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Analysis of Constraints Faced by Stakeholders towards a Successful Value Chain: Case Study of Pomelo in Yangon Region

Mya Lwin Lwin Aung



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Yangon Region**

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List of Abbreviations

ASEAN	:	Association of South East Asian Nations
CFC	:	Common Fund for Commodities
DOA	:	Department of Agriculture of Myanmar
EU	:	European Union
FAO	:	Food and Agriculture Organization
FDA	:	Food and Drug Administration
GDP	:	Gross Domestic Product
IPM	:	Integrated Pest Management
Kg	:	Kilogram
MAPT	:	Myanmar Agricultural Produce Trading
MFFVPEA	:	Myanmar Fruit, Flower and Vegetable Producer & Exporter Association
MNPED	:	Ministry of National Planning and Economic Development
MOAI	:	Ministry of Agriculture and Irrigation
MOLF	:	Ministry of Livestock and Fisheries
MT	:	Metric Ton
MTF	:	Myanmar Tourism Federation
NGOs	:	Non-Governmental Organizations
PGG	:	Pomelo Grower Group
UNDP	:	United Nations Development Programme
USD	:	United States Dollar

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Abstract

This study focuses on the constraints faced by all the stakeholders of the current pomelo value chain process: growers, collectors, wholesalers and retailers, particularly the smallholder farmers and their access to the modern markets to achieve proper value chain in Yangon Region, Myanmar. Within recent years, pomelo has become a potential export item in Myanmar. Yet the current value chain process of pomelo from growers to export market has several constraints and is underdeveloped. Accordingly, this study explores the internal and external factors affecting the production and distribution of each stakeholder, their costs and profit margins. From this study, retailers incur the highest costs while the wholesalers gain the largest profit margin among stakeholders. For development of a proper value chain in the pomelo export market in Myanmar growers play the vital role. Improving technology, knowledge, collaboration, access to markets and access to financial capital for the growers are indispensable.

1. Introduction

Myanmar is renowned for its rich natural resources for several decades. Yet the economy suffers from inefficient economic policies, corruption and rural poverty. Despite Myanmar's emergence as a natural gas exporter, socio-economic conditions have deteriorated under the mismanagement of the previous regime. In Myanmar, 26 % of the population lives below the poverty line and the average proportion of total household budget spent on food is 68 %. Hence, it can be said that Myanmar is still one of the poorest countries in South-East Asia. According to a recent country-wide survey, agriculture remains the basis of the economy with almost 63 % of the labor force engaged in farming.¹

The 2011 government reforms and implementation of an open door policy to the economy initiated lowering export taxes, easing restrictions on its financial sector, and reaching out to international organizations for assistance. Although there have been some changes, the majority of the population are still living in rural areas with their livelihood depending largely on agriculture. Even in agriculture, most farmers are small holders' farmers who rely on staple and cash food cultivation. Development of horticulture and other type of crops still lag behind with insufficient knowledge, education, inputs and infrastructure. In order to upgrade the livelihoods of the majority of population and alleviate poverty, upgrading the agriculture sector is indispensable for the country.

In Myanmar, rice is historically regarded as the main staple and export yet pulses and beans has contributed as export crops in recent years. The agro-climatic conditions within the country are suited to a large variety of crops such as equatorial plantation crops and temperate fruits in addition to the common foods and industrial crops of monsoon Asia. Although Myanmar can produce a wide variety of fruits, they are mainly intended for domestic markets alone until recent years. This is not because of the demand deficiency, but because of the insufficient knowledge, inefficiency in access to markets and poor infrastructure in general.

¹ www.unops.org/english/whatwedo/UNOPSinaction/Pages/Reducing-poverty-across-Myanmar.aspx

1.1 Overview

Before 1988, the agricultural policy of Myanmar could be depicted as rigid and controlled and a subsidized policy that highly emphasized domestic food security and stability of price. After the economic transition from a planned economic system to a market-oriented system in 1988, agricultural policies of Myanmar paid attention to boosting and promotion of agricultural exports. The Government considers “*as the base for all-round development of other economic sectors*”. In pursuance to the implementation of agricultural development policies, the following three main objectives are prioritized without jeopardizing the production of other crops of the country.

- (a) Fulfilling the needs of local consumption
- (b) Export of more surplus of agricultural products for the increase of foreign exchange earnings
- (c) Assistance to rural development through agricultural development

Myanmar is now trying very hard to achieve economic development with momentum yet Myanmar’s economy is still mainly reliant on the agricultural sector and the majority of the population is rural-based. The main objective of the Ministry of Agriculture and Irrigation aims to call for the Promotion of Productivity in Agriculture. At the same time, within the context of a market-oriented economic system, freedom in agricultural production and participation of the private sector has become a major policy in the agriculture sector.

Major issues on the future development of the agricultural sector are regional food security, extension of agricultural land, enhancing participation of private entrepreneurs in agricultural activities, income generation activities through introducing new crops, and encouraging farmers to cultivate environmentally friendly crops. When agriculture sector can be enhanced through uplifting the value chain, it can eliminate poverty, ensuring food security and enhancing exports.

The agriculture policies laid down in 1992 include production of food crops and industrial crops with no restriction, permit the production of industrial and plantation crops for commercial scale, allowing private investors and farmers to expand agricultural production in

cultivable wastelands, encouraging the participation of the private sector in the distribution of farm machineries and farm inputs and utilizing agriculturally unproductive land for other production programs.

Yet most of these policies are mainly aimed in promoting paddy, oil crops, pulses and beans and industrial crops. For cultivation of fruits, they are regarded mainly for domestic markets. Later, some agricultural policies related to the important industrial crops were changed for the improved performance of producers and development of local market activities. However, efforts of the public sector to upgrade fruit cultivation, production and exports have been very few. Only the formation of grower groups under the UMFCFI can be seen as support for farmers in horticulture.

1.2 Research Rationale

In recent decades, some fruits have been exported to other countries. After 2010, efforts have been made to increase export of fruits. Among these crops, pomelo has great potential due to its quality and supply. Pomelo is the largest citrus fruit that is consumed in fresh and juicy forms. It is recognized as a healthy fruit due to its high nutrition and vitamin contents. Yet exports can be made by very few farmers from the Yangon Region. In this study, pomelo is chosen as the targeted fruit as it has a potentially huge demand in the world market even though current exports from Myanmar are at the initial stage.

Within the previous decade, demand for pomelo is growing in the world market. Myanmar produces pomelo in southern part of the country mainly for domestic consumption yet higher demand for pomelo from abroad in recent years have persuaded cultivators to grow more of the fruit. This study aims to find out ways to promote the production and marketing of pomelo as well all as to overcome the difficulties that the stakeholders encounter.

Present value chains of pomelo in this study, in Yangon, Myanmar are still insufficient and fragmented. Smallholder farmers are unable to integrate into export markets, where there are opportunities to improve income and reduce poverty of these farmers. Hence, to reach the right track of the value chain for potential fruits, pomelo is currently the prerequisite for stakeholders in Myanmar.

1.3 Objectives of the Research

In exploring the pomelo value chain process, the main objectives of this study are to explore the enabling environments for promoting pomelo production, to link small farmers to the modern market, and to examine constraints or issues that hamper the pomelo production and value chain process in Myanmar.

1.4 Research Questions

The major questions that this research seeks to answer are:

1. What are the key factors of the existing situation and their difficulties for the better market linkage?
2. What agricultural technologies are necessary to improve rural livelihoods and sustainability in the selected crop and how to enter the export market?

1.5 Scope and Limitations

The value chain composes of inputs provision from final consumers; this study only analyzes the growers and intermediaries and excludes input providers and consumers. Interviews were carried out during the years 2012-2013. In exploring the current value chain process of pomelo exports in Yangon Region, three townships, Teikkyi, Hlegu, and Hmawbi are chosen. Stakeholders are classified into five groups- growers, collectors, wholesalers, retailers and exporters. At each level of the value chain, interviews were made to selected stakeholders in trading pomelo. Total selected interviewees were 37 persons (Growers 21 persons, Collectors 5 persons, Wholesalers 5 persons, Retailers 5 persons and Exporter 1 person). Key Informant Interviews (KII) was also carried out at the UMFCCI and respective Departments.

2. Review of Literature

2.1 Concept of Value Chain

The value chain is a process of organizing the connected group of activities that create value by producing goods or services from basic raw materials for purchase by a consumer. The

entire series of organizational work activities add value at each step beginning with the processing of raw materials and ending with the finished product in the hands of end-users (Sree Rama Rao, 2010). The conceptual tool of value chain has been accepted as a key factor affecting the long-term profitability of business since the 1980s.

It was first suggested by Michael Porter in his publication, *Competitive Advantage: Creating and Sustaining Superior Performance*, in 1985. According to Porter, the value chain is regarded as the internal processes of a firm to design, produce, promote, deliver and support its product. At the firm level, a business's value chain and its activities are a reflection of its history, its strategy, its approach to implementing its strategy, and the underlying economics of the activities themselves. Porter described a chain of activities common to all businesses, and separated them into primary and supporting activities.

Primary activities are concerned with the creation of a product or delivery of service. They can be grouped into five main areas: *inbound logistics, operations, outbound logistics, marketing and sales, and services*. Each of these primary activities is linked to support activities which help to improve their effectiveness or efficiency. Support activities include *procurement, technology development, human resource management, and infrastructure*.

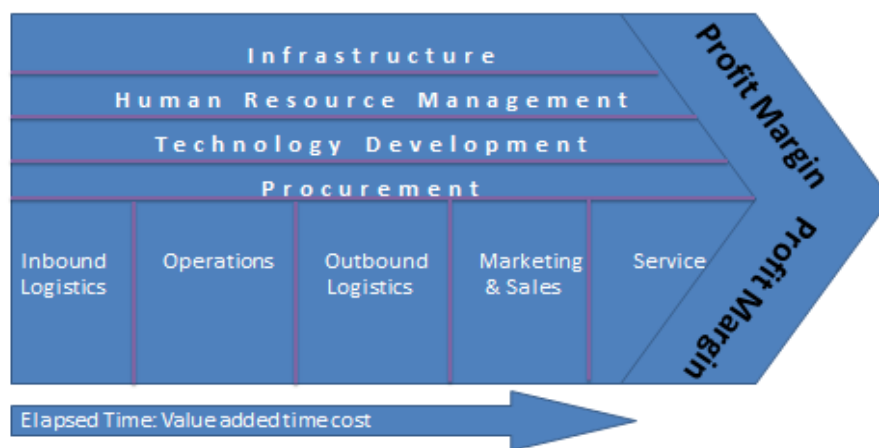


Figure 1. Generic Value Chain Analyses by Porter

Source: www.docstoc.com

The main aim of employing value chain management is to reduce delivery times, lessen inventories and augment customer satisfaction through integrate communication and collaboration between the production chain. Value can be increased through

- (i) Increase perceived benefits while holding price or cost constant,
- (ii) Increase perceived benefits while reducing price or cost, or
- (iii) Decrease price or cost while holding perceived benefits constant².

The success of a value chain process is the ability to provide added value through improvements in delivery time, price and products to customers. The analysis of value chain is widely utilized not only in business management, but also in agriculture production. Especially in horticulture, value chain analysis provides a useful tool in examining the questions and activities of how the products farmers produce reach the final consumer, economic relationships between players in the chain, how this relationship is likely to change over time, what are the major threats to the entire value chain and the key determinants of farmer's share of the profits created by the chain. The following figure shows the value chain of the pomelo production and trade in Ben Tre Province, Vietnam. Currently, Vietnam became the top pomelo exporter among Asian countries and has passed the pomelo export of Thailand in recent years.

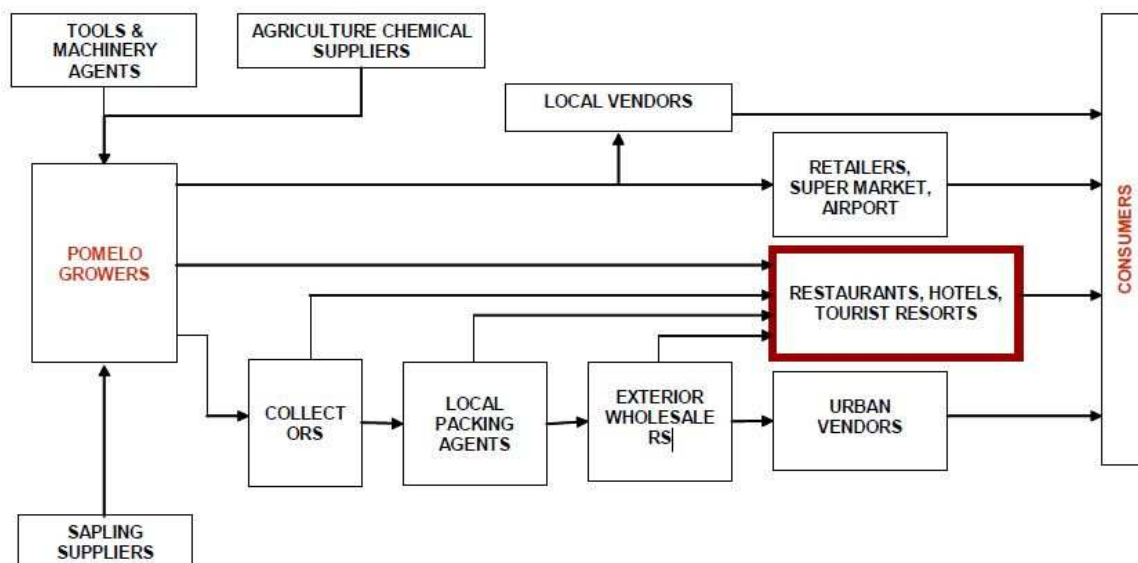


Figure 2. Pomelo Value Chain in Ben Tre Province

Source: www.sme-gtz.org.vn/Portals/0/AnPham/16%20Analysis%20of%20Pomelo%20VC%20in%20Ben%20Tre%20province-ENG.pdf

² David A. Collier, James R. Evans, OM2; Operations Management, 2009 South-Western, a part of Cengage Learning

Pomelos are consumed in fresh form. There is no processing product so far. There are 5 marketing channels in Ben Tre which are shown below.

Channel 1: farmer → retailer → consumer

Channel 2: farmer → restaurant and tourist resort → consumer

Channel 3: growers → collectors → restaurant and tourist resort → consumer

Channel 4: growers → collectors → local packers → restaurant and tourist resort → consumer

Channel 5: growers → collectors → local packager → local whole sellers → retailers/super markets → consumer

Each and every step of these channels has pros and cons. Fewer stakeholders within the chain may generate small holder farmers with greater profits yet cannot fulfill the market demand. In contrast, larger chains in marketing of pomelo can generate low returns for famers but tends to fill the needs of demand from various parts of the country as well as from abroad. Therefore, it is necessary to balance between achieving high profits for growers as well as fulfilling the market demand and exports.

2.2 Framework of Analysis

The conceptual frame work of the study is shown in Figure 3.

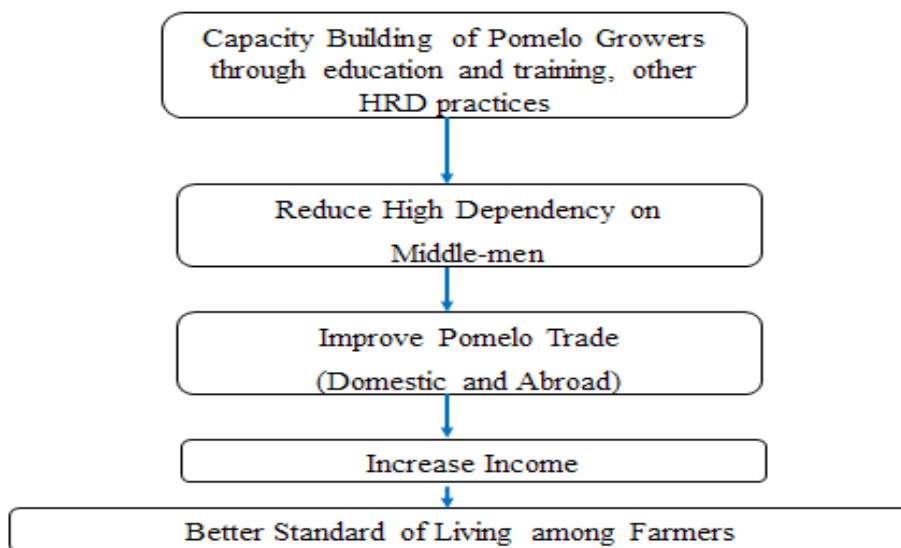


Figure 3. Conceptual Framework

Farmers' and growers' performance towards the achievement of a larger export market can be enhanced through the reduction of their dependency on middleman. To reduce the dependency, it is necessary to empower the grower, i.e. capacity building through dissemination of knowledge via training, education and other measures. Accordingly, price received by growers will increase which will generate better income for growers and achieve a better standard of living.

2.3 Value Chain and Poverty Reduction

At the local and regional levels, growth of urbanization and income, changes in pattern of consumption, competition and higher value preferences generate firms to gain competitive advantage by performing activities more cheaply or better than competitors. In addition, change in cost structures, competitive advantages, demand and risks at the global level encourage firms in the developing world to move away from traditional approaches to innovative value chain approaches.

For poverty reduction in developing countries, rural development is indispensable and the value chain approach provides a useful framework not only for farmers at the micro level, it can also enhance meso (group) level through collaborative efforts and also at the macro level with support of the public sectors. With the rising speed of globalization, increasing production and export of agricultural products this can be an effective way of reducing rural poverty. In order to achieve this, integrating and upgrading the rural poor into the value chain processes is essential, especially in the agriculture sector of developing countries.

2.4 Value Chain Mapping and Analysis

In today's business environment, the major purpose of every firm and organization is not just earning profit, but to provide value to its customers and stakeholders. In business management, the term *value* is the perception of the benefits associated with a good, service or bundle of goods and services in relation to what buyers are willing to pay for them, i.e.

$$\text{Value} = \text{Perceived benefits} / \text{Price (cost) to the customer}$$

If the value ratio is high, the good or service is recognized positively by customers and success will be achieved by the producing organization. To explore the general overview of

the value chain and to undertake analysis, a value chain mapping is necessary. In addition to showing the networks, the most vulnerable groups are also visualized in the mapping. By looking at a value chain mapping, potentials and constraints at each level of process can be visualized and can be able to realize the necessary measures to enhance the process. A basic description of a value chain can be seen as follow:



Figure 4. A Simple Value Chain

Source: From Survey

A value chain can be mapped and analyzed using value chain analysis (VCA) which can include qualitative and/or quantitative measures. Not all value chains are as easy and simple as mentioned above. The following figure shows an example of a complex value chain and mapping of the agriculture products.

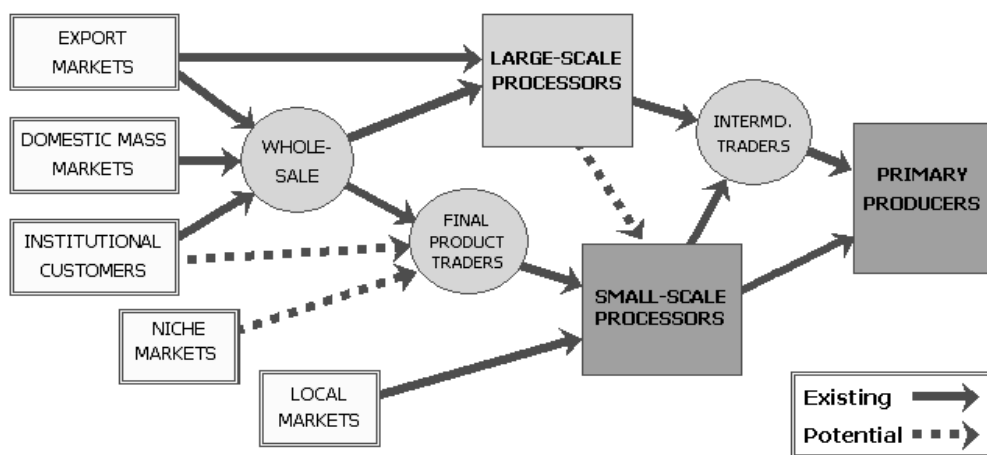


Figure 5. A Complex Value Chain

Source: *Guidelines for Value Chain Analysis*, 2006

In undertaking value chain mapping, the initial step is to identify the core processes in general and whether they are simple or complex. Then, major stakeholders are needed to be portrayed. After that, the flow of products from the initial producers to the final consumption can be described. The next step is to show the flow of knowledge, information and volume,

geographical flow of products as well as changes in product values. Then, necessary services that enhance the value chain process are also required to be illustrated. Finally, mapping is concluded with the potentials and constraints faced by each stakeholders at various levels.³

2.5 Research Techniques

When conducting a value chain analysis, it is necessary to find out the strengths and weaknesses of stakeholders at each level. By doing so, emphasis can be made to transform the weaknesses into strengths and achieve added value to respective stakeholders. This study stresses four stakeholders: growers, collectors, wholesalers and retailers.

In exploring the process of pomelo export from Myanmar, fresh fruits are the only product. According to value chain process, core activities of inbound logistics, operating process, outbound logistics, marketing and sales and services to customers are needed to be taken into account. However, in this fresh fruit export value chain, inbound logistics are not so significant. Accordingly, outbound logistics, marketing and sales activities are the most prominent activities. Supportive activities including procurement, technology development, human resource management, and infrastructure are also crucial especially in the pomelo export value chain.

To find the weakest point of the value chain and its causes can be achieved through finding out of the pros and cons. A SWOT analysis is used to find out the internal and external factors during the value chain of pomelo. The analysis was developed in the 1960s by Albert Humphrey by using data from the top companies in the United States at the time. SWOT is used as a strategic tool to look at the direction of a business or to help make decisions. Internal factors are the strengths and weaknesses internal to the organization or market depending upon their impact on the organization's objectives. External factors compose of the opportunities and threats presented by the external environment to the organization.

Another analytical tool used in this study is the problem tree analysis. It is also known as situational analysis or problem analysis. Problem tree analysis helps to illustrate the linkages between a set of relationships by fitting them into a hierarchy of related factors. It is used for

³ [www.valuechains4poor.pbworks.com/w/page/12518345/Mapping %20the%20Value%20Chain](http://www.valuechains4poor.pbworks.com/w/page/12518345/Mapping%20the%20Value%20Chain)

linking the various issues or factors together which may contribute to an institutional problem and help identifying the underlying or root causes of an institutional problem.

In this study, efforts have been made to improve the value chain of pomelo export through finding out internal and external strengths and weaknesses through SWOT analysis. In addition, for the internal weaknesses, the problem tree analysis is used to explore the causes and look for ways to mitigate or eliminate these causes. In addition, share of profit and costs incurred by all stakeholders have been studied to explore the ways to enhance the added value of pomelo.

2.6 Reviews on Previous Studies of Value Chain

In many developing countries, value chain approaches practiced in the agriculture sector can be seen mostly in horticulture. As stated by Baloyi (2010), smallholder farmers in Limpopo Province have a comparative advantage in vegetable growing yet they have lack of access to commercial farming and high value added markets. In addition, the study found that, individual farmers can be able to access on – farm infrastructures and link to formal markets than a group of farmers. Most farmers in Africa are small holders with a lack of access to formal markets and better and cheaper inputs. Utilization of the value chain approach can solve this problem to a certain extent.

The weaknesses of value chain in horticulture have been examined by Hichaambwa (2010). Horticulture has long been regarded as highly promising export sector of the economy and also plays as a crucial role in rural income generation and urban consumption in Zambia. The sector has weaknesses of transport related losses, lack of standardization to enhance quality, low capacity of brokers for efficient brokerage leading to slower sales, poor crop management, poor hard market infrastructure, lack of storage capacity and limited processing capacity leading to great wastage.

The research suggested that capacity building for stakeholders in horticulture – growers, brokers, traders, dealers and consumers, investing in hard and soft infrastructures, enhancing the better flow of information and upgrading the storage and transportation facilities are a prerequisite for the development of horticulture in landlocked, LDC economy of Zambia.

The Madagascar Position Paper on post-harvest and transport technologies (2010) examined the challenges of the horticultural sector, issues relating to post harvest, transport, and marketing for domestic and international level. The paper suggested that although there is market liberalization, effective collaboration of public and private sectors is indispensable for ensuring benefits from the value chain approach in horticulture.

Larry C.Y. Wong and Eh Mywe Aye Wai (March 2013) examined that Rapid Value Chain Assessment: Structure and Dynamics of the Rice Value Chain in Myanmar. “The challenge is in getting the ‘basics’ and ‘balance’ right. After undergoing this process, these recommendations are expected to contribute greatly towards increasing efficiency, competitiveness and sustainability of the Myanmar rice supply chain and rice industry as we move into a more globalized and liberalized trading environment as well as a more integrated ASEAN in the 21st century.”

Raphy Favre and U Kyaw Myint (2009) focus on “An Analysis of the Myanmar Edible Oil Crops Sub-Sector”. They found that Myanmar has set some levels of standardization of marketed agricultural commodities which are sufficient for the domestic markets. Similarly, the prevailing maze of weight and measures units used in marketing oil crops has not been a major drawback to the operation of the domestic agricultural marketing system as most actors along the chain have become familiar of this diversity of units. Yet, in maintaining the ability of Myanmar to further develop quality export markets, it is critical to harmonize trade standards and measures. There continue to be substantial costs associated with the standardization of measures (e.g. replacement of all measuring implements), and the longer Myanmar waits to adjust to international standards, the higher will be the costs.

Myanmar is equipped with a few laboratories on food stuffs (MAPT50 and FDA51) that can conduct analysis on oil crops and edible oils. The MoLF is equipped to conduct nutritional analysis on oil cakes. Yet, despite the existence of laboratories, systematic food safety controls are not implemented, leaving room for unethical practices of edible oil adulteration.

Perhaps the major food safety concern is the use of recycled metallic drums which have transported chemicals, fuels and engine oils to store edible oils. Priority interventions from the study are to harmonize trade standards and measures in line with the international system, to value existing laboratories and the need for upgrading to satisfy food safety control

requirements in the edible oil crops sub-sector, to implement systematic food safety controls on oil crops, edible oils and oil cakes in all markets of Myanmar, to ban the use of recycled metallic drums to store and transport edible oils, to replace recycled metallic drums with clearly identifiable containers such as plastic drums, and to provide training to the private sector on international certification standards.

The above studies explore important features of value chain in agriculture from various aspects. Yet this study explores the weakest point of the value chain of pomelo exports in order to understand its causes. Finally, ways to reduce or resolve the problem will be found out for the future development of pomelo export value chain.

3. Research Methodology

3.1 Data Collection

To perform the value chain analysis for pomelo production and exports in selected townships of the Yangon Region, the initial step is to classify the stakeholders. The stakeholders involved in pomelo value chain compose of growers, collectors and exporter. Interviews were made with all groups of stakeholders from April to May, 2013.

Altogether 30 growers were interviewed for this study. Among them, 18 growers could not provide completers answers as they did not have records of their previous production as well as costs and other financial matters due to poor education levels. Among the respondents of 12 growers, only 3 could provide adequate answers. The remaining 9 growers' answers were confused and unclear.

For the collectors, there were 5 regular pomelo collectors within the study area. During the interview period, there is no processor for the pomelo market. However, in the future, there will be one potential processor who will produce dried pomelo and pomelo jam. In this study, only one exporter was interviewed for the pomelo market. The exporter has been exporting since last year.

The sampling frame is within the Yangon region and sample size in this study composes of 37 respondents including growers, collectors, wholesalers, retailers and exporters. Data

collection was carried out in selected townships of the Yangon Region from April to May 2013. Methods involved key informant interviews, focus group discussions and sourcing of production information from crop research institutes, statistical abstracts and farmers' groups. Subsequent to the data collection and preliminary analysis, industry experts were consulted to validate the draft results and seek feedback on major bottlenecks and recommendations for improvement.

3.2 Method and Technique of Data Analysis

This study explores the value chain of pomelo export in the Yangon Region with qualitative analysis. Primary data is obtained from interviewing all stakeholders. From the collected data, costs and profit margins of actors in each level along the value chain are calculated. In addition, internal and external assessments of the stakeholders at each stage of the value chain are carried out through SWOT analysis. Then, the problem tree and objective tree are constructed to uncover the causes and mitigation measures for the future development of the pomelo exports.

3.3 Description of the Study Area

Pomelo is grown in States and Regions of the lower part of Myanmar as our local saying "Upper Myanmar is Good for Mango and Lower Myanmar is Good for Pomelo". The study mainly stresses on pomelo production and exports of farmers in selected townships of the Yangon Region. The Region is selected as it is the main center for both trading and conducting business. The top three growing areas are Mawlamyine, Bago, Yangon and among them Mawlamyine is the best geographical area for pomelo cultivation. However, the local-people in this area use traditional methods and cannot carry out mass production. Another reason is that they are not interested in the export process since they have other hindrances such as difficulties in transportation, poor infrastructure, and lack of access to markets as well as higher costs of production and export. Due to these reasons, the selected area for this paper is Yangon.

Yangon is the main center for trading and business in Myanmar. The city is previously the capital city of Myanmar and now regarded as the main trading hub for all kinds of merchandise in Lower Myanmar. The international banking system is only available in

Yangon which is one of the best cities for commerce. Both air and sea freight trading are available in only Yangon. Currently, there is one more international airport in Mandalay that supports upper Myanmar traders. There are three main ports for sea freight in Yangon, Thilawa (Thanlyin), Bo Aung Kyaw (Yangon) and Asia World (Yangon). Much of the country's normal trade goes through Thilawa Port, the largest and busiest port in Myanmar. Thus, Yangon is recognized as having a high potential in agricultural production with main products including pomelo and other fruits, vegetables and ornamental plants.

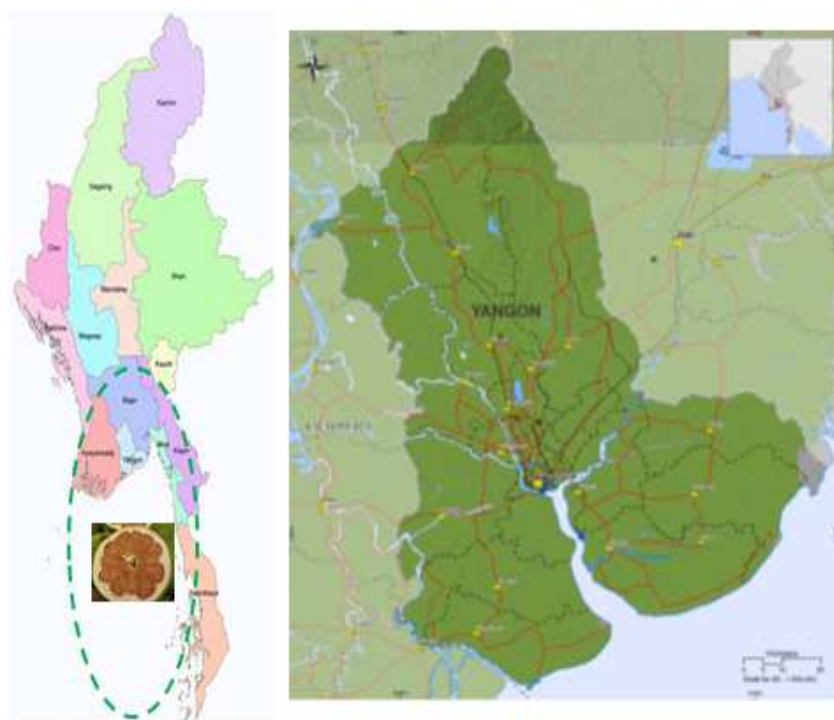


Figure 6. Location of the Survey Area

Source: Myanmar Information Management Unit (MIMU)

Within the Yangon Region as a whole, there are 33 townships. Among these 33 townships, only 3 townships (Hlegu, Hmawbi and Taikkyi) are mainly cultivated and the other areas have lesser cultivation. In this research, the main cultivated area of Yangon; Hlegu, Hmawbi and Taikkyi are selected. Hlegu Township is located in the northeastern part of Yangon city and on the way of the new Yangon-Naypyidaw Highway. Although it is near to the Yangon city township it is still largely rural. In Hlegu Township, Paunglin Dam and Ngamoeyeik

reservoir supply water to over 28,300 hectares (70,000 acres) of farmland between Hlegu and Yangon. In addition, they supply water of nearly 340 million liters (90 million gallons) daily to the people living in Yangon. Hlegu Township is also subdivided into 53 Village Tracts. Another area called Hmawbi Township is located northwest of the city of Yangon. In Hmawbi Township, is where the 1,016 acres (4.11 km²) of Myaung Dagar Industrial Zone is located. The zone is mainly intended for steel factories. Hmawbi Township is also subdivided into 40 Village Tracts. Taikkyi Township is also in the Northern District of Yangon Region, Myanmar. Taikkyi Township is subdivided into 3 towns that include Taikkyi town, Okekan town, and Ahpyauk town. Taikkyi Township is also subdivided into 75 Village Tracts.

In these townships, informal networks of financing play a key role for growers, such networks including; local money lenders at village or higher levels, agricultural input supply shops many of whom provide inputs on credit, and local collectors who will typically be the principle or sole buyer from a particular area and may either purchase the product harvest outright or provide storage services to the producer for later sale. These networks of social capital appear to provide the overwhelmingly dominant form of support to production and as such the logical entry point for external assistance.

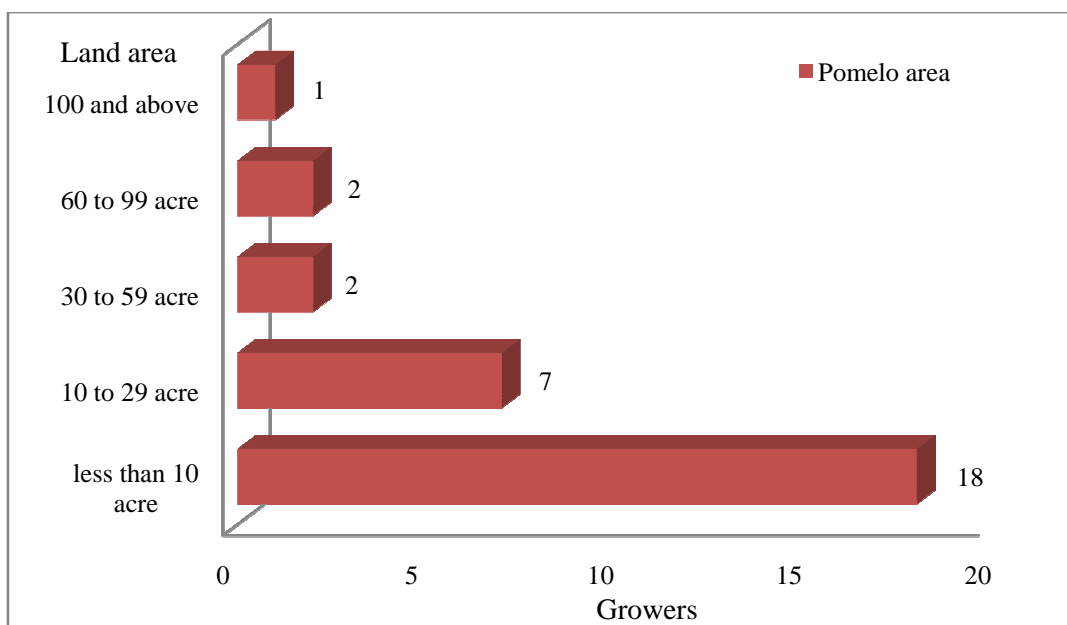


Figure 7. Land Access in Acres by Pomelo Growers (Survey April-May, 2013)

Source: Survey Data

The majority of the growers cultivate on small land areas for pomelo (about 18 pomelo growers use cultivate land area of less than 10 acres). In contrast, only one grower operates on more than 100 acres of land. Pomelo growers who possess 10 to 29 acres of land are only 7 in number, while 2 growers operate 30 to 59 acres and 60 to 99 acres respectively. From these data, it can be said that most of the total land area is not used to grow the pomelo. If they have certain market situations, they can emphasize more on the growth of pomelo than other crops.

3.4 Data Analysis

To analyze the current value chain of pomelo export in Yangon Region, relative financial positions of actors in the value chain are considered. The investments, variable, fixed and/or other relevant costs, and revenues are known and the financial position of the value chain actors can be analyzed. The marketing margin, characterized as some function of the difference between retail and farm price of a given farm product, is intended to measure the cost of providing marketing services. The margin is influenced primarily by shifts in retail demand, farm supply and marketing input prices. But other factors also can be important, including time lags in supply and demand, market power, risk, technical change, quality and spatial considerations. The marketing margin is the so-called price-cost margin and price-cost margins are best viewed as net margins including net of labor and other variable costs of marketing.

Economic analysis of the determinants of retail and farm price of pomelo in Yangon is shown in the following table. This marketing margin is based on the assumption of price-taking behavior in both the output markets for the final product and input markets for all inputs, including the market for the agricultural raw product. In this table, all actors along the value chain produce only for the national market and not for export markets. Marketing systems cannot be effective without being efficient in its operation. Marketing efficiency is the ratio of inputs to outputs. Typical inputs are land, labor, capital and raw materials whilst common outputs are service levels, specific volumes of products delivered to the customer and the provision of a given level of satisfaction.

Marketing efficiency is principally comprised of operational efficiency and pricing efficiency. The concept of pricing efficiency is only relevant to competitive markets. The

price mechanism directs resources to where there is effective demand and where maximum economic returns can be earned from those resources. In this value chain, retailers use the highest marketing cost along the chain. The marketing cost used by wholesalers is less than that of other actors within the chain but they can create higher profits than the other actors.

Table 1. Calculation of Marketing Cost and Marketing Margins

Value Chain Actor	Costs			Revenues	Profits		Margins	
	Unit Total Cost	Added Unit Cost	% Added Cost	Unit Price	Unit Profit	% Total Profits	Unit Margin	% of Margin
Farmers	A	-	A/F	G	G-A	(G-A)/(J-F)	G	G/J
Collectors	G+B	B	B/F	H	H-B-G	(H-B-G)/(J-F)	H-G	(H-G)/J
Wholesalers	H+C	C	C/F	I	I-C-H	(I-C-H)/(J-F)	I-H	(I-H)/J
Retailers	I+D	D	D/F	J	J-D-I	(J-D-I)/(J-F)	J-I	(J-I)/J
Total	F=A+B+C+D		100		J-F	100	J	100

*Added unit costs refer to the added costs at each stage of production net of the procurement cost from the previous stage.

Source: A tool book for practitioners of Value Chain Analysis

Note: A to J represents the financial value start from the unit cost of farmers to unit profit margin.

In this table, the division of investments, costs, revenues, net income (or profit) and margins among the actors in a value chain are considered. The aim of this step is to make conclusions about the final position of an actor compared with other actors in the chain. There are several ways to present the financial position of actors in a value chain, for instance, in a table or through a diagram. Table 1 is the example of how to calculate the formulas of value added margins and profits along a chain whereas the results from the study was calculated by using the given guidelines of DFID Value Chain Toolkit (2008).

3.5 Background of Pomelo Value Chain in the Study Area

In Myanmar, economic reforms in post 2010 encourage achieving a proper market economic system. New laws and regulations are promulgated to boost foreign investment, external trade and participation of the private sector. In addition measures in relation to rural development and poverty alleviation are carried out at the macro level. These policy changes and other external factors generate opportunities and threats for pomelo export within the Region.

Under pomelo horticulture of Myanmar, the first point on the value chain is the growers. They grow varieties of pomelo in the lower part of Myanmar. Then, sell these fruits by themselves in the local market as well as to retailers within their locality or to collectors who can distribute them to wholesalers. Subsequently, wholesalers again supply to retailers at the fruit markets. Those who directly sell to local retailers are not significant in this whole value chain process. Hence, this process is excluded in this study of value chain for export. Unlike other fruits, processing of pomelo has not been a major produce as efforts have been made by few firms to preserve the fruit in various forms – jam, juice, marmalade, etc. Hence, for exporting their products, fruits, growers have not accessed exporters directly. Between the two parties, there are various stages of intermediaries.

The second major point in value chain is the role of collectors. Collectors buy pomelo from farmers and then resell to wholesalers in various parts of the country. Collectors already have links with wholesalers from fruit markets of the major cities. They need to fulfill the required amount asked from various wholesalers. Therefore, in contrast to other type of businesses, inbound logistics – acquisition of inputs for growing pomelo – is skipped and outbound logistics begins from growers to collectors. The collectors then transport pomelo to wholesalers from major fruit markets in lower and upper Myanmar, i.e. mainly to Yangon and Mandalay.

The wholesalers sell the pomelo to exporters for foreign markets and retailers for domestic markets. In the value chain process, this link needs includes not only distribution and selling but also the process of marketing. Getting access to the potential exporter is important for wholesalers. Within the ASEAN region, pomelo is mainly exported by Vietnam and Thailand with the major importer being Singapore. Hence, for exporting high quality pomelo

for the foreign market, wholesalers need a required quality and volume at the right time. In this pomelo value chain, provision of customer service is rare and service can be provided only at the retail level.

The above mentioned activities are necessary to link properly with supporting activities to improve effectiveness or efficiency of the stakeholders. Among these supportive activities, procurement is crucial for collectors, wholesalers and retailers. For growers, maintaining HR is important. Pomelo growing regions have abundant labor resources with most of them persuaded by higher wages from other regions especially neighboring countries. Moreover, another supportive activity, technological development is also important for growers as well.

Infrastructure includes not only the physical infrastructure but also the market infrastructure. Even in Yangon, growers cannot access directly to the export market due to a lack of knowledge and poor transport infrastructure and facilities. Accordingly, it is necessary to find the internal and external factors that affect the value chain of pomelo export. The following figure describes the moderate value chain mapping for pomelo for the export market in Yangon in 2013.

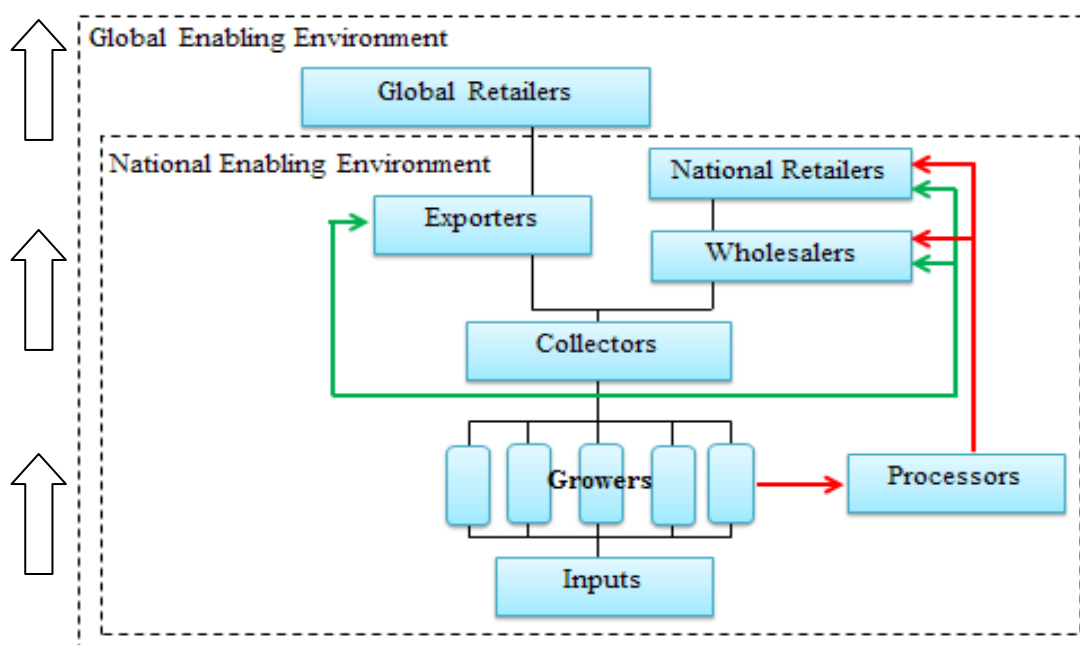


Figure 8. Value Chain Mapping for Pomelo Export in Yangon Region

Source: Author's Analysis

Like other value chains, the pomelo export process in Yangon Region starts with the regular system of inputs: growers, collectors, wholesalers and national retailers. Starting from last year, the order has extended from growers to exporters which have now started to send to Singapore. Another step of value added process is the link towards exporter that has to be taken into account. In the above figure, the potential processing firm is shown with a red arrow. The firm is inventing preserved pomelo for marketing in the near future. Hence, the current pomelo value chain in Yangon Region can be classified as follows.

Channel 1: Grower → Collectors → National Retailer → Final consumer

Channel 2: Growers → Collectors → Wholesalers → Final consumer

Channel 3: Growers → Collectors → Exporter → Global Retailers

Channel 4: Growers → Process Firm → Wholesalers → National Retailers

Unlike other countries, especially Vietnam, all the channels pass through the collectors stage who gain benefits. Growers cannot access retailers, final consumers or exporters at all. In addition, there is no special recognition or marketing of the benefits of pomelo and hence, Pomelo is not regarded as an ideal health fruit in Myanmar.

3.6 Analysis of the Value Chain

In analyzing the value chain of pomelo cultivation in the Yangon Region, the first step is to analyze by SWOT analysis. Internal and external factors that affect pomelo value chain in Yangon Region is examined based on interviews of stakeholders, personal observations and secondary data sources. In production and export of pomelo, various stakeholders face different strengths and weaknesses. Among them, farmers or growers face rigorous problems with the least income from the value chain.

Internal assessments of strengths and weaknesses are based on the main factors of the value chain analysis; inbound logistics, process, outbound logistics, marketing and sales, and service provision of specific stakeholders; growers and middlemen. The following table illustrates the internal factors affecting the value chain of pomelo exports.

Table 2. Strength and Weaknesses of the Pomelo Value Chain in Yangon Region

Strengths	Weaknesses
<p>For Growers</p> <ul style="list-style-type: none"> - Can produce high quality pomelo for export - Suitable geography and climatic condition - Availability of cheap labor - Availability of other inputs locally - Higher operational efficiency of employees - Able to expand the area of cultivating Pomelo <p>For Marketers</p> <ul style="list-style-type: none"> - Able to buy Organic Pomelos at a low price - Reselling at various markets; urban wholesale markets or few export markets with high prices - Enjoy profits 	<p>For Growers</p> <ul style="list-style-type: none"> - Lack of Irrigation Facilities - Lack of knowledge and education to expand market - Difficulty in accessing modern technology - Lack of risk reduction measures - Low investments caused by difficulties in access to financial facilities - Lack of storage facilities - Limited value adding - Lack of local management expertise - Lack of Research and Development <p>For Marketers</p> <ul style="list-style-type: none"> - Lack of innovation in market changes - Unable to access wider export market - Lack of bargaining power in export market

Source: Survey Data

Myanmar possesses strengths in the standard quality pomelo for exports due to its geographical and climatic conditions. In addition, the use of traditional techniques encourages the production of organic fruits. In addition, pomelo is a type of perennial crops. Accordingly, inputs can be accessed domestically including labor. One of the strengths of the pomelo market is that current cultivation can supply higher demand from abroad as well as availability of arable land in the future. In contrast, most growers only know how to grow the fruits traditionally. They have a lack of knowledge and education to expand the market. Consequently, innovation in market changes, risk reduction (production risks, marketing risks, financial risks, etc), are value added, research and development and management

expertise become a lower priority. These factors can generate lower profitability for their products and can be exploited by intermediaries.

Another drawback for growers includes a lack of financial and physical facilities. Although there exist some loan programs from the Ministry, the availability is low and insufficient. Hence, most borrow from outside sources with at the market rate of interest. This generates a vicious cycle for farmers in settling these loans. For logistics processes, it is difficult to measure as collectors spend outbound logistics of pomelo to the urban market.

The next step is to analyze the external factors affecting the value chain of pomelo production and exports. These external factors mainly stress on supporting factors of the value chains analysis. They include infrastructure, human resource development, technology and procurement. Yet, in the pomelo case, government policies are included as one of the supporting factors. The opportunities and threats of the pomelo market are portrayed in table 3.

Table 3. Opportunities and Threats of the Pomelo Value Chain in Yangon Region

Opportunity	Threat
<p>For Growers</p> <ul style="list-style-type: none"> - Initiation to collaborate with Ministry concerned, UMFCCI and INGOs - Training and Technical Assistance - High Potential for greater foreign demand other than existing foreign market - Government initiations for poverty alleviation and development of SMEs - Encouragement of Rural Development programs by the government at various levels 	<p>For Growers</p> <ul style="list-style-type: none"> - Poor production and market infrastructure - High local transport costs - Lack of access to urban and export market - Lack of credit facilities - Migration of labor to neighboring countries - Low policy priority for exports of fruits and horticulture products - Need for proper training and education program for management techniques for local farmers to gain value added - Need to enhance current technical assistance projects and sustain them

Opportunity	Threat
<p>For Marketers</p> <ul style="list-style-type: none"> - Government Policy towards market economy - Expanding to Export Market - Initiation of market exchange rate 	<p>or Marketers</p> <ul style="list-style-type: none"> - Transport charges changes - Labor shortage - Lack of Bargaining Power - Inelastic demand

Source: Author's Survey Data

In production and export of pomelo, opportunities for assistance include government and INGOs, changing trend of government policies towards the rest of the world, i.e. especially after the 2010 initiative for greater demand for pomelo and other fruits of Myanmar from abroad. In addition, encouragement of domestic reforms particularly the rural development programs and encouragement of SMEs to local producers to boost their production. Yet, there are also threats for the market as well.

Being a developing country, poor production infrastructure and market infrastructure lead to high transaction costs. For the growers and other stakeholders of pomelo, the lack of collaborative efforts and unionization brings about exploitation from foreign buyers. Lack of credit facilities, low policy priority for exports of fruits and horticulture products by the public sector and insufficient training and education program for local farmers impede availability of a higher value added. Another threat is the migration of youth to work in neighboring countries where they obtain higher wages in recent years. High transport and other transaction costs also cause retailers to incur high costs in the value chain.

In order to understand the impacts of the current value chain of pomelo on various stakeholders, another type of analysis is examining of added unit cost and profits of all four actors, farmers, collectors, wholesalers and retailers. As stated in the previous chapter, it can be said that the added unit cost is more than that of the profits which is similar to the unit margins.

From this value chain analysis, the second way of increasing value is the most appropriate for pomelo export in Yangon Region. By reducing the steps between growers and exporters, prices will be lower and growers and consumers can gain benefits. Among the four value chain actors, retailers spent the most added units of marketing cost, 39%, but the wholesalers

spent only 11%. Based on the data, the wholesalers can gain the highest unit profit of \$0.27 (33%), whereas the farmers have the lowest unit profit, which is \$0.18 (22%).

It seems that while the farmers have to pay the least amount for the revenue, the collectors and wholesalers have to pay \$1.45 and \$1.95 respectively. The lowest profit earners, the farmers, had to pay the least revenue which is only about \$0.56. However, retailers have to pay the revenue of about two times more than that of the others. In unit margins, the percent of farmers and wholesalers are similar (19% & 17% respectively) whereas those of collectors and retailers are about 30%.

Presenting the total costs, revenues and profits per actor in a year shows the scale of an actor's business. This is important because if only the profit per unit is considered, an actor might appear to have an unfair share as they make only a small profit per unit. However, looking at the actor's total profit per year may demonstrate that the actor actually earns a reasonable income. In conclusion, among all the value chain actors, the wholesalers have the most profit with very little amount of cost.

Table 4. Calculation of Marketing Cost and Marketing Margins

Value Chain Actor	Costs			Revenues	Profits		Margins	
	Unit Total Cost (\$)	Added Unit Cost (\$)	% Added Cost	Unit Price (\$)	Unit Profit (\$)	% Total Profits	Unit Margin (\$)	% of Margin
Farmers	0.38	-	17	0.56	0.18	22	0.56	19
Collectors	1.28	0.72	33	1.45	0.17	21	0.89	30
Wholesale rs	1.68	0.23	11	1.95	0.27	33	0.50	17
Retailers	2.80	0.85	39	3.00	0.20	24	1.05	35
Total		2.18	100		0.82	100	3.00	100

*Added unit costs refer to the added costs at each stage of production net of the procurement cost from the previous stage.

Source: Author's Survey Data

Added unit costs refer to the added costs at each stage of production net of the procurement cost from the previous stage. The diagrammatic presentation of the value chain margins is shown in Figure 9.

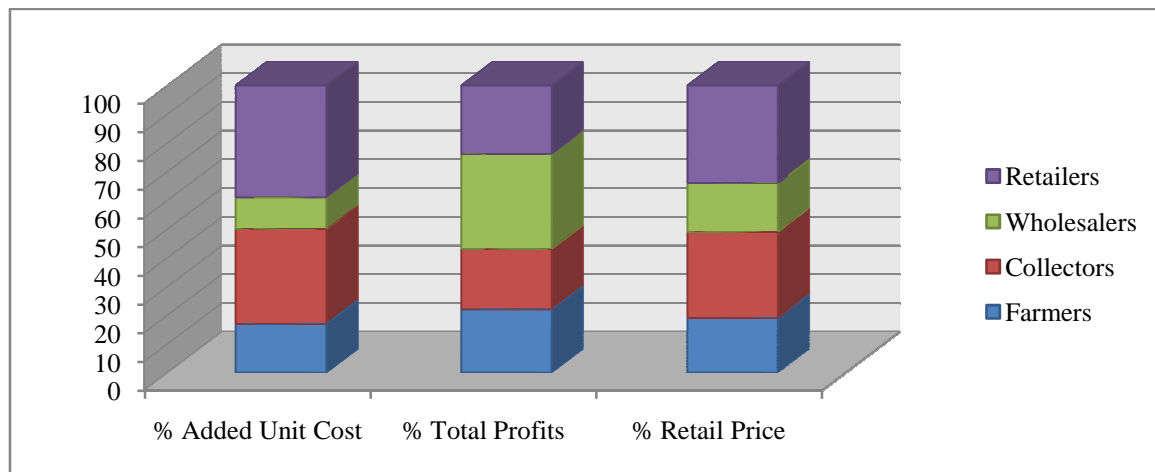


Figure 9. Value Chain Margins for the Actors in Each Level of the Value Chain as % of the Overall Value Added

Source: Table 4

It may be evident that the farmer incurs high costs and has little profit, while the wholesalers can have more returns than costs. This suggests that costs and margins are shared unequally in the value chain. The intervention might be scaling up the business of an actor in a chain in order to make the business more attractive for the actor. Resolving these threats and weaknesses are necessary in order to gain added value for all stakeholders. In order to mitigate them, challenges and constraints of the pomelo value chain are highlighted to find out possible measures to mitigate and eliminate them. The following table presents the challenges and constraints of the stakeholders facing the difficulties and the possible solutions throughout the pomelo value chain. The first challenge is the availability of water. Since growing of pomelo needs enough water to have quality and mass production, especially in summer period, but it needs to have an irrigation system for about 5 months so tube well water must be used in this process. Irrigation is mainly from natural resources and techniques should be learned from the MOAI (Ministry of Agriculture and Irrigation).

If natural resources are rare or the plantations are not near the river or near water sources, the only way to solve the irrigation system is to use tube well water for plantation. During summer, if the water is not adequate, fruits fall down before they are ripe and can badly affect

fruit production. To use the tube well water, electricity is essential and if it is not available at all times a generator including engine and fuel should be ready.

Table 5. Challenges and Constraints of Growers in Pomelo Value Chain

Issue and Constraints	Possible Solutions
Irrigation	Tube well
Production Technology	Knowledge sharing program, work shops
Lack of Marketing knowledge	Communication and participation in Exhibitions
Irrigation & resource management	Learn from MOAI
Diseases	Cure by pesticide & fungicide / treatment for disease
Theft	plants
Harvesting	Use more labor for security
Financial supporting	Try for retail market as much as they can because wholesales price vary less than market price
High risk of seedling	Loan with low interest rate from Govt. or NGOs
Fruits fall down before ripe during summer	Substitution, Improve seed multiplication and distribution
Insect attack when plants have new leaves	Irrigation
Difficulty for irrigation without electricity; 5 months a year	Pesticide and maintain birds; birds that eat insects
Labor shortage	Tube well; Engine, Fuel
Packaging system	
Value addition/ post-harvest	Hire from other regions
Export market development	Loan
Investment costs very high	Processing technology Export/Import regulations and associated incentives Contract farming

Source: Author's Survey Data

The growers need appropriate technology and to do so, knowledge sharing programmes and workshops should be held for them. Thus, for the pomelo growers, the FAO provides the

supporting program for 3-year project. The first year has begun from the 14th to 17th February 2012 to provide crop management training to 50 selected growers. In the second year, only 3 growers from 3 demonstration farms were provided with the IPM (integrated pest management) training, evaluation and monitoring from 13th to 21st February, 2013. The third year program is still uncertain. Based on the provided training program, the MFFVPEA association have provided and extended training program as well as knowledge training to the growers on how to use the fertilizers and organic techniques.

The growers should be given knowledge of probable diseases in their farms, by doing so they should know how to prevent these prior to the incident. They should also be given training in managing immediate actions of these diseases since pomelo plants are long term plants and take at least 5 years to bear fruits. There will also be a production gap minimum of 5 years and during this time farmers will incur expenses.

Another consideration should be the training of pesticides and fungicides usage and by learning so; the growers will know how to cure treatment their farms. Most insects are usually found during the time when the plants have new leaves. Hence, it is not only necessary to use suitable insecticides, but also natural birds which can maintain the nature also needs to be raised to eat the insects on the plants; this is an eco-friendly approach to controlling pests and insects. The MFFVPEA should occasionally solve the growers' inquisitive questions but it has not supported this totally to allow full potential of the mass production of fruits. Thus, provision of a regular knowledge sharing program and regular workshops can support the production technology and can enhance quality mass production. Better technology provides not only quality assurance but also better food safety.

At present, the seedlings in each farm are not uniform. This means that even though, the seedlings are for white pomelo, not all plants are white pomelo but are mixed with the other genes. If substitutions are made in the old farms, uniform seedlings should be confirmed. If new farms have to be undertaken, all the seedlings used should be selected to be uniform. If possible, the guaranteed seedlings only should be bought.

In the case of harvesting, most growers wait for the collectors and certain market demand to control wastes and other expenses, thus the maturity in the plants can cause defects in quality of the fruits. Thus they should have a wholesale market and export market to pluck the fruits

at the right time and to sell the bulk fruits. There are also many thieves during the fruit ripening period so the produce needs to be protected. Security to guard the plantation area also adds to the increasing costs.

A financial supporting system is essential for the entire process of cultivation and production. At present, growers solve the financial problem by taking local loans which have a high interest so they are in the spiral of debt and loans. If the government or NGOs can provide growers with financial support at low rates of interest, they can have more profit. If the growers use the value added process, fresh fruits will be more valuable than raw. In the post-harvest handling technology, storage facility, packaging system and packing house are necessary but these processes need high costs. To solve these processes, unless local can do that, foreign direct investment (FDI) is required.

For wholesale and export, a marketing process is essential since the growers can't do the marketing themselves and don't have enough market information and lack the resources to do it. They just rely on middle men for their earning so they suffer from middle men exploitation. To avoid these situations, they need improved communication and participation in local as well as international exhibitions. They should also visit local and neighboring countries.

Recently, 10 pomelo growers visited the farms in Thailand in 2012 and 43 members of pomelo growers visited the Horti Asia 2013 Exhibition in Thailand. They should continuously learn to receive international information and if the association or other organizations can regularly support this there will be continuous benefits for growers. Now, the MFFPVEA association opens the farmers' market in Thirimingalar wholesale greengrocers and the growers can sell their produce and have direct markets to consumers. By doing so, they can have more opportunities direct dealing with the customers and more market information. As many markets as the growers can reach, they can have more and more opportunities to improve their livelihood.

If they can access export markets, they can have mass sales within a short period of time and can improve their earnings. If they can produce potential products such as pomelo and can have a regular export market, exports of more surpluses of agricultural products will help

increase foreign exchange earnings and assist rural development through agricultural development.

One of the constraints is the migrant of labor who move from locale to better places for higher earnings so that they have to find the labors from other areas and have to spend more money to find the labor and their cost of staying there. Farmers at present grow these crops using traditional methods, without proper knowledge of new technologies that have been developed for training, pruning, fertilization, fruit thinning, etc. Poor road infrastructure, transport and irrigation facilities are also major constraints in Myanmar.

Table 6. Effects of Pomelo Value Chain

Causes Issues	Technology I	Market Information II	Fund Raising III	Integrated I+II+III
Cost	High	Medium	High	High
Technology	Appropriate	Appropriate	Low	Appropriate
Social Risk	Low	Low	High	Medium
Possibility of increase Quantity Export	Medium	High	High	High
Negative Environmental Impact	Low	-	Low	Low

Source: Author's Survey Data

According to the information from survey, it is found that raising funds is high in 3 issues, except technology and negative environmental impacts. It can be said that raising funds is the most frequent experience that affects production and export of pomelo among farmers. The effects of the two factors, technology and market information are not as severe as raising funds. Among the five issues, cost is also high in most of the categories. Farmers and stakeholders face costs related issues during the value chain process of pomelo export. The major reason for cost issues include lack of infrastructure, difficulty in access to market, and poor technology for mass and quality production.

By integrating all three sectors, the cost and possibility of increase in quantity exports are high but the negative environmental impact is low. It can be said that these two issues, cost and mass production hamper the production and export of pomelo in Yangon. Major reasons are higher costs for using advanced technology, high raising funds cost (especially due to high interest rates from informal sources), difficulty in access to larger markets, and difficulty in raising required capital for mass production. By solving these issues, the required output, intermediate outcome and end outcome can be achieved.

To resolve the issues, a problem tree approach is used to analyze the causes and effects of a negative outcome. The problem tree is shown in Figure 10.

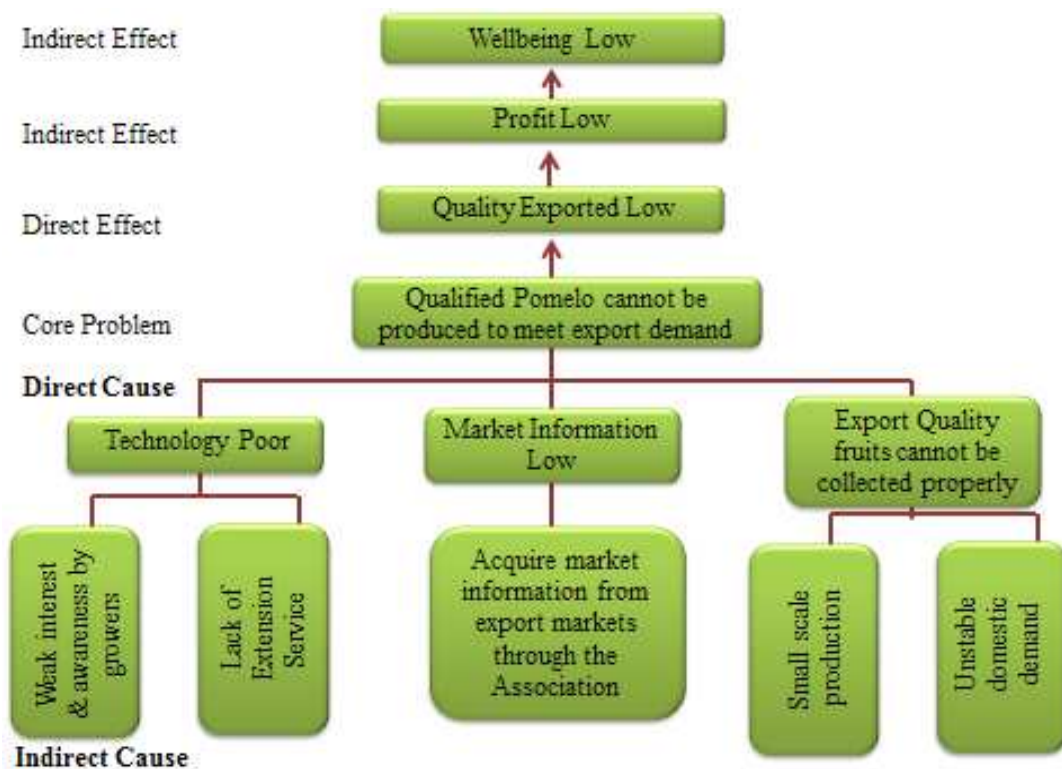


Figure 10. Problem Tree

Source: Author's Survey Data

There are three main direct causes of low profit or low wellbeing. These are as a consequence of poor technology and low market information. Another reason is that export quality fruits cannot be collected properly by middlemen and collectors. Poor technology means that the growers are not so interested in the technology and are not aware of that as well. Perhaps the worst of all is the lack of an extensive service.

Another factor is that the growers cannot acquire enough market information from export markets through the association. The third factor concerns local farmers, their small scale production and instable domestic demand. This results in poor quality fruits and inability to achieve export quality. Because of these factors, qualified pomelo cannot be produced to meet export demand and that is the core problem. From this result, the direct effect is that the export quality is low followed by low profits and low well being as indirect effects. In contrast to problem tree, the objective tree attempts to solve the negative aspects mentioned in the problem tree. The objective tree is presented in Figure 11.

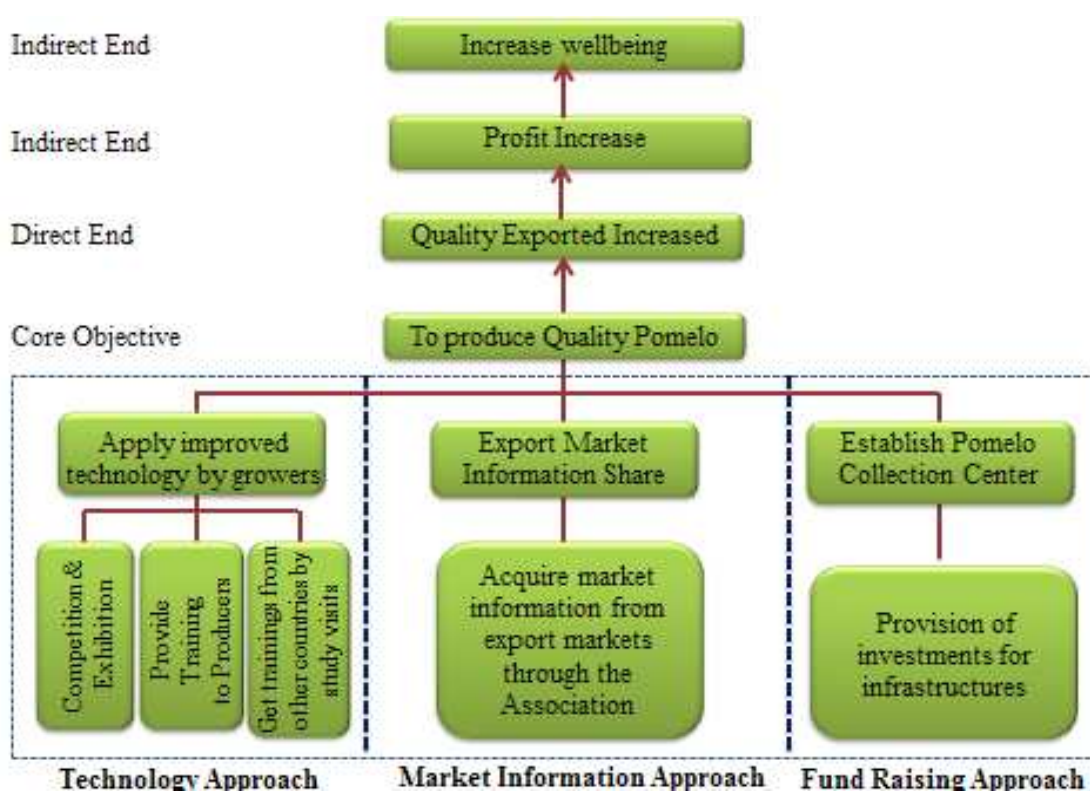


Figure 11. Objectives Tree
 Source: Author's Survey Data

To complete these objectives, three main approaches: (technology approach, market information approach and fund raising approach) are focused upon. Firstly, in the technology approach, competitions and exhibition are undertaken for all growers. All producers are provided training and they can also receive trainings from other countries through study visits. These three activities are carried out to apply improved technology by growers.

Secondly, in the approach of market information, export market information is shared to acquire market information from export markets through the association. The last approach is the fund raising approach and this can be done to establish a pomelo collection center by providing investments for infrastructure. By achieving these approaches, the core objective of producing quality pomelo can be attained. By doing so, the direct end is to increase quality export. Based on these processes, the indirect objectives are to increase profit as well as wellbeing.

4. Results and Discussion

Up till now, agriculture is regarded as a main stay for the population in Myanmar and horticulture has become a potential for the export market. Myanmar has abundant land resources for expansion of horticulture. Among them, production of pomelo is rising with an increasing trend. In the lower part of Myanmar, pomelo plantations have been in existence since ancient periods, yet most of the products are intended for the domestic market.

In recent decades, production and export of pomelo from South East Asian countries, especially Thailand and Vietnam have increasingly contributed to the global market for pomelo. Malaysia and Singapore followed the export of pomelo after Thailand and Vietnam. In 2008, the ASEAN share of pomelo export contributed only 0.6% but increased to 1.4% of total world export of pomelo. Myanmar initiated the export of pomelo in 2012 which amounted to US \$ 1,200 (20 MT). The amount of export will be expected to rise in the coming year.

5. Conclusions and Recommendation

5.1 Conclusions

From this study, the value chain of Pomelo in Yangon region has been shown to differ from the usual value chain. Pomelo is sold and exported in its natural condition. Hence, growers play a vital role in producing quality pomelo for domestic and export markets. Current pomelo value chain in Yangon has 4 channels and three of those channels need to pass

through collectors. There is no chance for growers to meet wholesalers in the domestic market or exporters.

Based on our observations, growers face more weaknesses than marketers in the value chain of pomelo export in Yangon Region. Although growers have strengths of resource capacities for future expansion such as an abundance of land, favorable weather conditions and good farming practices, weaknesses relating to internal inefficiencies, and inadequate knowledge and technology hamper their potentials. In conducting an external assessment, although NGOs, NPOs and the Government are initiating in pomelo value chain, poor transport infrastructure, deficient credits, reduced policy priority and technical assistants still exist.

In contrast, wholesalers receive greatest profit, followed by collectors. Retailers have to incur costs of about two times more than that of the others. In order to meet foreign demand as well as improve the gain of local pomelo growers, upgrading the current value chains of pomelo production and exports towards more appropriate one is indispensable. Accordingly, challenges and threats faced by the most affected and the most prominent stakeholder, growers are explored.

In Myanmar, the major beneficiaries within the pomelo value chain process are intermediaries, especially the wholesalers. Their cost is the least among other stakeholders and they gain the highest profits. For the retailers, although they can make profit, their cost is the largest among stakeholders, even higher than growers. In fact, the main stakeholder among them is growers and uplifting their production and added value from pomelo is necessary. By doing so, their income and employment opportunities will become high and this in turn leads to their livelihoods as well as regional development. In addition to this, poverty reduction will be enhanced among farmers. However, this cannot be achieved without removing the influence of middlemen.

Analysis of the problem tree and objective tree explore the direct and indirect causes of the problem among farmers/growers. Among them, major hindrances for expanding their exports are poor technologies, low access to market information, and mass production of high quality pomelo to meet foreign demand. These three factors are rooted from poor awareness, lack of extension services, and lack of contact with markets, small scale production and

instable demand condition. Due to these factors, low productivity of quality pomelo will be incurred.

This enhances low exports, which lead to low income, profit and living standards of farmers. At the same time, external challenges such as policy changes, exploitation of middlemen, and other factors can also affect productivity and exports. Hence, the objective tree analysis illustrates mitigation measures for the above negative causes and effects.

5.2 Recommendations

The main aim of the value chain process is to improve export earnings by increasing the productivity and marketing process of quality pomelo within the region. To fulfill this aim, the first and immediate action is to improve productivity of quality pomelo. Then, mass production of quality pomelo can be attained and processed to the export consortia.

To reduce the direct and indirect negative effects in the value chain, utilization of appropriate technology and quality assurance are a prerequisite. The first step involves technical trainings, competition and exhibition and study visits abroad as well as to local regions. The next step includes quality seedlings that are provided to the main growers. The required fertilizer is also needed to be supplied. Then, sufficient post-harvest implements and tools are also vital. After the post-harvest process, the important processes such as storing in the warehouse, cool storage, sorting by machine, packaging, transport vehicles and generators also play a central role for quality product export. Infrastructure investment and trading agreement forums are also important and need to be supported by the public sector. However, these remedies necessitate sufficient findings as well as a policy priority.

From the information mentioned above, it can be concluded that among all the value chain actors, wholesalers have the most profit with very little amount of cost. Government policy should be enhanced to upgrade the production of horticulture as well. In addition, individual fruits clusters (unions) should be organized to achieve bargaining power for the small holders and rural farmers to achieve a better standard of living. Complex procedures related to exports should be reduced. Otherwise, smallholders will not be able to reach the high value added level at all.

From the analysis, the following factors can be deduced. The future prospect of the export market can be achieved through mass production with the desired quality within a targeted time. For local growers alone, the ability to contact export markets is impracticable due to the lack of skill, knowledge and experience not only for mass production, but also for marketing and exports of fruits to buyers. That is the reason why the role of intermediaries becomes crucial for the value chain process.

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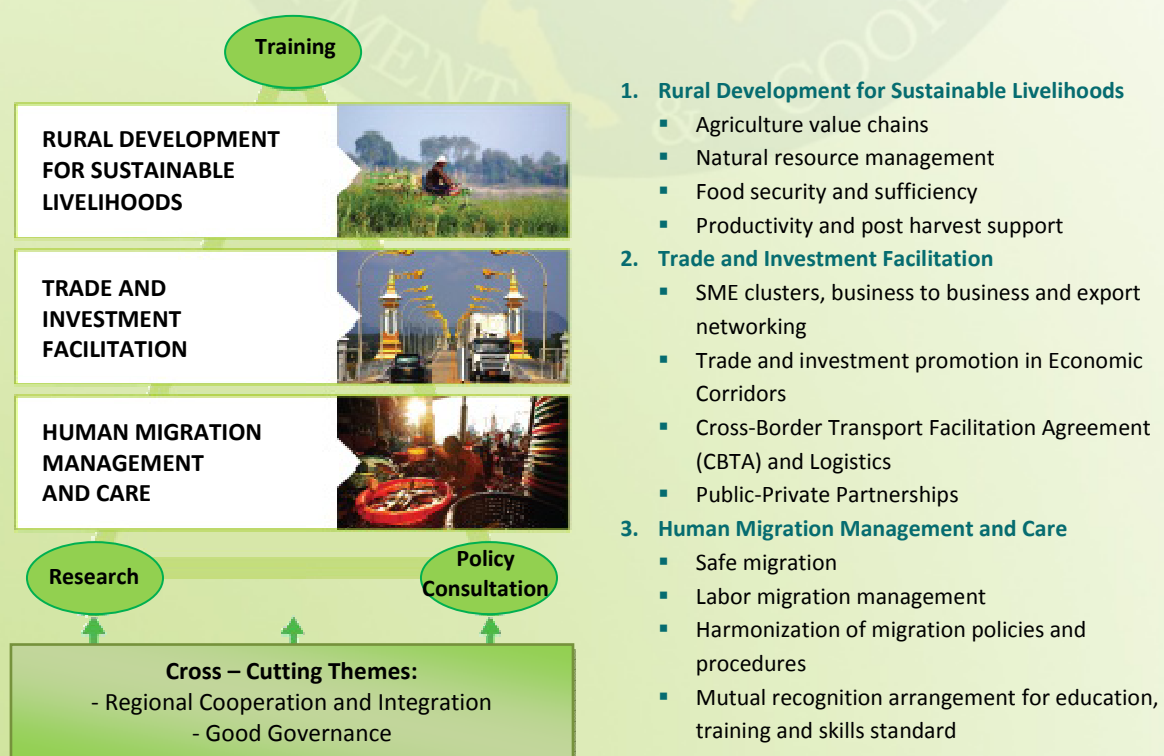
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