

# **PROFITABILITY OF RICE FARMING PRACTICES: A CASE STUDY OF YANAUNGMYINE VILLAGE TRACT, DEKKHINATHIRI TOWNSHIP, IN NAY PYI TAW UNION TERRITORY**

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## **Abstract**

This research paper is primarily intended to investigate the relationship between local farmer practices and their farm input cost and return cost of rice production. Major objectives of this paper are; (i) to investigate the current farming systems in the study area, (ii) to observe and study the socio-economic characteristics of the selected farmers (ii) to assess and compare the household income and household expenditure (iv) to analyze how far farmers benefited from rice cultivation. Relevant data will be elicited from both the primary and secondary sources. Questionnaires and open interviews are the main instrument for data collection. Data analysis will be carried out using quantitative analyses, qualitative assessment and benefit cost ratio analysis. It is found that household expenditure, farmer's income and outcome are affected by different groups of each social characteristic of the selected farmers. According to the assessment, it is found out that backwardness, poverty stagnant agriculture, lack of alternative income and employment and environmental degradation are components of an integrated problem in the Village Tract. There is a need for enhancing employment and income generation activities in the study area. Revolution of the farming systems is a strategy for rural income growth and poverty reduction in the village tract.

**Keywords:** benefit cost ratio, household expenditure, farmer's income and outcome

## **Introduction**

Nowadays, the government of Myanmar is trying to reduce poverty to fulfill its objective. Agricultural sector must be developed in Myanmar, 61.2% of population resides in rural area and are employed in the agriculture, livestock, and fishery sector (MOAI 2010). In Myanmar, there is a rice base farming system, and most of farmers are familiar with this system. The major source of income in rural areas comes from rice production. Therefore, rice production is a major source of employment, income generation as well as nutrition for rural households, and the growth of increasing rice production is extremely important in Myanmar. Rice is by far the most economically important food crop in many developing countries, providing two third of the calorific intake of more than 3 billion people in Asia, and one third for nearly 1.5 billion people in Africa and Latin America (FAO 1995a).

## **Study Area**

Yanaungmyine Village Tract is one of the Village Tract in Dekkhinathiri Township in Nay Pyi Taw Union Territory (Dekkhinathiri District, Mandalay Region). In the south and east is Lewe Township, in the west is Dekkhinathiri Ward and in the north is Hotel Zone (Figure.1). The total area of Yanaungmyine Village Tract is estimated to be about 39.601sq km (15.29 square miles). In 2011 January 20, Dekkhinathiri Township is established with 2 wards, 8 Village Tract and 28 villages by the Republic of the Union of Myanmar Ministry of Home Affairs. In 2013 November 3, Dekkhinathiri Township changed and established with 2 Wards, 7 Village Tract and 22 Villages by the Republic of the Union of Myanmar Ministry of Home Affairs (Figure 1).

## **Aim**

The aim of this paper is,

- To study the local people (farmers) status in the study area

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## **Objectives**

Major objectives of this study are;

- to investigate the current farming systems in the study area,
- to observe and study the socio-economic characteristics of the selected farmers
- to assess and compare the household income and household expenditure
- to analyze how far beneficiary farmers benefited from rice cultivation

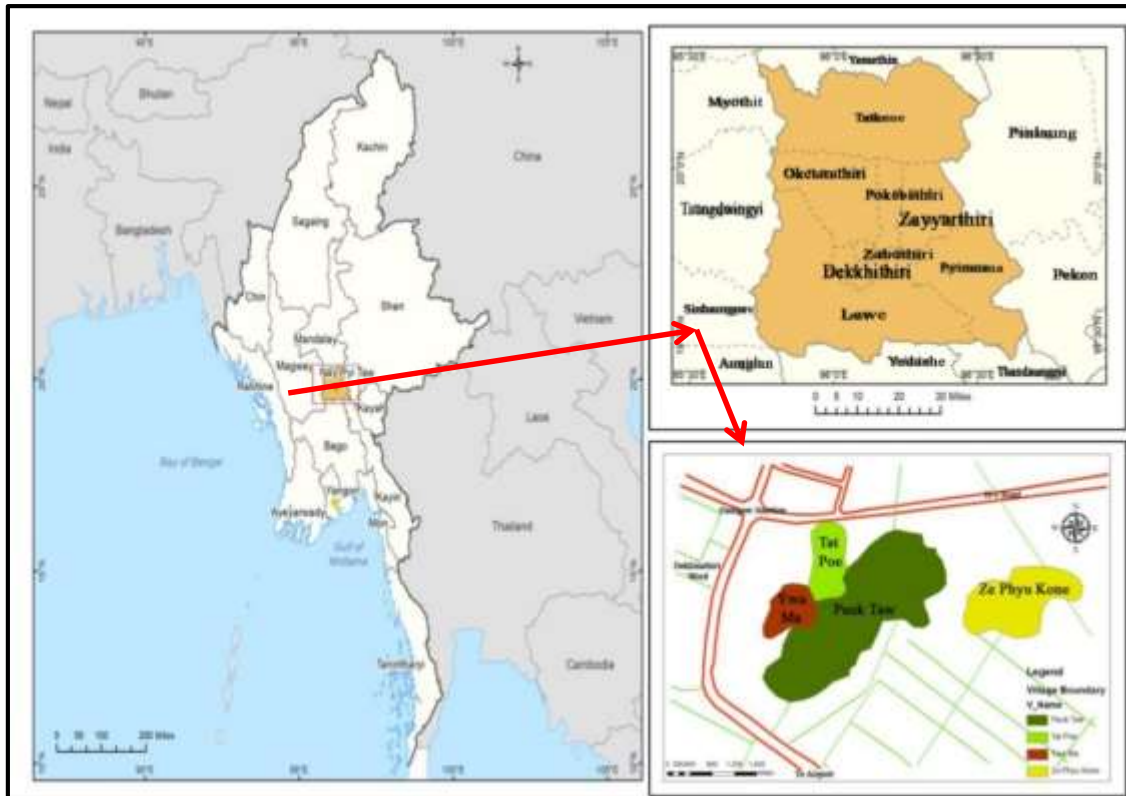
## **Methodology and Sources of Data**

A multi-methods approach was used in this study, that was both qualitative and quantitative methods of data collection and analyses were used to address the research questions. Qualitative data techniques were used to address the selected village tracts (includes 4 villages). Purposive sampling methods were used to select households in rice production. Total of 134 sampled farmers including 118 males-headed households and 16 female-headed households were interviewed. They are 20 male-headed households and 4 female-headed households from Yawa Ma Village and 42 male-headed households and 6 female-headed households from Pauk Taw Village and 28 male-headed households and 2 female-headed households from Tat Poe Village and 28 male-headed households and 4 female-headed households from Zi Phyu Kone Village. The household level survey was carried out in each four villages in Yanaungmyine Village Tract, Deikkinathiri Township within Nay Pyi Taw Union of Territory (Figure 1).

Socio-economic characteristics of sample rice farmers such as material status, age, education level, farming experience, family size, annual household income as well as crop income, off-farm income, non-farm income, household assets and farm implements were collected. And also cultural practices of production such as rice production area, seed source, varieties used, seed rate per acre/hectare, annual husbandry, and utilization of fertilizer, seed, and pesticide were collected. Moreover, cost and returns of production of male and female-headed households were also included in data collection.

Quantitative techniques are typically used in deductive strategies of inquiry, and were helpful in understanding the usefulness of an intervention. Survey questionnaires were used to gather the primary data on the sample population, and are used in the analysis of the study area.

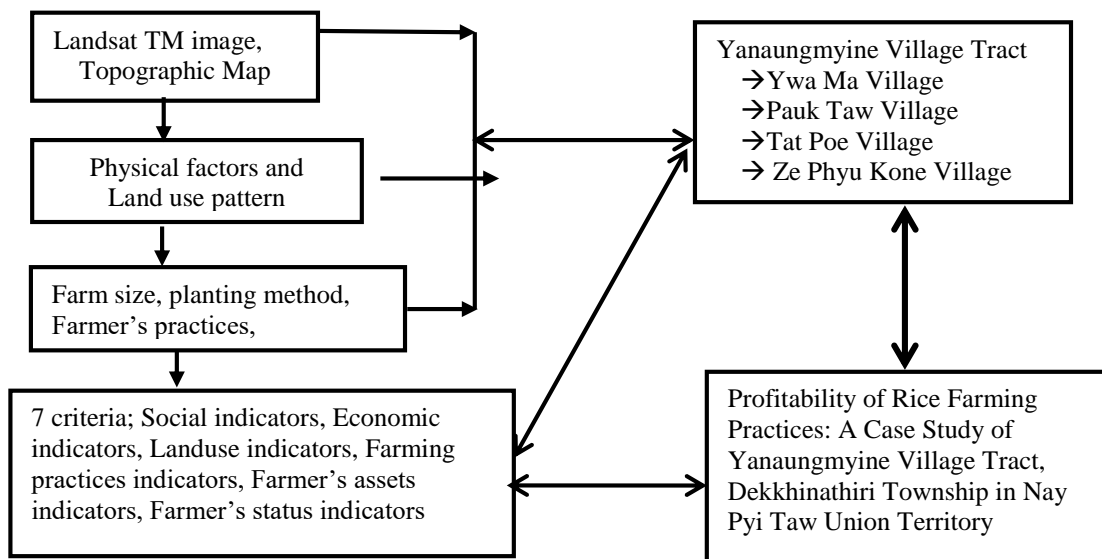
After that, this study analyzed physical conditions, human factors and agricultural practices within Yanaungmyine Village Tract, Dekkhinathiri Township in Nay Pyi Taw Union Territory (Mandalay Region) and it was investigated by using the secondary data. Major sources of the secondary data were collected from the Settlement and Land Records Department, the Ministry of Agriculture and Irrigation, and Township Peace and Development Council. The actual practices and agricultural conditions of the farmers are emphasized by using the primary data, which were gathered by using questionnaires, open interviews and field observations (Figure 2).



Source: Based on Google Map, 2020

Figure 1 Location of the Study Area (2020)

For data analysis, quantitative analysis and qualitative assessment were used to express the local farmers' agricultural practices and agricultural conditions in Yanaungmyine Village Tract, Dekkhinathiri Township in Nay Pyi Taw Union Territory (Mandalay Region). Moreover, the analytical techniques used in this study area were the descriptive analysis, and it was applied to describe and compare the socio-economic conditions, input use, farmer assets, farmer household expenditure, yield, existing farming practices and income of sample selected local farmers.



Source: Author, 2020.

Figure 2 Work Flow of the Study Area

The first analysis method was the difference between the 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 second analysis method was the deduction of the opportunity cost and total variable cash costs from gross benefit. This return was referred to as “return above variable costs” or “gross margin”. The “return per unit of capital invested” could be calculated by gross benefits per total variable costs. The “return per unit of cash cost” could be calculated by gross benefits per total cash costs. These analysis methods could be expressed with equations as:

**Method (1)**

$$\text{Return above variable cash cost} = \text{Total gross benefit} - \text{total variable cash cost}$$

**Method (2)**

$$\text{Return above variable cost (Gross margin)} = \text{Total gross benefit} - \text{total variable cost}$$

**Method (3)**

$$\text{Return per unit of capital invested} = \frac{\text{Total gross benefit}}{\text{Total variable cost}}$$

**Method (4)**

$$\text{Return per unit cash cost} = \frac{\text{Total gross benefit}}{\text{Total cash cost}}$$

**Research Question**

How can the farmers’ knowledge and their current farming systems guide their household income and outcome in the future of Yanaungmyine Village Tract, Dekkhinathiri Township in Nay Pyi Taw Union Territory?

**Finding and Discussion**

Rice cultivation is the most important factor in the study villages. In addition, the soils of the selected land should be fertile because poor fertility gives low yield. Population distribution in Yanaungmyine Village Tract is also related to agricultural lands. The most intensive use of land for agriculture is found mainly in the populated village tracts. The predominant ethnic group is Bamar and most of the Bamar people, traditionally, engaged in agriculture and its related works especially rice/paddy cultivation.

**The Evolution of Farming Systems within Yanaungmyine Village Tract**

In the previous years, traditional cropping systems and farming techniques were still important in the study area although some farmers adopted mechanization in their farms. Crop management practice was the main factor of cultivation of rice (paddy). Rice can be grown through broadcasting or by transplanting. For seed multiplication, it is desirable to grow rice under transplanting systems. Growing crops by transplanting method is supported by nurseries. Seedlings used for growing transplanted crop is raised in nursery, in which several systems are prevalent. For seed multiplication, wet system of nursery growing is recommended by agricultural offices and farmers. Fertilizer is used well before final puddling. The nursery is managed by proper top-dressing, watering and weeding to produce healthy seedlings, which assure good crop and high yield potential. Excess water is drained off, if it is flooded due to heavy rains or irrigation. Sowing of early and medium duration varieties in the nursery should be done in the period from the first week of May to mid-June.

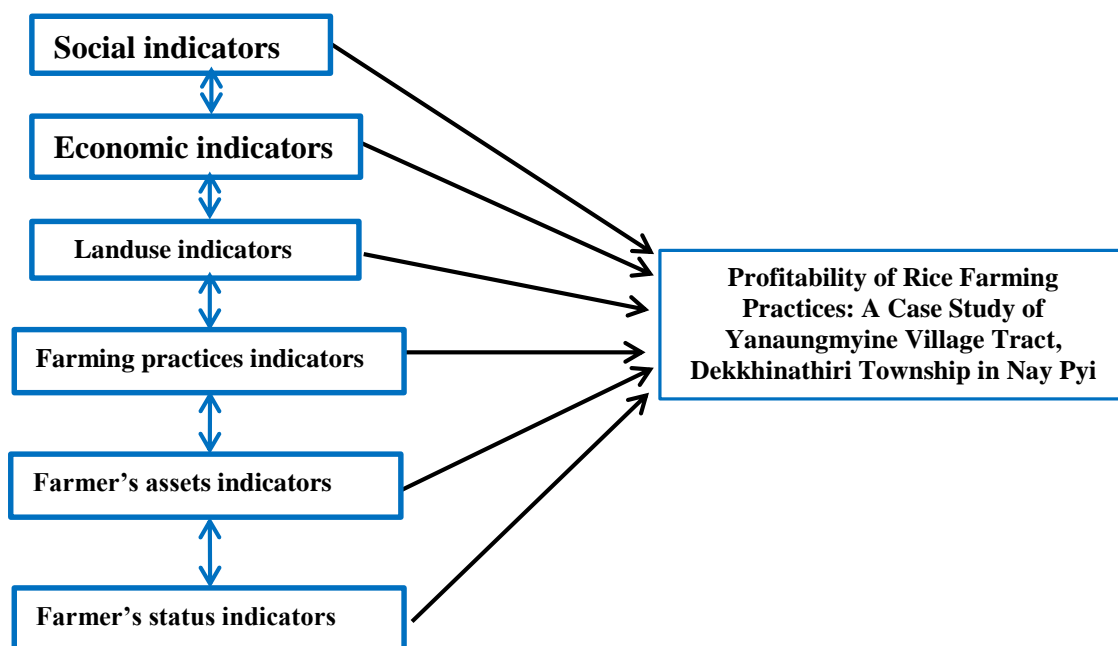
Seedlings become ready for transplanting after 3 to 4 weeks of sowing, depending upon the variety. The seedlings are uprooted gently. The rootless, weed, diseased, or those seedlings differing in any way from the usual characteristics of the variety under multiplication are discarded in the nursery.

The land should be prepared well by two to three ploughings followed by leveling. Poor field condition leads to failure or poor survival growth during seedling establishment and vegetative crop growth stages. Timeliness and good land preparation assures good yield of a crop. Poor land preparation may also lead to serious weed infestation. Land leveling allows maintenance of a uniform water depth and greatly facilitates subsequent management practices for establishment of stand, top-dressing with fertilizers, weed control, and field drainage for harvest.

In recent years or after 3 years, government encouraged the use of machines instead of traditional use of cows and buffaloes for nursery, transplanting, ploughing and threshing in their fields. Small-scale farm tractors are widely used in the study area with the aid of government. Therefore, rural agricultural activities in the study area, of Dekkhinathiri Township, depend on government policies and the market conditions of agricultural products. Agriculture was the main economic activities in these sample village tracts. These sample village tract has 4 villages; Pauk Taw, Tat Poe, Ywa Ma and Ze Phyu Kone villages.

**Conceptual Framework of the Study area**

The conceptual framework of the study area was shown in Figure 3. It was included six variables such as social indicators, economic indicators, landuse indicators, farming practices indicators, farmer’s assets indicators and farmer’s status indicators. The general conceptual framework of this study was framed on the participation of local farmers within four villages in Yanaungmyine Village Tract, Dekkhinathiri Township. In this framework, farmers whether participation which impacts on rice or paddy cultivation. Rice or paddy cultivation would be correlated by their six indicators such as age, education level, farm size, family size and assets and etc. Not only social indicators but also economic indicators would be related to farmer status Figure 3.



Source: Author, 2020

**Figure 3** Conceptual Framework of the Study area

### Historical Background of Agricultural Factors affection upon the Study Area

Yanaungmyine Village Tract lines between Nay Pyi Taw Union Territory and Lewe Township main road. In 2008, Yanaungmyine Village Tract was a big village with an area of 16,022 acres (25.03 sq. miles) and comprised of seven small villages. There were 520 households and total population with 3,568 persons in Yanaungmyine Village Tract. There were 335 farmers in Yanaungmyine Village Tract. In the total village tract area, agricultural land was 3188 acres comprising 2,372 acres of rice fields, 815 acres of Ya (dry farm) lands and 1 acre of garden land in 2006-2007. Therefore, farmer-agricultural ratio was 1:9. Main crops were: monsoon paddy, summer paddy, sesame, groundnut, Black gram, chili, vegetables, and fodders. (Thin Thin Myat,2008)

At present, Yanaungmyine Village Tract was a village with an area of 16,022 acres (25.03 sq. miles) and comprised of four villages. There were 1,195 households and total population with 3,503 persons in Yanaungmyine Village Tract. There were 182 farmers in Yanaungmyine Village Tract. Therefore, farmer-agricultural ratio is 1:9. Main crops were: monsoon paddy, summer paddy, Black gram, chili, vegetables, and fodders. According to 2019 data, farmers were decreased from 335 to 182 farmers because of new urban extension (Nay Pyi Taw Union Territory). Moreover, agricultural land was also 2,372 acres of paddy fields decreased to 1,101 acres of rice or paddy fields. Main crops were: monsoon paddy, summer paddy, black gram, sesame, groundnut, chili, vegetables, and fodders.

Most of the respondents practiced the transplanting method (96.1 percent) in monsoon paddy and direct seeding method (97.2 percent) in summer for crop establishment. The seeding rates of monsoon and summer rice cultivation are 2 bsk per acre, 2 or 2.5 bsk per acre, respectively.

**Table 1 House Hold Conditions of Yanaungmyine Village Tracts (2019)**

No	Village	Houses	Household	Farmer
1	Pauk Taw	553	553	71
2	Tat Poe	289	291	41
3	Ywa Ma	165	167	36
4	Ze Phyu Kone	184	184	34
	Total	1191	1195	182

Source: Landuse Department, Dekkhinathiri Township (2019)

**Table 2 Farmers of Yanaungmyine Village Tracts in Dekkhinathiri Township**

Village Tract Name	Population			Farmers	Farmers (Return Q)
	Male	Female	Total		
Pauk Taw	787	865	1652	71	48
Tat Poe	322	348	670	41	30
Ywa Ma	278	312	590	36	24
Ze Phyu Kone	287	304	591	34	32
Total	1674	1829	3503	182	134

Source: Field Survey Data, 2019

### **Rural Poverty Definition**

Rural poverty refers to poverty in rural areas, including factors of rural society, rural economy, and political systems that give rise to the poverty found there. Rural poverty is often discussed in conjunction with spatial inequality, which in this context refers to the inequality between urban and rural areas. Both rural poverty and spatial inequality are global phenomena, but like poverty in general, there are higher rates of rural poverty in developing countries than developed countries. (<https://en.m.wikipedia.org/wiki/Rural-poverty>)

Poverty is not having enough material possessions or income for a person's needs. Poverty may include social, economic, and political elements. Absolute poverty is the complete lack of the means necessary to meet basic personal needs, such as food, clothing, and shelter. (<https://en.m.wikipedia.org/wiki/Rural-poverty>)

### **Rural Income Growth and Poverty Reduction of Yanaungmyine Village Tract**

The rural poor have little land or landless, schooling or other assets, and face many interlocking barriers to go out from vicious cycle of poverty. Rural anti-poverty policy focused only on increasing the productivity of the poor would be not enough if public spending on education and health for urban receives more than rural areas. In general, poor people living in rural areas share several characteristics including low levels of educational attainment, a relatively large number of children, and relatively low access to material resources, weak social, and physical infrastructure, and higher susceptibility to community wide exogenous shocks. The problems of malnutrition, lack of education, low housing condition are more severe in rural areas.

The poor often have distinctive source of livelihood. It is common for the poor to work as cultivators, small artisans, petty traders and wage laborers. Agriculture is the main source of income both for the self-employment that is highly seasonal or part-time. People who live in or close to a state of poverty often experience significant fluctuations in their income or consumption particularly for rural poor of developing countries. When examining country where rural incomes from agriculture fluctuate, one should therefore use household or individual expenditures to access poverty in more reliable way.

By construction the poverty profile, the characteristics of the different socio-economic income or consumption groups such as very poor, poorer and poorest can be compared and analyzed. The poverty profile can provide the information on the identity of the poor along with their occupations, education level, age, household structure, dependency ratio, land holding, head of household, housing, access to the social services, and institutional networks. This will allow for a better understanding of who are poor and poorer, and what are the differences between the poor and poorest. Then further statistical analysis can be applied to test the relationship between the household consumption and the various characteristics of the poor and non-poor.

According to survey in the study area, the consumption of rice by each family in the survey was 1.6 Baskets per month for average 4 member families and 2.75 Baskets per month for average 8 member families. And also, the consumption of oil by each family in the survey was 1.5 viss per month for average 4 member families and 3 viss per month for average 8 member families. Similarly, the consumption of vegetable for each family cost 15000 kyat per month for average 4 member families and 30,000 kyat for average 8 member families. Typical Myanmar household in the central area consumed rice sauce as a source of a protein in their diet. It was consumed every day especially in central area where local raw (food) material was abundant. But, from nutritional point of view, food intake of rural families was found slightly lower than what was needed to have a reasonable healthy life. The average total cost of meat per family of 4 members (adult) per month was 24,000 kyat, 8 members (adult) per month was 48,000. Meat cost per person per month is 6,000 kyat on the average. It can be interpreted as optimum requirement of income per person per

month. Other cooking material total cost per month is 9,000 and 1,000 kyats. The cost per household was 66,576 kyat per month and 798,912 kyat per year or 133,152 kyats per month and 1,597,824 kyats per year.

**Table 3 Total Cost of Optimum Level Meals for 8 Member Families per Day**

Food Item	Unit	Amount	Value (MMK)
Rice (Stable food)	Basket	2.75	36,652
Cooking Oil	Vises	3	9,000
Meats (Daily)	Vises	16	48,000
Vegetables (Daily)	Tickles	30 to 90	30,000
Fish Paste, Extract, Salt	Vises	1 to 2	5,000
Onion	Tickles	2 to 3	1,500
Fuel Wood	Vises	10	3,000

Source: Field Survey, 2019

Farmers do not worry they manage to store enough paddies for their own consumption as long as they have rice, which was the staple food. Dishes of meat or fish were not so important. They can even have their meals with fish sauce and vegetables in case of food/income shortage (Table 3).

Diet comprises of carbohydrate from rice, animal protein from fish sauce and vitamins from vegetables. Minimum requirement of food for 8 member family cost 845 kyat per month. It costs 120 kyat per person per day. For the entire household it will cost 133,152 kyats per month and 1,597,824 kyats per year.

### The Role of Labour Income Growth

During the last decade, the increase of labour income per worker-more than an increase of employment has contributed the most to poverty reduction (Inchauste et.al., 2014).

Structural information also strengthens rural-urban linkages in terms of production and markets, as well as rural-urban labour mobility, while fostering the growth of secondary and peri-urban cities. Agricultural transformation is both a cause and effect of structural transformation, involving the shift from primarily subsistence farming to market-oriented and diversified production systems (FAO, 2017a).

This study area was based on primary source of data and they were collected from rice producing farmers with structured interview questionnaire and open interviews. The types of data were collected or selected according to the following criteria; age, farm size, family size, cropping pattern, land holding, education, use of mechanization, use of labour, etc. Technical data concerning with the rice production and constraints encountered by farmers in rice production, state of extension access, technology access and crop with higher profit were then collected. Economic data such as cost of production cost of labour, income from farm and non- farm, expenditure of food, shelter, clothing, social and education were also collected from each respondent. Farmer groups were categorized as low income farmers (n=39), medium income (n= 80), high income (n=15). Farmers with household per month income of greater than 3,000,000 was defined as high (11 percent) and 3,000,000 were categorized as medium income (60 percent) and farmers with income below 35,000 were low income farmers (29 percent).

Four Villages (one village Tract), were randomly chosen in the study area. They were Pauk Taw, Tat Poe, Ywa Ma and Zi Phyu Kone Villages from Yanaungmyine Village Tract in



Deikkinathiri Township, Nay Pyi Taw Union Territory. Most of the farmers depended on rice and winter crops for their livelihood. Some of the farmers in the study area were depended on their other family member such as government staff, company staff and other works.

### Information on Selected Farmers

Social characteristics of sample farmers, farm size, sown acreage (monsoon rice and summer rice acreages), ownership of farm implements and machineries, luxury assets, cost and return of rice production, total income and expenditure of sample farmers, and share of income and expenditure are presented. The information will help in understanding the farmer's socio-economics condition in relation to their income and expenditure situation of monsoon and summer rice growing farmers in the study area.

In this study area, most of the respondents were average of 50 years of age ranging from 28 to 78 years. Majority of the sample farmers had low level of education (79 percent) and while 21 percent of sample farmers possessed high level education. The average family size was 6 ranging from 2 to 13 members. The average family labour in the farm was 2 with the range of 1 to 9. The average farm size was 9 acres ranged from 1.0 to 12 acres (Table 4).

**Table 4 Social Characteristics of Selected Farmers in the Study Area**

Items	Unit	All	Income Group		
			Low	Medium	High
Age	Year	50	50	51	49
Farm Size	Acre	9	3	8	17
Family Size	Number	6	5	6	7
Family Labor					
<b>Education</b>					
-Low	Percent	79 %	82%	83%	60%
-High	Percent	21%	18%	17%	40%

Source: Field Survey 2019.

Household's assets by Farmer income were shown in Table 4 In farmer assets, about 31 of sample farmers hand tractor and 10 households owned threshers and 57 households possessed water pump for irrigation. About 26 households possessed bullock cat. Only 85 households possessed cow or cattle. About half of the sample farmers hired implements for cultural operations. About 74 households owned television and 28 farmers owned video, 39 farmers possessed settle box, 27 farmers owned Radio, 122 farmers owned hand phone, 71 farmers possessed motor cycle, 12 farmers motor car, and cycle, some farmers owned bicycle receptively (Table 4 & 5). Luxury assets and farm assets were owned by different income groups of farmers. Where, high income farmers possessed the highest percentage of each asset. Medium income farmers used moderate amount of each assets and low income farmers owned the lowest percentage of most assets.

The farmers in the study area grew monsoon rice, summer rice and black gram. All of the sample farmers grew monsoon rice and average farm size was about 0.057 hec (5.7 acres), whereas 29 percent of farmers grew summer rice on the same acre of rice field. About 71 percent of farmer's possessed black gram owned about 0.015 hec (1.5 acres). Twenty percent of farmers grew vegetable and average farm size was 0.010 hec (1.0 acres) respectively. (Table 6)

The commonly used rice varieties were Manawthukha, and Lonethwehmwe. Most of the farmers used their owned seed stored from previous season. The seed rate used was 2 baskets for

monsoon rice and some farmer cultivated 1.25 baskets for summer rice while they were transplanted and broadcasted in monsoon rice. There was weeding practice in the survey area. Some Farmer used cow dung as bio-fertilizer which about 3 cart loads per acre in monsoon rice and about 2 cart loads in summer crops (Table 7)

**Table 5 Farmer Assets Owned by Different Income Groups of Farmers in Percentage**

Item	Housing Style			Luxury Assets							Farm Assets					
	Wood	Brick	Bamboo	TV	Settle Box	Motor Car	Cycle	Bicycle	Three Weed	Hand Phone	Plowing	Hand	Threshing	Pump	Bullock cart	Cow/ Cattle
Low Income (N= 39)	10	1	28	15	0	1	22	25	0	34	9	1	1	1	11	28
Medium Income N=80	30	7	43	45	25	5	38	28	9	74	59	23	3	45	15	43
High Income (N= 15 )	9	6	0	14	14	6	11	5	3	14	11	7	6	11	0	14
All Farmers (N=134 )	49	14	71	74	39	12	71	58	12	122	79	31	10	57	26	85

Source: Field Survey 2019

**Table 6 Percent of Households and Cultivated Area of Different Crops Grown by Farmers**

Item	Household		Sown Acre		Mean Acres
	N	%	Minimum	Maximum	
Monsoon Rice	99	100	1	99.00	5.70
Summer Crop	29	29	1	28.00	3.69
Black Gram	71	71	0.6	70.6	1.50
Vegetable	22	20	1.2	18.8	1.00

Source: Field Survey-2019

**Table 7 Input Used and Output of Selected Farmers (per acre) in Rice Production**

Item	Monsoon Rice			Summer Crop		
	Amount	Price	Value	Amount	Price	Value
<b>Input</b>						
Seed (bsk)	2	9000	18000	1.25	8600	10750
Cow Dung (cart)	3	5000	15000	2	5000	10000
Weeding person)	7	3000	21000	5	3000	15000
Compound(kg)	50	10000	10000	50	10000	10000
Pesticide 1(liter)	0.53	3000	3000	0.53	3000	3000
<b>Output</b>						
Yield	80	5500	440,000	82	5000	410,000

Source: Field Survey, 2019

Most of the selected farmers applied urea-fertilizer or compound fertilizer at the rate of 50 kg per acre in monsoon rice while the rate is more than double in summer rice which was about

50kg per acre. The amount of pesticide applied in rice production was not so much in the study area. Yield of monsoon rice was about 80 baskets per acre and summer rice was yielded about 79 baskets per acre in the study area.

### Analysis and Assessment of Cost and Benefit

In this research study, cost and return of monsoon rice, summer rice and black gram production were examined. Variable cost of production included material input cost and hired labour cost. Material input costs were calculated by multiplying unit amount and affective price or field price of inputs. Hired labour costs were valued by market wage rates and man days used in all farming practices. Return of rice production included return from sale with affective price or field price of rice. The data concerning with coast and return analysis of monsoon rice and summer crops production of selected farmers are presented in Table 3.9. It was found that total material cost of monsoon rice was 46,000 kyat per acre, 33,750 kyat per acre for summer rice and 85,000 kyat per acre for black gram.

Total labour cost of monsoon rice was 114,000 kyat per acre and that of summer rice and black gram are 104,000 kyat per acre and 50,000 kyat per acre. Total cost for monsoon rice production was 160,000 kyat per acre and that of summer rice and black gram were 137,750 kyat per acre and 135,000 kyat per acre.

**Table 8 Input Cost and Return Cost of Rice Production (per acre), 2019**

No	Items	Monsoon Rice	Summer Rice	Black gram
<b>Cost</b>				
<b>Material Cost (MM Kyat)</b>				
1	Seed	18,000	10,750	45,000
2	Cow Dung	15,000	10,000	10,000
3	Fertilizer	10,000	10,000	-
4	Pesticide	3,000	3,000	30,000
<b>Total Material Cost</b>		<b>46,000</b>	<b>33,750</b>	<b>85,000</b>
<b>Labour Cost (MM Kyat)</b>				
1	Preparation	-	-	-
2	Ploughing	5000	5000	5000
3	Harrowing	10,000	10,000	-
4	Replant	40,000	35,000	-
5	Irrigation	-	-	-
6	Weeding	3000	3000	-
7	Fertilizer	3000	3000	5000
8	Pesticide	3000	3000	5000
9	Harvesting/ Threshing/ Winnowing	50,000	45,000	35,000
<b>Total Labour Cost</b>		<b>114,000</b>	<b>104,000</b>	<b>50,000</b>
<b>Total Cost</b>		<b>160,000</b>	<b>137,750</b>	<b>135,000</b>
<b>Return</b>				
	Yield Per Acre	80	82	15
	Price Per Basket	5500	5000	20,000
<b>Total Return</b>		<b>440,000</b>	<b>410,000</b>	<b>300,000</b>
<b>Net Return</b>		<b>280,000</b>	<b>272,250</b>	<b>165,000</b>
<b>Benefit cost ratio</b>		<b>2.75</b>	<b>2.98</b>	<b>2.22</b>

Source: Field Survey, 2020

Based on the survey data, mean yields for monsoon rice were 80 baskets per acre, 82 baskets per acres for summer rice and 15 baskets per acres for black gram. Total return of monsoon rice was 440,000 kyat per acres and that of summer rice and black gram were 410,000 kyat per acre and 300,000 kyat per acre. Net return for monsoon rice was 280,000 kyat per acre and that of summer rice and black gram were 272,250 kyat per acre and 165,000 kyat per acre. Benefit cost ratio for monsoon was 2.75 and that for summer rice and black gram were 2.98 and 2.22. Net return of summer rice production was higher that of monsoon rice. So summer rice production and black gram production are more attractive for farmers (Table 8).

### **The Contribution of Summer Rice and Monsoon Rice Production to Share of Income and Expenditure Components**

Mean total income for all farmers in the study area was 2095151 kyat per year. Of them all, farm income would be accounted for 1831382 kyat per year and 263769 kyat per year for non-farm income. Farm income contributed 87 percent of total income and non-farm income contributed 13 percent of total income (Table 9).

Among farm income, income from monsoon rice contributed 36% (about 659,917 kyat per year), income from summer rice contributed 57 percent (about 1,036,047 kyat per year) and income from other crops and farming involved only 7 percent (about 135,418 kyat per year).

**Table 9 Income and Expenditure Shares of Selected Farmers**

<b>Items</b>	<b>Percent</b>
Farm Income	95
Non-Farm	5
<b>Total Income</b>	<b>100</b>
Income from Monsoon Rice	44
Income from Summer Rice	41
Income from Others	15
<b>Total Farm Income</b>	<b>100</b>
Food Expenditure	59
Clothing Expenditure	5
Residence Expenditure	4
Education Expenditure	8
Other Expenditure	24
<b>Total Expenditure</b>	<b>100</b>

Source: Field Survey, 2019

Total expenditure of sample farmers in the study area was 1,102,311 kyat per year. Among which, food expenditure took the highest share which was 70 percent (about 733.83 kyat per year), 8 percent each for clothing and education expenditure. Residence expenditure included reparation of home, roofing and lighting. Residence expenditure contributed 4 percent of total expenditure. Other expenditure included 10 percent of total expenditure (about 122.827 kyat per year).

In Table 10 total household income of low income farmer was about 627,170 kyat per year, and total household expenditure was 638,833 kyat per year. In medium income, total household income was about 721,653 kyat per year, and total household expenditure was 1,102,311 kyat per year. Total household income of high income farmer was about 2,096,261 kyat per year but total expenditure of that farmer was about 1,078,884 kyat per year. Total household income of low

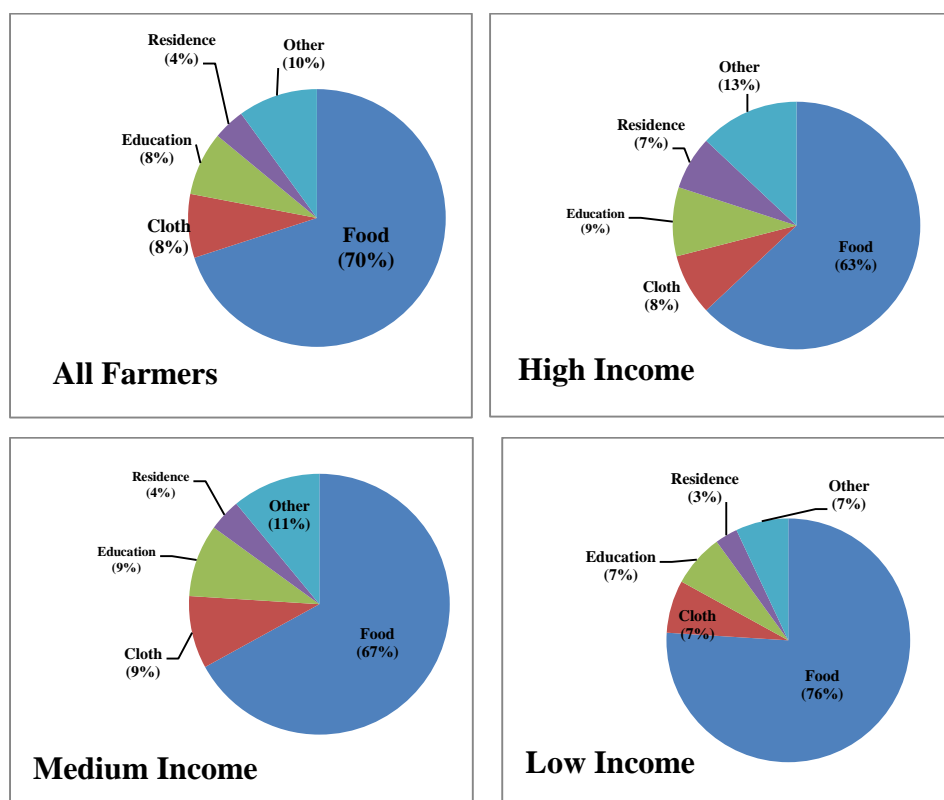
income farmer was lower than household expenditure of that farmer. It was evident that low income farmer faced with income shortages.

**Table 10 Per Capita Income and Expenditure of Different Income Group of Farmers**

Farmers With	Number	Per Capita Income (Kyat)			Per Expenditure (Kyat)		
		Per Year	Per Month	Per Day	Per Year	Per Month	Per Day
Low Income	29	600,000	50,000	1667	432,200	3,600	120
Medium Income	60	1,680,000	140,000	4667	199,800	16,650	555
High Income	11	3,600,000	300,000	10,000	304,200	25,350	845

Source: Field Survey, 2019

Per capita income of low income farmer was about 1667 kyat per day and per capita expenditure of that farmer was about 120 kyat per day. In medium income group of farmers, per capita income was 4667 kyat per day and per capita expenditure was 555 kyat per day. Per capita income of high income farmer was over 10,000 kyat per day and per capita expenditure of that farmer was 845 kyat per day. High income farmer can expend more expenditure, while income of low farmers just covers their expenditure.



Source: Field Survey, 2019

**Figure 4** Share of Expenditure for All Income Groups of Farmers

Other expenditures included social, donation, recreation, and gambling. Clothing expenditure included umbrella, slipper, hat, light cloth, jacket etc. education expenditure included cost for registration, book, pencil, ruler, pocket money, tuition and others. Food expenditure share of high income group of farmer was 63 percent, that of medium income group of farmer was

67 percent and that of low income group of farmer was 76 percent. It can be clear that the lower the income they expend the higher expenditure percentage for food rather than other expenditures. Low income farmers could expend only 7 percent for social and other expenditure. (only half of high income group of farmers). Similarly, education and clothing expenditure for low income farmers (7 percent) were also than that of high (9 percent) and medium income farmers.

### **Conclusion**

Myanmar's population is about 54.37 million people and two thirds of Myanmar people live in rural areas and are depends on agriculture and the food sector as their main source of livelihood. Increasing agricultural productivity, availability of rural employment, and sustainable rural livelihoods are keys to reducing poverty. Increasing agricultural and labour productivity will raise the incomes of the poor in rural areas.

This study emphasizes on estimating the household income, household expenditure, farmer assets and food poverty situation of the study area. Farmers are stratified into three groups, such as low-income farmers, medium-income farmers and high-income farmers to find out the incidences of poverty in different incomes groups.

The study is done for four villages (one village tract), Pauk Taw, Tat Poe, Ywa Ma, and Ze Phyu Kone Villages, based on the representative of the monsoon, summer rice and black gram growing farmers. A total of 182 respondents are interviewed in January 2020 for the growing season of 2019. The primary data such as social characteristics, cost of production, year per acre, total income and expenditure, etc. are collected from each respondent. Secondary data are mainly obtained from Land Records Department and the Ministry of Head Quarter Department.

Benefit-cost analysis is conducted to estimate benefit-cost (B/C ratios) for monsoon, summer rice and black gram production program. Benefit-cost (B/C ratios) for both rice productions is greater than one. Benefit-cost (B/C ratios) for summer rice production (2.98) was greater than that of monsoon rice (1.75), since summer rice production attained the higher benefit-cost ratio; it is more attractive for farmers.

Total income is used as the dependent variable and farm size, family size, permanent family labour; total expenditure and yield per acre are used as independent variables in analysis estimate. Farm size, total expenditure and yield per acre of rice are influenced on total income in this study. The rest of the variables are not significant and they have less effect on total income. In the result of calculation result or estimate, larger farm size earned more income than small farm size. Yield per acre of both monsoon and summer production highly influence on total income.

Yield per acre of rice production is a major source of income because if it is increased, income from the sale of rice will increase. Total expenditure highly relied on total income. If total income of farmers increases, the expenditure will increase. Therefore, the government should create more income source to increase the level of expenditure. Then, total income and total expenditure share are accounted. 87 percent of total income came from farm income and 13 percent came from non-farm income. About 57 percent of farm income could be accounted for summer rice production. 36 percent came from monsoon rice and 7 percent from other crops and farming. Income from summer rice took the highest share in farm income. So, it contributed the major income source in the study area.

On the other hand, the food expenditure is 70 percent and it took the highest share in total expenditure because it was essential for livelihood, expending 3 percent each for clothing and education, 9 percent on the residence and 10 percent for other expenditures such as social, donation,

and recreation and gambling. Food items contributed 75 percent and non-food items contributed 25 percent of the total expenditure. So, the food poverty situation of sample farmers is estimated.

The income needed for minimum per capita daily requirement of food is estimated as 302 kyats. The people whose per capita income below 302 kyats per day are referred to as food poor, total poverty line cannot be established because there is no standard used to measure non-food items. The headcount ratio for the study area is estimated as 38 percent, it is slightly lower to the estimate of 40 percent reported by FAO (1980-1990). It means 38 percent of total sample farmers' fall below food poverty threshold line. The headcount ratio of low-income farmers is 71 percent and of medium-income farmers is 29 percent. There is no incidence of poverty in high-income groups of farmers.

### **Limiting Factors**

There is still a large gap between the farmers' yields and it indicates the various limiting factors affecting rice productivity and production range from farming techniques to marketing.

### **Suggestions**

From the economic point of view, farmers benefited from rice cultivation have a relatively between farm size and family size. Crop diversification plays one of the major roles in the agriculture sector from the sustainable point of view. Samples of local farmers should be encouraged to use more fertilizer, family labour and machinery so as to increase productivity in rice cultivation. Good quality seed and hired labour should be used to offer for greater efficiencies and for increased cultivation in the study area. This could be done through provision of microfinance for rice farming of local farmers to enable the required inputs and hire labour for rice cultivation processes.

Planning and implementation of rice cultivation should be considered to increase the profitability and technical efficiency of rice production in the study area. Stakeholders should be provided the reducing production constrains associated with technical, socio-economic status and use of better quality seeds, control high transport and so on. After that, rice farmer associations should be formed to be better able to access market information and determinate this information to farmer groups and organizations providing greater transparency and access to local rice markets. The non-government, stakeholder and other agencies needs to continue to provide technical and financial support to farmer's organizations.

At the same time, assistance of administrators and policy makers should also provide the farmer's needs and to find out the solutions which are difficult to implement by the use of rice cultivation practices.

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