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ANALYSIS OF THE POVERTY IN RURAL AREA OF MAUBIN DISTRICT, AYEYARWADY REGION

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YANGON UNIVERSITY OF ECONOMICS

DEPARTMENT OF ECONOMICS

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Ph.D PROGRAMME

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JUNE, 2021

CERTIFICATION

I hereby certify that the contents of this dissertation are wholly my own work unless otherwise referenced or acknowledged. Information from sources is referenced with original comments and ideas from the writer herself.

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ABSTRACT

The study is an analysis of the poverty in rural area of Maubin District, Ayeyarwady Region. The objectives of the study are to identify the income inequality, to measure the headcount index, poverty gap index, poverty gap squared index, poverty index and to examine the causes of poverty there. Gini coefficient showing with Lorenz Curve is used for the measure of income inequality, and the method revealed by Foster, Joel Greer & Erik Thorbecke (1984) is used for the measure of poverty. Binary Logistic Regression analysis is applied to analyze the causes of poverty. Gini coefficient is 0.597, showing a high inequality and a severe gap of consumption in the study area. Poverty line of the study area is determined at 1551 Kyats per capita a day. It is found that 45.9 percent of population is the poor. Binary Logistic Regression analysis shows that male headed households, family size of 4 to 6 and above 6 members, employment type of general worker and no access to national grid electricity access are more likely to happen poverty. Characteristics of household heads, which are age of household heads from 40 to 49 years and 50 years and above, middle school, high and higher education level of household heads, land owner, fly proof toilet condition and clean water availability, are less likely to happen poverty cet.par. By providing mass production of agricultural produces, by establishing the agro-based value-added manufacturing industries, by promoting the vocational schools and technology improvement, by developing the electricity access, farm land access, water supply and health awareness, it can create highly paid job opportunities to eliminate poverty in the study area. Attempts to apply income redistribution programs are also needed to be worked out poverty challenge in Maubin District.

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LIST OF ABBREVIATIONS

ADB	Asian Development Bank
CLMV	Cambodia, Laos, Myanmar and Vietnam
CPI	Consumer Price Index
CSO	Central Statistical Organization
Edu	Education
GDP	Gross Domestic Product
HH	Household
HHH	Household Head
ICT	Information and Communication Technology
IHLCA	Integrated Household Living Condition Assessment
ILO	International Labor Organization
IMF	International Monetary Fund
MDGs	Millennium Development Goals
MLCS	Myanmar Living Condition Survey
MNPED	Ministry of Planning and Economic Development
MPLCS	Myanmar Poverty and Living Condition Survey
NGOs	Non Government Organizations
NSO	National Statistical Organization
OLS	Ordinary Least Square
PPP	Purchasing Power Parity
SDGs	Sustainable Development Goals
UN	United Nations
UNDP	United Nations Development Program
UNESCAP	United Nations Economic and Social Commission for Asia and the Pacific
USD	US Dollar

CHAPTER I
INTRODUCTION

An analysis of the extent and causes of poverty, especially in rural areas is essential for the poverty reduction program, which is one of the major issues bearing from the global priorities of completing the Millennium Development Goals (MDGs) endorsed by the United Nations (United Nations, 2010). It is set to be met by 2015. An ambitious new sustainable development agenda for achieving a set of Sustainable Development Goals (SDGs) is more comprehensive for the sustainable development to be fulfilled by 2030 that will be reaching to a meaningful and universal agreement on climate change.

Eradicating poverty which is the first target of SDGs in all forms and extreme poverty is the most important global challenge, and it is a crucial requirement for sustainable development because a significant percent of the population is struggling to survive living even in a strong economy of a developed nation. Therefore, the poverty measurement is needed for conducting at the household level, community level, state level, regional level and international level of the poverty reduction programme and its implementation, monitoring and evaluation of these activities in order to achieve the target of SDGs.

As long as international attention is focused more sharply on poverty reduction than for 20 years, the poverty reduction programme is being prominent in the world. Since the global community began a systematic monitoring of the incidence of income poverty with the targeted transition from the Millennium Development Goals to the Sustainable Development by 2030, income poverty had fallen significantly from 29.7 percent for the period 2000-2004 to 10.3 percent for the period 2010-2013 in the Asia-Pacific region (Balisacan, M. A., Edillon, G. R., & Sharon Faye A. Piza, F. S, 2005). However, extreme poverty increased to 14.7 percent in 2017 (ESCAP, 2017).

In order to pursue inclusive and sustainable development in a manner that leaves no one behind by 2030, developing countries should settle poverty reduction programmes as a life course. Indonesia, Malaysia, Thailand and Vietnam have been conducting poverty reduction programmes to achieve the SDGs. Likewise, poverty

reduction program in Cambodia, Lao PDR and Vietnam made the poverty rate reduced to 17.7 percent, 16.7 percent and 3 percent respectively in 2012 (World Development Report, 2016). However, in Myanmar, poverty was at the rate of 37.5 percent in 2010 and 26.1 percent in 2015 (World Bank Group and Ministry of Planning and Finance, 2017). In addition, World Bank Group and Ministry of Planning and Finance (2017) said that 40.1 percent of the population are near the poverty line in 2015. Therefore, it can be said that the poverty rate of Myanmar is still high according to these studies.

1.1 Rationale of the Study

The target of the Millennium Development Goals (MDGs) is to halve the poverty rate by 2015 (World Development Report, 2016). The overall poverty rate in Myanmar was at the rate of 32 percent in 2005, 25.6 percent in 2010 and 19.4 percent in 2015 (IHLCA Project Technical Unit, 2011). Government of Myanmar set the target to reach the poverty rate 16 percent in 2015, which is the half of the rate in 2005, in line with the guideline of United Nations to be met with MDGs target (U Myint, 2011). However, it could not meet with the target of MDGs, which requires to reduce the half of the poverty rate from 2005 to 2010 (United Nations, 2010). Moreover, the poverty incidence was almost twice high in rural than urban area at 29 percent and 15 percent respectively, of which 84 percent of poverty was being incurred in the rural areas (IHLCA Project Technical Unit, 2011).

The government has undertaken the eight tasks[1] of poverty reduction programs as the national concern since 2012 (U Myint, 2011). Since then, eight tasks have been implemented in all States and Regions of the whole country. Ayeyarwady region also has implemented to some extent as the regional development and poverty reduction programmes. Accordingly, the infrastructure development was seen by constructing the eleven High Way Roads, and it is more than that of before 1988 in Ayeyarwady region. So, the transportation network in Ayeyarwady region is better access to the Capital of Myanmar, Yangon after 2012 (General Administration Department, 2018). However, Ayeyarwady region has been suffering from poverty at the high rate of 32.2 percent in

[1] The government has carried out the regional development and poverty reduction plans by formulating eight tasks, namely the development of agricultural productivity, development of livestock breeding and fisheries, development of rural small-scale productivity, development of micro saving and credit associations, development of rural cooperative tasks, development of rural socio economy, development of rural energy and environmental conservation for inclusiveness with respective to the people centered approach since 2012 (U Myint, 2011).

2010 and 45.7 percent in 2015 (IHLCA Project Technical Unit, 2011; Central Statistical Organization and World Bank Group, 2019).

Accordingly, the above situations become considerable reasons to study this Ayeyarwady region. In Ayeyarwady region, there are six districts, namely Maubin District, Pathein District, Myaung Mya District, Hinthada District, Phyarpon District, and Laputtar District. Population density in Maubin District is 598 per square mile. It is 413 people per square mile in Pathein District, 444 people per square mile in Hinthada District, 590 people per square mile in Myaung Mya District, 491 per square mile in Phyarpon District, and 322 per square mile in Laputtar District. Therefore, Maubin District has the highest population density among them. Moreover, Maubin District is situated at the shortest distance from Yangon, the capital city of business in Myanmar. In addition, the real GDP growth rate in 2016-2017 is 0.6 percent in Maubin District. It is (-)1.1 percent in Myaung Mya District, 3 percent in Hinthata District, 3.3 percent in Laputtar District, 3.5 percent in Phyarpon District, and 4.7 percent in Pathein District **(**Planning department, 2018). Based on the growth rate, Maubin District is at the second lowest one among six districts.

Therefore, these situations generate a desire to study the income distribution, condition of the existence of poverty, the intensity of poverty, the severity of poverty and the causes of poverty in Maubin District.

1.2 Problem Statement of the Study

Maubin District is far only 50 Kilometers from Yangon, the main regional and international marketplace. Furthermore, the high way roads are developing to connect with domestic and international markets. In spite of enjoying the favorable factors of spatial structure for income generation in the delta area, the income level and growth rate are low, reaching at the second lowest level. Moreover, the population density is the highest compared with other five districts. The highest population density makes the region develop if the population bonus can be utilized effectively for the greater income generation. However, the GDP growth rate and its level are low.

Taking into account the desire to reduce the extent of income inequality, the situation of the existence of poverty, its extent and causes of poverty need to be examined in Maubin District.

The thesis attempts to answer the research questions on the study as follows:

(1) How greater the magnitude of income inequality is?

(2) What is the extent of poverty in the study area?

(3) Which factors are causing poverty?

1.3 Objectives of the Study

The study aims to measure the magnitude of income inequality in order to realize one of the components for the composite measure of poverty index, to determine the incidence, intensity and severity of poverty, poverty index, and to examine the causes of poverty observing the significant factors affecting poverty in order to consider the movement of households out of poverty in the rural areas of Maubin District, Ayeyarwady region.

1.4 Method of Study

In order to achieve the objectives of the study, the combined method of the descriptive method and analytical method is used. In order to measure the income inequality for the investigation of income distribution, Gini coefficient measure is applied with the derivation of Lorenz curve. Regarding to measure the extent of poverty, method revealed by Foster, J., Greer, J., and Thorbecke, E (1984) is used to calculate the headcount index, poverty gap index and the squared poverty gap index (Foster, J., Greer, J., & Thorbecke, E, 1984). The headcount index is the measure, determining the existence of poverty. The poverty gap ratio or income gap ratio is calculated in order to measure the intensity of poverty; and the squared poverty gap index is calculated for the gauge of severity of poverty. Poverty index is also calculated for the consideration of a measure of poverty. Descriptive analysis is done based on the primary household social and consumption expenditure survey in order to identify the profile characteristics of households. Finally, with Binary Logistic Regression Model, the analytical study on socio characteristics, economic characteristics and community characteristics is employed in order to examine the causes of poverty in the study area.

A stratified random sampling method is used in selecting the sample household size. The Cross-Sectional Analysis is applied for data collection on household characteristics, household consumption expenditures and the economic facilities, reflecting to the daily living of households in Maubin District in 2018. The study area consists of 4 townships, 235 village groups, 1648 villages and 186751 households (General Administration Department, 2018). The total population is 973948. Using the list frame of the first stage units (FSUs) of the villages, and with an assumption of

response rate 99%, 17 villages were selected by simple random sampling without replacement at the first stage. To determine the sample size, Krejcie and Morgans formula adjusted to Cochran's method for quantitative variables was used. Using the list frame of the second stage units of the households at stratified random sampling with proportion, 1663 households were selected[2].

1.5 Scope and Limitations of the Study

The study only focuses on the rural areas of Maubin District. For an individual researcher, the study of the whole Ayeyarwady region is very wide, so the scope is needed to specify for the effective study. It is only a cross-sectional analysis.

In order to identify the income inequality, there are three methods for the measurement. In this study, Gini coefficient is applied as an indicator for the measure of income inequality. Since Gini coefficient is used in the study in order to analyze the inequality, there may contain some limitations on sample bias for the validity of Gini coefficient calculation. A measure of inequality can be studied not only by describing the macrolevel status of the political, social, cultural and economic situation that occur among groups of people but also by focusing on consumption expenditure among individual households (Rohwerder, B., 2016). However, the study only emphases the individual household consumption expenditure.

In addition, the study scrutinizes the situations what are the causes of poverty by analyzing the social characteristics, such as age, sex, family size, education of household heads, and toilet condition; the economic characteristics, namely land ownership, occupation of household heads, housing condition; and the community characteristics on the electricity access and water availability. Other causes of poverty, such as ethnic, belief and culture, political and turmoil situation, disaster and weather crisis, the effect of factors of production are not observed in the study because the study only focuses on the quantitative measure.

1.6 Organization of the Study

Thesis consists of six chapters. Chapter 1 is the introduction, composing the rationale of the study, problem statement, objectives of the study, method of study, scope and limitations of the study, and organization of the Study.

[2] Calculation based on data from General Administration Department, Maubin District

. Chapter 2 is for literature review in order to develop the background knowledge on the concept of the extent of poverty and measurement of poverty, the concept of income inequality and its measure, and causes of poverty. Some international countries' experiences and reviews of previous studies on income inequality, poverty and causes of poverty are applied as literature review for exploring the empirical background knowledge. Finally, the framework for the analysis is determined in the chapter.

Chapter 3 deals with the poverty profile in Myanmar and Maubin District. It consists of poverty in Myanmar, poverty characteristics in Myanmar, poverty profile of Ayeyarwady region and background situation in Maubin District in order to gauge the poverty analysis of both national concern and regional concern.

Chapter 4 focuses on the empirical analysis of the existence, intensity, income inequality, and causes of poverty in Maubin District. It comprises of research methodology, profile of respondents in the study area, measuring income inequality, measuring the extent of poverty, and the analysis of causes of poverty. Based on the data collected, indicators or index of poverty and income inequality are calculated. Determinants of poverty are evaluated by the Binary Logistic Regression Model analysis.

Chapter 5 is the conclusion section, consisting of findings and recommendation for the ways of shifting these causes out of poverty, which are the constraints to regional income generation. Then, findings call for the implication of recommendations in order to promote the individual and regional income generation with an appropriate Poverty Reduction Plan and Programme of Maubin District, Ayeyarwady Region.

CHAPTER II
LITERATURE REVIEW

In this chapter, theoretical consideration and empirical studies of various researchers from both of the international and domestic researchers are reviewed as the relevant literature. The concept of poverty, concept of income inequality, measures of the extent of poverty, causes of poverty, reviews on previous studies and framework for the analysis are parts of the chapter for the study.

2.1 Concept of Poverty

Poverty is meant by the deviation in well beings, low income or expenditures, inability to acquire basic goods and services, limited access to basic public service, quality housing, clean water, and sanitation. Generally, poverty is caused by persons with less income level, which is insufficient to purchase the basic necessities for daily life. Poverty is regarded as lack of access to basic needs, goods, which is fundamentally economic or consumption oriented. Then, poverty was developed because the standard for estimates was added by the nutritional and other requirements of individual households in 1901. In addition, poverty may be a combined set of deprivation of health, education, food, knowledge, influence over one's environment and other things. There are three sorts of criteria, during which poverty is predicated on income poverty; whether based on sustainable livelihood or social inclusion; whether supported current consumption or future security (Maxwell, S., 1999). Therefore, poverty is defined by both monetary and non-monetary poverty. Poverty concepts were developed rapidly with three types of criteria while some focused poverty on income poverty or human development. The others were based on sustainable livelihood or social inclusion though some economists reviewed poverty on current consumption or future security (Maxwell, S., 1999). In the 1960s, it was more emphasized on the level of income while it was extended to consider deprivation in the 1970s. If some people were deprived by the minimum nutrition, poverty would be happened, but it was meant by not only a failure of the minimum nutrition level but also a failure to keep up with the

living standards of quality of life (Damas. P., & Israt. R. Md., 2004). The poor are considered as individuals or households unable to purchase a specified amount of basic goods and services, such as nutrition, shelter or housing, water, goods necessary for survival, health care, education, working skills and tools, political and civil rights in decision making for better social welfare (Weber, B., Jensen, L., & Miller, K. K., 2005).

In the mid-1970s, "Poverty became to be defined not only as lack of income, but also as lack of access to health, education and other services". Adam Smith, who was the primary major thinker in economics to deliberate poverty within the 18th century and the proponent of a wealth-creating capitalism, defined poverty as the inability to get necessities required naturally or custom (Austin, J. M., 2007).

Different researchers described seven types of poverty, namely situational, generational, absolute, relative, urban, and rural poverty. Due to the findings of Campuscrosswalk.org (2011), situational poverty is generally caused by a situation that creates economic losses occurred by the weather crisis and severe health problems. Generational poverty occurs in two generations of families hit by poverty. Structural poverty is defined by the persistent socioeconomic degradations, and it is prevented by the limited factors of production, lack of skills of employment, permanent lack of socio-political and cultural factors. An absolute poverty is meant by the subsistence level below the minimum for their survival of living (Todaro, P. M, & Smith, S., 2011). Relative poverty is emphasized on the comparisons of one situation of poverty with another, when the lowest proportion of population is compared with upper portions of income Quintiles. Urban poverty occurs in municipal areas with populations of 50,000 people and above, in which they are facing with stress, crowded population, turmoil, and noise (Cook, S. & Pincus, J., 2014). Moderate poverty is meant by the conditions of life in which basic needs are met, but just merely satisfactory condition. Rural poverty occurs when there is a lack of infrastructure, services and productive resources in the rural area that creates poverty (Cook, S. & Pincus, J., 2014).

Poverty may occur with or without income inequality. There is a relationship among economic growth, income inequality and poverty. When the economy grows, income inequality may exist. The increase in average income as the part of economic growth leads to reduce an income inequality if the growth is used for the resource allocation and income redistribution. Therefore, it is necessary to identify how large the magnitude of income equality is in the study area.

2.2 Concept of Income Inequality

"Inequality is mentioned because the discrepancies within the areas of income, wealth, education, health, nutrition, space, place, infrastructure, politics and social security" (Haughton, J., & Khandker, R. S., 2009). The study reviews the concept and measure of income inequality and its relationship with economic growth. Income inequality is mainly concerned with the distribution of income earned by the individual with respect to total income earned for the input use of labor, land, capital and intangible resources. If economy grows, income inequality will grow first. Then, if some of the growth are used up for the development, inequality will decline, and it is getting equity. The relationship between economic growth and income inequality can be seen as an inverse U shape (Todaro, P. M, & Smith, S., 2011). Economic growth is the suitable measure to deteriorate poverty (Stiglitz, E. J., Kaushik, B. & Hon, V., 2015). The increase in per capita income or income inequality will be indirectly related with poverty if the economic growth of a region is adequately used to cure the decline in the respective economic sectors. In the first step of economic development, inequality is raised firstly, then as the economic growth persists, the income inequality declines gradually (United Nations, 2020). Therefore, income inequality is necessarily analyzed to identify in each region of Myanmar.

Poverty may be possibly raised by the negative changes in average income if there is a negative relationship between the poor who are living below the poverty line (L), and the average income of total population, which is the per capita income (Rebecca. M. B., & Card, D., 1993). Hence, "the power or magnitude of growth can be utilized for the sake of poverty reduction with respect to improvement in average income". Therefore, poverty is distinguished as being unable to meet the "physical basic needs"; food, health care, education, shelter etc., and "nonphysical needs"; participation, identity, etc., which are the requirements for a meaningful life (World Bank, 2008).

Since poverty index is calculated as the product of Gini coefficient, poverty gap or income gap index and the headcount ratio, it gives the ratio of population that requires to reach above the minimum income level with equal income distribution (Amartya, S., 1976). It will decrease if the average income of total population increases, while it will increase if average income decreases (World Development Report, 2000-2001). The higher the average income, which can people's living move up above the

minimum income level ceteris parabus, the less the poverty index is (World Development Report, 2000-2001). Hence, the other things are considered as constant.

It is accepted that poverty will generally be greater in the country with higher income inequality because the forces of economic growth cannot be utilized in poverty reduction. It happened a rising trend of income inequality. The equitable income distribution increases the chance for the poor to have access the basic necessities. Thus, the distribution of income has an important influence on poverty (World Development Report, 2000-2001). In order to classify the income distribution, income inequality can be measured in three ways: (1) as "the total income share received by the poorest 40 percent of the population", (2) as "the ratio of the income share of the richest 20 percent", and (3) as measured by "the Gini coefficient".

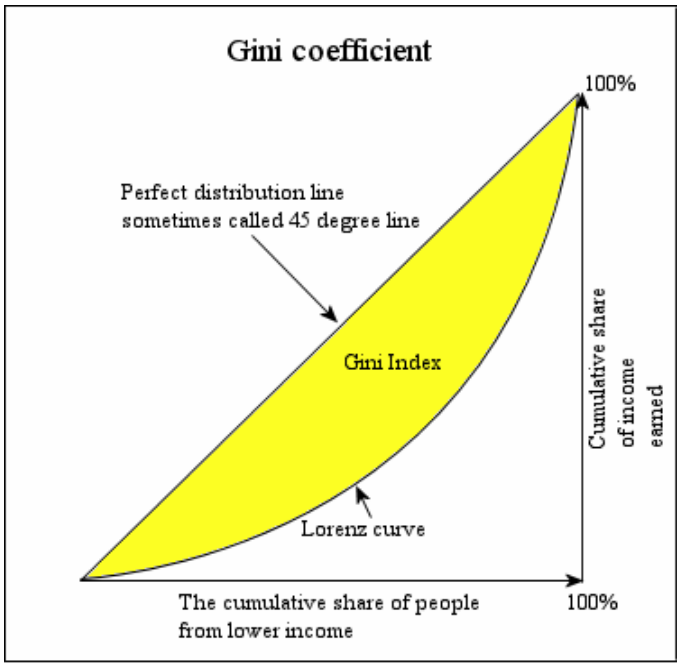
With the derivation of the Lorenz curve, the Gini coefficient is an indicator that is commonly applied by both of the researchers and economists for its features of benefit to the aspect of reliability. They are (1) "mean independence, meaning that the measure would not change if all income were doubled", (2) "population size independence, concerning that the measure would not change if the population were to change", (3) "symmetry, describing that the measure would be no change even if incomes of the people change" (Haughton, J & Shahidur R. Khandker, R. S., 2009; P 105; Rohwerder, B., 2016).

In most developing countries, Gini coefficient lies in the range of 0.3 to 0.7 while it is found around 0.4 in the developed countries (Angelsen, A & Wunder, S, 2006). "0" Gini coefficient reflects to a perfect equal income shared society, meaning that individual has the equivalent income. Its value 1 represents a perfect unequal income share. These two extreme values will never occur. If it lies between 0.2 and 0.3, a relative equality is created there (Moges, D., 2019). If it lies in the ranges from 0.3 to 0.4, it is represented as "the adequate equality". If it exists between 0.4 and 0.5, it is represented a big income gap, and is categorized as the severe income gap there. If it is above 0.4, it can be said that the political instability and growing social tensions frequently happened (Moges, D., 2019). Gini coefficient is seen as the ratio of area between the line of perfect equality and the Lorenz Curve to the area under the line of perfect equity. Lorenz curve is shown in Figure 2.1.

Figure (2.1) depicts the Lorenz curve where the horizontal axis plots the distribution of cumulative share of population from the lowest income to the highest income while the vertical axis shows the cumulative share of income earned. "The

Lorenz Curve" is the curve, that is drawn the "cumulative value of total consumption expenditure or income from the lowest 20 percent, 40 percent, 60 percent, 80 percent to 100 percent by that of total population in the income quintiles with the comparison of equal income distribution path or the perfect income distribution line". Income distribution is divided by five quintiles, such as 20 percent, 40 percent, 60 percent, 80 percent and 100 percent of total income or consumption expenditure.

Figure (2.1) Lorenz Curve and Gini Coefficient



Source: Michael P. Todaro, 2011

Lorenz curve lied on the perfect income distribution line or Equity Line shows that there is an income equality. When income inequality occurs, the Lorenz curve lies below the equity line. It depicts that the poorest population may earn the lowest portion of income. The distance below the equity line shows the magnitude of unequal income distribution.

2.3 Measures of the Poverty Extent

Extent of poverty is referred to as the existence of poverty, measuring with poverty rate or headcount index, poverty gap, squared poverty gap and the poverty index. Poverty analysis is primarily required to determine the households or individuals who are poor. Poverty is determined by the income level of the poverty line. It is

identified by the minimum amount of income or consumption expenditure of a person (United Nations, 2010).

As per Global Poverty Estimates, the World Bank states that people who earn income at most $ 2 per day are suffering from the "moderate poverty". Income at $ 1.25 per day is applied for the assessment of "extreme poverty". "People living in extreme poverty have a risk from vulnerability, undernourishment and disease infections. "The absolute poverty is identified by the baskets of basic needs for food, non-food and fundamental services that might be daily individual use". The world poverty or international poverty line was set income level at US$ 1.25 measured by 2005 purchasing power parity US dollars, and US$ 1.9 at 2011 PPP for developed countries (Jolliffe, D. & Prydz, B.E., 2016).

The existence of poverty or the extent of poverty is identified by the measure of headcount index, poverty gap index for the assess of poverty intensity, the squared poverty gap index for the assess of poverty severity and the poverty index for the assess of poverty with equal income distribution.

(i) Headcount Index

Poverty level is examined by the measure of Headcount Index. With the method revealed by Foster, J., Greer, J., & Thorbecke, E (1984), Headcount Index is expressed as the percentage of poor by total population. Headcount Ratio (HCR) or (H) is defined as the ratio of number of poor to total population. It is also called the poverty ratio. It helps to understand whether the poverty condition is stagnating, reducing, increasing or not.

$$PR = HCR = \frac{\text{Number of People Below Poveorty Line}}{\text{Total Population}}$$

Where, PR = Poverty Rate

HCR = Headcount Ratio

For the overall measure of poverty, Headcount ratio is used. It is regarded as the most basic measure. It shows the percent of poor population. For the assessment of existence of poverty, Foster, J., Greer, J., & Thorbecke, E (1984) proposed as follows:

$$P_{\alpha}(y,z) = \frac{1}{n}\sum_{i=1}^{q}\left(\frac{z-yi}{z}\right)^{\alpha}$$

Where, "z" = Poverty line income or consumption expenditure level,

"q" = the number of households whose income or consumption expenditure is below the level of poverty line,

"n" = total number of sample households,

"y" = the income or consumption expenditure of household,

"α" = the FGT parameter, which is called as "poverty aversion or poverty elimination parameter".

The value of poverty elimination parameter "α" will be "0", "1", and "2". "P" gives the different meaning with level of concern on poverty. If there is no aversion to poverty, "α = 0", P_0 will be referred to as Headcount index. Headcount index (P_0) measures the percent of poor population. If "α" is 1, "P" will stand for intensity of poverty. It is called poverty gap index. If "α" is 2, "P" will be described as severity of poverty, or squared gap poverty (World Bank Institute, 2005). The measure of headcount index is as follows:

Headcount Index $\mathbf{P_0}$ = N_p / N ;

Where, N_p = the Number of poor and

N = Total population or sample

OR

Headcount Index P_0 = $q \frac{1}{N}$

If the degree of aversion to poverty is increased, then α = 1, there is a depth of poverty. Its measure of poverty is called the poverty gap or income gap index (World Bank Institute, 2005).

(ii) Poverty Gap Index

The poverty gap index (P_1) or income gap index (I) measures the intensity of poverty. Therefore, this index is expressed as "a proportion of the difference between the poverty line consumption or income level and individual level to the poverty line level" (World Bank Institute, 2005). It shows the depth of poverty. It is described as "the income gap ratio" (Amartya, S., 1976). Poverty gap (G_i) is calculated by deducting the actual level of individual consumption expenditure or income (y_i) from that of poverty line level (z). It measures the total amount of income or consumption

expenditure necessary to raise everyone whose income is below the poverty line up to that line (World Bank Institute, 2005). Poverty Manual stated that poverty gap showed the average income or consumption that had a shortfall percentage of poverty line level. It is expressed as follows:

$(G_i) = (z - y_i) \cdot I (y_i < z)$, then poverty gap index (P_1) is written as

Poverty Gap Index (P_1) $= \frac{1}{n}\sum_{i=1}^{q}\left(\frac{z-yi}{z}\right)$

Where y = per capita consumption expenditure

z = consumption expenditure level of poverty line

n = the numbers of sample households

It can be reviewed as the minimum cost of eliminating poverty using transfer if the transfer is used efficiently and effectively. The smaller the poverty gap index, the less budget allocation for poverty alleviation is required. This is called "the extent of the income shortfall of each poor" (Amartya, S., 1976). It is related with the poverty index.

(iii) Poverty Severity Index or Squared Poverty Gap Index

The measure of the severity of poverty is expressed as P_2 that is used for the measure of the poorest (World Bank Institute, 2005).

$$(P_2) = \frac{1}{n}\sum_{i=1}^{q}\left(\frac{z-yi}{z}\right)^2$$

The poverty severity index is used in order to take into account the income inequality. It is "the weighted sum of poverty gap". It shows the percentage of the poor, who is the poorest. The Squared Poverty Gap index expresses the targeted poor people whose income or consumption expenditure are far below the poverty line.

(iv) Poverty Index

In order to consider the equal income distribution and eliminate the income gap, Poverty Index (P) is measured. It is the composite measure of poverty, poverty gap and the Gini coefficient, and it is calculated by the product of "the head-count ratio (H) multiplied by the income-gap ratio (I) augmented by the Gini coefficient (G) of the distribution of income among the poor weighted by (1 - I)" (Amartya, S., 1976). It is written as follows:

Poverty Index = [I + (1 - I)G] H

Where (I) = Poverty gap or income gap ratio

(G) = Gini coefficient

(1-I) = the weighted ratio of the mean income of the poor to the poverty line income level.

If (P) is "0", there is no poverty in the region, meaning that everyone has income that is greater than the income level of poverty line. If (P) is 1, everyone has zero income with no consumption. However, it is non sense. Therefore, "P" will never be 1 (Amartya, S., 1976). It gives the proportion of population that requires to reach above the poverty line with the consideration of equal income distribution.

2.4 Causes of Poverty

In the regional economy, the interrelated economic actions such as investment, production and consumption in the region can bring into effect the regional economic growth. According to the economist Hilhorst, J. G. M. (1980), regions can stimulate economic growth by taking the comparative advantage in identifying regional constraints of their specific location on growth by coordinating local responses. Hilhorst pointed out that regional economic growth cannot be achieved without shifting the regional constraints, and putting them in place with well-focused and arranged programs through empowering the households by promoting their access to factors of production. According to Hilhorst, it was revealed that regional deficiencies reflect to the causes of poverty. As a result of the lack of productive resources or the insufficient access to productive resources, such as agricultural land, physical capital and financial assets, leads to low income, unemployment, malnutrition, and an inadequate access to resources hinders the capability of individuals from having a higher quality of life while the human resource factor is the major cause of poverty (Haveman. R & Schwabish. J., 2000). An inefficient allocation of resources, resulting from the weak policy environment, the inadequate infrastructure, a weak access to technology and credit are also considered as factors that create poverty (Waheed Olowa, O., 2012).

Bradshaw, T. K., stressed on the determinants of poverty and shaped the strategies to relieve from these factors. These are stemmed from (1) "individual disparities" (2) "social belief" (3) "political-economic shortcomings" (4) "geographical discrepancies" and (5) "the cumulative process" (Bradshaw, T. K., 2000). Therefore, "inequalities in economic condition, decision making, and social situation" are factors that create poverty instead.

Causes of poverty are very important in analyzing the poverty and drawing up a poverty alleviation strategy as poverty profile is varied with respect to the geographical aspect, the individual, the economic and the community characteristics of a region (Singh, P. K., & Chudasama, H., 2020). The nature and causes of poverty are complex and diverse since causes of poverty are diversified by the characteristics and the geographic location of countries (Damas. P., & Israt. R. M., 2004). For instance, the income generation of countries is hindered by individual characteristics, such as gender, education; productive resources namely land ownership, employment and capital investment in the regional areas; community characteristics including geographic location and infrastructure utilities. They are different depending on the countries.

2.4.1 Social Characteristics

The economist, Hilhorst, J. G. M. (1980) expressed that regional constraints such as individual, social and political constraints, economic constraints, and geographical constraints deter the regional economic growth and development. Among these constraints, according to Hilhorst (1980), the characteristics of households, the lack of awareness on health care in the countryside, the lack of knowledge, the lack of skills of the people, an inadequate education level, lack of autonomy, the mismanagement of policy changes, and the lack of collective participation in public decision making in development activities are regarded as the first type of constraint. Characteristics of individual insufficiencies such as gender of household heads, age of the household heads, the number of family members, education and health status of the household heads can influence the income generation of a household.

According to (Bradshaw, T. K., 2006), poverty is caused by individual insufficiencies. (Bradshaw, T. K., 2006) said that theoreticians believed that individuals in poverty were the most responsible persons, who created their own problems. The poor argued that they could have avoided their problems if they have worked harder with better choices in the highly paid jobs at the expense of lack of genetic qualities or intelligence. However, they are not able to reverse their characteristics so easily. Moreover, (Bradshaw, T. K., 2006) pointed out that “Neoclassical Economics” reinforced the individual sources of poverty. As individuals seek to maximize their own well beings by making choices and investments, assuming that they have the perfect

information, and they seek to maximize their well beings, people who decide to invest in higher education or vocational training may have better paying jobs in the future.

Above mentioned concepts are related to social deficiencies or social characteristics, which consist of individual characteristics, demographic characteristics, and lack of skills and education.

2.4.2 Economic Characteristics

Hilhorst, J. G. M. (1980) pointed out that deficiencies comprising landless, the lack of employment creation, and the insufficient capital formation are considered as the second constraint or causes of poverty. In his view, this second type of constraint is called the economic constraint. The lack of capital stemming from landlessness in the rural area and job deficiency are seen as the major types of economic characteristics. The force of agriculture financing pulls households towards poverty incidence. On the one hand, the lack of education expenditure creates the unskilled labor and increasing informal workers, giving low wage earners. Lower education standard and unskilled labor classification reinforce the region's economic degradation. It reflects to the vicious cycle of income generation, low education standard and employment creation.

Poverty is caused by economic, political, and social distortions (Edwards, M. E., Plotnick, R., & Klawitter, M., 2001). It is mentioned in the progressive social theory (Edwards, M. E., Plotnick, R., & Klawitter, M., 2001). It does not look to the individual as a source of poverty, but to the economic, political, and social system that cause people to limit opportunities and resources with which to achieve income and well beings. In this regard, discrimination is created by the skill from one place to another that offers the opportunities. The problem faced by the working poor households is seen as a wage problem preventing poor families from getting better jobs.

2.4.3 Community Characteristics

The third type of constraint mentioned by Hilhorst, J. G. M. (1980) is named as the physical constraint, such as geographical deficiency, inadequate transportation system, the lack of infrastructure development, and insufficient electricity in the community level. Poverty is caused by geographical deficiencies

Poverty is caused by the related cyclical movement. It looks at the individual and their community that is caught by a spiral effect between creating opportunities and

facing or trying to overcome the challenges in income generation. As such weakness of individual deficiencies, social belief, political-economic shortcomings and geographical disparities are mutually affected to become an uncertain economy, it will raise the level of poverty (Sher, J., 1977). This in turn creates the regional economic degradation. In a review of the literature on rural poverty, "the economic agglomeration theory describes that spatial concentrations create the rural discrepancies in poverty". However, in the urban areas, as firms attract supportive services and markets, the emergence of industrial clusters becomes strong (Phillips, G. R., & Besser, L. T., 2013). These regional constraints create the insufficient financing in their daily life of income generation so that shifting these regional constraints or the weak characteristics can be considered as the diagnostic factors of poverty reduction programs.

The relationship among factors that create poverty actually accumulates since a cycle of economic contraction starts. Eman Abd Allah, Abd Allah Mohamed & Nayera Yehia Solieman Eid. (2018) stated that individual levels of education and employment status of a developing country interact to create a spiral effect of disinvestment and the economic decline of the community. The same factors at different levels in advancing communities will contribute to the growth and well beings.

The cycle starting from the individual level challenges of income generation repeats to the inadequate opportunities in the community. Low level of education and low wage earning undermine the improvement of self-capacity for self-determination and self-efficacy mutually (Eastwood. R., & Lipton. M., 1999). The lack of highly paid jobs leads to the lack of income and consumption, inadequate savings, and the contraction of investment for education. All of these factors contribute back to the lack of opportunities in the community (Fields, G. S., 2012). Moreover, low-income households are probably to have lower-quality of social, and local services from their environments.

The last cycle of poverty incorporates with many of the previous theories. It shows how people become disadvantaged in their social context which then affects psychological abilities at the individual level. "The structural and political factors in the cyclical theory reinforce each other with economic factors which are linked to community and to political and social variables" (Eastwood. R., & Lipton. M., 1999). The cyclical theory shows how multiple problems or challenges cumulate. Therefore, poverty is not just happened by one cause but many or combination of causes.

2.5 Reviews on Previous Studies

Rural poverty is recorded as 63 percent in developing countries, and 20 percent of world's populations is poor, who are living on less than $1 a day (IMF, 2001). Rural poverty in the worldwide reaches to 90 percent, like Bangladesh (World Bank Group, 2019). Rural poverty and causes of poverty are necessarily reviewed as the factors of social characteristics, economic characteristics and community characteristics, which are coincidence with theoretical thoughts of findings. Social Characteristics include the demographic characteristics of households, education level and health status of households. The availability of infrastructure, such as roads, water, electricity, the availability of clinic, hospital, education, and proximity to markets is referred to as the community level characteristics. Household size, age structure and gender of household heads are considered as the demographic characteristics. Economic Characteristics consist of employment status and property owned for productive capacity. Health and nutritional status, education and shelter are revealed as social characteristics (World Bank Institute, 2005).

The researcher Haughton and Khandker (2009) tried to find out the determinants of poverty by using a multiple regression model on the primary data of the Cambodian Socio- Economic Survey for 15,000 households in 900 villages of different sub-sets of rural households (Haughton. J. & Khandker. R. S., 2009). The study aimed to identify the main immediate and proximate causes of poverty, to classify the causes of poverty by the individual, regional and the community characteristics, to explain how the regression analysis was used to identify the proximate causes of poverty and their relative importance, to evaluate the assertion that the weakest part of poverty analysis is the understanding of poverty's fundamental causes, and to define a successful antipoverty strategy. The multiple adaptive regression splines- MARS models and the classification and regression tree models- CART were used to identify the proximate causes of poverty and their relative importance on economic growth through poverty reduction programmes. Size of household, dependency ratio, gender of head, gender of household adults on assets of land, tools and other means of production, housing, employment and income structure, type of work wage labor or self-employment, remittance inflows, health and education of household members on average were used as the explanatory variables of household characteristics. In terms of individual characteristics, age, education, employment status, health status and ethnicity were analyzed as the independent variables with respect to the dependent variable of per

capita consumption expenditure. It was found that a high dependency ratio was associated with greater poverty. Female headed households were particularly poorer than male headed households. Adults in the poorest quintile had the average education 3.1 years of schooling, 5.3 years among the richest quintile, 5.1 years of men's education, and 3.2 years of women's education. The study of the Cambodian CSES of 1993/94 showed that the poor in larger households were with family size of 6.6 persons in the poorest quintile, compared with 4.9 family members in the richest quintile.

Regarding the community characteristics, vulnerability to flooding, remoteness, quality of governance, property rights, and their enforcement were considered as independent variables for the regional level characteristics that create poverty. The availability of infrastructure, such as roads, water and electricity, and the availability of services in health care, medical clinics, and education, proximity to markets, distance to local administrative centers and social relationship was used as the community level characteristics. In the first multiple regression analysis, logarithm per capita consumption expenditure was used as the dependent variable that was a function of independent variables. Secondly, regression analysis with the fixed effect of estimation method on the repeated panel data was applied to help drop out the effect of unobserved factors. However, qualitative analysis method was used to evaluate the regional level causes of poverty while the quantitative analytical method was applied for gauging the availability of infrastructure in the community level. Regional characteristics, remoteness, less infrastructure and poorer access to markets and services, resource-based land availability and quality, weather, typhoons and frequency of earthquakes for environmental conditions, regional governance and management, and inequality were considered as the explanatory variables on the explained variable of per capita consumption expenditure. Community characteristics, such as transportation road access, the piped water availability, land ownership, schools and clinics, social structure and capital were considered as dependent variables. Inadequate public services, weak communications, underdeveloped markets and infrastructure were dominant features of life in rural Cambodia and significantly contributed to poverty.

The policy recommendation was set to improve the infrastructure for achieving the economic growth in Cambodia (Haughton. J. & Khandker. R. S., 2009). Policies to enhance asset and livestock accumulation of productive durable assets especially agricultural equipment, such as water pump, poultry, fish and cattle could be used to increase revenue generation. Policies to make agriculture land concession to the

landless and improve irrigation system could be applied for the positive effect on per capita food consumption. Lastly, policies to reduce vulnerability to shock, such as serious illness, crop failure, animal death or stolen, family loss, land conflict or natural disaster could be used.

Magnus Andersson and Anders Engvall (2006) conducted the multiple regression analysis on the Laos Expenditure and Consumption Survey 3 - LECS3 for 8048 households from 18 provinces of rural areas in Lao PDR. It revealed the determinants of poverty. Objectives of the study were to analyze the causes of poverty, to assess the impact of poverty, to find out the specific policies and to improve the welfare. Poverty determinants included demographic data such as age and sex of household members, education levels, landholding, village characteristics and access to public goods. Multiple Regression analysis showed that household characteristics on dependency ratio and the number of adults were significantly and negatively associated with per capita consumption. It showed that the larger families had the lower per capita consumption. Their consumption levels would be reduced if the family had many dependent family members. Higher economic dependency ratio was one of the most important factors on poverty. The welfare level was reduced further if many of the family members were categorized as dependents. This was consistent with cross country studies, which indicated that higher fertility increased poverty in Laos PRD. Gender of the household head was another factor that potentially affected household income. Three factors for understanding poverty in Lao PDR, consisting of geographic variations, ethnicity and economic growth were considered as the regional level consideration on all provinces. It showed that more than nine-tenths of the inequality was due to the geographical variation in each region while less than one-tenth was due to the differences between regions. Moreover, some crucial areas, such as lack of investment in education, lack of entrepreneurship, lack of agricultural production, and lack of infrastructure in Laos PRD were found as the factors of creating poverty. Ethnic origin was a significant factor for minority households because they had less ownership of inputs and less favorable household characteristics. It showed that 52 percent of the ethnic minority and 70 percent of rural people live in poverty. Based on the findings of the survey data, 10 to 14 percent of inequality happened in Laos PDR due to the differences in regions and ethnicity.

In the study, the multiple regression model was used to evaluate the access of transportation, access to electricity, access to education and health services that were

considered as exogenous factors for determining the household income generation in Laos PDR. Policy recommendations were considered as the priority activities of poverty reduction strategy for Lao PDR. These were (1) to reduce dependent family members, (2) to invest in female education (3) to stimulate entrepreneurship and diversification agriculture and related sectors, (4) to raise the agricultural productivity, and (5) to improve infrastructure and health care sector.

Son Thanh Tung (2015) studied the symptoms and causes of poverty in a rural Vietnamese commune of North Central Coast region in order to measure and explained the relative poverty on a sample survey of 200 households from a mountainous commune in Vietnam's North Central Coast region. Causes of poverty namely different forms of resource endowment, social exclusion defined by gender and ethnicity were examined by the ordinary least square method. The ordinary least square estimates showed that poverty was most strongly affected by differences in human and social capital. The root causes of poverty that was important for long term poverty reduction had been associated with location, vulnerability, flawed institutions, lack of human capital, and the weak social capital in Vietnam. It showed that 55 percent of Vietnam were mountainous, of which 49 percent live in poverty in the North West mountain region. Accordingly, many of the people living there were poor and life in the mountains was hard due to the poor quality of top soils, inaccessibility of road maintenance, fewer markets for produces, the harsh weather like landslides, flash floods, drought and storms due to the climate change. Possible social exclusion, including gender and ethnicity was the last factor influencing poverty in the long term. Almost 40 percent of all poor people were ethnic minorities in Vietnam, typically living in remote areas, and they often had the less access to infrastructure and basic services, low rates of female education, high rates of subsistence farming, high illiteracy rates and large family members. Occupation of household heads was seen that 52.5 percent of the poor were working in the agriculture and forestry sector while 8.8 percent of them was doing in the fishing work, and the rest 8.7 percent was working as unskilled workers in the informal sector. Particularly, the main sources of income of the poor were coming from agriculture, foreign remittance, and work activities of informal sector that was significantly and positively correlated with poverty status. Most of the poor household heads generated in the lower income job segment while the smaller number of poor household heads worked for the larger income earned non-farm jobs. Regarding the Educational Attainment of Household Head, almost 50 percent of

household heads did not complete any formal schooling, and almost 30 percent of those who did not complete high school became poor. However, only 2 percent of college graduates had income that was below the poverty line. Regarding the education status, the average enrollment rate for the bottom 10 percent of the population was lower than 55 percent, and it was about 75 percent for the top 10 percent of population. Most of the poor household heads had the lower education level than that of non-poor household heads, and it was significantly and positively related to the poverty status.

A domestic literature review study is approached to the Doctorate Thesis, entitling the Analysis on Causes of Poverty in Rural Area of Dry Zone in Sagaing Region by Thar Htay (U Thar Htay, 2015). It was based on 3174 sample households from 13 sample villages from 4 Townships of 2 Districts, which were selected from 666 villages of 4 Districts. The objectives of the study were to measure the extent of poverty and inequality and to explore the causes of poverty in the rural area of Dry Zone in Sagaing Region. Monywa Township and Ayardaw Township from Monywa District and Yinmarpin Township and Sarlingyi Township from Yinmarpin District were studied. Per capita consumption expenditure was used in order to measure the poverty status in this study. It showed that the Headcount Index was 49.37 percent, 49.44 percent and 49.4 percent in Monywa Township, Ayardaw Township, and Monywa District respectively. Also, it was 54.75 percent, 45 percent and 49.9 percent in Yinmarpin Township Sarlingyi Township, and Yinmarpin District respectively.

It was interpreted that headcount index was over three times more than that of Sagaing regional level, 15.1 percent (IHLCA Project Technical Unit, 2011). All results of the survey data on Dry Zone of Sagaing region were based on the benchmark data of National level Poverty Line instead of using that of regional level. It was seen that the researcher used the income level of Poverty Line of the National Level revealed by the IHLCA survey result. Therefore, the determination of poverty line of the regional level should be used for the identification of poverty rate. It was found that the Headcount Index of Dry Zone Areas of Monywa and Ayardaw Townships were quite high compared with that of regional level.

Gini coefficient of Monywa Township, Ayardaw Township and Monywa District was 0.36, 0.3 and 0.34respectively while it was 0.32, 0.38 and 0.35 in Yinmarpin Township, Sarlingyi Township and Yinmarpin District respectively.

The study examined the causes of poverty by using the Binary Logistic Regression Model based on the household per capita consumption expenditure. Gender

of household head, occupation of household head, education of household head, household size, age dependency ratio, economic dependency ratio, land ownership and number of sources of income were considered as independent variables.

Gender of household heads did not affect to the poverty incidence level in the study area. Most of the household heads and household, 81.3 percent of them finished their primary education level, and were working in farms and in non-farm as causal workers or low wage workers. The jobs neither demand the secondary, tertiary and higher education level nor offer the larger salaries. This is one of the reasons of Poverty. However, Poverty rate is higher in Yinmarpin District than Monywa District though there is no illiterate person in Yinmarpin District. It has the higher rate of household heads who finished the Primary schooling, Middle schooling, High schooling and Graduates than those in Monywa District. Therefore, this result is also different with other studies. It showed that education level is positively related to the poverty status in his study. The occupation of the household heads influenced on the income level of the family, reflecting to the direct relationship between the rate of unemployed household heads and the poverty rate in Yinmarpin District than those in Monywa District. It described that the incidence of poverty was higher as the job opportunities were scarce. Age dependency ratio has a positive impact on the household's living standard. The average age of the majority household heads was in the middle age group. The study showed that there was no effect of gender status of the household head to the poverty incidence level. The higher household size 5.2 members were found in Yinmarpin District than 4.9 members in Monywa District, reflecting to the higher poverty incidence in Yinmarpin than Monywa District so that the poverty rate was positively related to the household size. The diversification of income source of households was directly related to the income level. Landlessness was the major source of poverty, showing that the majority of household who was landless household was 35.65 percent in Yinmarpin District while it was 31.17 percent in Monywa District.

The electricity access in Yinmarpin District was 33.15 percent, which was larger than that of Monywa District, 10.3 percent. It can be said that the incidence of poverty in Yinmarpin is higher though the percentage of electricity access is lower than that in Monywa District. It was the different result finding with others. It showed that the electricity access was positively related to the incidence of poverty in Sagaing Region. Low Access to Credit or Credit System, Poor Transportation, Deficiency in Labor Market, Limited Information and Knowledge to extend, Low Human Resource

Development, No Irrigation Water were described in the study as the macroeconomic determinants of poverty. In order to reveal these macroeconomic determinants, the researcher conducted an interview with questionnaires to 17 working groups of NGOs, who were doing projects for poverty reduction programme. Based on their qualitative questionnaires, yes or no responses were encountered as the macroeconomic determinants. This analysis is fully relied on the personal expression.

Policy recommendation of poverty reduction for the Dry Zone rural area were drawn to generate more jobs in non-farm activities, to find means for the increase of land ownership and the numbers of sources of income, to create the productive activities on the improvement of agricultural productivity, market access, and vocational training, to provide the infrastructure development in order to reduce the higher burden of dependency with larger family size, low agricultural productivity, less job opportunity and inadequate infrastructure development.

Empirical studies showed that poverty was the global issue, and causes of poverty would be found in different countries, not only in the developed countries but also in the developing countries, depending on their deficiencies of geographical constraint, economic constraint and socio-political constraint. In the empirical studies of causes of poverty, deficiencies in different countries were analyzed by the various researchers as the classification of household characteristics and community, regional or macro level characteristics. In these empirical studies, the nature of the causes of poverty was not different from one country to another, meaning that the common characteristics were provident in most of the countries. Household characteristics, namely sex, age and education of the household head, and family size, economic characteristics, consisting of employment status of household head, farm land ownership, and regional or community characteristics, such as infrastructure, access of utilities are commonly considered as causes of poverty that generate in countries. Therefore, the study of poverty and causes of poverty are referred to as the country-based issue. Depending on the situation of characteristics, the significant level of causes of poverty may occur.

In the Thesis, the Binary Logistic Regression analysis is also applied, and per capita consumption expenditure is examined whether poverty status exists or not with respect to the exogenous variables of social characteristics, economic characteristics and community characteristics.

The study of Income Distribution and Poverty in Irrigated and Rain-fed

Ecosystems in Nyaung Don Township, Myanmar was done by Yolanda T Garcia in 1996, aiming to assess the government policy of new rice-based technologies on income and employment of rural households, to measure the poverty and income inequality, and to identify the factors affecting poverty. Nyaung Don Township is situated in Maubin District of Ayeyarwady region. The case study on the primary survey was conducted by reviewing data of living condition assessment on 739 households in 1996 (Yolanda, T., & Garcia, 1996). Regarding the household characteristics, household size in both irrigated and rain-fed villages was found five members on average. The education level of people was low at five schooling years and at most primary schooling. The high rate of population over 67 percent of the total population was engaged in agriculture as farmers, hired laborers, and livestock or fishing farmers.

The unequal access to land resources was found with 41 percent of the total households, who were landless farmers, attributing to the 48 percent in the irrigated villages and 34 percent in the rain-fed villages while the rest was attributed to the deep-water areas. The Gini ratio for the irrigated villages (0.45) was greater than that for the rain-fed villages (0.42), indicating that the distribution of income in the irrigated villages, where the technology adoption started in the early 1990s, was more unequal than that in the rain-fed villages.

For the measurement of the incidence and causes of poverty, the poverty line was established by assuming minimum per capita income level that was sufficient for the average level of a person's rice consumption about 27 kg per month and some other nonfood necessities, in which the value was amounted to 5,850 kyats or US$ 48.75 per adult people a month at PPP (2005) or US$ 37.9 per capita a moth at PPP (2005). A household is considered as a poor who is living below this consumption level.

The headcount ratio, the poverty gap ratio, and the squared poverty gap ratio were calculated. The headcount index was 28 percent, implying that 28 percent of all households were having incomes below the poverty line. The proportion of landless rate was 40 percent of households in 1996.

The intensity of poverty, defined by the poverty gap ratio was 10 percent, of which 18 percent was accrued to the land owner farmers, while 44 percent was attributed to the landless farmers, and the rest are not living as farmers. The severity of poverty measured by the squared poverty gap ratio was 5 percent. It was also found to be higher in the irrigated villages implying that households in the irrigated villages were worse off in terms of income generation.

Causes of income inequality were mainly accrued to the landlessness, the top-down pressure of cropping pattern and the insufficient infrastructure. Even though there was a plenty of land area in the country, 40 percent of the total households were landless farmers implying that the unequal access to land resources in the villages of the Township during the Socialist Form of Government contributed to the income inequality of households. It was found that the incidence of landlessness was observed to be higher at the rate of 48 percent in the irrigated villages compared with the rain-fed villages of 39 percent while the rest was attributed to the deep-water areas. The second major source of income inequality was non-farm income with the contribution of 23 percent and 29 percent in irrigated and rain-fed villages respectively as the cropping pattern adopted by farmers with their land access and asset of capital resources were identified to their income generations.

The study pointed out the third point that it couldn't catch up with the vast potential increase in crop production, especially for rice because it missed to use the appropriate technological support for the farmers and the sufficient infrastructure development like irrigation. The results of the study showed that an insufficient coverage of irrigation and the top-down pressure by the government to adopt modern rice technology without giving the suitable guidance and support to the farmers' preparation for the adoption process, the potential production has not been maximized by an adverse effect of income in the irrigated areas. However, the study done in 1996 had not yet been focused on the causes of poverty in the study area.

As the second time review, the extended survey on the 900 households of the Nyaung Don Township as a case study data measuring the income distribution and poverty of irrigated and rain-fed ecosystems was conducted by Jonna, P. E. and Otsuka, K. in 2012 (Jonana, P. E., & Otsuka, K., 2014). It was a case study entitling on Moving Out of Poverty: An Inquiry into the Inclusive Growth in Asia by Jonna, P. E. and Otsuka, K. In the study, the poverty line of Ayeyarwady region was determined at 289,058 Kyats a year in 2012. It was equivalent with US$ 1.25 per capita a day that was pegged as the international poverty line. The findings showed that the poverty incidence by land owning farmers was 39 percent in 2012, indicating that 39 percent of land owner farmers were poor while 61 percent of land owner farmers were non-poor. Poverty incidence rate was 74 percent for landless farmers, meaning that 74 percent of landless farmers were poor while 26 percent of landless farmers were non-poor in 2012. Poverty rate increased from 28 percent in 1996 to 39 percent of farm land owner and

74 percent of landless farmers in 2012. The landless rate was 79 percent of households in 2012. The landless rate increased from 40 percent in 1996 to 79 percent in 2012. Poverty gap ratio showed the intensity of poverty of which the poverty gap ratio of farmers and landless farmers were 19 percent and 42 percent respectively.

Arable land area per capita was decreased from 0.45 hectares per capita in 1960 to 0.21 hectares per capita in 2011 in Myanmar. It declined from 2.62 hectares per capita in 1996 to 1.63 hectares per capita in 2012. The landlessness was increasingly accounted from 40 percent of households in 1996 to 79 percent in 2012. However, the average household size declined from 5.3 members in 1996 to 4.7 members in 2012. There was a declining proportion of household heads, who was working in their own farms, showing from 55 percent to 30 percent. The proportion 18 percent of households increased to 34 percent, who were nonfarm informal sector workers. In general, the education quality of labor improved from 26 to 32 percent in the secondary schooling (7-10 years of schooling), and from 5 to 20 percent for the tertiary schooling (more than 10 years of schooling). The average schooling of household head was 5.3 years.

The study found out the determinants of household income by using Ordinary Least Square OLS method separately for land owner farmers and landless households, embracing with the differences in coefficients between 1996 and 2012. It revealed that first, the market returns to land increased showing that an additional 1 hectare of land increased the agricultural income of farmer households by $ 402.61 in 1996 and by $ 1410.19 in 2012 (Jonna P. et.al. 2012, Table 3.7. p.67). Second, the availability of irrigation raised agricultural income since irrigation expansion induced the adoption of Modern Variety. Third, an additional working age member increased the agricultural income by the same amount for land owner farmers and the landless households.

Fourth, the secondary and tertiary schooling significantly raised nonfarm income, particularly of tertiary education increasingly overtime. Fifth, the coefficient of gender was not significant implying the absence of significant gender discrimination in the labor market. Sixth, nonfarm income of landless households in 2012 was significantly greater in rain-fed and irrigated areas than the deep-water area. Finally, the irrigated lower terrace area had the higher agricultural income in 2012 than the other villages because of the market access for commercial fish production. The study did not measure the causes of poverty of the area in 2012.

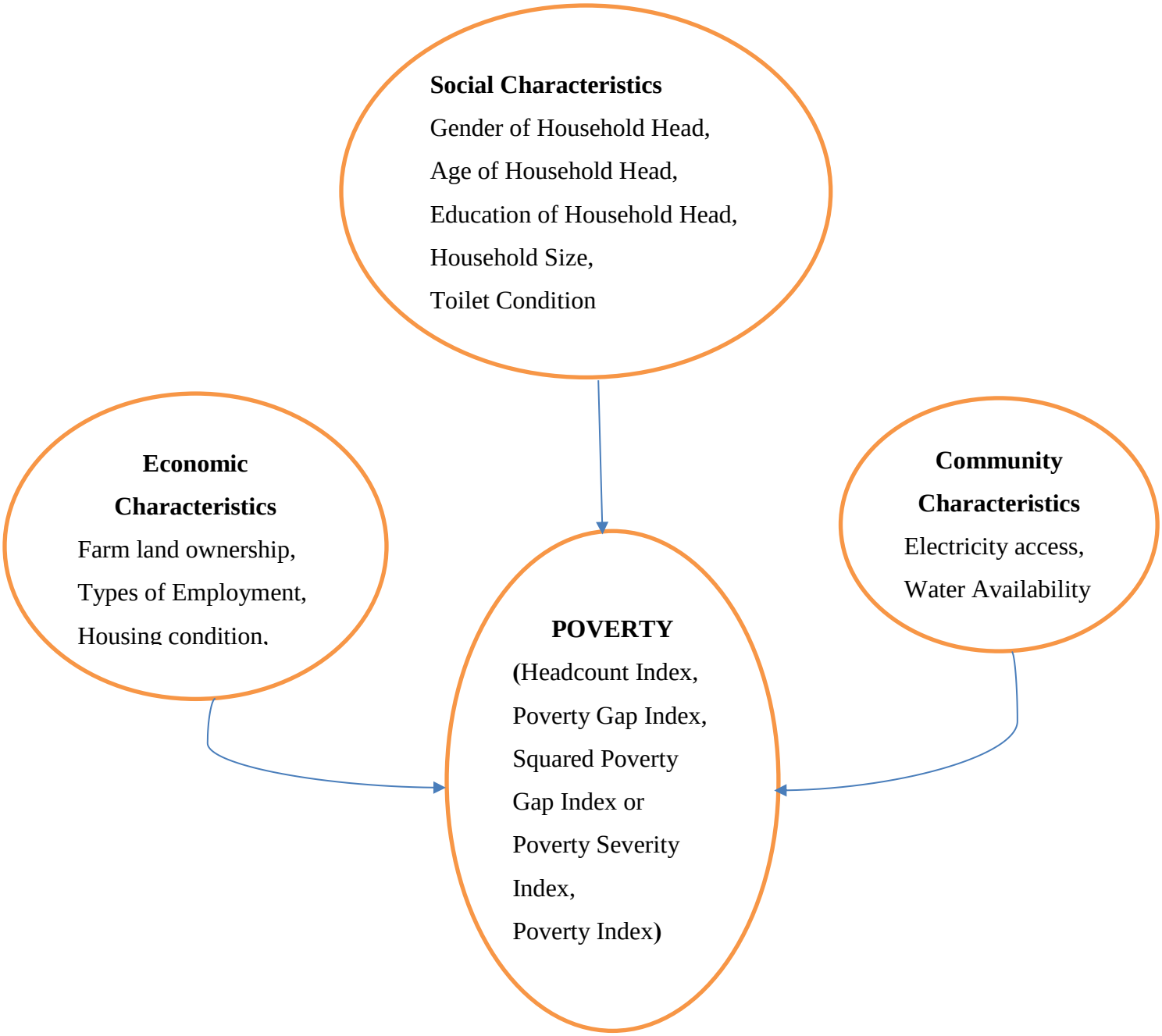
Based on the studies done by domestic and international researchers, the poverty and causes of poverty is reviewed as an issue of country-based evidence, which is caused by not only household characteristics, but also by community characteristics.

2.6 Framework for the Analysis

Data on household consumption expenditure in the rural area of Maubin District is employed to identify the poverty status that is below the poverty line. Poverty line of the study area in 2018 is determined by the minimum consumption expenditure at 1551 Kyats per capita a day. Households whose consumption expenditure is below the poverty line level are considered as the poor while those of above the poverty line are regarded as the non-poor. Poverty of the study area is provided by the measure of Headcount Index, Poverty Gap Index, Squared Poverty Gap Index or Poverty Severity Index and Poverty Index.

After realizing that there is a poverty status in the study area, an analysis starts to examine the factors that create poverty or the causes of poverty. There are some determinants of poverty. In the study, factors or characteristics, namely social characteristics, economic characteristics, and the community characteristics are used to analyze whether these characteristics affect to the poverty or not. Binary Logistic Regression model is applied for the analysis of causes of poverty. In the analysis, dependent variable is regarded as the poverty status. Poverty status is determined by per capita consumption expenditure. Independent variables are classified as social characteristics, economic characteristics and the community characteristics. The framework for the analysis is shown in Figure 2.2.

Figure (2.2) Framework for the Analysis



Source: Own Compilation

In order to analyze the poverty status of the study area, the proportion of households who are poor to the total population is measured as the headcount index. Poverty gap index is required to measure in order to determine the depth of poverty, which shows the percent of poverty line consumption level that is needed for budget allocation. In terms of severity of poverty, the squared poverty gap index that shows the poorest rate is measured. With the consideration of equal income distribution, the proportion of population required to reach above the poverty line consumption level is also identified by the measure of poverty index. Share of consumption expenditure of households is necessarily observed in order to know how much of total consumption is evenly distributed or not. Each quantile of population to total consumption expenditure shows that the proportion of households in which percentage of total consumption expenditure is distributed. Therefore, Gini coefficient for the identification of income inequality is necessarily measured.

In addition, the study analyzes the causes of poverty, in which factors create poverty. Binary Logistic Regression model is used to examine whether social characteristics namely household size, sex, age, education of household head and toilet condition; economic characteristics such as farm land ownership, types of employment, housing condition; and community characteristics consisting of water availability and electricity access effect on poverty or not in this study.

CHAPTER III
POVERTY IN MYANMAR AND AYEYARWADY REGION AND BACKGOUND SITUATION OF MAUBIN DISTRICT

The Republic of the Union of Myanmar is one of the poorest countries in Southeast Asia. Gross Domestic Product value at constant price is (63827918.6) Kyat million and GDP at current price is (90450949.1) Kyat million with its growth rate of 6.8 percent in 2017-2018 in Myanmar. Per capita GDP is (1694219) Kyats or US$ 1129.47 in the fiscal year 2017-2018. Once per capita GDP represents to the standard of living of individual household members, it is intended to increase US$ 3000 by 2020 by setting the plan target of the National Economic Plan (Planning Department, 2018). On the one hand, Myanmar is striking to meet with the target of SDGs by 2030. One of the targets of SDGs, which is zero hanger or poverty that must be met by 2030, is the national concern in Myanmar. Therefore, poverty status in Myanmar is required to learn as the background history of the analysis for tackling the challenge of poverty or zero hanger.

3.1 Poverty in Myanmar

In Myanmar, there are three sources of studies on poverty analysis that are conducted by the government public sector. An analysis of poverty is started by the Planning Department for the Ministry of National Planning and Economic Development under the Central Government of Myanmar in 2005 and 2010. Poverty status is identified in the study of the Integrated Household Living Condition Assessment of the IHLCA Project Technical Unit jointly done by the Ministry of National Planning and Economic Development and UNDP. Both of the money measured poverty line and the food poverty line are used in order to determine poverty in Myanmar. They conducted the study on 18660 sample households of both urban and rural areas of Myanmar in 2005 and 2010. Moreover, the World Bank Group and the Ministry of Planning and Finance conducted an analysis of poverty in Myanmar with multiple imputation technique adopted a Standard Imputation Approach and used data

on IHLCA-I, IHLCA-II and Myanmar Poverty and Living Conditions Survey (MPLCS) data in order to attribute the household expenditure backwards and forwards (World Bank Group and the Ministry of Planning and Finance, 2017). For the identification of poverty status, the poverty line was determined to establish the minimum consumption expenditure level at 445 Kyats per capita a day in 2005 and 1031 Kyats per capita a day in 2010 (IHLCA Project Technical Unit, 2011). Then, poverty line was determined at 1241 Kyats per capita a day in 2015 with equivalent consumption expenditures. In addition, Myanmar Living Condition Survey Assessment of the poverty report was done by the joint members of the Central Statistical Organization and UNDP during the period from 2016 to 2017 on 13,730 households of various States and Regions (Central Statistical Organization and World Bank Group, 2019). The poverty line was determined to set the minimum consumption expenditure level at 1590 Kyats per adult a day in 2017 (Central Statistical Organization and UNDP, 2019).

According to the latest study currently done by the Central Statistical Organization and UNDP (2019), poverty rate was 48.2 percent in 2005, 42.4 percent in 2010, and 32.1 percent in 2015. It used the imputation method with the price at on the first quarter of 2017 (Central Statistical Organization and UNDP, 2019). Poverty rate in 2017 was 24.8 percent at the union level, 11.3 percent in the urban area and 30.2 percent in the rural area. The different poverty rates based on the different benchmark data of poverty line consumption expenditure level are shown in Table 3.1 and Table 3.2.

Table (3.1) The Comparison of Poverty Rate Estimation

Sources	Estimated Poverty Rate		
	2005	2010	2015
IHLCA Technical Unit, 2011 used Methodology (2004-2005)	32.1 %	25.6%	19.4%
World Bank Group and Ministry of Planning and Finance, 2017 used Methodology (2009-2010)	44.5 %	37.5 %	26.1 %
Central Statistical Organization and World Bank Group, 2019	48.2 %	42.4 %	32.1 %

Source: (1) IHLCA Project Technical Unit (2011)

(2) World Bank Group and Ministry of Planning and Finance (2017)

(3) Central Statistical Organization and World Bank Group (2019)

Table (3.2) Poverty Estimates with Different Methodologies

Poverty Index	IHLCA, 2011 used Methodology (2004-2005)			World Bank Group, 2017 used Methodology (2009-2010)		
	2005	2010	2015	2005	2010	2015
Estimated Poverty Rate	32.1%	25.6%	19.4%	44.5%	37.5%	26.1%
Poverty Gap	6.4%	4.1%	3%	11.1%	8.5%	5.8%
Poverty Gap Squared	1.9%	1.1%	0.7%	3.9%	2.8%	1.9%
Near Poor (Poverty Line)	51.8%	47.2%	37.4%	61.2%	54.7%	40.1%

Source: (1) IHLCA Project Technical Unit (2011)

(2) World Bank Group and Ministry of Planning and Finance (2017)

As shown in Table (3.2), poverty rate for the same study period was different because of the various methodologies the researchers used. Different methodologies mean that IHLCA Project Technical Unit used the base year of 2004-2005 IHLCA survey data and poverty line benchmark data, and studied for the periods of 2005, 2010 and 2015. World Bank Group and the Ministry of Planning and Finance used the base year 2009-2010 IHLCA survey data result and the poverty line benchmark data, and studied the same periods of 2005, 2010 and 2015. The Central Statistical Organization

and World Bank Group used the different poverty line benchmark data for the same study periods. They considered the different dimensions of input consideration. Moreover, it used the imputation method with the price at on the first quarter of 2017. However, they did not study the poverty gap index, poverty gap squared index and the near poverty fraction (Central Statistical Organization and World Bank Group, 2019).

Though these studies analyzed the poverty rate by using the different benchmark data methodologies with poverty line and different base year data, the trend of poverty was found declining from 2005 to 2015. Also, these studies showed that poverty rate, poverty gap index and poverty gap squared index declined from 2010 to 2015, describing that living condition improved. Although the living conditions of the poor were improving during these periods, there were many people who were living at the near-poor level of the designated poverty line consumption level (World Bank Group and Ministry of Planning and Finance, 2017). The near poor fraction was declining from 51.8 percent in 2005 to 37.4 percent in 2015 in terms of 2004-2005 poverty line-based data. With methodology based on 2009-2010 poverty line, it declined from 61.2 percent in 2005 to 40.1 percent in 2015. Though the near poor fraction was improving, it showed that the vulnerability of poverty was substantial (World Bank Group and Ministry of Planning and Finance, 2017).

Even though the different benchmark data was used, all reports showed that the poverty rate declined, meaning that there was an improvement well beings of the Myanmar people from 2005, 2010 to 2015. However, it is interpreted that the rate is not met with the target of MDGs that is set to be fulfilled by 2015 in Myanmar for which the target in 2015 is set to halve the poverty rate that exists in 2005.

Though the poverty rate is declining and different, depending on the poverty line determination deflated with inflation rate, it is clearly interpreted that the magnitude of poverty is greater than the previous studies. The estimated poverty rates done by the IHLCA Project Technical Unit are lower than those done by World Bank Group and Ministry of Planning and Finance in the same study periods because the researchers from World Bank Group and Ministry of Planning and Finance use the poverty line benchmark data of 2017, which is larger than those of other sources. It is concluded that there is a weak point of organizations in which the same methodology should be used for the study of poverty situation of Myanmar in order to learn the real situation of poverty in the same study area. In addition, the identification of the minimum consumption level in order to determine the poverty line should be based on the level

of international poverty line that is pegged at 1.25 per capita a day. The standardized consumption expenditure level to determine the poverty line is set for a poverty analysis, depending on the type of poverty purposely. The minimum consumption level for the determination of poverty line is set at US$ 1.25 for the study of extreme poverty, and it is regarded as the international poverty line. Poverty line is determined at US$ 1.9 for the analysis of poverty in the developed countries, and it is determined at US$ 2 for the study of moderate poverty (Jolliffe, D. & Prydz, B.E., 2016). The above mentioned three sources of poverty analysis did not follow the standard for the determination of the international poverty line. Therefore, it is difficult to evaluate the real poverty status that happened on the ground.

IHLCA Project Technical Unit has done the analysis of poverty dynamics in Myanmar in 2010 (IHLCA Project Technical Unit, 2011), but other two studies have not focused on the analysis of poverty dynamics. Poverty Dynamics is regarded as the changes in the poverty status of individual households over time. Some population flow into poverty while some people flow out of poverty, for which they are reviewed as four situations of poverty, namely entry into poverty, escape from poverty, chronic poverty and non-poor. Households who remain poor are referred to as chronically poor, while those who escape from or enter in poverty are called transitory poor, and some are non-poor. It was found that 28 percent of households in Myanmar were in the position of transitory poverty and 10 percent of households was chronic poor in 2010 (IHLCA Project Technical Unit, 2011).

IHLCA Project Technical Unit (2011) revealed that happening disasters, including storms, floods, and gutted by fires forced the households' entries into poverty, while the chronic poverty was mainly affected by droughts. A high economic dependency ratio of household, which was one of the demographic characteristics, was the root cause of poverty. The variable of economic dependency ratio of households was more closely related to the entries into poverty than chronic poverty. It also showed that an inability to work or loss of work was closely associated with entries of poverty. However, households with smaller household size could escape from poverty rather than those with larger household size. Living daily earning for such respective activities of informal sector workers, such as construction wage workers, vendors, and casual labors were caught into the poverty trap for a long time, creating to the chronic poverty. The main economic activities of households, who escaped from poverty, were

associated with manufacturing and other industrial classification, trading, some owners of groceries and stores, and self-employing services.

Some small-scale land size owner farmers flowed into the entries of poverty as they accidentally lost their land plots, and had the larger dependency burden. Landless farmers were more likely associated with the chronic poverty since they did not have the sufficient capital for farming. Regarding the land ownership situation, the chronic poor households were landless farmers. Some households, who entered into poverty, were small size land owners but the number of land owners is small (IHLCA Project Technical Unit, 2011). Therefore, land ownership and farm land size are correlated with the escape from poverty, meaning that landlessness is one of the important causes of poverty, which hinder the individual income generation in the study area of Myanmar.

Housing, water supply, sanitation and electricity also mainly created the chronic poverty as they indirectly affect to the poor living standard. There is no clear relationship between health and nutritional indicators and the individual poverty level because health related shocks are not major causes of impoverishment in Myanmar. Literacy and net enrolment rate in basic education are correlated with escapes from poverty. Inability to work and unskilled labor are closely related with individual education level and human resource development programme by the government (IHLCA Project Technical Unit, 2011).

It is interpreted that landless rate is increasing, and it is found that an inability of work or loss of work, larger family size than 5 members, economic dependency ratio, market inefficiency in trading, low level of education, low pay wage causal workers, underdevelopment of infrastructure, disaster of climate change, shortage of water supply, and electricity access are closely and significantly correlated with the entry of poverty. Among these factors, low pay wage causal workers, landless and the shortage of water supply, and electricity access are evaluated as the factors of chronic poverty in Myanmar.

3.2 Poverty Characteristics in Myanmar

IHLCA Project Technical Unit (2011) showed that there were some differences in poverty characteristics of not only between the poor and non-poor but also between in rural areas and urban areas. Poverty characteristics are found as follows:

(1) Household size; poor households have the larger household size than non-poor at (6 vs 4). It is not much different between rural and urban areas.

(2) Economic dependency ratio[3]; poverty occurs due to the low returns of economic activities.

(3) Agriculture works; 54 percent of the poor household members are working as agricultural work labors, but 49 percent of non-poor household members are generating their income as agricultural labors.

(4) Casual labor; 28 percent of poor household members are engaged in the casual works in rural areas, so that low-wage earners are increasing in the informal sector.

(5) Landlessness; Poor households have the smaller farm size at 4.4 acres, which is less than the average farm size of the international standard of South-East Asian countries at 6.7 acres than non-poor households at 7.3 acres. The highest rate of landlessness is found at 41 percent in Bago, while the landless rate is 39 percent in Yangon and 33 percent in Ayeyarwady region respectively.

(6) Child labor force participation rate; child labor force participation rate of the poor, whose age are from 10 to 14, is 18 percent vs 10 percent of non-poor. It created the lower enrolment rate of the schooling of poor children than non-poor children. The labor force participation rate of the poor for 15 years and above was 67.1 percent in 2005 and 69.1 percent in 2010, representing the improvement in employment of the poor.

(7) Unemployment; The unemployment rate of the poor family is 2.4 percent, which is higher than that of non-poor at 1.4 percent.

(8) Employment; The influence of the informal sector low wage workforce is very large at 73 percent of the total labor force. The low skilled casual laborers are 18 percent, and the unpaid family workers are 15 percent of total employment. They are largely concentrated in the rural areas.

3 Economic dependency ratio is the proportion of the numbers of unemployed household members to the employed members

(9) Quality of roofing; In terms of quality roofing, 32 percent of the poor could use for their housing of quality roofing, which is lower than that of non-poor at 59 percent. It is at 39 percent in the Ayeyarwady region.

(10) Drinking water; There are differences in the access between the poor and the non-poor at (62 percent vs 72 percent) while that of (65 percent vs 81 percent) is found in rural and urban areas. It is lower at 45 percent in the Ayeyarwady region.

(11) Electricity; There are large differences in the access of electricity between the poor and the noon poor at (28 percent vs 55 percent) while that of (34 percent vs 89 percent) is found in the rural and urban. It is at 30 percent in the Ayeyarwady region.

(12) Malnutrition; The rate of malnutrition is 35 percent of the poor and 30.6 percent of the non-poor when that of 33.7 percent and 25.5 percent is found in the rural and the urban respectively.

(13) Education; In terms of the net secondary enrolment rate, there are large differences between the poor and the non-poor at (35 percent vs 59 percent), while they are 47 percent and 75 percent in the rural and the urban respectively. Regarding the educational attainment, the proportion of poor household heads who completed the middle schooling or higher schooling is 22 percent, which is lower than that of the non-poor, 40 percent. The rate of the households who have completed the primary education or less is 75 percent compared with 37 percent of the urban residents. Due to the education expenditure, the ratio of education expenditure to total spending of the poor is 1.2 percent, which is lower than that of the non-poor, 1.8 percent.

Researchers from the IHLCA Technical Unit, and World Bank Group and Ministry of Planning and Finance have analyzed the household characteristics, and the condition of public utility access. Household characteristics with respect to poor and non-poor status of households, such as household size, demographic dependency ratio and female headed household, are reviewed for the year 2005, 2010 and 2015. These are shown in Table 3.3.

Table (3.3) Household Characteristics

Sr.	Characteristics	Year	Poverty Status		Region		Union Level
			Poor	Non Poor	Urban	Rural	
1.	Household Size (Members)	2005	6.1	4.9	5.1	5.2	5.2
		2010	6	4.7	4.9	5	5.2
		2015	5.3	4	4.2	4.3	4.3
2.	Demographic Dependency ratio (%)	2005	62	56	48	61	58
		2010	56	52	46	56	53
		2015	67.6	46.6	44.5	54.2	51.3
3.	Female Headed Households (%)	2005	18.3	19.1	25.1	16.7	18.9
		2010	18.5	21.5	26.7	18.7	20.8
		2015	19.4	21.5	23.4	20.1	21.1

Source: (1) IHLCA Project Technical Unit (2011)

(2) World Bank Group and Ministry of Planning and Finance (2017)

According to Table (3.3), a comparison study for the year 2005, 2010 and 2015 showed that the family size of poor households became smaller from 2005, 2010 to 2015. Demographic dependency ratio that reached to the poor was better from 2005 to 2010, but it became worse from 2010 to 2015, meaning that the number of poor household members, whose age was below 16 years and above 60 years became larger in 2015 than that of 2010. Also, the ratio of female headed households who were poor became larger in 2015 than that of 2010.

World Bank Group and Ministry of Planning and Finance (2017) applied the multiple regression model in order to focus on how household characteristics were related to poverty status in terms of household consumption expenditure, what the compositions of consumption structure were different among poor and non-poor. It showed that demographic structure of a household was closely associated with poverty. Spending on food, cooking fuel, clothing and soap account for nearly 80 percent of the expenditures of the bottom quintile of population. Consumption basket of the majority of population was dominated by their survival. Poorer and rural households had the higher dependency ratio, and it was strongly correlated with education rather than household size, location, and age of the household heads. There was no significant relationship between gender of household head and poverty. Poverty was associated

with lower level of education of household head, meaning that household heads who had lower level of education were likely to be poor.

The result of the multiple regression model showed that there was an effect of education, health, infrastructure facilities of public utilities, productive and financial assets on the household consumption and income level (World Bank Group and Ministry of Planning and Finance, 2017). Education of the household heads was positively related to their total spending expenditure. There was a positive relationship between higher level of education and total consumption expenditure for their living including education and health services in urban area than in rural area. However, Secondary education and higher education level were closely related to the higher living standards in both urban and rural areas. Dropout ratio was also calculated in the study. The dropout ratio of all children aged from 13 to 18 who stopped schooling before completing the primary education was 14 percent, and that of lower secondary schooling was 17 percent. For health care, the average spending expenditure for health care service was 6 percent of total household spending, and that of the poor households is about 5.8 percent. Therefore, the spending for health care service is not much different between the average spending and the spending by the poor.

Regarding the productive assets, though land was the most important factor of production, the poor were less likely to own land for the agricultural production in the rural areas. Job diversification of poor households was mainly concentrated on the informal sector economic activities, which are low wage works.

Regarding the condition of public utility services, only 32.5 percent of population got the electricity access with the public grid and 10.6 percent of people were using electricity from the source of private grid, while 40.6 percent were from household preparation systems of various energy sources, but 16.3 percent of population had no electricity access. In the rural areas, 21.7 percent of population could not get electricity access from any source while 12.6 percent of population got public grid, and 12.8 percent got from the private grid. The proportion 52.9 percent of population were getting electricity power from other sources. Accordingly, neither 56.8 percent of population at the union level nor 74.6 percent of population in rural areas could not have the chance to use electricity for the productive purpose.

There were various accesses to safe drinking water source across the country, and also the access of safe drinking water depended on the weather and geographical areas. 85 percent of urban households got access the safe drinking water, while 62 percent of

rural households and 45 percent of dry zones got access the safe drinking water by means of tube and purified water bottle. A half of the population in the Coastal areas, which was the lowest rate to access the safe drinking water, relied upon the source of river, dam and lakes a year-round.

An access to the improved sanitation facilities was also an important measure to represent the living standard and health condition. The study done by World Bank Group and Ministry of Planning and Finance showed that 25 percent of households in rural areas had the lack of access to the luxurious toilet facilities, and 16 percent of rural households had no fly proof toilet. In the Coastal areas, 37 percent of households were using open space without access to any toilet facility, and it is three times more than that of the national level.

Findings of the report jointly done by World Bank Group and the Ministry of Planning and Finance (2017) are as follows:

(1) The expenditure growth of urban areas is faster than that of rural area.

(2) Supporting to be stronger growth in farms and villages is very important for reducing poverty and inequality.

(3) The decline trends in both the poverty gap index showing the depth of poverty, and the poverty gap squared index defining the severity of poverty imply a welfare improvement of people during these study periods.

(4) The status of poor and non-poor households is distinguished by the demographic household characteristics, such as the numbers of dependent family members, ages, education of household heads, and the asset ownership.

(5) Though there is a high degree of income diversification in Myanmar, the poorer households are more solely engaged in agriculture with small plots of land and limited irrigation, and engaged in casual labor activities.

(6) The poorer households are worse off as they have less property ownership, making constraints for getting credits and market competition.

(7) The poor, especially in the rural areas are suffering from the insufficient public utilities, such as less access of electricity grid line, inadequate infrastructure, less clean water and health services.

(8) Poverty is caused by many deprivations, such as health related difficulties resulted from high cost of health care, and the high transaction cost for

accessing the resources that hinder the well beings of the poor. This relationship can be seen as the effect of cycle of poverty.

(9) Some unanticipated shocks, namely natural disaster, crop failure, imperfect market price condition, and health risk vulnerability, create poverty because these shocks reduce the economic growth.

(10) An indebtedness issue makes households poor. A fifth of all households in Myanmar is likely to be heavily indebted, resulting from taking out a loan to cover basic food needs, rather than raising investment through saving.

Income inequality measure, Gini coefficient in rural area of Myanmar in 2015 was 28 percent while it was 36.6 percent in urban, and it was 31.7 percent at the National level. It means that unequal income distribution is found more likely to be happening in urban than in rural. There were some households, who were 25.9 percent at the top 10 percent quintile of population, meaning that 25.9 percent of households are allocated highest income 10 percent of total income. They are included in the first group of highest income earners. 3.5 percent of households was at the bottom quintile of population, describing that 3.5 percent of households are allocated the lowest income 10 percent of total income. It means that they are of the lowest income group earners. Measure of income inequality is shown in Table 3.4.

Table (3.4) Measure of Income Inequality and Distribution of Income

Country	Gini Coefficient	Income Distribution			
		Top 10 %	Top 20%	Bottom 10%	Bottom 20%
Myanmar (2015)	31.7%	25.9 %	40.2 %	3.5 %	8.4 %

Source: World Bank Group and Ministry of Planning and Finance (2017)

In many countries, the effect of economic growth on poverty reduction is considered and measured as the growth elasticity of poverty reduction. It is monitored to know how growth has effectively converted into poverty reduction. Total growth elasticity of poverty reduction shows the percentage change in poverty with respect to a percent change in economic growth. The negative value of growth elasticity of poverty reduction means that economic growth can contribute to the poverty reduction resulting in the decline in poverty. There is an inverse relationship between poverty

and economic growth. The situation of growth elasticity of poverty reduction is shown in Table 3.5.

Table (3.5) The Situation of Growth Elasticity of Poverty Reduction

Data Methodology	Year	National		Urban		Rural	
		Poverty	Elasticity	Poverty	Elasticity	Poverty	Elasticity
IHLCA (2011) based (2005)	2015	19.4	(-)2.8	9	(-)4.3	23.3	(-)2.7
	2005-2015	- (12.7)	(-)2.6	- (12.5)	(-)2.7	- (12.5)	(-)2.9
World Bank Group (2017) based (2010)	2015	26.1	(-)1.9	19.2	(-)2.1	28.8	(-)1.7
	2005-2015	- (18.4)	(-)1.3	- (23)	(-)1.3	- (16.6)	(-)1.4

Source: World Bank Group and Ministry of Planning and Finance (2017)

Regardless of the sign of the relationship, the greater value of total growth elasticity of poverty reduction is, the larger contribution to the poverty is reduced (Martin Ravallion, 1997). Across the countries, Myanmar's growth elasticity of poverty reduction was found below the average value of other countries (Heltberg Rasmus, 2002). The economic growth of Myanmar could contribute less apparently to alleviate poverty. According to the IHLCA survey result in 2011, growth elasticity of poverty reduction in Myanmar from 2005 to 2015 was 2.6 percent, meaning that 1 percent change in GDP could reduce 2.6 percent of poverty during the period between 2005 and 2015. World Bank Group and Ministry of Planning and Finance (2017) showed that it was 1.3 percent from 2005 to 2015, representing that poverty was reduced 1.3 percent by the 1 percent change of economic growth.

Above mentioned studies from three sources, such as IHLCA Project Technical Unit (2011), World Bank Group and Ministry of Planning and Finance (2017) and Central Statistical Organization and World Bank Group (2019) should focus on income elasticity together with its implication, determination on budget allocation for poverty reduction, calculation of the rate of poverty reduction and poverty index in Myanmar by using the consistent base year with same methodology and standardized international poverty line. IHLCA Project Technical Unit, and Central Statistical Organization and World Bank Group have conducted the analysis on poverty profile of Myanmar as a

whole, including all States and Regions. However, these studies did not focus on the policy analysis as the link among the income inequality, poverty index, and rate of poverty reduction. There is no study by the public sector in Myanmar to evaluate the poverty index, rate of poverty reduction and policy implication for poverty reduction.

In brief, based on the findings done by the above-mentioned studies, they are interpreted that some physical constraints, which include an insufficient infrastructure development of electricity access, transportation facilities, education and health care facilities, political constraints, and economic constraint of low productivity and less job opportunities, are challenging factors that create the existence of poverty in Myanmar. Hence, it is required for Myanmar to conduct further studies of the causes of poverty that hit to people's low living standard in the various regions and states of the country. This is the reason that Myanmar should proceed the poverty reduction plan as the prioritized action plan in the near future.

Therefore, findings from the previous studies in Myanmar show that there is a requirement to examine the causes of poverty in the various states and regions in order to propose an action for addressing the poverty challenges.

3.3 Poverty Profile of Ayeyarwady Region

IHLCA Project Technical Unit jointly participated by the Ministry of Planning and Economic Development and UNDP has conducted the integrated household living condition assessment survey for the period of 2005 and 2010 as a whole country, Myanmar. Ayeyarwady region is the delta area where is the closest place to Yangon, the main source of domestic commercial and international trading in Myanmar. However, the fourth largest poverty rate occurs in Ayeyarwady region during the period from 2005 to 2010 and 2017. Poverty profile in Ayeyarwady region was done by IHLCA Project Technical Unit for the study periods of 2005 and 2010. It is shown in Table 3.6.

Table (3-6) Poverty Profile and Characteristics of Ayeyarwady Region

Sr.	Poverty Profile and Characteristics	2005	2010
1.	Headcount Index (Rural)	30.3	34
2.	Poverty Gap Index (Rural)	0.06	0.6
3.	Squared Poverty Gap Index (Rural)	0.02	0.0143
4.	Poorest Quantile share in total consumption (%)	11.5	12.8
5.	Average HH Size	5.1	5.5
6.	Female headed households (%)	12.8	16.4
7.	Primary education level of HHH (%)	37.6	58.3
8.	Occupation Own account workers (%) Casual Worker (%)	 33.8 17.9	 Not Recorded Not Recorded
9.	landless rate (%)	32.6	50.4
10.	Access to Quality Roofing (%)	20.5	19
11.	Safe and Convenient Drinking Water (%)	30.1	41.5
12.	Fly Proof Toilet Use (Toilet Condition) No Fly Proof Toilet Use (%)	 73.8	 81.4
13.	Electricity Access (%) (Access includes provision from public, communal and private sources)	14.6 (13)	19.8

Source: IHLCA Project Technical Unit (2011)

According to Table (3.6), IHLCA survey data showed that poverty incidence or Headcount Index of Ayeyarwady region in 2005 was 30.3 percent and 34 percent in 2010, meaning that poverty increased from 2005 to 2010. No study of poverty profile in Ayeyarwady region for the year 2015 was conducted. However, World Bank Group and Ministry of Planning and Finance has done the Myanmar Living Conditions Survey in 2017 (World Bank Group and Ministry of Planning and Finance, 2019). It showed that Headcount Index of Ayeyarwady region in 2017 was 31.7 percent based on the poverty line at 1590 Kyats per adult a day; poverty gap was 6.3; squared poverty gap index was 1.9. It mentioned that the agro-zone level, the Coastal zone and the hills and mountainous zone had the highest poverty rates, such as 32 percent and 31 percent respectively. It pointed out that with about 1.8 million poor people, Ayeyarwady region

had the highest number of poor inhabitants. It was the second highest in Shan State and third largest in Sagaing region. World Bank Group and Ministry of Planning and Finance (2019) did not find out the causes of poverty in Ayeyarwady region in 2017.

IHLCA Project Technical Unit (2011) has found the characteristics of poverty in Ayeyarwady region. As shown in Table (3-6), the poorest quantile consumption shares to total consumption increased from 11.5 percent in 2005 to 12.8 percent in 2010. Per capita household consumption expenditure was worse from 2005 to 2010 by showing that poorest quantile consumption shares to total consumption expenditure increased. Average household size also increased from 5.1 to 5.5. It showed that it was a more populated place in 2010 than in 2005. It is required to create more and better job opportunities in order that all of the family members employ. The proportion of female headed households increased from 12.8 percent to 16.4 percent in 2010. It is necessary for females to have better jobs for the improvement of well beings. Primary education level of household heads was seen as a common situation, and it increased from 37.6 percent in 2005 to 58.3 percent in 2010. The numbers of more educated household heads become less than the numbers of household heads who complete the lower level of education from 2005 to 2010. The employment type of own account workers and the casual workers were common type of occupation in Ayeyarwady, resulting in the fact that 50.7 percent of the household heads were living as the low wage earners. Landless rate in 2005 was 32.6 percent, and it increased to 50.4 percent, describing that most of the agricultural farmers were doing as the wage workers in others' farms. The reason of landlessness is found that some farms near the rivers are land sliding and some farms are transformed into fishing pounds. Housing condition was reviewed as the access to quality roofing because of the contraction of household income. It declined from 20.5 percent in 2005 to 19 percent in 2010, showing that the living standard for the access of shelter was getting worse within 5 years in Ayeyarwady region. In order to assess the water availability, safe and convenient drinking water was reviewed as improved situation from 30.1 percent to 41.5 percent. It was found that 73.8 percent of households used fly proof toilet, and 26.2 percent of households were using no fly proof toilet in 2005. However, it was seen as the improved sanitation from 2005 to 2010 though 18.6 percent of households were still using the open space toilet that is not a type of fly proof toilet. Finally, the electricity access, which included access provision from public, communal and private sources in rural areas of Ayeyarwady region, was only 14.6 percent. It was ranked as 13^{th} worse region among 15 States and

Regions in Myanmar. However, it improved from 14.6 percent to 19.8 percent. The electricity access, which is the essential service, should be considered as the prioritized action in order to address the poverty challenge because electricity power is essential for generating the productive capacity that can carry out the improvement of income generation.

In order to address the poverty challenge, causes of poverty are main concern to be reviewed. Maubin District of Ayeyarwady region is also required to study the causes of poverty since it has to study the rationale features mentioned in the problem statement. On the one hand, one of the prerequisite situations is that Nyaung Don township in Maubin District has been facing with the high poverty rate and income inequality. Therefore, it is important to review the previous case study of Nyaung Don Township and the background situation of Maubin District.

3.4 Background Situation in Maubin District

There are four townships in Maubin District, namely Danuphyu Township, Maubin Township, Nyaungdon Township, and Pantanaw Township, with 235 village groups and 1648 villages situated there. Its total area is 1651.48 square miles. Maubin District lies between North Latitude 16 Degrees 30 Minutes and 17 Degrees 25 Minutes, and between East Longitude 95 Degrees 18 Minutes and 95 Degrees 55 Minutes. It is far only (50) Kilometers from Yangon.

There are 186751 households, 973948 persons, living in Maubin District, and the religion of household members is Buddhism. It has a tropical climate with monsoon seasons. Maubin District is a plain land, and is rich in streams. Maubin Township is at 1362 feet high above sea level. Among the population of Maubin district, the majority of people are Myanmar and Kayin nationals. A significant fact of Maubin District is the place of Commander-in-chief Maharbandoola's cemetery, and Monument statue is situated in Maubin district, Danuphyu Township.

3.4.1 Topography and Demography

Danuphyu Township

18 Quarters and 63 Village groups are constituted in Danuphyu Township. It is bordered with Htan Ta Pin and Taik Gyi Townships in the East, KyonPyaw Township in the West, Nyaung Don Township in the South and Za Lun Township in the North.

The total land area is 289.5 Sq-ft. Its topography is covered with the alluvial area at the above sea level of 28.05 feet. It is located between North Latitude 17 Degrees 22 Minutes and East Longitude 95 Degrees 27 Minutes.

Its demography shows that there are 44,803 households and 179,806 people, of which 12.2 percent is living in the urban area while 87.8 percent of total population is living in the 450 villages of 63 village tracks in the rural area. Its population growth rate is 1.1 percent. It consists of 16 wards, and 450 villages. The population density is 863/sq-mile. According to the administrative data in 2018, 69.4 percent of total population is being in the working aged group, who is above the eighteen years old, while 30.6 percent is accordingly the demographic dependent on them. Population with age and sex distribution in Danuphyu Township is shown in Appendix A.

Pantanaw Township

Pantanaw Township has been constituted with 4 Quarters, 52 Village tracks and 449 Villages. Its area is 498.52 Sq miles, and it is wide 17 miles from East to West with Nyaung Don Township in the East and Kyaung Kone Township in the West. Its length is wide 29 miles from South to North with Danuphyu Township in the North and Warkhema Township in the South. There is no hill in the Township. It has the fine weather with the highest and lowest temperature of 27.78 ˚C and 23.11 ˚C respectively.

There are totally 278,737 people living in the township, of which 92.7 percent of total populations are living their daily life in the village tracks, rural area, while the rest 7.3 percent is living in the 4 Quarters of urban area. The gender ratio shows that the accounted ratio of Male in the rural area is 49.81 percent and 48.77 percent in the urban area. The annual population growth rate 1.01 percent is estimated. Its population density is 592/sq-mile. 63.8 percent of the population is in the working age group, who are above 18 years old, while 36.2 percent of population represent to the demographic dependent persons.

Nyaung Don Township

Nyaung Don Township is situated in Maubin District, Ayeyarwady region, and has the area of 348.23 square miles or 222,868 acres with the coverage of 10 quarters and 44 village tracks. It is located about 50 Kilometers away from Yangon. 57.68 percent of total land area is being used for agricultural production as the net cultivated

land, the rest are streams, irrigation channels, ponds, residential areas, graveyards and pasture land.

Nyaung Don Township is in the Delta area. The weather is tropical monsoon climate and wetland at maximum temperature of 96 ̊C and minimum temperature of 60 ̊C. Nyaung Don is situated above the sea level of 20 inches. In additions to the government's effort to construct small and large dams, the installed pumping stations help farmers grow the agricultural production while some farms are being used for the rain fed plantation system. Ayeyarwady River, Panhlaing River, and Bawlie River are flowing around the township area.

According to the data in 2018, the population density is 739/sq-mile. Its population growth rate is 1.2 percent. 68 percent of the total population is working age group people, reflecting to the 32 percent of demographic dependent persons. 88.1 percent of the total population is living in the rural area, and 11.9 percent is living in the urban area.

Maubin Township

Maubin Township is situated between North Latitude 16 ̊ 30´ and 16 ̊ 57´, East Longitude 95 ̊ 24´. Its area is 515.38 square miles. It is situated above the sea level of 13.62 feet. Its border areas are Nyaung Don Township and Twuntay Township in the East, Warkhema Township in the West, Kyaiklat Township in the South and Pantanaw Township in the North. It has the advantage from rivers, which are useful and important flowing sources of the fresh water for drinking and agriculture. It is situated beside the Maubin Bridge, which is used for express transportation. There are slopes gradient grounds with alluvial soil in the township that are good for plantation.

Its population density is 771/sq-mile for total population of 314093 living in its 12 Quarters, 76 Village Groups, comprising 442 Villages. The population growth rate is 1.02 percent. 87.2 percent of the total population is living in the rural area, while 12.8 percent is living in the urban area. 64.7 percent of the population is working age group people, and 35.3 percent is demographically dependent on the working age people. Population in age and sex distribution in Nyaung Don Township and Maubin Township are summarized as shown in Appendix A.

In Maubin District, the population growth rate is not much different with each other in four townships. The overall population growth rate in Maubin District is 1 percent a year, and the average population density is about 600 per square mile, showing

that 600 people are living in a square mile there. Demographic distribution in Maubin District is shown in Table 3.7.

Table (3.7) Demographic Distribution in Maubin District

Township	Total Population	Density (Per sq mile)	Growth Rate (%)
Maubin	314093	771	1.02
Pantanaw	278737	592	1.01
Nyaung Don	215906	739	1.2
Danuphyu	179,806	863	1.1
Total	**988542**	**599**	**1.1**

Source: General Administration Department, Maubin District (2018)

Maubin District is a populated place for their living so it is necessary to study the cause and effect of family size to the standard of living and income generation.

3.4.2 Basic Economic Situation

The benchmark data is required to know how the basic economic situation is being provided by the individual household income generation.

Danuphyu Township

Per capita income increased from 913 Thousand Kyats in 2016-2017 to 995 Thousand Kyats in 2017-2018. Gross Domestic Product at constant price decreased from 140 Thousand Kyat Millions in 2015-2016 to 136 Thousand Kyat Millions in 2016-2017 at the growth rate of (-3.5) percent, and increased to 143 Thousand Kyat Millions in 2017-2018. 75.8 percent of total arable land is used for cultivation, and 89 percent of it is farm land while the rest 11 percent is garden land cultivation according to the administrative records of Agriculture Department in 2014-2015. Irrigated cultivation is benefited from 2 sluice gates of each reservoir small dams with the length of 18/5 miles and 15/0 miles.

The principal sources of people living are Agriculture, and livestock breeding and fishing. Farmers of Danuphyu Township are getting the favorable surplus in the production of Rice, Pulses, Fish paste, Dried fish, and Mat, so that they can enjoy with sales commodities by doing their owned business. There are some famous primary

product factories of food, such as Rice mill, Oil mill, Sticky candy firms, and firms of small scale agricultural machinery.

Agriculture is the major source of household income generation while the second largest source is the living with Open Fishing, Fishery Firms, and Livestock Breeding. Small scale firm production is the third largest source of income generation. There are eight kinds of associations, such as Rice Mill Owners' Association, Small and Median Enterprises Owners' Association, Pulses and Sesame Traders' Association, Rice Firm Owners' Association, Rice Traders 'Association, Pulses and Beans Qualified Company, Rice Qualified Company, and Fuel Trading. A Wholesale center was established in 2015-2016.

Industrial development is described as (148) firms for local consumption, (1) construction material firm, (4) businesses for consumer goods, (1) firm of crude oil and gas mineral, (1) electronic and (21) general work firms.

Some service sector businesses, such as (10) General Clinics, (1) Traditional Clinic, (15) Private Tuitions, (7) Battery Charging Business, (19) Hairdressing and Beauty Saloon, (70) Trishaw Leasehold Service, (4) Computer Copy Service and (5) Fuel Pumps are contributing to the regional income generation.

As the financial sector development, Two State Owned Banks, such as Myamma Economic Bank, and Myanma Agriculture Development Bank, and Three Private Banks, such as CB bank, AYA bank, and Kanbawza Bank are providing their services for regional economic growth. On the other hand, MADB Myanmar Agriculture Development Bank and some Microfinance Associations are the sources for the access of finance in generating the businesses.

Pantanaw Township

Per capita income of Pantanaw Township is 1,002 Thousand Kyats in 2016-2017 and it increased to 1,083 Thousand Kyats in 2017-2018. Gross Domestic Product at constant price decreased from 220 Thousand Kyat Millions in 2015-2016 to 219 Thousand Kyat Millions in 2016-2017 at the growth rate of (-0.4) percent, and increased to 228 Thousand Kyat Millions in 2017-2018. The net arable land is 72.31 percent of total land area, of which 74.02 percent of the net arable land is Farm land, and 25.98 percent is for Garden plantation.

The main source of the economy is running for the production of rice, fishery products and reed mat. Using the high yielding variety of RS seeds has been effective

for the household income generation. As the Township is situated at the favorable spatial location of the 51 miles distance from Yangon, the regional trade is much facilitated to the Gateway of internal and external trade and good communication. The regional government is providing the quality seeds (RS), one Basket per acre for (503) Acres in 2014-2015. Breeding and consuming the carnivorous poultry farms are increased by the raw material support of CP Company, and credit provision of the regional livestock and agriculture development banks. Pork production is also famous business for their living and is increasing with the provision of pig origin and credit. Fishery products are breeding in the (299) natural ponds for 13555 Acres of (301) business men, resulting in the increase in (23) dried fish producers.

Regarding the industrial development, there are the large-scale Rice Mills, Small Rice Mills, Oil Mills, Wood and Timber cutting mills, Fertilizer product mill, firm for agricultural machinery, Ice Mill and other small businesses for raw materials, but their weakness of technology and technical skills prevent from the efficiency for quality assurance.

Nyaung Don Township

Per capita income for Nyaung Don Township is 1,296 Thousand Kyats in 2016-2017 and it increased to 1,442 Thousand Kyats in 2017-2018. Gross Domestic Product at constant price decreased from 220 Thousand Kyat Millions in 2015-2016 to 218 Thousand Kyat Millions in 2016-2017 at the growth rate of (-1) percent, and increased to 228 Thousand Kyat Millions in 2017-2018. The main economic activity is a paddy crop cultivation in the field of 109584 acres in 2015. Fishing is the second important source of deep water areas of village groups, and there are 1212 fishing businesses in 25882.25 acres. Farming and agricultural works are primarily running for other crop production, such as pulses, maize, chili, tomato, groundnut, black gram, betel leaf, sugar cane, coconut, cucumber, fuel wood, and secondary source of livestock breeding, such as pigs, cattle, ducks, chickens, poultry, eggs, open fishing and fish pond. In the Ayeyarwady region, Nyaung Don Township is a significant place representing the diversity of the ecosystems, where indicate the different types of land, such as irrigated land area, upper and lower terrace area, rain fed land area and deep-water area. Nyaung Don Township has a location advantage because households can get jobs in factories and government organization located in Yangon.

There are (154) firms for consumption, (7) construction material firms, (1) firm of crude oil and gas mineral, (9) general work firms and (1) agricultural machinery and parts business.

Maubin Township

Per capita income of Maubin Township is 1,644 Thousand Kyats in 2016-2017 and it increased to 1,836 Thousand Kyats in 2017-2018. Gross Domestic Product at constant price increased from 392 Thousand Kyat Millions in 2015-2016 to 405 Thousand Kyat Millions in 2016-2017 and 431 Thousand Kyat Millions in 2017-2018. The net arable land is 12879 acres, 3.9 percent of total land area, of which Farm land is 52.3 percent of the net arable land, 47.6 percent is for Garden plantation, and 0.01 percent is for Dhani plantation. 23.23 percent of total land area is backwater area that is not useful for any cultivation, 3.1 percent is a creek and ponds in the fishery farming area, 2.8 percent is the area of dam and weir for irrigation. Mechanized Farming is being developed with the hire use both of private owned and public owned agricultural machines. Income source classification of agriculture production, livestock breeding and fishery production, informal sector jobs, services, domestic and international migrant workers, and government public staff contribute to the regional income generation. Fishing firms are famous professions, contributing the maximum percentage to GDP in Maubin Township, in which 10805 fishery enterprises are working in 146 natural fishing ponds of 38894 Acres.

Apart from these businesses, small and medium scale industries, such as (242) Rice mills, (14) Oil mills, (3) Purified Water Factories, (1) Clothing business, (4) Pondering Mills, (1) Ice Making Factory, (6) Lathe firms, (6) Candle making firms and (7) Noddle Factories, are also contributing to GDP as the third source of income generation. The specific crude oil enterprise is running a business in (15) Oil Wells of South Maubin Oil Land, producing average (16,000) drums of crude oil a day.

Gross Domestic Product in Pantanaw Township, Nyaung Don Township and Danuphyu Township decreased between the period from 2015-16 to 2016-2017. The economic situation of Maubin Township is the best among four townships in the District. It is shown in Appendix B.

The overall economy in Maubin District is accounted as an increase in Gross Domestic Product from 979,101.6 Kyat Millions to 1,030,820.3 Kyat Millions. The

growth rate of GDP was fluctuated during the period from 2015 to 2018. Consequently, the economic status was not stable for the sustainable growth of household income generation. It is necessary to study the factors that raise the stable household income generation for the economic growth of the study area.

Productivity in economic sectors of Agricultural Sector, Industrial Sector and Service Sector contributes to the regional income generation that is the accumulation of productivity generating in Townships and Districts level. Therefore, the magnitude of productivity of economic sectors is important to become a greater share of Gross Domestic Product in the region. In each township, the share of Agricultural Sector to GDP is increasing while these of Industrial Sector and Service Sector are fluctuating. GDP, the growth rate of GDP and the share of main economic sectors to GDP during the period from 2014-2015 to 2017-2018 in the study area are shown in Table 3.8.

Table (3.8) states that the sectoral growth rates in three main economic sectors, such as the agricultural sector, industrial sector and the service sector are fluctuating during the period from 2014-2015 to 2017-2018. As shown in Appendix B, the growth of the agricultural sector in Maubin District is decreasing. However, it increased during the period from 2016-2017 to 2017-2018. It is found that the share of economic sectors in agriculture is declining from 58.1 percent in 2014-2015 to 53.2 percent in 2017-2018 while the share of industrial sector is increasing from 12.6 percent in 2014-2015 to 14.2 percent in 2017-2018, and the share of service sector is also increasing from 29.3 percent to 32.6 percent in 2017-2018.

According to Table (3.8), it shows that the agricultural sector development is the main stay of household living in Maubin District because more than a half of the share of GDP comes from the production of agricultural sector. Therefore, agriculture sector should be more emphasized to promote its productivity.

Table (3.8) GDP and Share of By Sector in Maubin District at (2000-2001) Constant Price (Kyats Million)

Sr.	GDP and Share of GDP by Sector	2014-2015	2015-2016	2016-2017	2017-2018
Maubin District GDP		**949104.7**	**973465.3**	**979101.6**	**1030820.3**
1	Agricultural Sector	551731.1	541554.4	535164.6	548540.3
	Share of Agriculture Sector in GDP	58.1	55.6	54.7	53.2
2	Industrial Sector	119414.8	133038.2	134022.6	146347.4
	Share of Industrial Sector in GDP	12.6	13.7	13.7	14.2
3	Service Sector	277958.8	298872.7	309914.4	335932.6
	Share of Service Sector in GDP	29.3	30.7	31.7	32.6

Source: Planning Department, Maubin District (2014-2018)

Even though the agriculture sector is the main stay of economic sector, the production of agricultural sector is fluctuated during the period from 2015 to 2018. They are not considered as the sufficient economic condition to both of the micro level and macro level economic growth because total production of agricultural sector has to be allocated for the consumption of 973948 household members living in Maubin District. Similarly, the share of industrial sector in GDP was also fluctuated and declined, and it contributed to the low share in GDP. In Maubin District, there was a smaller number of factories, and most of the firms were small scale firms. They also reflect to the low-income generation of households.

3.4.3 Education and Health Care Service

One of the factors for stimulating growth is knowledge, which plays an important role of public goods, and it is acting as intangible capital. Human capital development is the primary driver of growth (Romer, 1990). If individual education level interacts a vicious effect of rate of return on investment of the economy, it will create a country as the sign of a developing country. The same factors in advancing communities contribute to growth and well beings.

The improvement in higher schooling and education is investigated by looking at the physical indicators of education related concerns. Since Maubin Township is located beside the high way pave road, and it is the more urbanized area, the infrastructure development of Schools and Universities has improved. There are (1) Maubin University for Art and Science specialized students, (1) Technical University, (1) Computer Science University, and (1) Technical High School for higher education human resource development. Regarding the basic education, the numbers of Basic Primary Schools, Basic Middle School and Basic High are increasing in Pantanaw Township and Nyaung Don Township. The numbers of Basic High School and Basic Middle School have been increasing while of Basic Primary School is decreasing because of the upgrading the skills of school. There are (42) Basic High Schools, (74) Basic Middle Schools, and (910) Basic Primary Schools in Maubin District. In terms of reviewing the higher education status, Maubin University, Computer Science University, Technical University and Technical High School have been established only in Maubin Township of Maubin District since 2014. Maubin Township is a better place where supports for the development of education than other townships in the District. The numbers of primary schools, middle schools and high schools have been increased by the government supports after the periods of 1988 onwards.

There is no number of hospital typed as the 200 Bed Hospital in Danuphyu Township while other three townships have it. According to data shown in the Appendix-C, general expression of health care center and staff shows that the numbers of healthcare center and the numbers of healthcare staff are the smallest in Danuphyu Township, and the second less in Nyaung Don Township. In viewing the Doctor Patient Ratio, one Doctor is taking care to 458 Patients in Nyaung Don Township, 425 Patients in Danuphyu Township, 382 Patients in Pantanaw Township and 96 Patients in Maubin Township, showing that it is the less ratio of health care service to patients in Nyaung Don Township while the second less is in Danuphyu Township, and the third less is in Pantanaw Township.

Data of the numbers of schools and education indicators in Maubin District and the situation of health care service are shown in the Appendix-C.

According to data shown in the Appendix- C, the support in education service and health care service has been improving during the period from 2014 to 2018.

However, the response by the household heads and the authorized persons pointed out that there were some weaknesses in the development of education and

health care services among four townships in Maubin District during their schooling ages last three decades. The numbers of schools were not met with the standards for township and the district level for establishing the education centers and health care centers during the last three decades. The standard scheme for the establishment of school in each type of education level to be upgraded is identified that a primary school must be built if there are 100 students and above within (1) mile from one place to another. The standard is set for establishing a middle school if there are 200 students and above within (2) miles, and it is set for building a high school if there are 200 students and above within (10) miles.

The respondents of household heads and authorized persons expressed their idea that they gave up the completion of secondary and higher education schooling. Therefore, they couldn't get jobs for highly paid salaries. Since the provision of education and health services is important for the facilitation of household income generation in the study area, investment in education should be devoted to the improvement in future income generation.

3.4.4 Transportation

Transportation is one of the important factors in determining the economic growth. It can affect indirectly to the cost of living and directly to the household living standards. Economic growth is positively affected by the stock of infrastructure assets, and also income inequality declines with higher infrastructure quantity and quality. Infrastructure development can be highly effective to combat poverty. To the extent, the result of an increase in physical availability and quality of infrastructure, such as transportation means highlights the economic growth acceleration. Though the transportation in Maubin District cannot be viewed that it is perfect and sufficient, it can show the improvement in infrastructure development. Data of Transportation condition is shown in Appendix-D.

Types of road are seen as the classification of Pave Road, Road with Stone and Earth Road in the study area. It is found that the quality of roads and the length of roads have been improving and developing in Maubin District from 2014-2015 to 2017-2018 since the numbers of Pave Road are increasing. According to the data shown in the Appendix-D, infrastructure on transportation has been developing.

The length of Pave Road is the shortest in Danuphyu Township while it is the longest in the Maubin Township. Maubin Township has the better transportation services

than other townships. Accordingly, better transportation supports to greater GDP. The real GDP value is 431 Thousand Kyat Million in Maubin Township, which is the largest when GDP in Danuphyu Township is 143 Thousand Kyats Million that is the lowest. Therefore, it is interpreted that there is a direct relationship between the better facilities of transportation access and the good economic generation.

CHAPTER IV
EMPIRICAL ANALYSIS

In this chapter, the measurement of income inequality, the extent of poverty and causes of poverty in rural areas of Maubin District are analyzed based on the primary survey data on household level consumption expenditure. Research methodology, including sample size determination and questionnaire design, profile of the respondents, measuring income inequality, measuring the extent of poverty, analytical study of causes of poverty are parts of the chapter.

4.1 Research Methodology

The study tries to look at the macroscopic view and microscopic view on rural areas of Maubin District by measuring income inequality, analyzing the poverty with the measure of headcount index, poverty gap index, squared poverty gap index, and the poverty index, and examining the causes of poverty based on the primary data of consumption expenditure and socioeconomic condition.

Firstly, the field visit and the field compilation are done to get information from the targeted study area. The persuasive personal interview is used as the appropriate data collection method with questionnaires because it is the most common method for getting the higher response rate and easy to know the mutual understanding on the objectives of the survey.

Secondly, Gini coefficient with the derivation of Lorenz curve is measured in order to identify the inequality for deciding the income redistribution programs. Regarding the analysis of the extent of poverty, poverty line of the study area is constructed at the minimum consumption level for their survival. Household per capita consumption expenditure is used to examine whether the poverty status exists or not. Selecting particular compilation technique or method proposed by Foster, J., Greer, J., & Thorbecke, E (1984) is applied for the calculation of Headcount Index, Poverty Gap Index, and the Squared Poverty Gap Index, while method revealed by Amartya, S (1976) is used to measure the poverty index with the consideration of equal distribution.

Finally, the Binary Logistic Regression model is applied to analyze the causes of poverty in the study area how social characteristics, economic characteristics and the community characteristics are correlated with poverty status in the study area.

4.1.1 Sample Size Determination

The numbers of 186751 households are living in 1648 villages, of 235 village tracts, of 4 townships in Maubin District. A stratified random sampling method is used in selecting the sample household size for conducting the primary survey. Data used in this study are obtained from the information of household head profile, household profile and community profile by face-to-face interview in 2018.

The sample size determination of the population proportion formula is used in order to get the samples from the villages of the four townships in Maubin District.

$$n = \frac{N\,P\,(1-P)}{(N-1)\;D+\;P(1-P)} \qquad (1)$$

Where, n = sample size

N = population size =1648

P = proportion = 0.5

B = Bound on the error of estimate = 0.25 (from pilot survey)

D = Margin of error $\frac{B^2}{4} = \frac{0.25^2}{4} = 0.015625$

D = Margin of error $\frac{B^2}{4} = \frac{0.25^2}{4} = 0.015625$

$$n = \frac{1648 \times 0.5 \times 0.5}{(1648-1)0.015625 \;+\; 0.5 \times 0.5} = 15.85568 \cong 16$$

In this study, since a response rate is assumed as 99 %, the required sample size is 17 villages out of 1648 villages from four townships in Maubin District. Using the list frame of the first stage units (FSUs) of the villages, 17 villages are selected by simple random sampling without replacement at the first stage. The sample villages are presented in Table 4.1.

Table (4.1) Selected Villages from Four Townships in Maubin District

Sr. No.	Township Name	Village Tract	No. of Villages	Sample Village	Selected Village Name
1	Maubin	76	442	4	Layeaisu, Tarpat, Seikthar, Ahlan
2	Danuphyu	63	449	4	Sankin, NyaungChaung, Ahkyaw (East) and (West)
3	Nyaung Don	44	308	5	Tazin, Yaykyaw, Htonwa, Natpay, Tuchaung,
4	Pantanaw	52	449	4	Ywathitkone, Kuaungsu, Innma, Hlesaik
Total		235	1648	17	

Source: Calculation based on data from General Administration Department, Maubin District

After the selection of a random sample of FSUs (villages), an effort was made to construct a complete sampling frame (list frame) of the household. To determine the sample size for second stage, Krejcie and Morgans formula adjusted to Cochran's method for quantitative variables is used.

$$n = \frac{n_0}{1 + \frac{n_0}{N}}$$

$$n_0 = \frac{N\,P(1-P)}{(N-1)\,D + P(1-P)}$$

Where, n = sample size

N = population size = 186751

P = proportion = 0.5

B = Bound on the error of estimate = 0.025

D = Margin of error $\frac{B^2}{4} = \frac{0.025^2}{4} = 0.00015625$

$$n_0 = \frac{186751 \times 0.5 \times 0.5}{(186751 - 1)0.00015625 + 0.5 \times 0.5} = 1586.4 \cong 1590$$

$$n = \frac{1590}{1 + \frac{1590}{186751}} = 1576.6 = 1580 \ \ households$$

Sample size = 1580/0.95 = 1663.2 = 1663 households

As a response rate is assumed as 95%, the resulted required sample size is 1663 households. Using the list frame of the second stage units of the households, 1663 households are selected at stratified random sampling with proportion to size as the second stage. The sample households are presented in Table 4.2.

Table (4.2) Selected Households from a Selected Village in Mubin District

Sr.	Township	Village	No. of Households	Random Sample Households
1	Maubin	Layeaisu Village	970	368
2	Maubin	Tarpat Village	68	26
3	Maubin	Seikthar Village	122	47
4	Maubin	Ahlan Village	305	118
5	Danuphyu	Sankin Village	305	118
6	Danuphyu	NyaungChaung Village	27	10
7	Danuphyu	Ahkyaw (East)Village	247	96
8	Danuphyu	Ahkyaw (West)Village	120	47
9	Nyaung Don	Tazin Village	110	43
10	Nyaung Don	Yaykyaw Village	352	137
11	Nyaung Don	Htonwa Village	289	112
12	Nyaung Don	Natpay Village	216	84
13	Nyaung Don	Tuchaung Village	286	111
14	Pantanaw	YwathitkoneVillage	113	44
15	Pantanaw	KyaungsuVillage	226	88
16	Pantanaw	Innma Village	334	130
17	Pantanaw	Hlesaik Village	216	84
Total Sample Size			4306	1663

Source: Calculation based on data from General Administration Department, Maubin District

4.1.2 Questionnaire Design

Primary survey data are used for the quantitative and qualitative analysis of measuring income inequality and analyzing the causes of poverty in the study area. Data are collected by interviewing to the household heads and community authorized persons with questionnaires that are represented as the household level and community level questionnaires. In the individual household level questionnaire, it includes the condition of household characteristics, household head and household member characteristics, employment status, household living condition, property, household consumption expenditure and income. Community level questionnaire covers the questions for the situation of infrastructure development and the needs for growth of income generation.

Household profile and household head profile are designed for getting the social characteristics, such as household size, gender of household head, age of household head, education status of household head and toilet condition when the occupation of household head, farm land ownership, housing condition are considered as economic characteristics. Electricity access and the availability of clean water supply are represented as the community characteristics.

4.2 Profile of Respondents in the Study Area

Functions of households, which are evolved by the capability of choice depending on the capability of household head and household characteristics are main concerns for poverty analysis since poverty is the failure of the same basic capabilities to function due to their household characteristics (Cook, S. & Pincus, J., 2014).

4.2.1 Social Characteristics

This sub-section seeks the social characteristics in relation to the income generation. Individual social characteristics are regarded as household size, age distribution, sex, education level of household head, reasons for dropping out or incompletion of schooling and toilet condition.

Mean value of the social characteristics of household heads is shown in Table 4.3. Profile of household characteristics of respondents in Maubin District by townships is shown in Table 4.4, and the reasons for dropping out of their schooling is shown in the Appendix-E.

Table (4.3) Mean Value of Social Characteristics of Household Heads

HH Characteristics	Mean Statistics
Age	53
Year of Schooling	6.3181
Family Member	4.6446
Numbers of Sample households	1663

Source: Own Compilation based on Survey Data (2018)

According to Table (4.3), the average age of the household in study area is 53 years, average education level of years of schooling is 6 years and average family size 4 members. Mean statistics of social characteristics are resulted from the reasonable large number of sample size of 1663.

Table (4.4) Profile of Household Characteristics of Respondents in Maubin District by Townships

Sr.	Characteristics	Townships				District
		Maubin	Pantanaw	Nyaung Don	Danuphyu	
1	**Sex of HHH**					
	Female (%)	15.7	25.1	32.2	21.4	23.5
	Male (%)	84.3	74.9	67.8	78.6	76.5
2	**Age of HHH (%)**					
	Below 30 years	0	0	4.3	8.9	2.7
	30-39 years	9.1	10.1	12.3	11.4	10.6
	40-49 years	20.8	39.9	19.7	29.5	25.9
	50 years and above	70.1	50	63.7	50.2	60.8
3	**Education Level (%)**					
	Below primary & primary level	42.8	43.6	33.3	56.5	42.4
	Middle level	29.2	39.9	52.2	32.5	38.7
	High level and above	28	16.5	14.5	11	18.9
4	**Family Size (%)**					
	1-3 members (ref)	22.9	27.5	33.9	29.9	28.2
	4-6 members	56.2	59	53.4	57.6	56.2

	Above 6 members	20.9	13.6	12.7	12.5	15.6

Table (4.4) Profile of Household Characteristics of Respondents in Maubin District by Townships (Continued)

Sr.	Characteristics	Townships				District
		Maubin	Pantanaw	Nyaung Don	Danuphyu	
5	**Toilet Condition (%)**					
	Non-fly proof toilet	5	8.4	8	16.2	8.4
	Fly proof Toilet	95	91.6	92	83.8	91.6
6	**Land ownership (%)**					
	Landless	76	86.1	88.7	66.4	80.3
	Land owner	24	13.9	11.3	33.6	19.7
7	**Occupation (%)**					
	Non-general worker	73.2	46.5	62.8	51.7	61.1
	General worker	26.8	53.5	37.2	48.3	38.9
8	**Housing Condition (%)**					
	Two stories & wood brick	15.9	13	11.5	6.6	12.5
	Hut	84.1	87	88.5	93.4	87.5
9	**Electricity (%)**					
	Non-use national	93.2	93.6	94.9	92.6	93.7
	Use national grid	6.8	6.4	5.1	7.4	6.3
10	**Availability of Water (%)**					
	Unclean water	22.4	39.6	41.9	45.8	35.5
	Clean water	77.6	60.4	58.1	54.2	64.5

Source: Own Compilation based on Survey Data (2018)

Firstly, sex of the household head of the family is considered as a factor, which may influence on the income generation of the family. According to Table (4.4), it is found that female headed household is the largest percentage of 32.2 percent in Nyaung Don Township among four townships, which is greater than the average rate 23.5 percent of Maubin District. It is almost double of the national level of the proportion of female headed households that is 16 percent in the rural area in 2017. It is the second largest in Pantanaw Township, and that of Maubin Township is the lowest. Male headed

households are larger than the female headed households in every township of Maubin District. The rate in each township is remarkably high at the rate of 84.3 percent, 74.9 percent, 67.8 percent and 78.6 percent in Maubin Township, Pantanaw Township, Nyaung Don Township and Danuphyu Township respectively. This shows that the larger numbers of male household heads have an important role in affecting the greater impact on household income generation or living standard depending their occupation. On the other hand, the result is likely to be influenced by the limitation of random sampling method.

Age distribution is one of the most important factors in the income generation for the household living. The age group of household heads is categorized into four groups, such as below 30 years, 30-39 years, 40 to 49 years and 50 years and above age group. The age distribution is shown in Table 4.4. According to Table (4.3), the mean age of household head is about 53 years. It is found that on average, the rate of household heads whose age are young adult age below 30 years is 2.7 percent in Maubin District. The average rate of household heads who are above 50 years age in Maubin District is 60.8 percent, and it is the largest proportion among the age groups. The second largest age group is 40 to 49 years with the proportion of 25.9 percent. If these populations are efficiently employed, the region will have an advantage for the growth of income generation.

Education status of household head is categorized into three ranges as below primary school and primary school education level, middle school and high school and high education level. The mean years of schooling of household head respondents is about 7 years. On average, the most common years of schooling is found in the primary school education level at 42.4 percent, reflecting that most of the household heads has low level of education level. It is largest in Dunuphyu Township, and followed by in Pantanaw Township and Maubin Township respectively. It shows that household heads who are leading to the household's income generation have completed the primary education level, which is the lowest level of education in Maubin District.

It is found that there are some household heads, who have dropped out their schooling. The reasons for being dropouts are divergent each other, and they are described as the financial aspect of the family, traditional motivation for the education, the qualification requirements and the distance of the schools. The household head respondents and the community authorized person said that in the past, during the periods of household heads' schooling days, the required numbers of middle and high

schools are lacking in the place near to their homes. On the one hand, the economic situation of the households forced them to quit schooling. Therefore, most of the household heads quit their schooling before completing the high school education level. The reasons for dropout schooling are shown in Appendix E. The reason of the financial aspect is found as the most common reason for being the dropouts of the household head schooling, and the average rate is 79 percent while the distance of schools is the second largest response rate at 15.6 percent for the reason of being dropout. According to data shown in the Appendix C, the number of schools in each level of education was much different from 1990 to 2018. The number of primary schools is increasing 12.1 percent from 800 in 1990 to 910 in 2018, while that of middle schools is increasing 61.9 percent from 37 in 1990 to 97 in 2018, and the number of high schools is increasing 87.5 percent from 11 in 1990 to 88 in 2018. The number of schools for each education level was the poor access and gave the lower opportunity of higher education during the periods of household head schooling. It is clearly seen that the number of Middle schools and High schools are very few or very limited number of schools during these previous three decades. Therefore, household heads had to face the difficulties to complete their middle and high level of education because of the far distance from home to school. This is one of the reasons that they quit their schooling before completing.

On the one hand, though the number of primary schools, middle schools and the high schools has been increasing, the vocational schools for upgrading the labor skills are required for the sake of technology improvement to build up the value-added industries by exploiting the locally produced agricultural and fishery primary products. Therefore, the use of labor-based technologies and borrowing technology should be necessarily provided to enhance the highly paid job creation and income generation in the study area.

The number of family members should be studied as a variable to gauge the effect on the hold income generation. The larger size household members can determine the positive effect on the income generation if they are productive resources for their income generation while the effect will be negative impact if they are not considerable productive based on their education and working experience with capacity. The smaller size family members may need smaller income than the larger family for their survival. Family size in the study area is categorized as one to three members, four to six members and above six members. According to Table (4.4), the mean value family size of household is approximately 5. An average family size of Ayeyarwady region is 4

members (Central Statistical Organization and World Bank Group, 2019). In Maubin District, most of the household has four to six family members with the proportion of 56.2 percent of total households. According to the study, the maximum percentage of total household 59 percent that have four to six family members is found in Pantanaw Township, while the second and the third largest rates are found in Danuphyu Township and Maubin Township respectively.

Toilet condition of households reflects to the living standard of households. Toilet condition is categorized into two types, such as Fly Proof Toilet and Non-fly Proof Toilet. In the rural study area of Maubin District, there exists the situation that some households are using open space type toilet, and some proportions of households are using the poor-quality type toilet. They are classified as non-fly proof toilet, and they are accounted as 8.4 percent of households showing the low standard of living. Most of the household 91.6 percent are using the latrine type toilet, flash type toilet or fly proof toilet. The condition of toilet is shown in the Appendix- H.

4.2.2 Economic Characteristics

The most widely used variables as the direct popular measures of household living standard are income and consumption expenditure. Once farm land ownership, the employment status of household heads and housing condition can influence on the household income and consumption expenditures, they are considered as economic characteristics.

Farmland ownership is an important factor for developing the household income generation. Farm ownership is degenerated by the family heritage programme, meaning that the farm size is gradually smaller than that of previous ten decades as per time past generation. The farmland ownership situation in Maubin District is also shown in Table 4.4. According to data shown in Table (4.4), 80.3 percent of households are landless in Maubin District while 19.7 percent of households are owners of farmland, of which most of households own 1 to 2 acres. Therefore, most of the household heads and family members are working as wage workers in other's farms. They are counted as employment type of the general workers because they are also employed as wage workers in the informal sector jobs during the periods of seasonal unemployment. The detailed classification of occupation is shown in Appendix J.

Reasons for having landlessness are found as the consequence of unaffordable income and the decline in economic situation, due to the policy consideration and

weather shock. Reason of the unaffordable income completely depends on the decline in economic situation of households. Some household heads have to sell their farm lands when they face with an economic contraction. The reason due to policy is referred to as the government policy on infrastructure development for building the Bridge, and farmland ownership law. When the government development program for building the Bridge was set, it caused the land sliding to some areas. Some farm lands beside the river bench were flooded by the effect of diving wave that changed the water direction, consequently, some farms owned by some households were lost. Moreover, the farmland ownership law allows the landowners to use land as a mortgage guarantee. Therefore, farms were used as mortgage when household heads took loans. In addition, flooding can accordingly raise the landlessness because of weather crisis of cyclone storm. Data on reasons for landlessness are shown in the Appendix-F. There are 83.2 percent of households that these households respond to the economic reason on average in Maubin District. Weather condition is the second reason for landlessness. The maximum portion of households in the rural area of Maubin Township that is 17.5 percent is hit by weather while the third largest rate of landless households, 9.6 percent is caused by policy reason. Therefore, landless household heads are also working as the wage workers as the low-wage earners.

The occupational choice of household heads is categorized as two classifications of job diversification, such as general workers and non-general workers. Retired persons, farmers, government staff, own business workers, and private staff are regarded as non-general workers while workers from informal sector and agricultural wage workers are considered as general workers. Type of employment or job diversification is shown in Table 4.4 and Appendix G. Employment type in Maubin District is generally found as general worker at the rate of 38.9 percent that is the largest portion of occupation while 23 percent of household head is working as farmer, 0.5 percent is as retiree, 15.8 percent is government staff, 14.3 percent is working for their own grocery and other business, 5.5 percent of household head is working as private staff. Type of the employment general worker is regarded as the informal sector worker for which the household heads get the low pay wages. Therefore, in Maubin District, most of the household heads who are working as general workers are living as the low wage earners. In addition, since there is a lack of job opportunity, some household heads migrate to Yangon and abroad for their living. As shown in Appendix A, the response

by the household heads shows that the local migration rate is 25 percent and the international migration is 4 percent.

Housing condition of the households is classified into two types, such as Two Stories Wood and Brick and Hut. As shown in Table (4.4), on average in the rural study area of Maubin District, most of the households, 87.5 percent are living in the low-quality type of housing named as hut, while only 12.5 percent of households are living in the housing type made of wood and brick and two storied houses. The housing condition reflects to the economic condition of households, showing that the low-quality housing condition is found in each township but they are not much different among four townships. The low-quality housing condition reflects to the low income earning. Higher income earners possess the high-quality houses. Housing condition is shown in the Appendix-G.

4.2.3 Community Characteristics

Household income generation and living standard depend on the provision facilities of public utilities by the regional government because the rationale of the government function is to provide the suitable and appropriate public utilities or public goods. Public utilities include electrical power transmission, water supply, transportation and communication facilities.

Electricity is one of the most important utilities for the human beings and economic generation. In the urban area of Myanmar, the electricity transmission grid line has been increased from 23 percent of households in 2005 to 42 percent in 2017 (Central Statistical Organization and World Bank Group, 2019). The overall coverage rate in the rural area increased from 6.4 percent in 2005 to 24.7 percent in 2017. In Ayeyarwady region, the coverage rate reaches at the third lowest rate of 15 percent (Central Statistical Organization and World Bank Group, 2019). In the study area of Maubin District, the electricity power utilization via the national grid line is shown in Table 4.4. According to the table, 6.3 percent of households use the national grid line power service, while 93.7 percent is using the various sources, such as Village electricity power center, Diesel engine and others. It is also useful as cooking fuel, depending on the household living economic structure. Only 6.3 percent of household is using the electricity utility as the cooking fuel. The proportion, 82 percent of households is using wood as the cooking fuel while 11.7 percent is using charcoal as

the Biomass in their living that is happening to the smoking effect in the environment. Most of the households are living their daily life without using electricity.

Water supply not only for drinking but also for daily use is one of the important resources for good health, reflecting to the well beings of people. In Myanmar, the proportion of using the purified drinking water is 48.9 percent, 18 percent and 5.7 percent in the Union level, in the urban area and in the rural area respectively (Central Statistical Organization and World Bank Group, 2019). In Ayeyarwady region, the availability of purified drinking water is much differentiated at the rate of 85 percent in the rainy season and 53 percent in the hot season because it is highly dependent on the rain (Central Statistical Organization and World Bank Group, 2019).

The availability of water supply in Maubin District is shown in Table 4.4. The clean water is defined as water supply from the source of tube, well and rain. Depending on the purification of water, household members need to buy the purified drinking water as shown in the Table. The average proportion of household 35.5 percent is using the unclean water in Maubin District while 64.5 percent is using the clean drinking water. For the cultivation and daily use purposes, water is available from the well, rainfall, tube pipe, river and dam. The availability of each type of source is not much different from each other. Water from the tube is mostly used for their living. The utility service for water supply in the study area is in good condition.

4.3 Measuring Income Inequality

Income inequality is concerned with the end result of well beings. Economic growth leads to the marginalization and greater inequality. Depending on the magnitude of income inequality and growth, they tend to create poverty. On the one hand, economic growth is considered as the key measure to the poverty reduction (Angelsen, A. and Sven Wunde, S, 2006).

In order to measure the income inequality, the Gini coefficient of each township in Maubin District is used with the derivation of the Lorenz curve. The Gini coefficient is calculated as follows:

$$Gini\ coefficient = \frac{The\ Area\ between\ the\ Line\ of\ Perfect\ Equality\ and\ the\ Lorenz\ Curve}{The\ Area\ under\ the\ Line\ of\ Perfect\ Equality}$$

The Area between the line Area of the line of Area under

of perfect equality And = perfect equality - the Lorenz Curve the Lorenz Curve

The per capita income data is categorized into Quintiles or five groups of households in that area. The lowest quartile stands for the lowest 20 percent of average household income. These classifications are 20 percent of household income, the second quintile or cumulative of 40 percent, the third quintile, or a cumulative of 60 percent, the fourth quintile, or a cumulative of 80 percent, and the fifth quintile or a cumulative of 100 percent of household income. According to Table (4.5), the bottom 20 percent of households takes in the lowest share of total consumption expenditure, 5 percent, and the top 20 percent of households enjoys the highest portion, 70 percent of total consumption expenditure in Maubin Township. The share of total consumption expenditure and the detailed calculation of Gini coefficient is shown in Table 4.5 and Appendix I.

Table (4.5) Quintile Share of Household Consumption in Maubin Township

Quintile	Share of Total Consumption (%)	Cumulative Probability of Mean Consumption	Area under the Lorenz Curve
Bottom/First	5	0.05	0.0046987
Second Quintile	6	0.15	0.0154557
Third Quintile	8	0.29	0.0291769
Fourth Quintile	11	0.48	0.0479993
Fifth Quantile	70	1.3	0.1295793
			0.2269101

Source: Own Compilation based on Survey Data (2018)

Area under the Lorenz Curve = 0.22691

Area under the line of perfect equality = 0.5

Area between the line of perfect equality and the Lorenz Curve = 0.5 - 0.22691

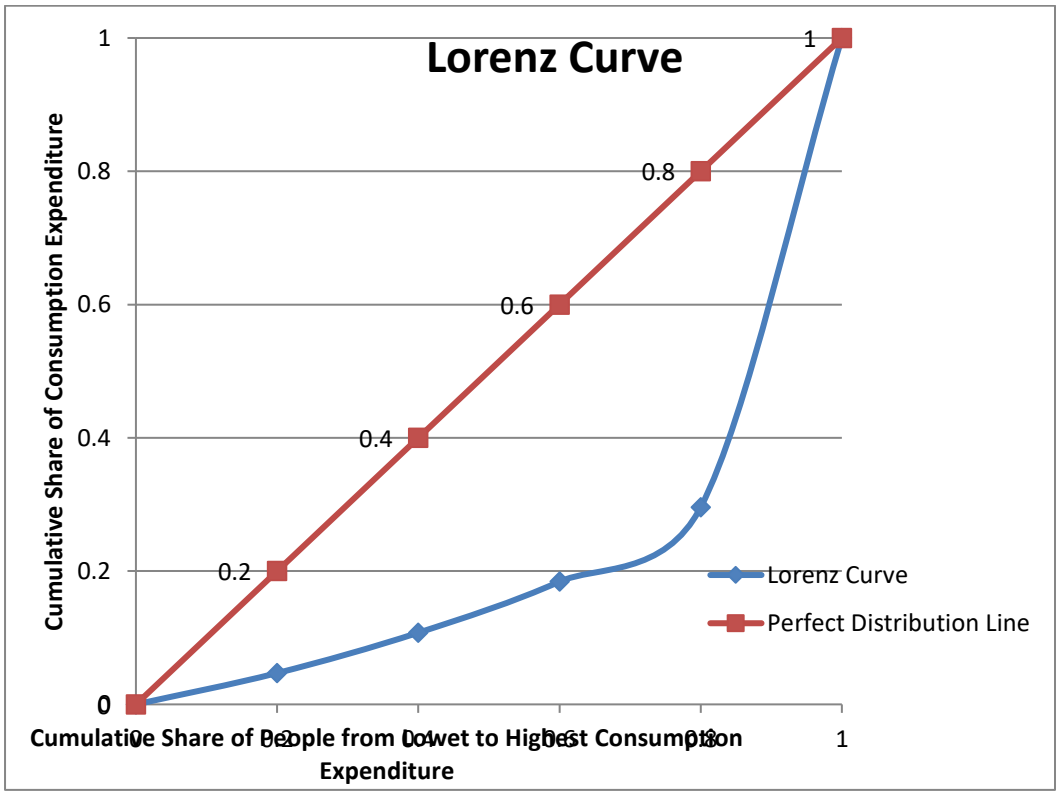
= 0.27309

Gini Coefficient = 0.27309/ 0.5 = 0.54618

The Gini coefficient in the study area of Maubin Township is 0.546. Since it is greater than 0.5, it indicates that there is a severe poverty in the study area (Moges, D., 2019). In Maubin Township, the severe gap of consumption is found so that income

redistribution should be considered as the resource allocation for the improvement in income generation. Budget in resource reallocation for establishing in the essential economic sectors, such as for public utilities development, restructuring the economic activities, is expected in order to increase the income generation of low-income households in Maubin Township because this resource reallocation may facilitate the adequate household economic condition.

Figure (4.1) Lorenz Curve of Maubin Township



Source: Own Compilation

Table (4.6) Quintile Share of Household Consumption in Nyaung Don Township

Quintile	Share of Total Consumption (%)	Cumulative Probability of Mean Consumption	Area under the Lorenz Curve
Bottom/First	4	0.04	0.004131038
Second Quintile	5	0.13	0.013497535
Third Quintile	7	0.26	0.026044931
Fourth Quintile	9	0.43	0.042762358
Fifth Quantile	74	1.26	0.126083923

			0.212519786

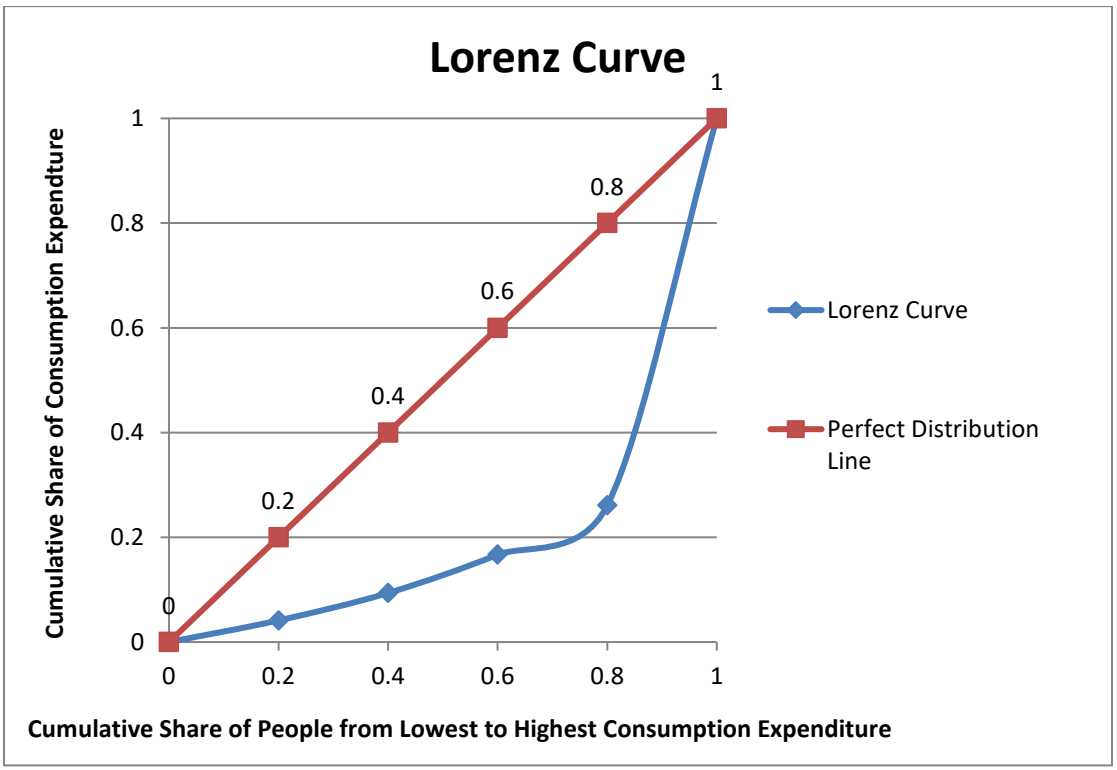
Source: Own Compilation based on Survey Data (2018)

According to Table (4.6), the bottom 20 percent of households enjoys the lowest share of total consumption expenditure, 4 percent, and the top 20 percent of households uses the highest share, 74 percent of total consumption expenditure in Nyaung Don Township.

Gini Coefficient in Nyaung Don Township = 0.28748 / 0.5 = 0.57496

The Gini coefficient in the study area of Nyaung Don Township is 0.57. It does generally mean that a severe gap of consumption is found in Nyaung Don Township. Therefore, budget allocation of resource allocation for establishing the essential economic sectors as the prioritized consideration is expected in order to increase the low-income households by improving the redistribution of income in Nyaung Don Township.

Figure (4.2) Lorenz Curve of Nyaung Don Township



Source: Own Compilation

Table (4.7) Quintile Share of Household Consumption in Pantanaw Township

Quintile	Share of Total Consumption Expenditure (%)	Cumulative Probability of Mean Consumption	Area Under the Lorenz Curve
Bottom/First	4	0.04	0.0038
Second Quintile	5	0.13	0.01264
Third Quintile	7	0.25	0.02469
Fourth Quintile	10	0.42	0.04136
Fifth Quantile	74	1.26	0.12552
			0.20801

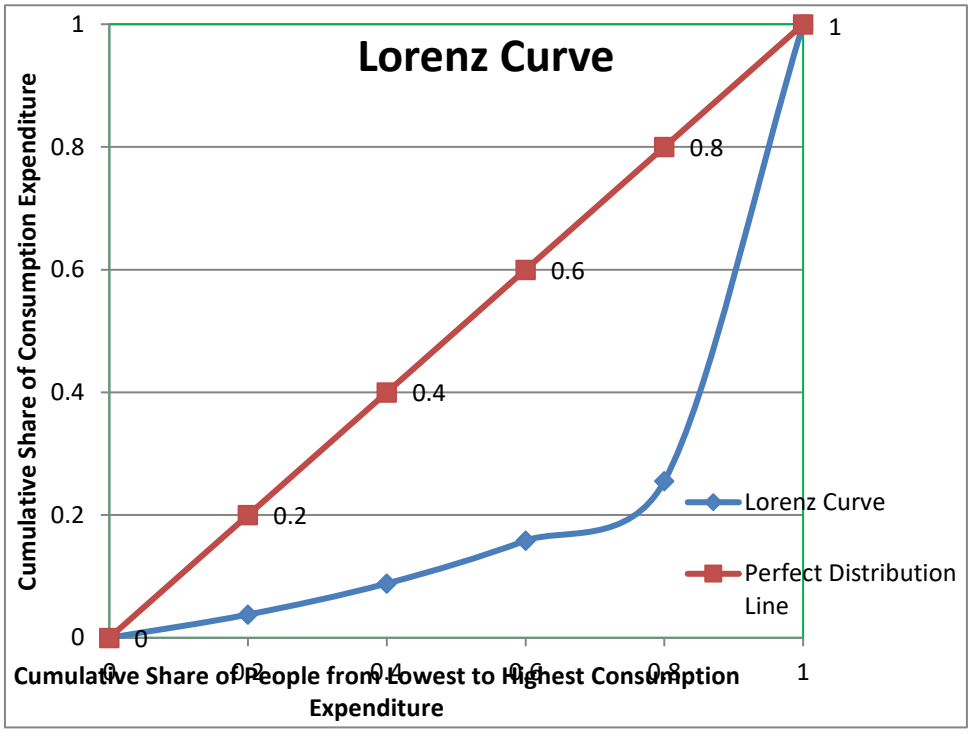
Source: Own Compilation based on Survey Data (2018)

Gini Coefficient in Pantanaw Township = 0.5 - 0.208 = 0.29/ 0.5 = 0.58

According to Table (4.7), the bottom 20 percent of households uses 4 percent share of total consumption expenditure for their consumption, and the top 20 percent of households uses the highest share, 74 percent of total consumption expenditure in Pantanaw Township.

The Gini coefficient in the study area of Pantanaw Township is 0.58, which is greater than those of Maubin and Nyaung Don Townships, meaning that there is likely more unequal distribution than in Maubin and Nyaung Don Townships. Though it is not much gap of consumption among four Townships, income redistribution programme for improving the low-income household income generation is required for tackling the challenge of poverty.

Figure (4.3) Lorenz Curve of Pantanaw Township



Source: Own Compilation

Table (4.8) Quintile Share of Household Consumption in Danuphyu Township

Quintile	Share of Total Consumption (%)	Cumulative Probability of Mean Consumption	Area under the Lorenz Curve
Bottom/First	4	0.04	0.003516358
Second Quintile	5	0.12	0.011838369
Third Quintile	6	0.23	0.022662194
Fourth Quintile	8	0.37	0.037138791
Fifth Quantile	77	1.23	0.122798609
			0.197954321

Source: Own Compilation based on Survey Data (2018)

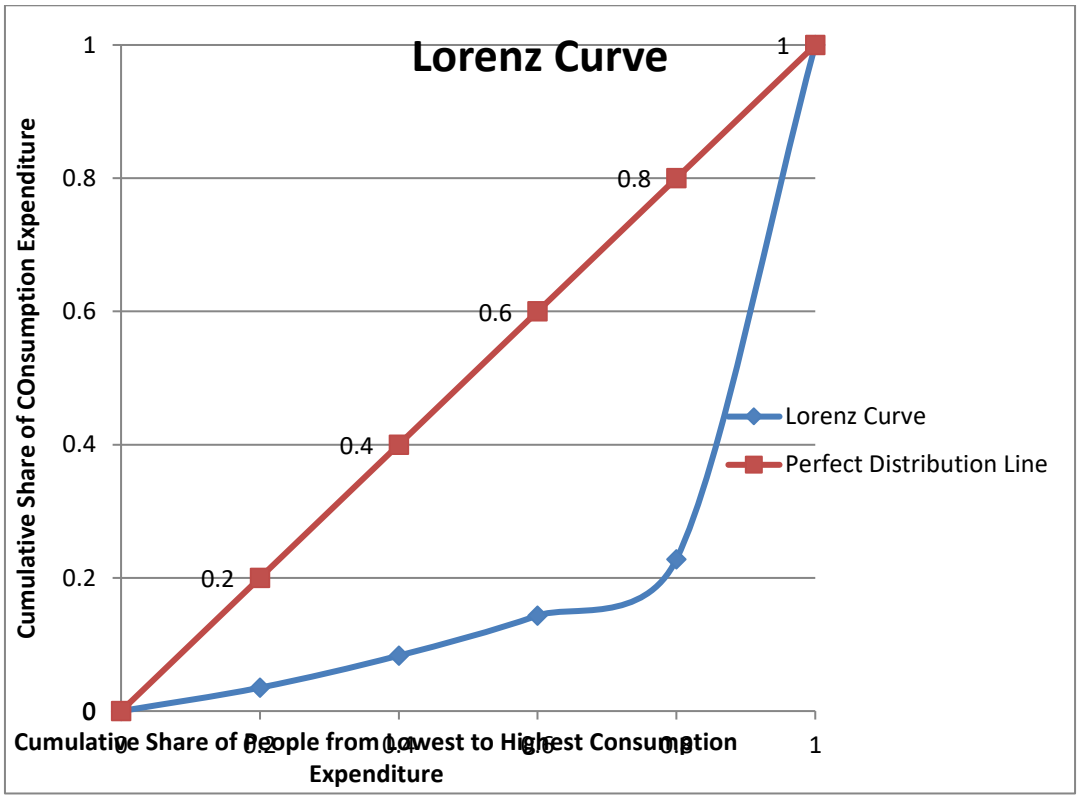
According to Table (4.8), the bottom 20 percent of households contributes the lowest share 4 percent of total consumption expenditure, and the top 20 percent of households uses the highest share, 77 percent of total consumption expenditure in Danuphyu Township.

Gini Coefficient in Danuphyu Township = 0.302/ 0.5 = 0.604

The Gini coefficient in the study area of Danuphyu Township is 0.604. It is the largest coefficient among other townships, meaning that households in Danuphyu

Township suffered from the issues hit by the most severe gap of consumption, which is resulted from the severe income gap. Therefore, income redistribution programme should be used for improving the income generation of low-income households in Danuphyu Township.

Figure (4.4) Lorenz Curve of Danuphyu Township



Source: Own Compilation

Table (4.9) Quintile Share of Household Consumption in Maubin District

Quintile	Share of Total Consumption (%)	Cumulative Probability of Mean Consumption	Area under the Lorenz Curve
Bottom/First	4	0.04	0.00373072
Second Quintile	5	0.12	0.012270625
Third Quintile	6	0.23	0.023471148
Fourth Quintile	9	0.39	0.038617371
Fifth Quantile	76	1.24	0.123686128
			0.201775991

Source: Own Compilation based on Survey Data (2018)

Table (4.10) Gini Coefficient of Maubin District

Township	Gini Coefficient
Maubin Township	0.546
Nyaung Don Township	0.57
Pantanaw Township	0.584
Danuphyu Township	0.604
Maubin District	0.5966

Source: Own Compilation based on Survey Data (2018)

Gini Coefficient in Maubin District = 0.2983/ 0.5 = 0.5966

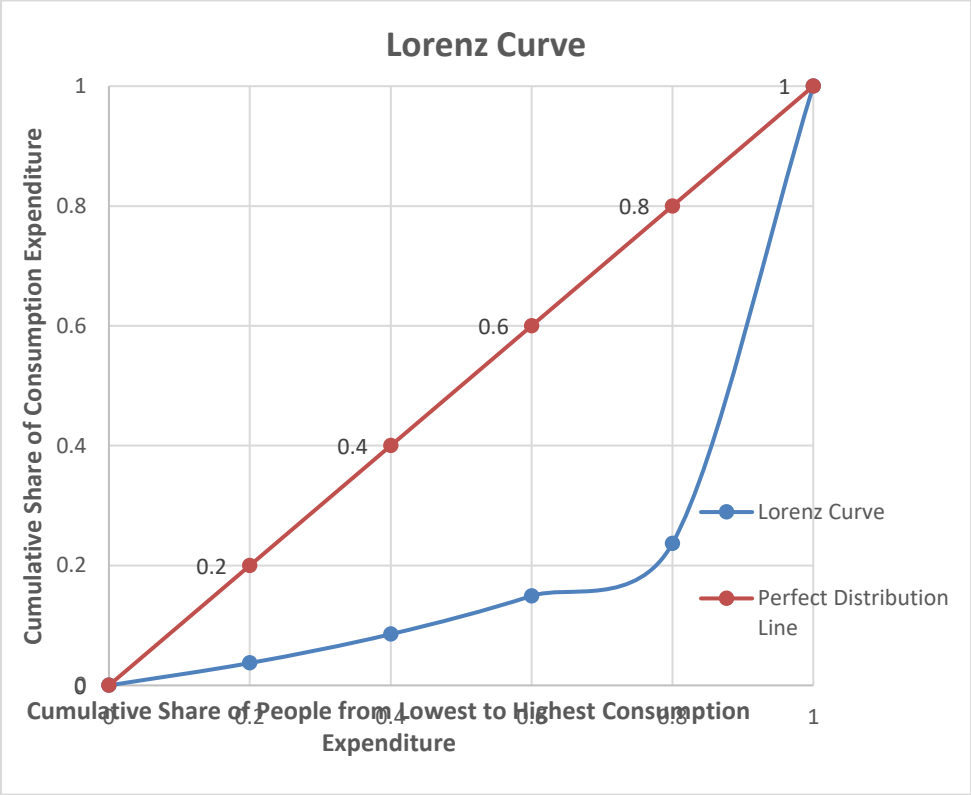
According to Table (4.10), and shown in Appendix I, Gini Coefficient in Maubin District is 0.597. The Gini coefficient is not much different in each township and in the District.

In Maubin District, the Gini coefficient is 0.597, showing that there is a severe gap of consumption resulted from the severe income gap. Moreover, since Gini coefficient indicator is above 0.4, it can be said that social tension may be growing there. Economic situation and the social tension are interrelated with each other. As shown in the Appendix (A), the response by the household heads shows that these conditions approximately result in the migration rate of 29 percent making households feel the social imbalance of living. Since most of the household heads educated the primary level and there are less opportunities of highly paid jobs in the study area, household members have to seek job opportunities outside Maubin District.

In Maubin Township, the Gini coefficient is the smallest, meaning that it is relatively much equal in distribution than other townships, such as Nyaung Don Township, Pantanaw Township, and Danuphyu Township, in Maubin District. However, it is the largest in Danuphyu Township. Within Maubin District, the value of Gini coefficient for each township is not much different in each township, showing that the share of total consumption expenditure used by the bottom 20 percent of households in each township is also not much different with that of average level in the District. However, the share of total consumption expenditure taken by the top 20 percent households is 19 times larger than that of bottom 20 percent households in Maubin District. Therefore, income redistribution programme should be considered in order to get the narrow gap of household income and consumption expenditure. The local and

regional governments should take into account the programs that was suggested by Miron. J.A. in 2011. The assistance in three programs should be preferably applied as the income redistribution programme, namely food stamps, medical and earned income tax credit for temporal considerable plan, progress taxation program that transfers income from the richer to the poorer, and policies, such as minimum wage law for general workers and setting price floor programme for farmers that promote economic condition to lower income earners.

Figure (4.5) Lorenz Curve of Maubin District



Source: Own Compilation based on Survey Results in 2018

Reducing the income inequality and poverty requires to know the determination of size of the poverty. Therefore, the study measures the existence of poverty, the intensity of poverty, the severity of poverty and the poverty index.

4.4 Measuring the Extent Poverty

In the study, the extent of poverty is subject to consider the existence of poverty, intensity and severity of poverty. It is analyzed by measuring the headcount index for the investigation of the existence of poverty, the poverty gap index for the identification of the intensity of poverty, the squared poverty gap index for the examination of the severity of poverty and the poverty index for the measure of the proportion of population to reach above the poverty line income level with income equality. In order to measure the existence of poverty and the extent of poverty in the study area, the per capita consumption expenditure of the households is determined by the threshold level of per capita consumption level at poverty line.

The tool poverty line determination of monetary measure of poverty is used to give a picture of the extent of poverty. In the study, the monetary measure of poverty is determined by per capita consumption expenditure approach for those whose food and non-food consumption expenditure are below the Poverty Line. The poverty line in 2012 that was determined in the case study of Nyaung Don Township, written in the book of Myanmar Moving Out of Poverty: An Inquiry into the Inclusive Growth in Asia by Jonna P. Estudillo and Keijiro Otsuka (Jonana, P. E. & Otsuka, K., 2014), was used as the benchmark data of US$ 1.25 $ per capita a day in 2012. In order to be more reliable to the present living condition of the Ayeyarwady region, it is deflated with the CPI data at current exchange rate of the region by substituting $ 1.25 a day for 30 days and calculating for 12 months as follows:

Poverty Line is denoted as $L_{2018,}$

$$L_{2018} = L_{2012} \times \frac{CPI\ \ 2018\ \ of\ \ Ayeyarwaddy\ \text{Re}\,gion}{CPI\ \ 2012\ \ of\ \ Ayeyarwaddy\ \text{Re}\,gion}$$

$$= 1.25 \times 30 \times 12 \times 1500 \times \frac{144.49}{172.31}$$

$$= \quad 566{,}020 \quad \text{Kyats per capita a year}$$

$$= \quad 1551 \quad \text{Kyats per capita a day}$$

The minimum consumption expenditure of poverty line is determined at 1551 kyats per capita a day or 566,020 kyats per capita a year. In order to measure the rural poverty of Maubin District, this poverty line is applied.

(a) Poverty Rate or Headcount Index

Headcount index is calculated for the investigation of the existence of poverty. Poverty headcount index is measured as follows;

$$P_{\alpha}(y,z) = \frac{1}{n}\sum_{i=1}^{q}\left(\frac{z-y_i}{z}\right)^{\alpha}$$

Where, n = Total sample population

y_i = Consumption expenditure per capita

z = Poverty line consumption expenditure level

q = Number of poor in the population

$y_{i, \ldots, } y_q <$ z $<$ $y_{q+1}, \ldots y_n$

$$P_0(y,z) = \frac{1}{n}\sum_{i=1}^{q} I(y_i < z)$$

Where I(yi<z) = an indicator function that takes on a value of 1 if the bracketed expression is true, and 0 otherwise.

Headcount Index $P_0 = \frac{N_p}{N} \times 100$

Where, N_p = the Number of poor and

N = Total sample

The measure of the Headcount Index in each township and in Maubin District is shown in Table 4.11, and it is summarized in Table 4.12.

Based on the primary survey data on 1663 households, the headcount index is calculated as shown in Table 4.11. Headcount index is referred to as the poverty rate. It shows that the poverty rate in Danuphyu Township is 47.6 percent, which is the highest among the other townships in Maubin District. It means that 47.6 percent of population is the poor in Danuphyu Township. It is the lowest in Maubin Township that is 44.2 percent with the highest per capita GDP. It means that 44.2 percent of population is the poor in Maubin Township. Accordingly, the overall poverty rate in Maubin District is 45.9 percent, meaning that 45.9 percent of population is the poor in Maubin District while 54.1 percent is represented as non-poor population. The greater the income and consumption level, the lower the poverty rate is.

According to Table (4.11), it shows that the expected estimate value of consumption expenditure is scattered fairly and closely to the regression line, and the average consumption expenditure in the study area expresses the closer and precise value of poverty situation with population parameter.

Table (4.11) Measures of Headcount Index of Townships and District

Sr.	Township		Poverty Status		Total
			Poor	Non Poor	
1.	Maubin	Numbers	247	312	559
		Headcount index	44.2	55.8	100.00
		Mean Consumption (Kyats)	850254.1322		
2.	Pantanaw	Numbers	163	183	346
		Headcount index	47.1	52.9	100.00
		Mean Consumption (Kyats)	886536.8119		
3.	Nyaung Don	Numbers	224	263	487
		Headcount index	46	54	100.00
		Mean Consumption (Kyats)	860236.9617		
4.	Danuphyu	Numbers	129	142	271
		Headcount index	47.6	52.4	100.00
		Mean Consumption (Kyats)	896045.9266		
Total (Maubin District)		Numbers	763	900	1663
		Headcount index	45.9	54.1	100
		Mean Consumption (Kyats)	868188.6009		

Source: Own Compilation based on Survey Data (2018)

Table (4.12) Poverty Rate or Headcount Index of Maubin District

Sr.	Township	Poverty Rate or Headcount Index
1.	Maubin	44.2
2.	Pantanaw	47.1
3.	Nyaung Don	46
4.	Danuphyu	47.6
Overall Maubin District		45.9

Source: Own Compilation based on Survey Data (2018)

Headcount index tells the percentage of people below the poverty line, meaning that it shows the percentage of the poor to the total population.

It shows that 44.2 percent, 46 percent, 47.1 percent and 47.6 percent of population is the poor in Maubin Township, Nyaung Don Township, Pantanaw Township and Danuphyu Township respectively. Accordingly, 45.9 percent of

population is the poor in Maubin District. The number of poor is not much different in each township, showing that the same geographic background condition makes the overall economic situation similar.

Poverty profile in Nyaung Don Township was studied in 1996, 2012 and 2018. The headcount index of Nyaung Don Township was 28 percent in 1996. Poverty incidence was 39 percent of land owners and 74 percent of landless farmers in 2012, meaning that 39 percent of land owners were poor and 61 percent of land owners were non-poor while 74 percent of landless farmers were poor and 26 percent of landless were non-poor. The studies in 1996 and 2012 used data for both of urban and rural areas. However, the study in the Thesis is focused on household conditions of rural area. Finding in this study describes that the headcount index is 46 percent in 2018, showing the increasing poverty rate in Nyaung Don Township from 28 percent in 1996 to 46 percent in 2018. There may have some unfavorable conditions found in the study area, which reinforce to deepen poverty. Therefore, it is necessary to observe the causes of poverty what deepen poverty in the study area of Maubin District.

The headcount index does not take the intensity of poverty into account so that other measures are considered to determine the further calculation.

(b) The Poverty Gap Index

In order to identify the intensity of poverty, poverty gap index is developed, which shows the shortfall percentage of the poverty line consumption level.

If the degree of aversion to poverty is increasing, then α = 1, the index is the measure of poverty gap or income gap. Its formula is described as follows:

Poverty Gap Index $(P_1) = \frac{1}{n}\sum_{i=1}^{q}\left(\frac{z - y_i}{z}\right)$

Where y = per capita consumption expenditure of individuals

z = consumption expenditure level of poverty line

n = numbers of sample households

The calculated measure of poverty gap index in the study areas of Maubin District is shown in Table 4.13.

Table (4.13) Poverty Gap Index of Maubin District

Sr.	Township	Poverty Gap of the Year (Kyats)	Poverty Gap Index
1.	Maubin	147731.22	0.261
2.	Pantanaw	164145.8	0.29
3.	Nyaung Don	150504.7	0.2659
4.	Danuphyu	165051.4	0.2916
Overall Maubin District		156844.1	0.2771

Source: Own Compilation based on Survey Data (2018)

The overall poverty gap value is 156844.1 Kyats and Index is 0.2771 in Maubin District. Among four townships, the poverty gap index in Danuphyu Township is the highest while it is the lowest in Maubin Township. Poverty gap Index is (0.2771) in Maubin District. Since poverty line is 1551 kyats per capita a day or 566,020 Kyats per capita a year, by deducting it from per capita consumption expenditure and taking the average value, the poverty gap value is determined. The amount required for the income distribution is 27.71 percent of (566,020) Kyats per capita a year, that is the 27.71 percent of the consumption level of poverty line. It is interpreted that 156844.1 Kyats is required for the income redistribution or allocation to each poor person a year in Maubin District. The smaller the poverty gap index, the lower the potential budget for reducing the poverty level is required. The greater the poverty gap, the more amount of cost requirement is needed.

(c) Poverty Severity Index

In order to take into account inequality among the poor, the measure of the severity of poverty is considered in this study. The poverty severity index is expressed as “the weighted sum of poverty gap”. Poverty Severity Index in the study area is measured as shown in Table 4.14.

The measures of poverty depth and poverty severity provide the complementary information on the incidence of poverty. It stretches the greater weight to people that fall far below the poverty line than those who are closer to the poverty line. The poverty severity index in Danuphyu Township is the largest while in Maubin Township is the lowest.

Table (4.14) Poverty Severity Index of Maubin District

Sr.	Township	Poverty Severity Index
1.	Maubin	0.114
2.	Pantanaw	0.1389
3.	Nyaung Don	0.1222
4.	Danuphyu	0.1491
Overall Maubin District		0.1302

Source: Own Compilation based on Survey Data (2018)

According to Table (4.14), the poverty severity index of Maubin District is 0.1302, meaning that 13.02 percent of total population are the poorest households in Maubin District. The regional authority should take into account this poorest households as the prioritized person of the action plan in order to reduce poverty. If they are ignored, the poorest situation will persist and it is transformed into the chronic poverty. The persistence of poverty situation may lead to increase the criminal cases of daily life in that area.

(d) Poverty Index

One of the measures of the extent of poverty is poverty index. It is the comprehensive measure of poverty, consisting of the existence of poverty, the intensity of poverty and the income inequality. Poverty Index (P) is calculated by the product of "the head-count ratio (H) multiplied by the income-gap ratio (I) augmented by the Gini coefficient (G) of the distribution of income among the poor weighted by (1 - I)".

Equation for the measure of Poverty Index in Maubin District is as follows:

$$\text{Poverty Index } (P) = [I + (1 - I)G] H$$

If P is "0", there is no poverty or no poor household in the region, meaning that everyone has an income greater than the income level of poverty line. If "P" is 1, everyone has zero income, no consumption, but it is non sense. Therefore, P will never be 1. Poverty index of the study area is shown in Table 4.15.

Table (4.15) Poverty Index of Maubin District

Township	Poverty Index (P)
Maubin District	32.2
Maubin Township	29.1
Nyaung Don Township	32.5
Pantanaw Township	31.7
Danuphyu Township	34

Source: Own Compilation based on Survey Data (2018)

Poverty index is 32.2 percent in Maubin District. It gives the proportion of population that requires to reach above the poverty line. It means that with the consideration of the equal income distribution, the required proportion of population to achieve that everyone is above the poverty line is 32.2 percent of population. The targeted population for reducing poverty in Maubin District is about 32.2 percent of total population with the consideration of equal income distribution.

In brief, it is interpreted that in Maubin District, the indicator of income inequality, which is Gini coefficient, is 0.5966. It indicates that there is a severe income gap, and it is interpreted that some social tensions are growing there. Once job opportunities are scarce in the study area, some household heads have to migrate out for their living. The existence of poverty is specified that 45.9 percent of population is the poor while 54.1 percent is the non-poor. Intensity of poverty is stated by the poverty gap of 0.2771 that 27.71 percent of poverty line consumption expenditure level, 156844.14 Kyats per capita a year is the required budget allocation for reducing poverty. There is a severity of poverty with the squared poverty gap index 0.1302. It means that 13.02 percent of total population is the poorest. The study reveals that the poorest households that is 13.02 percent of population should be the prioritized as the targeted group for taking action of poverty reduction. Finally, the proportion of total population required to reach above the poverty line is 32.2 percent of population with the consideration of income equality. Therefore, it is concluded that 32.2 percent of total population is required to consider as the targeted persons to reach out to the help for moving above the poverty line consumption level.

4.5 Causes of Poverty

Poverty is viewed as not only the aspect of lack of access to resources and income opportunity, but also as the other aspects of social positioning, such as geographical location, age, gender, class, ethnicity, community structure, decision making process and political issues (Yodmani, 2001). Poverty is created by the community level characteristics, economic characteristics and social characteristics. Household size, age structure, gender of the household head, education level of the household head, and toilet condition are considered as the Social Characteristics. Economic Characteristics include the employment status and land ownership. Electricity access and the availability of clean water are considered as the community characteristics. The study will see how these characteristics correlate either a positive or negative relationship with poverty.

4.5.1 Model Specification

In order to examine the determinants of poverty, the Binary Logistic Regression Analysis is applied on the 1663 sample households' income and expenditure. It is a prognostic model that is fitted where there is a binary dependent variable. Since logistic regression analysis calculates the probability of an event occurring over the probability of an event not occurring, the impact of independent variables is usually explained. The Binary logistic regression analysis is applied to determine the significant predictors of the social characteristics, economic characteristics, and community characteristics with respect to per capita consumption expenditure. These characteristics are considered as independent variables while poverty status based on per capita consumption expenditure is regarded as the dependent variable.

Cross-classification distribution and Chi-square test for bivariate analysis are used to investigate the household, economic and community characteristics associated with the dependent variable. The association between the dependent and independent variables is tested with the Pearson Chi square test. In this analysis, Hosmer-Lemeshow test, Omnibus test, Cox and Snell's R squared and Nagelkerke R squared are applied for the overall model evaluation of logistic regression. The likelihood ratio test based on model deviance is used to test the significance of logistic regression coefficients. In addition, Wald test is also used to test the significance for the coefficients in the logistic regression model.

Binary Logistic Regression Model on these characteristics is written as follows:

$$P(y=1)=\frac{e^{Z}}{1+e^{Z}}$$

$$\text{Prob } (y=1) = \frac{e^{z}}{1+e^{z}}$$

y = binary dependent variable (y=1 if poverty status occurs, otherwise 0)

$z = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \ldots + \beta_p X_p$

X = Independent Variables

Where, X_1 = Gender of household head

= 1 if female

= 2 if male

X_2 = Age of household head

= 1 if below 30 years

= 2 if 30-39 years

= 3 if 40-49 years

= 4 if 50 years and above

X_3 = Educational level of Household Head

= 1 if below primary level and primary level

= 2 if middle level

= 3 if high level and above

X_4 = Household size

= 1 if 1 to 3 members

= 2 if 4-6 members

= 3 if above 6 members

X_5 = Toilet condition

= 1 if an open space or non fly-proof

= 2 if fly-proof toilet/latrine

X_6 = Occupation of Household Head

= 1 if non-general worker

= 2 if general worker

X_7 = Farm land ownership

= 1 if farm landless

= 2 if farm land owner

X_8 = Housing condition

= 1 if wood and brick

= 2 if hut

X_9 = Electricity access

= 1 if use of National Grid electricity

= 2 if no access to National Grid electricity

X_{10} = Water availability

= 1 if unclean water

= 2 if clean water from tube, well and rain

Cross classification distribution and Chi square test for bivariate analysis is used to examine whether these independent variables are associated with poverty status or not.

4.5.2 Association between Poverty Status and Characteristics

An association test is required to distinguish whether there is a relationship between dependent variables and independent variables or not. Chi-square test is done in order to determine the association of the household characteristics, economic characteristics and the community characteristics with respect to the poverty status. Chi square test is required to use for testing whether there is an association between the independent variables and the poverty status. Characteristics include gender, age and years of schooling of the household heads, family size, occupation of household head, land ownership, housing condition, toilet condition for sanitation, electricity access and the availability of water. The association between these characteristics and poverty status is tested as shown in Table 4.16.

Table (4.16) Association between Poverty Status and Characteristics

Variables	Classification	Event		Pearson Chi-Square	P-value
		Non-poor	Poor		
Sex	Female	321(19.3%)	69 (4.1%)	163.04	0.000
	Male	579 (34.8%)	694 (41.7%)		
Age	Below 30 years	19 (1.1%)	26 (1.6%)	13.19	0.004
	30-39 years	113 (6.8%)	64 (3.8%)		
	40-49 years	213 (12.8%)	217 (13%)		
	50 years and above	555 (33.4%)	456 (27.4%)		
Family Size	1-3 members	406 (24.4%)	63 (3.8%)	347.26	0.000
	4-6 members	446 (26.8%)	488 (29.3%)		
	Above 6 members	48 (2.9%)	212 (12.7%)		
Education Status	Below primary level & primary level	315 (18.9%)	390 (23.5%)	46.95	0.000
	Middle level	380 (22.9%)	263 (15.8%)		
	High level and above	205 (12.3%)	110 (6.6%)		
Occupation	General worker	324 (19.5%)	323 (19.4%)	6.97	0.009
	Non-general worker	576 (34.6%)	440 (26.5%)		
Farm Land	Land owner	288 (17.3%)	40 (2.4%)	186.72	0.000
	Landless	612 (36.8%)	723 (43.5%)		
Housing Condition	Hut	763 (45.9%)	692 (41.6%)	13.21	0.000
	Wood and brick	137(8.2%)	71 (4.3%)		
Toilet Condition	Non-fly proof toilet (Open Space)	73 (4.4%)	67 (4%)	0.24	0.658
	Fly proof toilet	827 (49.7%)	696 (41.9%)		
Electricity	Use national grid	73 (4.4%)	32 (1.9%)	10.711	0.001
	No access to national grid	827 (49.7%)	713 (44%)		
Availability of Clean Water	Clean water availability	616 (37%)	457 (27.5%)	13.19	0.000
	Unclean water availability	284 (17.2%)	306 (18.4%)		

Source: Own Compilation based on Survey Data (2018)

According to the result of Table (4.16), out of total sample population, 69(4.1%) of the female headed households and 694 (41.7%) of male headed households are poor. There is an association and a relationship between gender of household characteristics and poverty at 1 % significant level.

Concerning with the aspect of the age of the household head, the result shows that among the total sample population, 26 (1.6%) of household heads who are younger than 30 years old, 64 (3.8%) of household heads whose ages are from 30 years to 39 years, 217 (13%) of household heads who are old 40 years to 49 years, 456 (27.4 %) of household heads who are old 50 years and above are the poor. The Pearson Chi Square test shows that there is an association between the age of the household heads and the poverty status, meaning that there is a relationship between age of the household head and poverty at 1% significant level.

Regarding the family size, 63 (3.8%) of sample household heads who have 1 to 3 family members, 488 (29.3%) of household heads who have 4 to 6 family members and 212 (12.7%) of household heads who have above 6 family members are poor. According to the result of Chi Square test, there is an association between family size and the poverty status. Family size factor is related with poverty at 1% significant level.

In terms of education level, the result shows that 390 (23.5%) of household heads with below primary level and primary education level, 263 (15.8%) of household heads who are more educated with middle education level and 110 (6.6%) of household heads who have finished high and higher level of schooling were living in the poverty. The result of the Pearson Chi Square shows that there is an association between education level of household heads and poverty. Education level of household head is the factor that is related with poverty at 1 % significant level.

Regarding the employment status, household heads whose occupation level of general workers 323 (19.4%) and household heads who are working as other types of jobs 440 (26.5%) are poor. There is an association and a relationship between general worker occupation type of household heads and poverty at 1 % significant level.

In terms of the characteristics of farm land ownership, 40 (2.4%) of land owner household heads and 723(43.5%) of landless household heads are poor. The result of the Pearson Chi Square shows that there is an association between farm land ownership and poverty. Farm land ownership of household head is related with poverty at 1 % significant level.

Regarding with electricity access, 32 (1.9%) of households that use the national grid electricity access and 713 (44%) of households that do not use the national grid are poor. According to the result of Pearson Chi Square analysis, there is an association between electricity access and poverty at 1 % significant level.

For the availability of clean water, 457 (27.5%) of households that have clean water availability and 306 (18.4%) of households that do not have clean water availability are poor. Due to the result of Pearson Chi Square analysis, there is an association between the availability of clean water and poverty at 1 % significant level.

In terms of housing condition of the household, 692 (41.6%) of households whose houses are low quality housing condition and (4.3%) of households who are living in the wood and brick housing are poor. The result of the Pearson Chi Square shows that there is an association between housing condition of the households and poverty.

However, due to the result of Pearson Chi Square analysis, there is no association between the toilet condition and poverty.

4.5.3 Estimation Results

The binary logistic regression model is applied in order to analyze the determinants of poverty or causes of poverty. The model is tested with fitting criteria as shown in Table (4.17).

Table (4.17) Model Fitting Information for the Causes of Poverty

Fitting Criteria	Chi Square	d.f	P-value
Hosmer and Lemeshow Test	10.337	8	.242
Omnibus Tests of Model Coefficients	769.139	14	.000
Cox & Snell R Square	0.370		
Nagelkerke R Square	0.495		
The overall correct percentage	78.8%		

Source: Own Compilation based on Survey Data (2018)

It is necessary to assess the significance of the variables with regards to predict the response variable. There are a number of statistical methods that can be used to carry out the assessment.

Hosmer-Lemeshow goodness of fit test, Omnibus test, Wald test are used in order to carry out the assessment of goodness of fit of the number of predictors. These test statistics are distributed as chi-square with degrees of freedom equal to the number of predictors. According to the results of Table (4-17), the values of R square 0.370 (Cox and Snell R square) and 0.495 (Nagelkerke R square) indicate that 49.5 % of the variation in poverty status can be explained by the variation of independent variables of social characteristics, economic characteristics and community characteristics. The overall percentage classification indicates that 78.8 % of the social characteristics, economic characteristics and community characteristics are predicted correctly. As shown in Appendix J, the result of Chi-square statistics for Omnibus Tests of Model Coefficients is 769.139 with the p value of 0.000, and the model is significant at 1% level. Since -2log likelihood statistics was 1524.970, the estimation terminated at iteration number 5 because parameter estimates changed by less than 0.001. It can be said that the existence of a relationship between the dependent variable and independent variables is supported to the analysis. The result of Hosmer and Lemeshow statistic shows Chi-square 10.337 with 8 d.f, and p value of (0.242) that is greater than 0.05. It is not significant at 5 % and above level. It indicates that the model is good fit and there is no evidence for lacking of fit of the model.

The parameter estimates for the household characteristics, economic characteristics and community characteristics in Binary Logistic model of the poverty status are shown in Table 4.18.

Table (4.18) Regression Results of Estimate

Variables	B	S.E.	Wald	Sig.	Adjusted Odd Ratio	95% C.I.	
						Lower	Upper
Constant	-2.102	0.560	14.064	0.000***	0.12		
Gender							
Female (ref)							
Male	1.574	0.170	85.994	0.000***	4.83	3.461	6.733
Age							
Below 30 years (ref)							
30-39 years	-1.677	0.438	14.654	0.000***	0.19	0.079	0.441
40-49 years	-1.462	0.410	12.689	0.000***	0.23	0.104	0.518
50 years and above	-1.273	0.397	10.264	0.001***	0.28	0.129	0.610
Family size							
1-3 members (ref)							
4-6 members	2.288	0.182	158.84	0.000***	9.86	6.907	14.074
Above 6 members	3.678	0.249	217.83	0.000***	39.55	24.269	64.453
Education condition							
Below primary level & primary level (ref)							
Middle level	-0.285	0.143	3.978	0.046**	0.75	0.569	0.995
High level and above	-0.279	0.180	2.405	0.091*	0.76	0.532	1.076
Occupation							
Non-general Worker (ref)							
General Worker	0.497	0.138	13.020	0.000***	1.64	1.255	2.154
Farm Ownership							
Landless (ref)							
Farmland owner	-2.359	0.202	137.04	0.000***	0.09	0.064	0.140
Housing condition							
Wood and brick (ref)							
Hut	0.170	0.216	0.623	0.430	1.19	0.777	1.811
Electricity access							
Use national grid (ref)							
No access to national grid	1.045	0.276	14.329	0.000***	2.84	1.655	4.885
Toilet condition							
Non-fly proof toilet (ref)							
Fly proof Toilet	-.474	.248	3.650	0.056**	0.62	0.382	1.012

Variables	B	S.E.	Wald	Sig.	Adjusted Odd Ratio	95% C.I.	
						Lower	Upper
Water availability							
Unclean water access (ref)							
Clean water access	-.497	0.139	12.851	0.000***	0.61	0.463	0.798

***, **, * significant at 1% , 5% and 10 %

Source: Own Compilation based on Survey Data (2018)

Female headed household, age of the household head below 30 years, 1 to 3 family size, the primary and lower education level of household head, non-general worker employment type of household head, the farm landless ownership, wood and brick housing, non-fly proof toilet, national grid electricity access and unclean water access are classified into the reference categories for analysis.

Regarding the gender of the household heads, the coefficient of male household head is 1.574 at 1 % significant level, and the adjusted odd ratio is 4.83, meaning that male household heads are about 4.8 times more likely to happen poverty than those of female headed households when the influence of other predictors is held constant. Similarly, the descriptive analysis shows that the proportion of female living in the poverty status is 4.1 percent of total households and that of male is 41.7 percent of total households. Among the poor, female contributes to 9 percent while male includes in 91 percent reflecting that male headed household may influence on poverty more than that of female. Moreover, male headed households contribute to a larger proportion 76.5 percent of total population than female headed households. These facts describe that the factor of male headed households has a significant role in affecting the livelihood of households being poor and more likely to happen poverty than female headed households in Maubin District. The study finds that male headed households have increased the poverty status of households. This finding of the study is different from that of the other studies in which there is a very little difference in the poverty rate between households headed by female and households headed by male (World Bank Group and Ministry of Planning and Finance, 2017). The different result of the study may be influenced by the skewed distribution between male headed households and female headed households of the samples.

With respect to the age of the household heads, the coefficient of the age of household heads ranging from 30 to 39 years is -1.677 at 1 % significant level, and the

adjusted odd ratio is 0.187. The coefficient of the age of household heads ranging from 40 to 49 years is -1.462 at 1 % significant level, and the adjusted odd ratio is 0.232. The coefficient of the age of household heads 50 years and above is -1.273 at 1 % significant level, and the adjusted odd ratio is 0.280. It describes that age of the household heads from 30 to 39 years, 40 to 49 years and 50 years and above ages are over 0.81 times, 0.77 times and 0.72 times less likely to happen poverty respectively as compared to those of below the age of 30 years when the influence of other predicators is held constant. Household poverty has been decreased by the household heads who have older ages than those of below 30 years. The results of descriptive analysis show that among the age groups, the proportion of household heads who are 50 years and above age to total sample household heads 33.4 percent is non-poor that is the largest. That proportion of non-poor household heads who are 40 years to 49 years old to sample household heads 12.8 percent is the second largest proportion while that proportion of 30 years to 39 years is 6.8 percent. These two age groups ranging from 40 years to 49 years and 50 years and above may influence and may have the matured life experience on income generation more than that of other age groups. Middle adult household heads have more chance to increase the income generation. Therefore, the result shows that the older aged household heads who are 50 and above 50 years have decreased the household poverty more than that of other younger household heads.

Regarding the family size the coefficient of household heads with 4 to 6 family members is 2.288 at 1 % significant level, and the adjusted odd ratio is 9.86. The coefficient of household heads with above 6 family members is 3.678 at 1 % significant level, and the adjusted odd ratio is 39.55. The households which have 4 to 6 family members and above 6 family members are about 10 times more likely and 40 times more likely to happen poverty respectively than those with 1 to 3 family members when the influence of other predicators is held constant. Descriptive analysis shows that the proportion 29.3 percent of total sample households that have 4 to 6 family members and that of above 6 family members 12.7 percent is the poor. The proportion of households that have 4 to 6 family members contributes to 64 percent of total poor households, and the proportion of households that have above 6 family members 27.8 percent is included in the total poor households. It means that the poor are more likely to live in the families with 4 to 6 family members and larger than 6 family member size. A smaller family has a more chance to generate the lower income earning for their survival than a larger family. Households that have a larger family size 4 to 6 and above

6 members have increased the poverty situation of households than that of other households that have smaller family size.

For the education level of household heads, the coefficient of household heads whose education level is middle level is -0.285 and the adjusted odd ratio is 0.75 at 5% significant level. The coefficient of household heads who have high level and above is -0.279 and the adjusted odd ratio is 0.76 at 10% significant level. Therefore, the result shows that household heads whose education level is middle level and high level and above are 0.25 times and 0.24 times less likely to happen poverty than those with primary and lower education level when the influence of other predicators is held constant. The result shows that in Maubin District, the common education level is the primary education level at the rate of 42.4 percent, which is the largest rate. According to the result of descriptive analysis, the proportion of poor household heads who finished the primary education level contributes 51 percent to total poor households that is the largest portion, and that of secondary education level is 34.5 percent while that of high and higher level is 14.5 percent of household heads. Therefore, middle, high and higher education level of household heads have reduced the poverty status of households as compared to primary education level.

Employment status is an important factor for income generation. Most of the household heads are doing as the general workers, which are the informal sector low wage job workers. In the regression analysis, the coefficient of general worker type of jobs is 0.497, and the adjusted odd ratio is 1.64 at 1% significant level. It indicates that employment type of general worker is over 1.6 times more likely to happen poverty than other job types of household heads when the influence of other predicators is held constant. The result of descriptive analysis shows that 36 percent of household heads whose occupation is general worker contributes to total non-poor. Those of household heads whose jobs are other than general worker 64 percent are recorded as the proportion of total non-poor. Moreover, a large proportion 38.9 percent of total sample household heads are general workers while 61.1 percent includes other types of occupation namely farmers, government staff, retirees, own business and private sector staff. It shows that the numbers of general worker influence the household income generation. Therefore, the occupation type of general worker has increased the poverty status of households in the study area while household heads who have other types of occupation rather than general worker have decreased the household poverty. It is noted that household heads should get jobs with other highly paid jobs of non-farm sector by

establishing the value-added firms for exploiting the local primary agricultural produce by developing the vocational training and promoting the mass production of primary produce and by taking advantage from labor intensive technology improvement.

Regarding the farm land ownership, the result of regression analysis shows that the coefficient of land owner is -2.359 and the adjusted odd ratio is 0.09 at 1% significant level. It describes that household heads who are land owners are about one time less likely to happen poverty as compared to landless household heads when the influence of other predicators is held constant. Land owner household heads have reduced the poverty status of household while poverty is increased by the landless household heads. The result of descriptive analysis shows that the proportion of landless household heads 43.5 percent of total sample households and the proportion of land owner household heads 2.4 percent of total households are the poor. The landless households contribute to the proportion 94.8 percent of total poor households. On the one hand, the proportion of sample household 80.3 percent is landless that is very large as compared to 19.7 percent of land owners. Therefore, it clearly describes that landless household heads have increased poverty rather than land owner household heads in Maubin District. In this study, the classification of land ownership includes sample households who own farmland. Casual workers and households who do not own farmland are categorized as landless although these households rely on non-farm activities.

In terms of electricity access, the coefficient of household heads who do not get the national grid electricity access is 1.045 at 1% significant level, and the adjusted odd ratio is 2.84. Poverty is about 2.84 times more likely to happen in the households that do not have the national grid electricity access than households with national grid electricity access when the influence of other predicators is held constant. The result of descriptive analysis shows that the proportion 44 percent of total sample households that do not use national grid electricity access is poor, and households that do not use the national grid electricity access are accounted as 93.5 percent of total poor households. Therefore, households that do not have the national grid electricity have increased poverty. National grid electricity power is important for generating the sufficient energy allocation to firms in order to increase productivity and socio-economic development in the study area.

According to the regression result on the toilet condition, the coefficient of household which has the fly proof toilet is -0.474, and the adjusted odd ratio is 0.62 at

5% significant level. It shows that the fly proof toilet condition is about 0.38 times less likely to happen poverty than non-fly proof toilet when the influence of other predicators is held constant. The result of descriptive analysis shows that the proportion of households that use fly proof toilet 49.7 percent of total sample households are non-poor. It contributes to 91.9 percent of total non-poor households and they use fly proof toilet. Therefore, households that use fly proof toilet have decreased poverty in Maubin District. If toilet condition is improved, health condition of household will also be improved, and so it can help improve the socio-economic condition.

In terms of the availability of water, the coefficient of clean water supply service is -0.497, and the adjusted odd ratio is 0.61 at 1% significant level. The result of binary regression analysis shows that households which get the clean water supply service are about 0.4 times less likely to happen poverty as compared to households that do not get the clean water supply service when the influence of other predicators is held constant. According to the descriptive analysis, the result shows that the proportion 37 percent of total sample households that have the clean water supply and 17.2 percent of total sample households that do not have the clean water supply are non-poor. The proportion of household 68.4 percent of total non-poor are households that have the clean water supply. Therefore, the availability of clean water helps households reduce poverty rather than that of unclean water availability.

The significant factors that create poverty are sex of household head, age of the household head, family size, education level of household head, employment type of household head, the farm land ownership, toilet condition, electricity access and clean water availability. They should be regarded as the prioritized factors for policy recommendation of drawing the action plans in the respective economic sectors in order to address the poverty challenge.

CHAPTER V
CONCLUSION

The study analyzes the poverty status in the rural areas of Maubin District. It finds out the income inequality with the measure of Gini coefficient and the derivation of Lorenz curve in order to identify the income inequality and its relationship with poverty. The study examines the poverty status with the measures of the incidence, intensity, severity of poverty and poverty index in the rural areas of Maubin District, Ayeyarwady region, Myanmar analyzing the indicators of Headcount Index, Poverty Gap Index, Poverty Severity Index, and Poverty Index. The study applied the binary logistic regression analysis to examine the causes of poverty based on the primary survey data of social characteristics, economic characteristics and the community characteristics with respect to household consumption expenditure.

5.1 Findings

Conditions, such as sex and age of the household heads, population pressure on family members, low electricity access of national power grid line and primary education or lower education level of household heads, the general worker employment type of non-farm sector, farm landless ownership, non-fly proof toilet condition and unclean water availability are prevalent to create poverty in the study area of Maubin District.

In accomplishing the first objective, to identify the income inequality with Gini coefficient and the derivation of the Lorenz curve of the study area, Gini coefficient in the study area is measured. Gini coefficient in Maubin District is 0.597, meaning that there is a severe gap of consumption, resulting from the severe income gap, and social tensions may be growing there. The larger the Gini coefficient, the greater the income inequality in the income distribution. There is an unequal distribution of income at the rate of 59.7 percent. One fifth, 20 percent of households of the lowest quantile take in

4 percent share of total consumption expenditure while top 20 percent of households use 76 percent share of total consumption expenditure, which is 19 times larger. Gini coefficient in each township is not much different from each other. The study shows that there is a high rate of income inequality of average income. Therefore, income redistribution programme should be considered in order to get the narrow gap of household income and consumption expenditure.

The indicators and situation provide the objectives to analyze the extent of poverty status with the measures for the incidence, intensity, severity of poverty and poverty index in the rural areas of Maubin District. Benchmark data minimum consumption expenditure of poverty line for Maubin District in 2018 is determined at 1551 Kyats per capita a day. It is consistent with 1590 Kyats, the determination of poverty line for the union level in 2017. It shows that per capita consumption expenditure in rural area of Maubin District, Ayeyarwady region is less expensive than that of union level. The study measures the poverty rates, such as Headcount index, Poverty gap index, Squared poverty gap index and Poverty index. Based on the results, headcount ratio or poverty rate is 45.9 percent in Maubin District, meaning that 45.9 percent of population is poor while 54.1 percent is regarded as non-poor in Maubin District.

The overall poverty gap value is 156844.1 Kyats, and poverty gap index is 0.2771 in Maubin District, showing the depth of poverty. It is interpreted that 156844.1 Kyats per each poor person a year will be required for the cost of bringing poor people up to the poverty line that can be seen as the potential saving for reducing poverty. Income gap ratio or poverty gap ratio shows the percentage of their mean income shortfall from the poverty level. Among four townships, the poverty gap index in Danuphyu Township is the highest while it is the lowest in Maubin Township.

The poverty severity index is 0.1302, showing the severity of poverty, and 13.02 percent of total population are the poorest households in Maubin District. It describes that the most vulnerable or the poorest households are considered as the first prioritized group of households in order to take into account the preparation of action plan. If they are ignored, the poorest situation may persist, and it may be transformed into the chronic poverty, creating the criminal cases.

Poverty index in Maubin District is 0.322. It gives the proportion of population, that requires to reach above the poverty line. The required proportion of population to achieve that everyone is above the poverty line is 32.2 percent of total populations with

the consideration of the equal income distribution. They should be regarded as the second prioritized group of households.

Regarding the objective, to analyze the causes of poverty, the Binary Logistic Regression Analysis is applied on the 1663 sample households' social characteristics, economic and community characteristics with respect to consumption expenditure.

According to the binary logistic regression results, gender of the household head, age of the household head, education of the household head, family size, occupation type of general worker, the electricity access, toilet condition and water availability are the significant predictors of the poverty status. Regarding the gender of the household heads, male household heads are more likely to happen poverty than those of female headed households cet.par. Poverty has increased by male headed households in Maubin District. Most of the male and female household heads are doing their living as general workers, such as daily wage earners in farming, construction works, fishing, gardening for betel, chili and vegetables, grocery shop keepers, livestock breeding and vendors. Some female household heads are working in the jobs of sewing machine earners. On the one hand, the number of male household heads contributes 76.5 percent to total sample households. Therefore, male household heads can enhance household income generation if they are skilled workers working in the highly paid jobs. On the other hand, the result is likely to be influenced by the effect of the limitation of random sampling method for selecting sample between male and female headed households.

With respect to the age of the household heads, age of the household heads from 30 to 39 years, age from 40 to 49 years and 50 years and above ages are less likely to happen poverty as compared to those of below the age of 30 years when the influence of other predicators is held constant. On the one hand, the age limit of the household heads ranging from 50 years and above is the largest portion 60.8 percent, and 40 to 49 age limits is the second largest 26.7 percent. The number of household head whose age is ranging from 30 to 39 is 10.6 percent. Household head whose age is older than 30 years has reduced poverty.

Regarding the family size, the households which have 4 to 6 family members and above 6 family members are more likely and 40 times more likely to happen poverty respectively than those with 1 to 3 family members when the influence of other predicators is held constant. It means that the poor are more likely to live in the 4 to 6 family members and larger than 6 family member size. Household poverty has been

increased by households that have 4 to 6 family size and 6 and larger than 6 family members.

For the education level consideration, household heads whose education level is middle level and high level and above are less likely to happen poverty than those with primary and lower education level when the influence of other predicators is held constant. However, in the study area, the common education level is the primary education. Middle education level, high and higher education level of household heads have reduced household poverty.

Regarding the employment status, the study describes that among the six occupation types, such as retired, farmer, general worker or causal worker, government staff, own business and private staff, most of the household heads 38.9 percent are working as the wage workers or the general workers of informal sector, which gives low wages. General workers consist of vendors, construction workers, daily wage workers of informal sector. Moreover, since landless agricultural workers are working as daily wage workers of the farm land owners, they are also considered as general workers. According to the Binary Logistic Regression result shows that employment type of general worker is over 1.6 times more likely to happen poverty than other job types of household heads, cet.par. The result shows that employment type of general worker is more likely to happen poverty than other job types of household heads when the influence of other predicators is held constant. It indicates that household heads whose occupation is general workers have increased poverty. The study is likely influenced by the limitation of sampling data and classification of types of employment. Therefore, household heads should get the highly paid jobs for processing industries of agricultural and fishery locally produced goods and garment industries.

In terms of land ownership condition, the result of Binary Logistic Regression model shows that the coefficient of land owner is -2.359 with the adjusted odd ratio of 0.09 at 1% significant level. It describes that household heads who are land owners are about one time less likely to happen poverty as compared to landless household heads, cet.par. Land owner households have reduced poverty. The result means that the possibility of poverty with respect to landless may be occurred by the effect of combination factors with other factors such as family size, retiree, government staff, private firms dealing jobs and general workers. It is only based on the assumption that the classification of landownership whether all sample households are landless or not, and the relationship between the land ownership and the poverty status is considered.

The study is likely influenced by the limitation of sampling data and classification of landlessness.

Regarding the electricity access, poverty is more likely to happen in the households that do not have the national grid electricity access than households with national grid electricity access when the influence of other predicators is held constant. In the study area, descriptive analysis shows that the low proportion of household 6.3 percent is using the national grid electricity access. Poverty has been increased in the households that do not have national grid electricity access.

According to the regression result on the toilet condition, household that uses the fly proof toilet condition is less likely to happen poverty than that of non-fly proof toilet when the influence of other predicators is held constant. Households that are using fly proof toilet have decreased household poverty. Finding shows that there is 8.4 percent of population who are still using non-fly proof toilet.

In the study area, clean water availability is in the good condition. Households which get the clean water supply service are less likely to happen poverty as compared to households that do not get the clean water supply service cet.par. The availability of clean water has reduced poverty.

The significant factors that affect poverty status must be regarded as the prioritized factors handling the plans of policy actions for the poverty reduction programme.

5.2 Recommendations

In order to improve the economic situation of individual households and the regional economic development, it is necessary to conduct the action plans with the appropriate recommendations for the integrated and inclusive growth by transforming the economic sector and building the agro-based industrial development in the study area compiling the tangible and intangible investment in education sector, industrial sector and agricultural sector. Based on findings, the study suggests four effective ways to address the challenge of poverty by applying the income redistribution programs, by helping poor households develop the income-generating businesses with high wages or salaries, by improving the performance of education sector and innovation and by facilitating the infrastructure development for the electricity access, the availability of clean water supply and farm land access.

Findings show that inequality expressing the Gini coefficient is 0.597, and there is an unequal distribution of income at the rate of 59.7 percent. Top 20 percent of households use 76 percent share of total consumption expenditure, and bottom 20 percent households in the lowest quantile take in 4 percent share of total consumption expenditure. The consumption share of top 20 percent households is 19 times larger than that of bottom 20 percent households. It shows that there is a high rate of income inequality of average income, and severe income gap. Therefore, local government and the central government should take into account the income redistribution programme, such as food stamps, medical and earned income tax credit for temporal short-term plan, progressive taxation program that transfers income from the richer to the poorer, and policies related to adjust the minimum wage rate for general workers annually with the minimum requirement of individual wellbeing and setting the price floor programme for farmers in order to get the narrow gap of household income and consumption expenditure.

The study finds out the existence of poverty with the measure of headcount index 45.9 percent revealing that 45.9 percent of households is poor. The intensity of poverty or the poverty gap index is 0.2771, and the severity of poverty or poverty gap squared index is 0.1302 explaining the poorest rate of 13.02 percent. The poverty index is 0.322, identifying 32.2 percent of population that everyone requires to shift above the poverty line.

After realizing the income inequality and the extent of poverty with the measures, the study analyzes the causes of poverty by using the Binary Logistic Regression Model. Analysis shows that gender of the household head, age of the household head, education of the household head, family size, occupation of household heads, farm land ownership, the electricity access, toilet condition and availability of water supply are the significant predictors of the poverty status.

Based on the findings of regression analysis, male household heads are 4.8 times more likely to happen poverty. Therefore, male household heads must be the targeted group members for increasing their income generation. Labor-intensive fishing firms, and agro-based industries should be considered as the establishment of the Supply Chain Industries for the sake of implementing the Inclusive Business (IB) model because there are many plantations of vegetables, fishing ponds and rice fields in Maubin District. Inclusive Business is expected to the development of agricultural produces, manufacturing industries and market access for the effective distribution of

products. Therefore, both of the local authority and the central authority should promote the opportunities for the development of small and medium scale enterprises, such as promoting the existing fishing firms and agro-based industries as the policy actions, and extend the market share of the local produced goods.

In addition, the age of household heads from 30 to 39, 40 to 49 years and 50 years and above are over 0.81 times, 0.77 times and 0.72 times respectively less likely to happen poverty. On the one hand, the results of descriptive analysis show that most of the household heads are in the adult age group, reflecting that there is a population bonus for driving the growth procedures in the study area. Middle adult household heads have more chance to increase the income generation by providing the highly paid job opportunities, such as non-firm agro-based industries. However, most of the household heads 38.9 percent are working as general workers or informal sector workers, which give the low wages for their living. It should take an advantage of having population bonus that should be utilized efficiently in the productive industries. Therefore, it is necessary to take a comparative advantage of the abundant labor by establishing the value-added processing and manufacturing industries of agro-based produces.

In terms of family size, the households that have 4 to 6 family members and above 6 family members are about 10 times more likely and 40 times more likely to happen poverty respectively. It means that in the study area, a larger family that has 4 to 6 and above 6 family members has increased household poverty as compared to households with 1 to 3 family members. A smaller size family needs lower living cost to take care the survival of their family members than that of larger size family. However, a larger family size household has the better opportunity than the smaller size family if all of the family members are equipped with good health, skills, better job opportunity and qualified education. In addition, if all family members have highly paid jobs, per capita income may be sufficient for their survival though the size of the family is large enough. Therefore, it shows that type of occupation and capacity of household heads are also important for income generation of household. With the collaborative action of business, local authorized persons and development partners, the opportunities for getting highly paid jobs, high skilled and healthy community should be provided.

Job opportunity is one of the important factors for income creation by utilizing the chance of labor-intensive job opportunities. Employment type of general worker is over 1.6 times more likely to happen poverty in the study area. For the consideration of

improving the income generation of larger size family, the creation of the highly paid jobs by establishing the mass production and by establishing the fishing firms is expected as the required action plan of recommendation.

Regarding the education situation, household heads whose education level is middle level and high level and above are 0.25 times and 0.24 times less likely to happen poverty. Middle level, high and higher education levels have a negative effect on poverty. On the other hand, the descriptive analysis shows that the numbers of household heads whose education level is middle or higher education level are less than those of primary education level. The primary education level of household heads in the study area is common so that more educated household heads should be accumulated.

On the one hand, education level of household head is closely linked to the type of employment. The common occupation type in the study area is found as general worker, which is low paid jobs, and their jobs provide low-income generation. If household heads have equipped with highly skilled level, they will get jobs with better salaries. Therefore, the education level of household heads is important for increasing their income generation, and hence, the provision for the development of more educated household heads, and highly paid job creation are considerable actions for promoting income generation in the study area. These activities should be accomplished by the collaborative action among domestic and international private enterprises, local authority and the central authority. Voluntary agencies or Non-Government Organizations should be encouraged to organize and give assistance for the proper implementation of taking poverty challenge.

In addition to the consideration of increase in economic situation with highly paid job creation, education level or capacity development in the productive sectors should be consistently implemented. The background situation of education sector shows that the numbers of schools have been developing. However, the vocational school is lack in the study area, so investment and technological innovation should be necessarily promoted for supporting the establishment of highly paid job opportunities in the future. The supporting of vocational training, the providing of practical training and techniques for labor intensive factories, and inputs for agricultural production should be provided for establishing the agro-based value-added industries. Both of the basic and advanced trainings for developing the suitable and respective economic activities by exploiting the raw materials produced in the study area are also required.

Maubin district has the special advantage getting from fishing and fishery products. For accomplishing these processes, the on-job training programme, mass production of agricultural produces, fishing firms and agro-based value-added industries are regarded as the development of industrial cluster with internal linkages in Maubin District. Agro-based industries for value added products should necessarily be engaged by the collaborative actions among local authority, central authority and the private entrepreneurs.

In this context, technology development is also required for establishing the value added agro-based industries. Employment creation of highly paid jobs, skill of labor, and technology improvement through borrowing technology and induced investment in technology are closely related with education sector development. Better education of both boys and girls in remote areas should be cultivated in order to create the skilled workforce, more self-employed persons and more highly paid jobs for developing the agro-based value-added industries. Therefore, a combined use of local participation in planning with the utilization of locally available labor, skills, technology, raw materials is a favorable and an appropriate work method for the answer of poverty challenge. In addition, a proper and an effective financial access via credit is a way to be productive if they are used up efficiently in the firms. Market for local products should be opened, and local authorities should find the way of market extension. Establishing the industries and firms within Maubin District should be achieved by the negotiation between local authority and private enterprises. Therefore, all of the family members are expected to employ in highly paid jobs.

For considering the health condition, the Binary Logistic Regression Model analysis indicates that fly proof toilet condition is significantly correlated with poverty status, and it is about 0.4 times less likely to happen poverty. The proportion of household 8.4 percent is still using the open type toilet. It is not the good habit for the health care condition. It must be eliminated to become better environment in good health. If it is ignored to do so, the bad infectious diseases may create and occur the chronic poverty. Toilet usage is one of the important factors of health care and good living standard. Health care improvement is also favorable to uplift the quality of life for the sake of improvement in social security. When health improved, more output could be produced with any given combination of skills, physical capital, and technical knowledge. A healthier person is more efficient in producing goods, services, and new ideas, and hence in his or her ability to innovate. Basic health care awareness raising

programme for using the fly proof toilet is the best practice for the improvement of living standard of the poor in the short term as well as in the long-term so that a plan for using the fly proof toilet can be expected as a project for upgrading the living standard in the study area. These activities can be achieved by the collaborative action among domestic enterprises, local authority and voluntary agencies for the proper implementation of taking poverty challenge.

With respect to electricity access, the households that do not have national grid electricity access are about 2.84 times more likely to happen poverty as the development of electricity access from the national grid will alleviate these above issues. Reciprocally, the lack of electricity may create the backward effect to social, education, health, economic and environmental issues. Productive activities are hindered by the lack of electricity access from the national grid. Therefore, the plan for electricity access development is also one of the prioritized actions. Hence, the creation of the highly paid jobs or high salaries are expected to call for the high demands of inclusive growth plan preparation, which consists of industrial development, agricultural development, education and health sector development, and infrastructure development. Therefore, investment in electricity infrastructure access is needed more in order to achieve the efficient and effective productivity growth and the elimination of environmental degradation.

Household heads who are land owners are about one time less likely to happen poverty. In order to address the poverty challenge and to improve the household income generation, landlessness issue should be considered as one of the policy actions since 80.3 percent of households are found as the landless households. Vertical expansion land reform programme is considerable as a suitable way of thought.

The result of binary regression analysis shows that households which get the clean water supply service are about 0.4 times less likely to happen poverty as compared to households that do not get the clean water supply service cet. par. Clean water availability has reduced poverty in Maubin District. Regional development policy and plan for clean water supply should be sustained providing more in the study area.

In conclusion, above mentioned sectors, such as Agricultural Sector and Industrial Sector for establishing the Agro-based industries, Supply Chain Industries for establishing the inclusive business, Labor Intensive Industries, Education and Health Sector and Infrastructure Sector for national grid electricity access, farm land access and water supply should be prioritized to implement within the framework of

promoting opportunity, facilitating the engagement of the local, central and the private enterprises, and enhancing the economic and social security. On the one hand, local government and the central government should take into account the income redistribution programme for the sake of promoting the lower income earners' consumption expenditure. The policy recommendations done by the study on the analysis of poverty should be considered in drawing the regional policy and planning procedures for tackling the poverty challenges in the rural areas of Maubin District. The stimulating overall growth plans by building up the capacity of labor via on job training and vocational schools, creation of job opportunities, skills, national grid electricity access, farm land access, the plan for fly proof toilet usage and water supply are the important implication as the policy recommendations for the rapid and inclusive growth centered in the rural study area of Maubin District.

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APPENDIX -A

Demographic Data in Danuphyu Township

Village Tracks	No. of Houses	No. of Households	Population				Density
			Male	Female	Total	Growth Rate	
(18) Quarters	5084	4970	10841	12503	23344	1.1	863
(63) Villages	39026	39384	80994	85807	166801		
Total	441110	44354	91835	98310	190145		

Source: General Administration Department, Maubin District (2018)

Demographic Data in Pantanaw Township

Village Tracks	No. of Houses	No. of Households	Population				Density
			Male	Female	Total	Growth Rate	
(4) Quarters	3421	3533	9361	10516	19877	1.01	592
(52) Villages	46348	46908	123757	128757	252514		
Total	49769	50441	133118	139273	272391		

Source: General Administration Department, Maubin District (2018)

Demographic Data in Nyaung Don Township

Village Tracks	No. of Houses	No. of Households	Population				Density
			Male	Female	Total	Growth Rate	
(10) Quarters	5524	5462	10995	12614	23609	1.2	739
(44) Villages	41428	41741	86030	89135	17516		
Total	46952	47203	97025	10174	19877		

Source: General Administration Department, Maubin District (2018)

Demographic Data in Maubin Township

Village Tracks	No. of Houses	No. of Households	Population				Density
			Male	Female	Total	Growth Rate	
(12) Quarters	7776	7789	19145	21771	40916	1.02	771
(76) Villages	58616	58846	137221	142159	279380		
Total	66392	66635	156366	163930	163930		

Source: General Administration Department, Maubin District (2018)

Demographic Distribution in Maubin District

Township	Total Population	Density (Per sqmile)	Growth Rate (%)
Maubin	314093	771	1.02
Pantanaw	278737	592	1.01
Nyaung Don	215906	739	1.2
Danuphyu	179,806	863	1.1
Total	988542	599	1.1

Source: General Administration Department, Maubin District (2018)

Household Head Labor Migration

Labor Migration of HHH	Maubin	Pantanaw	Nyaung Don	Danu Phyu	Total
No Migration	472 84.4%	246 71.1%	288 59.1%	175 64.6%	1181 71%
International Migration	14 2.5%	22 6.4%	13 2.7%	21 7.7.%	70 4.2%
Local Migration	73 13.1%	78 22.5%	186 38.2%	75 27.7%	412 24.8%
Total	559	346	487	271	1663

Source: Own compilation from survey data (2018)

APPENDIX - B

Gross Domestic Product and Per Capita Income in the Maubin District

At 2010-2011 constant price **(Kyat Millions)**

Sr.	District/ Township	2014-2015	2015-2016	Growth Rate %	2016-2017	Growth Rate %	2017-2018	Growth Rate %
	Maubin District							
	GDP	**949104.7**	**973465.3**	**2.6**	**979101.6**	**0.6**	**1030820.3**	**5.3**
	Per Capita Income	**1108060**	**1173624**	**5.9**	**1257983**	**7.2**	**1389938**	**10.5**
1	**Maubin Township**							
	GDP	379230.9	392015.5	3.4	405637.9	3.5	430835.9	6.2
	Per Capita Income	1382348	1451787	5.0	1644369	13.3	1836272	11.7
2	**Pantanaw Township**							
	GDP	215231.5	220437.3	2.4	219557.2	-0.4	228731.7	4.2
	Per Capita Income	914075	964085	5.5	1001930	3.9	1083356	8.1
3	**Nyaung Don Township**							
	GDP	218578.7	220160.4	0.7	217951.8	-1.0	227959.2	4.6
	Per Capita Income	1162528	1241324	6.8	1296750	4.5	1442558	11.2
4	**Danuphyu Township**							
	GDP	136063.6	140852.1	3.5	135954.7	-3.5	143293.5	5.4
	Per Capita Income	847786	913260	7.7	913263	0.0	995758	9.0

Source: Planning Department, Maubin District

APPENDIX – C

Numbers of Schools and Indicators in Maubin District

Sr.	Township	Number					Student Teacher Ratio			
		Type	2014 -15	2015 -16	2016 -17	2017 -18	2014 -15	2015 -16	2016 -17	2017 -18
1	Maubin	Maubin	1	1	1	1	7:1	9:1	13:1	10:1
		Computer Science	1	1	1	1	7:1	9:1	13:1	10:1
		Technical	1	1	1	1	11:1	12:1	11:1	10:1
		Technical High School	1	1	1	1	2:1	5:1	7:1	7:1
		High School	10	14	14	29	35:1	13:1	30:1	13:1
		Middle School	17	16	16	35	20:1	34:1	32:1	34:1
		Primary School	286	284	288	283	34:1	23:1	25:1	23:1
2	Pantanaw	High School	8	8	10	25	33:1	20:1	20:1	22:1
		Middle School	16	14	14	24	38:1	34:1	36:1	37:1
		Primary School	244	246	261	256	28:1	24:1	23:1	23:1
3	Nyaung Don	High School	5	6	7	14	28:1	22:1	26:1	30:1
		Middle School	8	10	10	20	36:1	33:1	34:1	35:1
		Primary School	191	195	194	192	27:1	20:1	21:1	21:1
4	Danuphyu	High School	7	7	7	20	23:1	23:1	26:1	27:1
		Middle School	8	8	8	18	34:1	33:1	31:1	31:1
		Primary School	185	185	189	179	17:1	17:1	18:1	17:1

Source: Education Office, Maubin District in 2018

APPENDIX - C

Health Care Center and Indicators of Health in Maubin District

Sr.	Type	Maubin				Pantanaw				Nyaung Don				Danuphyu			
		2014-15	2015-16	2016-17	2017-18	2014-15	2015-16	2016 -17	2017-18	2014-15	2015-16	2016 -17	2017-18	2014-15	2015-16	2016-17	2017-18
1	200 Bed Hospital Numbers	1	1	1	1	1	1	1	1	1	1	1	1	-	-	-	-
	Doctors	1	1	1	1	1	1	1	1	1	1	1	1	-	-	-	-
2	Cottage Hospital Numbers	-	-	-		4	4	4	4	-	-	-	-	4	4	4	
	Doctors	-	-	-	-	5	5	5	5	-	-	-	-	-	-	-	
3	Clinics	16	16	16	16	RHC 9 S/C 50 MCH 1	RHC 9 S/C 50 MCH1	RHC 9 S/C 50 MCH1	RHC9 S/C 50 MCH1	35	42	42	42	RHC 6 S/C 32 MCH 1	RHC 6 S/C 33 MCH 1	RHC 6 S/C 33 MCH 1	RHC 6 S/C 33 MCH 1
4	Traditional Medical Center	-	1	-	-	1	1	1	-	-	-	-		-	-	-	-
5	Health Assist-ants	11	3	13	14	9	9	9	9	6	6	7	7	4	5	5	5
6	Health Supervis-or (1)	2	-	3	3	3	3	3	3	1	1	1	1	3	3	3	4

Health Care Center and Indicators of Health in Maubin District (Continued)

Sr.	Type	Maubin				Pantanaw				Nyaung Don				Danuphyu			
		2014-15	2015-16	2016-17	2017-18	2014-15	2015-16	2016 -17	2017-18	2014-15	2015-16	2016 -17	2017-18	2014-15	2015-16	2016-17	2017-18
7	Maternity Nurse	108	94	106	114	n.a	n.a	n.a	n.a	44	44	63	63	45	42	48	52
8	Health Supervis-or (2)	17	35	69	59	32	40	48	51	16	16	50	14	5	8	42	24
9	Nurse	78	93	90	88	32	30	35	51	14	16	14	14	19	20	30	24
10	Doctor Patient Ratio	1: 257	1: 237	1: 388	1: 317	n.a	n.a	n.a	n.a	1: 667	1: 959	1: 1137	1: 1003	1: 945	1: 1005	1: 1140	1: 1757
11	Nurse Patient Ratio	1: 172	1: 178	1: 193	1: 195	1: 812	1: 893	1: 784	1: 878	1: 333	1: 333	1: 401	1: 400	1: 407	1: 482	1: 447	1: 421
12	Morta- lity rate (Under 1 year over 1000 Birth)	4.8	7.5	5.6	7.6	14.6	18.9	18.2	16.8	8.66	7.56	9.53	11.76	13.1	14.8	16.2	14.2
13	Fertility rate (with specialist)	10.9	14	10.5	11.7	-	-	-		-	-	-	-	5.8	60	56	60
14	Maternal Death Rate (100,000 Birth)	-	-	-	-	1.3	2.3	1.08	1.3	-	-	-	1.05	0.6	1.2	1.9	0.3

Source: General Administration Department Maubin District in 2018

APPENDIX - D

Roads of Maubin District

Sr.	Township	Year	Construction					
			Pave		Stone		Earth	
			Mile	Furlong	M	F	M	F
1	Maubin	2014-2015	53	7+ 330'	14	5+330'	-	-
		2015-2016	67	7	0	6	-	-
		2016-2017	71	1+200'				
		2017-2018	71	1+200'	-	-	-	-
2	Pantanaw	2014-2015	53	1+ 106'	9	5+330'	-	6+495'
		2015-2016	68	7+106'	-	-	0	1
		2016-2017	68	7+400'	-	-	-	260'
		2017-2018	69	-	-	-	-	-
3	Nyaung Don	2014-2015	58	5	1	-	-	-
		2015-2016	59	5	-	-	-	-
		2016-2017	57	7	1	6	-	-
		2017-2018	57	7	1	6	-	-
4	Danuphyu	2014-2015	22	1+330'	18	5+330'	-	-
		2015-2016	34	2	6 +1	1		
		2016-2017	37	7	3	4	-	-
		2017-2018	37	1+88'	4	1+572'	-	-

Source: General Administration Department Maubin District in 2018

APPENDIX - D

Bridges in Maubin District (from 2014 to 2018)

Sr.	Township	Name of Express Road and Bridge	Length		No. of Bridge
			Mile	Furlong	
1	Nyaung Don	Nyaung Don -Tar Kyay Road	4	7	
		Nyaung Don- Sarmalauk	5	5	4
		Nyaung Don Entry	4	-	-
		Mezali Bridge	240 ft x 28 ft		
		Linlunpin Bridge	180 ft x 33 ft		
		Autsu Bridge	180 ft x 33 ft		
		Bo Myat Tun Bridge	8544 ft x 40 ft		
		Ayeyarwady Bridge	10814 ft x 28 ft		
2	Pantanaw	Pantanaw- Dauntgyi Road	5	0	4
		Pantanaw- Shwe Laung-Warkaema Road	21	0	15
		Pantanaw-Mingaru –Kyontanii Road	19	4	8
		Pantanaw-Einme Road	11	6	8
		Pantanaw Entry	-	2	1
		Baw Di Bridge	180 ft x 27 ft		1
		Kyonkanaung Bridge	240 ft x 27 ft		1
		Pathwe Bridge	420 ft x 24 ft		1
		Pantanaw Bridge	420 ft x 36 ft		1
		Thonkhwa Chaung Bridge	270 ft x 30 ft		1
3	Maubin	Maubin – Yaylekalay-Shwetaungmhaw Road	18	6	10
		Maubin – Sarmalauk Road	21	3	14
		Maubin – Tyuntay Road	15	1	2
		Maubin – Kyeiklat Road	8	1	8
		Khattiya Bridge	420 ft x 28 ft		1
		Maubin Bridge	2362 ft x 40 ft		1

Bridges in Maubin District (from 2014 to 2018) (Continued)

Sr.	Township	Name of Express Road and Bridge	Length		No. of Bridge
			Mile	Furlong	
4	Danuphyu	Ah Kyaw	360 ft		1
		Kyontanee	240 ft		1
		Pazunchaung	120 ft		1
		Thakhyutchaung	15 ft		1
		Michaungiang	120 ft		1
		Hatsaing	120 ft		1
		Gawdu	120 ft		1
		Kyontamar	60 ft		1
		Htaiwalay	60 ft		1
		Kazan	50 ft		1
		Linlun	180 ft		1
		Outsu	180 ft		1
		Thantaiyoe	50 ft		1

Source: General Administration Department Maubin District in 2018

APPENDIX - E

Reasons for Dropout of Household Heads of Maubin District

Dropout Reason	Township				Total
	Maubin	Pantanaw	Nyaung Don	Danu Phyu	
Due to financial Aspect	507 (90.7 %)	250 (72.3 %)	463 (95.1 %)	93 (34.3 %)	1313 (79 %)
Traditional Motivation	21 (3.8 %)	4 (1.2 %)	7 (1.4 %)	6 (2.2 %)	38 (2.3 %)
Qualification Requirement	0 (0 %)	41 (11.8 %)	0 (0 %)	11 (4.1 %)	52 (3.1 %)
Distance of schools	31 (5.5 %)	51 (14.7 %)	17 (3.5 %)	161 (59.4 %)	260 (15.6 %)
Total	559 (100 %)	346 (100 %)	487 (100 %)	271 (100 %)	1663 (100 %)

Source: Own compilation from survey data (2018)

APPENDIX - F

Reasons for Landless of Maubin District

Reasons for Landless	Township				Total
	Maubin	Pantanaw	Nyaung Don	Danu Phyu	
Economic Reason	447 (80 %)	282 (81.5 %)	450 (92.3 %)	204 (75.4 %)	1383 (83.2 %)
Due to Policy	14 (2.5 %)	19 (5.5 %)	13 (2.7 %)	26 (9.6 %)	72 (4.3 %)
Weather	98 (17.5%)	45 (13 %)	24 (5 %)	41 (15 %)	208 (12.5 %)
Total	559 (100 %)	346 (100 %)	487 (100 %)	271 (100 %)	1663 (100 %)

Source: Own compilation from survey data (2018)

APPENDIX – G

Occupation of Household Heads of Maubin District in 2018

Characteristics	Townships				District
	Maubin	Pantanaw	Nyaung Don	Danuphyu	
Occupation (%)					
Retiree	0	0.3	0.2	0	0.5
Farmer	22.5	29.8	22.6	20.3	23
General Worker (Causal Worker)	26.8	53.5	37.2	48.3	38.9
Government Staff	26.6	2.1	19.6	14.7	15.8
Own Business	19.9	10.3	16.1	10.8	14.3
Private Staff	4.2	4	4.3	5.9	5.5

Source: Own compilation from survey data (2018)

Housing Condition of Maubin District in 2018

Housing		Township				Total
		Maubin	Pantanaw	Nyaung Don	Danu Phyu	
House with Two Stories	Count	11	0	2	1	14
	%	1.96%	0.0%	0.41%	0.36%	0.84%
Wood and Brick	Count	78	45	54	17	194
	%	13.94%	13%	11.08%	6.24%	11.66%
Hut	Count	470	301	431	253	1455
	%	84.1%	87%	88.5%	93.4%	87.5%
Total	Count	559	346	487	271	1663
	%	100.0%	100.0%	100.0%	100.0%	100.0%

Source: Own compilation from survey data (2018)

APPENDIX - H

Toilet Condition of Maubin District in 2018

	Township				Total
	Maubin	**Pantanaw**	**Nyaung Don**	**Danu Phyu**	
Latrine	243	225	299	206	973
	43.47%	65.02%	61.4%	76.0%	58.6%
Toilet in Remote Open space	49	10	46	35	140
	8.76%	2.9%	9.4%	12.9%	8.4%
Toilet	267	111	142	30	550
	47.77%	32.08%	29.2%	11.1%	33.0%
Total	559	346	487	271	1663
	100.0%	100.0%	100.0%	100.0%	100.0%

Source: Own compilation from survey data (2018)

APPENDIX - I

Calculation of Gini coefficient for Maubin Township

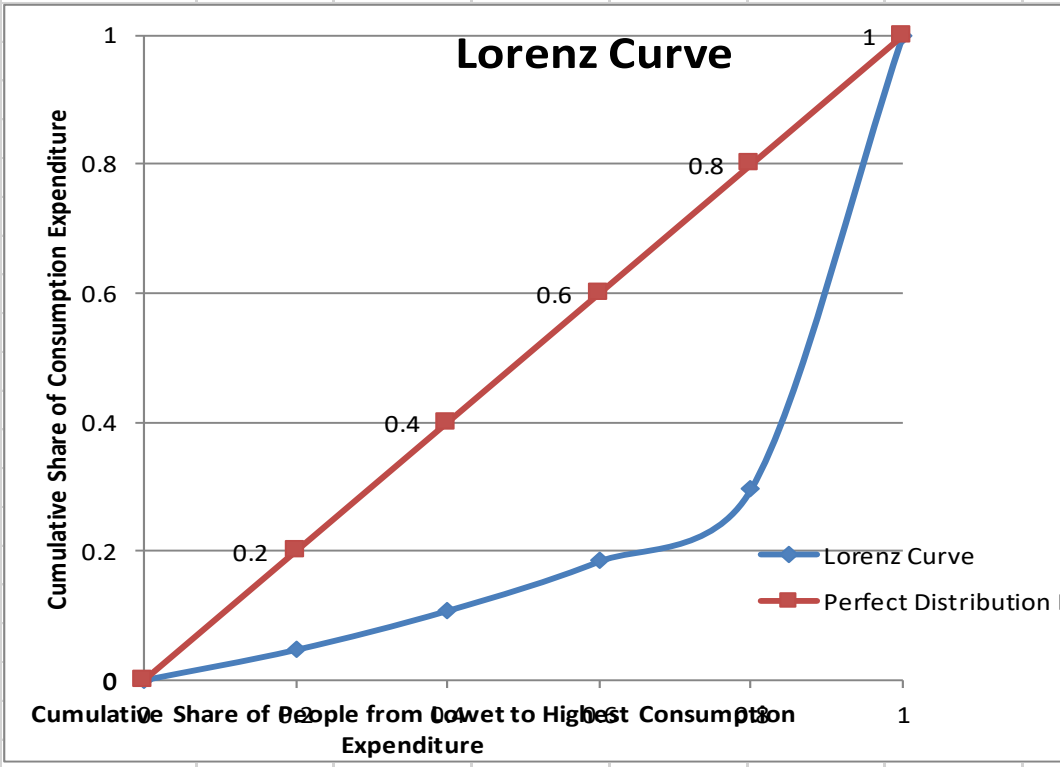
	Cumulative P(X)	
0	0	0
0.2	0.0469871	0.2
0.4	0.1075704	0.4
0.6	0.1841993	0.6
0.8	0.2957937	0.8
1	1	1

Scatter plot

		P(X)
20	470000	0.05
40	606000	0.06
60	766500	0.08
80	1116250	0.11
100	7044000	0.70
Total	10002750	

1/2(b1+b2)2

b1+b2	1/2(b1+b2)	1/2(b1+b2)0.2
0.0469871	0.023493539	0.004698708
0.1545575	0.077278748	0.01545575
0.2917698	0.145884882	0.029176976
0.479993	0.239996501	0.0479993
1.2957937	0.647896828	0.129579366
		0.2269101



Gini coefficient = Ratio of the Area between the line of perfect equality and the Lorenz Curve to the Area under the line of perfect equality

=0.5-0.2269101 = 0.2269

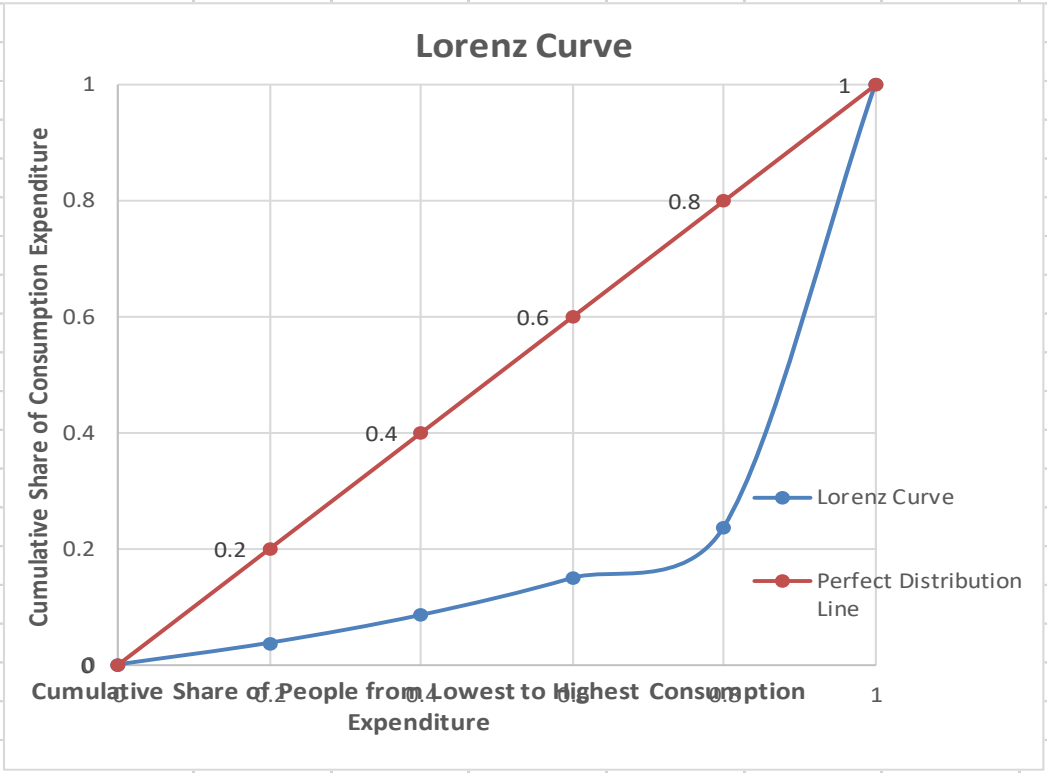
=0.2269/0.5 = 0.54618

Calculation of Gini coefficient for Maubin District

	Cummulative of P(X)	
0	0	0
0.2	0.04	0.2
0.4	0.09	0.4
0.6	0.15	0.6
0.8	0.24	0.8
1	1.00	1

Scatter plot

		P(X)
20	458800	0.04
40	591428.57	0.05
60	786000	0.06
80	1076666.7	0.09
100	9385000	0.76
Total	12297895	



1/2(b1+b2)2

b1+b2	1/2(b1+b2)	1/2(b1+b2)0.2
0.0373072	0.018653598	0.00373072
0.1227062	0.061353124	0.012270625
0.2347115	0.117355738	0.023471148
0.3861737	0.193086854	0.038617371
1.2368613	0.618430641	0.123686128
		0.201775991

Area under the Lorenz Curve = Sum (1/2(b1+b2)0.2) = Area = 0.2017

Substract area under the line of perfect equality from the area under the Lorenz Curve

Area between the line of perfect equality and the Lorenz Curve=0.5-0.02017

0.2983

Gini coefficient = Ratio of the Area between the line of perfect equality and the Lorenz Curve to the Area under the line of perfect equality

Gini coefficient = 0.2983/0.5 = 0.5966

APPENDIX - J

Frequencies (Maubin District)

Statistics

		Povertystatus1	Gender2	Landownership2	Electricityaccess 2	Age1
N	Valid	1663	1663	1663	1663	1663
	Missing	0	0	0	0	0

Statistics

		Housingcondition1	Toilet1	water1	Householdsize1	Education1
N	Valid	1663	1663	1663	1663	1663
	Missing	0	0	0	0	0

Statistics

		Occupation2
N	Valid	1663
	Missing	0

Frequency Table

Povertystatus1

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	non-poor household	900	54.1	54.1	54.1
	poor household	763	45.9	45.9	100.0
	Total	1663	100.0	100.0	

Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	1273	76.5	76.5	76.5
	Female	390	23.5	23.5	100.0
	Total	1663	100.0	100.0	

Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Below 30 years	45	2.7	2.7	2.7
	30-39 years	177	10.6	10.6	13.3
	40-49 years	430	25.9	25.9	39.2
	50 years and above	1011	60.8	60.8	100.0
	Total	1663	100.0	100.0	

Education

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Below primary school and primary school	705	42.4	42.4	42.4
	Middle school	643	38.7	38.7	81.1
	High school and above	315	18.9	18.9	100.0
	Total	1663	100.0	100.0	

Householdsize

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1-3 members	469	28.2	28.2	28.2
	4-6 members	934	56.2	56.2	84.4
	Above 6 members	260	15.6	15.6	100.0
	Total	1663	100.0	100.0	

Toilet

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Non-flyproof	140	8.4	8.4	8.4
	Flyproof	1523	91.6	91.6	100.0
	Total	1663	100.0	100.0	

Landownership

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Landless	1335	80.3	80.3	80.3
	Landowner	328	19.7	19.7	100.0
	Total	1663	100.0	100.0	

Occupation

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	General worker	647	38.9	38.9	38.9
	Non-general worker	1016	61.1	61.1	100.0
	Total	1663	100.0	100.0	

Housingcondition

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	wood and brick	208	12.5	12.5	12.5
	Hut	1455	87.5	87.5	100.0
	Total	1663	100.0	100.0	

Electricityaccess

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Use national grid electricity	105	6.3	6.3	6.3
	non-use national grid electricity	1558	93.7	93.7	100.0
	Total	1663	100.0	100.0	

Water

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	unclean water	590	35.5	35.5	35.5
	cleanwater	1073	64.5	64.5	100.0
	Total	1663	100.0	100.0	

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Povertystatus1 * Gender	1663	100.0%	0	0.0%	1663	100.0%
Povertystatus1 * Landownership	1663	100.0%	0	0.0%	1663	100.0%
Povertystatus1 * Electricityaccess	1663	100.0%	0	0.0%	1663	100.0%
Povertystatus1 * Age	1663	100.0%	0	0.0%	1663	100.0%
Povertystatus1 * Housingcondition1	1663	100.0%	0	0.0%	1663	100.0%
Povertystatus1 * Toilet	1663	100.0%	0	0.0%	1663	100.0%
Povertystatus1 * water	1663	100.0%	0	0.0%	1663	100.0%
Povertystatus1 * Householdsize	1663	100.0%	0	0.0%	1663	100.0%
Povertystatus1 * Education	1663	100.0%	0	0.0%	1663	100.0%
Povertystatus1 * Occupation	1663	100.0%	0	0.0%	1663	100.0%

Povertystatus1 * Gender

Crosstab

			Gender		
			Male	Female	Total
Povertystatus1	non-poor household	Count	579	321	900
		% within Povertystatus1	64.3%	35.7%	100.0%
		% within Gender	45.5%	82.3%	54.1%
		% of Total	34.8%	19.3%	54.1%
	poor household	Count	694	69	763
		% within Povertystatus1	91.0%	9.0%	100.0%

	% within Gender	54.5%	17.7%	45.9%
	% of Total	41.7%	4.1%	45.9%
Total	Count	1273	390	1663
	% within Povertystatus1	76.5%	23.5%	100.0%
	% within Gender	100.0%	100.0%	100.0%
	% of Total	76.5%	23.5%	100.0%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	163.040[a]	1	.000	.000	.000
Continuity Correction[b]	161.560	1	.000		
Likelihood Ratio	175.736	1	.000	.000	.000
Fisher's Exact Test				.000	.000
Linear-by-Linear Association	162.942[c]	1	.000	.000	.000
N of Valid Cases	1663				

Chi-Square Tests

	Point Probability
Pearson Chi-Square	
Continuity Correction[b]	
Likelihood Ratio	
Fisher's Exact Test	
Linear-by-Linear Association	.000
N of Valid Cases	

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 178.94.

b. Computed only for a 2x2 table

c. The standardized statistic is -12.765.

Povertystatus1 * Age1

Crosstab

			Age1	
			Below 30 years	30-39 years
Povertystatus1	non-poor household	Count	19	113
		% within Povertystatus1	2.1%	12.6%
		% within Age1	42.2%	63.8%
		% of Total	1.1%	6.8%
	poor household	Count	26	64
		% within Povertystatus1	3.4%	8.4%
		% within Age1	57.8%	36.2%
		% of Total	1.6%	3.8%
Total		Count	45	177
		% within Povertystatus1	2.7%	10.6%
		% within Age1	100.0%	100.0%
		% of Total	2.7%	10.6%

Crosstab

			Age1	
			40-49 years	50 years and above
Povertystatus1	non-poor household	Count	213	555
		% within Povertystatus1	23.7%	61.7%
		% within Age1	49.5%	54.9%
		% of Total	12.8%	33.4%
	poor household	Count	217	456
		% within Povertystatus1	28.4%	59.8%

	% within Age1	50.5%	45.1%
	% of Total	13.0%	27.4%
Total	Count	430	1011
	% within Povertystatus1	25.9%	60.8%
	% within Age1	100.0%	100.0%
	% of Total	25.9%	60.8%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	13.189[a]	3	.004	.004	
Likelihood Ratio	13.285	3	.004	.004	
Fisher's Exact Test	13.214			.004	
Linear-by-Linear Association	.007[b]	1	.933	.950	.478
N of Valid Cases	1663				

Chi-Square Tests

	Point Probability
Pearson Chi-Square	
Likelihood Ratio	
Fisher's Exact Test	
Linear-by-Linear Association	.025
N of Valid Cases	

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 20.65.

b. The standardized statistic is -.084.

Povertystatus1 * Householdsize1

Crosstab

			Householdsize1	
			1-3 members	4-6 members
Povertystatus1	non-poor household	Count	406	446
		% within Povertystatus1	45.1%	49.6%
		% within Householdsize1	86.6%	47.8%
		% of Total	24.4%	26.8%
	poor household	Count	63	488
		% within Povertystatus1	8.3%	64.0%
		% within Householdsize1	13.4%	52.2%
		% of Total	3.8%	29.3%
Total		Count	469	934
		% within Povertystatus1	28.2%	56.2%
		% within Householdsize1	100.0%	100.0%
		% of Total	28.2%	56.2%

Crosstab

			Householdsize1	
			Above 6 members	Total
Povertystatus1	non-poor household	Count	48	900
		% within Povertystatus1	5.3%	100.0%
		% within Householdsize1	18.5%	54.1%
		% of Total	2.9%	54.1%
	poor household	Count	212	763
		% within Povertystatus1	27.8%	100.0%

	% within Householdsize1	81.5%	45.9%
	% of Total	12.7%	45.9%
Total	Count	260	1663
	% within Povertystatus1	15.6%	100.0%
	% within Householdsize1	100.0%	100.0%
	% of Total	15.6%	100.0%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	347.256[a]	2	.000	.000	
Likelihood Ratio	382.401	2	.000	.000	
Fisher's Exact Test	381.153			.000	
Linear-by-Linear Association	343.488[b]	1	.000	.000	.000
N of Valid Cases	1663				

Chi-Square Tests

	Point Probability
Pearson Chi-Square	
Likelihood Ratio	
Fisher's Exact Test	
Linear-by-Linear Association	.000
N of Valid Cases	

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 119.29.

b. The standardized statistic is 18.533.

Povertystatus1 * Education1

Crosstab

			Education1	
			Below primary school and primary school	Middle school
Povertystatus1	non-poor household	Count	315	380
		% within Povertystatus1	35.0%	42.2%
		% within Education1	44.7%	59.1%
		% of Total	18.9%	22.9%
	poor household	Count	390	263
		% within Povertystatus1	51.1%	34.5%
		% within Education1	55.3%	40.9%
		% of Total	23.5%	15.8%
Total		Count	705	643
		% within Povertystatus1	42.4%	38.7%
		% within Education1	100.0%	100.0%
		% of Total	42.4%	38.7%

Crosstab

			Education1	
			High school and above	Total
Povertystatus1	non-poor household	Count	205	900
		% within Povertystatus1	22.8%	100.0%
		% within Education1	65.1%	54.1%
		% of Total	12.3%	54.1%
	poor household	Count	110	763

	% within Povertystatus1	14.4%	100.0%
	% within Education1	34.9%	45.9%
	% of Total	6.6%	45.9%
Total	Count	315	1663
	% within Povertystatus1	18.9%	100.0%
	% within Education1	100.0%	100.0%
	% of Total	18.9%	100.0%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	46.951[a]	2	.000	.000	
Likelihood Ratio	47.205	2	.000	.000	
Fisher's Exact Test	47.088			.000	
Linear-by-Linear Association	44.274[b]	1	.000	.000	.000
N of Valid Cases	1663				

Chi-Square Tests

	Point Probability
Pearson Chi-Square	
Likelihood Ratio	
Fisher's Exact Test	
Linear-by-Linear Association	.000
N of Valid Cases	

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 144.52.

b. The standardized statistic is -6.654.

Povertystatus1 * Landownership2

Crosstab

			Landownership2	
			Landless	Landowner
Povertystatus1	non-poor household	Count	612	288
		% within Povertystatus1	68.0%	32.0%
		% within Landownership2	45.8%	87.8%
		% of Total	36.8%	17.3%
	poor household	Count	723	40
		% within Povertystatus1	94.8%	5.2%
		% within Landownership2	54.2%	12.2%
		% of Total	43.5%	2.4%
Total		Count	1335	328
		% within Povertystatus1	80.3%	19.7%
		% within Landownership2	100.0%	100.0%
		% of Total	80.3%	19.7%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	186.722[a]	1	.000	.000	.000
Continuity Correction[b]	185.036	1	.000		
Likelihood Ratio	209.404	1	.000	.000	.000
Fisher's Exact Test				.000	.000
Linear-by-Linear Association	186.610[c]	1	.000	.000	.000
N of Valid Cases	1663				

Chi-Square Tests

	Point Probability
Pearson Chi-Square	
Continuity Correction[b]	
Likelihood Ratio	
Fisher's Exact Test	
Linear-by-Linear Association	.000
N of Valid Cases	

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 150.49.

b. Computed only for a 2x2 table , c. The standardized statistic is -13.661.

Povertystatus1 * Occupation2

Crosstab

			Occupation2	
			General worker	Non-general worker
Povertystatus1	non-poor household	Count	324	576
		% within Povertystatus1	36.0%	64.0%
		% within Occupation2	50.1%	56.7%
		% of Total	19.5%	34.6%
	poor household	Count	323	440
		% within Povertystatus1	42.3%	57.7%
		% within Occupation2	49.9%	43.3%
		% of Total	19.4%	26.5%
Total		Count	647	1016
		% within Povertystatus1	38.9%	61.1%
		% within Occupation2	100.0%	100.0%
		% of Total	38.9%	61.1%

Crosstab

			Total
Povertystatus1	non-poor household	Count	900
		% within Povertystatus1	100.0%
		% within Occupation2	54.1%
		% of Total	54.1%
	poor household	Count	763
		% within Povertystatus1	100.0%
		% within Occupation2	45.9%
		% of Total	45.9%
Total		Count	1663
		% within Povertystatus1	100.0%
		% within Occupation2	100.0%
		% of Total	100.0%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	6.967[a]	1	.008	.009	.005
Continuity Correction[b]	6.703	1	.010		
Likelihood Ratio	6.962	1	.008	.009	.005
Fisher's Exact Test				.009	.005
Linear-by-Linear Association	6.963[c]	1	.008	.009	.005
N of Valid Cases	1663				

Chi-Square Tests

	Point Probability
Pearson Chi-Square	
Continuity Correction[b]	
Likelihood Ratio	
Fisher's Exact Test	
Linear-by-Linear Association	.001
N of Valid Cases	

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 296.85.

b. Computed only for a 2x2 table

a. The standardized statistic is -2.639.

Povertystatus* Electricityaccess

Crosstab

Count

		Electricityaccess		
		Use national grid electricity	non-use national grid electricity	Total
Povertystatus	non-poor household	73	827	900
	poor household	32	731	763
Total		105	1558	1663

Crosstab

			Electricityaccess2	
			Use national grid electricity	non-use national grid electricity
Povertystatus1	non-poor household	Count	55	845
		% within Povertystatus1	6.1%	93.9%
		% within Electricityaccess2	52.4%	54.2%
		% of Total	3.3%	50.8%
	poor household	Count	50	713

	% within Povertystatus1	6.6%	93.4%
	% within Electricityaccess2	47.6%	45.8%
	% of Total	3.0%	42.9%
Total	Count	105	1558
	% within Povertystatus1	6.3%	93.7%
	% within Electricityaccess2	100.0%	100.0%
	% of Total	6.3%	93.7%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	10.711[a]	1	.001		
Continuity Correction[b]	10.059	1	.002		
Likelihood Ratio	11.063	1	.001		
Fisher's Exact Test				.001	.001
Linear-by-Linear Association	10.705	1	.001		
N of Valid Cases	1663				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 48.17.

b. Computed only for a 2x2 table

Povertystatus1 * Housingcondition

Crosstab

Count

		Housingcondition		
		wood and brick	Hut	Total
Povertystatus	non-poor household	137	763	900
	poor household	71	692	763
Total		208	1455	1663

Crosstab

			Housingcondition1	
			wood and brick	Hut
Povertystatus1	non-poor household	Count	339	561
		% within Povertystatus1	37.7%	62.3%

		% within Housingcondition1	59.9%	51.1%
		% of Total	20.4%	33.7%
	poor household	Count	227	536
		% within Povertystatus1	29.8%	70.2%
		% within Housingcondition1	40.1%	48.9%
		% of Total	13.7%	32.2%
Total		Count	566	1097
		% within Povertystatus1	34.0%	66.0%
		% within Housingcondition1	100.0%	100.0%
		% of Total	34.0%	66.0%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.240[a]	1	.624	.658	.343
Continuity Correction[b]	.161	1	.688		
Likelihood Ratio	.240	1	.624	.658	.343
Fisher's Exact Test				.658	.343
Linear-by-Linear Association	.240[c]	1	.624	.658	.343
N of Valid Cases	1663				

Chi-Square Tests

	Point Probability
Pearson Chi-Square	
Continuity Correction[b]	
Likelihood Ratio	
Fisher's Exact Test	
Linear-by-Linear Association	.062
N of Valid Cases	

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 95.43.

b. Computed only for a 2x2 table

c. The standardized statistic is -.490.

Povertystatus1 * Toilet1

Crosstab

			Toilet1	
			Non-flyproof	Flyproof
Povertystatus1	non-poor household	Count	73	827
		% within Povertystatus1	8.1%	91.9%
		% within Toilet1	52.1%	54.3%
		% of Total	4.4%	49.7%
	poor household	Count	67	696
		% within Povertystatus1	8.8%	91.2%
		% within Toilet1	47.9%	45.7%
		% of Total	4.0%	41.9%
Total		Count	140	1523
		% within Povertystatus1	8.4%	91.6%
		% within Toilet1	100.0%	100.0%
		% of Total	8.4%	91.6%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	13.210[a]	1	.000		
Continuity Correction[b]	12.675	1	.000		
Likelihood Ratio	13.476	1	.000		
Fisher's Exact Test				.000	.000
Linear-by-Linear Association	13.202	1	.000		
N of Valid Cases	1663				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 64.23.

b. Computed only for a 2x2 table

Chi-Square Tests

	Point Probability
Pearson Chi-Square	
Continuity Correction[b]	
Likelihood Ratio	
Fisher's Exact Test	
Linear-by-Linear Association	.000
N of Valid Cases	

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 259.69.

b. Computed only for a 2x2 table

c. The standardized statistic is 3.394.

Povertystatus1 * water1

Crosstab

			water1	
			unclean water	cleanwater
Povertystatus1	non-poor household	Count	284	616
		% within Povertystatus1	31.6%	68.4%
		% within water1	48.1%	57.4%
		% of Total	17.1%	37.0%
	poor household	Count	306	457
		% within Povertystatus1	40.1%	59.9%
		% within water1	51.9%	42.6%
		% of Total	18.4%	27.5%
Total		Count	590	1073
		% within Povertystatus1	35.5%	64.5%
		% within water1	100.0%	100.0%
		% of Total	35.5%	64.5%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	13.185[a]	1	.000	.000	.000
Continuity Correction[b]	12.814	1	.000		
Likelihood Ratio	13.170	1	.000	.000	.000
Fisher's Exact Test				.000	.000
Linear-by-Linear Association	13.177[c]	1	.000	.000	.000
N of Valid Cases	1663				

Chi-Square Tests

	Point Probability
Pearson Chi-Square	
Continuity Correction[b]	
Likelihood Ratio	
Fisher's Exact Test	
Linear-by-Linear Association	.000
N of Valid Cases	

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 270.70.

b. Computed only for a 2x2 table c. The standardized statistic is -3.630.

Logistic Regression

Case Processing Summary

Unweighted Cases[a]		N	Percent
Selected Cases	Included in Analysis	1663	100.0
	Missing Cases	0	.0
	Total	1663	100.0
Unselected Cases		0	.0
Total		1663	100.0

a. If weight is in effect, see classification table for the total number of cases.

Dependent Variable Encoding

Original Value	Internal Value
non-poor household	0
poor household	1

Block 0: Beginning Block

Classification Table[a,b]

Observed			Predicted		
			Povertystatus1		
			non-poor household	poor household	Percentage Correct
Step 0	Povertystatus1	non-poor household	900	0	100.0
		poor household	763	0	.0
	Overall Percentage				54.1

a. Constant is included in the model.

b. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	-.165	.049	11.261	1	.001	.848

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	769.139	14	.000
	Block	769.139	14	.000
	Model	769.139	14	.000

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	1524.970[a]	.370	.495

a. Estimation terminated at iteration number 5 because parameter estimates changed by less than .001.

Hosmer and Lemeshow Test

Step	Chi-square	df	Sig.
1	10.337	8	.242

Contingency Table for Hosmer and Lemeshow Test

		Povertystatus = non-poor household		Povertystatus= poor household		
		Observed	Expected	Observed	Expected	Total
Step 1	1	158	159.207	4	2.793	162
	2	154	155.223	12	10.777	166
	3	140	137.555	22	24.445	162
	4	125	127.422	39	36.578	164
	5	107	104.118	59	61.882	166
	6	62	70.051	106	97.949	168
	7	66	56.518	101	110.482	167
	8	50	43.158	109	115.842	159
	9	26	26.914	121	120.086	147
	10	12	19.834	190	182.166	202

Classification Table[a]

			Predicted		
			Povertystatus		
	Observed		non-poor household	poor household	Percentage Correct
Step 1	Povertystatus	non-poor household	684	216	76.0
		poor household	136	627	82.2
	Overall Percentage				78.8

a. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I.for EXP(B) Lower	Upper
Step 1[a]	Education			4.740	2	.093			
	Education(1)	-.285	.143	3.978	1	.046	.752	.569	.995
	Education(2)	-.279	.180	2.405	1	.091	.757	.532	1.076
	Householdsize			238.421	2	.000			
	Householdsize(1)	2.288	.182	158.843	1	.000	9.859	6.907	14.074
	Householdsize(2)	3.678	.249	217.828	1	.000	39.550	24.269	64.453
	water(1)	-.497	.139	12.851	1	.000	.608	.463	.798
	Toilet(1)	-.474	.248	3.650	1	.056	.622	.382	1.012
	Age			16.030	3	.001			
	Age(1)	-1.677	.438	14.654	1	.000	.187	.079	.441
	Age(2)	-1.462	.410	12.689	1	.000	.232	.104	.518
	Age(3)	-1.273	.397	10.264	1	.001	.280	.129	.610
	Gender(1)	1.574	.170	85.994	1	.000	4.827	3.461	6.733
	Landownership(1)	-2.359	.202	137.041	1	.000	.094	.064	.140
	Occupation(1)	.497	.138	13.020	1	.000	1.644	1.255	2.154
	Electricityaccess(1)	1.045	.276	14.329	1	.000	2.843	1.655	4.885
	Housingcondition(1)	.170	.216	.623	1	.430	1.186	.777	1.811
	Constant	-2.102	.560	14.064	1	.000	.122		

a. Variable(s) entered on step 1: Education, Householdsize, water, Toilet, Age, Gender, Landownership, Occupation, Electricityaccess, Housingcondition.

MYANMAR, Ayeyarwady Region, Maubin District, ……..
Township, ……Village

QUESTIONNAIRE, 2018

coverage period: Jan 2018 to Dec 2018

I. Household Characteristics

Name of household head
Relationship with HHH
Household code number
Name of village:

II. Household Head and Household Member Characteristics

Sr.	Particular	Answer	Code
1	Male/female	Female Male	1 0
2	How old (2018)		
3	Education Status (Years of schooling)		
4	Reasons for Drop out 1. Finance 2. Traditional trust 3. Quality requirement 4. Other		

Sr.	**Name**	**Male/ Female**	**Age**	**Relation ship**	**Marital status**	**Educa tion**	**Reasons for Droop out**
5.							

III. Employment Status

If HHH is working in the farm

Does this household cultivate a farmland? (1=yes, 0=no) If not, (Why?)	
Size of farmland (Acre),	
Tenure of farmland (owned, leasehold, share tenancy, borrowed)	

If HHH is not farmer and Occupation of Other family members

Private sector formal job – (1) , Public Staff- (2) , Own business or sale – (3), General worker –or **informal wage workers,** (4) Private staff, **salary work such as domestic work and construction, painter, stonemason, goldsmith, silversmith and self-employment such as trade and retail,** Retired – (5),

	Name	**Type of HH Member**	**Type of Occupation**

If HHH/members are working outside the home place

Name of HHH / household members	**Work place** **1. Domestic country** **2. Abroad**	**Type of job**

IV. H**ousehold living condition**

Sr.	Particular	Answer	Code
1	Number of people living in the house		
2	Do you have electricity? (National rid use - Yes - 0 No use - 1) If no, What are the alternative uses ?		
3	Electricity access If Not National Grid Verify (Village EPC - 1 Diesel Engine - 2 Other - 3)		
4	Source of water (1=tube well, 2=rainwater, 3=river, 4=well, 5= Others)		
5	Drinking Water Drinking Water (source)		
6	Fuel type of making meals	Wood Charcoal Electricity Gas	1 2 3 4
7	Land Ownership Owner - 0 Landless - 1		
8	Reason of landless Due to policy - 1 Due to economic reason - 2 Disaster/Weather - 3		
9	Toilet Latrine Type - 1 , Toilet - 2, Open Space – 3		
10	Type of house (1 = concrete, 2 = semi-concrete, 3 = temporary)		
11	Ownership of house No - 1 Yes – 0		

V. Household Consumption Expenditure (at 2018 Value)

Education	Health	Social	Investment	Food	Non food	House Maintenance	Entertainment	Internet & Tele-communication	Others

VI. Community level questionnaire for Infrastructure development and growth of income generation

Sr.	Description	Answer	Code
1	Township		
2	Village Tract		
3	Village		
4	No. of Primary School Teacher Student Ratio		
5	No. of Middle School Teacher Student Ratio		
6	No. of High School Teacher Student Ratio		
7	No. of Hospital and Clinics No. of Doctors and medical staff	No. of Hospital s ---------- and No. of Clinics ---------- No. of Doctors ---------- No. of medical staff ---------	
8	Village transportation access 1. No. of Tar Road and Length 2. Concrete Road and length 3. Earth Ground Road and length 4. Road with Stone and Brickbat 5. Water way transport/ Boat and Length 6. Other		
9.	Needs for growth of income generation 1. Mass production of agricultural produces (integrated -input support, seeds, soil transformation) 2. Industrial processing and manufacturing of agro-based value added products (rice and fishery industries) 3. Systematic loan management procedure 4. Market for local produces 5. Vocational Training 6. Public Utilities (electricity)		