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Advancing Free Trade
for Asia-Pacific **Prosperity**

Promoting Products Contributing to Sustainable and Inclusive Growth through Rural Development and Poverty Alleviation

APEC Policy Support Unit
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Contents

1. INTRODUCTION 1
2. TRADE, RURAL DEVELOPMENT, AND POVERTY ALLEVIATION: A BASIC FRAMEWORK 3
3. ANALYSIS OF THE LIST OF NOMINATED PRODUCTS 12
4. CREDENTIALS OF NOMINATED PRODUCTS 20
5. MARKET ANALYSIS OF NOMINATED PRODUCTS 42
6. ECONOMIC IMPACT ON RURAL DEVELOPMENT AND POVERTY ALLEVIATION 59
7. CONCLUDING REMARKS 70
BIBLIOGRAPHY 72
Appendix 1: Revealed Comparative Advantage of the Nominated Products 84
Appendix 2: Econometric Methodology 93

List of Figures

Chapter 2
Figure 2.1: Rural productivity and poverty in APEC, 1989-2013 3
Figure 2.2: Infrastructure and rural productivity in APEC, 2008-2012 6
Figure 2.3: Years of Schooling and rural productivity in APEC, 1990-2011 7
Figure 2.4: Simplified GVC of Fresh Agricultural Products and Processed Foods 9
Chapter 3
Figure 3.1: Trade of Nominated Products (USD billion) 13
Figure 3.2: APEC's Trade of Nominated Products by Development Level 14
Figure 3.3: Share of APEC's Trade by Type of Product 14
Figure 3.4: Share of APEC's Trade by Type of Product (excluding Lubricating Oil Feedstock) 15
Figure 3.5: Distribution of APEC MFN Average Tariff by HS Sub-headings 18
Chapter 5
Figure 5.1: APEC Export and World Import Growth Rates of Nominated Products 55
Chapter 6
Figure 6.1: Analytical Framework 60
Figure 6.2: Data Visualization - Elasticity Estimates for Nominated Products 64

List of Tables

Chapter 3
Table 3.1: APEC Exports: Top 10 Nominated Products 16
Table 3.2: APEC Imports: Top 10 Nominated Products 16
Table 3.3: APEC Economies: Distribution of Average MFN Tariffs of Nominated Products 17

Table 3.4: HS Sub-headings: Distribution of Average MFN Tariffs of Nominated Products 18
Chapter 5
Table 5.1: Nominated Products Gaining Comparative Advantage....44
Table 5.2: Nominated Products Strengthening Comparative Advantage....45
Table 5.3: Nominated Products with Declining Comparative Advantage....46
Table 5.4: Nominated Products Losing Comparative Advantage....46
Table 5.5: Top 20 Nominated Products with Comparative Advantage (2011-12)....47
Table 5.6: Nominated Products with Extremely Strong Positive Export Trend in the APEC Region....48
Table 5.7: Nominated Products with Very Strong Positive Export Trend in the APEC Region....50
Table 5.8: Nominated Products with Strong Positive Export Trend in the APEC Region....51
Table 5.9: Nominated Products with Weak Positive Export Trend in the APEC Region....53
Table 5.10: Nominated Products with Negative Export Trend in the APEC Region....54
Table 5.11: Nominated HS Sub-headings Capitalizing Global Export Opportunities (Zone I) by Product Category....56
Table 5.12: Nominated HS Sub-headings Not Capitalizing Global Export Opportunities (Zone II) by Product Category....57
Table 5.13: Nominated HS Sub-headings in Decline (Zone III) by Product Category....57
Table 5.14: Nominated HS Sub-headings with Increasing APEC Exports, but Decreasing Global Demand (Zone IV) by Product Category....58
Chapter 6
Table 6.1: Descriptive Statistics for 6-digit Trade Data....61
Table 6.2: Elasticity Estimates for Rural Development Indicators in APEC, 1989-2014....62
Table 6.3: Mean Values of GDP and 6-digit HS 2007 Trade Data....63
Table 6.4: Method 1 Significant Estimates of Elasticity with respect to Trade....65
Table 6.5: Method 2 Significant Estimates of Elasticity with respect to Trade....67

1. INTRODUCTION

The Global Financial Crisis in 2008/2009 motivated APEC economies to discuss ways to address global recovery. It also recognized the need for a "new growth paradigm" which highlighted the need to have a framework to increase resilience and promote high economic growth rates. The discussions within APEC stressed the importance of including policies that aim to foster inclusive growth and promote sustainable growth.

Those early discussions in APEC led to the creation of the APEC Growth Strategy initiative, which recognized balanced, inclusive, sustainable/green, innovative, and secure growth as the five attributes that APEC members should seek in any integral framework to support long-term economic growth and complement APEC's trade and investment agenda.

Among the actions listed to promote inclusive growth, some are directly related to the need to improve conditions in rural areas, such as the importance of promoting job creation and human resource development; developing SME entrepreneurship; improving social safety nets; and creating new economic opportunities for vulnerable populations. Likewise, in terms of the actions concerning sustainable/green growth, APEC members recognized the need to promote conservation and more sustainable management of agricultural and natural resources[1].

In 2013, several discussions within APEC emerged regarding possible ways to address the issue of development in rural areas. At the APEC Ministerial Meeting in Bali, Indonesia, in October 2013, ministers recognized "the importance of additional work to explore trade in goods, which contribute to sustainable and inclusive growth through rural development and poverty alleviation" [2]. The Ministerial Statement set the foundations to start a study which include goods that could help achieve sustainable and inclusive growth in a way that enhances rural development and alleviates poverty.

In this context, the Committee of Trade and Investment endorsed, in 2014, the terms of reference for a study with the aim of:

- Building an APEC understanding on products which contribute to sustainable and inclusive growth through rural development and poverty alleviation, based on objective and credible evidence.
- Exploring how liberalizing and facilitating trade in particular goods, could enhance rural development and poverty alleviation, taking into account positive and negative externalities.
- Providing recommendations on possible ways to promote products and/or sectors that could contribute to sustainable and inclusive growth through rural development and poverty alleviation[3].

Using the Harmonized System (HS) nomenclature 2012 at the six-digit level (sub-headings), 157 products were nominated by APEC economies for the purpose of this study. The terms of

[1] Asia-Pacific Economic Cooperation (2010).
[2] Asia-Pacific Economic Cooperation (2013).
[3] Asia-Pacific Economic Cooperation (2014).

reference specify that these Products are selected only for the purpose of this study and shall not prejudice to economies' position in the further work at the CTI[4].

The study includes a theoretical/empirical review about the links between trade and rural development (chapter 2), which identifies important issues that policymakers should keep in mind to improve conditions in rural areas. This chapter notes that trade alone is not sufficient to bring about significant positive changes to development and reduce poverty, and that other policies and conditions must be present to take advantage of the gains from trade. Policies related to infrastructure development; improved access to credit, health and education services; and labor market flexibility; among others, which enable small producers in rural areas to join various value chains, are also identified as critical in any integral strategy aiming to reduce poverty and promote rural development.

Chapter 3 looks at the relevance of the list of nominated products. In other words, it examines whether the current list of nominated products is worthy of discussion. The analysis shows the merit to discuss the list, as their global trade is increasing in recent years, reaching USD 1.7 trillion in 2012. In addition, MFN tariff information shows that many of those products are still facing high tariffs in certain markets. The study does not take into account preferential tariffs due to RTA/FTAs or unilateral preferential systems, such as the Generalized System of Preferences (GSP). However, the effects of RTA/FTAs and GSP in the nominated products are worth studying and discussing further.

Chapter 4 analyzes the credentials of nominated products in assisting rural development and improve living conditions. Extensive literature was reviewed to find evidence on the relevance of those products in income, employment, and poverty levels, among other socioeconomic indicators. Most of the studies reviewed in this chapter focused on particular regions/communities/geographic areas and specific products. Many of them showed that the impact of trade liberalization on development-related matters is positive for them, when other conditions, such as those policies mentioned in chapter 2 are in place. Otherwise, the impact could be negative in certain cases.

The study also conducts a market analysis in chapter 5 to determine the trade potential of every single nominated product, based on existing trade patterns.

Finally, a quantitative analysis is conducted in chapter 6, through the application of a partial equilibrium model to estimate how much an increase in trade in the nominated products will affect rural employment and/or poverty headcounts.

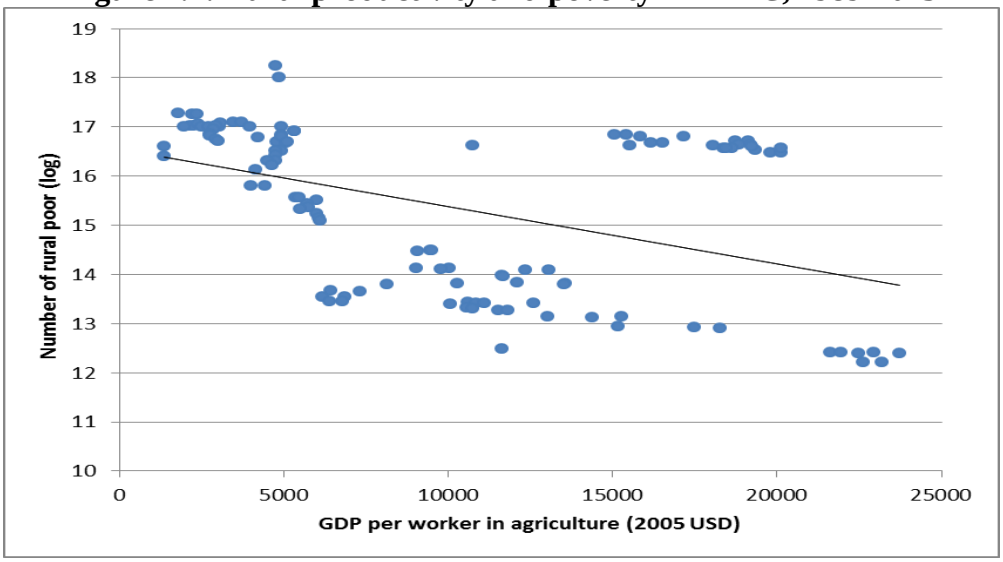
[4] Ibid.

2. TRADE, RURAL DEVELOPMENT, AND POVERTY ALLEVIATION: A BASIC FRAMEWORK

One of the ultimate objectives of APEC is achieving equitable development, which encompasses the need to have an inclusive approach and allow all groups in society to benefit from economic growth and government policies. While it is important to implement policies such as trade and investment liberalization that lead to sustainable growth rates, it is also important that economic progress benefits the whole society. Rural areas are no exception and play a critical role in any development strategy. They are the main source of food globally and they supply natural resources to industries. Improving conditions in rural areas is fundamental in any comprehensive plan to reduce poverty and attain ecological sustainability.

Rural development remains a key policy goal in any economy. A productive rural sector will not only contribute to food security in an economy, but will also provide opportunities for economic growth through the agricultural sector. According to the World Bank, agriculture contributes to development as an economic activity, as a means of support for household, and as a provider of environmental services[5]. Rural development will also go a long way in addressing poverty in an economy as poverty remains a largely rural phenomenon: around 70% of the world's extreme poor live in rural areas[6]. Indeed, rural productivity is negatively associated with rural poverty (Figure 2.1), indicating that increases in rural productivity can contribute to rural poverty reduction. Spillovers of rural development can also be felt in urban areas: rural development and increased rural productivity (and wages) can reduce the pressures on urban areas due to migration. Moreover, a growing and resilient rural sector can help rebalance economic growth by providing an alternative growth center away from urban areas, so downward business cycles in cities will not necessarily lead to a recession in the entire economy.

Figure 2.1: Rural productivity and poverty in APEC, 1989-2013



Note: Data available for China; Chile; Indonesia; Malaysia; Mexico; Peru; Thailand; and Viet Nam.
Source: World Bank World Development Indicators and Chinese Taipei General of Budget, Accounting and Statistics. APEC Secretariat, Policy Support Unit calculations.

[5] World Bank (2008), pp.2-3.
[6] International Fund for Agricultural Development (2011), p. 16.

The role of trade in rural development

A lot has been written about the effect of trade in growth and development issues, including poverty reduction and alleviation. This is a complex issue and empirical studies have either supported or opposed trade liberalization as one of the tools to reduce poverty and improve economic development. For example, the United Nations (2010) noted that the neoclassical economic theory suggests that trade enhances welfare and growth. Advocates of trade liberalization mention that removing trade barriers will create welfare/income gains and reduce poverty. In addition, they suggest that trade liberalization widens the market for producers, and the economy will gain due to an increase in the quantity and productivity of resources[7]. However, the same study also noted that in some cases, like in Africa, trade liberalization did not achieve the expected results, and instead it caused loss of tariff revenues, deteriorated fiscal accounts and undermined existing productive capacities[8].

On the other hand, many studies analyzing what would happen if comprehensive global trade liberalization occurs show positive overall effect on development. An IFPRI survey by Bouet (2006) on several computable general equilibrium (CGE) models found that the impact of global trade liberalization on the increase of world welfare ranged from 0.3 percent to 3.1 percent. Furthermore, estimates on poverty reduction ranged from 72 to 440 million people lifted out of poverty. This study also mentioned that full trade liberalization would contribute to poverty alleviation, as gains would go to unskilled labor in many developing regions. In addition, world income inequality would be reduced as well[9]. Nevertheless, as it will be seen in Chapter 4, many studies focusing on specific sectors and/or geographic areas, show that the impact of trade liberalization on development-related matters was not necessarily positive for them.

As seen in the cited studies, trade liberalization does not always result in gains for all. Trade liberalization brings about changes in the relative prices of products, resulting in winners and losers in the economy. For example, if liberalization reduces the price of certain food commodities, net importers may benefit in the short-term, but net exporters may not. Also, if liberalization reduces the prices of labor-intensive products, producers of those products may not be able to maintain wages, which could lead to lower wages for workers or even layoffs.
In the neoclassical theory, it is expected that the removal of trade barriers will shift resources from those inefficient sectors with no comparative advantage, to those sectors with comparative advantages[10]. It is then expected that growth in the latter could absorb the workers leaving uncompetitive sectors. However, in reality, transactions costs, labor rigidities, and skills mismatches could prevent this adjustment[11].

[7] United Nations (2009), pp. 98-100.
[8] Ibid, p. 99.
[9] Bouët, Antoine (2006), pp. 1-2.
[10] United Nations (2009), op. cit. p. 98.
[11] Another issue that explains why in some cases the empirical evidence has not been able to find a positive effect of trade liberalization in economic growth and welfare in some situations as neoclassical models suggest, is the fact that those models are based on assumptions that are not necessarily present, such as perfect competition, equal access to information and no barriers to market entrance nor exit.

In order to benefit from the gains of trade liberalization, it is important that trade policies are implemented in hand with other development policies. In other words, trade alone is not sufficient to bring about significant positive changes to development and reduce poverty. Other policies and conditions must be present to take advantage of the gains from trade. The United Nations (2010) pointed out that liberalization generates rationalization and increases productivity only if it is easy to enter and exit markets[12]. The International Fund for Agricultural Development (2004) mentioned that, in the context of trade reforms to eliminate distortions in the agriculture sector, agricultural growth contributed to poverty reduction in situations where there was little inequality in access to physical, financial, technological, human and social assets, as well as labor-intensive technologies[13]. Likewise, Le Goff and Singh (2013) found evidence in Africa that trade openness results in a reduction in poverty when the financial sector is deeper, education levels are higher and governance is stronger, which facilitates firms to adjust and workers to learn new skills, so resources can be reallocated to more promising activities[14].

The implementation of reforms to eliminate trade distortions will inevitably have winners and losers in the short-term. In this sense, governments should study the implementation of social safety nets that will allow the gains of trade to be channeled towards the sectors that will lose out with open trade. This is especially important if the losing sectors are in rural areas affecting poor households. An IMF Working Paper by Bannister and Thugge (2001) mentioned cash transfers, severance pay and retraining, and employment through public works as possible safety net program that can alleviate the impacts of more open trade[15].

Beyond Trade: Strengthening the links between trade and rural development

While economic growth is a necessary condition for rural development, it is by no means sufficient. Economic growth alone, even if concentrated in rural areas, will not be enough to ensure that rural areas are developed and rural poverty is reduced. Infrastructure, services, and policies are needed to make rural development faster than what trickle down could achieve. For example, giving farmers and the poor access to infrastructure, social services, and credit will not only help raise incomes and alleviate poverty, but it will also allow the rural economy to take advantage of the gains from trade. In addition, promoting policies for small producers in rural areas assisting them to have the capacity to join into agricultural/food value chains is crucial. The following are just a few of the other factors needed to strengthen the linkages between trade and rural development:

a. Transport and telecommunications infrastructure

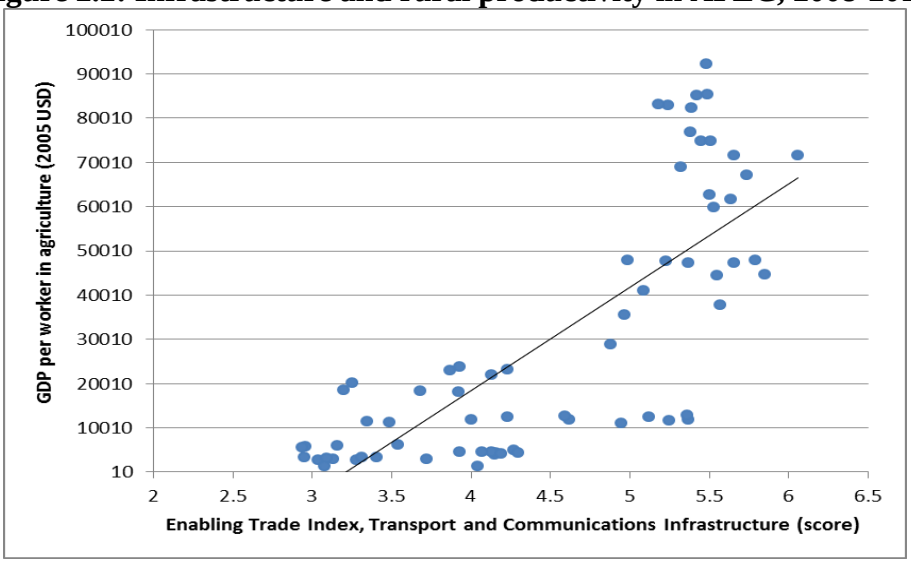
The lack of proper physical connectivity can constrain rural development. Transportation and communication infrastructure not only brings rural goods from farms to markets but also opens up opportunities for further economic growth. In general, most of the population in rural areas depends on agricultural and livestock products. The perishable nature of those products makes

[12] United Nations (2009), op. cit., p. 100.
[13] International Fund for Agricultural Development (2004), pp. 10-12.
[14] Le Goff, Maëlan and Raju Jan Singh (2013), p. 12.
[15] Bannister, Geoffrey J. and Kamau Thugge (2001), pp. 22-23.

it imperative for rural areas to have good transportation links with markets (for example, larger communities, cities and regions at the domestic level, and foreign markets)[16] where they can be sold for a profit. To make sure the products will reap a good price, they should arrive quickly and in good condition, which requires efficient roads and rails, adequate ports and airports, and proper storage units. Similarly, communications infrastructure allows producers in rural areas to be responsive to the needs of customers in urban areas or even across borders. Hence, the availability of—and access to—transportation and communications infrastructure is imperative for rural development.

Empirical evidence supports this linkage. As can be seen in Figure 2.2, better transportation and communications infrastructure (as measured using the Enabling Trade Index) is positively correlated with higher rural productivity. Likewise, Gannon and Liu (1997) reviewed several empirical studies concerning the role of transport, including rural transport, in economic a positive impact of information and telecommunications technologies (ICT) in rural growth. They found that investments in roads not only improved the access of the rural community to markets, educational, financial, health and government-related services, but they also helped to increase agricultural output, household incomes, women's participation in the economy and fertilizer usage[17]. Similarly, a study by Salcedo Cain et al. (2010) found that poverty reduction induced by trade liberalization in India is typically faster in states with better quality of transport infrastructure and more developed financial systems[18]. The OECD also found thatan improvement of 10 percent in transport and trade-related infrastructure quality has the potential of increasing developing countries agricultural exports by 30 percent[19].

Figure 2.2: Infrastructure and rural productivity in APEC, 2008-2012



Note: Enabling Trade Index is developed by the World Economic Forum. It scores economies on various areas using a scale from 1 (worst) to 7 (best). Data on this graph covers all economies except Brunei and Papua New Guinea.
Source: World Bank World Development Indicators and Chinese Taipei General of Budget, Accounting and Statistics. APEC Secretariat, Policy Support Unit calculations.

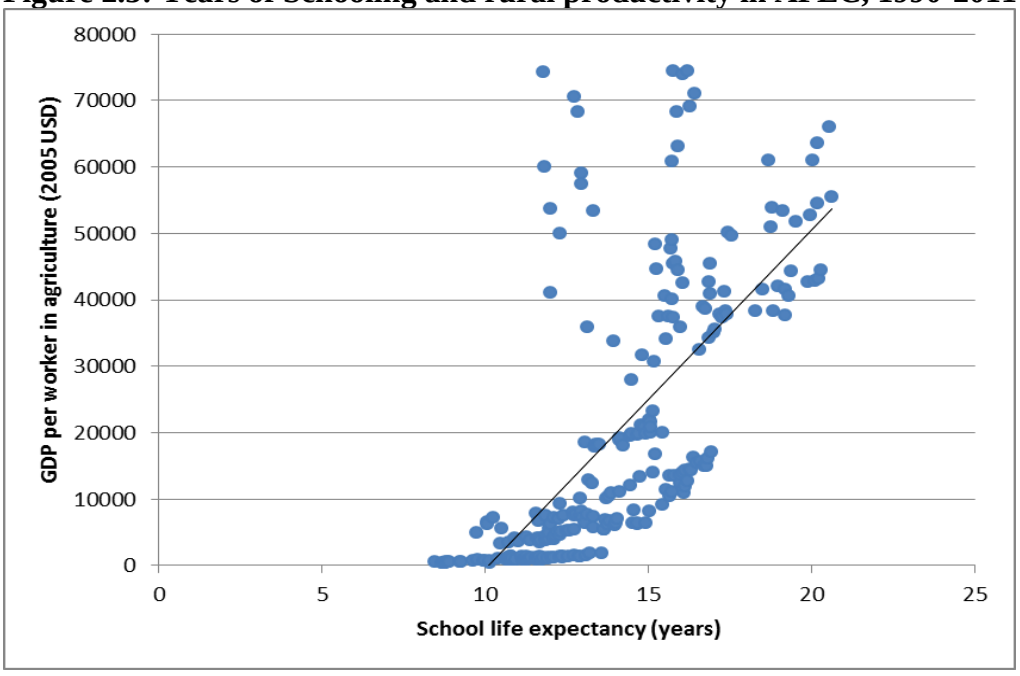
[16] Banjo, George, et.al. (2012), p. xx.
[17] Gannon, Chris and Zhi Liu (1997), pp. 9-10.
[18] Salcedo Cain, J. et.at. (2010), p. 30.
[19] Organization for Economic Co-Operation and Development (2012), pp.4, 28

Likewise, better access to telecommunications infrastructure can contribute to poverty reduction. Torero and Von Braun (2006) mentioned areas and noted that the introduction of ICTs, in particular those not needing specialized skills to use, would make a difference in rural areas. They also noted emerging evidence of income disparity between phone users and non-users in developing economies[20]. In addition, the authors mentioned that poverty alleviation through the use of telecommunications could be achieved by making markets more accessible to households and small enterprises; improving the quality and provision of health and education; allowing more effective use of social networks; and creating new institutional arrangements to strengthen the rights and powers of poor communities[21].

b. Access to education, training and health

Increasing productivity is key to reducing poverty in rural areas. In this regard, human capital development by improving access to quality education and training and healthcare is needed. As shown by the data, better access to education opportunities is associated with higher productivity in rural areas (Figure 2.3). Farmers need to build and update skills in order to implement better cultivation techniques, use modern equipment, improve planning, and learn how to manage their income. A similar case applies to rural households to find better job opportunities in non-agricultural sectors, and one of the key issues is to help rural workers to get jobs in services and industrial sectors supplying the agricultural sector, especially when technology starts requiring less labor to work in farms. In order to have skills that can adapt to various economic contingencies, rural workers will need to develop basic skills in the education system while have access to further skills development and training later in life. Likewise, productivity requires a healthy workforce who can put in more days into productive work.

Figure 2.3: Years of Schooling and rural productivity in APEC, 1990-2011



Note: Data on this graph covers all economies except Brunei and Papua New Guinea.
Source: StatsAPEC and APEC Secretariat, Policy Support Unit calculations.

[20] Torero, Máximo and J. Von Braun (2006), pp. 238-239.
[21] Ibid, pp. 4-5.

The World Bank´s World Development Report 2008 on Agriculture for Development reported that people in rural areas have on average two to four years less education than in urban areas, and one of the main problems is that low levels of education in rural areas tend to persist over generations: poorly educated parents tend to have poorly educated children, who may not have good opportunities to leave poverty. More investment in education could break the poverty cycle[22]. Indeed, some studies such as Castilho et.al. (2009) found that better access to education—from basic to tertiary—reduced poverty[23]. The OECD found that a 10% improvement in the secondary education enrolment rate would generate a 7.2% increase in agricultural trade value[24]. The World Bank also suggests that rural conditions could be improved by active labor market training programs. For example, by providing on-the-job training and expanding their knowledge and skills[25].

Inadequate access to health services is another factor that could worsen poverty and development conditions. Poor nutrition and health is a very important reason why children do poorly in school. Later in life, if workers do not have proper access to health services, this can have a negative effect on labor productivity and household incomes can be affected. An International Food Policy Research Institute (IFPRI) study by Asenso-Okyere, et.al. (2011) noted that ill health in farm households could have the following impact: absenteeism from work; family time diverted to caring; loss of savings assets in dealing with the disease; loss of farming knowledge; reduction of land under cultivation; planting of less labor-intensive crops; reduction of the variety of crops planted; and reduction of livestock.

c. Access to financial services

One of the restrictions that farmers face in rural areas is the lack of access to credit. Many farmers do not have assets they can use as collateral, or their assets are too small in size to give them access to enough capital to invest in resources such as equipment, seeds and fertilizers, among others. The World Bank (2008) mentions that restrictions to obtain loans severely limits the ability of rural firms to compete[26]. In some cases, it is not possible to use assets as collateral to get loans, because those households working the land may not be the owners, or because of problems in property registration.

Some studies have been able to find empirical evidence on the positive effects of the access to credit in reducing poverty. For example, Hao (2005) found that access to credit is significantly and positively related to poverty reduction in rural Viet Nam in the short and long term. In other words, loans to poor households could help them to escape from poverty[27]. Other studies also showed that the expansion of bank branches into unbanked places reduced rural poverty. Burgess and Pande (2005) found that increase deposit mobilization and credit expansion in rural areas contributed to reduce rural poverty in India[28].

[22] World Bank (2008), pp. 216-218.
[23] Castilho, Marta, et.al. (2010), p. 16.
[24] Organization for Economic Co-Operation and Development (2012), pp.5, 29.
[25] World Bank (2008), op. cit., p. 218.
[26] World Bank (2008), op. cit., p. 13.
[27] Hao, Quach Manh (2005), p. 233.
[28] Burgess and Pande (2005), p. 781.

d. Efficient water and irrigation systems

Rural areas depend significantly on agriculture and livestock production, which are often water-intensive. Regular and reliable access to water is a key factor affecting productivity, and irrigation plays an important role. For instance, the World Bank (2008) noted that land productivity of irrigated land is more than double than that of rain-fed land[29]. Echevarria (2000) emphasized that investments in small-scale irrigation and improved technology, such as drip and mini-spray irrigation, in small farms could have very positive results and that these irrigation projects had a significant effect on rural employment[30].

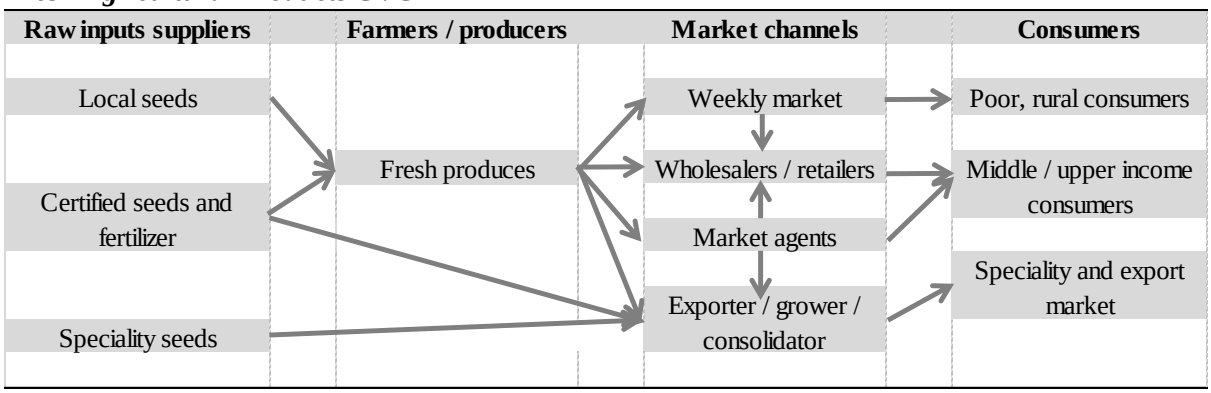
e. Flexible labor regulations

Improving development conditions in the rural areas and reducing poverty requires that the rural community have access to proper jobs. As mentioned earlier, it is important to focus on job creation not just in farms, but also in services and industrial sectors that support agriculture production. As the use of technology increases, it is not necessary for farms to hire the same number of workers to produce the same amount of goods. Hence, other sectors supporting agriculture and livestock activities in rural areas need to absorb those workers that may be leaving their jobs in farms.

Figure 2.4 shows the complexity of the global value chain (GVC) of fresh agricultural products and processed foods. It involves not just farming, but also many other activities, in order to produce them and reach final consumers. For example: seeds, fertilizers, agrochemicals, farm and irrigation equipment, transportation, communications, consolidation centers, processing factories, market agents, retail and wholesale shops, among others. Some of these activities could be good candidates to absorb the excess of rural labor supply explained previously.

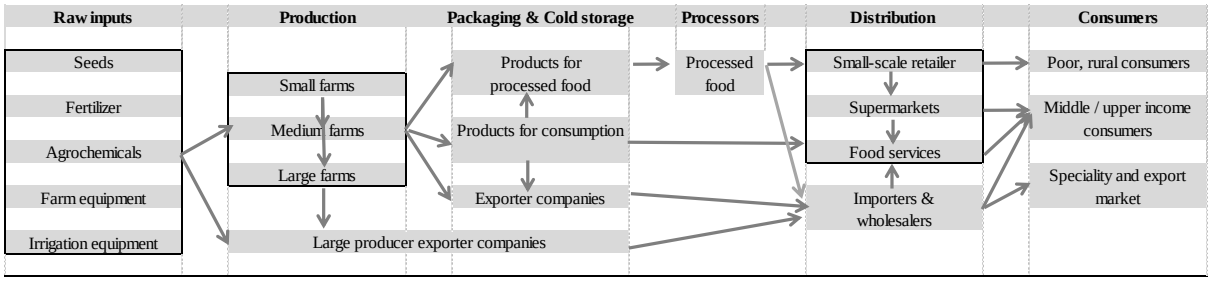
Figure 2.4: Simplified GVC of Fresh Agricultural Products and Processed Foods

Fresh Agricultural Products GVC



[29] World Bank (2008), op.cit., p. 9.
[30] Echevarria, Ruben G. (2000), p. 160.

Processed Foods GVC



Source: Zhang (2014), APEC Secretariat – Policy Support Unit

However, for those other sectors to absorb an excess of labor supply in the agricultural sector, it is important that labor regulations are flexible enough to provide the economy with opportunities to absorb them. Labor markets in rural areas are different from those in urban areas. A large proportion of rural labor is in the informal sector or even unpaid family work, so labor regulations and protections often do not apply in a rural setting. Moreover, rural labor markets have a seasonal dimension—many workers are gainfully employed during planting and harvesting season, but are jobless in the interim. These will have to be considered in the development of labor market regulations.

Previous studies have also found evidence on this matter. For instance, Pham (2006) noted that the adjustment of rural workers leaving the agricultural sector in Viet Nam would be more difficult in situations with more restrictive labor regulations[31]. In addition, Salcedo Cain, et.al. (2010) in a study focusing on Indian states noted that the "beneficial effect of openness are typically larger in states with more flexible labor market institutions"[32].

f. <u>Facilitating urban-rural links through information systems, business associations and advisory services</u>

It is important for rural communities to be competitive, but what can these communities do to reduce their transaction costs and have a chance in open markets? Establishing solid connections with suppliers and final customers is essential for them to do so. Being part of relevant business associations could facilitate access to information to reduce their transaction costs, identify potential partners and promote their products. In addition, business associations could assist their interests by promoting policies that are going to help expand their commercial interests.

Echevarria (2000) noted that small farmers can improve their position in markets with the use of price information centers, access to advisory and negotiation services, associations to participate in commercial ventures and contracts with agroindustries[33]. In some economies, it is the private sector that creates those information systems and other associated services. However, in places where this is not possible, governments should consider implementing similar information and promotion centers, or other cost-efficient mechanisms to bring these services closer to rural areas. For example, having competent commercial advisors visiting

[31] Pham, T Hung (2006), pp. 23-24.
[32] Salcedo Cain, et.al. (2010), op. cit., p. 36.
[33] Echevarria, Ruben G. (2000), op. cit., p. 160.

these areas from time to time, or using ICT services to access information could be possible options depending on the realities of each area.

g. Value chains approach for rural development and poverty alleviation

A value chain approach can improve small producers' life conditions in rural areas[34]. Particularly, agricultural value chains have the potential to reduce poverty and promoting inclusive growth when the poor and other marginal groups participate in them[35]. Infrastructure development, access to education and training, and access to financial services discussed above are significant factors to encourage the establishment of agricultural/food value chains. Other important factors are the efforts by governments to provide an enabling environment for small producers and facilitate their access to innovative techniques and modern technology.

Finding an effective mix of policies

An effective mix of policies ranging from trade liberalization to trade facilitation, infrastructure, and value chains approach, is important to achieve rural development and poverty alleviation through the promotion of trade. The results of many studies suggest the importance of having integral strategies to improve the conditions in rural areas. For example, Hoeckman and Nicita (2008) found that the impact of reducing the costs associated with policies that increase transactions costs at and behind the border will have a greater payoff than further reductions in tariffs and NTM[36]. Also, OECD (2012) found out that a reduction of tariffs in 10 percent, would increase agricultural trade by 3.7 percent. However, this outcome was lower in comparison to the impact of a 10 percent improvement in the secondary education enrolment rates in agricultural trade (7.2 percent increase). Similarly, this OECD study found that a 10 percent improvement of the transport and trade-related infrastructure quality would increase developing economies' agricultural exports in about 30 percent[37].

It is important to note that those studies do not advocate governments to refrain from the application of trade liberalization policies. They only show that it is important to complement trade policies with other measures, such as the improvement of the quality of infrastructure and education. In this way, it is going to be possible to maximize the potential to effectively develop rural areas and their related economic activities such as the agriculture.

[34] Asian Development Bank (2012), pp.51-55
[35] Asian Development Bank (2013)
[36] Hockman, Bernard and A. Nicita (2008), p.19
[37] Organization for Economic Co-Operation and Development (2012), pp.4, 29.

3. ANALYSIS OF THE LIST OF NOMINATED PRODUCTS

As result of extensive discussions in the Committee on Trade and Investment during 2013 and 2014, 13 interested APEC industrialized and developing economies nominated a list of 157 products by June 2014. Most of the products were nominated in the Harmonized System (HS) 2012 at the six-digit level (sub-headings). The list comprises a wide array of products. 95 of them (60.5% of the nominated products) are considered as agricultural products as agreed in Annex 1 of the WTO Agreement on Agriculture[38]. 62 products (39.5%) are considered non-agricultural products, which includes fishing, manufacturing, among others.

After the nominations were submitted and the list of products was endorsed, we decided to ask to ourselves the following question: how worth is it to discuss this list? In order to discuss the answer, we decided to review the rationale that economies submitted to nominate products, as well as their trade flows and tariff barriers.

Rationale of Nominations

Many of the explanations given by APEC members was related to the contribution to those products in the economy. In some cases, the products were considered as key exports as source of foreign exchange, income for small-scale farmers, jobs for rural communities, among others. It was also noted that exporting those products could take an important role in developing specific sectors, promoting inclusive growth and alleviating poverty.

In addition, some APEC members also nominated products based on the fact that they already employ a significant number of workers/households, and that the quality of life could improve for rural households by having access to markets to sell those products. A better market access could also assist farmers to improve agricultural productivity and meet food security goals.

The nominated products are also seen as important inputs for the global value chain of several industries. For example: agriculture, food processing and furniture, among others. They are also seen as fundamental in the production of renewable energies such as biofuels, which could lead to a more sustainable green growth.

Finally, in specific cases, the nominations took into account the product contribution to gender issues, by helping to improve women's participation in the economy.

All the aforementioned reasons are valid in the context of promoting trade for inclusive and sustainable growth in order to contribute to rural development and poverty alleviation. No doubt that APEC economies have nominated those goods each of them consider as critical for rural development and poverty alleviation. Trade is an important tool for APEC economies to achieve these objectives, but as mentioned in chapter 2 and 4, it is important that initiatives to promote trade come together as an integral strategy encompassing other policy areas as well (for example, infrastructure development, education, among others), otherwise it is going to be difficult to take advantage of it and achieve the expected outcomes.

[38] World Trade Organization (2015).

Trade of Nominated Products

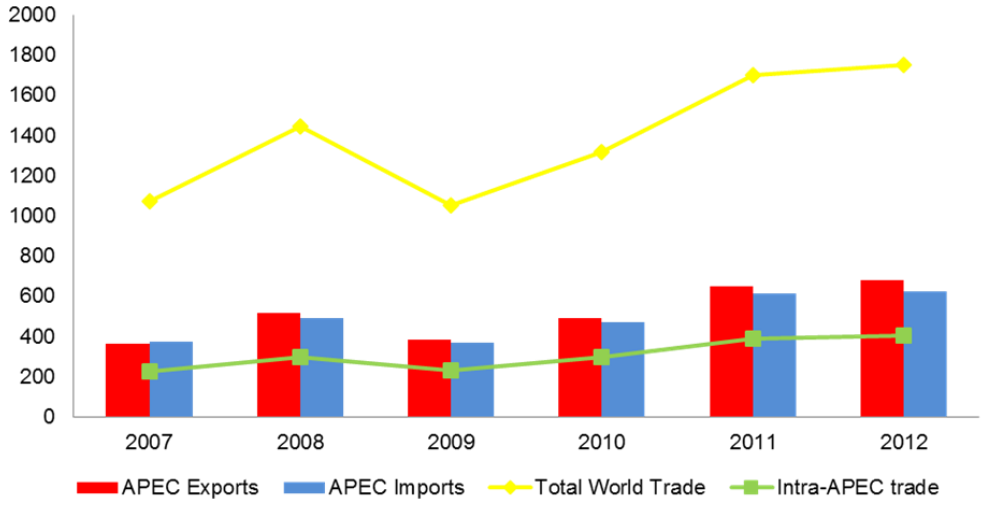
As most of the products were nominated in the HS 2012 nomenclature, it makes sense to obtain the trade flows in that nomenclature. However, the disadvantage is that this nomenclature only offers data from year 2012 onwards, and not all economies in APEC (and worldwide) have proceeded to report trade flows in that nomenclature yet.

In order to conduct this analysis, it was required to conduct an exercise in order to correlate HS 2012 sub-headings with HS 2007 sub-headings. In many cases, the correlations of sub-headings were perfect, but in 18 cases, it was necessary to make some adjustments. In some occasions, some HS 2007 sub-headings were merged into one HS 2012 sub-headings. Similarly, some cases showed one HS 2007 subheading being split into many HS 2012 sub-headings. Other cases also showed a combination of merging and splitting subheadings.

At the end, the 157 nominated products using HS 2012 sub-headings, were converted into 149 sub-headings in the HS 2007 nomenclature. In few specific cases, we had to use equivalents to obtain specific data flows in HS 2002 and HS 1996 nomenclature, due to the lack of reported data in HS 2007 nomenclature.

When looking at the trade flows of the nominated products, we notice an upward trend in recent years. Between 2007 and 2012, their global trade grew up at an average annual rate of 10.3 percent, reaching USD 1.7 trillion in 2012. APEC exports and imports grew up at a faster pace, at 13.5 and 10.8 percent per year, totaling USD 681.5 billion and USD 624.3 billion, respectively. Intra-APEC trade also increased quickly during the same period (12.3 percent), and reached USD 401.9 billion in 2012. The figures show an increasing importance of APEC as origin and destination of the nominated products. For example, in 2007, APEC exports explained 33.8 percent of the global trade of nominated products. APEC's share increased to 39 percent in 2012.

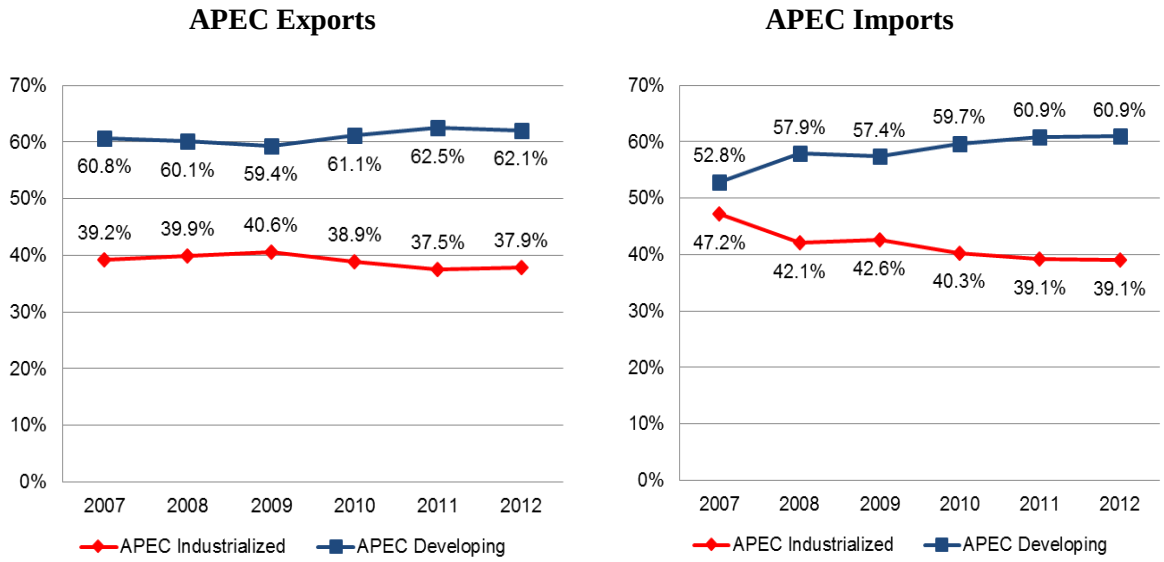
Figure 3.1: Trade of Nominated Products (USD billion)



Source: UN COMTRADE; WITS. APEC Secretariat, Policy Support Unit calculations

If APEC's trade of nominated products is analyzed by looking at the development levels of APEC economies, two issues are immediately noticed: 1) APEC developing economies explain most of APEC's nominated products trade; and 2) the share of APEC developing economies is increasing in time, especially in the case of imports.

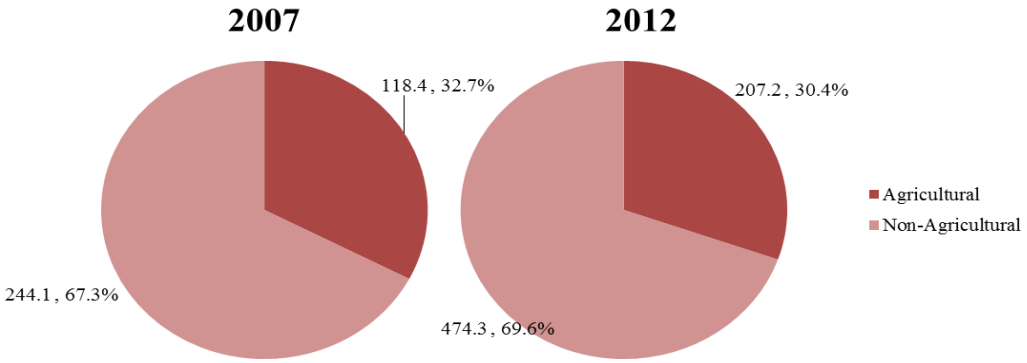
Figure 3.2: APEC's Trade of Nominated Products by Development Level

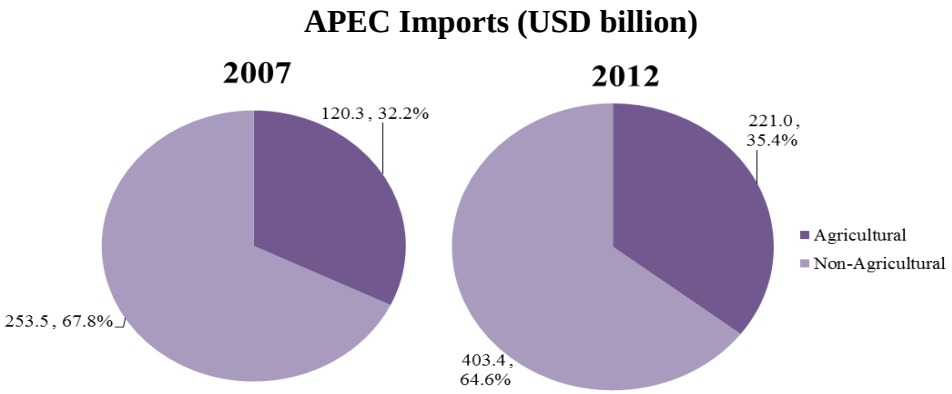


Source: UN COMTRADE; WITS. APEC Secretariat, Policy Support Unit calculations

APEC's trade composition of the nominated products reflects that non-agricultural products trade is larger than that for agricultural products for both exports and imports, explaining about 2/3 of APEC's trade

Figure 3.3: Share of APEC's Trade by Type of Product
APEC Exports (USD billion)

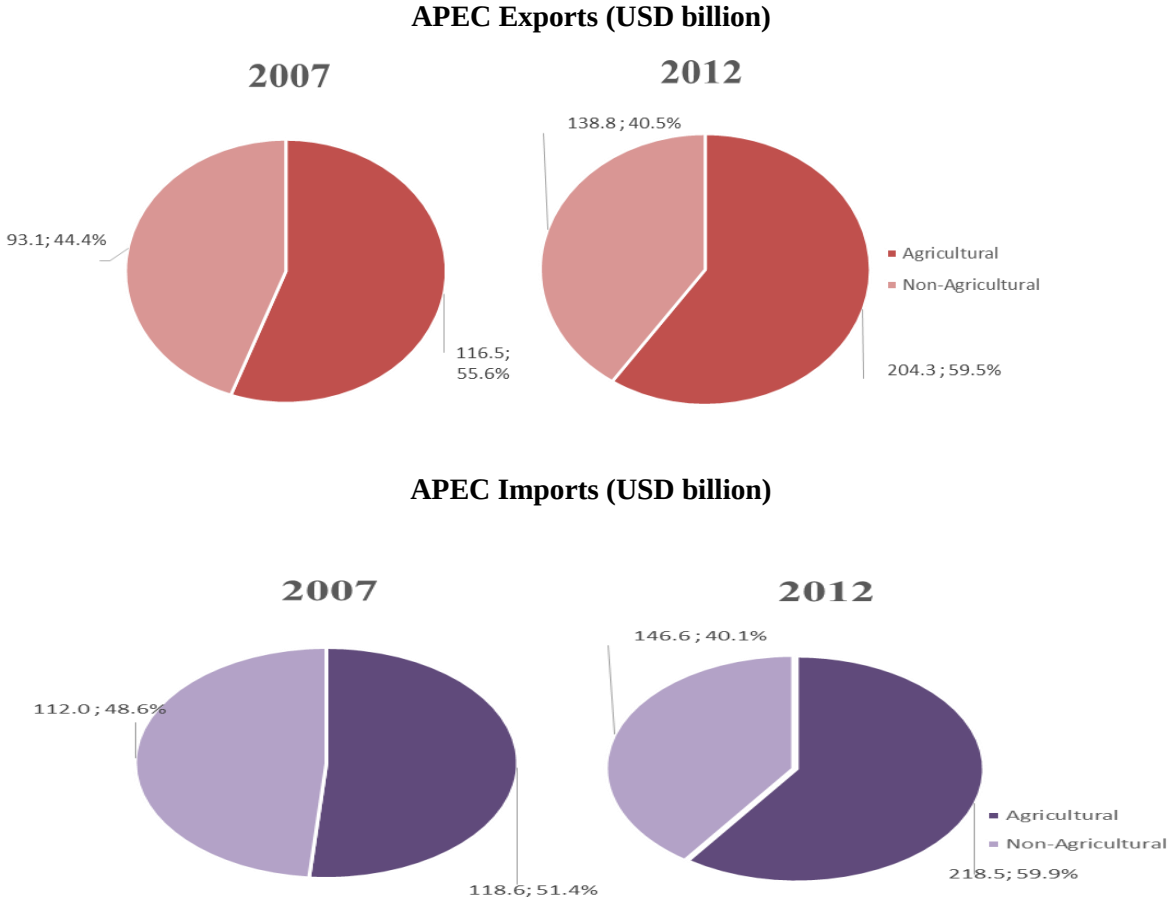




Source: UN COMTRADE; WITS. APEC Secretariat, Policy Support Unit calculations

However, the higher proportion of non-agricultural products in APEC's trade is mostly explained by the fact that one product, Lubricating Oil Feedstock, a raw material for biofuels, represents more than half of APEC's non-agricultural exports and imports. If this product is not included in the calculations, the composition of trade changes substantially and agricultural products would explain a larger share of trade (around 60 percent in 2012).

Figure 3.4: Share of APEC's Trade by Type of Product (excluding Lubricating Oil Feedstock)



Source: UN COMTRADE; WITS. APEC Secretariat, Policy Support Unit calculations

The top 10 products exported by APEC from the list of nominated products explained 72% of the total APEC exports of all nominated products in 2012. This means that the concentration of exports by the APEC region is high. As mentioned beforehand, lubricating oil feedstock explains almost half of those exports. Many of the rest of the top 10 products are agricultural commodities such as soybeans, wheat, palm oil, maize and rice.

Table 3.1: APEC Exports: Top 10 Nominated Products

#	HS 2007 Code	Description	2007 USD billion	2012 USD billion	Average growth rate
1	271019	Lubricating Oil Feedstock (TNE)	151.6	338.8	17.4%
2	120100	Soybeans	10.9	27.1	20.1%
3	100190	Wheat and Meslin	16.8	23.8	7.2%
4	151190	Palm oil and its fractions, whether or not refined (excl. chemically modified or crude)	11.4	22.2	14.3%
5	382490	Other Chemical Products & Preparations of the Chemical or Allied Industries nes or Incl (KGM)	9.6	17.2	12.4%
6	840734	Gasoline/Diesel Engine	14.1	15.0	1.3%
7	151110	Palm Oil, Crude	5.1	11.9	18.2%
8	940360	Other Wooden Furniture, nes	7.7	11.2	7.6%
9	100590	Other Maize	11.0	10.6	-0.8%
10	100630	Rice	5.7	9.6	10.7%
		Top 10	**244.0**	**487.3**	**14.8%**

Source: UN COMTRADE; WITS. APEC Secretariat, Policy Support Unit calculations

From the imports' side, the top 10 imported nominated products explained 66.7% of total APEC imports of all nominated products in 2012. As seen in the case of exports, lubricating oil feedstock is also the main import by the APEC region among all nominated products, explaining 41.5% of those APEC imports in 2012. Among the top 10 imported nominated products, we have a mix of agricultural products such as soybeans, palm oil, wheat, wine and coffee, and non-agricultural products, such as gasoline/diesel engines and other chemical products, among others.

Table 3.2: APEC Imports: Top 10 Nominated Products

#	HS 2007 Code	Description	2007 USD billion	2012 USD billion	Average growth rate
1	271019	Lubricating Oil Feedstock (TNE)	143.3	259.9	12.6%
2	120100	Soybeans	17.2	44.7	21.0%
3	840734	Gasoline/Diesel Engine	16.3	21.7	5.9%
4	382490	Other Chemical Products & Preparations of the Chemical or Allied Industries nes or Incl (KGM)	12.5	19.7	9.5%
5	100590	Other Maize	9.8	16.9	11.5%
6	100190	Wheat and Meslin	6.8	12.2	12.3%
7	151190	Palm oil and its fractions, whether or not refined (excl. chemically modified or crude)	5.7	11.7	15.6%
8	220421	Wine of fresh grapes, other than sparkling, in bottles less than 2 litres	7.9	11.2	7.2%

9	090111	Coffee, whether or not roasted or decaffeinated; coffee husks and skins; coffee substitutes containing coffee in any proportion	5.1	9.6	13.4%
10	940360	Other Wooden Furniture, nes	9.6	9.4	-0.5%
		Top 10	**234.1**	**416.9**	**12.2%**

Source: UN COMTRADE; WITS. APEC Secretariat, Policy Support Unit calculations

MFN Tariffs of Nominated Products

The product nominations are worth discussing from the MFN tariff perspective. To analyze MFN tariffs, this study is only considering the latest available tariff data from the WTO Tariff Database Facility[39]. Data is available in HS 2012 nomenclature, so all the 157 nominated HS sub-headings were included in the analysis. In some cases, we found the presence of non-ad valorem tariffs charged by some economies. When possible, those non-ad valorem tariffs were converted into ad-valorem equivalents. The average MFN tariff figures mentioned throughout this document take into account those non-ad valorem equivalents.

While APEC's MFN tariff average was equivalent to 5.7 percent in 2012[40], APEC's MFN tariff average for all nominated products was equal to 10.3 percent. In the case of the agricultural nominated products, their MFN tariff average reached 13.1 percent, more than twice as much as the average for the non-agricultural nominated products (6 percent).

Non-ad valorem tariffs are pushing up average MFN tariffs in APEC. If ad-valorem equivalents were omitted from the calculation, the average for the nominated products would be equal to 9.6 percent (0.7 percentage points lower) and that for agricultural nominated products would reach 11.4 percent (1.7 percentage points lower).

If we have a look at the distribution of the nominated products' average MFN tariff by APEC economy, nearly half of the APEC economies (10 economies) charged a tariff average of 10 percent or more. Four APEC economies had average tariffs above 15 percent.

Table 3.3: APEC Economies: Distribution of Average MFN Tariffs of Nominated Products

Avg. MFN Tariff	Number of APEC Economies	Share
0-5%	8	38.1%
5-10%	3	14.3%
10-15%	6	28.6%
>15%	4	19.0%
Total	**21**	**100%**

Source: WTO. APEC Secretariat, Policy Support Unit calculations

[39] World Trade Organization (2009).
[40] APEC Policy Support Unit (2014), p. 2.

The distribution of the average MFN tariff by HS sub-heading (product) shows that 21 percent of the sub-headings (33 of them) faced average MFN tariffs across APEC between 10 and 15 percent. 17.8 percent of the sub-headings (28 of them) experienced an average MFN tariff above 15 percent in the APEC region.

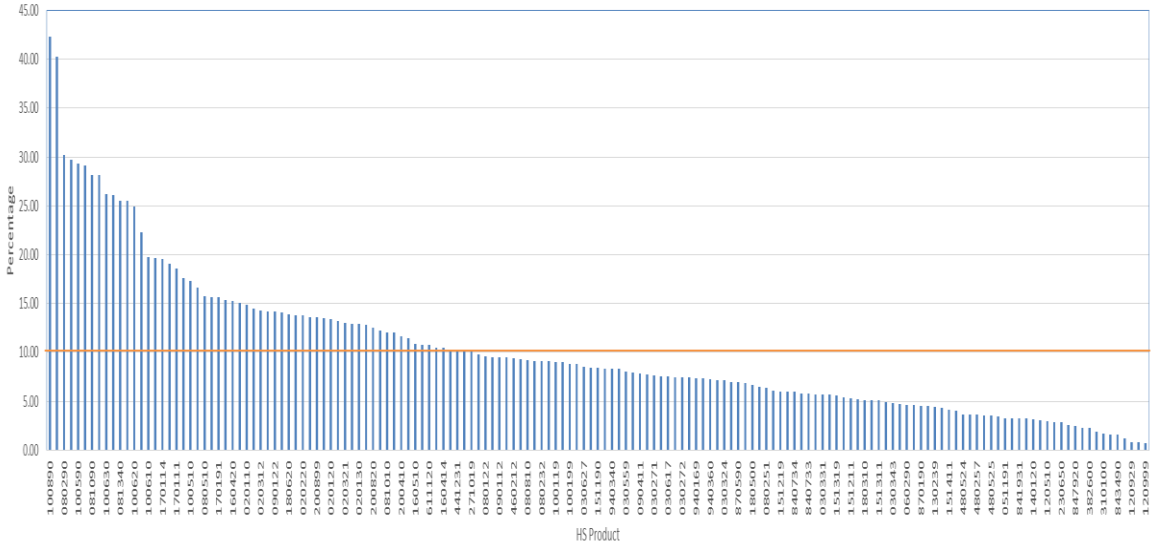
Table 3.4: HS Sub-headings: Distribution of Average MFN Tariffs of Nominated Products

Avg. MFN Tariff	Number of HS Codes	Share
0-5%	38	24.2%
5%-10%	58	36.9%
10%-15%	33	21.0%
>15%	28	17.8%
Total	**157**	**100%**

Source: WTO. APEC Secretariat, Policy Support Unit calculations

Some HS sub-headings face very high average MFN tariffs in APEC (see Figure 3.5). The analysis found 61 sub-headings with averages above 10 percent. In two cases, the MFN tariff average was above 40 percent (for example, quinoa). 14 sub-headings had MFN tariff averages above 20 percent. Nuts, rice, maize, bananas, guavas, soybeans and sugarcane were among those products affected by high tariffs within the APEC region.

Figure 3.5: Distribution of APEC MFN Average Tariff by HS Sub-headings



Note: The red line indicates an average MFN tariff value of 10 percent.
Source: WTO. APEC Secretariat, Policy Support Unit calculations

Preferential Tariffs of Nominated Products

This study does not include an analysis of preferential tariffs under RTA/FTAs or unilateral preferential systems such as the Generalized System of Preferences (GSP). Preferential tariffs favours exporters of those products covered under those initiatives. In the case of the GSP schemes, they usually grant reduced or zero tariff rates to selected products originating in

developing economies to assist these economies in the efforts to increase their export earnings and accelerate their economic growth. According to UNCTAD, 13 GSP schemes have been notified, including six APEC economies (Australia; Canada; Japan; New Zealand; Russia; and the United States[41].

A further study on the effect of APEC member economies' GSP tariffs and preferential tariifs under RTA/FTAs on the nominated products is worth exploring to understand the impact of those schemes in reducing poverty and develop rural areas.

[41] See http://unctad.org/en/Pages/DITC/GSP/About-GSP.aspx

4. CREDENTIALS OF NOMINATED PRODUCTS

Through a literature review, this chapter discusses the credentials of the nominated products in assisting rural areas to improve their living conditions. Extensive literature is available with regards of the impact of many products in rural areas. However, the studies are not necessarily analysing specific HS sub-headings. They usually study a generic product or sector in most cases, including both nominated and non-nominated sub-headings. For example, an analysis of the impact of the livestock sector would include beef products in general, not just frozen beef, which is one of the nominated products.

To facilitate the review, the 157 nominated HS sub-headings were grouped in 32 product categories. A great deal of the studies are microeconomic in nature, in which the focus is a specific rural community, town or province producing any of the product categories listed in the study. Our main focus has been to look at bibliography whose focus was to look at the effect of the production or trade of those product categories in development-related indicators, such as poverty levels, employment, income and living standards, among others. Studies related to non-APEC economies have been used in the cases it was not possible to find literature concerning any APEC economy.

As it can be seen in the rest of this chapter, the literature shows positive, mixed and negative findings regarding the impact of the selected product categories in development-related indicators. It is important to clarify that the findings in each individual study circumscribe to particular contexts and situations and the results for one economy or region regarding a specific product will not necessarily apply to other places. However, the literature review allows the identification of some common characteristics that are present in those rural areas/communities that benefitted the most from an increase in production and trade of the selected products. In general, as mentioned in chapter 2, those communities with better access to infrastructure, educational levels, skilled labour and use of technology tend to experience the greatest improvements.

01. Animal or vegetable fertilizers (HS 310100)

The impact fertilizers have on income and employment in rural areas appear to be mixed. Literature on fertilizers generally do not differentiate between organic and chemical fertilizers and it has focused on the effect of government subsidies on income and the yield of agricultural crops.

Ramli et. al. (2012) estimated that reducing fertilizer subsidies could reduce rice yield from 4.052 metric tonnes per hectare to 3.081 metric tonnes per hectare and production in Malaysia from 1.61 million metric tonnes to 1.22 million metric tonnes by 2015, leading to greater imports of rice yearly towards 2015[42]. Mkwara (2013) reported that fertilizer subsidies increased the incomes of agricultural households in Malawi, being the rural agricultural small-scale households those experiencing the largest income increases between 0.80 and 3.07 percent depending on subsidy rates. However, this paper also found that incomes of rural and

[42] Ramli et. al. (2012), p. 216.

urban non-agricultural households actually fell more, as they depended on the sales of agricultural products, which saturated the domestic market and brought prices down as fertilizer inputs became cheaper. Mkwara also found a decline in labour opportunities in farm and off-farm labour[43]. Warr and Yusuf (2013) reported that the effect of fertilizer subsidies slightly depressed Indonesia's gross domestic product, but reduced poverty conditions as more rice is produced more cheaply. Fertilizer usage also raised the value of land and the marginal product of unskilled labour which in turn leads to their wage increments[44].

The literature shows a positive relationship between the use of fertilizers and harvest yields. For example, Lumbo et. al. (2010) reported that cheaper organic fertilizer production enabled farmers to supplement income from twice the production of backyard vegetable and onion harvest in Mindanao, Philippines[45].

02. Biofuels (HS 271019, 382600)

A review of the literature on the impacts of biofuel production on rural development and poverty alleviation reveals mixed impacts. Shelanere and Kulshreshtha (2013) argued for positive impacts, claiming that direct and indirect employment was created from biofuel expansion that created stable communities by reducing rural-to-urban migration pressures and increased purchases of goods and services, including health and energy services. Consumers may experience higher food prices, but poor farmers earned from the higher prices.[46]

Mixed effects were observed in German et. al. (2010). 77 percent of respondents in Malaysia and 67 percent of respondents in Ghana felt that employment in plantations for biofuel production improved their livelihoods, but small-scale feedstock producers in emerging biofuel industries did not experience the benefits and the majority of jobs in these plantations actually went to migrants outside the communities hosting the plantations (only 4 percent of households who lost land for biofuel production secured employment in this area). German et. al. also reported that indigenous communities in Malaysia and Indonesia who depended on non-timber forest products experienced problems in collecting them due to the expansion of biofuels production[47].

03. Chemical products (HS 291619, 382313, 382490)

Literature on the impact of chemical products on rural development and poverty alleviation has been sparse. However, in one study, Lennox and MacKenzie (2008) identified that tall oil, a by-product of wood pulp manufacture, may be used as an organic substitute for bitumen. Small scale processing of 'organic' substitutes in rural locations can bring benefits such as reduced

[43] Mkwara (2013), pp. 246-247, 250. However, another study from Ricker-Gilbert and Jayne (2008) shows that purchases of subsidized fertilizer in Malawi reduced purchases by poorer farmers as wealthier farmers hoarded subsidized fertilizers.
[44] Warr and Yusuf (2013), pp. 17-18.
[45] Lumbo et al (2010), p. 202.
[46] Shelanere and Kulshreshtha (2013), pp. 5-8.
[47] German et. al. (2010), pp. 6-9.

environmental impact, increase local employment, domestic economic activity, social and infrastructure development, without compromising food crop production[48].

04. Cocoa and related products (HS 180310, 180320, 180400, 180500, 180610, 180620, 180631, 180632, 180690)

Most of the studies on cocoa's contribution to rural development and poverty alleviation are related to Africa. Franzen and Mulder (2007), in their study on cocoa production's impact on income in southern Cameroon, observed that cocoa was an important cash crop that accounted for about one third of household income and was used to buy food. However, it can lead to displacement of households who were unable to compete with migrants who can afford the resources to invest in cocoa[49]. Breisinger et. al. (2008) also observed with respect to Ghana that even though cocoa significantly helped lift cocoa-farming households out of poverty from 60.1 percent in 1991/92 to 23.9 percent in 2008 (equivalent to 112,000 cocoa-farming households), the impact of cocoa production on poverty reduction may be limited. This is because only 19 percent of rural households cultivated cocoa and poor cocoa households constituted only 3.4 percent of all rural households, as well as the fact that cocoa production was geographically concentrated in the forests which had a lower share of rural poor than the national average[50].

Alongi (2011) also noted that cocoa farmers in Cote d'Ivoire benefited from high prices of cocoa driven up by traders. Nevertheless, lucrative trade in cocoa farming had contributed to poor social conditions, as it encouraged adults to use child labour in cocoa farming, instead of facilitated their access to proper education. Limited education has been one of the factors why most cocoa farmers in Cote d'Ivoire were still living in poverty conditions[51].

05. Coconut oil (copra) (HS 151311, 151399)

Review of the literature shows that copra-derived coconut oil producers have been facing difficulties to improve rural development and poverty-related indicators. For example, the Action Group on Erosion, Technology and Concentration (2013) found that in spite of copra's contribution to the gross domestic product of the Philippines, poverty incidence of coconut farmers was 62 percent due to stagnation of copra prices, low wages, the agrarian structure in coconut-growing regions, and competition from synthetically derived oils[52]. Mwachiro and Gakure (2011) observed that copra was inefficient to produce in Kenya, requiring five to ten coconuts to produce a kilogram of copra, and prices for copra ranged between KSH 7 – 25 per kg (USD 0.08 - 0.29 per kg)[53].

06. Coffee (HS 090111, 090112, 090121, 090122, 090190, 210111)

Positive results were reported by Amarasinghe et. al. (2013), who noted that Vietnam's coffee sector supported the livelihood of over 2 million people, with export volumes peaking at 27.8

[48] Lennox and Mackenzie (2008), pp. 6, 9.
[49] Franzen and Mulder (2007), pp. 3840-3841.
[50] Breisinger et. al. (2008), pp. 6-7.
[51] Alongi (2011), pp. 66-69.
[52] Action Group on Erosion, Technology and Concentration (2013), pp. 5, 11.
[53] Mwachiro and Gakure (2011), p. 216.

million bags in 2012 generating US$ 3.74 billion in revenue equivalent to three percent of Vietnam's gross domestic product[54].

However, negative impacts were observed by Thuku, Paul and Almadi (2013) in a study of market reforms in Kenya. While coffee was the second highest contributor to Kenya's agricultural sector and generated the fourth largest foreign exchange earnings after tourism, tea and horticulture, market reforms had also raised the cost of fertilizers and labour. This affected coffee yields which declined from 8,919 hg/ha in 1980 to 3,794 hg/ha in 2004. This had impoverished farmers, increased unemployment and reduced foreign exchange earnings.[55].

Mixed reports were described by Shapera (2003) regarding the coffee sector in Peru, where about 130,000 families were working in the sector and was expected to reach 420 million pounds in production on small plots, mainly with family labour. However, the highly volatile price of coffee —reaching as high as US$ 3.30 in 1977 and as low as US$ 0.415 per pound in 2001— had forced coffee farmers to be unable to pay labourers, barter crops for food and resort to sending children as labourers[56].

07. Edible meats and related products (HS 020110, 020120, 020130, 020210, 020220, 020230, 020311, 020312, 020319, 020321, 020322, 020329)

The literature review on the impact of edible meats and related products on rural development and poverty alleviation shows mixed results.

In a study conducted on Assam, India, the Assam State Rural Livelihoods Mission Society (undated) showed that pigs served as an additional income source to tribal communities in Assam district in India. Villagers opined that piggery is a good source of income as a piglet can fetch INR 1,500 (around USD 25) and a matured pig at INR 8,000 to 9,000 (around USD 133 to 150). Low capital and high demand for pork in the district and neighbouring districts and states, together with the prolific productivity of pigs (reproducing 10 to 15 piglets), made piggery very profitable[57]. Lambertz et. al. (2012) showed that in Thailand, most of the livestock farms were small scale in terms of farmed area and herd size and kept on average 4.8 buffaloes and 6.8 beef cattle respectively, as of 2008. Cattle is considered long term investments and acts as savings to cover expected and unexpected expenses. Also, Lambertz et. al. found that beef cattle was the main source of income for 50 percent of medium-scale farms and for 75 percent of large-scale farms[58].

The elimination of non-tariff barriers (NTBs) on edible meats and related products could generate net welfare gains. A study by Karugia et. al. (2009) looking at NTBs such as weighbridges, security, transiting, customs clearance, road toll stations, cattle branding, standards and certification, and bribes in Kenya, Tanzania and Uganda, showed that these

[54] Amarasinghe et. al. (2013), p. 1.
[55] Thuku, Paul and Almadi (2013), pp. 198, 201, 205.
[56] Shapera (2003), pp. 78-79.
[57] Assam State Rural Livelihoods Mission Society (undated), pp. 1, 5, 13, 16-17. It is important to note that some factors, such as health related factors, especially pertaining to pigs as carriers of Japanese Encephalitis disease, can reduce piggery's profitability and attractiveness.
[58] Lambertz et. al. (2012), pp. 155, 158, 161-163.

NTBs constituted over 25 percent of total transfer costs for Kenya and Uganda, and approximately 19 percent for Tanzania. By completely eliminating NTBs, net welfare gains would yield three percent increase in social surplus in Uganda and one percent increase in social surplus in both Kenya and Tanzania each. Even if 50 percent of the NTBs were eliminated instead, social surplus would rise by 0.1 percent for Kenya, 0.3 percent for Tanzania and two percent for Uganda, totalling 2.4 percent in total social surplus for all three countries[59].

Henson and Loader (2000) noted SPS measures are a major factor influencing the ability of developing countries to exploit export opportunities for agricultural and food products in developed country market. Suppliers in developing countries that strive to meet SPS requirements may become dependent on higher value exports to developed markets. Strict microbiological and animal health requirements are generally applied to meat and meat products. Many developing economies lack the resources, such as scientific and technical infrastructure, to fulfil those requirements and exploit those export opportunities[60].

Expansion of pastures for livestock production has been one of the driving forces behind deforestation. FAO reported that the portion of the globe covered by forests shrank by an estimated 94,000 square kilometres a year during the 1990s. Most of the land that was cleared and burned was converted to growing crops and grazing livestock. In Latin America, in particular, most of the deforested land ended up as pasture used to raise cattle in extensive grazing systems. The problem is that forest soils are too nutrient-poor and fragile to sustain crops for long. After sometime, the soil is depleted and crop yields fall. In the short term, returns can be high for farmers, but after just five to 10 years, overgrazing and nutrient loss could turn rainforest land that was once a storehouse of biological diversity into an eroded wasteland[61].

08. Fish, crustaceans and related products (HS 030271, 030272, 030311, 030324, 030331, 030332, 030342, 030343, 030351, 030363, 030367, 030389, 030559, 030563, 030617, 030627, 051191, 160414, 160420, 160510)

The papers reviewed in this category cover the following products: fish paste, crab harvesting, shrimp harvesting, and fisheries.

Fish paste appears to exhibit mixed impacts in a study conducted in Cambodia by Navy, Leang and Chuenpagdee (2006).They found that semi-final fish paste and fish paste were the most important processed products in terms of quantity produced at 73 percent and 13 percent of the total catch in the Tonle Sap Lake, respectively. Fish processing is an important job source for women, as they explained 80 percent of the work force. However, only 16 percent of the households that reported fishing as one of their economic activities earned an income from it. Fishing was considered important as a main source of protein and fallback against crop failure, but not as an income generating activity[62].

[59] Karugia et. al. (2009), pp. 2-9.
[60] Henson and Loader (2000), pp. 92-93, 99
[61] FAO, Livestock Policy Brief 3 (2006) p.1
[62] Navy, Leang and Chuenpagdee (2006), pp. 3-4.

Regarding crab harvesting, Sandika and Hirimuthugoda (2011) reported that the annual income for collecting crab in Koggala Lagoon, Sri Lanka, averaged at SLRs 76,560 (USD 696). The majority of crab collectors were classified as middle wealth as they can afford a permanent house made of brick and cement, household equipment (e.g. radio, television, land or mobile phone, basic furniture), and at least a motorcycle as family vehicle. However, low job satisfaction levels had been recorded for crab collectors due to low harvest from low availability of crabs, competition among crab harvesters and low social recognition of their occupation[63].

Fishing and molluscs collection activities are an important source of jobs in some rural areas. In Bangladesh, Mahmood and Ansary (2013) conducted a survey on shrimp fry collectors in the southwest coast. It revealed that nearly 45 percent of landless households, or between 100,000 and 300,000 people, living by the coast were involved in shrimp fry collection which made up 70 to 80 percent of their total income. However, this activity had not allowed them to improve substantially their living standards, as 55 percent of them lived in tin houses. A great percentage of the shrimp collectors were functionally illiterate, and 74 percent of children involved in it were school dropouts[64]. Dey, Bose and Alam (2008) reported that Bangladesh's fisheries sector provided employment to over 60 percent of the rural population. About 1.2 million people were directly employed in the fisheries sector, and a further 12 million rural people earned indirectly from fisheries-related activities like downstream activities of fish trading and processing. Employment in the fisheries sector grew at 19.1 percent per annum between 2000 and 2003[65].

Phillips (1995) noted that shrimp culture may have adverse effects on other coastal inhabitants. Thus, sustainability will likely depend on more effective farm planning, site selection, and management that carefully consider the carrying capacity of the environment and the needs of the other users of coastal resources. Shrimp culture can make an important contribution to the economies of many developing countries. Experience shows that a more effective approach to environmental management is required, one that integrates shrimp culture into the coastal environment in a much more sustainable manner.[66]

09. Fruits and related products (HS 080111, 080300, 080430, 080450, 080510, 080550, 080610, 080810, 081010, 081040, 081090, 081340, 200799, 200820, 200899, 200949)

This section covers the following fruits: aguaymanto (also known as physalis and cape gooseberry), apple, banana, grape, guava, orange, and pineapple.

Many studies have shown that fruit production could be an important job source in rural areas. Chemonics International Inc. (2012), on studying aguaymanto's positive contributions in Peru, noted that aguaymanto had provided employment to small farmers in mining and other neighbouring communities. Sales of aguaymanto generated USD 240,457 in fiscal year 2012 and created 12,200 net days of work[67]. The International Fund for Agricultural Development

[63] Sandika and Hirimuthugoda (2011), pp. 20, 21-22.
[64] Mahmood and Ansary (2013), pp. 139, 140, 145, 146, 147, 148.
[65] Dey, Bose and Alam (2008), pp. 7, 53, 54.
[66] Phillips. M. J (1995), p.58
[67] Chemonics International Inc. (2012), p. 32.

(2005) observed that grapes had brought to Georgia USD 36.5 million of exports in 2002, and involved 30,000 farmers in grape production[68]. Concerning guava production, Pandit (2014) recorded that improvements made to India's value chain of guava for domestic and export markets led to average income of guava growers to rise by 312 percent in the last five years until 2014. About 300 man-days per year of semi-skilled and skilled work were generated during the period of the study[69]. Hodges et. al. (2001) found that the impact of the citrus industry in the economy of Florida was worth US$ 9.1 billion in output and 89,700 jobs between 1999 and 2000, the impact mostly being indirect through other activities surrounding the citrus industry.[70].

Other studies focused on the income obtained by fruit farmers. In some cases, the studies show a large disparity among farmers. Girmay et. al. (2014) conducted a survey on apple producing households in southern Ethiopia. They noted that 4.3 percent of those surveyed earned the lion's share of the income, being the maximum earning USD 20,734.90; while 61.7 percent of the surveyed households earned less than USD 52.50 per year[71]. Smith (2010) found that the wages from Fairtrade bananas in Ecuador could not cover the cost of the "basic food basket", for an average household, valued at USD 473.75 but could cover the "poverty food basket" at USD 343.29[72]. Research by Banana Link (2010) found that the pineapple industry had provided thousands of jobs in Costa Rica and enabled a weekly wage of 73 euros to be earned above the national minimum wage of 62.46 euros per week. However, pineapple workers were working around 80 hours per week to obtain this income[73].

One study also found social dislocation effects due to trade diversion. Smith (2010) argued that farmers in the Windward Islands in the Caribbean Sea faced social problems when the EU started importing cheap Latin American bananas in the 1990s, leading to the number of growers to drop from 24,000 in 1993 to 7,000 in 2002[74].

A study by Henson and Loader (2000) noted that fruits are typically subject to strict controls against pests and plant diseases. SPS measures are a major factor influencing the ability of developing economies to exploit export opportunities for agricultural and food products in developed market. However, many developing economies lack the scientific resources and technical infrastructure necessary to fulfil with those requirements and export to develop markets[75].

10. Garments (HS 611120)

One of the main inputs for the garment industry is cotton. A higher demand for cotton should favour cotton farmers. Orden et. al. (2006) conducted price simulations in some rural areas in Pakistan and showed that every 10 percent increase in the price of cotton raised a cotton landowner's average household income by PRs 4,806 (USD 79.34) in Punjab and PRs 11,700

[68] International Fund for Agricultural Development (2005), p. 41.
[69] Pandit (2014), pp. 31, 84.
[70] Hodges et. al. (2001), p. 12.
[71] Girmay et. al. (2014), pp. 166, 171.
[72] Smith (2010), p.68.
[73] Banana Link (2010), pp. 3-5.
[74] Smith (2010) pp. 66-67.
[75] Henson and Loader (2000), pp. 92-93, 99

(USD 193.16) in Sindh, and raised the sharecropper average household income by PRs 3,914 (USD 64.62) in Punjab and PRs 4,894 (USD 80.80) in Sindh. A 20 percent increase in cotton prices reduced initial poverty rates of 56 to 58 percent (38 percent in Punjab and 45 percent in Sindh), and reduced poverty rate among cotton-producing households from 40 percent (828,800 households) to 28 percent (580,160 households)[76].

On the opposite, Minot and Daniels (2002) simulated a reduction in the farm level price of cotton in Benin by 40 percent and found that it would reduce rural per capita income by seven percent in the short run and five to six percent in the long run, while poverty would rise to eight percent in the short run equivalent to 334,000 individuals below poverty line and stabilise at six to seven percent in the long run as households adjusted to new prices. The multiplier effect estimated that every one dollar less spent by cotton growers would result in $2.70 reduction in overall demand[77].

Kabelwa and Kweka (2006) studied the impact of Tanzania's trade liberalization in the textile industry and cotton farmers. On the one hand, they showed that employment in the textile sector declined from an average of 26.6 percent of total manufacturing employment between 1991 and 1994 to an average of 10.1 percent between 2001 and 2004. Global competition forced textile firms to restructure their operations and adopt new technologies, thus voluntarily retiring workers who could not be retrained. Most of the skilled workers were offered three-month contracts, but unskilled workers were offered casual employment. On the other hand, trade liberalization benefitted cotton farmers by shifting agricultural income away from marketing boards and enabled profit to be earned with relation to the production cost[78].

11. Machinery and equipment (HS 732190, 840733, 840734, 841931, 843490, 843710, 847920, 848690, 870190, 870590)

The impacts machinery and equipment have on rural development and poverty alleviation appear to be positive overall, as they help to increase the productivity and income in rural areas. This analysis covers the following equipment: drying machines, engines, oil presses, solar cells and tractors.

The Asian Development Bank (2012) found that by building a drying machine as part of a plum-drying workshop in the Kyrgyz Republic, local farmers in the cooperative earned USD 3,820 from their dried-plum enterprise in the first year of operation which was six times the average income of previous years[79].

For gasoline engines, Brando (2012) found that handheld harvesters operating on a two-stroke gasoline engine enabled coffee growers in Brazil who bought the machine to pick more coffee and make more money each day[80].

[76] Orden et. al. (2006), pp. 18-19, 22.
[77] Minot and Daniels (2002), pp. 9-12, 15-16.
[78] Kabelwa and Kweka (2006), pp. 3, 9, 12, 13-14, 16-17.
[79] Asian Development Bank (2012), pp. 10-11.
[80] Brando (2012), p. 23.

On oil presses, Mujeyi and Chamunorwa-Mujeyi (2013) showed that installing a hand-operated oil press to process jatropha oil in Mali enabled Malian workers to earn a net profit of USD 1.43 per day from processing 12 kg of jatropha, which was more than the daily average wage for workers in Mali[81].

The Global Environment Facility Small Grants Programme (2011) found that by installing solar electrification systems in rural Ghana, about 2,245 households benefited from the electricity with more than 14,549 beneficiaries in 32 villages enjoying more light. They also enabled Ghanaian women to work to expand income generating activities by working into the night[82].

Khan et. al. (2009) found that households surveyed in Pakistan that purchased a tractor reported increase in income. 53 percent of these households reported improvements in living standards with the construction of new houses and guesthouses; 20 percent reported increase in consumption; 62 percent reported lifestyle improvements; and 76 percent of the households were able to send their children to private schools instead of government schools[83].

12. Maize (HS 100510, 100590)

New maize varieties could improve agronomic practices over local practices and raised farmers' incomes which benefitted maize production from accessibility to cheaper maize seeds[84].For example, Rovere et. al, (2008) showed that the distribution of improved maize seeds in Mexico increased maize production and reduced poverty among farmers. Farmers who adopted the improved seeds increase their income by 24.3 percent compared to those non-adopting farmers. However, Kelleman et. al. (2009) reported that evidence from a case study in Mexico suggests that recently evolved political, economic, and social conditions may be changing the social processes that generate and maintain maize diversity, with implications for in situ conservation. Current agricultural processes are contributing to the narrowing of maize genetic diversity under which maize is farmed[85].

Thanh and Neefjes (2005) noted that good maize prices arising from efficient production and ample demand for maize helped lift maize farmers out of poverty compared to alternative crops in Viet Nam. However, despite poverty alleviation wages remained low for many farmers[86].

13. Nuts (HS 080122, 080211, 080212, 080231, 080232, 080251, 080290)

This section covers the following products: almonds, brazil nuts, pistachios, and walnuts.

A literature review shows example of economies being able to or with potential to turn the production of nuts into a very important source of income. For example, the Australian Nut Industry Council (2007) revealed that Australia's almond industry was estimated to be worth

[81] Mujeyi and Chamunorwa-Mujeyi (2013), p. 8.
[82] Global Environment Facility Small Grants Programme (2011), pp. 2-3.
[83] Khan et. al. (2009), pp. 509, 513.
[84] Rovere et. al. (2008), pp. 10-13.
[85] Keleman et.al. (2009), pp. 67.
[86] Thanh and Neefjes (2005), pp. 36, 38.

between USD 370 million and USD 500 million at the farmgate, depending on the price[87]. In a study concerning pistachio growers, Tootelian (2011) concluded that annual output totalling USD 682.5 million per year in California, Arizona and New Mexico was expected to be generated caused by direct spending from pistachio growers, indirect spending from additional businesses, and induced spending from increased labour income in the pistachio industry. Total annual income of current and additional employees was expected to exceed USD 224.4 million[88].

Nuts could contribute an important number of jobs. Collinson, Burnett and Agreda (2000) showed that the Brazil nut industry generated jobs for 27,000 people in the remote Peruvian province of Madre de Dios, both directly and indirectly. Brazil nuts acted as an income source that kept the poor from becoming more impoverished and were one of the few resources that remained under the control of the poor. However, despite the fact that Brazil nuts generated an average annual income of USD 6,410 for nut collectors, they remained poor considering that the average size of the collectors' families was six members, which means that this annual income would be equivalent to USD 89 per month on a per capita basis, lower than the minimum living wage of USD 200 per month[89].

Non-tariff barriers have been identified as a deterrent to development for Brazil nuts farmers. Ivarsson (2008) found negative implications of non-tariff barriers, such as the EU's regulatory limits on mandatory low Aflatoxin levels, in Brazil nuts trade and development, which had affected close to 1 million people depending on it in Brazil, Bolivia and Peru[90].

Lack of access to credit is another hurdle towards rural development of nuts producers. A study on walnut growing by McNeil (2014) in Australia, New Zealand and China (Guanxi) identified that one of the primary constraints to rural development is related to access to capital and personal financial risks[91].

14. Oil seeds (HS 120510, 120929, 120999)

The literature review on the impact of oil seeds production—canola and beet seeds—on rural development and poverty alleviation shows mixed results. On a positive note, Brookes and Barfoot (2006) calculated that by growing genetically modified canola, annual total national farm income benefit in Canada from using this new technology had risen from USD 6 million in 1996 to USD 175 million in 2005, and the cumulative farm income benefit amounted to USD 792 million between 1996 and 2005[92]. Fernando (2014) affirmed that in China's case, 1 million women would benefit directly from canola being grown if each woman in the labour force devoted 0.5 ha on average to growing it[93].

[87] Australian Nut Industry Council (2007), p. 9.
[88] Tootelian (2011), p. 12.
[89] Collinson, Burnett and Agreda (2000), pp. 9-10.
[90] Ivarsson (2008), pp. 2-3.
[91] McNeil (2014), pp. 1, 6.
[92] Brookes and Barfoot (2006), p. 20.
[93] Fernando (2014), p. 5.

Oil seeds and beet seeds can be used for the production of biofuels. In this regard, Sielhorst, Molenaar and Offermans (2008) conducted a study on biofuels development in Africa and argued that biofuels may increase conflicts over limited availability of land and resources and decreasing food production. Biofuels can generate employment but on a limited basis as they require lower labour input[94].

15. Other animal products (HS 051199)

Literature review on cochinilla's contribution to rural development and poverty alleviation is limited. Diaz-Cayeros and Jha (2012) conducted a statistical analysis of cochinilla production in rural Mexico. It revealed that those places with a history of producing cochinilla experienced a reduction in poverty headcount by ten percent, equivalent to that produced by the cash transfer program titled Progresa/Oportunidades (*Progress/Opportunities* in Spanish) over a ten year period. Areas involved in cochinilla production also increased female literacy rates by 50 percentage points and had just as adequate public goods and services like water, electricity and drains as those in nearby non-producing areas[95].

16. Other cereals (HS 100850, 100890)

This section cover a literature review of the impacts of quinoa and kiwicha (amarathus caudatus) on rural development and poverty alleviation indicators.

Quinoa's positive impact is demonstrated in Iwanciw and Suarez (2007) who noted that quinoa in Bolivia contributed 55 percent to 85 percent of family income of quinoa farming households, and was more evident among women-led families with few livestock. Quinoa had seen 7000 small farmers growing approximately 25,000 tons per year. This had contributed to more than USD 5 million in quinoa exports[96]. Antonio (2011), however, cautioned against this amidst quinoa's reported benefits. She argued that revenue earned from quinoa sales in Bolivia had reduced migrations to the city, but would not benefit the quinoa farmers and inhabitants in Oruro and Potosi provinces who continued to be among the poorest in Bolivia as measured by the Human Development Index[97]. Rojas, Soto and Carrasco (2004) took a more pessimistic view, highlighting that modern farming technology and booming overseas demand for quinoa had eroded the fertility of the land in Bolivia, which had reduced agricultural productivity and decreased profit earned from shrinking quinoa production. In fact, they noted that 90 percent of quinoa farming households were poor[98].

Kiwicha's positive impacts is reported in Bjarklev, Kjær and Kærgård (2008) who noted that kiwicha had been identified as a possible sustainable income source for small-scale farmers in Mexico because their traditional indigenous knowledge of farming can facilitate adopting organic farming principles which can create export market openings for organic amaranthus in the EU[99]. In highlighting successful mutant crop varieties, the International Atomic Energy

[94] Sielhorst, Molenaar and Offermans (2008), pp. 35-38.
[95] Diaz-Cayeros and Jha (2012), pp. 4, 21-23.
[96] Iwanciw and Suarez (2007), p. 42.
[97] Antonio (2011), pp. 7, 17, 24.
[98] Rojas, Soto and Carrasco (2004), pp. 60, 61-62, 68.
[99] Bjarklev, Kjær and Kærgård (2008), p. 2.

Agency (2007) reported that mutant kiwicha had enabled large harvest yields which had led to a small industry in Peru being established to manufacture food products in the highlands like barley flakes, pearl grains and flour, which can address the high rates of unemployment in the area[100].

17. Other fats and oils (HS 151411, 151590, 151620, 152000)

Some studies conducted on the impacts of glycerine and oil made from sacha inchi reveal their impacts on rural development and poverty alleviation to be positive. Green (2009) noted that in Mali, glycerine as a by-product of biodiesel from jatropha oil can be used to make high quality soap that acted as an income source. A local women's cooperative will buy the glycerine to make soap, allowing the women in Mali to benefit directly from jatropha biofuel production in providing income, employment and reducing poverty in the community[101].

Concerning sacha inchi, Oxfam (2009) reported that the rising global demand for omega oils made sacha inchi a potential cash crop for indigenous farmers in Peru. By supplementing existing crops grown for their own consumption, indigenous farmers hoped to earn money from sales of oil made from sacha inchi to save, and finance education and health care[102]. Quiroga et. al. (2009) conducted a cost-benefit analysis on technologies to help small and medium scale farmers to be more competitive and build agricultural supply response capacities and found that mechanical pressing of sacha inchi yielded internal rates of return ranging between 36 and 207 percent[103].

18. Palm oil (HS 151110, 151190)

The Palm Oil Agribusiness Strategic Policy Institute (2014) highlighted some benefits from the production of palm oil in improving development-related indicators in Indonesia. The number of workers employed in oil palm plantations in Indonesia rose from 3.4 million people in 2000 to 9.3 million people in 2013. Income from oil palm was found to be most lucrative to farmers at USD 960-3,340 per hectare, compared to wood (USD 1,099 per hectare), rubber (USD 72 per hectare), paddy (USD 28 per hectare), and cassava (USD 19 per hectare). It forecasted that an increase in crude palm oil production by ten percent would lower poverty in Central Kalimantan by 3.1 percent, in Riau by 4.7 percent, in South Sumatra by 5.8 percent, and in North Sumatra by 6.58 percent[104].

A literature review conducted by Rist, Feintrenie and Levang (2010) shows positive results in different cases. They cited a study by Susila (2004), which found that oil palm contributed significantly to rural income at Rp 5-11 million (USD 500-1,000) or over 63 percent of smallholder household incomes in two locations in Sumatra, which had an effect alleviating poverty as the percentage of poor people in those palm oil communities was under ten percent. In addition, they found a study by Simeh and Tengku Ahmad (2001) in which the poverty incidence of smallholder oil palm producers in Malaysia had been negligible since the early

[100] International Atomic Energy Agency (2007), p. 1.
[101] Green (2009), pp. 26, 58.
[102] Oxfam (2009), p. 19.
[103] Quiroga et. al. (2009), pp. 7, 9-10.
[104] Palm Oil Agribusiness Strategic Policy Institute (2014), pp. 77, 84, 87, 90.

1980s in comparison to small-scale producers of other commodities. However, Rist, Feintrenie and Levang (2010) also recognized that the development of palm oil has been a source of controversy, due to social and environmental conflicts that could have serious implications for rural communities[105]. In fact, the UNEP (2011) reported that the production process tends to reduce freshwater and soil quality and affect local communities which are dependent on ecosystem products and services. In addition, UNEP mentions that palm oil plantations contain less biomass and have a shorter lifespan than natural forests, therefore less carbon is sequestered. The drainage of peatlands to palm oil plantations could increase greenhouse gas emissions[106].

19. Paper and paperboard (HS 470700, 480255, 480256, 480257, 480300, 480524, 480525, 481029)

Many studies have highlighted the paper industry as an important job source. The International Trade Strategies Global (2011) noted that pulp and paper industries in Indonesia directly employed 247,722 people in Indonesia excluding employment in pulpwood harvesting for 2009, of which 79,923 people were in pulp manufacturing and 167,799 people were in paper manufacturing[107]. Pogue (2009) noted that by 2005, 40,000 people were employed in South Africa's pulp and paper industry, which was supported by over 11,000 informal paper recyclers[108]. Biggs and Messerschmidt (2005) found that the paper making industry in Nepal provided employment to 4,155 families or 21,000 people, across 16 of 75 districts in Nepal. Women made up about 80 percent of those employed in the industry[109].

Chamberlain et. al. (2005) argued that the South African pulp and paper industry employed 13,200 people in 2003. However, this study showed that employment in the paper industry had a negative long-term trend as restructuring and efficiency forced workers out[110]. Lang (2008) noted a similar long-term decrease in employment of the pulp and paper industry in Europe from 389,300 people in 1991 to 259,100 people in 2006 which indicated that the industry may be responsible for losing jobs even as pulp and paper production in Europe increased during the same period from a capacity of 38.7 million tonnes in 1991 to 46.8 million tonnes in 2006[111].

20. Pepper (HS 090411, 090412)

Buyinza and Mugagga (2010) compared the benefit-cost ratio of growing hot peppers, maize and beans in Uganda. The results showed that the benefit-cost ratio and the net profit was the highest for hot peppers. In 2005, the benefit-cost ratios were 12.33 for hot pepper, 5.17 for maize and 4.85 for beans and the corresponding profits per hectare were equal to USD 1.233 for hot pepper, USD 0.471 for maize and USD 0.530 for beans. A similar situation was found

[105] Rist, Feintrenie and Levang (2010), pp. 1010, 1034.
[106] United Nations Environment Programme (2011), pp. 2-3.
[107] International Trade Strategies Global (2011), p. 28.
[108] Pogue (2009), p. 144. See for main book http://www.hsrcpress.ac.za/product.php?productid=2256.
[109] Biggs and Messerschmidt (2005), p. 1827. Also cited in Potter, Nelson and Coghlan (2010), p. 5.
[110] Chamberlain et. al. (2005), pp. 55-57.
[111] Lang (2008), pp. 17, 92.

by the authors in year 2000 as well. Based on these findings, the authors infer that hot peppers can be grown as a cash crop and contribute to livelihood and poverty reduction in Uganda[112].

The Food Economy Group and Save the Children (2005) in their joint study were more cautious about the role of pepper in Ethiopia, noting that decline in pepper production would result in reduced income and therefore, less food and non-food items purchased in the Alaba-Mareko Lowland Pepper Livelihood Zone in Ethiopia. The study noted that poor infrastructure, lack of affordable transportation and inadequate local market information hindered farmers' access to markets. Poor households sold about 100-150 kg while better off households sold about 250-350 kg of pepper[113].

21. Potatoes (HS 200410)

The impact of potato cultivation on rural development and poverty alleviation is generally positive. For example, the Swiss Agency for Development and Cooperation (2008) introduced a potato seed which saw the number of Bhutanese households growing potato from zero percent in 1970 to 46 percent in 1988 to 59 percent in 2000. Cash income from potato cultivation grew from CHF 0 per household in 1970 to CHF 175 per household (25 percent of total household income) in 1988 to CHF 360 per household (21 percent of total household income) in 2000. Potato was the only agriculturally feasible crop to grow at heights above 2,500 metres, which without would push many households to find off farm work and/or migrate to urban centres to earn income. As of 2007, potato production contributed CHF 19 million or two percent to Bhutan's gross domestic product[114]. Peer et. al. (2013) also found that in their study on the economics of potato growing in Jammu in India that potato growing was profitable as the total return per hectare of Rs 142,740 (USD 2,876) exceeded the total expenditure cost of growing which was Rs 82,484 (USD 1,661), generating a net return of Rs 60,255 (USD 1,214) or a benefit-cost ratio of 1.73[115].

Yu et. al. (2007) assessed SMEs processing potatoes in the China's Xiji County after the start of the Potato Industrialization Strategy in 2003 and noted that their average income was about 3,184 Yuan in 2005, which was 1.83 times the per capita income of rural residents in the province. Per capita income from potato-linked industries rose by 57 percent between 2002 and 2005, which probably explained the decline in the number of people living below the absolute poverty line from 92,000 in 2002 to 40,000 in 2003 to 26,860 in 2005, as well as the rise in rural residents' per capita income from 1,216 Yuan in 2004 to 1,740 Yuan in 2006[116].

Singh (2008) reported the export share of developing countries for fresh potatoes and frozen potatoes are 14.3 percent and 2.9 percent, respectively, in spite of the fact they produce 47 percent of world potato production. The export of potatoes from developing countries faces several constraints and concrete measures are needed to be undertaken. Surveys of potential

[112] Buyinza and Mugagga (2010), pp. 12, 16.
[113] Food Economy Group and Save the Children (2005), pp. 1, 3.
[114] Swiss Agency for Development and Cooperation (2008), pp. 1-3.
[115] Peer et. al. (2013), pp. 5642-5643.
[116] Yu et. al. (2007), pp. 14, 20-21, 24.

export markets and strengthening of suitable infrastructure for export like cold storage, surface transportation and shipping facilities are essential components of successful exports[117].

22. Products of vegetable origin (HS 110620, 130239, 140490)

This section covers the following products: achiote, maca, tara, uña de gato and yacon. Contributions to rural development and poverty alleviation from products of vegetable origin have been overall positive, though external factors have dampened their full potential.

ProNaturaleza (2011) cited that Peruvian export sales of achiote had increased dramatically from USD 7 million in 2007 to USD 11 million in 2010[118]. A later report by ProNaturaleza (2012) noted that employment in the sector that traded in BioTrade products that included achiote would jump from more than 10,000 workers in 2010 to about 60,000 workers in 2020 (assuming 20 percent annual rate of increment) or more than 250,000 workers (assuming 40 percent annual rate of increment). BioTrade products like achiote can also potentially reduce poverty, but this was not guaranteed[119].

Concerning tara, Korneffel (2012) observed that tara had provided income for 20,000 small farming families in Peru where 60 percent of the population lived below the poverty line. Tara had risen in price to EUR 35 per hundredweight, or about ten times the amount it was just a few years ago[120], which increased the income of tara producers. The Belgian Trade for Development Centre (2013) also noted that expansion in tara production with the help of NGOs had led more than 6,000 tara farmers in northern Peru to experience dramatic increases in income from USD 0.85 per day to USD 3.15 per day[121].

As for uña de gato, de Jong et. al. (1999) argued that Peruvian small-scale farmers who harvest uña de gato, do it to supplement their income, as their main activity is farming. Their incomes increase with higher demand for uña de gato and if this is directly supplied by the owners. The authors found that benefits for small-scale farmers would be reduced significantly if the production of uña de gato is to shift to in vitro production, unless this is produced under partnership agreements with these small-scale farmers[122].

As for maca and yacon, some reports found out that trade obstacles such as the EU´s Novel Foods Regulation, implemented in 1997, may hamper their exports. The International Plant Genetic Resources Institute (2005) noted that while increased urban demand (such as processed convenience products) and international demand helped to turn yacon into an income earner from a subsistence crop for Peruvian farmers, these barriers reduce international demand for yacon[123]. Similarly, Hermann (2009) described a case in which Netherlands seize a consignment of maca imports in August 2003 after policies based on the Novel Foods

[117] Singh (2008), http://www.fao.org/docrep/010/i0200e/I0200E07.htm
[118] ProNaturaleza (2011), p. 39.
[119] ProNaturaleza (2012), pp. 26-27.
[120] Korneffel (2012), p. 37.
[121] Belgian Trade for Development Centre (2013), p. 2.
[122] de Jong et. al. (1999), p. 11.
[123] International Plant Genetic Resources Institute (2005), pp. 7, 23.

Regulation with respect to maca were implemented in May 2003. This incident led maca exports to EU to drop sharply from a high total free-on-board value of USD 113,000 in 2002[124].

23. Rattan, other plaiting materials and related products (HS 140120, 460122, 460193, 460199, 460212)

A survey of the literature on rattan's contribution to rural development and poverty alleviation reveals positive results. Positive results are mentioned in Von Zeipel (2010) who reported higher incomes for villagers in seven villages and 60 households in Laos as they earned 8.5 million kip, or approximately USD 1,000, in additional income from selling rattan seedlings and rattan cane. This additional income enabled 70 percent of rattan sales to go towards providing communal education and healthcare facilities while the remaining 30 percent of sales went to individual members. It had also allowed farmers to diversify production away from rice and other small-scale crops[125].

Oladele, Aiyeloja and Aguma (2013) also reported positive returns from rattan sales in Nigeria. One region (Obio Akpor) reported profit margin of about US$ 10,809.24 over three years from 2009 to 2011 while cane producers in another region earned additional US$ 1,506.22 on top of their routine jobs as drivers, artisans and petty traders. Rattan-based enterprises generated employment for both urban and rural inhabitants, attracting young people into the industry[126]. Chaudhary and Paudel (1997) calculated that small-scale rattan processors in Nepal yielded average annual profit of ten to 30 percent even as initial cost of establishment can range from USD 1,000 to 8,000, depending on demand, costs of raw materials, taxes, middlemen charges and other factors[127].

24. Residues and waste from food industry (HS 230120, 230650)

Giving an economic value to residues and waste from food industry could generate positive impacts. For example, Sargeant (2001) noted that palm oil cake was used as animal feed to be exported to Europe and oil palm's empty fruit bunches and palm oil mill effluent were recycled to reduce fertilizer costs and improve soil structure[128]. Cushion, Whiteman and Dieterle (2010) observed that glycerol and seed cake, as by-products of jatropha in biodiesel production, could reduce the price of biodiesel. In India, pongamia oil production had been shown to provide employment and income to the rural poor, especially poor women[129].

Employment wise, Prasad and Visagie (2005) mentioned that promoting biodiesel in South Africa would help save ZAR 1 billion (USD 95.6 million) per annum in oil cake, oil seeds, glycerol and seed cotton, and create up to 300,000 jobs in disadvantaged rural areas. Oil cake

[124] Hermann (2009), pp. 500, 505. However, the author mentions that as at December 2008, maca appeared as listed as a non-restricted species by the Novel Foods Regulation.
[125] Von Zeipel (2010), pp. 1, 3, 6.
[126] Oladele, Aiyeloja and Aguma (2013), pp. 32-34.
[127] Chaudhary and Paudel (1997), pp. 160-161.
[128] Sargeant (2001), p. 16.
[129] Cushion, Whiteman and Dieterle (2010), pp. 195, 200.

made from cotton seed would reduce the protein shortage in animal feed and substitute oil cake imports[130].

25. Rice (HS 100610, 100620, 100630, 100640)

The literature on the impact of rice in the economy is abundant. Many studies focus on the effects of an increase of rice production in the economy due to improvements in technology. For example, Diagne et. al. (2012) observed that increased rice production in Sub-Saharan Africa as a result of the rice breeding research was estimated to reduce by USD 650.6 million (PPP) in annual expenditure on rice of non-rice farming consumers living below the $1.25 poverty line. At least 4.2 million people in rice-farming households would be lifted out of extreme poverty line (above USD 1.25 per head per day). 6.8 million urban and rural non-rice farming households would be lifted out of extreme poverty conditions by the expenditure savings in rice. Overall, the number of people under extreme poverty would reduce by four percent[131]. Similarly, Singh et. al. (2005), evaluated a program designed to increase the rate and extent of adopting efficient technologies, practices and inputs in the rice industry in Australia, and concluded that every USD 1 dollar invested in the program from 1986 to 2002 yielded a return of USD 18, or a cost-benefit ratio of 18.0[132].

Other studies are related to the importnce of rice in food security, For example, Matsuno et. al. (2006) noted that rice is the most important crop in Asian economies facing monzoons. Rice is highly valued in those economies owing to its strong linkages to food security, socio-economy development of the rural community and conservation of natural resources and the environment[133].

However, other studies focused on different markets have been more cautious about the impact of rice technology improvements in the economy. For instance, Hossain (2002) analyzed the impact of rice research on poverty alleviation in Bangladesh. He argued that modern high yielding rice varieties would increase demand for hired labour substantially but would decline with mechanization. Full employment would not reduce poverty when the prevailing agricultural wage was about USD 1 per day. However, rice research had generated demand for occupations working in the non-farm sector which benefitted incomes of poor households. Moreover, surplus rice outpaced demand which had kept prices of rice low, thus enabling poor households to purchase rice which reduced pressure on income expenditure. Thus, the amount of rice that an agricultural wage labourer could buy with their daily wage in 1987-1988 which was 2.8 kg had increased to 5.7 kg in 2000, rising at 5.8 percent per year during 1987-2000 period[134].

Studies regarding the impact of the liberalization of the rice trade also showed mixed results. On the one hand, Wailes (2005) concluded that reform of protectionist policies on the rice trade worldwide was estimated to increase rice trade by ten to 15 percent. Rice exporters would receive 25 to 35 percent higher in price, while rice importers would pay ten to 40 percent lower

[130] Prasad and Visagie (2005), pp. 15-16.
[131] Diagne et. al. (2012), pp. 25, 32.
[132] Singh et. al. (2005), pp. 29-33.
[133] Matsuno et al. (2006)
[134] Hossain (2002), pp. 3-4.

in price, depending on the type of rice[135]. Gulati and Narayanan (2002) further argued that trade liberalization would benefit countries with competitive rice sectors, such as all rural households in Thailand and Vietnam. Higher rice prices in rice exporting economies could also generate employment in the rural sector as production increases with price, raising incomes of these workers in rice exporting economies. Moreover, they noted that non-farming sectors in Asia and Africa would benefit with additional income due to an increase in agricultural income[136].

On the other hand, Talukder (2014) was less enthusiastic in his analysis of income of rural households in Bangladesh. He recognizes that agricultural trade liberalization could impact positively on rice production, but farm households would experience lower gains than non-farm households due to a greater decrease of the producer price than the consumer price[137]. Abaza et. al. (2005) were more pessimistic when studying the impact of trade liberalization on rice in Indonesia. The study noted that the implementation of the WTO Agreement on Agriculture could have influenced the decline of rice prices and disincentive farms to produce rice. The elimination of input subsidies and other agricultural support also meant higher production costs for rice. Both impacts were likely have a negative impact on poverty in rural areas[138].

26. Rubber and live plants (HS 060210, 060290, 400110, 400280, 401699)

Papers analysing the effect of rubber cultivation in rural areas show mixed results. An example of a positive review is found in Rajasenan (2010) who conducted a study on the livelihood and employment of workers in rubber and spice plantations in Kerala, India. He showed that rubber workers on the whole benefited more than their counterparts in the spice plantations. Increase in the price of rubber raised demand for employment from 375,770 in 2003 when rubber was Rs 48 (USD 1.03) per kg to 416,900 when rubber was priced at Rs 107 (USD 2.30) per kg. This study also showed that rubber workers had access to better housing and education, with 50 percent having high school education[139].

Some negative effects caused by rubber cultivation were found by Dararath, Top and Lic (2011) in a paper analysing the case of Cambodia. The substitution effect of agricultural crops per rubber made rice yields to drop from 864 kg per hectare to 696 kg per hectare. In addition, 77 percent of people surveyed felt that their income was inadequate after rubber plantations were established. 68 percent of local people felt that rubber plantation owners did not improve their livelihood and 67 percent of respondents felt that rubber plantations contributed poorly to reducing poverty[140].

Mixed impacts was seen in a study on rubber plantations by the International Union for Conservation of Nature (IUCN) Lao PDR and the National Economic Research Institute (NERI),the Ministry of Planning and Investment of Lao PDR (2011). The study noted that staff in rubber plantations earned wages of USD 3 per person per day which was slightly higher than

[135] Wailes (2005), p. 192.
[136] Gulati and Narayanan (2002), pp. 14-15, 17.
[137] Talukder (2014), pp. 99.
[138] Abaza et. al. (2005), p. 64.
[139] Rajasenan (2010), pp. 22, 24, 27-28, 34, 39, 43.
[140] Dararath, Top and Lic (2011), pp. 24-29.

the national minimum wage of USD 2.70 per person per day, but the living situation remained similar before rubber was cultivated as wages' contribution to household income did not change much, but fears of future food insecurity and conflicts over plantation project implementation had surfaced. In addition, almost all the streams and ponds had become shallower or dried up[141].

27. Soybean (HS 120110, 120190)

Sanginga et. al. (1999) found that soybean production could improve farmers' living conditions in the State of Benue, Nigeria. The cultivation of soybean was twice as profitable as that for groundnut. Among the surveyed farmers, soybean was ranked first in most important source of cash income by 42 percent of men and 47 percent of women. The mean income for men and women were higher in soybean cultivated regions than those in non-growing regions, which was N 14,051 (USD 151.49) and N 9,156 (USD 98.72) respectively. Men and women derived 58 percent of their income from soybean compared to approximately 20 percent for those in non-soy growing regions. As a result, men had more access to material items like radios (48.4 percent), mattresses (71.9 percent), bicycles (27.7 percent), livestock (58 percent) and metal-roofed houses (41 percent). A good percentage of women used their higher income from soybean production to pay for school fees (89.7 percent), medical bills (45.9 percent), more expensive foods (meat, fish, condiments) and other household items (67 percent)[142].

Weinhold, Killick and Reis (2013) performed a statistical analysis of the effect of soybean cultivation in the Brazilian Amazon and found that soy acreage was negatively correlated with poverty, but inequality was positively correlated with soil acreage. Rural household income was positively correlated with soy production, but not urban household income. Wealthy soy farmers, however, benefited the most from increased soy production. Local perception of growing inequality had led to opposition of large scale soy farming in the Amazon region[143]. Fernandes (2009) also observed that the operations of some large scale farmers in the Amazon region had displaced small farmers by buying their land and forcing them to move deeper into the jungle to farm. Logging and deforestation intensified due to the mechanization of soybean cultivation which accounted for 25 percent of Brazil's total soy planted area[144].

28. Sugars (HS 170111, 170112, 170113, 170114, 170191, 170199)

Sugar production has been linked to an improvement of development indicators in a number of reports. For example, Fedesarrollo (2009) observed that the sugar industry in Colombia had generated a total of 265,402 jobs in 2007 and contributed 0.54 percent of total GDP, or USD 1.1 billion. Municipalities in Colombia with sugarcane industries had higher life quality indices, their population had on average 0.5 additional years of schooling, and their GDP per capita was around USD 777 higher than those for other municipalities[145]. Liboni and Cezarino (2012) also highlighted the side benefits for Brazil, where the sugarcane industry has

[141] International Union for Conservation of Nature (IUCN) Lao PDR and the National Economic Research Institute (NERI), Ministry of Planning and Investment of Lao PDR (2011), pp. 16-18, 19, 21-23.
[142] Sanginga et. al. (1999), pp. 16-18, 23, 26, 29.
[143] Weinhold, Killick and Reis (2013), pp. 141-142, 146.
[144] Fernandes (2009), pp. 161-162, 163.
[145] Fedesarrollo (2009), pp. 3, 5.

contributed positively to GDP; generated direct and indirect employment; and provided more social service benefits. For example, in 2003, in the State of Sao Paulo, over 600 schools, 200 nurseries and 300 outpatient clinics were built. A sample of 47 companies in the State of Sao Paulo revealed that over 90 percent provided health care, dental care, transport and group life insurance, over 80 percent provided food and pharmaceutical care and over 84 percent had profit sharing arrangements, accommodation, dining and nursery amenities. 24.5 percent of payroll was devoted to areas such as profit sharing, food, health, safety, education, professional training and development of workers[146].

However, an early paper by de Menezes, Piketty and Duarte (2008) found that the percentage of poor in the sugarcane industry fell between 1992 and 2006 in many sugarcane producing states in Brazil, but despite some social improvements, the sugarcane sector did not significantly participate to reduce poverty and inequality. In fact, the authors found that since the beginning of the 2000s the sugarcane industry may be causing a negative effect[147].

In addition, Waswa et. al.(2009) reported that although contract sugarcane farming is the most dominant and popular land use among farmers in Nzoia Sugarbelt in Kenya, the intended goal of increasing farmers' incomes seemed to have failed. Key net income depressors were tillage, seedcane, and transportation costs, all of which were determined by the sugar company with no input from sugarcane farmers[148].

29. Sunflower and safflower oil (HS 151211, 151219)

A survey on the impact of sunflower and safflower oil production elicits positive reviews. For example, Salisali (2012) noted that sunflower production could generate a significant number of jobs in Tanzania, where 438,153 farmers engaged in sunflower production by 2012[149]. The International Fund for Agricultural Development (IFAD) Office of Evaluation (2011) observed that sunflower had overtaken ground nut as the single most important source of household income in Uganda. Sales from sunflower oil, seed and cake enabled farmers to diversify their income sources into complementary agricultural practices such as fish and cattle rearing, and non-agricultural activities such as brick-making and property rental. Farmers experienced better access to consumer durables, upgraded their homes and set up savings and credit facilities which enabled farmers to improve production capacity and meet social needs[150]. These observations are supported by Bandiera and Rasul (2003) whose study on adoption of sunflower cultivation in northern Mozambique showed that farmers who did not adopt sunflower cultivation were more likely to experience higher rates of poverty, lower incomes, less infrastructure, less months of food security and lower oil consumption[151].

[146] Liboni and Cezarino (2012), pp. 219- 221.
[147] de Menezes, Piketty and Duarte (2008), pp. 4-6, 16.
[148] Waswa et al. (2009), p. 1.
[149] Salisali (2012), pp. 2, 5, 7.
[150] International Fund for Agricultural Development Office of Evaluation (2011), pp. 45, 47.
[151] Bandiera and Rasul (2003), p. 28.

30. Wheat, meslin and related products (HS 100119, 100199, 110100, 110900)

Some studies on wheat have focused on the impact of technology as part of the efforts to increase wheat production. Hafeez et. al. (2011) noted that farms in two areas of Pakistan's Punjab relied on wheat as a major income source. The study suggested that government officials should focus their efforts in technologies to improve rice and wheat production, since they account for a large share of income for small landholders[152]. However, Teshome and Abate (2013) observed that improved wheat technologies in Ethiopia brought some problems such as pest and weed build-up and nutrient depletion from monocropping, excessive fertilizer use, pests attacks and recycling of improved wheat seed varieties, which can reduce productivity and quality of harvest [153].

Other studies had a look at the impact of trade liberalization in wheat. Hobson (2006) studied the effect of trade liberalization and deregulation in South Africa's wheat-flour-bread value chain and found that product prices and profits appeared to decrease. While wheat production had increased, employment in wheat producing areas had fallen due to decreases in profit from wheat and increased hiring costs in both small and large farms alike. Many smaller producers shut down, while many larger producers resorted to economies of scale and mechanization. However, hiring increased higher up in the value chain, especially in the baking industry[154].

Siam and Croppenstedt (2007) simulated liberalization scenarios for Egypt's wheat market and obtained mixed results as well. Under a scenario of complete liberalization, wheat consumption demand would fall by 6.5 percent, and output supply would decrease by 4.2 percent. Real per capita income for rural non-farming households would be reduced between 1.8 and 2.4 percent; while for rural farming households it would decline between 5.1 and 7.4 percent. Labour use would fall in nearly 0.9 percent as well. If a complete liberalization is accompanied with a 20 percent increase in wheat import prices, large increase in consumer prices would lead to consumption falling by 6.2 percent, but wheat production increasing 15.6 percent. Real per capita income for rural non-farming households would decline between 5.6 and 7.2 percent, and for rural farming between 13.5 and 20.8 percent[155].

31. Wine (HS 220421)

Some studies reported that the wine industry could generate an important number of jobs. For example, the Stonebridge Research Group (2012) observed that the State of Washington 's wine industry had provided almost 30,000 full-time jobs for more than 71,000 individuals nationally, generating revenues of nearly USD 1.2 billion for the State and USD 2.8 billion in the whole United States[156].

Other studies showed that, in particular areas, wine producers were experiencing poverty conditions. For example, Anderson (2013) noted that while every Georgian farm household grew grapes and produced wine, most of them were poor living on less than USD 2 a day even

[152] Hafeez et. al. (2011), pp. 157.
[153] Teshome and Abate (2013), pp. 234-235.
[154] Hobson (2006), pp. 11-12, 14.
[155] Siam and Croppenstedt (2007), pp. 18-19, 23-24, 27-28.
[156] Stonebridge Research Group LLC (2012), p. 9.

as they represented half of Georgia's households and employment. Agricultural wages were just one third of non-farm workers and poverty rates were almost twice as high in the rural areas than in the urban areas[157]. Similarly, the Global Feasibility Study Team (2010) observed that in Ethiopia, farmers faced low wages and this hindered the ability to invest in vineyards and wineries. In part, this situation was explained by the lack of coordinated investment in irrigation, limited infrastructure, and perceptions of government instability, which deterred investment in this sector[158].

32. Wood and wood products (HS 440810, 441231, 441232, 940161, 940169, 940330, 940340, 940350, 940360)

The production of wood and wood products can have a positive effect on certain communities. For example, Timsina (2005) found that the creation of a community sawmill in the Chaubas area of the Kavre District in Nepal had enabled 100 households to be employed for two to three months per year on activities such as logging and transporting logs. Also, an average of 6,000 person days per year of work had been generated, enabling women to participate in supporting activities like tree marking and pruning. About 15 to 25 households in each of the five forest user groups in the study benefitted from these activities. The study also found that the community sawmill reduced emigration. At least USD 15,459 could be spent on communal facilities like building roads, schools and drinking water systems as a result of the establishment of the sawmill[159].

However, wood and wood products can have a negative effect when logging causes deforestation. For example, Barbier, et. al. (1995) reported that timber production is a factor in tropical deforestation[160].

There are some studies which have documented some negative social consequences. For example, a case study conducted in Saravan Province in Laos by the International Union for Conservation of Nature (IUCN) Lao PDR and the National Economic Research Institute (NERI), Ministry of Planning and Investment of Lao PDR (2011) found that three wood processing companies employed more than 1,290 people and generated USD 6 million of total production value, or 2.7 percent of total production value of the province. However, workers were earning a relatively low monthly income of about LAK 700,000 (or USD 87.50), which was still higher than the national minimum wage of LAK 569,000 (or USD71.10), but that the heavy workload and high living costs rendered the monthly salary low, which did not attract people to join as permanent workers in the wood processing industry. In many cases, workers were reluctant to move full time to these wood processing companies, because that would mean giving up much of the agricultural work and spending more money on food, which was not appealing noting the low salaries paid by those companies[161].

[157] Anderson (2013), pp. 1-2.
[158] Global Feasibility Study Team (2010), pp. 11- 13.
[159] Timsina (2005), pp. 15-16.
[160] Barbier et. al. (1995), pp. 411
[161] International Union for Conservation of Nature (IUCN) Lao PDR and the National Economic Research Institute (NERI), Ministry of Planning and Investment of Lao PDR (2011), pp. 19-24.

5. MARKET ANALYSIS OF NOMINATED PRODUCTS

As shown in Chapter 2, APEC's overall trade of nominated products experienced an upward trend between 2007 and 2012. However, when the nominated products are analyzed at the individual level, not all of them face the same trade potential. This section aims to determine the export potential of the nominated products for APEC as a whole, by using trade statistics to identify those products with comparative advantage and positive export trends.

The methodology in this section focuses on finding out the export potential of the APEC region as a single entity. It does not analyze the potential of individual APEC economies, as the intention is to identify those nominated products in which APEC has a collective global comparative advantage, as well as those that the APEC region increased its exports in recent years.

The results in this section will stand for APEC as a whole region and not necessarily for individual economies. For example, if the APEC region has a comparative advantage exporting a particular product, this does not mean that every APEC economy will have a comparative advantage in exporting it. Taking into account the collective spirit in APEC, the analysis in this report only focuses on aggregates for the APEC region. Nevertheless, the methodology allows to conduct a similar exercise for any APEC individual economy (or any other economy/region in the world). In this regard, any interested party could identify those products in which they have export potential.

Revealed Comparative Advantage Index

a. Description of the indicator

In order to recognize those products with comparative advantage, the study proposes to use the Revealed Comparative Advantage (RCA) index, developed by Balassa (1965)[162], which compares the share of a particular product in the total exports of an economy vis-à-vis the share of the same product in world exports. If the share of the product in an economy's total exports is greater than the share of the same product in the world exports, then the economy has a comparative advantage in that product.

For APEC, the identification of the products with comparative advantage can be formalized by using the following index:

$$RCA_{APEC\ i} = \frac{(\frac{X_{APEC\ i}}{X_{APEC}})}{(\frac{X_{World\ i}}{X_{World}})} = \frac{(Share\ of\ product\ i\ in\ APEC\ exports)}{(Share\ of\ product\ i\ in\ World\ exports)}$$

$X_{APEC\ i}$ = APEC exports of product "i"
X_{APEC} = Total APEC exports
$X_{World\ i}$ = World exports of product "i"
X_{World} = World exports

[162] See Balassa, Bela (1965)

If the value of the RCA index for product "i" is greater than 1, it means that the share of this product in APEC exports is greater than that for world exports. Product "i" is relatively more important for APEC exports than for world exports. Therefore, APEC has a revealed comparative advantage in exporting product "i".

Based on this index, any product does not have comparative advantage if its RCA index value is equal or lower than 1.

The calculation of the RCA index can be done for a single year or for specific periods. RCA index values can be compared across time for any particular product to determine if it is gaining or losing comparative advantage. In addition, values are comparable across products in order to determine which ones are have a greater comparative advantage.

Since data for year 2013 is not available at UN Comtrade for a number of economies, trade data for the period 2007-2012 has been used to determine whether the nominated products have comparative advantage or not. In order to attenuate the fluctuations in data and reduce the bias in the results due to external events affecting trade in single years (for example, Global Financial Crisis), bi-annual data is used for the years as follows: 2007-08, 2009-10 and 2011-12.

b. Nominated Products with Revealed Comparative Advantage

The RCA index values show that the APEC region increased the number of nominated products with comparative advantage from 55 to 67 between 2007 and 2012[163].

Regarding the 67 products where APEC had comparative advantage at the end of this period (i.e. 2011-12), 16 of them had no comparative advantage at the beginning of this period (i.e. 2007-08) and gained them in the next few years, 10 of them being agricultural products. Indeed, within this group, three agricultural products, namely cocoa paste wholly or partially defatted (HS 180320); cane sugar containing added flavoring or coloring matter (HS 170191); and other vegetable products not elsewhere specified or included (HS 140490), are those that gained comparative advantage the most. (Table 5.1)

[163] See Appendix 1 to obtain the values of the RCA indices per product for the APEC region as a whole.

Table 5.1: Nominated Products Gaining Comparative Advantage

HS 2007 Code	Description	2007-08	2011-12	Difference
180320	Cocoa paste, Wholly or partly defatted	0.78	**1.39**	**+0.61**
170191	Other: Containing added flavouring or colouring matter	0.84	**1.36**	**+0.52**
140490	Other Vegetable products not elsewhere specified or included.	0.69	**1.29**	**+0.60**
090412	Pepper of the genus Piper (black and white): Crushed or ground	0.81	**1.26**	**+0.46**
151411	Crude Low Erucic Acid Rape or Colza Oil not Chemically Modified (TNE)	0.81	**1.24**	**+0.43**
940330	Wooden furniture of a kind used in offices	0.94	**1.19**	**+0.25**
940161	Other seats, with wooden frames	0.93	**1.15**	**+0.22**
081090	Other fruit, fresh.	0.78	**1.14**	**+0.36**
847920	Machinery for the Extraction/Preparation of Animal/Fixed Vegetables fats/Oils having Individual Functions, N.E.S. in CH.84	0.68	**1.13**	**+0.46**
870590	Snow blower	0.70	**1.11**	**+0.41**
051191	Products of fish or crustaceans, molluscs or other aquatic invertebrates; dead fish, crustaceans, molluscs or other aquatic invertebrates, unfit for human consumption	0.89	**1.09**	**+0.21**
030559	Anchovies (Stolephorus spp.) (Ikan bilis), Dried, other than edible fish offal, whether or not salted but not smoked	0.93	**1.08**	**+0.15**
732190	Stoves, ranges, grates, cookers (including those with subsidiary boilers for central heating), barbecues, braziers, gas-rings, plate warmers and similar non-electric domestic appliances, and parts thereof, of iron or steel	0.99	**1.08**	**+0.08**
080610	Grapes, fresh	0.94	**1.06**	**+0.12**
940360	Other wooden furniture, n.e.s.	0.79	**1.01**	**+0.22**
160420	Fish pastes, fish balls or fish cakes', and 'Ikan pekasam (fermented fish)'	0.93	**1.01**	**+0.07**

Source: UN Comtrade; WITS. APEC Secretariat, Policy Support Unit calculations

The RCA indices also show 34 products that already experienced comparative advantage in 2007-08, and reinforced them afterwards (Table 5.2). Twenty-four of them are agricultural products. Oil-cake and solid residues resulting from the extraction of coconut or copra oil (HS 230650), other mucilages and thickeners derived from vegetable products (HS 130239), almonds in shell (HS 080211) and other dried fruit other than that of headings 08.01 to 08.06 (HS 081340), were those agricultural products which further strengthened their comparative advantage. Among the non-agricultural products, those that improved their comparative advantage the most were as follows: plywood consisting of sheets of wood less than 6 mm thick (HS 441232), frozen yellowfin tuna (HS 030342) and unsaturated acyclic monocarboxylic acids (HS 291619).

Table 5.2: Nominated Products Strengthening Comparative Advantage

HS 2007 Code	Description	2007-08	2011-12	Difference
230650	Oil-cake and other solid residues resulting from the extraction of vegetable fats or oils from coconut or copra	**2.08**	**2.66**	**+0.59**
080211	Almonds, in-shell	**2.04**	**2.56**	**+0.52**
160510	Crab, prepared or preserved	**2.07**	**2.49**	**+0.42**
151190	Palm oil and its fractions, whether or not refined (excl. chemically modified and crude)	**1.97**	**2.16**	**+0.19**
151110	Palm oil, crude	**2.05**	**2.11**	**+0.06**
200820	Pineapples, otherwise prepared or preserved, whether or not containing added sugar or other sweetening matter or spirit, not elswhere specified or included	**1.89**	**2.03**	**+0.13**
441231	Plywood consisting solely of sheets of wood <= 6 mm thick, With at least one outer ply of tropical wood specified in Subheading Note 2 to this Chapter	**1.66**	**2.03**	**+0.37**
441232	Plywood consisting solely of sheets of wood <= 6 mm thick, with at least one outer ply of non-coniferous wood or other tropical wood than specified in Subheading Note 1 to this chapter	**1.33**	**1.95**	**+0.62**
110620	Flour, meal and powder of sago or of roots or tubers of heading 07.14	**1.80**	**1.91**	**+0.11**
080212	Almonds, shelled	**1.65**	**1.87**	**+0.23**
090411	Pepper of the genus Piper (black and white): Neither crushed nor ground	**1.44**	**1.84**	**+0.40**
080231	Walnuts in-shell	**1.39**	**1.83**	**+0.44**
081340	Other fruit, dried, other than that of headings 08.01 to 08.06	**1.31**	**1.81**	**+0.50**
020220	Fresh/Chilled/Frozen Beef	**1.76**	**1.80**	**+0.04**
291619	Unsaturated acyclic monocarboxylic acids, their anhydrides, halides, peroxides, peroxyacids and halogenated, sulphonated, nitrated or nitrosatedderivatives	**1.21**	**1.79**	**+0.59**
030343	Skipjack or stripe-bellied bonito	**1.35**	**1.77**	**+0.43**
151319	Coconut (copra) oil and its fractions thereof, whether or not refined, but not chemically modified	**1.71**	**1.74**	**+0.03**
080111	Desiccated coconuts, fresh or dried	**1.57**	**1.67**	**+0.10**
080232	Walnuts shelled	**1.45**	**1.66**	**+0.21**
160414	Tunas, skipjack and bonito (Sarda spp.), whole or pieces, but not minced, prepared or preserved	**1.26**	**1.64**	**+0.39**
030342	Yellowfin tuna, Frozen	**1.05**	**1.64**	**+0.59**
130239	Other Mucilages and thickeners, whether or not modified, derived from vegetable products	**1.07**	**1.62**	**+0.55**
440810	Veneer, coniferous (softwood) less than 6 mm thick	**1.29**	**1.61**	**+0.32**
081040	Cranberries, bilberries and other fruits of the genus Vaccinium	**1.48**	**1.50**	**+0.02**
120510	Canola Seed	**1.03**	**1.48**	**+0.44**
200899	Other fruits, nuts and other edible parts of plants	**1.11**	**1.45**	**+0.34**
030379	Tilapia (Tilapiinae), Mullet , Monkfish (Lophius spp), Butterfish, Sablefish (Anoplopoma fimbria)	**1.17**	**1.44**	**+0.28**
080290	Nuts, edible fresh and dried, nes	**1.23**	**1.42**	**+0.19**
100190	Wheat and Meslin	**1.32**	**1.42**	**+0.11**
030352	Frozen cod "Gadusmorhua, Gadusogac, Gadusmacrocephalus"	**1.28**	**1.35**	**+0.06**
151620	Vegetable Fats and Oils and Their Factions	**1.22**	**1.34**	**+0.12**
940350	Wooden furniture of a kind used in the bedroom	**1.09**	**1.26**	**+0.17**
020322	Fresh/Chilled Frozen Pork	**1.12**	**1.16**	**+0.04**
120100	Soybeans	**1.09**	**1.15**	**+0.06**

Source: UN Comtrade; WITS. APEC Secretariat, Policy Support Unit calculations

The calculation of the RCA indices also allows identifying 17 products with existing but declining comparative advantage between 2007 and 2012, eight of them being agricultural products (Table 5.3). Rattan (HS 140120), rice in the husk (HS 100610), other maize (HS 100590) and broken rice (HS 100640) were the products with the largest decline in their comparative advantage. An interesting finding is that all the four nominated sub-headings related to rice reported a decline in their comparative advantage (HS 100610, 100620, 100630 and 100640).

Table 5.3: Nominated Products with Declining Comparative Advantage

HS 2007 Code	Description	2007-08	2011-12	Difference
151311	Coconut (copra) oil, crude	**2.09**	**1.97**	**-0.12**
400110	Natural rubber latex, whether or not prevulcanised	**1.87**	**1.77**	**-0.10**
030332	Frozen plaice "Pleuronectesplatessa"	**1.85**	**1.72**	**-0.12**
140120	Rattan whole, core, fibre, skin, split	**2.17**	**1.49**	**-0.67**
100610	Rice in the husk (paddy or rough)	**2.05**	**1.48**	**-0.58**
230120	Flours, meals and pellets of fish or crustaceans, molluscs or other aquatic invertebrates, unfit for human consumption	**1.54**	**1.44**	**-0.11**
460199	Oil Palm Fiber Mat	**1.49**	**1.40**	**-0.09**
940169	Other seats, with wooden frames	**1.47**	**1.39**	**-0.08**
611120	Babies' garments and clothing accessories, of cotton, knitted	**1.35**	**1.24**	**-0.11**
100630	Semi-milled or wholly milled rice	**1.27**	**1.21**	**-0.06**
100110	Wheat	**1.31**	**1.17**	**-0.14**
470700	Recovered (waste and scrap) Paper or Paperboard	**1.21**	**1.13**	**-0.07**
030613	Other shrimps and prawns	**1.12**	**1.12**	**-0.01**
840734	Gasoline/Diesel engine	**1.08**	**1.07**	**-0.01**
100640	Broken rice	**1.35**	**1.07**	**-0.28**
100620	Husked (brown) rice	**1.14**	**1.02**	**-0.13**
100590	Other maize	**1.30**	**1.01**	**-0.30**

Source: UN Comtrade; WITS. APEC Secretariat, Policy Support Unit calculations

Four nominated products lost comparative advantage in recent years. Table 5.4 shows that the mixtures of natural rubber or natural gum with synthetic rubber (HS 400280) and uncoated paper and paperboard weighing 40 to 150 g/m^2 (HS 480255) were the products mostly affected in the APEC region.

Table 5.4: Nominated Products Losing Comparative Advantage

HS 2007 Code	Description	2007-08	2011-12	Difference
400280	Mixtures of natural rubber or natural gum with synthetic rubber	**1.50**	0.93	**-0.57**
840733	Gasoline/Diesel engine	**1.12**	0.90	**-0.22**
080250	Pistachios, in shell	**1.11**	0.79	**-0.32**
480255	Uncoated paper and paperboard obtained by a mechanical or semimechanical process weighing 40 g to 150 g/m², in rolls.	**1.23**	0.76	**-0.47**

Source: UN Comtrade; WITS. APEC Secretariat, Policy Support Unit calculations

Looking at the top 20 nominated products with comparative advantage, 14 of them remained in the 2011-12 list in comparison to 2007-08. 13 of the top 20 products with comparative advantage are agricultural products. Three out of the seven non-agricultural products correspond to the fishing industry.

Table 5.5: Top 20 Nominated Products with Comparative Advantage (2011-12)

Position 2007-08	Position 2011-12	HS Code 2007	Description	2011-12
3	1	230650	Oil-cake and other solid residues resulting from the extraction of vegetable fats or oils from coconut or copra	2.66
7	2	080211	Almonds, in-shell	2.56
4	3	160510	Crab, prepared or preserved	2.49
8	4	151190	Palm oil and its fractions, whether or not refined (excl. chemically modified and crude)	2.16
6	5	151110	Palm oil, crude	2.11
9	6	200820	Pineapples, otherwise prepared or preserved, whether or not containing added sugar or other sweetening matter or spirit, not elswhere specified or included	2.03
15	7	441231	Plywood consisting solely of sheets of wood <= 6 mm thick, With at least one outer ply of tropical wood specified in Subheading Note 2 to this Chapter	2.03
2	8	151311	Coconut (copra) oil, crude	1.97
29	**9**	**441232**	**Plywood consisting solely of sheets of wood <= 6 mm thick, with at least one outer ply of non-coniferous wood or other tropical wood than specified in Subheading Note 1 to this chapter**	**1.95**
12	10	110620	Flour, meal and powder of sago or of roots or tubers of heading 07.14	1.91
16	11	080212	Almonds, shelled	1.87
24	**12**	**090411**	**Pepper of the genus Piper (black and white): Neither crushed nor ground**	**1.84**
25	**13**	**080231**	**Walnuts in-shell**	**1.83**
31	**14**	**081340**	**Other fruit, dried, other than that of headings 08.01 to 08.06**	**1.81**
13	15	020220	Fresh/Chilled/Frozen Beef	1.80
42	**16**	**291619**	**Unsaturated acyclic monocarboxylic acids, their anhydrides, halides, peroxides, peroxyacids and halogenated, sulphonated, nitrated or nitrosatedderivatives**	**1.79**
28	**17**	**030343**	**Skipjack or stripe-bellied bonito**	**1.77**
10	18	400110	Natural rubber latex, whether or not prevulcanised	1.77
14	19	151319	Coconut (copra) oil and its fractions thereof, whether or not refined, but not chemically modified	1.74
11	20	030332	Frozen plaice "Pleuronectesplatessa"	1.72

Note: The nominated products in **bold** are those that were not in the top 20 list in 2007-08.
Source: UN Comtrade; WITS. APEC Secretariat, Policy Support Unit calculations

Moreover, for the APEC region, seven products reported an RCA index greater than two. From the export perspective, the importance of those products in APEC exports more than doubles their importance in world exports. This means that APEC as a whole has a very strong comparative advantage in those nominated products in comparison to the rest of the world.

Export Trend of Nominated Products

a. Description of the indicator

Another relevant indicator to analyse the relevance of the nominated products for the APEC region is the export trend. The trend could be measure as follows[164]:

$$XTrend_{APEC\ i} = \frac{(X^{t}_{APEC\ i} - X^{0}_{APEC\ i})}{\frac{\sum_{0}^{t} X_{APEC\ i}}{\#\ of\ years}} = \frac{(Trade\ flow\ difference\ between\ latest\ and\ initial\ year)}{(Average\ trade\ flow)}$$

$X^{t}_{APEC\ i}$ = APEC exports of product "i" in year "t". Superscript "t" refers to the latest year in the period
$X^{0}_{APEC\ i}$= APEC exports of product "i" in year "0". Superscript "0" refers to the initial year in the period

The nature of this indicator allows identifying which products are experiencing a favourable trend in recent years. When this indicator takes positive values for any particular product, it means that APEC exports of those products increased during the period under evaluation. On the contrary, any negative value means a decline in exports, therefore it could indicate that those products might not be a priority for the APEC region.

The greater the value of this indicator, the more important the product to be considered as a priority for APEC as a whole. The indicator will take higher values the greater the increase of exports between the start and end year of the period under evaluation. In addition, the higher the value of the indicator is when the increase of exports has been more significant at the end of the period.

When the export trend is positive, it can be classified as follows:

Export Trend	Value	Strength of Trend
	0 < XTrend ≤ 0.25	Weak
	0.25 < XTrend ≤ 0.5	Strong
	0.5 < XTrend ≤ 0.75	Very strong
	XTrend > 0.75	Extremely strong

b. Trend of Nominated Products

The analysis of the export trend of the nominated products indicates that 135 of them experienced a positive trend between 2007 and 2012. 18 products showed an extremely strong positive export trend, being 14 of them agricultural products. Cocoa paste, wholly or partially defatted; frozen herrings; raw cane sugar not containing added flavouring or colouring matter; and cocoa powder not containing sugar or other sweeteners, were those products in the APEC region whose exports showed the strongest upward trend (see Table 5.6).

Table 5.6: Nominated Products with Extremely Strong Positive Export Trend in the APEC Region

[164] MINCETUR (2004)

HS 2007 Code	Description	Trend 2007-12
180320	Cocoa paste, Wholly or partly defatted	1.87
030351	Frozen herrings "Clupeaharengus, Clupeapallasii"	1.37
170111	Cane sugar, raw, not containing added flavouring or colouring matter	1.22
180500	Cocoa powder, not containing added sugar or other sweetening matter.	1.11
151411	Crude Low Erucic Acid Rape or Colza Oil not Chemically Modified (TNE)	0.97
080231	Walnuts in-shell	0.97
081340	Other fruit, dried, other than that of headings 08.01 to 08.06	0.94
081090	Other fruit, fresh.	0.92
090412	Pepper of the genus Piper; dried or crushed or ground fruits of the genus Capsicum (peppers) or of the genus Pimenta (e.g., allspice)	0.91
480256	Uncoated paper and paperboard, in square or rectangular sheets with one side <= 435 mm or with one side and the other side <= 297 mm in the unfolded state, not containing fibres obtained by a mechanical or chemi-mechanical process or of which <= 10% by weight of the total fibre content consists of such fibres, and weighing 40 g to 150 g/m², n.e.s.	0.90
080211	Almonds, in-shell	0.88
480257	Uncoated paper and paperboard, , in square or rectangular sheets with one side > 435 mm or with one side <= 435 mm and the other side > 297 mm in the unfolded state, not containing fibres obtained by a mechanical or chemi-mechanical process or of which <= 10% by weight of the total fibre content consists of such fibres, and weighing 40 g to 150 g/m², n.e.s.	0.85
090121	Coffee, whether or not roasted or decaffeinated; coffee husks and skins; coffee substitutes containing coffee in any proportion: coffee, roasted, not decaffeinated	0.81
030379	Frozen pollack "Theragrachalcogramma", frozen fish n.e.s.	0.81
170199	Other Cane or Beet Sugar, Chemically Pure Sucrose	0.80
140490	Other Vegetable products not elsewhere specified or included.	0.78
080450	Guavas, mangoes and mangosteens, fresh or dried	0.75
120510	Canola Seed	0.75

Source: UN Comtrade; WITS. APEC Secretariat, Policy Support Unit calculations

Forty-one products showed a strong positive export trend between 2007 and 2012, 28 of them being agricultural products (Table 5.6). Most of the nominated sub-headings related to coffee, peppers and sugars experienced extremely strong or very strong upward export trends (Tables 5.6 and 5.7).

Table 5.7: Nominated Products with Very Strong Positive Export Trend in the APEC Region

HS 2007 Code	Description	Trend 2007-12
151211	Crude sunflower-seed or safflower oil	0.75
090411	Pepper of the genus Piper (black and white): Neither crushed nor ground	0.75
090122	Coffee, roasted, decaffeinated	0.73
291619	Other Unsaturated Acyclic Monocarboxylic Acids, Their Anhydrides, Halides	0.72
080250	Pistachios, in shell	0.70
180310	Cocoa paste, Not defatted	0.70
110620	Flour, meal and powder of sago or of roots or tubers of heading 07.14	0.69
020321	Fresh/Chilled Frozen Pork	0.69
080290	Nuts, edible fresh and dried, nes	0.68
130239	Other Mucilages and thickeners, whether or not modified, derived from vegetable products	0.67
441232	Plywood consisting solely of sheets of wood <= 6 mm thick, with at least one outer ply of non-coniferous wood or other tropical wood than specified in Subheading Note 1 to this chapter	0.67
210111	Extracts, essences and concentrates, of coffee, tea or mate, and preparations with a basis of these products or with a basis of coffee, tea or mate, roasted chicory and other roasted coffee substitutes	0.66
020220	Fresh/Chilled/Frozen Beef	0.66
200899	Other fruits, nuts and other edible parts of plants, otherwise prepared or preserved	0.65
382313	Fatty acids, industrial, monocarboxylic; acid oils from refining (excl. stearic acid, oleic acid and tall oil fatty acids)	0.65
180632	Other Chocolates & Food Preparations wiht Cocoa in Blocks Slabs or Bars not Filled	0.64
110900	Wheat gluten, whether or not dried	0.64
080232	Walnuts shelled	0.63
090111	Coffee, not roasted, not decaffeinated	0.63
090112	Coffee, not roasted, decaffeinated	0.63
030331	Frozen sockeye salmon [red salmon]	0.62
180690	Other Chocolate and other food preparations containing cocoa	0.61
151110	Palm oil, crude	0.61
160510	Crab, prepared or preserved	0.61
151319	Coconut (copra) oil and its fractions thereof, whether or not refined, but not chemically modified	0.59
848690	Machines and apparatus of a kind used solely or principally for the manufacture of semiconductor boules or wafers, semiconductor devices, electronic integrated circuits or flat panel displays; machines and apparatus specified in Note 9(C) to this Chapter; parts and accessories.	0.59
030563	Anchovies, salted and in brine, but not dried or smoked	0.58
180610	Cocoa powder, containing added sugar or other sweetening matter	0.58
081040	Cranberries, bilberries and other fruits of the genus Vaccinium	0.56
080122	Brazil nuts shelled	0.55
170112	Raw sugar not containing added flavouring or colouring matter: Beet sugar	0.54
230650	Oil-cake, Solid Residues Resulting from Extraction of Coconut, Copra Oil	0.54
030332	Frozen plaice "Pleuronectesplatessa"	0.54
870590	Snow blower	0.53
020230	Fresh/Chilled/Frozen Beef	0.53
030342	Yellowfin tuna, Frozen	0.52
271019	Lubricating Oil Feedstock (TNE)	0.51
160414	Tunas, skipjack and bonito (Sarda spp.), whole or pieces, but not minced, prepared or preserved	0.50
080510	Oranges, fresh or dried	0.50
120100	Soybeans	0.50
847920	Machinery for the Extraction/Preparation of Animal/Fixed Vegetables fats/Oils having Individual Functions, N.E.S. in CH.84	0.50

Source: UN Comtrade; WITS. APEC Secretariat, Policy Support Unit calculations

Forty-seven nominated products reported a strong export trend between 2007 and 2012, 26 of them being agricultural products. As the strength of the export trend declines, the proportion of the non-agricultural nominated products is increasing. (Table 5.8)

Table 5.8: Nominated Products with Strong Positive Export Trend in the APEC Region

HS 2007 Code	Description	Trend 2007-12
020312	Fresh/Chilled Frozen Pork	0.49
400110	Natural rubber latex, whether or not prevulcanised	0.48
151190	Palm oil and its fractions, whether or not refined (excl. chemically modified and crude)	0.48
441231	Plywood consisting solely of sheets of wood <= 6 mm thick, With at least one outer ply of tropical wood specified in Subheading Note 2 to this Chapter	0.47
020120	Fresh/Chilled/Frozen Beef	0.47
030343	Skipjack or stripe-bellied bonito, frozen	0.46
841931	Drying machine for agricultural produce	0.46
080212	Almonds, shelled	0.45
382490	Other Chemical Products & Preparations of the Chemical or Allied Industries nes or Incl (KGM)	0.45
080300	Bananas, including plantains, fresh or dried	0.44
030352	Frozen cod	0.44
843710	Others / a sorting machine	0.42
030559	Anchovies, dried, other than edible fish offal, whether or not salted but not smoked	0.40
480525	Testliner "recycled liner board", uncoated, in rolls of a width > 36 c, Weighing more than 150 g/m2.	0.40
020322	Fresh/Chilled Frozen Pork	0.38
401699	Articles of Vulcanised Rubber other than Hard Rubber, N.E.S. in CH.40	0.38
080610	Grapes, fresh	0.37
020329	Fresh/Chilled Frozen Pork	0.37
080111	Desiccated coconuts, fresh or dried	0.36
940360	Other wooden furniture, n.e.s.	0.36
940161	Other seats, with wooden frames	0.35
151620	Vegetable Fats and Oils and Their Factions	0.35
310100	Animal or vegetable fertilisers, whether or not mixed together or chemically treated	0.34
480300	Toilet or facial tissue stock, towel or napkin stock and similar paper for household or sanitary purposes, cellulose wadding and webs of cellulose fibres	0.34
151219	Refined Sunflower-Seed or Safflower Oil & Fractions not Chemically Modified (TNE)	0.34
020319	Fresh/Chilled Frozen Pork	0.33
030613	Crustaceans, whether in shell or not, live, fresh, chilled, frozen, dried, salted or in brine; Other shrimps and prawns	0.32
170191	Other: Containing added flavouring or colouring matter	0.31
120999	Other Seeds Fruit & Spores for Sowing (TNE)	0.31
440810	Veneer, coniferous (softwood) less than 6 mm thick	0.30
060210	Other live plants (including their roots), cutting and slips; mushroom spawn of rubber trees	0.30

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HS 2007 Code	Description	Trend 2007-12
081010	Strawberries, fresh	0.30
481029	Paper and paperboard used for writing, printing or other graphic purposes	0.29
080810	Apples, fresh	0.29
051191	Products of fish or crustaceans, molluscs or other aquatic invertebrates; dead fish, crustaceans, molluscs or other aquatic invertebrates, unfit for human consumption	0.29
200949	Pineapple juice, unfermented and not containing added spirit, whether or not containing added sugar or other sweetening matter	0.28
100630	Semi-milled or wholly milled rice	0.28
470700	Recovered (waste and scrap) Paper or Paperboard	0.28
051199	Other Animal products not elsewhere specified or included; dead animals of Chapter 1	0.28
151311	Coconut (copra) oil, crude	0.28
080430	Pineapples, fresh or dried	0.28
180631	Other Chocolates & Food Preparations with Cocoa in Blocks Slabs or Bars Filled	0.28
230120	Flours, meals and pellets of fish or crustaceans, molluscs or other aquatic invertebrates, unfit for human consumption	0.27
090190	Coffee, not roasted, decaffeinated	0.26
100190	Wheat and Meslin	0.26
940350	Wooden furniture of a kind used in the bedroom	0.26
020130	Fresh/Chilled/Frozen Beef	0.25

Source: UN Comtrade; WITS. APEC Secretariat, Policy Support Unit calculations

Twenty-six nominated products reported a weak positive export trend between 2007 and 2012, 14 of them being agricultural products. Among these agricultural products, many are related to grains such as rice, maize or other cereals. (Table 5.9)

Table 5.9: Nominated Products with Weak Positive Export Trend in the APEC Region

HS 2007 Code	Description	Trend 2007-12
100620	Husked (brown) rice	0.25
200820	Pineapples, otherwise prepared or preserved, whether or not containing added sugar or other sweetening matter or spirit, not elswhere specified or included	0.24
030623	Anchovies, salted and in brine, but not dried or smoked	0.23
200799	Fruits preserved. Tropical fruits	0.21
200410	Potatoes (frozen processed)	0.20
030311	Frozen sockeye salmon [red salmon]	0.20
120929	Other Beet Seeds For Sowing (TNE)	0.20
060290	Other live plants (including their roots), cutting and slips; mushroom spawn of rubber trees: other (ex-out: 06029040; 06029050)	0.19
480524	Testliner "recycled liner board", uncoated, in rolls of a width > 36 c, Weighing 150 g/m2 or less	0.19
100510	Maize	0.18
732190	Stoves, ranges, grates, cookers (including those with subsidiary boilers for central heating), barbecues, braziers, gas-rings, plate warmers and similar non-electric domestic appliances, and parts thereof, of iron or steel	0.18
160420	Fish pastes, fish balls or fish cakes, and fermented fish	0.16
100890	Other cereals	0.16
180620	Other preparations in blocks, slabs or bars weighing more than 2 kg or in liquid, paste, powder, granular or other bulk form in containers or immediate packings, of a content exceeding 2 kg	0.15
870190	Tractor(more than 50 horsepower)	0.14
940330	Wooden furniture of a kind used in offices	0.13
611120	Babies' garments and clothing accessories, of cotton, knitted or crocheted	0.09
220421	Wine of fresh grapes, other than sparkling,in bottles less than 2 liters	0.09
840734	Gasoline/Diesel engine	0.08
100640	Broken rice	0.08
080550	Lemons, fresh and dried	0.07
460199	Oil Palm Fiber Mat	0.05
100610	Rice in the husk (paddy or rough)	0.03
110100	Wheat or meslin flour	0.03
940340	Wooden furniture of a kind used in the kitchen	0.01
030269	Tilapia, Catfish, fresh or chilled	0.01

Source: UN Comtrade; WITS. APEC Secretariat, Policy Support Unit calculations

Seventeen products reported a negative export trend during the period 2007-12, 10 of them being non-agricultural products. Many products made with rattan or other plaiting materials are included in this group. (Table 5.10)

Table 5.10: Nominated Products with Negative Export Trend in the APEC Region

HS 2007 Code	Description	Trend 2007-12
100590	Other maize	-0.00
152000	Crude Glycerol (TNE)	-0.04
151590	Other fixed vegetable fats and oils (including jojoba oil) and their fractions, whether or not refined, but not chemically modified.	-0.06
840733	Gasoline/Diesel engine	-0.08
940169	Other seats, with wooden frames	-0.09
843490	Parts of milking machines or dairy machines n.e.s.	-0.12
140120	Rattan whole, core, fibre, skin, split	-0.13
100110	Wheat	-0.17
480255	Uncoated paper and paperboard, in rolls of any size, not containing fibres obtained by a mechanical or chemi-mechanical process or of which <= 10% by weight of the total fibre content consists of such fibres, and weighing 40 g to 150 g/m², n.e.s.	-0.20
020110	Fresh/Chilled/Frozen Beef	-0.22
180400	Cocoa butter, fat and oil.	-0.24
020210	Fresh/Chilled/Frozen Beef	-0.32
400280	Mixtures of any product of heading 40.01 with any product of this heading: Heveaplus rubber MG 49, Heveaplus rubber MG 30, Epoxidised rubber ENR 25 and Epoxidised rubber ENR 50	-0.46
460212	Basketwork, wickerwork and other articles, made up from plaiting materials or rattan	-0.63
460193	Plaits and similar products, of rattan plaiting materials, whether or not assembled into strips; plaiting materials, plaits and similar products of rattan flat-woven or bound together in parallel	-0.86
020311	Fresh/Chilled Frozen Pork	-0.88
460122	Mats, matting and screens, of rattan plaiting materials, flat-woven or bound together in parallel	-1.43

Source: UN Comtrade; WITS. APEC Secretariat, Policy Support Unit calculations

Analysis of Export Market Opportunities by the APEC Region

One of the questions that we seek to respond in this report is whether the APEC region is capitalizing on market opportunities with respect to the nominated products.

The purpose is to check whether the capacity of APEC economies as a whole to sell the nominated products overseas is matching the global demand for those products. Taking into account the period 2007-2012, the export growth rates by the APEC region for each of the nominated products and the global import growth rates of the same products are compared with specific benchmarks rates in order to determine whether APEC is taking advantage of export opportunities in global markets. The analysis uses the following benchmark rates for the period 2007-2012:

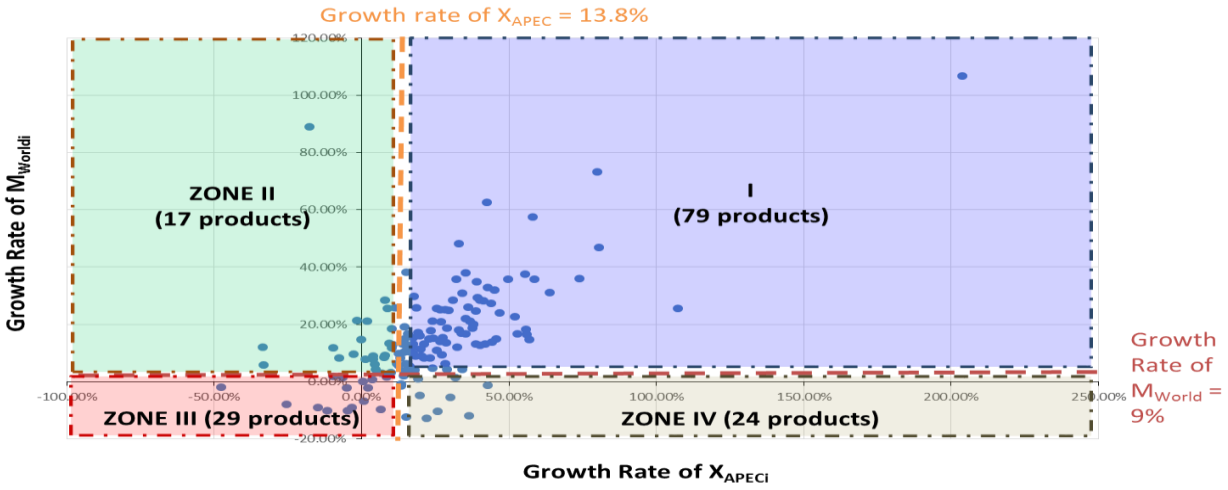
- The average growth rate of APEC total exports to the world = 13.8 percent.
- The average growth rate of the World total imports = 9 percent.

In this sense, nominated products can be classified in four zones as follows:

- Zone I: those products in which APEC has increased its exports above the average growth rate of APEC total exports to the world (13.8 percent); and the world has increased its imports above the average growth rate of the world total imports (9 percent). Those are the nominated products in which APEC is capitalizing market opportunities, since their exports are growing at a faster pace than the benchmark, and the world imports of those products are also doing the same.
- Zone II: those products in which their exports by APEC have evolved below the average growth rate of APEC total exports to the world (13.8 percent), but the world has increased its imports above the average growth rate of the world total imports (9 percent). Those are the nominated products in which APEC is not capitalizing global market opportunities, as their exports are growing slowly (or falling), despite the fact that world imports are increasing significantly. It is in those products where APEC economies should emphasize more initiatives, such as promotion activities, to start capitalizing the existing market opportunities.
- Zone III: those products in which their exports by APEC have evolved below the average growth rate of APEC total exports to the world (13.8 percent), and their world imports have evolved below the average growth rate of the world total imports (9 percent). The nominated products in this category could be considered to be in decline, since their global demand is weakening and APEC exports are growing slowly (or falling).
- Zone IV: those products in which APEC has increased their exports above the average growth rate of APEC total exports to the world (13.8 percent); but their world imports have evolved below the average growth rate of the world total imports (9 percent). The nominated products in this category are facing decreasing world demand and it may be difficult for APEC exports to continue growing fast in the years to come.

A scatterplot of the nominated products juxtaposed with their APEC export growth rates and the world import growth rates shows that 79 of the products are located in Zone I. In other words, APEC is capitalizing global export opportunities in more than half of the nominated products (53 percent of the products).

Figure 5.1: APEC Export and World Import Growth Rates of Nominated Products



Source: UN Comtrade; WITS. APEC Secretariat, Policy Support Unit calculations. Adapted from ITC (1999).

Table 5.11 shows the nominated HS sub-headings located in Zone I, by product categories. Most of them correspond to agricultural products. Indeed, all nominated products related to nuts, coffee, soybeans, coconut oil, palm oil and sunflower and safflower oil are included here. Many fruits and related products, cocoa and related products and edible meats are also included. Regarding the non-agricultural products, most of the HS sub-headings in this zone correspond to fish and crustaceans.

Table 5.11: Nominated HS Sub-headings Capitalizing Global Export Opportunities (Zone I) by Product Category

#	Product Category	HS Codes
1	Edible meats and related products	020120, 020220, 020230, 020319, 020322, 020329
2	Fish, crustaceans and related products	030331, 030342, 030343, 030351, 030379, 030559, 030613, 160414, 160510
3	Other animal products	051199
4	Fruits and related products	080111, 080450, 081010, 081040, 081090, 081340, 200899, 200949
5	Nuts	080122, 080211, 080212, 080231, 080232, 080250, 080290
6	Coffee	090111, 090112, 090121, 090122, 090190, 090411, 210111
7	Pepper	090412
8	Rice	100630
9	Products of vegetable origin	110620, 130239, 140490
10	Wheat, meslin and related products	110900
11	Oil seeds	120510, 120999
12	Soybean	120100
13	Coconut oil (copra)	151311, 151319
14	Palm oil	151110, 151190
15	Sunflower and safflower oil	151211, 151219
16	Other fats and oils	151411
17	Sugars	170111, 170112, 170199
18	Cocoa and related products	180310, 180320, 180500, 180610, 180631, 180632, 180690
19	Residues and waste from the food industry	230120, 230650
20	Biofuels	271019
21	Chemical products	291619, 382313, 382490
22	Animal or vegetable fertilisers	310100
23	Rubber	400110, 401699
24	Paper and paperboard; articles of paper pulp, of paper or of paperboard	470700, 480256, 480257
25	Machinery and equipment	843710, 847920, 848690

Source: UN Comtrade; WITS. APEC Secretariat, Policy Support Unit calculations

Table 5.12 shows the products located in Zone II, those that are experiencing a solid growth in global demand, but unfortunately APEC is not capitalizing market opportunities. Seventeen HS sub-headings are included and most of them correspond to agricultural products as well. It

is noticeable that some grains such as certain types of rice, wheat, maize and other cereal products are included here.

Table 5.12: Nominated HS Sub-headings Not Capitalizing Global Export Opportunities (Zone II) by Product Category

#	Product Category	HS Codes
1	Fish and crustaceans, molluscs and other aquatic invertebrates	030311, 160420
2	Rice	100610, 100640
3	Wheat, meslin and related products	100190
4	Maize	100510, 100590
5	Other cereals	100890
6	Oil seeds	120929
7	Other fats and oils	151590, 152000
8	Potatoes	200410
9	Fruits and related products	200799
10	Rubber	400280
11	Rattan, other plaiting materials and related products	460193
12	Paper and paperboard	480255, 480524

Source: UN Comtrade; WITS. APEC Secretariat, Policy Support Unit calculations

The 29 HS sub-headings included in Table 5.13 correspond to the nominated products in Zone III. These are products in decline, with fading global demand and with weakening APEC exports. Many of them correspond to rattan, other plaiting materials and their related products; machinery and equipment; and wood and wood products.

Table 5.13: Nominated HS Sub-headings in Decline (Zone III) by Product Category

#	**Product Category**	**HS Codes**
1	Edible meats and related products	020110, 020130, 020210, 020311
2	Fish, crustaceans and related products	030269, 030623
3	Live plants	060290
4	Fruits and related products	080550, 200820
5	Wheat, meslin and related products	100110, 110100
6	Rice	100620
7	Rattan, other plaiting materials and related products	140120, 460122, 460199, 460212
8	Cocoa and related products	180400, 180620
9	Wine	220421
10	Garments	611120
11	Machinery and equipment	732190, 840733, 840734, 843490, 870190
12	Wood and wood products	940169, 940330, 940340, 940350

Source: UN Comtrade; WITS. APEC Secretariat, Policy Support Unit calculations

The HS sub-headings in Table 5.14 corresponds to the nominated products that APEC has increased their exports, but are facing a decreasing global demand (Zone IV). Twenty-four sub-headings are included in this zone. These products could start facing difficulties in the future

to expand their exports, as the global demand for those products is declining or not growing at a significant pace. Among the types of product categories included in Zone IV, we have many fruits and related products; fish, crustaceans and related products; wood and wood products; and paper and paperboard.

Table 5.14: Nominated HS Sub-headings with Increasing APEC Exports, but Decreasing Global Demand (Zone IV) by Product Category

#	Product Category	HS Codes
1	Edible meats and related products	020312, 020321
2	Fish, crustaceans and related products	030332, 030352, 030563, 051191
3	Live plants	060210
4	Fruits and related products	080300, 080430, 080510, 080610, 080810
5	Other fats and oils	151620
6	Sugars	170191
7	Wood and wood products	440810, 441231, 441232, 940161, 940360
8	Paper and paperboard	480300, 480525, 481029
9	Machinery and equipment	841931, 870590

Source: UN Comtrade; WITS. APEC Secretariat, Policy Support Unit calculations

6. ECONOMIC IMPACT ON RURAL DEVELOPMENT AND POVERTY ALLEVIATION

In this section, we attempt to analyse the impact of trade in the nominated goods on rural development and poverty alleviation. Typically, analyses involving poverty, rural development, and distribution would require micro-level data from household surveys, firm-level surveys, or labour force surveys, as well as sub-economy production and trade data at the regional or provincial level (i.e., locality where the nominated products are made). This is because the level of detail required to tease out the impacts of very specific products on rural development and poverty alleviation will only be seen at the household and local level. Variations in macroeconomic data cannot be expected to reflect variations in product-level data so as to result in measurable impacts.

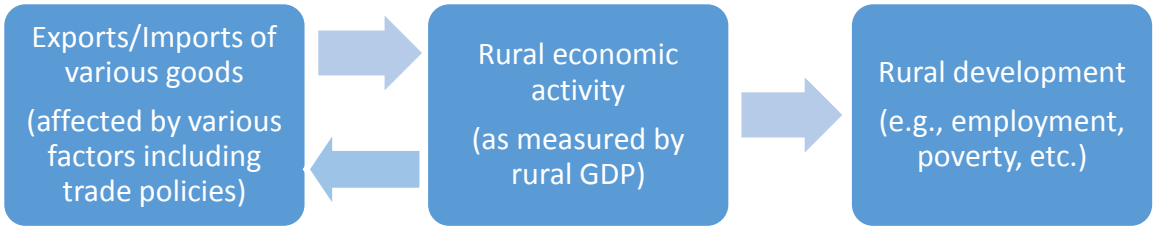
However, in doing this analysis we are faced with various constraints. First constraint is time and manpower, which limits the amount of person-hours that can be devoted to the study (e.g., the analysis of one round of household survey data for one economy will easily consume at least one person-month of manpower). More bindingly, data for this analysis was limited to publicly available trade and macroeconomic data; it was not feasible to utilise micro-level data this study. The analysis for this stage also required an APEC-wide rather than economy-specific analysis. Given the aims of the study and the constraints binding the analysis, we develop an analytical framework and methodology that will maximise the use of the available data and provide information on the rural development impact of trade in nominated products.

Analytical Framework

In order to analyse the impact of trade in the nominated products on APEC's rural development, we estimated the elasticities of rural development with respect to exports and imports for each of the 157 nominated products. These elasticity estimates inform us how a 1% increase in imports or exports of these nominated goods will affect selected rural development indicators.

To explain these elasticity estimates, we begin with a framework of the interrelationships between these trade, rural GDP and rural development indicators (Figure 6.1). Rural economic activity determines rural employment: the more economic activity there is, the more employment will be generated as goods and services are produced. Directly, rural economic activity can generate employment for rural workers, which provides them with wages to improve their access to goods and services and helps alleviate or reduce income poverty. Indirectly, rural economic activity can generate tax revenues, which the government can utilise to provide basic services and social protection. Economic activity is a necessary, but not sufficient, condition for poverty reduction and alleviation as well as rural development, as it depends on other factors such as infrastructure development, access to credit, access to social services and protection, labor market regulations, and business conditions, among others (i.e., the factors discussed in Section 2 of this report).

Figure 6.1: Analytical Framework



Trade, on the other hand, is strongly related to rural economic activity. From the export side, if the product is exported by an economy, then higher exports for that product will require higher production, which in turn requires more inputs, such as raw materials and labour, to feed into production. From the import side, an imported product could fuel rural production, as it could be an input to produce a good made in rural areas. However, if the imported product competes directly with the rural local products, it may have, in some cases, a negative impact on the production of local products. Trade is also affected by macroeconomic factors such as economic activity in foreign markets and exchange rates, geographical and historical factors, as well as by trade policies imposed by governments.

Based on this analytical framework, we see two crucial linkages: (1) between rural economic activity and rural development and (2) between trade and rural economic activity and. In order to analyse these linkages, we derive two estimates of elasticities corresponding to these two linkages: (1) elasticity of rural development with respect to rural economic activity (which we label ε_{DR}) and (2) elasticity of rural economic activity with respect to trade in specific goods (which we label ε_{RTi}). Multiplying these two elasticities will give us the elasticity of rural development with respect to trade in specific goods (or ε_{DTi}), which tells us the percentage change in rural development associated with a 1% increase in trade in a specific good[165].

Data Availability and Limitations

In order to analyse the impact of trade in the nominated goods on rural development, export and import data were gathered for the 157 nominated goods for 21 APEC member economies covering 2007-2012. Since the nominations were made in the HS 2012 nomenclature, trade data under that nomenclature is only available from 2012 onwards. Therefore, it was necessary to convert data or identify equivalent sub-headings in the HS 2007 nomenclature in order to obtain trade data for the aforementioned period. Upon conversion, there were only 149 product categories in 6-digit HS 2007 nomenclature. As there 149 products, 21 economies, and 6 years, a total of 18,774 data points are possible for exports and imports if all economies report detailed trade data annually. However, there are only 14,945 data points for exports and 16,402 data points for imports, indicating that more than 20% of data points for exports and about 13% for imports are missing. Table 6.1 provides a breakdown of the average values for the gathered trade data (i.e., unweighted averages of all reported trade data per year) and the number of observations available per year.

[165] For a more detailed technical discussion of the methodology, please see Appendix 2.

Table 6.1: Descriptive Statistics for 6-digit Trade Data

Year	Exports		Imports	
	Mean (in million USD)	Obs	Mean (in million USD)	Obs
2007	145.4	2,492	140.1	2,667
2008	211.2	2,436	185.3	2,660
2009	155.9	2,459	138.9	2,658
2010	201.0	2,447	176.0	2,665
2011	260.4	2,493	218.0	2,808
2012	260.3	2,618	212.1	2,944

Note: Figures are simple averages for all economies for which data are available
Source: UN COMTRADE; WITS. APEC Secretariat, Policy Support Unit calculations.

Note that for any particular year, a total of 3,129 observations is ideal if all economies report data. At best, imports data for 2012 are most complete where 6% of the data are missing; at worst, exports data for 2008 are problematic with 22% of data missing. Issues with missing data have an impact on the ability to derive elasticities later on as the econometric methodology requires comparing change-on-change (i.e., first differencing), and missing data can impact the number of usable time series.

Data were also gathered on various macroeconomic and social indicators in APEC economies covering 1989 to the latest available data. These data were gathered from the World Bank[166] and Chinese Taipei Directorate General of Budget, Accounting and Statistics. While macroeconomic data are fairly reported regularly, social indicators often have gaps between data points and depend on when economies choose to undertake socioeconomic surveys and release results.

Empirical Analysis

An analysis of macroeconomic data and social indicators shows that there is a significant correlation between rural economic activity and rural development. To implement this analysis, we use agricultural GDP (in constant 2005 US dollars) as the proxy for rural economic activity. To analyse its impact on rural development, five indicators were considered; namely, (1) number of people employed in agriculture, (2) number of people in rural areas below the rural poverty line (based on poverty lines set by individual economies), (3) total number of people below the economy-defined poverty line, (4) number of people living on less than $2.50 per person per day (in 2005 US dollar PPP), and (5) number of people living on less than $5.00 per person per day (in 2005 US dollar PPP).

Table 6.2 presents the results of the analysis for ε_{DR}. The columns indicate the five indicators of rural development, which are the dependent variables in the regression analysis. Numbers in the row for Agriculture GDP provide the elasticity estimates for ε_{DR}. For example, looking at column (1), we see that a 1% increase in agriculture GDP in APEC economies is associated with a 0.61% increase in the number of people employed in the agricultural sector. Asterisks beside elasticity estimates indicate statistical significance; lack of an asterisk means that no

[166] Databases include the World Development Indicators, Ease of Doing Business, and PovCal.

statistically significant association was observed between the rural development indicator and value-added of agriculture in GDP.

Table 6.2: Elasticity Estimates for Rural Development Indicators in APEC, 1989-2014

	(1) Employed in Agriculture[a]	(2) Rural Poor[b]	(3) Total Poor	(4) Living below $2.50/day	(5) Living below $5.00/day
Agriculture GDP	0.607**	-1.391*	-0.167	0.770	0.733
	(0.215)	(0.636)	(0.893)	(0.820)	(0.585)
Constant	-0.0946	48.27**	20.74	-2.015	-0.521
	(4.964)	(14.68)	(20.81)	(19.28)	(13.76)
Observations	381	132	172	312	312
Overall R-squared	0.759	0.541	0.176	0.182	0.152
Number of economies	20	8	10	14	14

Notes: *** = significant at p < 0.01; ** = significant at p < 0.05; * = significant at p < 0.10. Estimation method is panel ordinary least squares with economy-level fixed effects. Robust standard errors are reported in parentheses. Coefficients for year dummy variables are excluded in the table for brevity.

[a] Data cover all economies except Papua New Guinea.

[b] Data cover Chile; China; Indonesia; Malaysia; Mexico; Peru; Thailand; and Viet Nam.

Source: World Bank, Chinese Taipei Directorate General of Budget, Accounting and Statistics. APEC Secretariat, Policy Support Unit calculations

Table 6.1 shows that there is a significant association between rural production and employment in agriculture and the number of rural poor. In particular, a 1% increase in agriculture real GDP is associated with a 0.61% increase in primary sector employment and a 1.39% decrease in the rural poverty headcount. Moreover, changes in agriculture GDP, economy-level characteristics, and year-specific events are enough to explain 76% of the variation in agricultural employment and 54% of the variation in rural poverty headcounts. These results are in line with established theory and are predicted by the analytical framework discussed earlier. An increase in rural output would require more inputs such as labor; thus, there should be a positive relationship between agriculture GDP and employment in the sector. Likewise, more employment in agriculture leads to higher mean incomes in rural areas, resulting in lower rural poverty (assuming overall inequality is unchanged or is reduced).

On the other hand, there is no significant association between agriculture GDP and the three other poverty indicators included in the analysis in columns (3) to (5). This is to be expected since these indicators are for overall poverty levels, which includes both urban and rural poverty. Hence, changes in rural production cannot be expected to be associated with poverty reduction in both rural and urban areas. Results in Table 6.2 indicate that agriculture GDP is a good proxy for rural economic activity as it is able to discriminate correlations between direct measures of rural development (i.e., agriculture employment and rural poverty) and imprecise proxies (i.e., overall poverty levels).

The next step of the analysis is to derive estimates of ε_{RTi}, which relates the relationship between changes in trade (i.e., either exports or imports) and rural economic activity as measured by the contribution of agriculture to GDP. Apart from the missing data issues

discussed earlier, there is also the issue of relative scale. Table 6.3 shows that, on average, data for GDP from agriculture are in the tens of billions of dollars, while that for exports and imports at the 6-digit level are in the low hundreds of millions—on average, trade data at the 6-digit product level are equivalent to 0.29% of the agriculture value-added activity in APEC. This implies that we are unlikely to see any direct relationship between highly detailed trade data and GDP-level indicators—many other factors affect GDP-level data that variations in trade data (at the 6-digit HS 2007 level of detail) are unlikely to result in corresponding variations in GDP.

Table 6.3: Mean Values of GDP and 6-digit HS 2007 Trade Data (in million USD)

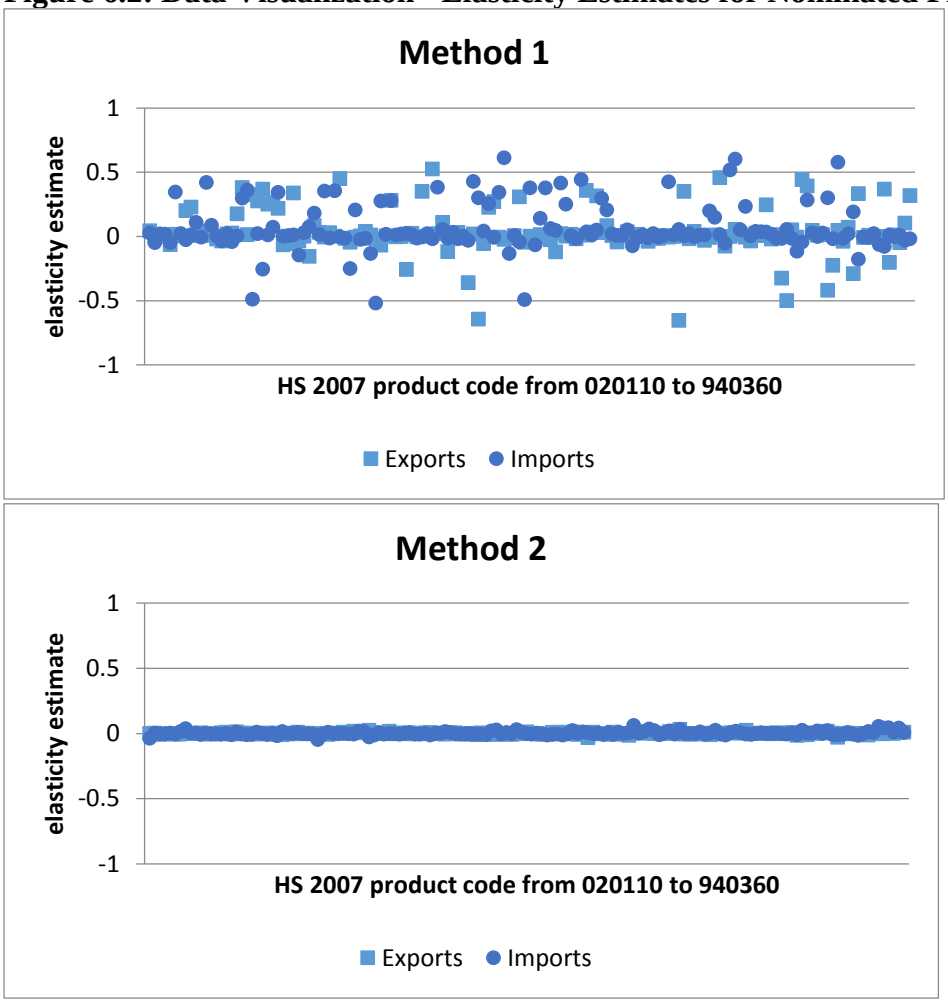
Year	Value-Added of Agriculture	Exports	Imports
2007	46,500	145	140
2008	56,150	211	185
2009	57,610	156	139
2010	66,950	201	176
2011	83,790	260	218
2012	84,780	260	212

Note: Figures are simple means for all economies for which there are available data.
Source: UN COMTRADE; WITS; World Bank; Chinese Taipei Directorate General of Budget Accounting and Statistics. APEC Secretariat, Policy Support Unit calculations.

Despite the limitations, we attempted to derive elasticities of agriculture value-added with respect to each of the nominated products (i.e., ε_{RTi} for exports and imports for each nominated product). Two methods were used to derive the elasticities: (1) Method 1 is a multi-stage panel regression analysis that takes into account various control factors such as GDP (foreign and domestic), real exchange rates, and tariff rates for primary goods, and (2) Method 2 is a direct one-on-one panel regression analysis of trade and agriculture value-added while controlling for economy and year effects. Method 1 is a more rigorous methodology that allows us to control for various variables; however, it is highly demanding on the quality of data and observations are lost for each missing data point. On the other hand, Method 2 is less rigorous and only allows a look into correlations (although reverse causality and economy- and year-effects are still controlled); however, it gives us the highest likelihood of obtaining a significant result.

The complete elasticity estimates for exports and imports for each nominated good using both methods are presented in Appendix 3. Figure 6.2 allows us to visualize the elasticity estimates according to the two methodologies. It can be seen that estimates under Method 1 have a high degree of variance with no discernible pattern, although a majority of elasticity estimates are positive. On the other hand, there is much less variance under Method 2, and they closely hew around zero. This observation shows the difficulty of finding meaningful relationships between highly detailed product-level data and macro-level indicators such as GDP. Method 1, which is grounded in theory, is resulting in wildly varying and unreliable results. On the other hand, Method 2, which is an atheoretical and direct analysis of correlation, says that the relationship is close to zero. This implies that to properly test the relationship between product-level trade data and macro-level indicators such as GDP, there is a need to delve into other micro-level data at the economy or sub-economy level.

Figure 6.2: Data Visualization - Elasticity Estimates for Nominated Products



Source: UN COMTRADE; WITS; World Bank; Chinese Taipei Directorate General of Budget, Accounting and Statistics. APEC Secretariat, Policy Support Unit calculations.

Despite data limitations, however, statistically significant estimates of elasticity were still derived. Of the 149 nominated products (in HS 2007 6-digit code), Method 1 resulted in 18 products with significant elasticities for export and 7 significant elasticities for imports; for Method 2, we were able to derive 28 statistically significant elasticites for exports and 23 for imports.

Table 6.4 shows the statistically significant elasticity estimates derived using Method 1. The figures in the table show the percentage change in agriculture value-added in GDP (column 1), number employed in agriculture (column 2), and number of rural poor (column 3) that is correlated with a 1% increase in exports or imports in a particular product, holding all other factors constant. For example, a 1% increase in shelled walnuts exports in APEC is associated with a 0.029% increase in agricultural GDP, 0.017% increase in employment, and a 0.040% reduction in rural poverty. On the other hand, a 1% increase in the frozen cod imports is associated with a 0.488% reduction in agricultural GDP, 0.296% reduction in agricultural employment, and a 0.679% increase in the number of rural poor. Note that figures under column 1 are the estimates of ε_{RTi} using Method 1, while the figures in columns 2 and 3 are the figures in column 1 multiplied by the elasticity estimates in Table 6.2.

Products with positive elasticity estimates for columns 1 and 2 (and negative estimates for column 3) are those that are positively correlated with rural development; that is, a 1% increase in trade in these products is correlated with improvements in rural development indicators (e.g., agricultural employment and rural poverty). On the other hand, products with negative estimates for columns 1 and 2 (and positive estimates for column 3) have a negative correlation with rural development.

Looking at column 1 of Table 6.4, we see that of the 18 products with statistically significant estimates for exports, 5 products have positive elasticities and 13 products have negative elasticities. Meanwhile, all of the 7 products with statistically significant estimates for imports are negative. These results do not confirm the conjecture in the analytical framework: while imports are largely negative as expected, results for exports are also largely negative and not in line with expectations. However, given the data limitations and missing values, estimates derived from Method 1—which is more rigorous but more demanding of data—are unlikely to yield in reliable results.

That said, a few patterns emerge from Table 6.4. With the exception of fish cakes, all products which are most positively associated with rural development (shaded green in the table) are unprocessed or slightly processed products. On the other hand, with the exception of frozen cod, the products that are most negatively associated with rural development (shaded red) tend to require more processing.

Table 6.4: Method 1 Significant Estimates of Elasticity with respect to Trade

		(1)		(2)		(3)	
		Agriculture GDP		Agriculture Employment		Rural Poverty	
Product Name	**Product Code**	**Exports**	**Imports**	**Exports**	**Imports**	**Exports**	**Imports**
Fresh/Chilled/Frozen Beef	20210		-0.047		-0.028		0.065
Fresh/Chilled/Frozen Beef	20220	0.018		0.011		-0.025	
Frozen sockeye salmon [red salmon]	30311	-0.035		-0.021		0.049	
Frozen plaice	30332		-0.040		-0.024		0.056
Frozen cod	30352		-0.488		-0.296		0.679
Brazil nuts shelled	80122	-0.155		-0.094		0.216	
Walnuts shelled	80232	0.029		0.017		-0.040	
Lemons, fresh and dried	80550		-0.015		-0.009		0.020
Strawberries, fresh	81010	-0.067		-0.041		0.093	
Coffee	90112	-0.256		-0.155		0.356	
Rice	100640	0.021		0.013		-0.029	
Wheat or meslin flour	110100	-0.055		-0.034		0.077	
Rattan whole, core, fibre, skin, split	140120		-0.492		-0.299		0.684
Palm oil, crude	151110	-0.006		-0.003		0.008	

Product Name	Product Code	(1) Agriculture GDP		(2) Agriculture Employment		(3) Rural Poverty	
		Exports	Imports	Exports	Imports	Exports	Imports
Crude sunflower-seed or safflower oil	151211	-0.008		-0.005		0.011	
Coconut (copra) oil, crude	151311	-0.120		-0.073		0.167	
Fish pastes, fish balls or fish cakes	160420	0.034		0.021		-0.048	
Raw sugar not containing added flavour	170111	0.029		0.018		-0.041	
Other: Other	170199	-0.042		-0.025		0.058	
Cocoa butter, fat and oil	180400		-0.073		-0.044		0.102
Pineapples, prepared or preserved	200820	-0.652		-0.396		0.907	
Pineapple juice, unfermented	200949	-0.017		-0.010		0.024	
Babies' garments and clothing	611120	-0.418		-0.254		0.582	
Snow blower	870590		-0.061		-0.037		0.086
Other seats, with wooden frames	940169	-0.203		-0.123		0.282	

Note: n.e.s. = not elsewhere specified. Estimates are significant at the 90% confidence level or higher. Products with the top 3 most positive elasticity estimates for exports and imports are shaded green. Products with the top 3 most negative elasticity estimates for exports and imports are shaded red.
Source: UN COMTRADE; WITS; World Bank; and Chinese Taipei Directorate General of Budget, Accounting and Statistics. APEC Secretariat, Policy Support Unit calculations.

A similar analysis is done for the results using Method 2. Looking at column 1 of Table 6.5, we see that of the 28 products with statistically significant estimates for exports, 20 products have positive elasticities and 8 products have negative elasticities. Meanwhile, of the 23 products with statistically significant estimates for imports, 12 products have positive elasticities and 11 products are negative. These findings are in line with the intuition in the analytical framework—exports are more likely to have a positive relationship with rural economic activity (and hence rural development), while the relationship for imports can be either positive or negative depending on whether an imported product is a complement or a substitute for local production.

A few patterns emerge from the elasticity estimates in Table 6.5. With a few exceptions, trade in fresh or chilled meat or seafood seems to be negatively associated with rural development, while trade in fruits and nuts is mostly positive. Trade in coffee and cocoa is mostly positively correlated with rural production and development, although trade in cocoa butter is not. Meanwhile, trade in plant-based oils such as copra and other fatty acids is positive, but trade in machinery and equipment is generally negative. Trade in wood or rattan products is also mainly positively linked with rural development.

Table 6.5: Method 2 Significant Estimates of Elasticity with respect to Trade

Product Name	Product Code	(1) Agriculture GDP		(2) Agriculture Employment		(3) Rural Poverty	
		Exports	Imports	Exports	Imports	Exports	Imports
Recovered Paper	4707		-0.036		-0.022		0.050
Fresh/Chilled/Frozen Beef	020120	-0.006		-0.004		0.009	
Fresh/Chilled/Frozen Beef	020230	-0.003		-0.002		0.005	
Fresh/Chilled Frozen Pork	020312		0.006		0.003		-0.008
Fresh/Chilled Frozen Pork	020321		-0.005		-0.003		0.008
Frozen lesser or Greenland halibut	030331	0.012		0.007		-0.016	
Yellowfin tuna, Frozen	030342	0.014		0.008		-0.019	
Frozen herrings	030351		-0.008		-0.005		0.011
Frozen fish, n.e.s.	030379		0.011		0.007		-0.015
Anchovies, salted and in brine	030563		-0.006		-0.004		0.009
Crustaceans, whether in shell or not	030623		-0.016		-0.010		0.023
Seafood products	051191	-0.009		-0.005		0.012	
Almonds, in-shell	080211		-0.006		-0.004		0.009
Bananas, including plantains	080300	0.012		0.007		-0.016	
Pineapples, fresh or dried	080430	0.010		0.006		-0.014	
Guavas, mangoes and mangosteens, fresh	080450	0.019		0.011		-0.026	
Grapes, fresh	080610	0.026		0.016		-0.036	
Apples, fresh	080810		-0.012		-0.007		0.016
Cranberries, bilberries and other fruit	081040		-0.004		-0.003		0.006
Coffee	090111	0.005		0.003		-0.007	
Pepper of the genus Piper	090411	0.007		0.004		-0.010	
Pepper of the genus Piper	090412	0.009		0.006		-0.013	
Soybeans	120100		0.029		0.018		-0.041
Rattan whole, core, fibre, skin, split	140120		0.012		0.007		-0.017
Other Vegetable products, n.e.s.	140490	0.015		0.009		-0.020	

Product Name	Product Code	(1) Agriculture GDP		(2) Agriculture Employment		(3) Rural Poverty	
		Exports	Imports	Exports	Imports	Exports	Imports
Coconut (copra) oil, crude	151311	0.008		0.005		-0.011	
Coconut (copra) oil and its fractions	151319	0.011		0.007		-0.015	
Fish pastes, fish balls or fish cakes	160420	-0.029		-0.018		0.040	
Crab, prepared or preserved	160510	0.012		0.008		-0.017	
Raw sugar not containing added flavour	170112		-0.005		-0.003		0.006
Other: Other	170199		-0.006		-0.004		0.008
Cocoa butter, fat and oil.	180400	-0.013		-0.008		0.018	
Cocoa powder, not containing added sugar	180500	0.006	0.063	0.004	0.038	-0.008	-0.087
Cocoa powder, containing added sugar	180610	0.014		0.008		-0.019	
Potatoes (frozen processed)	200410	0.005		0.003		-0.006	
Other fruits, nuts n.e.s.	200899	0.033	0.034	0.020	0.021	-0.046	-0.047
Fatty acids, industrial, monocarboxylic	382313	0.003		0.002		-0.004	
Plywood	441231	0.004		0.002		-0.005	
Plywood	441232		0.006		0.004		-0.008
Toilet or facial tissue stock	480300		0.026		0.016		-0.036
Testliner recycled liner board, uncoated	480524	-0.008		-0.005		0.011	
Stoves, ranges, grates, cookers	732190	0.018		0.011		-0.025	
Gasoline/Diesel engine	840734	-0.027		-0.016		0.037	
Machinery	847920		-0.013		-0.008		0.018
Tractor (more than 50 horsepower)	870190	-0.010		-0.006		0.014	
Other seats, with wooden frames	940161		0.057		0.034		-0.079
Other seats, with wooden frames	940169		0.044		0.027		-0.061
Wooden furniture	940330		0.045		0.027		-0.062
Wooden furniture	940350		0.043		0.026		-0.059

Note: n.e.s. = not elsewhere specified. Estimates are significant at the 90% confidence level or higher. Products with the top 5 most positive elasticity estimates for exports and imports are shaded green. Products with the top 5 most negative elasticity estimates for exports and imports are shaded red.
Source: UN COMTRADE; WITS; World Bank; and Chinese Taipei Directorate General of Budget, Accounting and Statistics. APEC Secretariat, Policy Support Unit calculations.

These estimates seem to indicate that trade in goods that are more closely linked with agricultural production—such as fruits, forestry, and plant-based oils— are more likely to be positively associated with rural economic activity and development. Conversely, trade in goods that are associated to industrial products—such as machinery and equipment—are less likely to be linked positively with rural development. However, the negative elasticity estimates for meat products tend to counter this assessment. The exceptions to the rules (e.g., negative estimates for apples and cranberries; positive estimates for wood-related manufactures) also raise questions. These counterintuitive estimates may indicate that there are other factors at play such as methods and modes of production or distributional issues, and analysis at the economy and sub-economy level could shed light into these factors.

It should be mentioned that the elasticity estimates presented above and in Appendix 3 are the average for all APEC economies—no distinction is made at the economy level. Hence, while these elasticities apply for the APEC region as a whole, they may not apply for any economy in particular. A product with a negative or insignificant elasticity estimate for APEC as a whole may actually be positive for an individual economy (and vice versa).

7. CONCLUDING REMARKS

This study provides a framework to analyze the potential of the nominated products in terms of how their trade could assist to promote rural development and poverty alleviation, in a way to contribute to sustainable and inclusive growth.

Since the study does not intend to take sides with any APEC economy, the analysis took into account the APEC region as a whole only. We are aware of the limitations of this approach, as the APEC region is not a single market. The intention is not to determine which nominated products are going to be helpful for each individual APEC economy to achieve this goal. Instead, the purpose is to present a methodology -by using the whole APEC region as an example- that can be replicated by any interested parties to determine if their products of interest have the market potential to succeed and contribute to improve social conditions in rural areas.

The study shows that the discussion of the list of nominated products for APEC is relevant from both the trade and tariff perspectives. In addition, it shows that many of the nominated products have trade potential in world markets and enjoy comparative advantages. However, since this analysis was conducted for the APEC region as a whole, the results are not necessarily applicable to every single APEC member. The results by product are probably going to be more relevant to the largest APEC exporters in each of the nominated products. It is important to highlight that the results of this study are non-binding in nature and do not prejudice the APEC economies' positions within APEC and other international fora in terms of trade liberalization. The work conducted is only exploratory in relation to a list of goods nominated by interested APEC economies and it is not related to any specific initiative concerning trade liberalization.

Although some statistically significant findings were gleaned from the analysis in Section 6, it is important to point out that the main result of the econometric impact analysis is the lack of significant results. Despite the use of methodologies that only afford the minimum rigor required of this kind of analysis, significant results were obtained for only a small minority of products. Using more rigorous estimation methods and techniques will result in even less significant results. This points to two key messages.

First, there is a need to refer back the discussion in Section 2 that trade and rural development are linked through a myriad of other factors. Trade alone cannot be expected to result in wholesale rural development. As seen in the lack of significant results, the direct relationship between trade in specific products and larger issues such as GDP, employment, or poverty is difficult to establish without looking into micro-level and sub-economy data. While one can argue that trade in specific labor-intensive products will employ more poor workers in a given locality, it is difficult to see the impact empirically at an economy-wide level (and even more difficult at the APEC level). In this sense, picking up some products as targets for specific government policies may not necessarily have a big impact at the economy-wide level.

Trade is an important factor for economic growth, which in turn is a necessary condition for development, but more factors are needed to establish a causal relationship between trade and

rural development. Factors such as access to and quality of basic services, access to credit, human capital investment, social safety nets, labor market conditions, development of global value chains with rural participation, and institutions of governance are more closely linked to rural development than trade alone. The presence of those factors will assist economies to take full advantage of trade to benefit rural areas. In other words, rural development and poverty alleviation will depend not just on improving market access via trade liberalization and facilitation, they will also depend on other complementary policies related to expanding access to infrastructure and enhancing quality of social policies, among others.

This brings us to the second key message: an analysis of rural development impacts will require more detailed micro-level data at the economy and sub-economy level. The analysis of rural development impacts requires looking into both production and income issues as well as distributional and equity issues. The development impact of trade in a particular product hinges on who it employs, who gains from its profits, and how fiscal and social policies influence this distribution. It will need to look into economy-specific factors affecting returns to labor and capital, skilled and unskilled employment, income distribution and redistributive mechanisms, household consumption patterns, and others. The analysis on how those products participate in global value chains could also give a good idea on the impact of their trade. While such a study is possible, it will require significantly more time, manpower and resources—as well as access to raw data.

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Appendix 1: Revealed Comparative Advantage of the Nominated Products

#	HS 2007 Code	Description	2007-08	2009-10	2011-12
1	230650	Oil-cake and other solid residues resulting from the extraction of vegetable fats or oils from coconut or copra	2.08	1.96	2.66
2	080211	Almonds, in-shell	2.04	2.04	2.56
3	160510	Crab, prepared or preserved	2.07	1.97	2.49
4	151190	Palm oil and its fractions, whether or not refined (excl. chemically modified and crude)	1.97	1.91	2.16
5	151110	Palm oil, crude	2.05	2.04	2.11
6	200820	Pineapples, otherwise prepared or preserved, whether or not containing added sugar or other sweetening matter or spirit, not elswhere specified or included	1.89	1.83	2.03
7	441231	Plywood consisting solely of sheets of wood <= 6 mm thick, With at least one outer ply of tropical wood specified in Subheading Note 2 to this Chapter	1.66	1.81	2.03
8	151311	Coconut (copra) oil, crude	2.09	2.03	1.97
9	441232	Plywood consisting solely of sheets of wood <= 6 mm thick, with at least one outer ply of non-coniferous wood or other tropical wood than specified in Subheading Note 1 to this chapter	1.33	1.40	1.95
10	110620	Flour, meal and powder of sago or of roots or tubers of heading 07.14	1.80	1.84	1.91
11	080212	Almonds, shelled	1.65	1.65	1.87
12	090411	Pepper of the genus Piper (black and white): Neither crushed nor ground	1.44	1.51	1.84
13	080231	Walnuts in-shell	1.39	1.70	1.83
14	081340	Other fruit, dried, other than that of headings 08.01 to 08.06	1.31	1.23	1.81
15	020220	Fresh/Chilled/Frozen Beef	1.76	1.74	1.80
16	291619	Unsaturated acyclic monocarboxylic acids, their anhydrides, halides, peroxides, peroxyacids and halogenated, sulphonated, nitrated or nitrosatedderivatives	1.21	1.18	1.79
17	030343	Skipjack or stripe-bellied bonito	1.35	1.28	1.77

#	HS 2007 Code	Description	2007-08	2009-10	2011-12
18	400110	Natural rubber latex, whether or not prevulcanised	1.87	1.94	1.77
19	151319	Coconut (copra) oil and its fractions thereof, whether or not refined, but not chemically modified	1.71	1.57	1.74
20	030332	Frozen plaice "Pleuronectesplatessa"	1.85	1.84	1.72
21	080111	Desiccated coconuts, fresh or dried	1.57	1.45	1.67
22	080232	Walnuts shelled	1.45	1.37	1.66
23	160414	Tunas, skipjack and bonito (Sarda spp.), whole or pieces, but not minced, prepared or preserved	1.26	1.33	1.64
24	030342	Yellowfin tuna, Frozen	1.05	1.10	1.64
25	130239	Other Mucilages and thickeners, whether or not modified, derived from vegetable products	1.07	1.29	1.62
26	440810	Veneer, coniferous (softwood) less than 6 mm thick	1.29	1.43	1.61
27	081040	Cranberries, bilberries and other fruits of the genus Vaccinium	1.48	1.35	1.50
28	140120	Rattan whole, core, fibre, skin, split	2.17	2.13	1.49
29	120510	Canola Seed	1.03	1.12	1.48
30	100610	Rice in the husk (paddy or rough)	2.05	1.76	1.48
31	200899	Other fruits, nuts and other edible parts of plants	1.11	1.17	1.45
32	030379	Tilapia (Tilapiinae), Mullet , Monkfish (Lophius spp), Butterfish, Sablefish (Anoplopoma fimbria)	1.17	1.28	1.44
33	230120	Flours, meals and pellets of fish or crustaceans, molluscs or other aquatic invertebrates, unfit for human consumption	1.54	1.46	1.44
34	080290	Nuts, edible fresh and dried, nes	1.23	1.20	1.42
35	100190	Wheat and Meslin	1.32	1.18	1.42
36	460199	Oil Palm Fiber Mat	1.49	1.22	1.40
37	940169	Other seats, with wooden frames	1.47	1.55	1.39
38	180320	Cocoa paste, Wholly or partly defatted	0.78	0.83	1.39
39	170191	Other: Containing added flavouring or colouring matter	0.84	1.07	1.36
40	030352	Frozen cod "Gadusmorhua, Gadusogac, Gadusmacrocephalus"	1.28	1.17	1.35

#	HS 2007 Code	Description	2007-08	2009-10	2011-12
41	151620	Vegetable Fats and Oils and Their Factions	1.22	1.31	1.34
42	140490	Other Vegetable products not elsewhere specified or included.	0.69	0.84	1.29
43	090412	Pepper of the genus Piper; dried or crushed or ground fruits of the genus Capsicum (peppers) or of the genus Pimenta (e.g., allspice)	0.81	0.91	1.26
44	940350	Wooden furniture of a kind used in the bedroom	1.09	1.18	1.26
45	151411	Crude Low Erucic Acid Rape or Colza Oil not Chemically Modified (TNE)	0.81	1.01	1.24
46	611120	Babies' garments and clothing accessories, of cotton, knitted or crocheted	1.35	1.31	1.24
47	100630	Semi-milled or wholly milled rice	1.27	1.26	1.21
48	940330	Wooden furniture of a kind used in offices	0.94	1.07	1.19
49	100110	Wheat	1.31	1.19	1.17
50	020322	Fresh/Chilled Frozen Pork	1.12	1.00	1.16
51	120100	Soybeans	1.09	1.14	1.15
52	940161	Other seats, with wooden frames	0.93	1.04	1.15
53	081090	Other fruit, fresh.	0.78	0.82	1.14
54	470700	Recovered (waste and scrap) Paper or Paperboard	1.21	1.20	1.13
55	847920	Machinery for the Extraction/Preparation of Animal/Fixed Vegetables fats/Oils having Individual Functions, N.E.S. in CH.84	0.68	0.79	1.13
56	030613	Crustaceans, whether in shell or not, live, fresh, chilled, frozen, dried, salted or in brine; Other shrimps and prawns	1.12	1.16	1.12
57	870590	Snow blower	0.70	0.94	1.11
58	051191	Products of fish or crustaceans, molluscs or other aquatic invertebrates; dead fish, crustaceans, molluscs or other aquatic invertebrates, unfit for human consumption	0.89	0.83	1.09
59	030559	Anchovies (Stolephorus spp.) (Ikan bilis), Dried, other than edible fish offal, whether or not salted but not smoked	0.93	0.88	1.08

#	HS 2007 Code	Description	2007-08	2009-10	2011-12
60	732190	Stoves, ranges, grates, cookers (including those with subsidiary boilers for central heating), barbecues, braziers, gas-rings, plate warmers and similar non-electric domestic appliances, and parts thereof, of iron or steel	0.99	0.94	1.08
61	840734	Gasoline/Diesel engine	1.08	1.04	1.07
62	100640	Broken rice	1.35	1.13	1.07
63	080610	Grapes, fresh	0.94	0.95	1.06
64	100620	Husked (brown) rice	1.14	1.21	1.02
65	940360	Other wooden furniture, n.e.s.	0.79	0.96	1.01
66	100590	Other maize	1.30	1.12	1.01
67	160420	Fish pastes, fish balls or fish cakes', and 'Ikan pekasam (fermented fish)'	0.93	0.89	1.01
68	080450	Guavas, mangoes and mangosteens, fresh or dried	0.70	0.77	1.00
69	080810	Apples, fresh	0.89	0.93	0.97
70	400280	Mixtures of any product of heading 40.01 with any product of this heading: Heveaplus rubber MG 49, Heveaplus rubber MG 30, Epoxidised rubber ENR 25 and Epoxidised rubber ENR 50	1.50	1.09	0.93
71	020130	Fresh/Chilled/Frozen Beef	0.89	0.85	0.93
72	020230	Fresh/Chilled/Frozen Beef	0.81	0.78	0.92
73	271019	Lubricating Oil Feedstock (TNE)	0.72	0.74	0.90
74	180610	Cocoa powder, containing added sugar or other sweetening matter	0.82	0.93	0.90
75	120929	Other Beet Seeds For Sowing (TNE)	0.89	0.88	0.90
76	840733	Gasoline/Diesel engine	1.12	0.68	0.90
77	020329	Fresh/Chilled Frozen Pork	0.82	0.80	0.90
78	480256	Uncoated paper and paperboard, in square or rectangular sheets with one side <= 435 mm or with one side and the other side <= 297 mm in the unfolded state, not containing fibres obtained by a mechanical or chemi-mechanical process or of which <= 10% by weight of the total fibre content consists of such fibres, and weighing 40 g to 150 g/m², n.e.s.	0.47	0.56	0.85

#	HS 2007 Code	Description	2007-08	2009-10	2011-12
79	382490	Other Chemical Products & Preparations of the Chemical or Allied Industries nes or Incl (KGM)	0.77	0.75	0.84
80	200949	Pineapple juice, unfermented and not containing added spirit, whether or not containing added sugar or other sweetening matter	0.93	0.91	0.84
81	382313	Fatty acids, industrial, monocarboxylic; acid oils from refining (excl. stearic acid, oleic acid and tall oil fatty acids)	0.56	0.75	0.81
82	151590	Other fixed vegetable fats and oils (including jojoba oil) and their fractions, whether or not refined, but not chemically modified.	1.00	0.82	0.79
83	030623	Anchovies, salted and in brine, but not dried or smoked	0.79	0.84	0.79
84	080250	Pistachios, in shell	1.11	0.81	0.79
85	480300	Toilet or facial tissue stock, towel or napkin stock and similar paper for household or sanitary purposes, cellulose wadding and webs of cellulose fibres	0.66	0.74	0.78
86	401699	Articles of Vulcanised Rubber other than Hard Rubber, N.E.S. in CH.40	0.68	0.71	0.78
87	110900	Wheat gluten, whether or not dried	0.69	0.82	0.78
88	120999	Other Seeds Fruit & Spores for Sowing (TNE)	0.79	0.84	0.77
89	843710	Others / a sorting machine	0.70	0.68	0.77
90	200410	Potatoes (frozen processed)	0.77	0.75	0.77
91	480255	Uncoated paper and paperboard, in rolls of any size, not containing fibres obtained by a mechanical or chemi-mechanical process or of which <= 10% by weight of the total fibre content consists of such fibres, and weighing 40 g to 150 g/m², n.e.s.	1.23	0.97	0.76

#	HS 2007 Code	Description	2007-08	2009-10	2011-12
92	480257	Uncoated paper and paperboard, , in square or rectangular sheets with one side > 435 mm or with one side <= 435 mm and the other side > 297 mm in the unfolded state, not containing fibres obtained by a mechanical or chemi-mechanical process or of which <= 10% by weight of the total fibre content consists of such fibres, and weighing 40 g to 150 g/m², n.e.s.	0.57	0.67	0.76
93	020321	Fresh/Chilled Frozen Pork	0.39	0.42	0.74
94	030351	Frozen herrings "Clupeaharengus, Clupeapallasii"	0.21	0.38	0.73
95	870190	Tractor(more than 50 horsepower)	0.59	0.60	0.70
96	848690	Machines and apparatus of a kind used solely or principally for the manufacture of semiconductor boules or wafers, semiconductor devices, electronic integrated circuits or flat panel displays; machines and apparatus specified in Note 9(C) to this Chapter; parts and accessories.	0.55	0.59	0.69
97	152000	Crude Glycerol (TNE)	0.79	0.48	0.69
98	090111	Coffee, not roasted, not decaffeinated	0.62	0.54	0.68
99	100890	Other cereals	0.89	0.59	0.66
100	180500	Cocoa powder, not containing added sugar or other sweetening matter.	0.58	0.56	0.65
101	020319	Fresh/Chilled Frozen Pork	0.60	0.58	0.65
102	081010	Strawberries, fresh	0.61	0.59	0.64
103	100510	Maize	0.70	0.59	0.64
104	051199	Other Animal products not elsewhere specified or included; dead animals of Chapter 1	0.68	0.60	0.63
105	841931	Drying machine for agricultural produce	0.43	0.49	0.61
106	940340	Wooden furniture of a kind used in the kitchen	0.59	0.59	0.61

#	HS 2007 Code	Description	2007-08	2009-10	2011-12
107	180620	Other preparations in blocks, slabs or bars weighing more than 2 kg or in liquid, paste, powder, granular or other bulk form in containers or immediate packings, of a content exceeding 2 kg	0.62	0.60	0.60
108	480525	Testliner "recycled liner board", uncoated, in rolls of a width > 36 c, Weighing more than 150 g/m2.	0.48	0.54	0.56
109	180400	Cocoa butter, fat and oil.	0.73	0.61	0.52
110	170112	Raw sugar not containing added flavouring or colouring matter: Beet sugar	0.31	0.44	0.52
111	180631	Other Chocolates & Food Preparations with Cocoa in Blocks Slabs or Bars Filled	0.45	0.45	0.50
112	080550	Lemons, fresh and dried	0.55	0.47	0.50
113	030331	Frozen sockeye salmon [red salmon]	0.42	0.47	0.49
114	210111	Extracts, essences and concentrates, of coffee, tea or mate, and preparations with a basis of these products or with a basis of coffee, tea or mate, roasted chicory and other roasted coffee substitutes	0.34	0.38	0.49
115	220421	Wine of fresh grapes, other than sparkling,in bottles less than 2 liters	0.51	0.48	0.48
116	310100	Animal or vegetable fertilisers, whether or not mixed together or chemically treated	0.52	0.48	0.48
117	200799	Fruits preserved. Tropical fruits	0.47	0.41	0.48
118	481029	Paper and paperboard used for writing, printing or other graphic purposes	0.31	0.38	0.46
119	170199	Other Cane or Beet Sugar, Chemically Pure Sucrose	0.33	0.41	0.46
120	080510	Oranges, fresh or dried	0.37	0.38	0.43
121	843490	Parts of milking machines or dairy machines n.e.s.	0.47	0.42	0.41
122	020312	Fresh/Chilled Frozen Pork	0.28	0.37	0.41
123	180690	Other Chocolate and other food preparations containing cocoa	0.30	0.33	0.41
124	090122	Coffee, roasted, decaffeinated	0.35	0.37	0.41

#	HS 2007 Code	Description	2007-08	2009-10	2011-12
125	090121	Coffee, whether or not roasted or decaffeinated; coffee husks and skins; coffee substitutes containing coffee in any proportion: coffee, roasted, not decaffeinated	0.31	0.32	0.40
126	151211	Crude sunflower-seed or safflower oil	0.28	0.23	0.40
127	110100	Wheat or meslin flour	0.44	0.38	0.38
128	030269	Tilapia, Catfish, fresh or chilled	0.45	0.44	0.38
129	170111	Cane sugar, raw, not containing added flavouring or colouring matter	0.28	0.21	0.38
130	030311	Frozen sockeye salmon [red salmon]	0.53	0.46	0.37
131	030563	Anchovies, salted and in brine, but not dried or smoked	0.22	0.44	0.36
132	180632	Other Chocolates & Food Preparations wiht Cocoa in Blocks Slabs or Bars not Filled	0.22	0.27	0.33
133	090190	Coffee, not roasted, decaffeinated	0.31	0.38	0.33
134	151219	Refined Sunflower-Seed or Safflower Oil & Fractions not Chemically Modified (TNE)	0.33	0.30	0.30
135	090112	Coffee, not roasted, decaffeinated	0.24	0.29	0.30
136	180310	Cocoa paste, Not defatted	0.27	0.22	0.28
137	060210	Other live plants (including their roots), cutting and slips; mushroom spawn of rubber trees	0.19	0.25	0.28
138	080122	Brazil nuts shelled	0.26	0.22	0.28
139	460212	Basketwork, wickerwork and other articles, made up from plaiting materials or rattan	0.44	0.29	0.27
140	020120	Fresh/Chilled/Frozen Beef	0.18	0.18	0.22
141	060290	Other live plants (including their roots), cutting and slips; mushroom spawn of rubber trees: other (ex-out: 06029040; 06029050)	0.23	0.22	0.22
142	080300	Bananas, including plantains, fresh or dried	0.17	0.15	0.21
143	080430	Pineapples, fresh or dried	0.17	0.16	0.19
144	480524	Testliner "recycled liner board", uncoated, in rolls of a width > 36 c, Weighing 150 g/m2 or less	0.15	0.15	0.14
145	020210	Fresh/Chilled/Frozen Beef	0.14	0.12	0.11

#	HS 2007 Code	Description	2007-08	2009-10	2011-12
146	460193	Plaits and similar products, of rattan plaiting materials, whether or not assembled into strips; plaiting materials, plaits and similar products of rattan flat-woven or bound together in parallel	0.34	0.14	0.11
147	020311	Fresh/Chilled Frozen Pork	0.15	0.07	0.06
148	020110	Fresh/Chilled/Frozen Beef	0.05	0.03	0.04
149	460122	Mats, matting and screens, of rattan plaiting materials, flat-woven or bound together in parallel	0.07	0.02	0.02

Source: UN Comtrade, WITS. APEC Secretariat, Policy Support Unit calculations

Appendix 2: Econometric Methodology

Based on the analytical framework discussed in Section 6, we analyze two crucial linkages: (1) between rural economic activity and rural development and (2) between trade and rural economic activity and. To quantitatively analyze these linkages, we express the analytical framework in Figure 6.1 in formal terms. Let T_i = trade in good *i*, which may be either exports (X_i) or imports (M_i)[167], R = rural economic activity measured as rural GDP, and D = rural development indicator, which may be measured in terms of rural employment or poverty. As rural GDP data is not directly available in a number of APEC economies, we are using the value added of agriculture in GDP as a measure of rural GDP. This includes the activities in the ISIC nomenclature classified in sections 1-5 (i.e. forestry, hunting, fishing cultivation of crops and livestock production).

Based on the framework above, we can formalize the relationships as:

$$X_i = X_i(Y, Y_f, E, P, .) \quad (1)$$

$$M_i = M_i(Y, Y_f, E, P, .) \quad (2)$$

$$R = R(T_1 \dots T_i \dots T_n, .) \text{ for goods } i = 1 \dots 157 \quad (3)$$

$$D = D(R(.), .) \quad (4)$$

Where Y = total GDP in the domestic economy (note that Y is the sum of rural and urban GDP), Y_f = indicator of GDP in foreign economies (i.e., world GDP minus domestic GDP), E = real exchange rate, and P = vector of trade policy indicators (e.g., average tariff rates in the domestic and foreign economies, time and cost to export and import a container). In order to control for inflation effects, real values (i.e., in constant 2005 USD) of exports, imports, and GDP are utilized in the analysis.

Equations (1) to (4)[168] mirror the analytical framework in Figure 6.11: rural development is affected by rural GDP, while trade and rural GDP affect each other; any impact of trade on rural development is channeled through its impacts on the rural GDP.

Note that equations (1), (2), and (3) show reverse causality between trade in various goods and rural GDP: higher trade will lead to higher rural GDP, which in turn can lead to more trade. For this analysis, however, we are more concerned about how trade affects rural GDP, and how rural GDP affects rural development. Hence, we need to analyze the relationship

$$D = D(R(T_1, \dots T_i(.) \dots T_n, .), .) \quad (5)$$

where T_i = trade in good *i* and may either be exports (X_i) or imports (M_i). To get the impact of trade in good T_i on rural development indicator D, we derive

$$\frac{\partial D}{\partial T_i} = \frac{\partial D}{\partial R}\frac{\partial R}{\partial T_i} \quad (6)$$

[167] Unless otherwise stated, our exposition of the methodology will refer to *Ti* rather than *Xi* and *Mi* separately. This is done for brevity since the methodologies are analogous for exports and imports.

[168] Unspecified functional arguments indicate other explanatory variables that are omitted from this analysis that will add to the error term during econometric analysis.

Multiplying both sides by unity and rearranging, we get

$$\frac{\partial D}{\partial T_i}\frac{T_i}{D} = \varepsilon_{DTi} = \frac{\partial D}{\partial R}\frac{R}{D} \cdot \frac{\partial R}{\partial T_i}\frac{T_i}{R} = \varepsilon_{DR} \cdot \varepsilon_{RTi} \quad (7)$$

This equation says that the elasticity of the rural development indicator with respect to trade in good T_i (which we denote as ε_{DTi}) is the product of the elasticity of that indicator with respect to rural GDP (i.e., ε_{DR}) multiplied by the elasticity of rural GDP with respect to trade in good T_i (i.e., ε_{RTi}). In other words, calculating this indicator will tell us the percentage decrease (or increase) in, say, employment or poverty resulting from a 1% increase in trade in good T_i.

To estimate (7) econometrically, we first need to estimate two variables: ε_{DR} and ε_{RTi}. Estimating ε_{DR} is straightforward as it is unidirectional. If we have panel data (i.e., time series across many economies) on R = rural GDP in real terms and D = number of employed individuals in agriculture (or number of poor people), we can econometrically estimate the equation

$$\ln D = a + b\ln R + cYear + u \quad (8)$$

where *Year* is a vector of year dummy variables, u is the error term, and scalars a, b and vector c are estimated coefficients (we suppress subscripts for economy and year for brevity). Estimation will be done using fixed effects panel ordinary least squares (OLS). Under this specification, it can be shown that $\varepsilon_{DR} = b$. Other economy-specific determinants of rural development—such as efficiency of social service delivery, geography, quality of institutions, or history—will be captured by the fixed effects specification of the regression, while year-specific shocks will be captured by the *Year* vector. If there is enough data, measures of inequality (e.g., Gini coefficient) can also be included in (8) to control for income distribution effects.

Estimating ε_{RTi}, on the other hand, will be more involved since there are 149 goods (in HS 2007 6-digit code) to estimate their own export and import elasticities and there is the issue of reverse causality—i.e., trade and rural GDP mutually affect each other—which can bias the estimates. Moreover, we also have to control for trade policy and external factors that affect trade (e.g. GDP growth in the rest of the world and relative exchange rates). However, to account for the limitations in the data, we use two methods to estimate ε_{RTi}.

Method 1: We first find the determinants of trade in various goods. To do so, we conduct a fixed effects panel OLS regression to estimate the following equation for each good i (note that there are separate estimates for exports and imports; goods and year subscripts are supressed for brevity)[169]:

$$T = a + bY + cY_f + dE + eP + fYear + u \quad (9)$$

where T, Y, Y_f, E, and vector P are as defined in equation (1) and *Year* is a vector of year dummy variables as in equation (8). After estimating (9), a predicted value for T, which we now call T^*, will be generated based on the explanatory variables and the estimated coefficients. Values

[169] Note that T_i refers to both X_i and M_i. Hence, there will be a total of 314 econometric regressions to be run.

of T^*, rather than actual observed T, will then be plugged into the regression analysis for ε_{RTi}. Using T^* rather than T has two advantages: (1) it is more grounded in theory and controls for many factors affecting trade volumes and (2) it partially addresses the reverse causality issue we identified earlier. However, deriving T^* is very data intensive and demanding on the quality of data—missing data points at any point of the dataset will result in dropped observations and lower degrees of freedom and less reliable estimates.

In order to estimate ε_{RTi}, we conduct a fixed effects panel regression on a structural equation analogous to (8):

$$\ln R = a + b\ln T^*_i + cYear + u \text{ for all goods } i = 1 \text{ to } 149 \quad (10)$$

where R, T^*_i, and $Year$ are as previously defined (year subscripts are suppressed for brevity). However, given the strong likelihood of reverse causality between R and T_i, we employ the Arellano-Bond generalised method-of-moments (AB-GMM) estimation procedure. AB-GMM is suited for this analysis as it addresses reverse causality issues by using lagged values of the endogenous variables (in this case, R and T_i) as instrumental variables[170]. Moreover, the AB-GMM procedure is suited for panel data that has a short time span—in this case, trade data for goods i across APEC economies only cover 2007-2012, so AB-GMM is ideal for this analysis. As before, it can be shown that $\varepsilon_{RTi} = b$ after estimating (10).

Method 2: In this method, we skip the step of deriving T* as defined in equation (9) and go straight to estimating ε_{RTi} using actual T. Hence, the structural equation is:

$$\ln R = a + b\ln T_i + cYear + u \text{ for all goods } i = 1 \text{ to } 149 \quad (11)$$

As in Method 1, the AB-GMM estimation procedure is employed in the analysis to address reverse causality issues. Method 2 is less analytically rigorous than Method 1 as it does not control for many factors affecting trade, but it is less data intensive and more likely to result in usable estimates.

After deriving ε_{DR} and ε_{RTi}, we can derive ε_{DTi} as in (7), which informs us how a 1% increase in trade in good i will impact rural development, either in terms of employment or poverty. The estimates are for APEC as a whole; observations showing economies not trading a certain good will be dropped out of the calculations. Comparisons between elasticities will be possible as all estimates will be expressed in terms of percentage change in rural development measure resulting from a 1% increase in trade or production of good i.

The methodology is a very simple model connecting trade performance in good i to rural development through the rural GDP in APEC economies to be covered by the study. It does not delve into distributional impacts of trade and does not distinguish between sectors where employment is generated. Micro-level data is needed to make distinctions between the direct and indirect effects of trade performance in good i on rural development; econometrically analyse distribution and social protection mechanisms; and discuss other aspects of employment and poverty in rural areas.

[170] The intuition of this method is that while this year's trade may have an impact on this year's GDP, it cannot also have had an impact on last year's GDP.

Appendix 3: Elasticity of Agriculture GDP with respect to Trade (ε_{RTi}), by Product

		Method 1		Method 2	
Product Name	**Code**	**Exports**	**Imports**	**Exports**	**Imports**
Recovered (waste and scrap) Paper	4707	0.045	0.027	0.000	-0.036**
Fresh/Chilled/Frozen Beef	020110	0.001	-0.047	0.004	0.004
Fresh/Chilled/Frozen Beef	020120	0.017	0.019	-0.006**	0.000
Fresh/Chilled/Frozen Beef	020130	0.001	0.017	-0.001	-0.001
Fresh/Chilled/Frozen Beef	020210	-0.063	-0.047**	-0.001	0.005
Fresh/Chilled/Frozen Beef	020220	0.018***	0.347	-0.002	-0.002
Fresh/Chilled/Frozen Beef	020230	0.005	0.024	-0.003*	0.015
Fresh/Chilled Frozen Pork	020311	0.201	-0.025	0.004	0.039***
Fresh/Chilled Frozen Pork	020312	0.230	0.012	0.001	0.006***
Fresh/Chilled Frozen Pork	020319	0.008	0.109	0.003	0.004
Fresh/Chilled Frozen Pork	020321	0.009	-0.005	0.007	-0.005**
Fresh/Chilled Frozen Pork	020322	0.043	0.421	-0.004	0.003
Fresh/Chilled Frozen Pork	020329	0.010	0.086	-0.001	0.000
Fish, fresh or chilled, excluding fish	030269	-0.021	0.006	-0.003	-0.002
Frozen sockeye salmon [red salmon]	030311	-0.035**	-0.035	0.007	-0.002
Frozen lesser or Greenland halibut	030331	0.019	0.023	0.011**	0.000
Frozen plaice Pleuronectesplatessa	030332	0.027	-0.040*	-0.004	-0.008
Yellowfin tuna, Frozen	030342	0.178	0.004	0.014***	0.014**
Skipjack or stripe-bellidbonito,frozen	030343	0.382	0.300	0.003	-0.003
Frozen herrings	030351	0.015	0.362	0.003	-0.008**
Frozen	030352	0.326	-0.488**	0.003	-0.005
Frozen fish, n.e.s.	030379	0.276	0.022	-0.003	0.011**
Anchovies	030559	0.370	-0.253	0.004	0.003
Anchovies, salted and in brine	030563	0.253	0.014	0.004	-0.006***
Crustaceans	030613	0.268	0.074	-0.005	0.004
Crustaceans	030623	0.219	0.344	0.003	-0.016***
Seafood products	051191	-0.064	0.004	-0.009**	0.017
Other Animal products n.e.s.	051199	-0.055	0.008	-0.001	0.005
Other live plants	060210	0.340	0.014	0.000	0.000
Other live plants	060290	-0.036	-0.144	0.012	0.008
Desiccated coconuts, fresh or dried	080111	0.004	0.030	0.000	-0.001
Brazil nuts shelled	080122	-0.155*	0.075	0.003	0.000
Almonds, in-shell	080211	0.084	0.181	-0.001	-0.006*
Almonds, shelled	080212	0.032	0.015	0.001	-0.044
Walnuts in-shell	080231	-0.005	0.354	-0.002	-0.003
Walnuts shelled	080232	0.029*	-0.012	-0.006	0.012
Pistachios, in shell	080250	0.002	0.357	0.000	0.003
Nuts, edible fresh and dried, n.e.s.	080290	0.451	-0.004	0.005	0.001
Bananas, including plantains	080300	-0.016	-0.013	0.012*	0.002
Pineapples, fresh or dried	080430	-0.046	-0.250	0.010*	0.000

		Method 1		Method 2	
Product Name	**Code**	**Exports**	**Imports**	**Exports**	**Imports**
Guavas, mangoes and mangosteens	080450	-0.006	0.208	0.019***	-0.003
Oranges, fresh or dried	080510	0.004	-0.022	0.007	0.020
Lemons, fresh and dried	080550	0.039	-0.015***	0.010	0.017
Grapes, fresh	080610	0.012	-0.133	0.026**	-0.026
Apples, fresh	080810	-0.016	-0.519	0.010	-0.012*
Strawberries, fresh	081010	-0.067*	0.277	0.001	0.007
Cranberries, bilberries and other fruit	081040	0.005	0.018	0.001	-0.004*
Other fruit, fresh.	081090	0.282	0.279	0.020	0.001
Other fruit, dried	081340	-0.003	0.013	-0.001	0.000
Coffee	090111	0.000	0.020	0.005*	-0.003
Coffee	090112	-0.256***	0.026	-0.001	0.002
Coffee	090121	0.026	0.014	0.006	0.010
Coffee	090122	-0.003	-0.012	0.000	-0.003
Coffee	090190	0.351	-0.003	0.000	-0.003
Pepper of the genus Piper	090411	0.002	0.024	0.007*	0.003
Pepper of the genus Piper	090412	0.526	-0.018	0.009*	-0.010
Wheat	100110	0.023	0.384	0.003	0.000
Wheat and Meslin	100190	0.109	0.056	-0.001	0.005
Maize	100510	-0.116	-0.012	-0.003	0.016
Other maize	100590	-0.015	0.032	0.006	0.009
Rice	100610	0.033	-0.016	0.006	-0.001
Rice	100620	-0.013	0.003	-0.004	0.000
Rice	100630	-0.360	-0.031	-0.004	0.000
Rice	100640	0.021**	0.428	0.002	0.001
Other cereals	100890	-0.643	0.301	-0.008	-0.002
Wheat or meslin flour	110100	-0.055***	0.043	0.006	-0.003
Flour, meal and powder of sago	110620	0.226	0.258	-0.003	-0.008
Wheat gluten, whether or not dried	110900	0.273	-0.004	-0.006	0.021
Soybeans	120100	-0.005	0.343	-0.003	0.029***
Canola Seed	120510	-0.022	0.613	-0.004	-0.004
Other Beet Seeds For Sowing	120929	-0.016	-0.132	-0.004	0.009
Other Seeds Fruit & Spores for Sowing	120999	0.009	0.009	-0.005	-0.001
Other Mucilages and thickeners	130239	0.309***	-0.042	-0.001	0.030
Rattan whole, core, fibre, skin, split	140120	-0.044	-0.492***	0.001	0.012***
Other Vegetable products not elsewhere	140490	0.004	0.380	0.015**	-0.001
Palm oil, crude	151110	-0.006**	-0.064	0.003	-0.003
Palm oil and its fractions, whether or	151190	0.014	0.143	-0.002	0.004
Crude sunflower-seed or safflower oil	151211	-0.008*	0.380	-0.006	0.000
Refined Sunflower or Safflower Oil	151219	-0.025	0.062	-0.004	-0.011
Coconut (copra) oil, crude	151311	-0.120**	0.047	0.008*	-0.005
Coconut (copra) oil and its fractions	151319	0.023	0.417	0.011*	-0.004

		Method 1		Method 2	
Product Name	**Code**	**Exports**	**Imports**	**Exports**	**Imports**
Crude Low Erucic Acid Rape or Colza Oil	151411	0.002	0.252	0.000	-0.010
Other fixed vegetable fats and oils	151590	0.018	0.004	-0.001	-0.002
Vegetable Fats and Oils	151620	-0.016	-0.018	0.013	0.025
Crude Glycerol	152000	0.010	0.443	-0.006	0.002
Tunas, skipjack and bonito (Sarda spp.)	160414	0.359	0.034	0.005	0.013
Fish pastes, fish balls or fish cakes'	160420	0.034**	0.010	-0.029*	0.007
Crab, prepared or preserved	160510	0.317***	0.050	0.012**	-0.002
Raw sugar	170111	0.029**	0.298	0.000	0.005
Raw sugar	170112	0.085	0.206	0.000	-0.004*
Other: Containing added flavouring	170191	0.008	0.021	-0.005	0.010
Other: Other	170199	-0.042*	0.007	0.012	-0.006*
Cocoa paste, Not defatted	180310	0.005	0.009	-0.002	0.012
Cocoa paste, Wholly or partly defatted	180320	0.038	0.053	-0.007	0.001
Cocoa butter, fat and oil.	180400	-0.007	-0.073***	-0.013***	0.007
Cocoa powder, not containing added sugar	180500	0.017	-0.007	0.00602*	0.063***
Cocoa powder, containing added sugar	180610	0.003	0.013	0.0140**	0.005
Other preparations	180620	-0.038	-0.010	0.004	0.015
Other Chocolates & Food Preparations	180631	-0.013	0.022	0.004	0.035
Other Chocolates & Food Preparations	180632	-0.015	-0.005	0.001	0.025
Other Chocolate and other food	180690	0.006	0.006	-0.002	-0.008
Potatoes (frozen processed)	200410	-0.005	0.427	0.004*	0.005
Fruits preserved -Tropical fruits	200799	-0.001	0.012	0.015	0.022
Pineapples, otherwise prepared	200820	-0.652*	0.056	0.002	-0.003
Other fruits, nuts	200899	0.352	0.006	0.033**	0.034*
Pineapple juice,	200949	-0.017***	0.022	-0.002	0.001
Extracts, essences and concentrates	210111	0.041	0.000	-0.002	0.001
Wine of fresh grapes	220421	-0.003	0.009	0.000	0.001
Flours, meals and pellets of fish	230120	-0.029	0.013	-0.003	0.013
Oil-cake and other solid residues	230650	-0.006	0.200	0.003	-0.003
Lubricating Oil Feedstock	271019	0.012	0.150	-0.008	0.004
Unsaturated acyclic monocarboxylic acid	291619	0.459	0.014	0.001	0.027
Animal or vegetable fertilisers	310100	-0.075	-0.053	0.000	-0.004
Fatty acids, industrial, monocarboxylic	382313	0.000	0.518	0.003*	-0.010
Palm Biodiesel Palm Biodiesel	382490	0.056	0.603	0.007	0.010
Natural rubber latex	400110	0.014	0.052	0.007	0.018
Mixtures of any product of heading 40.0	400280	-0.004	0.235	0.004	0.007
Articles of Vulcanised Rubber	401699	-0.035	0.006	0.027	-0.002
Veneer, coniferous (softwood)	440810	0.025	0.041	0.002	-0.006
Plywood	441231	0.008	0.038	0.003*	0.002
Plywood	441232	0.246	0.034	0.001	0.006**

Product Name	Code	Method 1		Method 2	
		Exports	Imports	Exports	Imports
Mats, matting and screens, of rattan	460122	-0.019	0.017	0.005	0.000
Plaits and similar products, of rattan	460193	0.014	-0.016	-0.001	0.002
Oil Palm Fiber Mat	460199	-0.323	-0.014	0.007	0.005
Basketwork, wickerwork and other l	460212	-0.498	0.055	0.002	-0.002
Uncoated paper and paperboard	480255	0.053	-0.015	0.004	-0.002
Uncoated paper and paperboard	480256	-0.005	-0.115	0.009	0.003
Uncoated paper and paperboard	480257	0.443	-0.041	-0.012	-0.009
Toilet or facial tissue stock, towel	480300	0.393	0.284	-0.009	0.026***
Testliner recycled liner board	480524	0.048	0.027	-0.008*	0.003
Testliner recycled liner board	480525	0.009	-0.001	0.007	0.004
Paper and paperboard used for writing	481029	0.015	0.028	0.002	0.022
Babies' garments and clothing	611120	-0.418**	0.302	0.009	0.002
Stoves, ranges, grates, cookers	732190	-0.223	-0.018	0.018**	0.023
Gasoline/Diesel engine	840733	0.048	0.579	0.005	-0.005
Gasoline/Diesel engine	840734	-0.038	-0.015	-0.027**	-0.008
Drying machine for agricultural produce	841931	0.073	0.021	-0.001	-0.005
A part for an oil press	843490	-0.290	0.193	0.004	0.009
Others / a sorting machine	843710	0.334	-0.176	0.000	-0.004
Machinery for the Extraction	847920	-0.006	-0.006	-0.001	-0.013**
Machines and apparatus	848690	0.011	-0.008	0.001	0.001
Tractor(more than 50 horsepower)	870190	-0.006	0.022	-0.010**	0.016
Snow blower	870590	0.000	-0.061***	0.002	0.008
Other seats, with wooden frames	940161	0.368	-0.078	0.003	0.057**
Other seats, with wooden frames	940169	-0.203**	0.013	0.000	0.044*
Wooden furniture	940330	0.013	-0.002	0.009	0.045**
Wooden furniture	940340	-0.048	0.010	0.002	0.013
Wooden furniture	940350	0.105	-0.031	0.016	0.042**
Other wooden furniture, n.e.s.	940360	0.319	-0.017	0.012	0.009

Notes: *** = significant at $p < 0.01$; ** = significant at $p < 0.05$; * = significant at $p < 0.10$. Elasticity estimates may be statistically insignificant (i.e., cannot reject the null hypothesis that the elasticity is zero at a given level of confidence 1 – p) because of a high standard error, an elasticity estimate very close to zero, insufficient observations ($n < 30$), or a combination of all these factors. n.e.s. = not elsewhere specified.
Source: UN COMTRADE, WITS, World Bank, Chinese Taipei Directorate General of Budget, Accounting and Statistics. APEC Secretariat, Policy Support Unit calculations.