YANGON UNIVERSITY OF ECONOMICS

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A STUDY ON VALUE CHAIN OF MANGO IN MYANMAR

(CASE STUDY: MANDALAY REGION)

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EMPA-50 (15th Batch)

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A STUDY ON VALUE CHAIN OF MANGO IN MYANMAR

(CASE STUDY: MANDALAY REGION)

A thesis submitted as a partial fulfillment towards the requirements for the degree of Master of Public Administration (MPA)

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This is to certify that this thesis entitled "**A Study on Value Chain of Mango in Myanmar (Case Study: Mandalay Region)**" submitted as a partial fulfillment towards the requirement for the degree of Master of Public Administration has been accepted by the Board of Examiners.

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ABSTRACT

In Myanmar, nurturing horticulture is indispensable in recent years due to increasing demand from local and foreign markets. This study aims to identify the current situation and constraints faced by growers in mango value chain in Kyaukse Township and to find out the preferences of local consumers on mangoes. Descriptive analysis is used based on primary data. Survey was made to observe growers' marketing and distribution channels and consumers' buying preference and consumption patterns. 100 growers from major mango growing area, Kyaukse Township and 200 consumers from urban downtown Townships of Mandalay City. It was found that majority of the growers facing major challenges in access to labor, modern cultivation techniques, new market, practicing good agriculture practice and getting information from foreign market. In contrast, growers have strengths of getting information from local market, access to financial capital, farm equipment, land and high-quality seeds throughout the mango value chain. From the consumers' side, they preferred high quality mangoes from modern retail stores in the city. In addition, consumers buy mangoes through checking more on blemished and damaged conditions while some consumers started to check whether the mangoes are free from chemical fertilizers and pesticides.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

ADB	Asian Development Bank
ASEAN	Association of South East Asian Nations
DOA	Department of Agriculture
DOP	Department of Population
FAO	Food and Agriculture Organization
GDP	Gross Domestic Product
GVC	Global Value Chain
ICT	Information and Communications Technology
LDCs	Least Developed Countries
MFVP	Myanmar Fruit, Flower and Vegetable Producer and Exporter Association
MNCs	Multinational Corporations
MOAI	Ministry of Agriculture and Irrigation
MOALI	Ministry of Agriculture, Livestock and Irrigation
MT	Metric Ton
NGOs	Non-Governmental Organizations
3Rs	Reading, Writing and Arithmetic
R&D	Research and Development
UMFCCI	Union of Myanmar Federation of Chambers and Commerce and Industry
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme
UNIDO	United Nations Industrial Development Organization
USAID	US Agency for International Development
VC	Value Chain
WBCSD	World Business Council for Sustainable Development
WDI	World Development Indicator

CHAPTER I
INTRODUCTION

1.1 Rationale of the Study

Myanmar is well-known for its large agricultural economy for several decades. Yet the country needs to upgrade its agriculture sector up until now. Recent transformation in Myanmar after 2011 produces new policy measures to improve agriculture and develop rural areas yet it is still facing challenges. Traditionally, rice is regarded as main staple and export item. Since early 1990s, pulses and beans started contributing as major export and cash crops for farmers. At present, Myanmar has potentials in growing, marketing and exporting fruits which can enhance income of rural people. However, most of the horticulture products are still marketed in domestic market alone due to poor ability to follow local and international regulations. Knowledge and practices concerning agricultural certification is still low. Therefore, exports of raw agricultural products are still limited for Myanmar. On the other hand, poor knowledge in producing high value added agricultural products impede opportunities for poor.

Around the world, demand for horticulture products, especially fruits, is growing, yet access to export market by Myanmar growers is still low. Among several horticulture products, Myanmar mainly exports watermelon, honeydew melon, mango, and pomelo to other countries. Among them, mango is mainly exported to China through border trade route as well as Singapore through normal trade route since past decades. In Myanmar, there are about 200 species of mangoes with their seasons in summer and monsoon, from April to July. Some species are renowned for exports while others are marketed in local market as fresh fruits and value-added products such as Mango Leather, Pickle, Juice, Dried Mango, etc.

Mango growers in Myanmar are still manipulated by middlemen throughout the mango value chain in all parts of the country. Majority of the mango growers only rely

on collectors and wholesalers. Theoretically, fewer stakeholders throughout the value chain may generate greater profitability for growers. Therefore, larger value chains generate low returns for growers due to the exploitation of middlemen, which is mainly faced by Myanmar growers. In Myanmar, mangoes can be grown in all parts of the country yet they are mainly grown commercially and extensively in Mandalay Region and distributed to all parts of the country as well as exported to China. After increasing local demand and export of mango to China, the number of mango growers has increased in Mandalay Region. In addition, new flows of mango value chain are created with the use of ICT in recent years as well.

In this situation, improving value chain of mango in Myanmar can hope to enhance profitability and benefits for growers, which help upgrading their lives and contribute to economic development of the region or the country. At the same time, consumer demand for mangoes are increasing and changing based on tastes, preferences, health awareness, etc. Nowadays, organic mangoes and mangoes with specific brands are demanded more by customers. As the demand conditions of the foreign countries are difficult to assess, local preferences of mangoes are also required to study in order to improve the local chain processes.

Thus, this study aims to analyze the growers' challenges in value chain of mango and consumers' demand. To study this, Kayukse Township in Mandalay Region is selected as the township is renowned for planting and distributing mangoes locally and internationally. In addition, the species planted in Kyaukse Township are the most popular among local consumers.

1.2 Objectives of the Study

The objectives of the study are to identify the current situation of mango growers and their constrains in value change process and to analyze the preferences of local consumers on mangoes.

1.3 Method of Study

The method of the study is descriptive method, based on primary and secondary data. To analyze the growers' side, their marketing and distribution channels, their constraints and strengths in mango value chain are studied in Kyaukse Township. 100 growers of different land ownership of Kyaukse Township have been selected to

conduct survey. To obtain primary data, two surveys were conducted between April and June, 2019 in Kyaukse Township and Mandalay City within the Mandalay Region.

To find out the growers' value chain, Kyaukse Township is selected to make thorough study on mango value chain. From the Kyaukse Township, total of 100 mango growers are selected from five villages (Kyauk Sout Kalay, Kyauk Sout Kone, Dann Tine, Let Pan, and Kyauk Pa Sit Villages) to conduct a survey concerning their mango value chain. In particular, demographic characteristics, business information, input information, and marketing and distribution information were asked. Also, strengths and constraints of growers in different mango value chain are studied.

Another survey was carried out to 200 consumers from 4 townships of the Mandalay City (50 each from Maha Aung Myay, Chan Aye Thar Zan, Chan Mya Tharzi and Aung Myay Thar Zan Townships) are asked about their preferences in buying mangoes from different sources. Specifically, their demographic characteristics, mango buying preference, buying pattern and consumption pattern were asked to understand the current domestic urban market.

For observing consumers' demand preferences, 200 consumers were chosen from four downtown townships of Mandalay City by convenient sampling method to find out their preferences and choices of suppliers. Respondents are selected from urban areas of Mandalay City. Secondary data is used for illustrating the current condition of mango cultivation and its related products production within the Region. Secondary data was obtained from published sources of domestic and international organizations.

1.4 Scope and Limitations of the Study

This study identifies the growers' situation and consumers' buying decisions in mango value chain of Kyaukse Township. Yet other actors in addition to growers and consumers (collectors, wholesalers, retailers, and exporters) are excluded in this study. Kyuakse Township is selected for the study as it is the place, where mangoes are grown for commercial purpose. Also, processing of mangoes to high value added products are very low in this study area. Therefore, processing is skipped in making value chain analysis. Emphasis has been made to study the growers' marketing and distributional channels and current preferences of buying mangoes by urban consumers.

1.5 Organization of the Study

This study composes of five chapters. Chapter I is the introduction including rationale, objectives, methods, scope and limitations and organizations of the study. In Chapter II, literature review, includes theory of value chain, value chain analysis in agriculture, challenges face by grower in value chain and reviews on previous studies on agricultural value chain are explored. Chapter III is the overview of fruits value chain in Myanmar that includes background of horticulture subsector in Myanmar, mango production in Myanmar and background of the study area. Chapter IV is the analysis of the value chains for mango in selected townships that take into account demographic characteristics of the growers, business information (operation) of the growers and channels of mango value chain. In addition, consumers' preferences in buying mangoes are also presented in chapter IV. Finally, in Chapter V, the study is concluded with findings and recommendations.

CHAPTER II
LITERATURE REVIEW

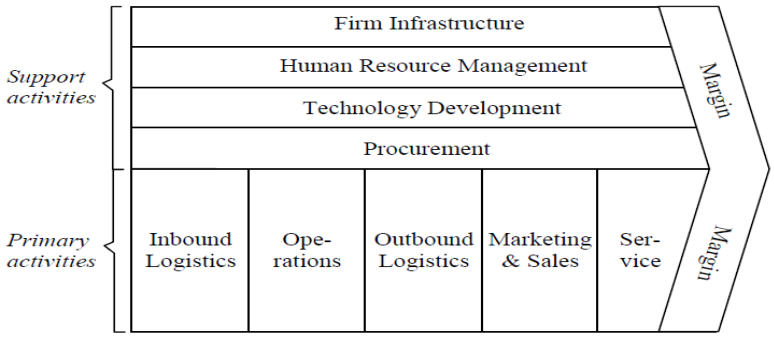
2.1 Definition and Concept of Value Chain

Value chain refers to all the activities undertaken by a company from initially purchasing raw materials and then manufacturing a product, to placing it on the market ready to be bought by consumers. All the value-adding activities in the value chain are interlinked, and are designed to make the best possible product or service, thus giving the commercial enterprise a competitive advantage in the marketplace (WBCSD, 2011).

Defining value chain is initiated in business sector as the sequence of value-added activities, from production to consumption, through processing and commercialization. Each segment of a chain has one or more backward and forward linkages and chains operate within a complex environment of policies, regulations, institutions and support services.

Value chain analysis is the process of breaking a chain into its constituent parts in order to better understand its structure and functioning. The analysis of value chain was firstly implied in the realm of business management by Michael Porter in 1985 to work out for creating largest possible value for customers. Generic value chain of Porter is illustrated in figure 2.1.

Figure (2.1) Generic Value Chain of Porter



Source: Porter (1985)

The value chain is regarded as internal processes of a firm to design, produce, promote, deliver, and support its product. In particular, the analysis is used as a tool to identify the value in each stage of production. He stressed the analysis mainly on the achievement of competitiveness, i.e. cost advantage and distinctive capabilities. Based on the above figure, Primary activities are grouped into five main areas including inbound logistics, operations, outbound logistics, marketing and sales, and service. Inbound logistics includes activities of receiving, storing and distributing the raw materials used in the production process. Operations turn raw materials into the final product. Outbound logistics means distribution of the product to consumers. Marketing and sales take into account activities of advertising, promotions, pricing, managing customer relationships of the final product and so forth. Service means installing, training, maintenance, after-sales services and so on for sustaining the performance of product after production (Porter, 1985).

In contrast, supportive activities help improving effectiveness and efficiency of the primary activities, which include procurement, technology development, human resource management, and infrastructure. Procurement contains the easy to receive raw materials. Technology development includes improvement in research and development and the use of automation. The human resource development activities compose of hiring and keeping suitable employees for designing, building and distributing the goods. The final part of supportive activity; firm infrastructure is the structure and management of organization, planning, accounting, finance and quality control (Porter, 1985). The amalgamation of primary and supportive activities generate greater profit margin at the firm level.

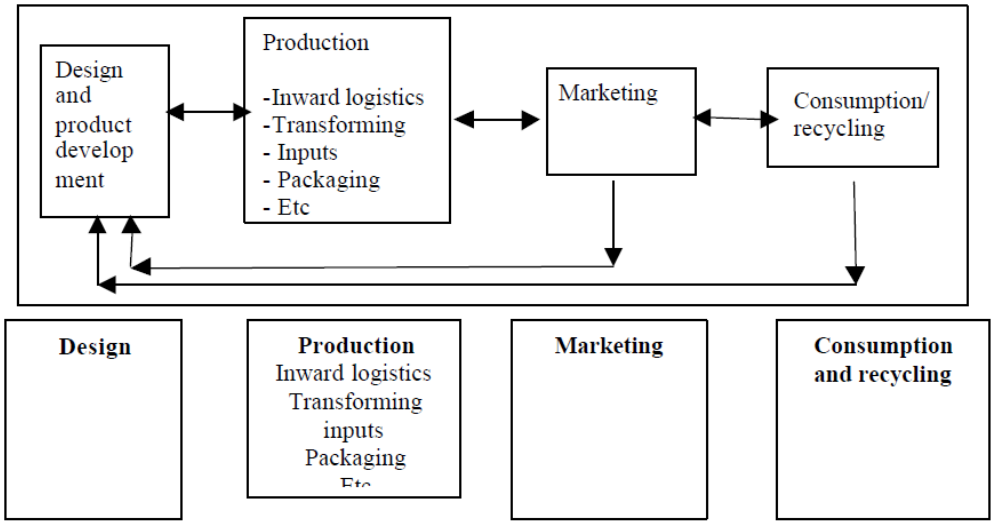
The main purpose of using value chain is to reduce delivery times, lessen inventories and augment customer satisfaction through integrate communication and collaboration between production chain. Chains include individuals and firms that included in interact to supply goods and services to end users. Firm's product values can be increased through increase perceived benefits while holding price or cost constant, increase perceived benefits while reducing price or cost, or decrease price or cost while holding perceived benefits constant.

Value chain is the full range of activities which are required to bring a product or service passing through the intermediate phases of production to delivery to consumers and final disposal after use. Value chain includes a wide range of activities implemented by various actors from producers, processors, traders and service

providers, etc. to bring a raw material through a chain to the sale of the final product. This starts from initial stage of production of raw material and move to other enterprises in linkages engaged in trading, assembling, processing, etc. The activities that comprise in a value chain can be contained within a single firm or divided among different firms (Kaplinsky and Morris, 2001).

Generally, the value chain describes the full range of activities which are required to bring a product or service from conception, through the different phases of production (involving a combination of physical transformation and the input of various producer services), delivery to final consumers, and final disposal after use. Value chain analysis is important in most sectors due to growing division of labor and the global dispersion of the production of components, the need for higher efficiency in production and the need for sustaining economic growth and income (Kaplinsky and Morris, 2001). Especially in manufacturing sector, four main stages are crucial for successful value chain. These stages include designing, production, marketing and consumption/ recycling. Simple value chain can be illustrated in Figure 2.2.

Figure (2.2) Links in a Simple Value Chain



Source: Kaplinsky and Morris (2001)

Value chain is the full range of value adding activities required to bring a product or service through the different phases of production, including procurement of raw materials and other inputs, assembly, physical transformation, acquisition of required services such as transport, and ultimately response to consumer demand. According to

the authors, value chain is a "vertical relationship" (Ponte and Gibbon, 2005) between the producer and the consumer with the emphasis on the flows of material resources, finance, knowledge, and information. In addition, value chain analysis as a tool for defining development opportunities, looking at each distinct step in the life of a product, the actors at each step, how value is added, and how much they earn for that value created (Piper, 2007).

In order to receive chain competitiveness, it requires operational efficiency in each of its segments, coordination of transactions among chain actors and incorporation within a supportive business environment. The above mentioned value chain analysis is mainly utilized in manufacturing sector under the area of business management. However, modifications of the analysis have been emerged in later years to use in other sectors of the economy.

2.2 Utilization of Value Chain Analysis in Agriculture

Today, analysis of value chain is widely used in agricultural products in addition to manufacturing sector. Specifically, it can be used to analyze throughout production and marketing of grains, fruits and vegetables. Traditionally, the emphasis of development in agriculture sector is mainly for gaining food security. In the twenty-first century, increase in world population leads to higher demand for food and agricultural products all over the world. Though agriculture sector play as insignificant role in economies of the developed countries, it is still an indispensable one for developing world and rural society. Specifically, achieving economic development necessitates expansion of non-agriculture sectors. Yet, agriculture sector is still needed to provide food, labor, capital, and market to that expansion.

The value chain in agriculture refers to relationship established between actors involved directly and indirectly in a productive activity with the aim of adding value in each stage of the value chain. It involves alliances among producers, processors, distributors, traders, regulatory and support institutions, which, departing from a market demand for their products and services, establish a joint vision to identify mutual needs and work jointly in the achievement of goals, willing to share the associated risks and benefits, and invest time, energy, and resources in meeting these goals (Richard and Besigye, 2005).

Next, value chain concept in agriculture traces product flows, shows value addition at different stages, identifies key actors and their relationship in the chain

(Baker, 2006). There is six-step process which went beyond the analysis of value chains towards implementation and active participation of. It involved

1. mapping and understanding of the value chain,
2. mapping and understanding the institutional and policy environment,
3. analyzing drivers, trends, issues and opportunities,
4. analyzing future scenarios for markets and inclusion,
5. identifying options of greater inclusion, and
6. developing strategies for supporting change.

Value chain in agriculture is made-up of a series of actors from input suppliers, producers and processors to exporters and buyers engaged in the activities required to bring a product from its conception to its end use (Bammann, 2007). Also, an approach to chain-wide learning for inclusive food market development was developed for emphasizing the importance of multi-stakeholder processes for influencing policies and institutions in dynamic food markets (Vermeulen, Woodhill, Proctor and Delnoye., 2008).

Nowadays, most Least Developed Countries (LDCs) have relied on exports of agriculture commodities as their major source of foreign exchange. As income rise in agricultural production, the potential is increased for a substantial expansion of domestic demand for consumer goods and agriculture inputs. The consumption demand generated by growing agricultural productivity provides a strong linkage to the non-agricultural sector. These linkages show that output in agriculture leads to increased incomes in the non-agriculture sector.

In rural areas of developing world of Asia and Africa, majority of the people are relying on agriculture sector. Hence, improving agriculture production as well as marketing is indispensable for upgrading welfare and economic development for population in rural area. With the development of international trade, enhancing the production and export of agricultural products can be an effective way of reducing rural poverty. If productivity is increased, farmers have significant benefits both through increased home consumption and through income generated from farm product sales.

Nowadays, commercialization of farmers and the concept of value chain become widely used in developing countries. Markets for agricultural products become globalizing with new consumption and production patterns. However, farmers from developing countries are still striving for their livelihoods by emphasizing on staple crops through traditional production and distribution methods. Some farmers or growers

rely mainly on middlemen for distributing their crops in domestic and international markets. Yet the effect of the middlemen's influence lead to higher prices which generate the product to become low competitiveness in market.

Good connection of all stakeholders (from farmers through middlemen to final consumers) along the chain of production and distribution of agricultural products become vital for upgrading the sequence of production and distribution. Nowadays, modern agricultural value chains in some countries developed due to industrialization and capacity building. Yet, poor institutional supports, low level of technical knowledge and lack of infrastructural development impede availability of resources and efficient and effective coordination in value chains. In agriculture sector, value chain analysis is indispensable for delivering value to customers, and reviewing the ways to maximize the value through analyzing the activities, and values.

Under agriculture sector, fruits and vegetables can be sort out as fresh fruit and vegetables, preserved, pulped and extracted products. The first category includes whole washed or unwashed fruits and vegetables and cut or prepared portions. Preserved products are canned and bottled fruits and vegetables, dried fruits, candied fruits, and frozen vegetables. Pulped products are juice, syrups, jellies, marmalades, jam, nectars, purees, and sauces. Extracted products compose of pectin, oil and fat, sugar, and starch.

In particular, value chain in horticultures provides useful tool in examining the activities of how farmers produced products to reach the final consumer, what are the threats to the entire value chain and how the economic relationships between all actors in the value chain (Collier and Evans, 2009). Fruits and vegetable value chain can generally be divided into five main stages; the utilization of inputs, production, packaging and storage, processing and distribution (including marketing).

Agricultural value chain refers to the full range of activities and flows of products, information and money that aim to add value to a raw agricultural product and link farmers to end consumers. Value chain mapping is conducted in two phases; one is an initial basic map after the collection of initial data illustrating participants and functions, and adjusted mapping, which is conducted following additional and follow-on interviews. The steps for putting together a value chain map are as follows: collect data from secondary sources, key informant interviews and/or surveys, use a function/participant worksheet, which includes the following elements: input supply, production, assembly, processing, wholesale and export. These elements help to organize key information about who is doing what in the value chain.

Value Chain Mapping is used to develop a basic understanding of value chain structures and create maps of the most suitable value chains. In particular, value chain maps, include actors participating in value addition with a focus on those interacting with smallholder farmers (e.g. agribusinesses, cooperatives, middlemen), core processes in a value chain and the interactions between the main actors involved in these processes (e.g. collection, processing, certification), product, information and money flows in the value chain (e.g. agricultural extension services, procurement payments, certification premium payments) crop sourcing by procurement channel (e.g. direct procurement, via middlemen, own plantations) and total addressable market in the country (i.e. total number of farmers engaged in the value chain nationwide).

A simplified version of a value chain is shown in Figure 2.4. The chain actors who actually transact a particular product as it moves through the value chain include input (e.g. seed suppliers), farmers, traders, processors, transporters, wholesalers, retailers and final consumers. (Hellin and Meijer, 2006)

Figure (2.3) A Simplified Value Chain in Agriculture

Source: Hellin and Meijer (2006)

In reality, value chains are more complex than the above example, in many cases, the input and output chains comprise more than one channel and these channels can also supply more than one final market. A comprehensive mapping therefore describes interacting and competing channels (including those that perhaps do not involve smallholder farmers at all). At the global level, value chain is more complex. The value of agricultural products can be increased at the stage ranged from supply of inputs to production, post-harvest handling, trading, processing, retailing and consumption through availability of market information, financial services, business knowledge, transportation, communications and research, etc.

2.3 Challenges Faced by Growers in Agricultural Value Chain

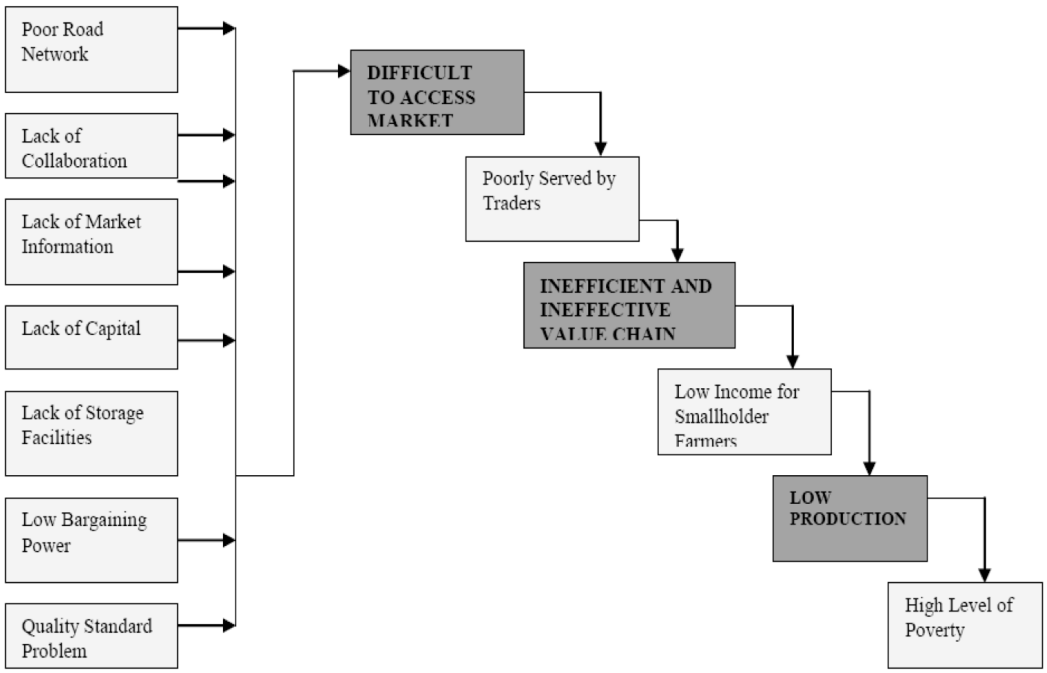
Throughout the agricultural value chain, growers can face several challenges including marketing constraints. Especially the smallholder farmers in developing

countries usually face human capital problem, poor resilient to climate change, lack of physical infrastructure, lack of access to markets and information, and high transaction costs, as well as lack of competitiveness in current and new market environment and low bargaining power. All these challenges generate negative consequences for their socioeconomic conditions.

The causes and effects of problems and challenges faced by smallholder throughout the value chain are regarded as main source of high level of poverty (Rogath, 2010). Major causes include poor infrastructure, low level of collaboration, lack of access to market and information, poor access to quality inputs, low bargaining power, and quality standard problems. These factors generate difficulties in access to market, exploitation of traders, lack of efficient and effective value chain, that lead to low income for growers, low production in the future and facing high level of poverty.

Following figure shows the major factors that lead to challenges and problems among growers of horticulture products and their sequential effects that finally lead to extreme poverty.

Figure 2.4 Smallholder Farmers' Problems and their Effects on the Value Chain



Source: Rogath (2010)

a. Lack of Human Capital

Smallholder farmers are often illiterate, with poor technological skills, which can be serious obstacles in accessing useful formal institutions that disseminate technological knowledge. As most of the growers are not equipped with financial and marketing skills, they cannot be able to meet the quality standards set by fresh agricultural produce market. Lack of production knowledge leads to lower quality in production (World Bank, 2002).

b. Challenges Faced in Cultivation

Cultivation of agricultural produces needs land, labor and capital. Poor access to these assets affects the way in which smallholder farmers can benefit from opportunities in agricultural markets, and especially in terms of the volume of products traded and the quality of those products (Bienabe, Celia, Jean-François, Laurent, Rocio, 2004).

c. Transaction Costs

Transaction costs include the costs of information, negotiation, monitoring, co-ordination, and enforcement of contracts. These transaction costs also result from information inefficiencies and institutional problems such as the absence of formal markets (Makhura, 2001). High transaction costs tend to discourage commercialization among growers. High transaction costs are caused due to poor infrastructure and communication services in remote rural areas.

Usually, smallholder farmers are located in remote areas and are geographically dispersed and far away from markets. Distance to the market, together with poor infrastructure and poor access to assets and information results in high business costs. Traders with higher social capital are better able to enter more capital-intensive marketing activities such as wholesaling and long-distance transport, whereas traders with poor social networks face major barriers to entry into the more lucrative market segments (Kherallah and Kirsten, 2000).

Therefore, reducing transaction costs is the vital to improving access to high-value markets in developing countries. For growers to be integrated into the agricultural value chain, greater effort is needed to reduce transaction costs and improve efficiencies along the agricultural value chain.

d. Lack of on-farm infrastructure

Typically, smallholder farmers or growers do not have access to on-farm infrastructure such as warehouses and cold storage facilities to keep their products in good condition after harvest. Lack of access to facilities such as post-harvest, storage and processing facilities constitutes a barrier to entry into agricultural markets, since the emphasis of buyers is more on quality. Access to storage facilities increases farmers' flexibility in selling their products, as well as their bargaining power (Bienabe, Celia, Jean-François, Laurent, Rocio, 2004).

e. Lack of or Poor Accessibility to Market Information

Rural producers and especially small growers have little information about the market demand, which is costly to obtain. Growers may gather information through contact with other actors/ stakeholders in the commodity chain, but the accuracy of this information is not certified, since those actors might be exhibiting opportunistic behavior (Bienabe, Celia, Jean-François, Laurent, Rocio, 2004),

Smallholder farmers lack information about product prices at the local level, about quality requirements, about the best places and times to sell their products, and about potential buyers. This in turn reduces their ability to trade their products efficiently and to derive the full benefit from the marketable part of their production.

f. Low quantity and poor quality of Agricultural Products

Due to their low endowment of resources and inputs such as land, water and capital assets, the majority of growers in developing world produce low quantities of products that are of poor quality, which leads to their products being neglected by output markets.

Increasing concentration in the food value chain is a global trend, caused by increasingly demanding consumers and concerns about food safety, which tend to make it very difficult for smallholder farmers to enter high-value markets in light of the low quantity and poor quality of their products.

g. Insufficient Market and Transportation

In agricultural value chain, growers from rural areas are negatively affected by lack of markets and imperfect information in remote areas. Most smallholder farmers and growers are located in rural areas where there are no formal agricultural markets or

agro-processing industries. They are compelled to market their produce to local communities in their areas, sometimes at lower prices, or to transport their products to towns at a higher cost. In addition, means of transport to carry their produce to markets is also a challenge. Transportation problems result in loss of quality and late delivery, which in turn lead to lower prices, and this is regarded as the greatest problem faced by emerging farmers (Louw, Madevu, Jordaan, Vermeulen, 2004).

h. Lack of bargaining power

Smallholder farmers and growers are also poorly served by traders, and crop prices vary by season, falling during the time of harvest and increasing when the supply declines. Finally, there is low local effective demand for agricultural products. The bargaining power of the small producers is especially low since they have poor access to market information and limited access to financial markets, which prevents them from selling their products at the most profitable time. Their lack of bargaining power may lead them to undervalue their production and obtain a smaller share of the added value created in the commodity chain. Small farmers have particularly low bargaining power when they operate in long supply chains, where the specificity of the product transformation assets leads to the creation of oligopsony (e.g. the oil-palm and cotton sectors in West Africa) (Bienabe, Celia, Jean-François, Laurent, Rocio, 2004)

i. Regulatory and Technological Barriers

In developing countries, some smallholder farmers or growers have potential to export some of their products are confronted with international regulation standards that they find difficult to meet. Farmers are now faced with new challenges that include products of high quality, knowledge of Good Agricultural Practices (GAP), capacity to comply with market and regulatory requirements, new issues of conformity assessment, and traceability. This setup poses a major challenge for farm producers, especially smallholder farmers, in their efforts to position themselves as business-driven competitors in a less-controlled global trading environment.

Technological innovations play as major role in development of agribusiness and will continue to influence the smooth running of business in the agricultural value chain. Rapid dissemination of information and communication can lead to high cost savings. E-commerce can be a good means of minimizing transaction costs in agribusiness by enabling the online buying and selling of products. In contrast to

developed countries, smallholder farmers in developing countries are poor and have no access to information technology, with the majority being poorly linked to international trade due to technological barriers.

Smallholder farmers' lack of access to technology has a negative effect on their ability to access markets locally, nationally, and globally. It is imperative to highlight that it may prove complicated to take the technological innovations that are applied in developed countries and match them to smallholder farmers in developing countries due to the prevailing financial constraints, as well as lack of human capital and technological know-how. The process is neither smooth nor inexpensive. It will require immense investment and commitment from all parties involved: government, private sector, and farmers themselves.

2.4 Importance of Consumer Buying and Consumption Preferences in Value Chain

The value chain composes all the activities that a company undertakes to create a competitive advantage and value for its customers. Usually, consumers have previously had very little influence on the value chain of fruits and agriculture products as they were not fully aware of what it was and any of its processes. A consumer who buys an item would have no idea where the item was grown, who made the item, under what conditions and growing methods or when to get the products. Nowadays, consumers play an important role in the creation of the value chain.

Nowadays, the consumer is the key figure in the supply chain and their needs and opinions will affect the supplier's decisions. Retailers, shipment and corporations alike are changing the way they operate, all because of the customers they service. Consumers can be able to access to information on all these areas and have therefore gained unprecedented influence over supply chain management. Emergence of e-commerce makes consumers to enhance direct linkages with suppliers or in agriculture sector, growers. Also development of transport mode, transport infrastructure and facilities realize the tracking of agricultural products orders by consumers. The ability to track orders has increased consumer expectations, forcing growers to pay close attention to potential challenges.

The above improvements can increase demand for qualified service sector workers and their income. Distribution centers or delivery firms are required to complete more tasks in less time in order to fulfill the demands of the consumers.

Improved information and communication technology make these tasks much easier to achieve. As a result of this, there is an increased demand for efficient workers in packaging, transporting and delivering who can handle the fast-paced duties of a distribution centre or delivery services.

With the increased volume of online orders for agricultural businesses, distribution centers are no longer focused on delivering large number of products to stores directly. Instead, they must be able to handle the orders from the stores as well as small orders at a consumer level. Warehouses must be able to process small to mid-sized orders to ensure both the customers and merchants are taken care of. The inventory for all of these processes must be accounted for at store level, in the warehouse and in the company as a whole. Streamlined communications across the whole of the supply chain is necessary to keep all products where they need to be and accounted for at all times.

Another point to consider in improving value chain of agricultural products is buying preferences, buying pattern and consumption pattern of these products. Usually, for fruits, consumers check several attributes including search attributes, experience attributes, safety attributes, marketing attributes, etc. Under the search attributes, factors such as color, sizes, freshness, damage and blemish levels of the agricultural products are taking into account. Under the experience attributes, taste, firmness, ripeness, aroma, etc. are considered. For achieving safety attributes, cleanliness of the products, chemical and pesticides contamination are taken into account. For marketing attributes, price, shops' cleanliness, information, packaging and certification of these fruits are included.

When exploring mango buying pattern, place, time and frequency, as well as amount of buying mango in each time are needed to consider. Buying places composes of modern retail store and supermarket, wet market, fruit wholesale market, street vendor/ roadside stallholder, from growers at the orchard and from growers through online, etc. This depends on the consumers' preferences as well as closeness of these locations, convenience in buying and so forth. Finally, consumption pattern usually includes frequency of consumption, amount of consumption, ways of consumption, their variety and others are included. By understanding all the above factors under consumers' choice of the agricultural products, growers can be able to change their production and marketing as well as their channels of distribution to achieve more profitable in the future.

2.5 Reviews on Previous Studies

International Studies

Thorbecke (1969) studied the access to value chain by rural people is vital for agriculture sector of the developing countries. If agricultural growth stimulates non-farm growth and employment, landless labor can also benefit from those employment opportunities. With the utilization of proper value chain approach, farmers can improve effective production methods, marketing techniques, access to updated information of the market and can be able to obtain the benefits of their attempts rather than depending on middle men and gain bargaining power within export market.

Grunert, (2002) examined four cases on market orientation of value chains in agribusiness and fisheries were examined by These are studied in working paper of the project, supra-company level determinants of degree of market orientation of value chains in agriculture and fisheries, which is carried out in Centre for Research on Customer Relations in the Food Sector, Aarhus School of Business, Denmark, the Norwegian College of Fisheries Science, University of Tromsø, Norway, and the Department of Marketing, University of Stirling, Scotland. The study found that in assessing the experiences of producers in value chain, market access is dependent on technological capabilities of producers, available infrastructures, bargaining power and market knowledge and orientation. Market orientation and market knowledge are uncertain to market access. The main findings are the importance of knowledge and willingness of producers to be compliance with demand for adding high value.

Hardwick Tchale and John Keyser (2010) studied Quantitative value chain analysis of Malawi agriculture sector. In particular, tobacco, maize, cotton, and rice through quantitative value chain methodology to assess the country's prospects for competitiveness and suggest weak links along the value chain that require attention in order to improve trade competitiveness. The study found that Malawi has some competitive advantage in the production yet not in maize and rice production for export. Major determinants of low competitiveness include the high cost of chemical fertilizer and other inputs, low productivity, and the higher trader margins and intermediation costs along the value chains. In addition, farm gate prices in Malawi are higher than in other countries, and this undercuts its trade competitiveness.

Baloyi (2010) examined the production and marketing constraints that often prevent smallholder farmers from accessing high-value markets in the agribusiness

value chain. This study aims to classify and examine the constraints confronting smallholder farmers in the Limpopo Province and to propose different strategies that can be used to make it easier for smallholder farmers to access high-value markets in the agribusiness value chain. This was achieved through personal interviews in two districts, the Capricorn and Vhembe districts, to obtain primary data. The study found that smallholder farmers who are currently not participating in high-value markets could improve their participation if they are given access to comprehensive agricultural support services. Smallholder farmers in Limpop Province have a comparative advantage in vegetable growing yet they have lack of access to commercial farming and high value added markets. 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. Greater attention must be given to supporting smallholder farmers in both districts to ensure that they engage in commercial production and participate in high-value markets on a sustainable basis.

Again, Marye (2014) studied value chain of fruits is analyzed to describe important marketing channels and actors involved on fruit value chain, and identifying constraints in fruit value chain in Woreda, Ethiopia. Generally, the study plans to analyze value chain of fruits in Debub Bench woreda, Bench Maji zone. It has specific objectives of describing important marketing channels and actors involved on fruit value chain, identifying the upgrading strategies in fruit value chain, analyzing the governance structure in the fruit value chain, analyzing the value addition and distribution between the different actors, and identify constraints in value chain of the fruit. The study found out that fruits pass through several intermediaries with little value being added before reaching the end users. Farmers can access a very low share of profit margin. Fruits producers faced low supply of inputs such as fruits seed, low irrigation facility, lack of technical training and lack of credit access. To upgrade the livelihood of smallholder producers, for agricultural research institutions, policy makers and researchers, infrastructural development is a key to support the fruits sector. Emphasis should be given to improved storage and transportation system, offering credit and other services to improve effective production and marketing of fruits.

Hammad Badar (2015) examined the value chain performance improvement for sustainable mango industry development was examined in Pakistan. This study aimed to find out how the performance of value chains could be improved in order to bring sustainable development to Pakistan's mango industry. It focused on areas of

consumers' mango value preferences and the implications of these preferences for the industry's development, the structure and performance of the mango industry, constraints on sustainable development of the industry and measures needed to address consumer, economic, social and environmental issues in the value chains so as to promote sustainable development of the mango industry. The study revealed that most value chain actors earned profits, yet inadequate creation of consumer value particularly neglect of food safety aspects, 30 to 40 per cent postharvest losses and poor export performance showed considerable gaps in economic performance. Although the industry generated sizeable employment, its social performance failed dismally to ensure employment for women and care for worker welfare and safety. Also, environmental condition of the mango growing areas was affected due to excessive chemical use, inefficient resource use and inadequate waste management. To cope with the above challenges, promotion of information flows within value chains and improvement of chain governance by building collaborative relationships between value chain actors. It also called for the upgrading of practices most likely to yield economic benefits and contribute to society and the environment through the use of clean nursery plants, modern orchard management and harvesting practices, use of cardboard packing, promotion of safe ripening methods and improvement in wholesale and retail level hygiene.

Addisu Hailu (2016) examined value chain analysis of vegetables in west Shoa zone of Ethiopia. This study analyzes value chain of vegetables in Ejere district, Oromia Region of Ethiopia focusing on potato and onion crops. Primary data were obtained by household survey using a pre-tested structured questionnaire and KIIs. The study found that value chains of vegetables are governed mainly by wholesalers with the assistance of brokers. Producers are price takers and hardly negotiate the price due to fear of post-harvest loss, in case the product is not sold. Five and six market channels were identified for potato and onion, respectively. Productivity of potato, gender of household head, distance to nearest market, off/non-farm income and area of land allocated for potato significantly affect the volume of potato supplied to the market while four variables such as productivity of onion, education level, farming experience and land allocated for onion significantly affect the volume of onion supplied to the market. The study suggests that there is a need to improve the input supply system,, improving farmers' knowledge and experience on vegetable production, encouraging adult education through extension service, improving productivity and volume sales of vegetables, strengthening the

linkage/interaction among vegetables value chain actors, expanding accessibility of market infrastructure and strengthening supportive institutions.

Myanmar Study

Kaung Myat (2012) observed the export conditions of Myanmar Mango was studied though hindrances and opportunities in the supply chain. He aims to identify problems within the current production, marketing and export of fresh mangoes. Exploratory research design was used to explore the mangoes value chain in two regions, the Mandalay Region and Southern Shan State of Myanmar. The study analyzed growers' view on mango marketing and exporting, marketers' view on mango marketing and exporting, exporters' view on mango marketing and exporting, experts' view on mango marketing and exporting and the conceptual map of factors influencing on Myanmar mango export quantity and price. The study found out those factors affecting Myanmar mango export quantities and price based on information given by the respondents. In contrast, factors hindering current mango exports of Myanmar include farm level, the marketing level, and the exporting level. Poor grading system, lack of knowledge among growers, and lack of technology lead to low productivity. Inadequate infrastructure, poor transport services, poor awareness of hygiene, and frequently changing trade policies and regulations generate low price and less competitiveness in export market than in local mango market.

CHAPTER III
OVERVIEW OF MANGO PRODUCTION IN MYANMAR

3.1 Background of Horticulture Subsector in Myanmar

Myanmar is as an agro-based country and agriculture is the backbone of its rural economy. The sector contributes 24.6 % (2017-2018) of GDP and 20% of total export earnings (WDI, 2019). Due to different agro-climatic conditions, Myanmar has rich sources of plant biodiversity and it grows more than 60 kinds of different economically important crops (MOAI, 2012). Among them, horticultural crops including culinary crops, flowers, fruits and vegetables are presently of limited economic importance in terms of export.

Myanmar can grow tropical fruits such as Mango, Coconut, Durian, Pomelo, Banana, Jujube, Tamarind, Grape, Watermelon, Citrus, Dragon fruit, Custard apple, Cashew nut, and Subtropical fruits of Citrus, Pineapple, Apple, Pear, Plum, Peach, Apricot, Persimmon, Avocado, etc. Among the major crops that remain important for local consumption and as potential exports include mango, pomelo and melons. In Myanmar, private sector plays as major role in horticultural crops production and distribution. However, poor facilities and low production of value added crops reduce the marketable agricultural commodities. Market potentials of diverse types of crops are varied in Myanmar.

Market demand for high value added horticulture products is still low with high level of competition from abroad. Being a developing country with low level of technology, poor business knowledge and poor market for high value added horticulture products, green fruits are only the main items to be produced and distributed in both local and international market. However, most of the horticultural crops are perishable and the quality and yield are highly dependent on climatic conditions or their growing seasons.

The gross planted and harvested areas of fruits in all States and Regions of Myanmar between 2012-13 and 2016-17 fiscal years are shown in Appendix II.

According to the table shown in Appendix II, in 2012-13 Tanintharyi Region, Ayeyarwady Region and Bago Regions are the largest area of growing and harvesting fruits while Chin State, Naypyitaw Council and Kayah State have the smallest fruit growing and harvesting areas. There were total of 1,453,605 acres of growing and 1,053,092 acres of harvesting in that year. In 2016-17, total area of 1,497,660 acres has been cultivated while 1,184,267 acres were harvested. Although there was little change in terms of the area cultivated and harvested, the largest and smallest areas were the same as past five years.

At the national level, total areas of growing and harvesting fruits are illustrated in table 3.1.

Table (3.1) Fruit Planted and Harvesting in Myanmar (2008-2017)

('000 acres)

No.	Year	Gross area Planted	Gross Area Harvested
1	**2007-08**	1330	1016
2	**2008-09**	1338	1044
3	**2009-10**	1366	1103
4	**2010-11**	1336	1111
5	**2011-12**	1372	1125
6	**2012-13**	1454	1053
7	**2013-14**	1465	1145
8	**2014-15**	1474	1161
9	**2015-16**	1488	1182
10	**2016-17**	1798	1184

Source: Department of Agricultural Land Management and Statistics (2019)

The above table shows the growing and harvesting of fruits in national level for 10 years period in Myanmar from 2007-2008 to 2016-2017. Both the growing and harvesting areas were fluctuating within the period due to market demand and weather condition of the States and Regions of Myanmar. However, the situation was improving during the period with the changing local and export market demand and knowledge of the growers in Myanmar.

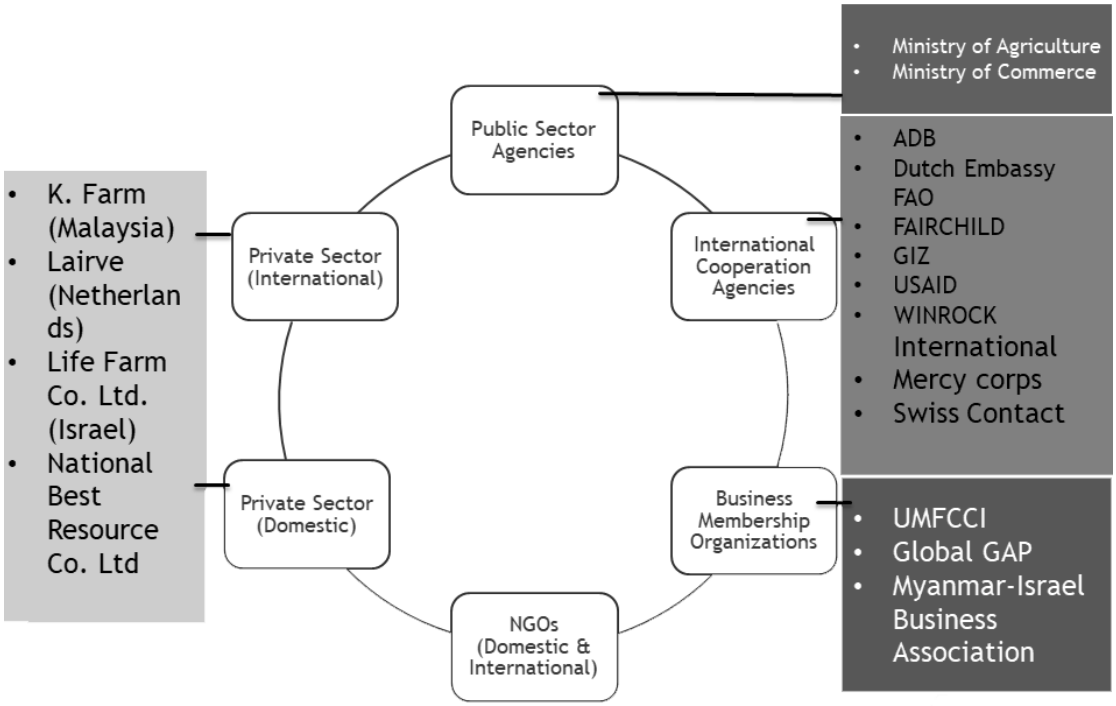
As horticulture products, particularly fruits Major problems encountered by the fruit growers in Myanmar are shortage of quality seeds, unavailability of financial assistance to invest enough inputs, need to enhance technical know-how, needs to improve pre and postharvest handling technology and an inadequate systematic marketing system. Sustainable crop production with good agricultural practices and production of safe and healthy foods is a need indeed. In this regard, horticulture plays a major role in producing foods of nutritional security today. The Department of Horticulture under the University of Agriculture has the mission of setting horticulture as a major discipline for today food and nutritional security and horticulturists as safe and healthy food producers and nature maintainers and is targeting to fulfill the missions to produce graduates well equipped with theoretical and technical expertise, to provide production technology of clean horticultural crops of high nutritive and economic value and to participate in preserving the nature and beautifying the world using plants and flowers.

To implement the above-mentioned missions, the department goes in line with university's education policies laid down by the state. To disseminate agricultural technology, teaching (theory and practices), demonstration plots, research works and extension services have been being implemented. Research trend on diversity and improvement, propagation, postharvest, value chain and tissue culture, curriculum reform/development with JICA (undergraduate), ACARE (postgraduate) have made since 2012.

In addition to the efforts of disseminating knowledge concerning horticulture by the Department of Horticulture, clusters were formed to promote production and marketing of horticulture products locally and internationally. Myanmar Fruit, Flower and Vegetable Producer and Exporter Association (MFVP) is working on different fruits, flowers and vegetables dealing with growers, sellers, traders, exporters and importers, and networking among them, purposing on bringing the high quality fresh producers to consumers based on environmental sustainable policy. Vision Statement of the MFVP is to enhance in existing and new markets for Myanmar fresh produce in line with consumer requirements and growers needs in 2020. It has Mission Statement of carrying out a number of measures and services to members regarding with development of producer clusters, capacity building and market and supply chain linkages. The general objective of the MFVP is to provide tropical and temperate fresh and processed quality fruits and vegetables for the consumer whereas the main mandates of MFVP are

to encouraging and supporting fruits and vegetable producers to be able to produce fresh and high quality safe fruits and vegetable up to export quality and packaging standard (Capacity Building) and enhancing coordination, cooperation and networking among the fruit and vegetable farmers (producers), crop buyers, wholesalers, distributors, exporters and suppliers of support services.

Figure (3.1) Collaborative Efforts of Diverse Stakeholders in Development of Horticulture



Source: MFVP (2018)

The above diagram illustrates the six main stakeholders in enhancing the development of horticulture sector in Myanmar. The stakeholders include public sector agencies, int'l cooperation agencies, business membership organizations, INGOs from both domestic and int'l and domestic private sector.

Since 2010, clusters for producers/exporters were formed as producers and exporters associations were formed under UMFCCI to encourage production and exports of horticulture products mainly the fruits and potential items of Myanmar. Prior to the establishment of these clusters, fruits and horticulture producers/ growers faced challenges in dealing with middlemen in local market and export market. Lack of bargaining power and experience in exporting fruits, growers ended up with incurring

extra costs in exporting their products. These groups were formed in order to cope with challenges and problems faced by producers and exporters of the horticulture products.

In Myanmar, Fruit, Flower and Vegetable Producers and Exporters Association operating at present are as follow.

1. Myanmar **Mango** Producer & Exporter Association
2. Myanmar **Pomelo** Producer & Exporter Association
3. Myanmar **Tea** Producer & Exporter Association
4. Myanmar **Muskmelon** Producer & Exporter Association
5. Myanmar **Coffee** Producer & Exporter Association
6. Myanmar **Mushrooms** Producer & Exporter Association
7. Myanmar **Organic** Producer & Exporter Association
8. Myanmar **Bamboo Shoots** Producer & Exporter Association
9. Myanmar **Banana** Producer & Exporter Association
10. Myanmar **Sacha Inchi** Producer & Exporter Association
11. Myanmar **Coconut** Producer & Exporter Association

Each clusters mentioned above grouped to carry out technical transfers, educating programs and request collectively when dealing with exporters and buyers. In this ways, challenges and problems are resolved step by step.

Then, next table is the current establishment of fruits and vegetables producers and exporters association in each state and region. As regions and states in Myanmar endowed with different topographies and climatic conditions, their horticulture products are differed and resulting associations. In addition, some States and Regions are more emphasized on horticulture products so that they have formed their State/Regional level associations separately. For instance, Yangon is the head quarter of the most of the horticulture clusters and associations where UMFCCI is located. In table (3.2), States and Regional Level Fruit, Flower and Vegetable Producers and Exporters Association and clusters are described.

Table (3.2) Fruit, Flower and Vegetable Producers and Exporters Association by States and Regions

No.	Fruits, Flowers & Vegetables Producer and Exporter Association	Clusters
1	**Yangon**	Mango, Pomelo, Muskmelon, Tea, Mushroom
2	**Mandalay**	Mango, Muskmelon, Tea, Coffee, Grapes, Pineapple
3	**Sagaing**	Mango, Muskmelon
4	**Bago**	Mango, Pomelo, Muskmelon, Coffee
5	**Rakhine**	Mango
6	**South Shan**	Mango, Tea, Coffee, Mushroom, Organic, Tomato
7	**North Shan**	Tea, Coffee
8	**Mon**	Pomelo, Muskmelon
9	**Kayin**	Pomelo, Coffee
10	**South Chin**	Coffee
11	**Magway**	Muskmelon
12	**Ayeyarwaddy**	Muskmelon, Cassava, Mushroom

Source: MFVP (2018)

According to the table, State and Regional Level Flowers and Vegetables Producer and Exporter Association are formed in Mandalay, Sagaing and Bago Regions whereas Kachin, Kayin, Ayeyarwaddy, Chin, Mon, Rakhine, South, North Shan States. In these areas, not only the horticulture products, also the perennial crops are growing for centuries and formation of these associations help enhancing the growth of these businesses and bargaining power in markets.

Moreover, clusters are formed not only in commercial city of Yangon, also in different States and Regions to solve region specific issues as well as to collaborate for getting bargaining power. To cope with region specific horticulture and agriculture

related problems, the States and Regions clusters are differed to that of producer/ exporter associations.

Clusters were formed in different States and Regions of Myanmar. These are Mango, Pomelo, Muskmelon, Cassava, Tea, Coffee, Mushroom, Organic, Grapes, Pineapple and Tomato. Mango clusters are formed and operating in Yangon, Mandalay, Sagaing, South-Shan, Bago and Yakhine State where Pomelo clusters are located in Yangon, Mon, Kayin, Bago Regions. For Muskmelon, formation of clusters is the widest, in Yangon, Mandalay, Sagaing, Bago, Mon, Magway and Ayeyarwaddy Regions. There is only one Cassava cluster in Ayeyarwaddy Region for Myanmar.

Tea and Coffee Clusters are mainly formed in mountainous areas of Shan (North - South), Yangon and Mandalay Regions and Southern-Shan State, Pyin Oo Lwin (Mandalay), Kayin, Bago and Southern – Chin States. Nowadays, Mushroom Clusters are established in Yangon, Ayeyarwaddy, and Southern-Shan State whereas Organic products and Tomato Clusters are formed in Southern- Shan State. Grapes and Pineapple Clusters are located in Mandalay Region where these fruits are mainly grown in Myanmar.

3.2 Mango Production in Myanmar

Among the diverse horticulture products, particularly fruits, Mango is regarded as the most popular among fruit growers in Myanmar. Mango can be grown on various soil types from temperate to tropical regions and can grow well in various climate conditions in Myanmar. Mango has popular since ancient Myanmar Kings' era and regarded as the best among fruits. In Myanmar, about 200 species of mangoes can be grown. Mango season in Myanmar is in summer and rainy seasons, from April to July, based on types.

In Myanmar, mango growing and harvesting areas has increasing steadily during the last decade. Annual increase in planting and harvesting of mangoes in Myanmar are shown in table (3.3).

According to the table, between 2007-08 and 2016-17, total planted areas of mango has increased from 191,000 acres to 257,000 acres while total harvested area has risen from 174,000 in 2007-08 to 225,000 acres in 2016-17. After 2011, growing mango is increasing mainly in central Myanmar (Mandalay, Sagaing Region and Nay Pyi Taw Council) for export market and Yangon Region for domestic market.

Table (3.3) Mango Planted and Harvested Area in Myanmar (2007-2017)

('000 acres)

No.	Year	Gross Area Planted	Gross Area Harvested
1	**2007-08**	191	174
2	**2008-09**	193	171
3	**2009-10**	196	177
4	**2010-11**	197	173
5	**2011-12**	205	183
6	**2012-13**	232	189
7	**2012-14**	237	191
8	**2014-15**	240	197
9	**2015-16**	247	200
10	**2016-17**	257	225

Source: Department of Agricultural land Management and Statistics (2018)

Renowned Myanmar Mango species are Ma Chit Su, Sine, Thone Lone Tit Taung, Sein Ta Lone, My Kyauk, Yin Kwal, Sugar Mango, and so forth. These diverse species have different varieties of taste, color and shapes. Among the major type of mango, Sein Ta Lone is the origin of Kyaukse Mandalay Region, upper Myanmar yet grown all over the country. It was famous among local and foreign consumers after 1990s. Harvesting period depends on Region. In Lower Myanmar, Sein Ta Lone can be harvested in last week of April while May first week in upper Myanmar and June second week in Hilly Regions of Shan State. The main advantage of the Sein Ta Lone is its long lasting. It is mainly exported to China via border trade route. Mya Kyauk is originated from Bago Region. Its large size and good taste attract consumers yet perishable nature impedes popularity in both local and export markets.

Shwe Hin Thar is the Mandalay origin and grown mostly in central Myanmar and Shan State. Although it is grown in Yangon Region, Shwe Hin Thar is less popular among local consumers. However, it has huge export market, China in past decade. Renowned local specie is Yin Gwe mango, which can be grown in every parts of Myanmar, yet prefer more in lower Myanmar and Rakhine State. It is also used for

Mango Leather and puree. Ma Chit Su is the most favorite among Myanmar consumers. It can be consumed at both stages, green and ripe. However, it has no export market at all. Major mango producing areas are observed in the southern regions; Ayeyarwaddy, Bago and Yangon Regions, and in the central region; Mandalay and Sagaing Regions. Exportable quality cultivars are mainly produced in the central and east region, and the remaining planting areas produce mango for local consumption.

Diverse types of mangoes are grown in all parts of Myanmar. Table (3.4) shows the gross planted and harvested areas of mangoes in all States and Regions of Myanmar including Nay Pyi Taw Council. As mango is a famous fruit among Myanmar people and able to grow in all parts of the country, it is grown even in Chin State and Kayah State. In Naypyitaw Council, commercial mango plantations have emerged and grown not only Sein Ta Lone, also the R2E2 specie for export market.

Table (3.4) Mango Planted and Harvested Area by States and Regions (2016-2017)

(acres)

No.	State/ Region	Gross Area Planted	Gross Area Harvested
1	**Kachin**	10298	9666
2	**Kyah**	420	382
3	**Kayin**	24984	13952
4	**Chin**	3206	2220
5	**Sagaing**	20532	19527
6	**Tanintharyi**	6106	5440
7	**Bago**	43797	39384
8	**Magway**	6137	6022
9	**Mandalay**	29990	26383
10	**Mon**	7963	6966
11	**Rakhine**	10331	8950
12	**Yangon**	18167	18016
13	**Shan**	20488	17810
14	**Ayeyarwaddy**	46166	44592
15	**Naypyitaw**	9139	5945
Total		**257724**	**225225**

Source: Department of Agriculture and Irrigation (2018)

The above table shows State and Regional contribution of planted and harvested are of mango in Myanmar reached 257,724 acres and 225,225 acres respectively in 2016-2017. Total number of production is 2,490.575,289 numbers in that year. Among the States and Regions, Ayeyaewady Region, Bago Region, Kayin State, Mandalay and Sagaing Regions and Shan State have the largest areas of plantation and harvesting. Yet major export market and domestic best-selling species are mainly produced in Mandalay Region.

The differences between planted and harvested areas are large in some States and Regions due mainly to the effects of climate change and pest problems. Resilient to climate change among mango growers are still challenging as most of the mango grower still using traditional approaches. Moreover, achieving GAP (Good Agriculture Practice) is still low among mango growers in Myanmar. Very few growers from Mandalay use organic growing methods and able to achieve GAP certificate in Myanmar. Majority still use traditional planting approaches combining with chemical fertilizers and pesticides. Therefore, getting GAP is still difficult for them until now. As a result, getting high prices for mangoes in export market is still in need. In addition to the production techniques, mango growers in Myanmar also avoid risks by selling their crops to collectors in advance to harvesting period every year with fix prices. Therefore, this process can avoid risks of bad weather or other pests and diseases problems before sending to local or export markets.

Myanmar's mangoes are primarily exported to China, and also to India, Bangladesh, Thailand, the Republic of Korea, Singapore, and Japan. The public sector in Myanmar has also established criteria for long-term organic farming. In the 2017-2018 fiscal year, Myanmar exported 50,000 tons of Sein Ta Lone (Diamond Solitaire). The country aims to raise the export volume of Sein Ta Lone to 100,000 tons by 2020 (Ministry of Commerce, Myanmar, 2019). Another weakness in Myanmar mango market is the inability to produce high value added products from mango to sell in both local and export market. Selling only the raw mangoes is less profitable as these fruits are perishable in nature. In many Asian countries, including neighboring country of Thailand, producing high value added mango products earn incomes for growers.

In Myanmar, processing technologies for high value added mango products, access to market and marketing techniques among growers are still inadequate. As a result, middlemen reaped the largest share of profits throughout the mango value chain of Myanmar. Value-added mango products such as mango paste, frozen mango,

preserved mango slices, wine, and dried mango are initiating to process and send to countries that have signed MoUs with Myanmar, mainly include Russia, Singapore, and China. Adding value to mango can help move beyond the domestic market and penetrate foreign markets. Nowadays, mangoes from Paleik area were purchased and sent to a processing factory in Nay Pyi Taw. Value-added mango products were shipped to foreign countries by Myanmar GP Company. Mango paste is used in making ice-cream, ice-pops, and juice (New Light of Myanmar, 2019).

Until now, traditional processing of mangoes is mainly available in Myanmar, including mango pickles of various types including soured mango, mango leather, dried mango, preserved mango and mango jams, etc. Yet there are needs to improve Mango Market in Myanmar as the above products can only sell within the local market of Myanmar. Improvement in quality of mango, management of disease and pest, establishment of modern storage and packaging house system, increasing processing factories, creating better and fairer wholesale market for growers, producing high value added products, developing agro-tourisms related with mango farms, carrying out the safety and security of mango for consumers through getting GAP certification, using environmental friendly agricultural practices, controlling fruit loss, conducting research and nurturing human resources are indispensable for the growers in Myanmar. As consumers become well informed and knowledgeable, demand for value added products with high quality and met with safety standards are higher even in local market. As a result, quality mango products producers become essential for Myanmar mango market.

3.3 Mango Production in Mandalay Region

In Myanmar, Mandalay Region is renowned for one of the largest mango plantations. Mangoes from Mandalay Region are popular as export item through border trade to China. Kuaukse Township is located in Kyaukse District of the Mandalay Region. It is bordered to the east with Ywa Ngan Township, Shan State and Pyin Oo Lwin Township, Tada Oo Township in the west, Myit Thar Township in the south and Sint Kaing Township in the north. Pang Laung, Zaw Gyi and Samone Rivers flow within the Kyaukse Township and play as major sources for irrigation facilities. Although the township is located in arid zone of central Myanmar, these water sources provide water supply for the agriculture sector of the Township.

In Kyaukse Township, total population is 257907 numbers whereas male population (124539) is slightly lower than female population (133368). Within the township, there are 10 wards in urban area while there are 86 village tracts and 89 villages in rural area of the Kyaukse Township. Only 16% of the population (41482 numbers) is residing in urban area and the rest, 216425 numbers are living in rural area of the Township. Within the Kyaukse Tonwship, labor force participation rate for the population aged between 15 and 64 years is 65.6 %. Among them, the labour force participation rate of females is 44.6 % and is lower than that of their male counterparts which is 88.5%.

The unemployment rate for those aged between 15 and 64 years 4.1%. Among the employed persons aged between 15 and 64 years, majority of the population (51.4%) are engaging in agriculture, forestry and fishing sector. Among them, male contribute 54.5% while female consists of 45.6% respectively. Among the working age employed population, majority of the workforce are working as skilled agricultural, forestry and fishery workers. Among the agriculture products, rice, pulses and beans, sesame and mango play as key role in Kyaukse Township. Table (3.5) shows the Mango growing area within the Kyaukse Township.

Table (3.5) Mango Planted and Harvested Area in Kyaukse Township (2007-2017)

(acres)

No.	Year	Gross Area Planted	Gross Area Harvested
1	**2007-08**	1122	1099
2	**2008-09**	1148	1123
3	**2009-10**	1190	1178
4	**2010-11**	1380	1367
5	**2011-12**	1599	1580
6	**2012-13**	1900	1878
7	**2012-14**	2243	2224
8	**2014-15**	2721	2710
9	**2015-16**	2680	2622
10	**2016-17**	2986	2929

Source: Department of Agriculture, Kyaukse (2018)

Within the Kyaukse Township, Mango growing areas has increasing within the past decade referring to the table. Majority of the mango are grown in 5 villages out of 89 villages. These villages are Kyauk Sout Kalay, Kyauk Sout Kone, Dann Tine, Let Pan, and Kyauk Pa Sit Villages. In these villages, major species of mango planted by growers are Sein Ta Lone, Hinthar, Padamyarr Nga Mout, Sein Cho, Nan Daw Mhine, Aung Din, Ma Saw Kyin, San Ya, Net Te, Yin Gwe and Wah Soe. Among them, the most planted specie is the Sein Ta Lone.

CHAPTER IV
SURVEY ANALYSIS

4.1 Survey Profile and Design

To study the current mango value chain in Kyaukse Township, 100 mango growers are selected to make survey relating to their mango marketing channels. Also, strengths and weaknesses of growers in different mango value chain are studied. To understand the preferences of mango consumers, 200 consumers from Mandalay City are asked about their fondness in buying mangoes from diverse sources from growers to retail outlets.

To obtain primary data from growers, survey was conducted between April and June 2019 in five villages of the Kyaukse Township. These villages are Kyauk Sout Kalay, Kyauk Sout Kone, Dann Tine, Let Pan, and Kyauk Pa Sit Villages where major mango growers existed. For growers, questionnaire is divided into 6 main sections; Demographic Characteristics, Basic Business Information, Input Information, Information about GAP certification, Constraints and Strengths and Marketing and Distribution.

For consumers, Demographic Characteristics, Mango Buying Preferences, Mango Buying Pattern and Mango Consumption Pattern are asked. Convenient sampling is used for both grower and consumer survery. 200 consumers were from four downtown townships of the Mandalay City (50 each from Maha Aung Myay, Chan Aye Thar Zan, Chan Mya Tharzi and Aung Myay Thar Zan Townships). Respondents are selected from urban areas of the Mandalay City.

4.2 Survey Results

In this section, efforts have been made to study both from supplier side (growers) and buyer (consumer) side. The first section is about the growers.

4.2.1 Analysis on Growers

At first demographic characteristics of the growers are presented. This include gender, age, education while business background takes into account membership in a cluster/ cooperative, year of experience of this plantation, mango variety available in the plantation and type of ownership of the current plantation. Table 4.1 shows the survey results of the growers.

Table (4.1) Demographic Characteristics of the Respondents (Growers)

No.	Particulars	No. of Respondents
1	**Gender**	
	Male	86
	Female	14
	Total	**100**
2	**Age**	
	25 - 34 years	19
	35 - 44 years	12
	45 – 54 years	28
	55 – 64 years	21
	65 years & above	20
	Total	**100**
3	**Education**	
	Basic 3 Rs	12
	Basic Education	36
	Bachelor Degree	47
	Master Degree	5
	Total	**100**
4	**Membership of Cluster**	
	Yes	62
	No	38
	Total	**100**
5	**Year of Doing Current Plantation**	
	Between 1 and 5 years	20
	Between 6 and 10 years	43
	Over 10 years	37
	Total	**100**
6	**Mango Variety at Respondents' Plantation**	
	Sein Ta Lone Only	78
	Sein Ta Lone and Others	22
	Total	**100**
7	**Type of Ownership of the Plantation**	
	Sole Proprietorship	42
	Partnership	14
	Family Business	44
	Total	**100**

Source: Survey data (2019)

Table (4.1) shows that among 86% majority of the respondents are male. Majority of the respondents are in age group between 45 and 54 years, which contributes 28%. Among the four types of educational qualification, most of the respondents got bachelor degree, which contributes 47% of the total followed by basic education, 36%. 62% of the respondents are members of clusters and associations such as mango cluster of the Mandalay Region and Mandalay Region Fruits Producers and Exporters' Association. 78% of the respondents grow Sein Ta Lone only while the rest grow other species together with Sein Ta Lone. Other species are Hinthar, Padamyarr Nga Mout, Sein Cho, Nan Daw Mhine, Aung Din, Ma Saw Kyin, San Ya, Net Te, Yin Gwe and Wah Soe Mango. Most of the plantations are family owned (44%) followed by sole proprietorship (42%). Only 14% of the respondents' plantations are partnership.

Next section is about the Input Information of Growers as shown in Table (4.2). This section includes land ownership of the respondents, growing techniques of respondents, number of workers, source of labor, source of finance, type of problems faced concerning with Inputs, types of government supports and types of NGOs and NPOs supports received by the grower/ respondents. Among the 100 growers, majority (58%) possesses land area between 11 and 50 acres while those with more than 50 acres contribute 22%. In addition, 87% of the growers use Normal Way (Using Chemical fertilizers/ pesticide) of growing mango while the rest (only 13%) use Pure Organic (Using Natural fertilizers/ pesticide) method. Majority of the growers (60%) have full time workers between 10 and 30 numbers.

As labor input is the most shortage for growers (due to migration within the Township), most of the workers are hired from outside the Kyuak Se Township (35%) mainly for preparation of land, covering mangoes with bags and in harvesting seasons. When hiring the part time workers, number is not fixed as it depends on the yield and availability of these part time workers. To get sufficient number of part time workers, growers need to pay in advance part of their wages and other gifts that part time workers most want before hiring them. Therefore, among the different types of inputs, access to labor is the most difficult one. Growers can easily buy plants and other inputs such as chemical fertilizer and pesticides, etc.

Table (4.2) Input Information of the Respondents

No.	Particulars	No. of Respondents
1	**Land Acres**	
	Less than 10 acres	22
	11 – 50 acres	58
	Above 50 acres	20
Total		**100**
2	**Growing Method**	
	Normal Way (Using Chemical fertilizers/ pesticide)	87
	Pure Organic (Using Natural fertilizers/ pesticide)	13
Total		**100**
3	**Number of Full Time Workers**	
	Less than 10	19
	10 – 30	60
	31 – 50	21
Total		**100**
4	**Main Source of Labor**	
	Family	18
	Local	23
	Out of the Township	35
	Out of the Region	24
Total		**100**
5	**Main Source of Finance**	
	Own Financing	27
	Family	37
	Friends and Relatives	26
	Formal Financial Institutions	10
Total		**100**

Source: Survey data (2019)

Then, when asking the main source of finance, majority access financial resources mainly from family (37%) followed by own financing (27%) and friends and relatives (26%). There are no respondents who access finance from Microfinance Groups or Informal Financial Markets in Kyaukse Township. They do not borrow from informal money lenders as well.

Then next section describes the extent of access to inputs by growers as shown in table (4.3). In this section, Likert scale analysis is used to study the extent of input access by respondents. The scores are ranged from 1 = very low to 5 = very high. Particularly, represents Very Low (very difficult to access) while 2 is the Low Level of

Access, 3, Neutral, 4 is the High Level of access to inputs whereas 5 is the Very High (very easy to obtain inputs).

Table (4.3) Extent of Access to Inputs

No.	Particulars	1	2	3	4	5	Total
1	Access to labor	89	11	0	0	0	**100**
2	Access to needed finance	0	6	9	28	57	**100**
3	Access to quality seeds and plants	0	0	12	22	66	**100**
4	Access to fertilizers, pesticides	0	0	0	39	61	**100**
5	Access to Natural fertilizers, pesticides	0	10	28	32	30	**100**
6	Access to Advanced Technology	22	24	19	20	15	**100**

Source: Survey data (2019)

The survey results show that growers faced difficulties in access to labor and advanced technologies. Although majorities are members of clusters and associations, these groups cannot disseminate the modern technologies for mango growing in Kyauk Se Township. Also, there is no growers who received supports from the Government as well as from NGOs and NPOs in terms of financial supports or technical assistants.

For the information concerning GAP certification, no respondents have GAP Certification for their mango orchard. Yet they have a plan to get GAP for their farms in order to get higher price and larger market in the future.

Next section is the major Constraints and Strengths faced by growers. Constraints and strengths given in the questionnaire are access to land, access to high quality seeds and plants, access to GAP, access to farm equipment, access to labour, access to financial capital, access to modern cultivation techniques, access to market information, access to new market, getting demand information from local market, getting demand information from foreign market and other. In this part, top constraints and strengths are presented in table below.

Table (4.4) Top Constraints and Strengths Faced by Respondents

No.	Constraints	No. of Respondents
1	Access to Labor	41
2	Access to GAP	33
3	Access to Modern Cultivation Techniques	12
4	Access to New Market	7
5	Getting Demand Information from Foreign Market in time	7
Total		**100**
No.	**Strengths**	**No. of Respondents**
1	Getting Demand Information from Local Market	32
2	Access to Financial Capital	28
3	Access to Farm Equipment	25
4	Access to Land	11
5	Access to High Quality Seeds and Plants	4
Total		**100**

Source: Survey data (2019)

Table (4.4) shows the most severe constraints and strength. Top constraints faced by the growers include access to labor, access to GAP, access to modern cultivation techniques, access to new market and getting demand information from foreign market in time.

On the other hand, major strengths of the growers in Kyaukse Township are getting demand information from local market, access to financial capital, access to farm equipment (including bags and other inputs), access to land and access to high quality seeds and plants.

Next section is about the Marketing and Distribution. Under this topic, questions concerning producing with own brand, source of market information, channels of distribution and pros and cons of the major channel of distribution in domestic and export markets faced by growers. Only 6 respondents use their own brand of mango to sell in the market.

Table 4.5 describes the marketing and distribution information of growers. Source of markets include friends and relatives, broadcasting media, from market itself, from printed media and from Social Media. Channels of distribution for mango by the growers include direct selling to consumers at own shop, direct selling to consumers online, sell to fruit collectors, sell to wholesalers, sell to retailers (venders), sell to retailers (supermarkets), sell to value added producers and sell to exporters.

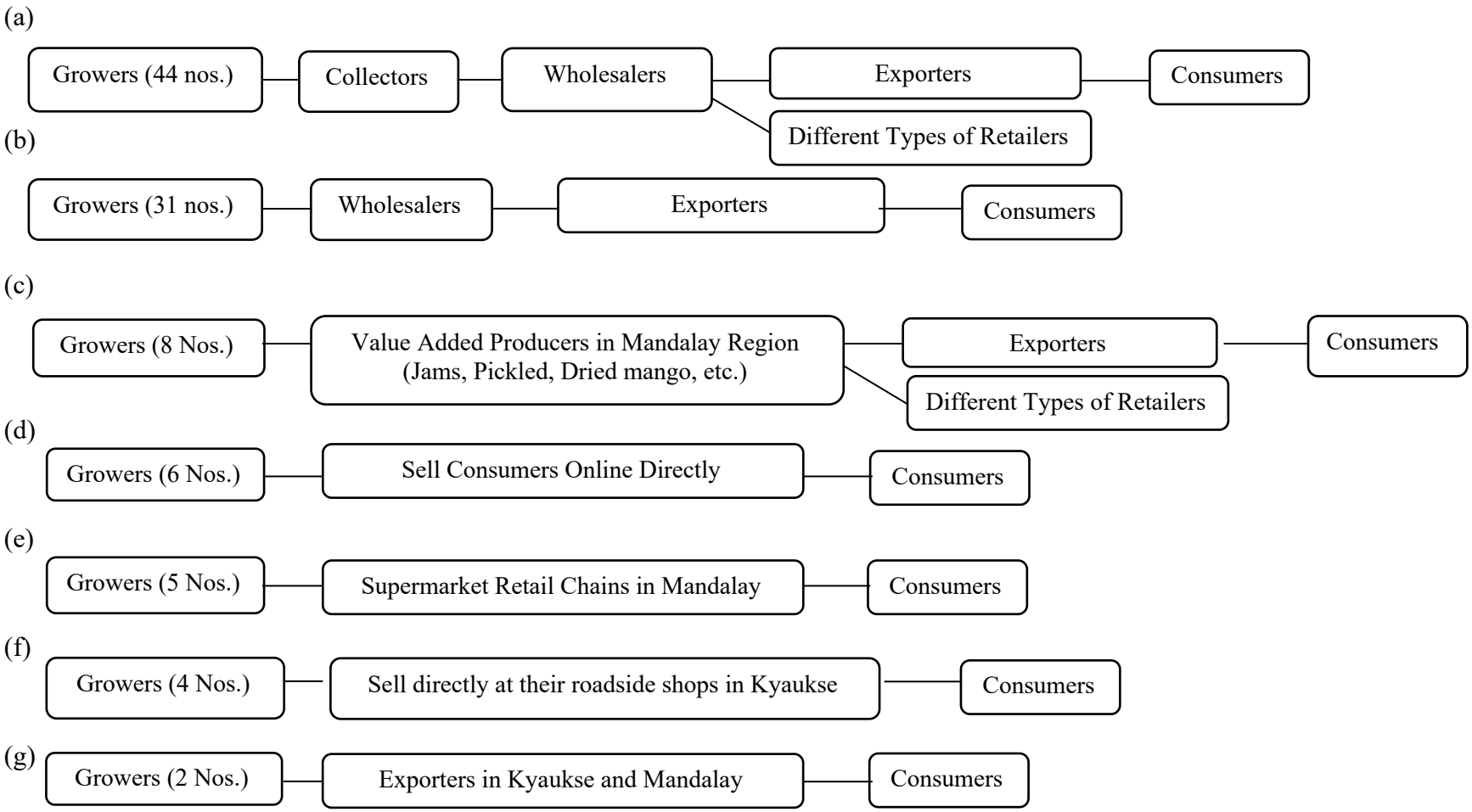
Table (4.5) Marketing and Distribution Sources of Respondents

No.	Particular	No. of Respondents
1	**Sources of access to market information**	
	From friends and relatives	18
	From broadcasting media	0
	From market	67
	From printed media	0
	From Social Media	15
Total		**100**
2	**Channel of Distribution**	
	Direct Selling to Consumers at own shop	4
	Direct Selling to Consumers online	6
	Sell to Fruit Collectors	44
	Sell to Wholesalers	31
	Sell to Retailers (Venders)	0
	Sell to Retailers (Supermarkets)	5
	Sell to Value Added Producers	8
	Sell to Exporters	2
Total		**100**

Source: Survey data (2019)

Among the Respondents, majority (44%) mainly distribute their mangoes through selling collectors. It was followed by 31% of the growers selling to wholesalers, Other channels are not so significantly as the first two channels yet they have their own channels of distributions. 8% sell to value added producers whereas 6% distributes them online to consumers. 5% of the growers got contact with modern supermarkets in Mandalay City and sell them while 4% of them sell at their roadside shops. The rest 2% sell directly to exporters. Their mappings details are shown as below.

Figure (4.1) Mappings of the Marketing Channels of Mango Growers in Kyaukse Township



Source: Survey data (2019)

For the channel (a), collectors buy mango orchards for each season when small fruits are appeared on mango trees. Through this approach, growers can get money from selling at this early stage. At the same time, collectors have to take care of the trees and fruits until they are sent to local or export market.

The channel (b) illustrates the second largest group of growers who distribute their mangoes to wholesalers who in turn sell them to retailers domestically or to exporters at the Muse and Mandalay.

Channel (c) is the selling of Sein Ta Lone (lower grade/ quality for export and domestic selling) to value added producers not only in Kyaukse, also in Paleik, Mandalay City and other nearby areas to produce other finished goods or semi – finished goods such as dried mango, pickles, jams, juice, puree, etc. Most of them are sell in domestic market while some are exported abroad.

Channel (d) is the newest form of distributing mangoes. 6% of the growers sell their products online with their own brands to consumers. They open social media pages or websites to sell their products. Majority of these growers use organic growing techniques. They mainly intended to sophisticated urban consumers and foreigners in Myanmar.

Channel (e) is also a new distributing channel, where major supermarket such as Ocean buys directly from mango growers in Kyaukse Township and gives them high process. These supermarkets demand high quality and chemical free products from these growers.

Channel (f) is showing the small vendors' distribution channels. 4% of the growers sell their mangoes on roadside stalls in Kyuakse near the express ways and high ways to sell to consumers directly.

Finally, channel (g) illustrates the growers who directly contacted with exporters in Muse trade point. As they have high connection with exporters, they mainly produce for export market and produce in line with the demand from exporters.

Then next section is to examine the pros and cons of each channels of distribution. In this part, pros and cons of growers are explored based on their size of plantation areas. In this study, those with land area less than 10 acres are regarded as small holder growers whereas growers operating between 11 and 50 acres are medium size holders while growers with land area of more than 50 acres are regarded as large holders in this case. Table 4.6 shows the advantages and disadvantages of different channels for growers.

Table (4.6) Advantages and Disadvantages of Channels for Growers

Description	Advantages	Disadvantages
Channel (a)	- Reduce or avoid risks of damaging mangoes - Get lump sum income for growers received in advanced - Reduce hard works	- Getting very low price for growers - No bargaining power by growers from collectors
Channel (b)	- Able to sell all the mangoes to wholesalers by growers - Price of mango is higher than channel (a)	- No bargaining power by growers from wholesalers - Growers are also the price takers in this channel - Risks of damaging mangoes due to human and natural causes
Channel (c)	- Able to sell all the mangoes to processers/manufacturers by growers - No strict quality standards	- Lower price than normal fruits with normal marketing channels - Risks of damaging mangoes due to human and natural causes before selling - Few numbers of processing firms
Channel (d)	- Higher profitability for growers - Direct access to consumers	- Quality assurance - Risks of damage in transportation - Small market size
Channel (e)	- Good for growers to get higher profits - No exploitation from middlemen	- High demand for the best quality of mango - Limited market capacity mainly for urban consumers - Need to pass the inspection of the supermarkets' personnel
Channel (f)	- No need to contact with middlemen - Able to get higher prices	- Limited market - Uncertain demand - Unsold stock of mango will be the problem
Channel (g)	- Able to get higher price - No exploitation from middlemen	- Uncertainties of Chinese border trade policies - Unpredictable demand for mangoes - Long run challenges

Source: Survey data (2019)

Channel (a) is the most widely used marketing channel among growers as it can reduce or avoid risks of damaging mangoes due to weather, human effects or pests. It has weakness of getting low price for growers comparing to selling mango by themselves to other middlemen or consumers directly. However, major growers use this approach throughout the years. Most of the growers in this channel are large sized and medium sized growers.

For channel (b), price received by growers is higher than (a). Wholesalers' prices depend mainly on demand from Chinese market and weather conditions of the other States and Regions in Myanmar. If weather is bad in most other regions of Myanmar, their mango yield may reduce and increase demand for mango from Kyaukse. Moreover, Government Policy also affects the price of wholesalers. For instance, Government holding of Mango festivals and other promotional events linked with tourism sector, the demand will increase and prices will up. Yet, middlemen reap the largest profit throughout the chain in most cases. Majority in this channel are large and medium sized growers.

Growers in channel (c) are mainly intended for export market of value added mango products and local market. The growers in this channel are mainly linked with finished goods producers in Paleik as well as in Mandalay City to produce finished products. Therefore, the growers do not need to upgrade the quality of fruits for exporting as it is. Most of the growers in this group grow Sein Ta Lone and other species. But participation of middlemen impedes access to high price by growers in this channel. In this channel, majority are medium size growers.

Channel (d) can make higher profitability for growers as there are no middlemen throughout the value chain. They can market their products online and get feedback directly from consumers. However, this channel has drawbacks of packing low quality mango mixed with high quality fruits when delivering them as consumers cannot check the fruits before sending. Moreover, they may face damage while transporting them from growers to consumers. In addition, the size of market for online selling is comparatively small comparing to normal marketing channels. Growers in this channel are mostly the small sized growers.

Channel (e) is also good for growers to get higher profits. In this channel, growers get prices close to export prices of mango. Yet high demand for quality mango and limited market capacity is the weakness for these channels. The personnel from the

supermarket come and check the conditions of plantations in Kyaukse to get quality assurance for the urban consumers. Medium size growers can be seen in this channel.

The channel (f) also skips the middlemen and direct contact with consumers by the growers. However, the numbers of buyers are limited for these roadside stalls and can face problem of unsold mango. Some of them produce mango leather and other value added products but limited market size of the grower affect their profitability. Growers in this channel are small holders.

Channel (g) is mainly intended for exporting to China. It has advantage of getting higher prices than selling in local market. However, uncertainties of Chinese border trade policies and unpredictable demand impede the profitability of these growers in the long run. Growers in this channel include large plantations, which mainly intended for export market.

4.2.2 Analysis on Consumers' Buying Preferences of Mangoes

In this section, efforts have been made to observe the demographic characteristics of the consumers, mango buying preferences which include search, experience, safety and marketing attributes, mango buying pattern and mango consumptions patterns of the buyers in urban Mandalay City.

Under the buying pattern, sources of buying mangoes such as modern retail store and supermarket, wet market, fruit wholesale market, street vendor/ roadside stallholder, growers at the orchard and growers through online are included. Consumption include frequency, ways of consumption, numbers and types of mangoes mainly consume are studied.

Gender is classified as male and female while six age groups are categorized ranging from 18 years to above 65 years. Educations of the respondents are classified as 4 groups, from basic 3Rs to Master and above. Occupations are categorized as government sector, private employee, self-owned business, informal sector, dependent and student. Table (4.7) shows the demographic characteristics of Respondents.

Table (4.7) Socioeconomic Background of Respondents (Consumers)

No.	Particular	No. of Respondents	Percent
1	**Gender**		
	Male	92	46
	Female	108	54
Total		**200**	**100**
2	**Age**		
	18 – 24 years	19	10
	25 - 34 years	46	23
	35 - 44 years	50	25
	45 – 54 years	45	23
	55 – 64 years	23	12
	65 years & above	17	9
Total		**200**	**100**
3	**Education**		
	Basic 3 Rs	21	11
	Basic Education	67	34
	Bachelor Degree	82	41
	Master Degree	30	15
Total		**200**	**100**
4	**Occupation**		
	Government Sector	31	16
	Private Employee	58	29
	Self-Owned Business	37	19
	Informal Sector	25	13
	Dependent	33	17
	Student	16	8
Total		**200**	**100**
5	**Household Monthly Income**		
	Less than Ks 200,000	39	20
	Ks 200,001 – 400,000	68	34
	Ks 400,001 – 600,000	50	25
	Ks 600,001 – 800,000	31	16
	Above Ks 800,000	12	6
Total		**200**	**100**

Source: Survey data (2019)

From the table, it can be seen that majority of the respondents are female (54%) and age group between 35 and 44 years are the largest group (50%). Among the different educational group, Bachelor Degree holders are the largest group (41%).

Among the job types, private employees play as main group (29%) among consumers. Finally, among five income groups, majority of the respondents (34%) have monthly household income between Ks 200,001 and Ks 400,000.

Following section is Mango buying preferences and consumption pattern. Mango buying preferences is shown in following tables. Likert Scale analysis is used to examine the buying preferences among consumers. In Likert Scale analysis, 1represnts never, whereas 2 is rarely, 3 is regarded as occasionally, 4 is frequently and 5, always. Table (4.8) shows the searches attributes to check before buying mangoes by respondents.

Table (4.8) Search Attributes to Check before Buying Mangoes by Respondents

Description	1	2	3	4	5	Total
Yellow Colour	9 (4.5%)	7 (3.5%)	35 (17.5%)	68 (34%)	81 (40.5%)	**200**
Large Size	21 (10.5%)	30 (15%)	33 (16.5%)	60 (30%)	56 (28%)	**200**
Freshness	0	0	0	101 (50.5%)	99 (49.5%)	**200**
Undamaged	0	0	10 (5%)	82 (41%)	108 (54%)	**200**
Unblemished	12 (6%)	18 (9%)	15 (7.5%)	77 (38.5%)	78 (39%)	**200**

Source: Survey data (2019)

From the table, among the search attributes, majority 40.5% always choose yellow color while majority 30% frequently choose large sizes. 50.5% frequently look for freshness. Moreover, majority of the respondents 39%, always check unblemished when buying mangoes.

Table 4.9 describes the experience attributes to check before buying mangoes by respondents. Experience attributes include firmness, sweet taste, ripeness, fiber free and aroma.

Table (4.9) Experience Attributes to Check before Buying Mangoes by Respondents

Description	1	2	3	4	5	Total
Firmness	0	0	9 (4.5%)	89 (44.5%)	102 (51%)	**200**
Sweet Taste	21 (10.5%)	40 (20%)	45 (22.5%)	50 (25%)	44 (22%)	**200**
Ripeness	21 (10.5%)	34 (17%)	40 (20%)	65 (32.5%)	40 (20%)	**200**
Fiber Free	26 (13%)	29 (14.5%)	43 (21.5%)	57 (28.5%)	45 (22.5%)	**200**
Aroma	14 (7%)	37 (18.5%)	39 (19.5%)	60 (30%)	50 (25%)	**200**

Source: Survey data (2019)

According to the table, Majority of the respondents always check firmness (51%) while majority frequently check sweet taste, ripeness, fiber free and aroma of mango before they buy.

The safety attributes to check before buying mangoes by respondents are shown in table (4.10). Satisfy attributes take into account cleanliness of the fruits, chemical free and pesticide free criteria.

Table (4.10) Safety Attributes to Check before Buying Mangoes by Respondents

No.	Description	1	2	3	4	5	Total
1	Mango Cleanliness	18 (9%)	29 (14.5%)	28 (14%)	75 (37.5%)	50 (25%)	**200**
2	Chemical Free	23 (11.5%)	37 (18.5%)	59 (29.5%)	55 (27.5%)	26 (13%)	**200**
3	Pesticide Free	23 (11.5%)	37 (18.5%)	59 (29.5%)	55 (27.5%)	26 (13%)	**200**

Source: Survey data (2019)

From the above table, it was found that majority of the respondents (37.5%) check frequently about the cleanliness of the fruits before they buy. For the points such as free from chemicals and pesticides, majority check only occasionally (29.5% each).

Table (4.11) indicates the marketing attributes to check before buying mangoes by respondents. In this section, major check points include price, retailer cleanliness information about mango, packaging and certification.

Table (4.11) Marketing Attributes to Check before Buying Mangoes by Respondents

Description	1	2	3	4	5	Total
Price	30 (15%)	32 (16%)	40 (20%)	67 (33.5%)	31 (15.5%)	**200**
Retailer Cleanliness	29 (14.5%)	39 (19.5%)	48 (24%)	46 (23%)	38 (19%)	**200**
Information about Mango	21 (10.5%)	30 (15%)	37 (18.5%)	69 (34.5%)	43 (21.5%)	**200**
Packaging	22 (11%)	36 (18%)	34 (17%)	61 (30.5%)	47 (23.5%)	**200**
Certification	58 (29%)	50 (25%)	36 (18%)	30 (15%)	26 (13%)	**200**

Source: Survey data (2019)

From the table, it can be seen that majority of the respondents frequently check price (33.5%), information about the mango species and packaging. For certification majority (29%) never check whereas majority sometimes check cleanliness of sellers. The main place of buying mangoes by respondents from urban areas of Mandalay City are as shown in table (4.12).

Table (4.12) Main Place to buy Mangoes by Respondents

No.	Particular	No. of Respondents	Percent
1	**Places**		
	Modern Retail Store and Supermarket	49	25
	Wet Market	38	19
	Fruit Wholesale Market	35	18
	Street Vendor/ Roadside Stallholder	40	20
	From Growers at the orchard	11	6
	From Growers through online	27	14
Total		**200**	**100**
2	**Frequency of Buying Mangoes in Each Season**		
	Daily	52	26
	Frequently	67	34
	Sometimes	50	25
	Rarely	31	16
Total		**200**	**100**

Source: Survey data (2019)

Table (4.12) Main Place to buy Mangoes by Respondents (Cont'd)

3	**Number of Mangoes Buy at a Time**		
	Less than 5	30	15
	5 – 10	87	44
	11 – 20	66	33
	More than 20	17	9
Total		**200**	**100**

Source: Survey data (2019)

Mango Buying Pattern include main place of buying mangoes, frequency of buying mango in one season and numbers of mangoes buy for household at each time. Under locations of buying mangoes, places such as modern retail store and supermarket, wet market, fruit wholesale market, street vendor/ roadside stallholder, growers at the orchard, growers through online and others are included.

Frequency of Buying Mangoes in Each Season include daily, frequently, sometimes and rarely while number of mangoes buy at a time takes into account less than 5 numbers, between 5 and 10 numbers, between 11 and 20 numbers and more than 20 numbers.

From the table (4.12), it was found that majority (25%) of the respondents bought mangoes from modern retail store and supermarket followed by street vendor/ roadside stallholder (20%), wet market (19%) and from fruit wholesale market (18%). Although buying fruits at the orchard is low among respondents, buying through online contributes 14% of the total respondents.

When asking consumers' buying rate of mangoes within each mango season, majority (34%) bought frequently while 26% bought daily and 25% bought sometimes. In terms of the volume of mango, most respondents (44%) bought between 5 and 10 numbers a time followed by 11 and 20 numbers of mangoes per time (33%).

Mango Consumption Pattern includes frequency of consuming mangoes in a season, numbers of mangoes consume at a time, major way of consuming mango, and most preferred mango variety of the respondents. Table (4.13) shows the mango consumption pattern of the consumers.

Table (4.13) Mango Consumption Pattern of Respondents

No.	Particular	No. of Respondents	Percent
1	**Frequency of Consuming Mangoes in a Season**		
	Daily	28	14
	Frequently	99	50
	Sometimes	46	23
	Rarely	27	14
Total		**200**	**100**
2	**Number of Mangoes Consume at a Time**		
	1	30	15
	2	46	23
	3	79	40
	4	23	12
	5	12	6
	More than 5	10	5
Total		**200**	**100**
3	**Major Ways of Consuming Mango**		
	Fruit	108	54
	Preserved Products	32	16
	Juice	24	12
	Snacks	19	10
	Other	17	9
Total		**200**	**100**
4	**Most Preferred Mango Variety**		
	Sein Ta Lone	77	39
	Ma Chit Su	65	33
	Yin Gwe	40	20
	Other	18	9
Total		**200**	**100**

Source: Survey data (2019)

Table (4.13) shows among the 200 respondents, majority consume mango frequently (50%), sometimes (23%), whereas 14% each consume daily and rarely. Number of mangoes consume by respondents' households at a time is 3 numbers (40%) followed by 2 numbers (23%). Majority (54%) preferred mango fruit as it is while 16% preferred preserved mangoes. In terms of the mango species, majority like Sein Ta Lone (39%) whereas 33% preferred Ma Chit Su and 20%, Yin Gwe.

CHAPTER V
CONCLUSION

5.1 Findings

This study observed the current value chain of mango in Kyaukse Township with emphasis on growers' marketing and distribution channels. In this study, it was found that majority of the respondents are male. Most of the respondents got bachelor degree. Moreover, most of the growers are members of clusters and associations such as mango cluster of the Mandalay Region and Mandalay Region Fruits Producers and Exporters' Association. When asking their growing nature, majority of the respondents grow Sein Ta Lone only. Being a small town with traditional business practices, most of the plantations are family owned.

The land ownership of the majority is medium sized and most growers still use Normal Way (Using Chemical fertilizers/ pesticide) of growing mango while the rest use Pure Organic (Using Natural fertilizers/ pesticide) method. Majority of the growers have full time workers between 10 and 30 numbers. Labor is the most scarce resources for growers, most of the workers are hired from outside the Kyuakse Township. Majority of the growers access financial resources mainly from family followed by own financing and friends and relatives. There are no respondents who access finance from Microfinance Groups or Informal Financial Markets in Kyaukse Township.

Mango growers faced main difficulties in access to labor and advanced technologies. Although majorities are members of clusters and associations, these groups cannot disseminate the modern technologies for mango growing in Kyaukse Township. There are no growers who received supports from the Government as well as from NGOs and NPOs in terms of financial supports or technical assistants. No respondents have GAP Certification for their mango orchard though they have planned to get GAP for their farms in order to get higher price and larger market in the future.

The most severe constraints of growers include access to labor, access to GAP, access to modern cultivation techniques, access to new market and getting demand information from foreign market in time. In contrast, major strengths of the growers in

Kyaukse Township are getting demand information from local market, access to financial capital, access to farm equipment (including bags and other inputs), access to land and access to high quality seeds and plants.

Majority of the growers mainly distribute their mangoes through selling to collectors. It was followed by another channel that the growers selling to retailers. Next channel is to sell to value added producers whereas some distributes them online to consumers. Another channel is that the growers got contact with modern supermarkets in Mandalay City and sell them while small holders sell at their roadside shops. Very few shares of growers sell mango directly to exporters.

Channel (a) is the most widely used marketing channel among growers as it can reduce or avoid risks of damaging mangoes due to weather, human effects or pests. It has weakness of getting low price for growers comparing to selling mango by themselves to other middlemen or consumers directly. However, major growers use this approach throughout the years. Most of the growers in this channel are large sized and medium sized growers.

For Channel (b), price received by growers is higher than channel (a). Wholesalers' prices depend mainly on demand from Chinese market and weather conditions of the other States and Regions in Myanmar. If weather is bad in most other regions of Myanmar, their mango yield may reduce and increase demand for mango from Kyaukse. Moreover, Government Policy also affects the price of wholesalers. For instance, Government holding of Mango festivals and other promotional events linked with tourism sector, the demand will increase and prices will up. Yet, middlemen reap the largest profit throughout the chain in most cases. Majority in this channel are large and medium sized growers.

Growers in Channel (c) are mainly intended for export market of value added mango products and local market. The growers in this channel are mainly linked with finished goods producers in Paleik as well as in Mandalay City to produce finished products. Therefore, the growers do not need to upgrade the quality of fruits for exporting as it is. Most of the growers in this group grow Sein Ta Lone and other species. But participation of middlemen impedes access to high price by growers in this channel. In this channel, majority are medium size growers.

Channel (d) can make higher profitability for growers as there are no middlemen throughout the value chain. They can market their products online and get feedback directly from consumers. However, this channel has drawbacks of packing low quality

mango mixed with high quality fruits when delivering them as consumers cannot check the fruits before sending. Moreover, they may face damage while transporting them from growers to consumers. In addition, the size of market for online selling is comparatively small comparing to normal marketing channels. Growers in this channel are mostly the small sized growers.

Channel (e) is also good for growers to get higher profits. In this channel, growers get prices close to export prices of mango. Yet high demand for quality mango and limited market capacity is the weakness for these channels. The personnel from the supermarket come and check the conditions of plantations in Kyaukse to get quality assurance for the urban consumers. Medium size growers can be seen in this channel.

Channel (f) also avoids the middlemen and direct contact with consumers by the growers. However, the numbers of buyers are limited for these roadside stalls and can face problem of unsold mango. Some of them produce mango leather and other value added products but limited market size of the grower affect their profitability. Growers in this channel are small holders.

Channel (g) is mainly intended for exporting to China. It has advantage of getting higher prices than selling in local market. However, uncertainties of Chinese border trade policies and unpredictable demand impede the profitability of these growers in the long run. Growers in this channel include large plantations, which mainly intended for export market.

From the consumer' survey, it was found that majority of the respondents are female with largest age group between 35 and 44 years. Among the consumers, Bachelor Degree holders are the largest while private employees play as main group and monthly household income between Ks 200,000 and Ks 400,000. Majority of the respondents bought mangoes from modern retail store and supermarket. When asking consumers' buying rate of mangoes within each mango season, majority bought frequently. In terms of the number of mango, most respondents bought between 5 and 10 numbers a time. Majority consume mango frequently and the number of mangoes consume by respondents' households at a time is 3. According to the survey, majority preferred mango as fruit while most respondents preferred Sein Ta Lone the most.

5.2 Recommendations

By looking at the above pros and cons, majority of the growers, mainly the medium and small sized growers have low level of bargaining power within the value

chain except those who directly linked with consumers or able to skip the influence of middlemen. As most of the growers have low level of knowledge and capacities to initiate new ways of marketing and distributing mango in Kyaukse Township, they mainly use traditional routes of distribution for mango. Moreover, getting GAP certificate for growers within the Township is challenging so that they still have low voice and demand from middlemen in both local and export markets.

Nowadays, there are changing consumers' preferences and demand together with the development of ICT creates new marketing channels for mango growers. However, only few growers can access this benefit up until now in Kyaukse Township although it is renowned as major producer and exporter of high-quality mangoes in Myanmar.

From the value chain study of mango in Kyaukse Township, it was found that improvement in rural infrastructure including horticulture markets, enhancement of technical transfer, market information and provision of environmental friendly inputs are in need for growers. Fulfilling the above needs can enhance mango value chain as well. In order to upgrade the value added in agriculture, not only the staple, also the horticulture activities are needed to support. Being possess favorable background, improvement in horticulture can support not only the local economy, but also upgrade regional and national development. Through the initiation of value adding processes rather than selling and exporting raw fruits, marketing margin for rural farm and nonfarm industries will develop and help reducing migration of workers.

By analyzing the value chains of both fruits, current market condition is mainly rely on domestic raw fruit market. There still have potential for expanding value adding products and foreign market. Effective supports from government departments and their collaborations, i.e. between Ministry of Agriculture and Irrigation, Ministry of Commerce and Ministry of Planning and Finance are indispensable. Government encouragement of mango cluster and association is also essential through setting, modifying and implementing appropriate policies. Accordingly, required standards of horticulture products can be met and able to access global market without any difficulties. Moreover, better collaboration among growers can improve their bargaining power in both local and international markets and able to avoid exploitation by middlemen.

REFERENCES

Aung, M.L. (2013). *Analysis of Constraints Faced by Stakeholders towards a Successful Value Chain: Case Study of Pomelo in Yangon Region.* Mekong Institute.

Badar, H., (2014) Value Chain Performance Improvement for Sustainable Mango Industry Development in Pakistan, *Doctoral Thesis*, School of Agriculture and Food Sciences The University of Queensland.

Bair, J. (2005). Global capitalism and commodity chains: looking back, going forward. *Competition & Change*, *9*(2), pp. 153-180.

Baker, D. (2006). Agriculture Value Chains: Overview of Concepts and Value Chain Approach. *Presentation Prepared for the FAO LDED Regional Workshop for Asia,* Bangkok.

Baloyi, J. K. (2010). An analysis of constraints facing smallholder farmers in the Agribusiness value chain, *Unpublished Doctoral dissertation,* University of Pretoria.

Bammann, H. (2007). Participatory Value Chain Analysis for Improved Farmer Incomes, Employment Opportunities and Food Security, *Pacific Economic Bulletin*, 22 (3)

Bienabe E, Celia C, Jean-François L C, Laurent L, Rocio S. (2004). *Linking small holder farmers to markets: lessons learnt from literature review and analytical review of selected projects*. Breton, The World Bank.

Bryceson, K., & Kandampully, J. (2004). The Balancing Act:" E" issues in the Australian Agri-Industry sector. In *25th Annual McMaster World Congress*. McMaster University.

Collier, D. A., & Evans, J. R. (2009). *Operations Management*. Cengage Learning.

Department of Agricultural Land Management and Statistics (2019) *Fruit Database 2011 - 2017* Myanmar

Department of Population (2014), *Census Main Report (UNION)*, Ministry of Labour, Immigration and Population, Myanmar.

Elms, D. K., & Low, P. (Eds.). (2013). *Global value chains in a changing world*. Geneva: World Trade Organization.

Emana, B., & Nigussie, M. (2011). Potato value chain analysis and development in Ethiopia. *The case of Tigray and SNNP regions. Consultancy report. International Potato Centre (CIP) and USAID (United States Agency for International Development), Addis Ababa*.

Gandhi, V. P., & Namboodiri, N. V. (2002). Fruit and vegetable marketing and its efficiency in India: A study of wholesale markets in the Ahmedabad area.

Gereffi, G. (1994). The organization of buyer-driven global commodity chains: how US retailers shape overseas production networks. *Contributions in Economics and Economic History*, 95-95.

Gereffi, G., & Fernandez-Stark, K. (2011). Global value chain analysis: a primer. *Center on Globalization, Governance & Competitiveness (CGGC), Duke University, North Carolina, USA*.

Gereffi, G., Humphrey, J., & Kaplinsky, R. (2001). Introduction: Globalization, value chains and development. *IDS bulletin*, *32*(3), 1-12.

Grunert, K. G. (2002). Market Orientation at Industry and Value Chain Levels: Concepts, Determinants and Consequences. *Journal of Customer Behaviour 1, pp 167-194.*

Grunert, K. G. (2006). How changes in consumer behaviour and retailing affect competence requirements for food producers and processors. *Economia Agraria y Recursos Naturales*, *6*(11), 3-22.

Hailu, A. (2016), Value Chain Analysis of Vegetables: The Case of Ejere District, West Shoa Zone, Oromia National Regional State of Ethiopia, *Master Thesis*, Haramaya University

Hellin, J. and Meijer, M. (2006). *Guidelines for Value Chain Analysis*. Food and Agriculture Organization of the United Nations (FAO), Rome, Italy.

Hichaambwa, M. (2010). Developments in the Horticultural supply chains in Zambia. *Food Security Research Project (FSRP),* Lusaka.

Humphrey, J., & Schmitz, H. (2004). Chain governance and upgrading: taking stock. *Local enterprises in the global economy: Issues of governance and upgrading*, pp. 349 – 360.

Kaplinsky, R., (2000), Globalisation and Unequalisation: What can be Learned from Value Chain Analysis, *The Journal of Development Studies,* 37 (2), pp. 117 - 146

Kaplinsky, R., and Morris, M. (2001). *A Handbook for Value Chain Research* (Vol. 113). Canada: IDRC.

Kaung Myat (2012). Export Conditions of Myanmar Mango: Hindrances and Opportunities in the Supply Chain. *Master Thesis*, University of Bologna.

Kherallah, M. and Kirsten, J. (2001), The New Institutional Economics: Applications for Agricultural Policy Research in Developing Countries, *Markets and Structural Studies Division. MSSD Discus*

Louw, A. Madevu, H., Jordaan D. and Vermeulen, H. (2004). Recovering Markets: Securing Small Producer Participation in Restructured National and Regional Agri Food System. *London: International Institute for Environment and Development (IIED).*

Makhura, M. T. (2001). Overcoming Transaction Costs Barriers to Market Participation of Smallholder Farmers in the Northern Province of South Africa. *PhD dissertation*, University of Pretoria, Pretoria.

Marye, M. (2014) Value Chain Analysis Of Fruits For Debub Bench Woreda, Bench Maji Zone, Snnpr: A Case Of Three Selected Fruits, Banana, Mango And Papaya, *Master Thesis*, Mekelle University.

Ministry of Agriculture and Irrigation (2012). *Myanmar Agriculture at a Glance,* Department of Agricultural Planning, Myanmar

Ministry of Agriculture and Irrigation (2014) *Myanmar Agriculture in Brief,* Myanmar

Muluken, M. (2014). Value Chain Analysis of Fruits for Debub Bench Woreda, Bench Maji Zone, *Doctoral dissertation*, Mekelle University.

Naing Tun Aung (2015), Value Chain Of Horticulture Exports Forrural Development In Myanmarcase: Analyzing Mango And Pomelo Value Chain In Yangon Region, *Master Thesis*, Ritsumeikan Asia Pacific University

Ouma, E. A., & Jagwe, J. (2010). Banana Value Chains in Central Africa: Constraints and Opportunities. In *Joint 3rd African Association of Agricultural Economists (AAAE) and 48th Agricultural Economists Association of South Africa (AEASA) Conference. Cape Town. South Africa.* pp. 19-23.

Piper, T., (2007) *Choosing Between Strategies: Adapting Industry Approaches to Specific Value Chain Analysis Using Three Comparative Commodities*. TechnoServe Inc. Washington D.C.

Ponte, S., & Gibbon, P. (2005). Quality standards, conventions and the governance of global value chains. *Economy and society*, *34*(1), 1-31.

Porter, M. E. (1985). *Competitive advantage: Creating and sustaining superior performance*. Simon and Schuster.

Richard, P. and Besigye, A. (2005) *Commodity Value Chains: Mapping Maize, Sunflower and Cotton Chains in Uganda*, USAID/ Rural Speed, Kampala.

Rogath, H (2010), Analysis of value chain for pigeonpea in Tanzania*, Master Thesis*, Molde University College

Tchale, H., & Keyser, J. (2010). Quantitative value chain analysis: an application to Malawi. *World Bank Policy Research Working Paper Series, Vol*.

Tefera, T. (2014). Analysis of Chickpea Value Chain and Determinants of Market Options Choice in Selected Districts of Southern Region: A Case of CIFSRF Call3 Project. *Journal of Agricultural Science*, *6*(10), p26.

Thorbecke, E. (1969). *The role of agriculture in economic development.* London/New York.

Tita, D. F. (2009). A transaction cost analysis of factors affecting market arrangements in the agroforestry tree product value chain in Cameroon. Ghent, Ghent University. *International Master of Science in Rural Development*, *131*.

Vermeulen, S., J. Woodhill, F.J. Proctor and R. Delnoye, (2008). *Chain-wide learning for inclusive agro food market development: a guide to multi-stakeholder processes for linking small scale producers with modern markets.* International Institute for Environment and Development, London, UK, and Wageningen University and Research Centre, Wageningen, the Netherlands.

Vernon, R. (1970). *The technology factor in international trade*. R. Vernon (Ed.). New York: National Bureau of Economic Research.

Vorley, B., & Fox, T. (2004). Global Food Chains — Constraints and Opportunities for Smallholders.

Woldemicael, (2008). Dairy marketing chains analysis: the case of shashemane, Hawassa and dale district's milk shed, southern Ethiopia. *Master Thesis, Department of Agricultural Economics*, Haramaya University.

Wong, L., & Wai, E. (2013). Rapid Value Chain Assessment: Structure and Dynamics of the Rice Value Chain in Burma. *Background paper*, *6*.

World Bank and UNIDO. (2006). Pakistan's Agro-based Exports and Sanitary and Phytosanitary (SPS) Compliance, A Joint World Bank and UNIDO Report.

WBSCD (2011) *Collaboration, Innovation, Transformation Ideas and Inspiration to Accelerate Sustainable Growth: A value chain approach,* World Business Council for Sustainable Development, France

Websites

- World Business Council for Sustainable Development https://www.wbcsd.org/Overview/Global-Network/The-WBCSD-Global-Network-brings-value-on-three-main-levels (accessed on May 1, 2019)
- Myanmar Fruit, Flower & Vegetable Producer And Exporter Association https://mfvp.org/ (accessed on June 29, 2018)
- Value Chain 4 Poor http://valuechains4poor.pbworks.com/w/page/12518345/Mapping%20the%20Value%20Chain (accessed on June 30, 2018)
- Market Links Organization https://www.marketlinks.org/good-practice-center/value-chain-wiki/value-chain-mapping-process (accessed on June 30, 2018)

APPENDIX I

Fruit Planted Area and Harvested Area by States and Regions (2013-2017) **(acers)**

State/ Region	2012-13		2013-14		2014-15		2015-16		2016-17	
	Gross Area Planted	Gross Area Harvested	Gross Area Planted	Gross Area Harvested	Gross Area Planted	Gross Area Harvested	Gross Area Planted	Gross Area Harvested	Gross Area Planted	Gross Area Harvested
Kachin	67593	47832	68044	48188	68159	48830	70330	50074	70355	48787
Kyah	1850	1843	1857	1824	1900	1842	1969	1865	1969	1951
Kayin	114940	43357	114968	44137	115909	45177	116272	45207	116425	49631
Chin	7361	6171	9562	6426	11009	6639	12363	7043	12497	7914
Sagaing	96775	94242	96921	94864	97479	96529	99285	99285	100012	98038
Tanintharyi	249498	194149	250045	193684	250058	195361	251185	202919	251881	203929
Bago	195727	180700	198160	182476	199647	185584	201335	186388	202145	187157
Magway	33705	32842	33891	32895	34377	32950	34718	33011	34718	33113
Mandalay	58919	52477	59244	55137	59854	55243	62350	54755	70546	61371
Mon	169400	111246	170885	104070	170885	104784	170973	112228	170973	116638
Rakhine	60901	45452	60850	46477	61631	47795	66989	49794	67217	50118
Yangon	78462	64925	78446	73948	78446	74460	74803	71597	74906	69904
Shan	95314	68102	96780	69977	95885	70370	95568	71040	93559	70210
Ayerarwaddy	217559	107331	218299	188430	219414	192191	219861	192654	219919	180757
Naypyitaw	5601	2421	8025	2727	10291	3822	10450	4732	10538	4749
Total	**1453605**	**1053092**	**1465977**	**1145260**	**1474944**	**1161577**	**1488451**	**1182592**	**1497660**	**1184267**

Source: Department of Agricultural Land Management and Statistics (2019)

APPENDIX II

PART 1

Questionnaire for Growers

Socioeconomic Condition of Growers

1. **Gender** □Male □Female
2. **Age** _____ years
3. **Education** □Primary □ Secondary □ University □Master and Above
4. **Native** _____ Region/ State

Basic Business Information of Growers

5. **Experience in Horticulture Business** _____ years
6. **Are you a member of any cooperative or cluster?** □ Yes □ No
7. **If your answer is Yes, what is the name of the cooperative/ cluster**

_____

1. **Year of Establishment of this plantation** _____ years
2. **Type of Fruits Grown** □ Mango □ Mango and Other Fruits
3. **Variety of the mangoes grown in your farm**

_____

_____

4. **Type of Your Business Ownership**

□ Sole proprietorship □ Family Business

□ Partnership □ Company □ Other _____

Input Information of Growers

5. **Number of Land Acres** _____
6. **Type of method for growing mangoes**

□ Normal Way (Using Chemical fertilizers/ pesticide)

□ Pure Organic (Using Natural fertilizers/ pesticide) □ Mixed

7. **Number of full time workers** _____
8. **Number of part time workers** _____

9. Main Source of Labor

□ Family □ Local □ Out of the township □ Out of the Region

10. Main Source of Finance

□ Own Financing □ Family □ Friends and Relatives

□ Formal Financial Institutions □ Microfinance Groups

□ Informal Financial Markets

11. Access to Inputs

1 = Very Low, 2 = Low, 3 = Neutral, 4 = High, 5 = Very High

Contents	1	2	3	4	5
Access to labor					
Access to needed finance					
Access to quality seeds and plants					
Access to fertilizers, pesticides					
Access to Natural fertilizers, pesticides					
Access to Advanced Technology					

12. Type of problems faced concerning with Inputs _____

13. Mention the types of government supports for your Farm Business

_____

14. Mention the types of NGOs and NPOs supports for your Farm Business

_____

Information about GAP certification

15. Do you have GAP Certification for your mango orchard? □ Yes □ No

16. If No, do you have a plan to get GAP for your farm? □ Yes □ No

17. If No, why? _____

Constraints and Strengths

18. What are the five major constraints faced by your farm?

(1= least severe, 5 = most severe)

□ Access to Land □ Access to High Quality Seeds and Plants □ Access to GAP

□ Access to Farm Equipment □ Access to Labour □ Access to Financial Capital

□ Access to Modern Cultivation Techniques □ Access to Market Information

□ Access to New Market □ Getting Demand Information from Local Market

□ Getting Demand Information from Foreign Market □ Other _____

19. What are the five major strengths faced by your farm?

(1= least severe, 5 = most severe)

□ Access to Land □ Access to High Quality Seeds and Plants □ Access to GAP

□ Access to Farm Equipment □ Access to Labour □ Access to Financial Capital

□ Access to Modern Cultivation Techniques □ Access to Market Information

□ Access to New Market □ Getting Demand Information from Local Market

□ Getting Demand Information from Foreign Market □ Other _____

Marketing and Distribution

20. Are you producing with your own brand? □ Yes □ No

21. Source of access to market information

□ From friends and relatives □ From broadcasting media

□ From printed media □ From Social Media

□ From market □ Other sources _____

22. Channels of Distribution for your fruits

□ Direct Selling to Consumers at own shop □ Direct Selling to Consumers online

□ Sell to Fruit Collectors □ Sell to Wholesalers □ Sell to Retailers (Venders)

□ Sell to Retailers (Supermarkets) □ Sell to Value Added Producers

□ Sell to Exporters □ Others _____

23. Marketing channels of your product (Domestic Market) through

□ Direct Selling □ Collectors □ Wholesalers □ Retailers □ Other _____

24. Marketing channels to Export Market through

□ Direct Selling □ Collectors □ Wholesalers □ Retailers □ Other _____

25. Pros and Cons of your major channel of distribution in domestic market

_____

_____

26. Pros and Cons of your major channel of distribution in export market

_____

_____

27. Through which channel did you profitable most within the Domestic Market?

_____

_____

28. Through which channel did you profitable most within the Export Market?

_____

_____

Please feel free to add any additional comment you may want to add:

_____

_____

Thank You So Much for your Cooperation!

PART II

Questionnaire for Consumers

Socioeconomic Condition

1. **Gender** □ Male □ Female
2. **Age** _____ years
3. **Education** □ Primary □ Secondary □ University □Master and Above
4. **Occupation** □ Government Sector □ Private Employee
   □ Self-Owned Business □ Informal Sector
   □ Dependent □ Student □ Others _____
5. **Household Monthly Income** □ Less than Ks 200,000 □ Ks 200,001 – 400,000
   □ Ks 400,001 – 600,000 □ Ks 600,001 – 800,000 □ Above 800,000

Mango Buying Preferences

6. **Below are some preferred attributes of mangoes. Please indicate the level of importance that you attach to each of these attributes.**

   1 = Never, 2 = Rarely, 3 = Occasionally, 4 = Frequently, 5 = Always

Check Points Before Buying	1	2	3	4	5
Search Attributes					
Yellow Color					
Large Size					
Freshness					
Undamaged					
Unblemished					
Experience Attributes					
Firmness					
Sweet Taste					
Ripeness					
Fiber Free					
Aroma					
Safety attributes					
Mango Cleanliness					

Chemical Free					
Pesticide Free					
Marketing attributes					
Price					
Retailer Cleanliness					
Information about Mango					
Packaging					
Certification					

Mango Buying Pattern

7. Where do you usually buy mangoes?

1 = Never, 2 = Rarely, 3 = Occasionally, 4 = Frequently, 5 = Always

Contents	1	2	3	4	5	Reason
Modern Retail Store and Supermarket						
Wet Market						
Fruit Wholesale Market						
Street Vendor/ Roadside Stallholder						
From Growers at the orchard						
From Growers through online						
Other						

8. How often do you buy mangoes during the mango season?

□ Daily □ Frequently □ Sometimes □ Rarely

9. How many mangoes normally do you buy at one time for your household?

□ Less than 5 □ 5 – 10 □ 11 – 20 □ More than 20

Mango Consumption Pattern

10. How often do you consume mangoes in mango season?

□ Daily □ Frequently □ Sometimes □ Rarely

11. How many mangoes normally do you buy at one time for your household?

□ 1 □ 2 □ 3 □ 4 □ 5 □ More than 5

12. How do you consume mangoes?

1 = Not Consume, 2 = Rarely, 3 = Occasionally, 4 = Frequently, 5 = Regularly

Contents	1	2	3	4	5
Fruit					
Preserved Products					
Juice					
Snacks					
Other					

13. Which mango varieties do you like and why?

1 = Not Consume, 2 = Rarely, 3 = Occasionally, 4 = Frequently, 5 = Regularly

Contents	1	2	3	4	5	Reason
Sein Ta Lone						
Ma Chit Su						
Yin Gwe						
Other						

Thanks for Your Kind Cooperation!