

# Economic Analysis of Production and Marketing Activities of Mung Bean (Green gram) Farmers in Selected Areas in Yangon Region, Myanmar

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## Abstract

Pulses in Myanmar are not only high value for daily diet but also significant crop for commercialization in farming. Mung bean is one of the main commercial crops in the selected survey areas in Yangon region. Therefore, this study was conducted to know the profitability and market performance of mung bean producers in the study area. The sampled farmers were categorized into three groups based on their mung bean cultivated area. The BCR results showed 1.92, 2.12 and 1.95 for small, medium, and high sown acre groups indicating the highest BCR obtained by the medium size (group II) farmers. All the sampled farmers were found in profitable conditions of mung bean production. In the cost share analysis, the results showed the highest share of production cost was material cost and followed by hired labor cost share all the groups. As one of the exports produces of mung bean faced price instability among farmers pointed that there should have steady export markets and encouraging the value-added products of mung bean. To produce the quality mung bean, the government should increase the extension facilities and improved techniques for mung bean production. Finally, the results of marketing activities indicated the requirement of systematic and advance marketing system for mung bean production is essential in Myanmar.

**Keywords:** Mung bean, farmers, production, marketing, profitability

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## 1. Introduction

With a contribution of about 26% to Myanmar's GDP and 24% in total exports earning, agriculture is the leading employer in the economy of about 61% (MOALI, 2018). Out of 67.66 million hectares of land in Myanmar, only 12.06 million hectares are under cultivated land (MOALI, 2018). Paddy, beans and pulses and oilseed crops contributed as three main groups among the total crop production in Myanmar. Pulses in Myanmar are not only high value for daily diet but also significant crop for commercialization in farming. After growing monsoon paddy, instead of leaving the land idle, pulses and beans can grow without any great effort or investment, since they neither require much of additional manure or fertilizers, nor ample amounts of water to grow the left over moisture in the land from the paddy is sufficient. The crop is ready in 3 months and quick sale of this nutritious staple is impetus enough for farmers to grow these, and statistics reveal a steady increase in land area being allocated for growing beans and pulses. Highly motivated farmers, less cumbersome cultivation cycle, ideal climatic conditions, and ample yield that brings quicker returns as compared to other crops, are some of the big advantages of cultivating beans and pulses (Myanmar Insider, 2015).

Myanmar's existing areas of export strength in beans and pulses are largely focused on dry beans—particularly pigeon pea, black gram, and mung bean (green gram). Liberalization of agricultural products including pulses marketing and production began in 1988 opened export marketing to private traders improved the domestic pulses production and trade. Mung bean was first cultivated in India about 4,500 years ago. Cultivated mung bean spread from India to China and other parts of Southeast Asia countries such as Myanmar, Thailand, etc. Mung bean is grown both in central Myanmar where it is cultivated in rainy season and lower Myanmar where it is grown mostly in the winter season on paddy field after monsoon crop. In central Myanmar, sowing season is on May-June and harvesting season is August-September. Sowing time in lower Myanmar is on late October-December and harvesting is February-March (Moe and et. al., 2008).

Mung bean is an important crop in Myanmar in terms of scale of production and exports. Production and trade of the pulses is in bulk. India is the main export market. Only a small amount of the mung bean is exported as raw material for the sprouted seed production in Europe (Dutch Vegetable Sector Support Myanmar, 2019). India is the largest buyer of Myanmar beans and pulses, making nearly three quarters of the export market. The next markets are the UAE, Thailand, Bangladesh, and Japan. The prices of mung bean are usually volatile at the beginning of the harvest period, and prices typically decline following a good harvest. These traders collect the mung bean from individual farms and then sell them on to large wholesalers or exporters who store them in large warehouses. Export companies will negotiate contracts with foreign buyers and export. Bayinnaung Wholesale

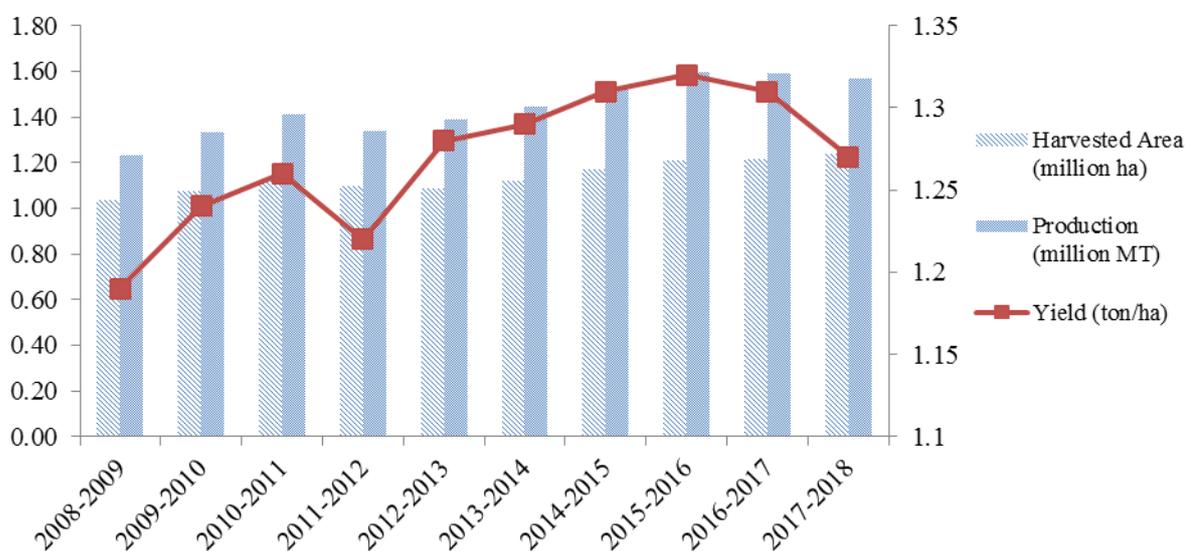
Market, Yangon is the key place for all the beans and pulses. Foreign investors looking to get into this market will find relatively few options, as currently all beans and pulses trading companies in Myanmar are locally owned. About 70% of all pulses are grown in winter season with a yield range of 1.0-1.3 MT/ha. Gradual increasing trend of mung bean export started around 229 thousand MT in 2011-12 reached to 360 thousand MT and 352 thousand MT in the years of 2012-13 and 2017-18 (MOALI, 2018).

### 1.1 Yield, Harvested Area and Production of Mung bean in Myanmar

As one of the world's second largest exporters of pulses, Myanmar contributed about 22% of total crop sown area with more than twenty kinds of pulses are being grown. Mung bean production was one of the profitable crops in Myanmar and widely produced in the Dry Zone (Sagaing, Magway, Mandalay, and the Delta Area (Yangon, Bago, Ayeyarwaddy). At the growing season of 2017-2018 sown area of pulses was about 4.4 million hectares with average yield of 1.27 metric ton per hectare and exported amount of 1.25 million metric ton accounted to 22% of total pulses production in Myanmar. Trend of mung bean cultivation and production in Myanmar for about ten years (2008 to 2018) bar graph is shown in Figure 1. Mung bean production in Myanmar presents gradually increased trend in total production though some year showed decreasing trend. The most volatile situation can be seen in the yield per hectare of mung bean, the lower yield was found in 2008-2009, 2011-2012 early year and again in 2017-2018 mung bean production season.

### 1.2 Rationale and Objective of the study

As one of the important commercial pulses in Myanmar, information on mung bean production could help farmers and stakeholders and others, who need the information for their respective purposes. Improving production and marketing facilities for agricultural crops and mung bean farmers in particular would enable to plan their production more in line with market demand, to schedule their harvests at the most profitable times, to decide which markets to send their produce. Therefore, it is necessary to find out the profitability and the market performance of mung bean production. Given the limited information of mung bean studies in Myanmar, the objectives of the study were to describe the socio-economics characteristics of sampled farmers in the study area; to determine the cost and returns of mung bean production in the study area; to determine the major problems the mung bean farmers' facing; and finally to describe the marketing activities of mung bean growers.



Source: MOALI, 2018

Figure 1. Mung bean production trend in Myanmar

## 2. Literature Review

### 2.1 Economic review on Myanmar pulses sector

Pulses are Myanmar's largest agricultural export crop (by volume and value), and second most important for domestic consumption after rice. Around seventy percent of the export quantities of Myanmar pulses are destined for India, and the rest goes to other countries. Therefore, the profitability of Myanmar pulses depends on Myanmar's export performance to those countries and the improvement pulses sector became a major issue in

the development process of Myanmar. An inelastic demand for Myanmar's pulses means that export revenues can be increased with price increase. There is still more to be done to improve the quality issue for pulses. Product quality is important strategic issue in the international market. Therefore, the pulses industry in Myanmar may be able to improve its market position by appropriate management and marketing strategies (Thanda Kyi & Von oppen 2004).

The contribution by pulses production to economic development in Myanmar depends to a considerable extent on their economic efficiency in terms of comparative advantage of domestic production and exporting marketing. These advantages for the major exportable varieties of pulses such as black gram (*Vigna mungo*) and green gram (*Vigna radiata*) were analysed by Aye Aye Mon (2002). It was found that resources for black gram and green gram production were efficiently utilized to the national welfare in Myanmar.

### *2.2 Review on method of Analysis*

Chase (2017) identified that an enterprise budget is a listing of all estimated income and expenses associated with a specific enterprise to provide an estimate of its profitability. A budget can be developed for each existing or potential enterprise in a farm or ranch plan. Enterprise budgets are useful for estimating costs and returns on enterprises currently in the farm plan, as well as new enterprises under consideration. Most enterprise budgets also list physical resources needed for production, which is useful information for prospective new producers. In addition to producers, other agribusiness professionals often find enterprise budgets to be valuable information sources.

An enterprise budget is an estimate of the costs and returns associated with the production of a product or products-referred to as an enterprise. An enterprise is usually based on some production input unit- an acre of land for most crop enterprise budgets, or an individual animal unit for livestock enterprise budgets. Enterprise budgets require less data than the whole farm budget, and when realistic and accurate cost allocations can be made by enterprise, the comparative profitability of enterprises can be measured. Enterprise budgets also can be used to derive breakeven prices and break-even yields (Smith et al. 2013). Shafiqul (2011) mentioned that costs are the expenses in organizing and carrying out the production process. The cost of production included different variable cost items like land preparation, human labor, seed, manure, fertilizer, insecticides, etc. Both cash expenditure and imputed value of family supplied inputs were included in the analysis. It revealed that highest cost was incurred for human labor (54%) followed by land preparation (28%) and seed cost (7%) when family supplied inputs were valued at market rate.

## **3. Research Methodology**

### *3.1 Area of study and data collection*

The study was carried out in the southern part of Yangon Region located in the lower part of Myanmar. It is bordered by Bago Region to the north and east, the Gulf of Mottama to the south, and Ayeyarwady Region to the west. Yangon is the most developed region of Myanmar with land area of 10,170 km<sup>2</sup> and a population of over 7 million representing 14% of Myanmar's total population. Yangon regions have 4 districts and 44 townships. The study area of Khayan and Thongwa townships are in the southern part and border with Gulf of Mottama which are also main production regions of mung bean.

A detailed household level survey was conducted for two major mung bean producing townships namely, Khayan and Thongwa in Yangon Division. From each township two of major mung bean producing villages were selected as further analysis. From Khayan Township, Khamat and Kamakalu villages and from Thongwa Township, Latpannankalae and Upper Katonepaw villages were selected. Primary data was collected through a comprehensive household survey in the above mentioned two townships under which four villages of winter mung bean producing season during 2017-2018. The farmers were selected through a purposive random sampling technique. The total sample consisted of 73 mung bean farmers in which 35 farmers from Khayan and 38 farmers from Thongwa townships. The survey was conducted through questionnaire, framed in such way as to draw out details covering household characteristics, wealth and farm characteristics, institutional and access related variables, risk and economic factors to estimate the profitability of mung bean production in the study areas. Some of the secondary data were obtained from Ministry of Agriculture, Livestock, and Irrigation (MOALI) and other written documents such as thesis, journals, and reports.

### *3.2 Methods of Analysis*

Mung bean farm enterprises were grouped according to their sizes with group I range between 1-5 acres, 5.1-10 acres being the group II and group III 10.1 acre and above. Descriptive statistics such as percentages, mean, frequency distribution, and tabulation were used to calculate the socio-economic and farm characteristics of the respondents. Farm enterprise budget analysis was used to determine the cost and return in mung bean producing sample farmers in the study area.

Descriptive analysis was used to obtain the general characteristics and marketing activities of the sampled

participants. Enterprise budget analysis enables to show the differences in net benefits under several resources' allocation in such a way as to help farm management decision. Therefore, this study applied the cost and return analysis, to determine the profitability of the mung bean production in the study area. Both cash and non-cash items were included in the estimation of material cost and labor cost. Non-cash items for material cost included seeds, family labor, owned working animals, farmyard manure and cost of inputs. Cash payment for labor included hired labor payment for production. Under the above categories gross benefit or total revenue is multiply output per unit area and the price received by the mung bean growers.

Enterprise budget contains several cost components such as total variable costs were taken into account per unit basis of; (1) Material input cost, (2) Hired labor cost, (3) Family labor cost and (4) Interest on cash cost. Table 1 expressed the relative indicators used in the study. The first measurement was the deduction of the opportunity cost and total variable cash costs from gross benefit. This return was referred to as "return above variable cost" or "gross margin". The second measurement was the difference between total gross benefits or total returns and total variable cash costs, excluding opportunity costs. This value was referred to as "return above variable cash cost". The return per unit of cash cost could be calculated by gross benefits per total cash costs. The return per unit of capital invested could be calculated by gross benefits per total variable costs.

Breakeven analysis for prices and yields is the useful information of enterprise budget. Breakeven analysis is a useful to calculate various combinations of price and yield that will cover anticipated costs (short-term production decisions). If anticipated receipts are greater than anticipated variable costs, you should continue the enterprise. If anticipated receipts are less than variable costs, losses would be minimized by not continuing the enterprise. Benefit cost ratio was used as profitability measures for each crop enterprise computing total gross margin or return above variable cost and return above cash costs (Olson, 2003).

Table 1. Relative Indicators used in the Study

<i>Indicators</i>	<i>Unit</i>	<i>How to calculate</i>
Return above variable cost	MMK/ha	RAVC = GB-TVC
Return above variable cash cost	MMK/ha	RAVCC= GB -TVCC
Return per unit of cash cost	MMK	GB /TVCC
Return per unit of capital	MMK	GB /TVC
Break - even yield	MT/ha	TVC/Average price per MT
Break - even price	MMK/MT	TVC/Average yield per hectare

Where,

GB = Gross Benefit

TR = Total Revenue

TVC = Total Variable Cost

TVCC = Total Variable Cash Cost

RAVC = Return Above Variable Cost

RAVCC = Return Above Variable Cash Cost

## 4. Results and Discussion

### 4.1 Socio-economic characteristics of the respondents

It is important to understand the socio-economic characteristics of mung bean farmers in the study area hoping to identify those characteristics may impact on their farming activities in the area. It included ratio of gender, age, educational attainment, household size, farming experiences etc. Results of analysis showed in table 2. Males dominate in mung bean farming as an occupational business in the study area like the other studied of farm survey in Myanmar. Results showed that majority (86%) of the respondents were male whilst the female respondents were 14% and among the three groups male respondents were relatively high.

Table 2. Socio-economic characteristics of mung bean farmers

<i>Characteristics</i>	<i>Group I (n=22)</i>	<i>Group II (n=27)</i>	<i>Group III (n=24)</i>	<i>Total (n=73)</i>
Male household head (%)	77	93	87.50	86
Female household head (%)	23	7	12.50	14
Mean value of age (years)	46	54	54	51
- range of age (years)	20-71	28-78	41-70	20-78
Mean years in farming experiences	22	31	28	27
- range	1-56	4-60	7-44	1-60
Education level of household head (%)				
- primary or monastery	9	33	8	18
- secondary/ middle school	50	30	25	34
- high school	41	30	58	42
- University	0	7	8	5
Average family member (person)	4	4	5	4
- range of member	2-8	2-7	2-7	2-8
- male member	2	2	2	2
- female member	2	2	2	2
Average family labor (person)	2	2	2	2
- range of member	1-5	1-5	1-5	1-5
Average owned farmland (acre)	4.54	9	24.64	12.96
- range acreage	1.5-10	5.5-18	10.31-74	1.5-74
Average mung bean sown area (acre)	3	8	21.44	11
- range acreage	1-5	5.5-10	10.31-74	1-74
Average yield of mung bean (kg/acre)	428.90	492.17	451.66	464
- yield range	326.50-653	326.50-653	326.50-653	326.50-653

Source: survey (2018)

The mean age was 51 years while group I had the youngest age of 46 and group III had the highest age of 54 years although the age variation was high between 20-78 years. One can infer from this result the sampled farmers in the study area are at their economic active age implies that there is quality of labor which may positively affect productivity of farm business hoping to adopt new innovations willingly. The mean of farming experience is amounted to 27 years but group II had the highest farming experience 31 years followed by group III and group I of 28 and 22 years showing that the sampled farmers in the study area possessed a long time experiences in farming. Still, some farmers had short time farming experiences indicating the results of 1-60 years from the mean range of experience. In total, the average educational attainment of household head had high school level of 42% followed by secondary, primary or monastery and high school level of 34%, 18%, and 5% respectively. Group III had the highest attainment in education 58% in middle school and the highest ratio in high school of 8% than the other groups. It indicated the level of farmer's education in the study area had a little higher in compare with other studied in Myanmar.

The mean of household size is 4 persons per house contributing each of 2 persons male and female with a range of family member from 2-8 persons. Group III is the more populated group with about 5 persons per family. This rate is similar with other studies of farming in Myanmar. When checking to the family member who helps in family farming was 2 persons with a range from 1-5 persons per house. This implies that they can utilize as a source of family labor in mung bean production activities. The average farm size owned by the farmers in the study area is about 13 acres with group III having the largest farm size nearly 25 acres. The area under the mung bean production in these areas was 11 acres in total average with a range of 1 to 74 acres and among the three groups; the mung bean cultivated acres occupied the largest proportion of total cultivated area. The mean output of mung bean in the study area recorded to be 459.78 kg/acre during the survey period. Group II recorded the highest yield among the three groups followed by group III and group I of 492, 451.66 and about 429 kg/acre, respectively.

#### 4.2 Production cost and profitability

Pulses production has become one of the growing sectors in Myanmar. This is likely to continue because pulses production is more profitable in terms of comparative advantage than rice, cotton, and sugarcane (Thanda Kyi & von Oppen 2000). Concordantly, pulse stands the largest export values among the agricultural produces. Mung bean production in the study area provides a substantial high income for the growers with the price token this time. Production cost can give benefit the data suppliers, namely the farmers themselves and indirectly through improved policymaking, better administrative decisions, and more efficient markets (FAO, 2016). Mung bean

production is a labor consuming activity especially in harvest time, a person day of labor is defined as six hours in farming. A wage of 3000-4000 MMK/day/labor was considered in this research. Production costs defined as the monetary value of the inputs required for mung bean production. Accordingly, the production cost per acre for mung bean is given in table 3.

Table 3. Average cost of mung bean production farmers based on an acre

Item	Group I (n=22)	Group II (n=27)	Group III (n=24)	Total (n=73)
Yield of mung bean (kg/acre)	429	492	457	462
Mung bean price (MMK/kg)	1036	1023	1069	1042
Gross revenue (MMK/acre)	444409	503611	489396	481096
Total material cost (MMK/acre)	108243	115087	121510	115136
Total family labor cost (MMK/acre)	29773	27593	28563	28568
Total hired labor cost (MMK/acre)	83659	85574	89942	86433
Interest on cash cost (MMK/acre)	9595	10033	10573	10078
Total Variable Cash Cost (MMK/acre)	201497	210694	222025	211648
Total Variable Cost (MMK/acre)	231270	238278	250587	240216
Return above cash cost (MMK/acre)	242912	292917	267371	269448
Return above variable cost (MMK/acre)	213139	265324	238809	240880
Return per unit of cash expensed (MMK/acre)	2.22	2.45	2.21	2.3
Return per unit of capital expensed or Benefit Cost Ratio (BCR) (MMK/acre)	1.92	2.12	1.95	2.0
Break - even yield (kg/acre)	222	229	240	231
Break - even price (MMK/kg )	501	516	243	510

Note: Approximately 1USD = 1330 MMK (Jan 2018)

Source: survey (2018)

The total variable production costs per acre among the three groups were identified to a range between 231,270 MMK to 250,587 MMK with 240,216 MMK being the mean average cost in the study area. The average price of 1kg of mung bean was 1042 MMK in total groups. The cost and returns of various calculations were given in the table 3. Among the three groups, group II had the highest share in all the return indicators. The return per unit of capital expense or benefit cost ratio was 2.0 in the average value among the sampled farms. It means that the surveyed enterprises obtained 200 unit of total profit for the 100-unit production cost. In other words, the farms involved in the sampled mung bean production obtained 2 MMK of total revenue for their 1 MMK cost and therefore achieved 1 MMK net profit although the lowest price obtained by group II. All these three groups got BCR greater than one indicated that mung bean production in the study area is profitable.

As for sensitivity analysis, break-even yield, and price per acre of mung bean production in the study area is calculated in the table. It revealed that the sampled mung bean growers should obtain at least these levels of yield and price to cover their variable cost of mung bean production. In this study average value for break - even yield was 231 kg/acre and break – even price was 520 MMK/kg.

#### 4.3 Production cost share

Table 4 described the share of variable production cost of mung bean cultivation in the study area. The material costs included seed, farmyard manure, urea fertilizer, compound fertilizer, T-super, Potash, foliar, and as in the plant protection agrochemicals such as insecticide/pesticides, herbicide, fungicide etc. This showed the highest share of total production cost in all groups of sampled farmers accounted from 46% to 49%. Among the fertilizers, compound, urea, and foliar spray were applied most of the sampled farmers while there were very few farmers applied farmyard manure in mung bean production. In the plant protections agro-chemicals utilization, nearly all farmers applied insecticides/pesticides while fungicides and herbicides application were nearly half of the sampled farmers.

Table 4. Percentage share of mung bean production cost based on an acre

Item	Group I (n=22)	Group II (n=27)	Group III (n=24)	Total (n=73)
Total material cost	46.80%	48.30%	48.49%	47.93%
Total family labor cost	12.87%	11.58%	11.40%	11.89%
Total hired labor cost	36.17%	35.91%	35.89%	35.98%
Interest on cash cost	4.15%	4.21%	4.22%	4.20%
Total production cost (variables)	100.00%	100.00%	100.00%	100.00%

Source: survey (2018)

In the cases of family and hired labor cost shares the denoted items were land preparation, seed sowing, and

agro-chemical applications, harvesting, threshing, and drying activities. Hired labor cost shared about 35 to 36% while the family labor shared around 12% of total mung bean production cost. Interest cost calculation based on the official rate from bank of Myanmar Agricultural Development Bank with other unforeseen cost multiplied with 5 months duration of cash usage from land preparation up to selling the produce. In the share analysis, the results showed the highest share of production cost was material cost and followed by hired labor cost share all of the groups which is consistent with the results from the study of world bank group, 2016.

#### 4.4 Constraint factors in mung bean production

Some of the constraints the mung bean farmers' experiencing is presented in the table 5. It was found that mung bean price fluctuation is the most pressing problem for the farmers encountering up to 86% indicating domestic production is mostly rely on export markets. Diseases and pest problems with 68% counted the second problem after price. In accordance with high production cost for material input applications and cost for hired farm mechanization leads to insufficiency supply of credits by the government and banks was recorded as next constraint. The changing climate conditions, poor soil and limited available of farm labor accounted 64%, 58% and 53% respectively. Seed impurity, limited price, and market information, and lacks technical know-how are the other problems that farmers encounter.

Table 5. Constraints facing of mung bean production (N=73)

<i>Constraints</i>	<i>N</i>	<i>Percentage</i>
Price fluctuation	63	86
Diseases and pests	50	68
Insufficiencies supply of credit	50	68
Poor climate condition	47	64
Poor soil	42	58
Difficulty of labor available	39	53
Seed impurity	22	30
Limited information	18	25
Lacks technical know-how	16	22

Source: survey (2018)

#### 4.5 Marketing activities of mung bean farmers

Table 6 presented the marketing activities done by the sampled mung bean growers in the study area. To know the product price information about 60% of farmers contact to the buyers before selling their produce. According to the sampled farmers in the study area they faced many price fluctuations of mung bean due to the changes in demand from abroad. Nearly 95% of the sampled farmers sold mung bean immediately (2-3 days drying) after harvest and all the sampled farmers preferred only in cash down payment rather than advance and credit payments. Approximately each of 50% sampled farmers sold mung bean to the village collectors (some were connected to the local wholesalers) and local wholesalers who they lived in the townships around these villages. The sampled farmer was not doing any grading system only they used clean produce. Only 34% of sampled farmers charged for the packaging materials and the rest paid by the local or township wholesalers. Farmers still using the traditional weighting system of viss (1.602 kilogram per viss) and one basket contain 20 viss. As mode of transportation for carrying the produce all farmers were using Tragyi because of low cost for transporting. Sampled farmers obtained various sources of information about the crop and some farmers got from more than one sources. Among them the highest percentage obtained from neighbour, township wholesalers, and local wholesalers. According to the sampled farmer's information obtained from the media was sometime behind than the current time.

Table 6: Marketing activities of sampled mung bean farmers (N=73)

<i>Marketing Activities</i>	<i>Variables</i>	<i>Frequency</i>	<i>Percentage</i>
Contact before selling	Yes	44	60
	No	29	40
Type of payment	Cash down	73	100
	Advanced payment	0	0
	Credit	0	0
Types of selling	Immediately	69	95
	Storage	4	5
Sell to whom	Village collector	38	52
	Local wholesaler	35	48
Grading before selling	Yes	0	0
	No	73	100
Actors who paid the packing cost	Local wholesalers	48	66
	Farmers	25	34
Weighting system	Viss (20 viss per basket)	73	100
Mode of transportation	Tragyi	73	100
	Neighbor	58	75
	Village collector	40	55
	Township wholesaler	44	60
	Television	17	23
	Journals	4	5
	News paper	6	8
Source of price information	Extension officers	9	12

Source: Survey (2018)

## 5. Conclusion and Recommendation

Mung bean is one of the potential crops for smallholder farmers in Myanmar because of its advantage on less water requirement than rice production and additionally mung bean growers in the study area, grow it after monsoon paddy. With the gradually increase demand from export markets of mung bean, growers increase their usage of material inputs and growing attention to the application of systematic production technologies in mung bean that leads to increase requirement for financial investment. This study could help to point out the conditions of mung bean growers in the study area not only in production but also in marketing, to the stakeholders, policy makers and others, who need the information for their respective purposes.

The results of the socio-economics factors presented the age, working experiences, family member, and education level of the sample farmers indicating the potential to improve the agricultural industry in Myanmar. Moreover, the cost and return analysis of all three groups of farmers showed they have significant benefit from mung bean production in the study area. As one of the exports produces of mung bean faced price instability among farmers pointed that there should have steady export markets and encouraging the value-added products of mung bean. To produce the quality mung bean, the government should increase the extension facilities and improved techniques for mung bean production. Finally, the results of marketing activities indicated the requirement of systematic and advance marketing system for mung bean production is essential in Myanmar. Based on the findings of this study, the following recommendations can be made.

- (1) The government through the Ministry of Agriculture, Livestock and Irrigation should establish a large scale commercial mung bean farm to attract the youth and others in order to reduce the unemployment rate which is another big problem in the country.
- (2) The training of more extension agents who will provide the farmers with need technology improvements especially in systematic disease and pest control and facilities should be given appropriate attention and consideration by the government.
- (3) The government should ensure effective dissemination of scientific and social information to encourage the usage of modern techniques by the farmers in mung bean production.
- (4) Moreover, mung bean farmers should provide with credit facilities from formal credit institutions at affordable interest rates to boost mung bean production in the country.
- (5) Farmers need to be supported to develop associations that increase their access to key services, while also enabling them to link to and partner with local private sector companies and traders.
- (6) According to the results of marketing activities analysis, farmers should be encouraged not only to do the grading and standardization processes based on size, color and purity criteria and systematic weighting system but also production practices such as seed selection, application of agrochemicals etc. in order to meet

requirement quality standard of mung bean from the demand from foreign markets.

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