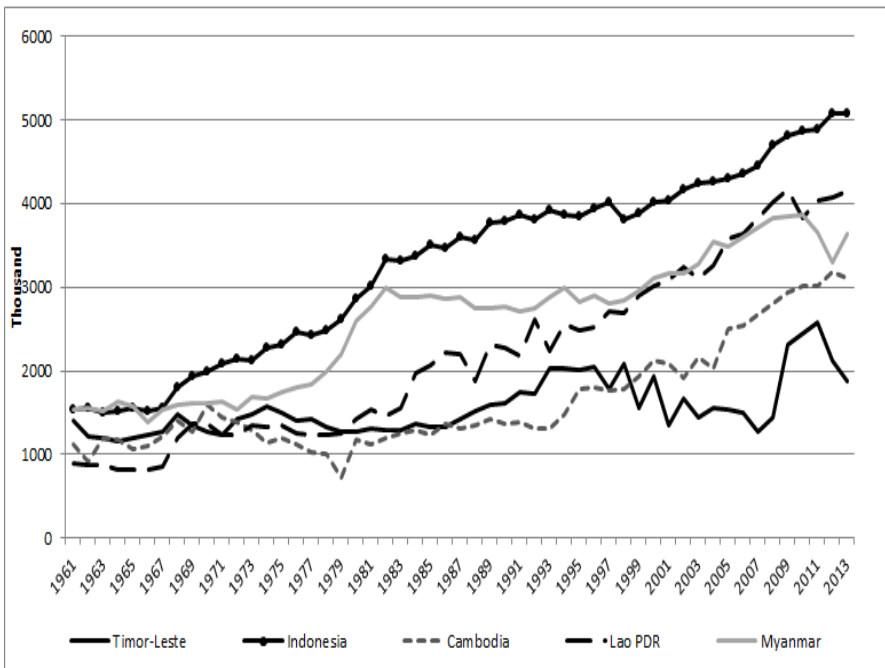
Source: World Bank (2013).

Figure 5: Production index of selected agriculture goods, Timor-Leste, 1969-2011



Source: World Bank (2013).

Cereal production in Timor-Leste since 1998 has been extremely low when compared with the commensurate figure achieved by its former occupier, Indonesia, and the LDCs of Cambodia, Laos and Myanmar (see Figure 6). While Indonesia showed the highest yield, the gap in cereal productivity between the latter LDCs and Timor-Leste had widened since 2000. Even war-torn Cambodia has since 1998 shown dramatic improvements in cereal yield. The dramatic fall in cereal productivity coming after the departure of Indonesia showed that domestic technological capabilities have not caught up with technological capabilities achieved by Cambodia, Laos and Myanmar. It is little wonder that food production in Timor-Leste is inadequate to meet domestic demand.

Figure 6: Cereal yield, selected countries, 1961-2009

Source: World Bank (2012).

The main agricultural crops and livestock in Timor-Leste are paddy, coconut, cassava, sweet potato, corn, coffee, fish and cattle, pigs, goats and poultry products (SOGES, 2009). The key products that should be promoted include Timor-Leste's food-based crops, such as paddy, cassava, sweet potato and corn, cash crops such as coffee, soybean, peanuts, green beans and coconuts, fish, cattle, pigs, goats and poultry products. Other products such as candlenut, cashew nuts and animal hide and skin are also available but have not been cultivated on a significant commercial scale. Large quantities of coconuts, cassava, sweet potato and peanuts actually rot in the countryside due to bad infrastructure and lack of transportation to bring them to Dili and the other urban locations. The government launched efforts to step up the production of paddy, cassava, sweet potato, bamboo and corn to meet the demand in Timor-Leste since 2008 (SOGES, 2009).

The FAO (2003) classified Timor-Leste as one of the cheapest producers of coffee in the world, which is harvested in near-wild form from the forest. Producers bear no overheads, provide no inputs with no pruning or replanting, and the only on-farm costs borne are weeding and harvesting. Because it

grows in a semi-wild state and no chemicals are used, it qualifies as organic coffee. The hybrid varieties of Arabica and Robusta coffee are also cultivated in Timor-Leste. Since the price of coffee has stabilised after the lifting of the Indonesian monopoly in 1995, many firms have invested in large coffee plantations. So far, the Cooperativa Café Timor (CCT) has the capacity to produce 600 metric tonnes of fresh coffee a day (SOGES, 2009: 91). Hence, coffee production and its related industry ranked the second largest export sector next to oil (US Department of State, 2013). In 2012, 60% of non-oil exports came from coffee and its related industries, generating over US\$22.8 million income for Timorese farmers (World Bank, 2013).

A survey in 2001 suggested that there were between 4,300 and 6,000 fishermen operating in 960 groups in 75 fishing centres around the coast of Timor-Leste. The government issued licences to foreign fisherman in 2008-10 to increase the landing of fish in Timor-Leste. Most fishermen use small boats equipped with gillnets, traps and hooks and lines fishing within 300 meters off the shore (Timor-Leste, undated). Shellfish and other seafood are harvested from the reef flats by women. In certain areas, beach seines are also used. Off-shore fishing licences are granted to foreign fishermen to complement rising domestic demand.

During the time of this research in 2009, the boats, skills of fishermen and equipment used by Timor-Leste fisherman were obsolete and hence, UNIDO (2009) recommended the government offer better boats and training, and ice factories, transport vehicles and development and demonstration centres focused on acquiring and adapting cutting edge fishing, maintenance, process and management techniques to support value addition in the industry. Unless the technological capabilities of fishermen are improved, much of the fish will be captured by fishermen from Indonesia and Thailand.

Over half of the animal products for food were imported, though Timor-Leste also exported cattle in 2010. The field observations by the authors in 2009 showed that the technological capabilities in the animal slaughtering, meat sorting and packing and processing industry were Timor-Leste were highly underdeveloped. The lack of abattoirs to slaughter cattle, goats and pigs is one of the reasons why these animals are moved to West Timor where they are slaughtered before the meat is re-imported (see SOGES, 2009: 24). With GDP projected to grow by 6.2% over the period 2010-20, the demand for meat, eggs and milk is expected to rise. While the supply of hides and skins in Timor-Leste is inadequate to warrant a full-scale leather processing industry, the government should issue licences for the establishment of ice factories and refrigeration houses to promote the livestock industry. Animal hides can still be exported to West Timor due to economies of scale and the amount produced in East Timor was uneconomical and hence, did not warrant its processing into leather domestically.

It is important to promote diversification of export crops in Timor-Leste

to prevent any specialisation in a few commodities. This will help the country reduce its dependency on a few commodities and avert falling terms of trade (see Rasiah, Norma & Chandran, 2016). Timor-Leste should expand its focus on the existing crops of coffee, coconut, green beans, soybeans and peanuts while efforts should be taken to plant bamboo that can be used to manufacture furniture. In line with this approach – which proved successful when Chile introduced salmon farming in the Southern provinces to evolve technological capabilities targeted at alleviating poverty since the 1980s (see Katz, 2006; Rasiah & Vinanchiarachi, 2012), - the government of Timor-Leste identified a number of agricultural products (including new ones) for import-substitution and for domestic consumption and exports (see Rasiah, Vinanchirarachi & Vadakkepat, 2014).

While the current efforts to build infrastructure and the promotion of better farming methods to raise output and yields of both the old and new crops, Ungku Aziz's initiatives to create cooperatives as well as government-coordinated marketing bodies will be necessary to solve problems of middlemen exploitation of asymmetric markets (Rasiah, Norma & Chandran, 2016). It is also important to stimulate growth in value added through the extension of agricultural value chain to include industrial processing such as sorting, pooling, drying and packaging.

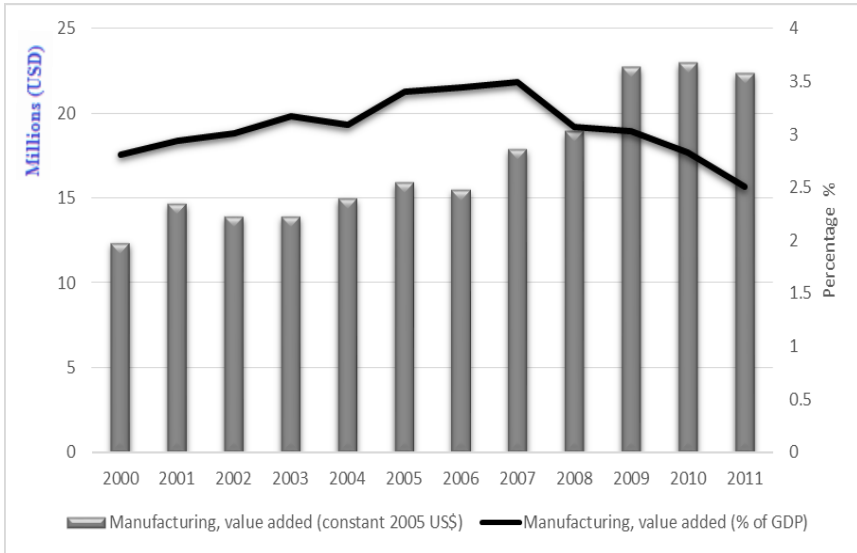
SOGES' (2009: 91-92) recommendation to pursue agri-business with an emphasis on downstream, on-farm, upstream and agricultural activities is good. Bamboo appears to be a promising product following UNIDO's (2009) efforts to support its farming and processing on a commercial scale. The main centre targeted at developing bamboo and bamboo products has enlisted technological support from abroad to diversify and deepen the industrial activities associated with bamboo. The supply of rattan and candlenut is considered sporadic and too highly dispersed for its export to be economical (FAO, 2003).

Manufacturing

Timor-Leste is an agrarian economy endowed with rich gas and oil resources with little industrial development. Due to its size, it lacks the scale to support heavy industries. The manufacturing sector in Timor-Leste has about 4,000 enterprises employing around 10,000 employees (Pedersen & Arneberg, 2000: 54). Except for coffee processing and sandalwood products, production is meant to meet the domestic market where manufacturing's share in total merchandise exports accounted for only 0.5% in 2004. The share of manufacturing in GDP is not only small at USD\$22.9 million in 2010, it has also fallen in trend terms from 2.8% in 2000 to 2.5% in 2010 (Figure 7). Within the overall industry, manufacturing's share rose steadily from 17.1% in 2000 to a maximum of 38.1% in 2006 before falling to 11.9% in 2011. However, the fall in manufacturing's share in industry and GDP is a consequence of rising

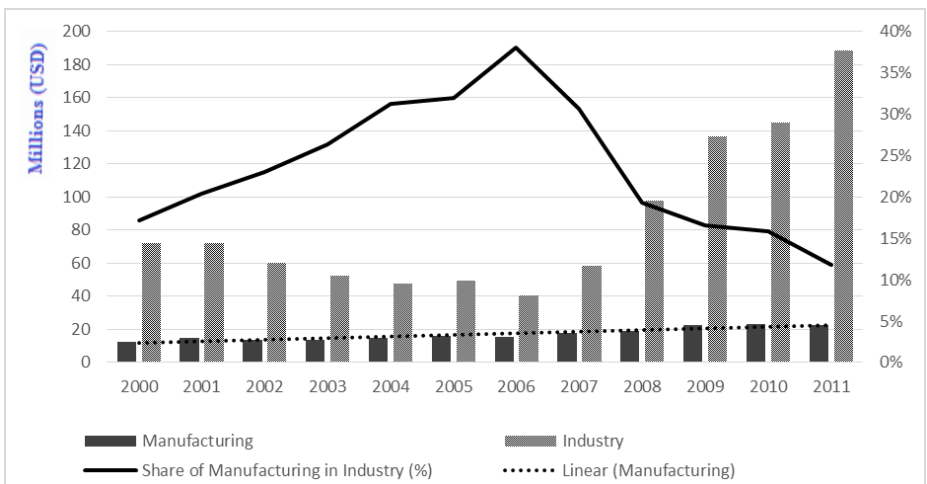
exports of oil and gas. Based on 2005 constant prices, manufacturing output grew from US\$12.3 million in 2000 to US\$22.3 million in 2011 (Figure 8).

Figure 7: Manufacturing value added, Timor-Leste, 2000-2011



Source: World Bank (2013).

Figure 8: Manufacturing and industry output, value added, Timor-Leste, 2000-2011



Source: World Bank (2013).

To initiate a shift from low to high value added products, the government should support participation of firms in designing, customisation, packaging and processing. The energy-related value added activity should be encouraged to go downstream into the petrochemical industry and petroleum processing. Because of the size and rural orientation of Timor-Leste, the realisation of the value addition explained in Figure 2 will require the implementation of strategies to stimulate upgrading into higher value added stages. Natural resources as well as the potentially economically important products in the country should then be subjected to value addition through sorting, processing and packaging, maintaining quality standards with complementary support from adapting and re-engineering, maintenance and repair manufacturing activities.

With the exception of a handful of medium-sized firms, the hundred-odd enterprises in Timor-Leste are small and micro-sized (UNIDO, 2009)⁶. Efforts must be taken to stimulate value addition in the sector and through growth in other sectors. The requisite meso-organisations must be established to coordinate macro-level policies effectively to reach the micro-level enterprises⁷.

The government's efforts to complement agricultural development through a strong focus on construction is a step in the right direction. For example, the government has embarked on developing two of the ports identified by the FAO (2003) for the landing of fish catch. While its construction is absorbing most of the costs, the maintenance of warehouse facilities (including refrigeration) has required engineering support to undertake minor boat and ship repairs. Timor-Leste's economic transformation should be based on potentially viable industries but must be driven by learning and innovation strategies.

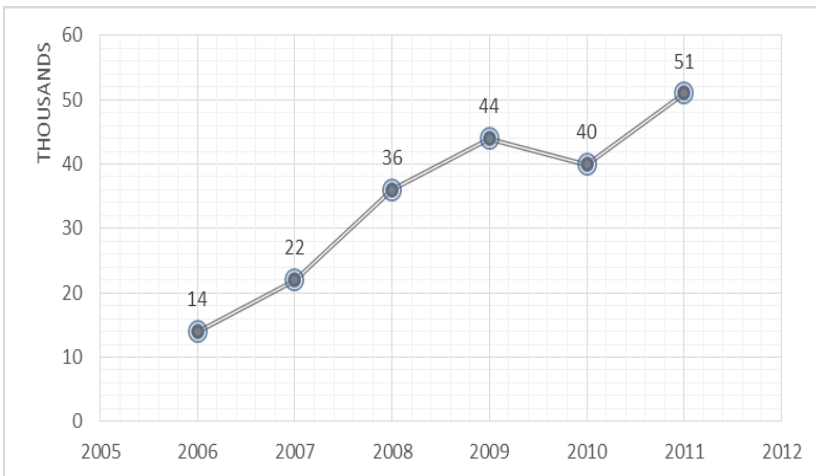
Manufacturing is unlikely to become a significant driver of economic growth of Timor-Leste unless the shortage of skilled workers, poor infrastructure and small local market are addressed. The obstacles to promote manufacturing continues to be the scarcity of capital and human resources, as the current productivity measured in terms of production per employee and contribution to GDP is positioning a dismal status. The lack of access to international market as a consequence of the weak competitiveness of Timorese product could be improved by optimising the utilisation of foreign technology and training scheme. Targeting for niche markets such as sandalwood and organic coffee, might be a good starting point. Timor-Leste's long-term industrial roadmap should be based on technological upgrading horizontally and vertically starting initially on existing endowments such as forest coffee, copra, sandalwood, candlenut and cashew nuts. Apart from essential consumption, the focus must be on using oil and gas revenue to finance infrastructure development and stimulating agriculture and manufacturing, and human resource development.

Tourism

Although tourism is not a sector that shows strong inter-industry linkages, it can contribute to economic growth and structural changes by attracting foreign exchange, especially when the country enjoys a marvellous geographical landscape and a pleasant climate as well as its socio-cultural and socio-economic conditions. Timor-Leste has been bestowed with plentiful natural resources and endowments that include spectacular mountains for sightseeing, cultural tourism and ecotourism. Together with the fabulous arts creation such as traditional architecture and ceremonies, the country has a large potential in tourism to generate foreign exchange and job creation.

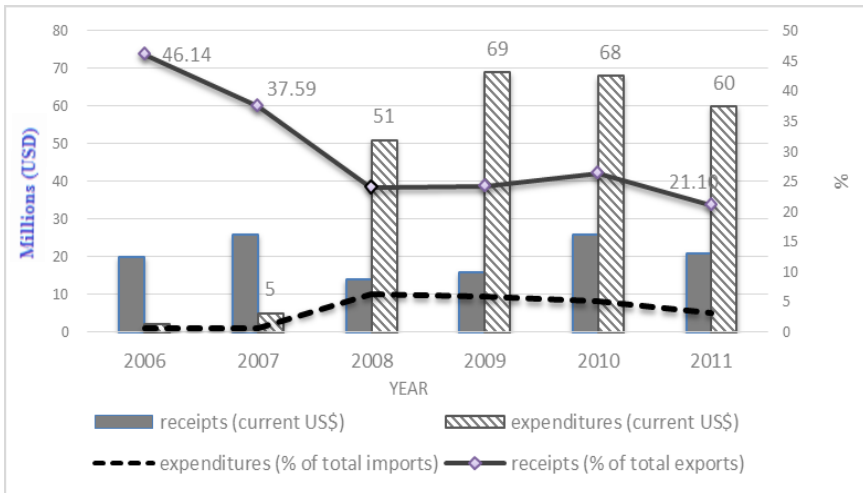
During the colonial period, only parts of Dili and Baucau attracted foreign tourists, especially Australians. Although the international arrivals soared from 14,000 in 2006 to 51,000 in 2011 (Figure 9), international tourism receipts did not see a significant increase. Overseas tourists brought about US\$20 million in 2006, which grew slightly to \$21 million in 2010. The industry peaked at US\$26 million in 2007 and 2010 and hit its trough at US\$14 million in 2008 and thus, international tourism receipts shows no clear trend. The share in total exports declined from its highest of 46.1% in 2006 to its lowest of 21.1% in 2011 (see Figure 10). Also, expenditures far exceeded receipts over the period 2008-11, which calls into question the approaches undertaken so far to promote the sector. It will be interesting to promote tourism as a complementary sector to take advantage of its natural beauty and sites.

Figure 9: International tourism, arrival, Timor-Leste, 2006-2011



Source: World Bank (2013).

Figure 10: International Tourism, Receipt and Expenditure, Timor-Leste, 2006-2011



Source: World Bank (2013).

4. Institutional Change

Given exports of oil and gas have not contributed in dramatically reducing poverty levels, the government must take steps to develop the renewable productive sectors such as agriculture and manufacturing and introduce policies to alleviate poverty. The development of technological capabilities should become the pivotal strategy to alleviate poverty in Timor-Leste as the political economy of economic development of the successful economies such as Malaysia shows (see Rasiah & Shari, 2001; Reinert, 2007)⁸.

Agriculture should be the main focus over the next decade with a complementary emphasis on rural industrialisation and simultaneously stimulate economic synergies in the renewable economic sectors. Shifting from low value added to increasing returns industries is argued by Young (1928), Kaldor (1967), Chang (2003) and Reinert (2007), but the authors assert they must be integrated with strategies to stimulate learning and innovation if Timor-Leste is to catch-up economically with the developed countries.

Institutional development should be targeted at macro instruments and meso-organisations that are connected and coordinated with the micro-level units to solve collective action problems and insulate the economy from external shocks. At the macro level, efforts must be taken by the government to provide stable exchange rates and to ensure critical inputs from abroad do not face volatile price fluctuations so that the infant firms are shielded from external shocks. Universities, standards and training organisations, technical

schools, incubators and R&D organisations are essential to provide the knowledge essential for firms to integrate with imported knowledge to support technological catch up in their respective product and service specialisations. Cooperatives should be encouraged to serve the poor so that savings and coordinated investments will enable peoples' effective participation in raising their savings and incomes. Indeed, Ungku Aziz's stellar role in spearheading the development of an integrated framework to coordinate the activities of cooperatives under ANGKASA should be adapted for implementation in Timor-Leste (Rasiah, Norma & Chandran, 2016). However, given the series of scandals that have characterised the cooperative movement in Malaysia, (which led Ungku Aziz to question the administration of ANGKASA in 2009, CAP, 2015), it is important that laws and regulations are enacted and enforced to prevent excesses and abuses of power in Timor-Leste.

Investment laws (involving local and foreign owners) and procedures, incentives and grants, as well as setting up and strengthening of infrastructure facilities should constitute as part of the enabling business environment in Timor-Leste that is necessary to make industrial policy work. The key products identified for promotion should then be juxtaposed against the most suitable areas of concentration where they are pooled for processing, maintenance work and for the installation of development and demonstration centres. A mapping of existing and missing components for the development of integrated clusters around the selected products should then be carried out. Programmes to involve and empower the rural population - with a special emphasis on women and youths that include coordination and training - are vital. A committee that evaluates *ex ante*, monitors and appraises *ex post* the institutions in place, especially incentives and grants to ensure that they are always upgraded to meet the changing needs of firms in particular and the population in general in an important institutional mechanism.

Given the lack of strong market-based transactions in the rural areas, the creation and strengthening of the business environment is one of the earliest priorities that the government of Timor-Leste should adopt. Infrastructure, investment and land tenure, business friendly incentives and grants, and law, security and order are critical aspects of the enabling business environment.

The promotion of clustering activities around the selected products will be important to generate economic synergies at one level and its appropriation by the rural people of Timor-Leste at another. The clustering process should adopt Best's (2001) definition of the concept that it should drive differentiation and division of labour rather than gravitate around particular product specialisations⁹. The overlapping complementary activities such as machinery and equipment manufacturing, incremental process engineering activities and the transport equipment (such as buses, trucks and ships) can be targeted to cross-support several products. The following will be the four key activities that should be developed to support clustering in Timor-Leste.

It is important to map the value-chain of products selected for promotion – upstream planting until harvesting in the farms, and pooling, transport and storage, and subsequently processing and packing before it is moved for wholesale and retailing activities. This constitutes the commodity chain. It is necessary to understand that typically, specialised activities in a value-chain are pursued in different locations.

Efforts must be made to identify the missing and underdeveloped components of value-chains through a mapping process. Value-chain and cluster experts are important to undertake this activity, and to also identify the concentrations of production that are current as well as those that can be potentially developed for specialisation. Mapping will integrate the value-chain with the complementary support activities, and linkages to the macro-, meso and micro organisations to complete the cluster.

A major task is to identify the macro-, meso- and micro-organisations that can support introduction and sustenance (including upgrading) of the promoted products. The direct and indirect linkages between these organisations will constitute the Timor-Leste cluster with sub-locations (zones) providing different specialisations. The identification of the roles by macro, meso and micro against the promoted products, and complementary suppliers should be carried out by a team of cluster experts.

The zoning of the areas for crop and livestock farming should take place after taking into account the aspirations of the community-determined decisions as well as the geographical suitability of the locations for products identified (see SOGES, 2009). The government has taken a step in the right direction by engaging the masses in the decision making process as well as creating the post of rural development officers whose prime tasks will be to act as the interface between the government and the rural masses. The rural development officers should also act as the information bridge between the rural people and government instruments. They should in addition be encouraged to participate in active discussion with the rural elders on social and economic topics that are important for the development of the rural community. Among the immediate tasks awaiting them should be engaging the rural masses to shape the product-based zoning process.

The mapping of missing components such as machinery and equipment engineering, repair and maintenance should enable the introduction of the missing components, the strengthening of weak components and the reorganisation of the structure to generate more synergies to support all industries in Timor Leste. This framework, which is recommended by Rasiah (2009), should be preferred over other approaches because Timor-Leste does not have sufficient critical mass of firms or people for supporting product-based specialisation in such complementary activities.

It is important that the Ministry of Economic Development and the Ministry of Agriculture take charge of the coordination of the upgrading

processes in Timor-Leste - the acquisition and development of best practices for diffusion to the farmers, processors and distributors through centres manned by trained agricultural officers.

A generic “technological roadmap” and a set of sector-specific technology roadmaps are vital that spell out sequentially the movement of capabilities in the promoted products alongside the type and nature of interventions, monitoring and appraisal mechanisms to ensure that the targets set are met. Sector specialists can actually undertake such activities. Multilateral assistance could be directed at supporting this process by identifying and selecting sector specialists to undertake it.

Six development and demonstration centres using the systemic quad approach presented in Rasiah (2007) should be established to drive knowledge acquisition and diffusion for value addition. The current bamboo demonstration centre should be expanded and its scope deepened to participate in adapting and re-engineering activities of forestry products. The remaining five centres should be equipped to play similar roles in their respective product areas.

The current bamboo demonstration centre should be transformed into a forest product processing and demonstration centre. The centre should also target the development (primarily adaptive engineering) and demonstration (including training) of teak and other forest products. The current framework of absorbing knowledge and training from the Guwahati centre in Assam (India) should be extended to connect with similar centres in Thailand and China. Products turned out by the centre were exhibited at the Malaysian International Furniture Festival (MIFF) in Kuala Lumpur in 2011. Participation at international exhibitions is critical to penetrate coveted market destinations. Replanting of bamboo trees in one of the recommended development options and peripheral lands that do not compete with food and other related crops should be given priority. The terrain for bamboo is often steep and hilly that is not suitable for most other crops. Collection should be based on monetising the inventory on the basis of grades for farmers and other villagers to bring them to collection points.

Overall, the six processing development and demonstration centres should focus on learning and innovation through the import of best practices from the world for adaptation and adoption in Timor-Leste. The role of Asean is important for adaptation of best practices in Timor-Leste. Monitoring, continuous improvement, problem solving and appraisal should be carried out to ensure that the centres are indeed value adding and meeting the needs of the rural people.

Best practice farming technology includes the mini hand held ploughing machines, bore-hole technology-based irrigation instruments. Innovation capability building must be targeted at value adding operations and include the following areas of focus adapting machinery, equipment and components, processes to produce raw and intermediate goods, organisational structure,

process layouts, farming methods, seeds, fish fries and livestock breeds, time management, aesthetics of tourism and green and socially responsible technologies.

Coffee processing has evolved in Timor-Leste with the wet processing facility employing 380 permanent staff working for CCT and around 3,000 seasonal workers a day using 100 trucks (30 owned by CCT), and the dry processing factory in Dili employing on average 700-800 women for sorting green beans from August till February. The CCT has a grinding facility at Manleuana producing 250gm packets of ground coffee (SOGES, 2009: 91). Coffee cluster specialists should be consulted on whether international standards on farming, processing, packaging and export are met and whether an expansion in existing capacity is desirable. Existing farming and processing technologies should be compared with best practices in Brazil, Columbia and Vietnam to see if there is a need to import, adapt and adopt them. In addition, there must be producer-user coordination between the farmers and processing firms and the buyers (Lundvall, 1992).

Entrepreneurship through learning modes should be promoted in Timor-Leste by introducing business-friendly guidelines, support and feedback mechanisms to improve delivery but also make create prime outlets for enabling and strengthening the private sector. Because of the focus on rural areas and the lack of market participation, the government should identify locations where the agricultural and forest output (especially perishable goods) can be pooled and sold.

The government can temporarily own these market outlets until private entrepreneurs purchase them. Price regulation and deregulation – to correct market failures – will be necessary on the one hand to shield the poor rural buyers and to minimise market volatility on the other. Eventually, the focus of industrial support must be to enable the private sector to participate in it. Given the lack of a critical mass of industrial firms, government initiatives must be targeted at stimulating entrepreneurs. The focus on rural entrepreneurship with extension into urban areas should be supported to encourage its participation and promotion of its products all over the country. Agri-business products promoted by SOGES (2009) are outlined in Table 1. We have added beef, fish and sweet potato for import-substitution and dropped candlenuts from this list because of a lack of critical mass in particular locations and the commercial cultivation of fruits lacks take up.

Although the tourism sector spin-offs are not strong it should nevertheless be promoted to stimulate positive returns, including operation skills and infrastructure development such as transportation access by air, sea and land, healthcare treatment. The government should ensure adequate capacity in policy planning, resource management and provision of other supporting facilities. Foreign investment can be introduced into tourism development to overcome capital shortages, and most importantly, learn the

successful operation experience. To attract foreign investors, the government must initiate incentives such as tax breaks and policy preference to attract international investment as well as a legal framework to protect the interests of local workers and capital owners.

5. Conclusions

As with most emerging economies especially post-colonial ones, Timor-Leste is struggling to create the conditions for rapid growth and structural change. While petroleum has remained strong, the country has faced a declining decline in agricultural productivity since independence. Cereal productions of Timor-Leste are lower than even Cambodia, Laos and Myanmar. Despite its small starting base, manufacturing has grown slowly. While petroleum exports have remained strong, the vicissitudes associated with volatile price fluctuations and its finite and non-renewable nature mean that Timor-Leste's growth cannot be fuelled permanently by this resource. It is little wonder that most poverty indicators of the country have not improved over the last decade.

Despite significant geographical, historical, cultural and economic differences, some aspects of Malaysia's early development experience can be adapted to address the challenges faced by Timor-Leste as well as support its poverty alleviation efforts. The development of technological capabilities and the promotion of cooperatives can help reverse the current decline in cereal productivity in the country. Human resource development is a key pillar the government must focus on to empower the people as well as stimulate structural changes from low to high value added activities. Ungku Aziz (1965) underlined education as the prime route through which poverty can be reduced.

Notes

1. We are grateful to Cheong Kee Cheok for his constructive comments. The usual disclaimer applies.
2. There are variations of this model, such as the "dependency model" based on neo-Marxist thinking of capitalist system exploitation, and the "dualistic-development model" based on the notion of dualism between rich and poor groups/regions (see Rasiah, 1995a). Some versions of these models enjoy support from anti-globalisation analysts (see Stiglitz, 2003).
3. Though Kalecki's work predates that of Keynes it was inaccessible to us because it was in Polish.
4. Some economists consider the domination of minerals in an economy as the 'curse of resources' (see Sachs & Warner, 1997). Mineral-endowed economies that have largely avoided Dutch disease include Australia, Canada and Norway.
5. This is confirmed by the Ministry of Agriculture officials of Timor-Leste that Timor-Leste only met 80% of its food demand from domestic production. Interviewed by the authors on 4-8 May 2008 in Dili.

6. Interviews with the Ministry of Economic Development carried out by the authors over the period 4-8 May 2008.
7. See Vinanchiarachi & Padmanand (2009).
8. Given the tiny size of Timor-Leste and the high cost of food compared with countries such as Cambodia we do not think clothing can be an export winner for Timor-Leste (see Rasiah, 2009).
9. Porter's (1990) product specialisation framework of clusters does not provide the differentiating qualities critical for driving industrial synergies (see Best, 2001; Rasiah & Vinanchiarachi, 2012).

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