UNIVERSITY OF CO-OPERATIVE AND MANAGEMENT, SAGAING
DEPARTMENT OF STATISTICS
MASTER OF APPLIED STATISTICS

THE EFFECTS OF SOCIO-ECONOMIC FACTORS ON POVERTY LEVEL OF HOUSEHOLDS IN PANDAUNG VILLAGE, SHWEBO TOWNSHIP

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This thesis is submitted to the Board of Examiners in partial fulfillment of the requirement for the degree of Master of Applied Statistics.

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ACCEPTANCE

This is to certify that this paper entitled **"The Effects of Socio-economic Factors on Poverty Level of Households in Pandaung Village, Shwebo Township"** submitted as a partial fulfillment towards the degree of Master of Applied Statistics has been accepted by Board of Examiners.

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DECEMBER, 2022

ABSTRACT

This study is concerned with socio-economic status of households in Pandaung village, Shwebo township. The purpose of this study is to describe the socio-economic status on paddy farmers' households and to analyze the factor of poverty on paddy farmers' households in Pandaung village, Shwebo township. Paddy farmers 154 households are selected from 240 households in Pandaung village, Shwebo township. There were one middle school in Pandaung village. Descriptive method, multiple regression analysis and binary logistic regression are used in this study to analyze the data. The results of the study show that most of the household heads have primary level education. According to the multiple regression model results, it is found that income, level of education, drinking water and properties of phone are influential factors of expenditure of households. Employing binary logistic regression model, the dependent variable, poverty situation of households, was regressed on four explanatory variables so as to identify determinants of poverty situation in Pandaung village. Regression results revealed that poverty situation falls as the economically active member in each household increases. The poverty situation was found to rise with household size and casual workers. Therefore, government should initiate educational programs for improving the socio-economic attributes of the households as a way of enhancing poverty level of the households.

ACKNOWLEDGEMENTS

Firstly, I would like to express my deep and sincere gratitude to Rector, Dr. Moe Moe Yee, University of Co-operative and Management, Sagaing for her kind permission, administrative support to do my research work, and valuable suggestions to improve this thesis.

A special and sincere thank with gratitude to Pro-Rector, Dr. Kyaing Kyaing Thet, Monywa University of Economics for her valuable suggestion and comments to complete my thesis.

A special and sincere thank with gratitude to Visiting Professor, Daw Khin Aye Myint, Head of Department of Statistics (Retired), University of Co-operative and Management, Sagaing for her kind and generous support and technical assistance to finish this thesis.

I would like to express my deepest appreciation and gratitude to my supervisor Professor Daw Khin San Kyi, Head of Department of Statistics, University of Co-operative and Management, Sagaing, for her keen interest, guidance, invaluable advices, encouragements, valuable supervisions and understanding to me throughout my study.

Sincere appreciation and gratitude go to board of examiners for their guidance to my difficulty, encouragement, moral support, and kindness during the study, and their critical and patient reading, and comments on this paper.

I would like to express my appreciation to all persons who kindly helped and supported in doing this study.

Finally, I would like to express a lot of thanks to my family and I would like to offer my deep gratitude and heartfelt thanks to those who earnestly helped and contributed directly or indirectly to accomplish this study. My special thanks also extend to the sample farmers in Pandaung village for their patient answers to the long questionnaires. I also acknowledge with than and love to all faculty members and teachers who have supported and coached me throughout my master of applied statistics educational livelihood.

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LIST OF ABBREVIATIONS

ANOVA	Analysis of Variance
GDP	Gross Domestic Product
IR	International Rice
KMO	Kasier-Meyer-Olkin
MDGs	Millennium Development Goals
PCA	Principal Component Analysis
RC	Reinforced Concrete
ROC	Receiver Operating Characteristic
SDGs	Sustainable Development Goals
SES	Socio-economic Status
SPSS	Statistical Package for the Social Sciences
USD	United State Dollar
VIF	Variance Inflation Factor

CHAPTER 1
INTRODUCTION

Myanmar has embarked on the national development programmes to all around and promoting the living standard of the people to achieve the aim of the emergence of a peaceful, modern and developed nation since 1989. In line with the objectives, the government has set up the five rural development tasks; securing smooth and better transportation in the rural areas, availability of clean water in the rural areas, uplift of education standard of the rural people, uplift of health care for the rural people and development of the economy in the rural regions to promote rural areas.

Transport supports family and community development by providing the necessary access to gatherings (social or political) outside of the locality. At one time development plans assumed that the only activity of the rural poor was agriculture, and development was therefore to consist solely of trying to improve agricultural performance.

Economic development is almost always accompanied by urbanization as development both pushes workers out of rural areas and pulls workers to the cities. The push comes because improvements in agricultural productivity and the cities offer economic opportunities in manufacturing and services that are more attractive than farm labor. Most development goals have strong social development elements. These include: poverty reduction strategies, promoting human development such as through better health and education, promoting good government, particularly through the encouragement of participator process.

Other development goals like economic reform and addressing environmental concerns may also have social development content. Economic reform provides the framework for poverty alleviation and greater resource allocation to health and education programmers. In addressing environmental issues, the outcome may be better community management of natural resources, and hence a more sustainable livelihood.

In the context of rural development, the positive social dimensions of change involve: To better access to basic social needs for food, water, health, education, security, justice, enfranchisement and human rights and to better access to the means for poor people to enhance farmer's productive capacity for markets, suppliers, employment, health and education. The best possible quality of life for rural people

based on: (i) the sustainable management and use of natural resources (land, water, air); (ii) fair economic and social opportunities (employment, income generation, education and skill development, nutrition and health, drinking water, rural infrastructure, community-based organizations, social protection etc.); (iii) the preservation of a rich cultural heritage (including cohesiveness and mutual support systems in rural communities); and (iv) the achievement of regional competitiveness in the production of agricultural products.

An improved quality of life in rural areas will serve as the "pull" factor to retain and attract a skilled and capable population, while at the same time opening up new opportunities for long-term private sector investment. Each and every person will be able to access quality social services, receive fair returns to his/her labour, become free from persistent indebtedness, consume nutritionally adequate food, and lead a respectable life. In performing rural development activities, the state plays its role as policy maker, strategy planner, supervisor, and rural development measures to implement these strategic plans have taken in selected target areas by constructing village approach.

Myanmar is one of the poorest countries in East Asia, with an estimated GDP per capita of between $800-$1,000 and a poverty headcount of 26 percent. The country's GDP is estimated at US$50 billion. Most social indicators are very low. The poor state of limited access to infrastructure are major impediments to providing basic health and education services, and for economic development. Almost half the roads are not passable during the monsoon season. Telecommunications and internet access is also very limited (World Bank, 2013).

Poverty is an issue that affects to all people, research indicates that increased poverty levels are proportional to increased crime rates, number of students that drop out of school, and lack of job opportunities. Likewise, increased levels of poverty also tend to have a negative effect on our communities. Poverty remains a global concern for the last few decades. It's nature and dimension are much complex in rural areas.

Poverty eradication issues were given the highest emphasis in the Millennium Development Goals (MDGs) and subsequently, these have been kept as the priorities in the Sustainable Development Goals (SDGs). Poverty restrains economic growth and sustainable development. The social, economic, demographic, cultural and other significant contributing factors for poverty reduction have implications on the economic development and policy interventions (World Bank, 2014).

Poverty has many forms in the literature, two forms of poverty are more common. One is relative poverty in which a person is not able to maintain a lowest level of living of a specific society (Yousaf & Ali, 2014). According to Akhtar (1988), relative poverty is measured as a percentage of average income of society. Second is absolute poverty in which person is not able to fulfill the basic nutrition requirements of its body. According to Batool (2007), in absolute poverty a person lies below the poverty line if he is not able to take 2350 calories in a day. Poverty is a socio-economic issue and also a variable that determines one's socio-economic status (Frisby, 1998).

The most commonly used global comparative poverty lines are USD$1.25 and USD$2.00 per day. As differences in price levels across the world evolve, the global poverty line must be periodically updated to reflect these changes. Since 2015, the last update, the global line spent $1.90. As of fall 2022, the new global line will update to $2.15.

Myanmar needs to reform its economy by 2030 to become better than the middle class, pathways have been sets up to accelerate the transformation of various socio-economic sectors by sector. The fundamentals of economic and investment, improving productivity and qualifiable statistical data through flexible economic environment are important fundamental boundary in implementing development policies for socio economic.

There are three main factors that social scientists used to calculate the socioeconomic status. Income is how much a person earns, including wages and salaries, as well as other forms of income such as investments and savings. The definition of income is sometimes expanded to include inherited wealth and intangible assets as well. Education is a person's level of education has a direct impact on their earning ability, with higher earning power leading to more educational opportunities that in turn increase future income potential. Occupation factor is more difficult to assess because of its subjective nature. White-collar professions that require a high degree of skilled training, such as physicians or lawyers, tend to require more education and thus return more income than many blue-collar jobs.

Socio-economic status (SES) is an economic and sociological combined total measure of a person's work experience and of an individual's or family's economic access to resources and social position in relation to others. The household income, education, and occupation are examined for an individual's SES own attributes are assessed. Socioeconomic status is typically broken into three levels such as high,

middle, and low to describe the three places a family or an individual may fall into. When placing a family or individual into one of these categories, any or all of the three variables are income, education, and occupation can be assessed.

Families with low socio-economic status often lack the financial, social, and educational supports that characterize families with high socio-economic status. Poor families also may have inadequate or limited access to community resources that promote and support children's development and school readiness. Unemployed or low-income parents tend to see as incompetent person. Inadequate resources create conflict in the home. Such a state of affairs may influence the adjustment of the child.

A low SES is known to have a negative influence on the growth of children and is considered to be a significant language and executive function predictor (Hackman & Farah, 2009; Noble et al., 2005). Noble et al. (2005) indicated that SES influence on executive function during infancy is mediated by the relationship of parents with children and the ability to reduce stress of parents. In another study, kids who lived in better physical conditions and whose mothers had a higher level of education received greater executive function scores (Filippetti, 2011).

The list of risk factors associated with low socioeconomic status includes higher teen pregnancy rates, high school dropouts, trauma, and illness all potentially occurring simultaneously, and each increasing the risk of poor health outcomes.

1.1 Rationale of the Study

Myanmar is an agricultural country that country's economy is mainly depending on exporting agricultural products to other countries. It is also a country which is rich in natural resources. The development of economy plays a vital role in building a modern and developed nation. Agriculture is a conventional business which has been done since the time of forefather. The agricultural sector is an important part for the economy of Myanmar.

National income from agricultural products which are produced in Myanmar. Moreover, the implementation of development of human resources can be get from these products. As the Republic of Union of Myanmar is depending mainly on agricultural sector, the government is striving its effort to expend cultivable land and improve the yield of crops per acre. Moreover, the government is also carrying out the projects by using modern technologies for expending cultivable land, sufficient water for cultivating and raising the yield of crops per acre.

Rice production in Myanmar accounts for approximately 43% of total agricultural production in the country, making it the seventh largest producer of rice in the world. Out of 67.6 million hectares of land, 12.8 million are used for cultivation. In 2019 alone, Myanmar accounted for 13,300 million metric tons of milled rice production. Major regions of the country grow paddy are Irrawaddy, Sittaung, Chindwin delta areas such as Ayeyarwady, Bago, Mandalay, Yangon and Sagaing regions.

Nowadays, the government is planning to improve the agricultural sector by laying down the economic policies and the fact "Building of a modern industrialized nation through the agricultural development, and all-round development, of other sector of the economy" is included in economic objectives. As the development of country's economy is mostly depending on the development of agricultural sector, implementing the availability of sufficient edible crops for the increasing population plays an important role.

In Myanmar, many kinds of crops such as rice, wheat, cotton, various beans and pulses and other oilseeds are cultivated. Among them, rice play an important role because almost everyone is using rice as an essential cooking and it is the most consumed food among the essential foods which are consumed every day by the Myanmar people. Rice is grown in both rainy season and summer. In addition, rice is also grown with the irrigation in summer.

Myanmar paddy cultivators need to grow the suitable paddy by choosing various rice seeds in accordance with the varied regions, ecological condition and weather of Myanmar. Rice is one of the most essential crops for domestic consumption. It is also grown in almost every region of Myanmar because they are economical and profitable crops to grow. Paddy is an essential consumer good for everyday consumption. According to the new import and export policy laid down by the government, private enterprises have had the permission to export rice freely to both local and foreign countries.

The government is supporting the farmers to improve rice production by building dams and irrigation canals in order to fulfill necessary rice for the sufficiency of domestic consumption as well as to export them as export goods to foreign countries. Rice are also essential export goods for the Myanmar to get foreign income. The government is helping farmers to be able to buy in installment modern technologies and machines which are needed for cultivating in time. In the world, the necessity of food

is increasing more and more daily in parallel with the growing of world's population. Hence, only if the production of rice improves, the foods will be sufficient as well as the economy of the country can develop more by exporting them.

Rice is the major crop for both economy and food security of the country. Therefore, efficient rice production would give more income and export revenue for the country because paddy production alone accounted about 35% of the total crop area in Myanmar. It would in turn allow Myanmar to make an essential step for construction of a developed country through reducing poverty, improving food security for all farms, fostering a more dynamic rural sector and making agriculture as a dynamic contributor to the national economy. Agriculture has been critically important in reducing poverty in Myanmar, and further progress in agriculture will remain important as Myanmar's economy continue to evolve.

A country's economy is based on townships and townships are based on wards and villages. The economic welfare of wards and villages in each township is the main role of living needs in a country. Understanding the economic and social situation of wards and villages in each township can assess the socio-economic of the country. Myanmar is rich in natural resources, land and water together with favorable weather conditions for crop production. Moreover, it is also an agricultural country and the agriculture sector is the backbone of its economy. Knowing the economic and social situation of the townships can be very helpful in planning of the country. So, population, education, marriage, occupation, type of worker, social information, basic food, fuel, clothing, social, consumption, luxury items of each household in Pandaung village are collected and presented.

The people-centered development of seven priority programs are access of drinking water, electricity, agriculture sector development, job opportunities, tourism, financial services, trade and investment that are need to develop and implement with accurate and statistical data in each sector. Socio-economics plays an important role in the development of rural and urban of a country.

Shwebo township is one of the most rice growing areas in Sagaing region and it exports rice to the People's Republic of China, Philippines and Bangladesh are the largest buyers. The rice varieties sown in Shwebo township consist of Shwebo Pawsan, Ayeyarmin, Shwebo-1, Hmawbi-1, Manawthukha, Manawharee, Sinthwelatt, IR-747, Shwethweyin and many other rice varieties. Among these varieties, Shwebo Pawsan

variety is popular for quality rice variety with high price. Then, Ayeyarmin is second in popularity as high yielding variety with reasonable price in Shwebo.

In this thesis, the socio-economic condition in Pandaung village, Shwebo township, Sagaing region is studied with statistical methods. The people of Pandaung village make agriculture as a major business. It can be said that agriculture is the life blood of Pandaung because all households are depending mainly on the agriculture. The farmers in Pandaung village mainly grow rice and other crops such as groundnut, sesame, and sunflower. Among them, the cultivation of rice is the most reliable. Therefore, the village can increase income and socio-economic status by selling crops at the wholesale center in another township.

1.2 Objectives of the Study

The objectives of the study are:

1. to examine the socio-economic factors on poverty level of households in Pandaung village in Shwebo township and
2. to analyze the influencing factors of poverty for farmers' households in Pandaung village in Shwebo township.

1.3 Methods of Study

Data were collected by asking to fulfill the questionnaires and using quantitative method. In this thesis, descriptive statistics is applied for the analysis of data using simple statistical tools like percentages. Principal component analysis is applied for construct of wealth index for Pandaung village, Shwebo township. Multiple regression analysis and binary logistic regression analysis were used in this study. In Pandaung village, 154 sample households were randomly selected from total 240 households, which were approximately 64.17% of total households. This study is mainly based on primary data and also used secondary data sources from the various issues of research journal, books, library and relevant websites.

1.4 Scope and Limitations of the Study

This study investigates the socio-economic status on paddy farmers' households in Pandaung village, Shwebo township. In Pandaung village, 154 households are selected from 240 households, June 2019 survey by using simple random sampling method. There are several ways to study, but descriptive analysis, multiple regression

analysis, wealth index using principal component analysis and binary logistic regression are used in this study. In this study used sixty-four percent as a sample of total households in Pandaung village. And also, the wealth index based on asset ownership is used in this study to describe the poverty level of households.

1.5 Organization of the Study

This study is comprised with five chapters. Chapter 1 includes the introduction which states five sub-titles such as rationale of the study, objectives of the study, methods of study, scope and limitations and organization of the study. Chapter 2 describes the literature review which includes into theoretical review and empirical review. Chapter 3 states research methodology. Chapter 4 presents analysis of the socio-economic factors on poverty level of households in Pandaung village and Chapter 5 is the conclusion of the study based on findings, recommendations and suggestions, and needs for further study.

CHAPTER 2
LITERATURE REVIEW

This chapter includes the determinants of socio-economic status. Therefore, there are many theories in the literature. This chapter seeks to describe a critical review of the relevant theoretical and empirical review regarding the socio-economic status of households.

2.1 Determinants of Socio-economic Status

Determinants of socio-economic status have identified the following variables as major determinants of a household socio-economic status.

Gender: Gender refers to the commonly shared expectations and norms within a society about appropriate male and female behavior, characteristics and roles. Gender can be considered a social and cultural construct that differentiates females from males and thus defines the ways in which females and males interact with each other. A gendered ability differential has correlation with economic status of the household (Gupta, 2000).

Age: Age is defined empirically with respect to a specific event call it the study event and with age distinguishing people by how long they have survived (Burt, 1991). Age of the respondent is anticipating a positive relation on earning ability and age-squared has a negative association with earning abil
ity (Fingleton & Longhi, 2013).

Family Size: The number of members normally residing in a household is its size. The size of the family is a matter of great importance not only for the country as a whole but also for the welfare and health of the individual, the family and the community. The development regarding social, educational and economic conditions leads to positive attitudes in favor of limiting of the family size (Pandy et al., 2013).

Education: Education is often looked to as an opportunity for children to overcome the disadvantage of social background by placing themselves on an equal footing with others upon entering the labor market. It is well known that the Socio-Economic Status (SES) of children's families have a significant influence on their educational achievement. And, of course, educational achievement is a good predictor of Socio-Economic Status (Taylor& Yu, 2009).

Assets: Household assets represent all that were owned by the household and had money value. This included physical assets like land, buildings, livestock, agricultural machinery and implements, non-farm business equipment, all transport equipment, and financial assets like due receivable on loans advanced in cash or in kind, shares in companies and cooperative societies, banks, etc., (NSSO, 2013).

Drinking Water and Health Care Facilities: Safe drinking water and primary health care facilities are crucial prerequisites and will be helpful for social development. Adequate and safe drinking water and health care facilities are important services required for a healthy household and community development. These facilities are closely related to social, economic and cultural development (Pawar& Cox, 2010).

Poverty: Poverty is a multifaceted phenomenon that affects not only the ability to purchase goods, but also various pressures that can inhibit a person's enjoyment of life. Productivity and incomes from employment and livelihoods are important factors in reducing poverty. Social conditions such as health, nutrition, education and housing influence productivity, thus affecting the state of poverty (Ha Noi, 2002).

2.2 Theoretical Review

Many theoretical reviews have endeavored to identify various determinants of socio-economic status. Socio-economic status is presented in the theoretical review. Socio-demographic factors and economic factors such as household size, education attainment, gender, age of household head, household asset ownership (i.e. type of house) and spatial factors have been identified as factors that influence socio-economic status.

2.2.1 Socio-economic Status

SES is the field of study that examines social and economic factors to better understand how the combination of both influences something of an individual or group of individuals based on education, income, occupation, and other relevant indicators, relative to other members of the population. It is often used to refer to a geographic region’s combined economic and social position relative to other areas. The socio-economic characteristics pertaining to demography, means of production and investment of income and the expenditure pattern of people living in a particular location are some of the crucial factors that help in determining the social and economic status of the people of that location. Based on these factors/dimensions, developmental

policies can be enhanced and planned, keeping the location as the focal point (Masudkar DD, Kamble VB & Anarase MS, 2017).

SES is the relative position of a family or individual in a social system in which individuals are ranked according to their access to or control over wealth, power and status. This definition highlights the relative nature of socio-economic scores as reflecting the hierarchical ranking that characterizes modern human societies, while "wealth, power and status" refer to the three components of social stratification highlighted in Weber (1922).

SES is a complicated system that takes into accounts not only family income and parental education/occupation, but also mental and physical wellbeing, family climate, housing conditions, and characteristics of the community (Hackman, Farah, & Meaney, 2010). In particular, in executive function assessments, parental education and parental occupation were found to be responsible for more than 14 percent of the variance in the children's scores (Noble, Norman, & Farah, 2005). A higher level of parental schooling, superior living conditions, greater cognitive stimulation at home, and enhanced cognitive output in children have been correlated with a larger family income (Clara Mazzoni, Stelzer, Alejandro Cervigni, & Martino, 2014; Crookston, Forste, McClellan, Georgiadis, & Heaton, 2014; Hamadani et al., 2014).

Education is the backbone for the socio-economic development of a country and it needs to be developed and delivered in a way where it meets the basic needs of the society. As is known and understood globally that societies, communities, groups, states and people in general, since ages, have certain aspirations and expectations too from education and where ever it has been delivered, it has led to the advancement and no destruction of societies had ever taken place-be it European, Asian or African continents.

Education has always been an instrument of growth and development. Education is not only related to academic but overall development of the individuals intellectual and emotional to be more specific. Socio-Economic Status is an economic and sociological combined total measure of a person's work experiences and of an individual's or family's economic and social position relative to others, based on income, education and occupation. Families with high socio-economic status often have more success in preparing their young children for school because they typically have access to a wide range of resources to promote and support young children's

development. They are able to provide their young children with high-quality child care, books, and toys to encourage children in various learning activities at home.

Occupational status, a component of socioeconomic status, is determined by a person's education, income and level of power such as social position, working conditions, decision-making and psychological demands. Occupational status can determine access to resources that can affect exposure to hazards and risk for death and disability.

Educational attainment is for fewer young people to complete both high school and college, especially those from schools that have fewer resources and higher rates of minority students. The cost of tuition is a barrier to education for low-income families, further perpetuating low socioeconomic status across generations. Over their lifetime, high school graduates earn half that of college graduates. The current generation is less likely to graduate from high school than their parents' generation.

Access to Health Care is a 2015 report from the World Health Organization states that 36% of the world's population, or nearly 2.5 billion people, lack access to improved sanitation facilities, putting them at risk of several diseases including dysentery, cholera and typhoid. In context, however, the report also states that disadvantaged subpopulations, such as rural residents, the poor and the less educated have seen greater increases in key coverage indicators over the past decade or so than their urban, wealthier and better-educated counterparts. Access to vision care is a health issue that can impact educational attainment and earning potential. Households in which individuals, and especially wage earners, experience poor health or premature death are at added risk for low income, creating a self-reinforcing cycle.

Some characteristics of low socioeconomic status create a feedback loop that creates or maintains low status. Education is one: lower educational attainment limits access to higher-status jobs, which limits opportunities for further education. Similar feedback loops involve access to medical care, nutrition, injury, disease, disability, psychiatric disturbance, substance abuse and homelessness.

It is widely believed that a person's socio-economic status affects the life choices that makes. The socio-economic status of a person is a combination between the education, experience, and income of the person and family. It is believed that all of these factors combined will help to impact the decisions that one makes throughout life. Socioeconomic status is as much something that a person is born in to, as well as something that can change over time. The interesting thing about socioeconomic status

is that it can be altered by an individual and by the descendants of the family for better or for worse.

In regards to evaluating one's socioeconomic status, there are a number of elements that must be taken into consideration. The employment, income, and education of the person affect the evaluation, just as much as the family that was born into affects the equation. One really unique aspect of socioeconomic status is that it can be altered by an individual and by the descendants of the family for better or for worse. The decisions of an individual can make a lasting impact on the results of the situation.

2.3 Empirical Review

Empirical reviews of the study is shown in Table 2.1

Table 2.1 Empirical Reviews of the Study

Author(s)	Title	Objective	Methodology	Findings
Po JYT et al. (2011)	Mortality Burden and Socio-Economic Status in India	The specific contribution of social castes, household income, assets, and monthly per capita consumption to mortality differentials in India	Using multiple logistic regressions	The finding of this study states that mortality differentials across social castes were attenuated after adjusting for household economic factors such as income and assets. Individuals living in the lowest income and assets quintiles had an increased risk of mortality. Mortality burden in India is largely patterned on economic dimensions as opposed to caste dimensions, though caste may play an important role in predicting economic opportunities.

Author(s)	Title	Objective	Methodology	Findings
Lakra et al. (2012)	Socio-Economic Status of Hybrid Rice Growers in Surguja District of Chhattisgarh	To determine the socio-economic status of the hybrid rice growers	Using the simple random sampling technique	The findings of this study revealed that majority of the respondents were found in middle age group and educated up to primary level having medium size of family with membership in more than one organization. Majority of the farmers had medium experience of hybrid rice cultivation and they were involved in agriculture and labor works. Maximum number of the farmers were having medium size of land holdings and surviving with the range of annual income. Majority of the famers had also obtained short term credit from co-operative societies.
Khudri (2013)	Evaluation of Socio-Economic Status of Households and Identifying Key	To evaluate living standards and socio-economic status of Bangladesh households	Using principal component analysis	The results also revealed that ownership agricultural land, having higher education reduce the likelihood of being poor whereas rural and unemployed people were more prone to poverty.

Author(s)	Title	Objective	Methodology	Findings
	Determinants of Poverty in Bangladesh			
Mohammad et al. (2014)	Impact of Microcredit Scheme on Socio-Economic Status of Farmers: A Case Study of PRSP in District Gujranwala	To find the impact of microcredit on socio- economic status and living standards of the farmers in rural areas of district Gujranwala	Using the simple random sampling technique	The study results clearly indicating fruitful benefits of the micro-credit scheme for the small farmers in uplifting their socioeconomic status.
Baswet (2016)	Influence of Socio-Economic Status on Implementation of Agricultural Extension Approaches among Smallholder Farmers: A Case of Agricultural Institutions	The influence of smallholder socio economic status on the implementation of the agricultural extension approaches by agricultural institutions based in Nyanza province in Kenya	Using multistage simple random sampling technique	The study found out that specifically, size of land owned by the smallholder households had a negative influence on the level of improved agricultural practices, while value of assets owned by the household had a positive influence on the level of improved agricultural practices.

Author(s)	Title	Objective	Methodology	Findings
	in Nyanza-Kenya			
Jumiyati Sri (2019)	Poverty Level of Farmers Based on Total Income and Feasibility of Rice Farming	To analyze the income and feasibility of farming and the poverty level of rice farmer household	Using qualitative descriptive method	This paper found that the rice farming has a comparative advantage, but the feasibility value has not been able to alleviate the rice farmer household of poverty.
Chalise et al. (2019)	Comparison of Poverty Status among Paddy Growers in Mid-Hills, Nepal	The status of rural household poverty level of paddy growing farmers in 2 mid-hill districts of Gandaki Province: Lamjung and Tanahun	Using principal component analysis	The result showed that household characteristics (foundation, outer -wall, number of sleeping rooms) and ownership status of assets like motorcycle and refrigerator are the indicators of poverty. This study sheds light upon economic status of the poor targeting their reduction of poverty via implementation of rice-based program.
Abas et al. (2020)	Paddy farmers perceived the socio-economic	To identify the level of knowledge and awareness of the paddy farmers	Using Chi-Square Test	This study has also revealed that farming experience is the most significant factor in influencing the awareness

Author(s)	Title	Objective	Methodology	Findings
	impacts of climate change: a case study in Pasir Mas, Kelantan	about climate change and its impact on the socio-economy		of paddy farmers towards climate change while farm size is the factor that influences the preparation that is done by the paddy farmers in order to deal with climate change. Farming experience indicates that the farmers have more knowledge about farming and its environment.
Alabi et al. (2021)	Determinants of Agricultural Loan Decision Making Process for Rice (Oryza Sativa) Farmers in Abuja, Nigeria	To determine the socio-economic profiles or characteristics of rice farmers, analyze the costs and returns of rice production, evaluate factors influencing rice farmers' decision to obtain an agricultural loan, evaluate socio-economic factors influencing the amount of the agricultural loan, and determine the constraints or	Using simple random sampling, descriptive statistics, principal component analysis	The result show that the socio-economic factors are statistically and significantly influencing the amount of loan obtained by rice farmers were age, sex, household size, and educational level.

Author(s)	Title	Objective	Methodology	Findings
		problems facing rice farmers		
Bidarti (2021)	Survive of the Indonesia Farmers in During the Covid-19 Pandemic: Findings of the South Sumatra	To perform an empirical analysis of rural farmer conditions in South Sumatera during the Covid-19 pandemic outbreak. There are some things focused on economic and demographic features, levels and patterns of income and consumption, the magnitude of debt factors, and social conditions and the position of farmers in society	Using multiple regression analysis	This paper findings first, during the pandemic, farmers were in a difficult condition because of the low income from agricultural products that was not balanced with consumption expenditure. And then, farmers' income during the pandemic amounted decrease from the previous year amounting. Second, farmers survive by making debt loans. Third, reduced income and large amounts of debt have caused farmers to be unable to meet their basic needs.
Abas (2021)	The Impact of Climate Change Disaster to the Socio-Economic of	To examine the impact of climate change such as precipitation, on	Using random sampling method, quantitative approach	The study found that the relationship between household income and weather variables between the two seasons is nonlinear. Therefore,

Author(s)	Title	Objective	Methodology	Findings
	Paddy Farmer in Malaysia	the net income of farmers		net revenue decreased in the low season as rainfall increased.
Sharma et al. (2021)	Agriculture in Relation to Socioeconomic Status of Tharu in Chitwan of Nepal	To comprehend the relationship between the socioeconomic status of the Tharu and agriculture	Using simple random sampling	The study behind this were lack of sufficient extension facilities, migration, land fragmentation, and the dominant psychology about traditional cultivation farming type was found to be significantly associated with the access to extension services.
Mukesh Sehgal (2021)	Demographic and Socio-Economic Status of the Farmers of North Eastern Part of Country: A Case Study	the objectives to know the socio-economic status of Siaha district farmers, to study the availability of resources, to locate the specific socio-economic weaknesses in their production organization, and to find the constraints that inhibit the popularization	Using simple random sampling	In this study, agriculture of the primary source of livelihood for the over whelming majority of the farmer's population. It is mandatory to identify and quantify the socio-economic factors which are key factors that are inhibiting their growth and development. The farmers owing to their lifestyle and community habitats have not been able to keep pace with present society.

Author(s)	Title	Objective	Methodology	Findings
		and adoption of modern technologies		
Ayindrela Halder (2021)	A Study on the Socio-Economic Status of Agricultural Farmers	To determine the socio-economic conditions of the farmers of 10 blocks in different districts of West Bengal	Using principal component analysis	This study found that the majority of the farmers across the blocks were middle-aged, educated up to the secondary level, and had an average or below-average income and expenditure as compared to the average monthly income and expenditure of the farmers of India.

Sources: Various Studies

CHAPTER 3
METHODOLOGY

This chapter presents the analytical methods used for the study of socio-economic data. It uses sampling design, data collection, principal component analysis (PCA), multiple regression and binary logistic regression.

3.1 Sample Size and Sampling Design

Yamane (1967) suggested that the calculation of sample size from a population which is an alternative to Cochran's formula. According to Yamane theory, for a 95% confidence level and p = 0.5, size of the sample should be

$$n = \frac{N}{1+Ne^2} \tag{3.1}$$

where, N is the population size

e is the level of precision.

$n = \frac{240}{1+240(0.05)^2} = \frac{240}{1.6} = 150$ respondents

The result of the above sample is 150 from the total population households of 240 which the lower number of responses from the respondents to maintain a 95% confident interval.

After calculating the representative sample size, the main aim of an investigator is to find the proper method of selecting samples. Sampling is simply the process of learning about the population on the basis of sample collected from the population. Sample is constituted by a part or fraction of the population. Thus, in the sampling technique, instead of every unit of the population, only a part of it is studied and the conclusions are drawn for the entire population on the basis of the sample.

The data used in this study is primary data from 2019 survey. Descriptive statistics were used to describe the demographic and socio-economic characteristics of the head of households in Pandaung village. The data obtained more detailed and completed information when it uses a combination of observation, household research, related facts and literature reviews, and face-to-face interviews. This study mainly adopted questionnaire survey. Multiple regression model was applied to examine the association between expenditure and socio-economic characteristics. Binary logistic

regression model was used to identify the demographic and socio-economic determinants of poverty.

This study also includes the Principal Component Analysis (PCA) to construct the wealth quintile based on the data of asset ownership, water source and sanitation, and housing materials. Households survey is one of the main reasons for choosing quantitative research as the major study method. The design of the survey was based on a random sample of 154 households. The households were selected by simple random sampling from 240 population of households in Pandaung village. The purpose of the survey is to get some useful information related to the demographic and social situations and to know the living conditions of the people living in the Pandaung village. Therefore, this survey was conducted in year 2019, highlighting the socio-economic conditions of people in Pandaung village. The data collection method used in this survey. In this survey, the list of households was obtained from the village council office. In this survey, 154 sample households were selected, which is approximately 64.17% of total households in Pandaung village.

3.2 Data Collection

The study utilized primary data. Primary data were obtained from Pandaung village in Shwebo township. Simple random selections of 240 sample households were personally interviewed in which 154 sample households from Pandaung village with a set of structured questionnaires. The questionnaire was constructed in details on all information about socio-economic status on paddy farmers of households. Demographic characteristics of the sample households such as age, education level, family size and properties of households were collected. And also, economic conditions of households such as monthly income and monthly expenditure were collected. Detail costs and yields were also composed in the questionnaires.

The questionnaire was designed in first, the survey question is a composite measure of a farmer's social condition. It can be collected data based on a farmer's age, education and household size. Second consideration is property of households such as home ownership, housing type, water availability, yield and fertilizer utilization per acre. Home ownership has 3 response categories: own, rent and other. Concerning housing type, the study takes 4 responses into considerations: RC, brick, wood and bamboo. Finally, economics conditions of households such as income and expenditure.

3.3 Principal Component Analysis

A principal component analysis is concerned with explaining the variance-covariance structure of a set of variables through a few linear combinations of these variables. Its general objectives are (1) data reduction and (2) interpretation. Although p components are required to reproduce the total system variability often much of this variability can be accounted for by a small number k of the principal components. There is almost as much information in the k components as there is in the original p variables. The k principal components can then replace the initial p variables, and the original data set, consisting of n measurements on p variables, is reduced to a data set consisting of n measurements on k principal components.

3.4 Population Principal Components

Principal components are particular linear combinations of p random variables $X_1, X_2, \cdots, X_p$. There linear combinations represent the selection of a new coordinate system obtained by rotating the original system with $X_1, X_2, \cdots, X_p$ as the coordinate axes. The new axes represent the directions with maximum variability and provide a simpler and more parsimonious description of the covariance structure.

Principal components depend solely on the covariance matrix $\sum$ (or the correlation matrix p) of $X_1, X_2, \cdots, X_p$. Their development does not require a multivariate normal assumption. On the other hand, principal component derived for multivariate normal population have useful interpretations in terms of the constant density ellipsoids.

Let the random vector x' =$[X\_1, X\_2, \cdots, X\_p]$ have the covariance matrix $\sum$ with eigenvalues $\lambda_1 \geq \lambda_2 \geq \cdots \geq \lambda_p \geq 0$.

The linear combinations are

$$Y_1 = a_1' X = a_{11}X_1 + a_{12}X_2 + \cdots + a_{1p}X_p \quad (3.2)$$

$$Y_2 = a_2' X = a_{21}X_1 + a_{22}X_2 + \cdots + a_{2p}X_p \quad (3.3)$$

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$$Y_p = a_p' X = a_{p1}X_1 + a_{p2}X_2 + \cdots + a_{pp}X_p \quad (3.4)$$

Then,

$$Var(Y_i) = a_i' \sum a_i \qquad i = 1, 2, \ldots, p. \quad (3.5)$$

$Cov(Y_i, Y_k) = \acute{a}_\iota \sum a_k$ i, k = 1, 2, . . . , p. (3.6)

The principal components are those uncorrelated linear combination $Y_1, Y_2, \ldots, Y_p$ whose variances in Eq. (3.4) are as large as possible.

The first principal component is the linear combination with maximum variance. It maximizes $Var(Y_1) = \acute{a}_1 \sum a_1$. It is clear that $Var(Y_1) = \acute{a}_1 \sum a_1$ can be increased by multiplying any a_1 by some constant. To eliminate this indeterminacy, it is convenient to restrict attention to coefficient vectors of unit length. Therefore define,

First principal component = linear combination $a_1'X$ that maximizes $Var(\acute{a}_1 X)$ subject to $a_1' a_1 = 1$

Second principal component = linear combination $a_2'x$ that maximizes $Var\ (a_2' X)$ subject to $a_2' a_2 = 1$ and Cov $(a_1' X, a_2' X) = 0$

At the i^{th} step,

i^{th} principal component =linear combination $a_i'x$ that maximize $Var(a_2' X)$ subject to $a_i' a_i = 1$ and $Cov(a_i' X, a_k' X) = 0$ for k < i

3.5 Principal Components for Covariance Matrices

There are certain patterned covariance and correlation matrices whose principal components can be expressed in simple forms. Suppose $\sum$ is the diagonal matrix

$$\sum = \begin{bmatrix} 6_{11} & 0 \cdots & 0 \\ 0 & 6_{22} & 0 \\ 0 & 0 \cdots & 6_{pp} \end{bmatrix} \quad (3.7)$$

Setting $e_i^1 = [0, \cdots, 0, 1, 0, \cdots, 0]$, with 1 in the i^{th} position, we observed that

$$\begin{bmatrix} 6_{11} & 0 \cdots & 0 \\ 0 & 6_{22} & 0 \\ 0 & 0 \cdots & 6_{pp} \end{bmatrix} \begin{bmatrix} 0 \\ . \\ . \\ . \\ 0 \\ 1 \\ 0 \\ . \\ . \\ . \\ 0 \end{bmatrix} = \begin{bmatrix} 0 \\ . \\ . \\ . \\ 0 \\ 1\sigma_{ii} \\ 0 \\ . \\ . \\ . \\ 0 \end{bmatrix}$$

(or) $\sum e_i = \sigma_{ii} e_i$

and its conclude that (6_{ii}, e_i) is the i^{th} eigenvalue-eigenvector pair. Since the linear combination $e_i^{'}X = X_i$, the set of principal components is just the original set of uncorrelated random variables.

The first principal component $Y_1 = e_1^{'}Z = \frac{1}{\sqrt{P}}\sum_{i=1}^{P} Z_i$is proportional to the sum of the p standardized variables. It might be regarded as an "index" with equal weights. This principal component explains a proportion

$$\frac{\lambda_1}{p} = \frac{1 + (p - 1)p}{p} = p + \frac{1 - p}{p} \quad (3.8)$$

of the total population variation. It can be seen that $\frac{\lambda_1}{p} = p$ for p close to 1 to p large.

3.6 Summarizing Sample Variation by Principal Components

Summarizing the variation in n measurements on p variables with a few judiciously chose linear combinations. Suppose the data $x_1, \ldots, x_n$ represent n independent drawings from some p-dimensional population with mean vector μ and covariance matrix Σ. These data yield the sample mean vector x, sample covariance matrix S and the sample correlation matrix R.

The uncorrelated combinations with the largest variances will be called the sample principal components. The sample principal components (PC) are defined as those linear combinations which have maximum sample variance. Specifically,

First sample principal component	=	linear combination $a_1^{'}X_j$ that maximizes the sample variance of $a_1^{'}X_j$ subject to $a_1^{'}a_1 = 1$
Second sample principal component	=	linear combination $a_2^{'}X_j$ that maximizes the sample variance of $a_2^{'}X_j$ subject to $a_2^{'}a_1 = 1$ covariance for the pairs $(a_1^{'}X_j, a_2^{'}X_j)$
⋮		
At the i^{th} sample principal component	=	linear combination $a_i^{'}X_j$ that maximizes the sample variance of $a_i^{'}X_j$ subject to $a_i^{'}a_i = 1$ and zero sample covariance for all pairs $(a_i^{'}X_j, a_k^{'}X_j)$, k < i

3.7 Testing of Adequacy of the Approach

Kasier-Meyer-Olkin (KMO) and Bartlett's Test of sphericity is a measure of sampling adequacy that is recommended to check the case to variable ratio for the analysis being conducted. In most academic and business studies, KMO and Bartlett's test play an important role for accepting the sample adequacy.

The Bartlett's Test of sphericity relates to the significance of the study and thereby shows the validity and suitability of the responses collected to the problem being addressed through the study. For a large sample, Bartlett's test approximates a chi-square distribution. However, the Bartlett's test compares the observed correlation matrix to the identity matrix. Therefore, the Bartlett's test form something of a bottom-line test for large sample, but is less reliable for small samples. For principal component analysis to be recommended suitable, the Bartlett's test of sphericity must be less than 0.05. In addition to, very small values of significance (below 0.05) indicate a high probability that there are significant relationships between the variables, whereas higher values (0.1 or above) indicate the data is inappropriate for principal component analysis.

Kaiser and Rice (1974) then modified it. This is just a function of the squared elements of the "image" matrix compared to the squared of the original correlation. The overall (MSA) as well as estimates for each item are found. The index is known as the Kasier-Meyer-Olkin (KMO) index. It checks if one can factorize efficiently the original variables. But it based on another idea. The correlation matrix is always the starting point. The variables are more or less correlated, but the correlation between two variables by removing the effect of the remaining variables. The KMO index compares the values of correlation between two variables and those of the partial correlations. The KMO ranges from 0 to 1, the world wide accepted index is over 0.6. Interpretation of the KMO is characterized by Kasier, Meyer and Olkin.

Table (3.1) Kaiser-Meyer-Olkin (KMO) Index

KMO value	Degree of Common Variance
0.90 to 1.00	Marvelous
0.80 to 0.89	Meritorious
0.70 to 0.79	Middling
0.60 to 0.69	Medicore
0.50 to 0.59	Miserable
0.00 to 0.49	Not suggested to apply

3.8 Wealth Index

The wealth index is a composite indicator for measuring the living standard of households in low and middle-income countries. It is calculated using data on a household's ownership of a selected set of assets, dwelling characteristics, type of water access, and toilet and sanitation facilities. The wealth index considers characteristics related to wealth status, avoiding variables that do not represent an asset, or outcome variables.

Since the late 1990s, wealth indices have become widely used instruments for measuring the economic status and living standard of households in low and middle-income countries, deriving information on "long-run wealth" from data already collected in large-scale surveys.

There are several ways in which wealth, economic status of households, and living standards can be measured. Income, expenditure, and consumption are three common measurements. However, there are challenges in collecting and measuring income and expenditure accurately. An alternative is to use data on asset ownership and housing characteristics and combine this information into a proxy indicator such as the wealth index, which is created using the statistical technique of principal component analysis (PCA). Asset ownership gives an indication of the long-term economic status of a household and is less dependent on short-term economic changes compared with other wealth or poverty measures (McKenzie 2005).

Wealth index is calculated using data on a household's ownership of a selected set of assets, such as televisions, bicycles, and cars; dwelling characteristics such as flooring material; type of drinking water source; toilet and sanitation facilities; and other information about household's material wellbeing. The wealth index considers characteristics related to wealth status, avoiding variables which do not represent an asset, such as nutrition, or outcome variables, such as education.

Each asset eligible to measure wealth for which information is collected is assigned a weight or factor score generated through principal components analysis. The resulting asset scores are standardized in relation to a standard normal distribution with a mean of zero and a standard deviation of one. Each household is assigned a standardized score for each asset, where the score differs depending on whether or not the household owned that asset. Wealth is the value of all natural, physical and financial assets owned by a household, reduced by its liabilities. Income, age, material status,

family size, religion, occupation, and education are all predictors for wealth achievement.

3.9 Multiple Linear Regression Model

Multiple regression analysis is a method of taking into account simultaneously the relationship between all the variables when two or more independent variables are to be used in making estimates of the dependent variable. The use of two or more independent variable regression analysis is an extension of the basic principles used in two-variable regression analysis. It is necessary to determine the equation for the average relationship between the variable.

In the linear equation that represents the multiple regressions model is

$$Y_i = \beta_0 + \beta_1 X_{i1} + \beta_2 X_{i2} + \cdots + \beta_k X_{ik} + \varepsilon_i \quad (3.9)$$

where Y_i = value of the dependent variable in the i^{th} trial, or observation

β_0 = constant in the regression equation, which indicates the value of Y when all $X_{ik}= 0$

$\beta_1, \cdots, \beta_k$= regression coefficients associated with each of the X_k independent variable

X_{ij} = value of the j^{th} independent variable in the i^{th} trial, or observation, associated with the process of sampling.

ε_i = the random error in the i^{th} trial or observation, associate with the process of sampling.

3.9.1 Evaluating the Model

Several tests can be used to evaluate a multiple regression model. In this study, (1) calculate and interpret the standard error of the estimate, (2) evaluate the entire model using ANOVA and the F-test and (3) evaluate the contribution of each independent variable with the use of t-tests.

The Standard Error of the Estimate

The standard error of the estimate, S_e , is found much as it was in the case of simple regression. The mean square error (MSE) is found by dividing the sum of the squared errors (SSE) by the degrees of freedom.

$$MSE = \frac{\sum(Y_i - \widehat{Y})^2}{n-k-1} \quad (3.10)$$

Then,

$$S_e = \sqrt{\frac{\sum(Y_i - \widehat{Y})^2}{n-k-1}} \quad (3.11)$$

This formula requires that the predicted value of Y ($\hat{Y}$) be calculated for every observation. The error, the difference between this predicted value and the observed Y-value (Y_i), is then squared and summed for all observation.

Evaluating the Model as a Whole

The overall F-test is used to test for the significance of overall multiple regression model. The ANOVA procedure tests the null hypothesis that all the β-values are zero against the alternative that at least one β is not zero.

Table 3.2 ANOVA Table for Multiple Regression Analysis

Source of Variation	**Sum of Squares**	**Degree of Freedom**	**Mean Square**	**F**
Regression	SSR=$\sum(\widehat{Y_1}\text{-}\bar{Y})^2$	k	MSR = $\frac{SSR}{k}$	MSR/MSE
Residual	SSE=$\sum(Y_i\text{-}\widehat{Y_i})^2$	n-k-1	MSE = $\frac{SSE}{n-k-1}$	
Total	SST=$\sum(Y_i\text{-}\bar{Y})^2$	n-1		

$$F = \frac{\text{MSR}}{\text{MSE}}$$

SSR=Regression Sum of Squares

SSE= Error Sum of Squares

SST=Total Sum of Squares

k = the number of independent variables in the regression model

n-k-1 = the degrees of freedom for residual

MSE = the mean squares of error

MSR = the mean square regression

Test of Significance of Regression Coefficients

The multiple regression model is defined as

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \cdots + \beta_k X_k + \varepsilon \quad (3.12)$$

This ratio of mean square regression to mean square error follows the F-distribution when the assumption that the residual are normally distributed is valid and the null hypothesis is true. The ratio of F-statistic;

$$F = \frac{MSR}{MSE} \tag{3.13}$$

where; the *MSR* is the mean square due to the regression which is equal to

$$MSR = \frac{SSR}{k} \tag{3.14}$$

where; the *MSE* is the mean square of error which is equal to

$$MSE = \frac{SSE}{n-k-1} \tag{3.15}$$

where; n-k-1 is the residual degrees of freedom and *k* is the number of independent variables. The decision rule for the F-test takes the following form;

Reject the null hypothesis if : F > $F_{\alpha,k,n-k-1}$

Do not reject the null hypothesis if : F ≤ $F_{\alpha,k,n-k-1}$

where; $F_{\alpha,k,n-k-1}$ is based on F the distribution with k degrees of freedom in the numerator, n-k-1 degrees of freedom in the denominator, and a probability of α in the upper-tail of the probability distribution.

Testing Individual Partial Regression Coefficient, β_j

An individual partial regression coefficient, β_j in the multiple regression model is tested to determine the significance of the relationship between x_i's and y. For any parameter β_j the hypotheses take the form.

Null Hypothesis : $\beta_j = 0$

Alternative Hypothesis : $\beta_j \neq 0$

The *t* statistic for $\hat{\beta}_j$ is simple to compute given $\hat{\beta}_j$ and its standard error:

$$t = \frac{\widehat{\beta_j}}{se(\widehat{\beta_j})} \tag{3.16}$$

The decision rule for this test takes the following form:

Reject the null hypothesis if: $|t| > t_{\alpha/2,n-k-1}$

Do not reject the null hypothesis if: $|t| \leq t_{\alpha/2,n-k-1}$

3.9.2 The Coefficient of Multiple Determination R^2

The coefficient of multiple determinations is defined as:

$$R^2 = \frac{\sum(\hat{y}_i-\bar{y})^2}{\sum(y_i-\bar{y})^2} = 1 - \frac{\sum(y_i-\hat{y})^2}{\sum(y_i-\bar{y})^2}$$

The numerator of the middle term is the explained sum of squares, or the sum of squares due to regression, *SSR*, as it is sometimes called. The denominator is the total sum of squares *SST*.

Therefore, it can be written as:

$$R^2 = \frac{SSR}{SST} \tag{3.17}$$

The coefficient of multiple determination shows the proportion of the total variability in *Y*, the dependent of variables is explained by the independent variables. That is the percentages of the total variation of the dependent variable that can be explain by the explanatory variables. The value of R^2 will be between zero and one, where $R^2 = 0$, the regression model cannot explain anything about the variation in the dependent variable or the estimated model does not fit the data. The case of $R^2 = 1$ represents a perfect fit of the estimated model of the data. A high value of R^2 shows good fit and a low value of R^2 shows a poor fit.

3.9.3 The Adjusted Coefficient of Multiple Determination ($\bar{R}^2$)

A measure that recognized the number of independent variables in the regression model is called the adjusted coefficient of multiple determinations and is denoted by $\overline{\mathrm{R}}^2$.

$$\bar{R}^2 = \frac{\frac{\sum(y_i - \hat{y})^2}{(n-k-1)}}{\frac{\sum(y_i - \bar{y})^2}{(n-1)}} \tag{3.18}$$

Reporting the adjusted R^2 is extremely important in comparing two or more regression models that predict the same dependent variable but have a different number of independent variables.

3.10 Multicollinearity

There are several sources of multicollinearity. As Montgomery and Peck (1982) note, multicollinearity may be due to these factors. (1) The data collection method employed, for example, sampling over a limited range of the values taken by the regressors in the population. (2) Constraints on the model or in the population being sampled. (3) Model specification, for example, adding polynomial terms to a regression model, especially when the range of the X variable is small. (4) An over determined model.

Multicollinearity problem arises when one of the independent variables is linearly related to one or more of the other independent variables. Such a situation violates one of the assumptions of multiple regression. Specifically, multicollinearity occurs if there is a high correlation between two independent variables, X_i and X_j, i.e if the correlation coefficient r_{ij} between X_i and X_j in the multiple linear regression model is high, multicollinearity exist. When two or more independent variables are linearly related, some degree of multicollinearity exists. If its presence becomes too pronounced, the model is adversely affected.

The most direct way of testing for multicollinearity is to produce a correlation matrix for all variables in the model. Another way to detect multicollinearity is to compare the coefficients of determination between the dependent variables and each of the independent variables. A third way to detect multicollinearity is to use the variance inflation factor (VIF).

The *VIF* for any independent variable is a measure of the degree of the multicollinearity contributed by that variable.

The *VIF* for any given independent variable X_i is

$$VIF(X_i) = \frac{1}{1-R_i^2} \tag{3.19}$$

Where, R_i^2 is the coefficient of determination obtained by regression X_i on all other independent variables. Multicollinearity produces an increase in the variation or standard error of the regression coefficient. VIF measures the increase in the variance regression coefficient over that which would occur if multicollinearity were not present. In general, multicollinearity is not considered a significant problem unless the VIF of a single $X_i$measure at level 10 or the sum of the VIF's for all X_i is at least 10.

3.11 Binary or Binomial Logistic Regression

Mathematically, a binary logistic model has a dependent variable with two possible values, such as pass/fail which is represented by an indicator variable, where the two value are labeled "0" and "1". In the logistic model, the log-odds for the value labeled "1" is a linear combination of one or more independent variables; the independent variables can each be a binary variable or a continuous variable. The corresponding probability of the value labeled "1" can vary between 0 and 1.

Binary Logistic Regression Model

In logistic regression, the dependent variable is usually binary. The dependent variable can take the value 1 with a probability of success p, or the value 1 with a probability of failure 1-p. This type of variable is called a binary variable.

Binary logistic regression modeling can be used in many situations to answer research questions and estimate the odds of being a case based on the values of the independent variables (predictors). This regression models relate a set of predictors and a binary response variable. A binary response has only two possible values (win and loses). Use a binary regression model to understand how changes in the predictor values are associated with changes in the probability of an event occurring. The binary logistic regression model has extensions to more than two levels of the dependent variable. Binary logistic regression model can be expressed as follows.

$$\text{Logit}\,(p) = \ln\left(\frac{p}{1-p}\right) = \beta_0 + \beta_1 X_1 + \cdots + \beta_k X_k + \varepsilon \tag{3.20}$$

Where, p is defined as the success probability. The coefficients βs are the parameters in the model, X_1 are the explanatory variables and e is an error term. As p ranges from 0 to 1, the logit (p) ranges from $-\infty\, to + \infty$. $\frac{p}{1-p}$ is the odd ratio or likelihood ratio and logit (p) is taking the natural logarithm of odd ratio. If p is the probability that a family will own a house, 1-p is the probability that a family will not own a house. Maximum likelihood method is used to obtain unknown constant $(\beta_0, \beta_1, \cdots)$.

Taking the exponent on both sides of binary logistic regression model.

$$\frac{p}{1-p} = e^{\beta_0+\beta_1 X_1+\cdots+\beta_k X_k+\varepsilon} \tag{3.21}$$

$$p = \frac{e^{\beta_0+\beta_1\beta_1+\cdots+\beta_k\beta_k+\varepsilon}}{1+e^{\beta_0+\beta_1\beta_1+\cdots+\beta_k\beta_k+\varepsilon}} \tag{3.22}$$

Performance of Binary Logistic Regression

To evaluate the performance of a binary logistic regression model, the following measures should test.

Omnibus tests are a kind of statistical test. The test whether the explained variance in a set of data is significantly greater than the unexplained variance, overall.

In addition, Omnibus test as a general name refers to an overall or a global test. Omnibus test as a statistical test is implemented on an overall hypothesis that regarding coefficients $\beta_1 = \beta_2 = ... = \beta_k$ vs. at least one pair $\beta_j \neq \beta_j$, in multiple linear regression or in logistic regression. Usually, it tests more than two parameters of the same type and its role is to find general significance of at least one of the parameters is involved. Other names include F-test or Chi-Square test.

Goodness-of-fit statistics assesses the fit of a logistic model against actual outcomes. The inferential goodness-of-fit test for logistic model is the Hosmer-Lemeshow (H-L) test. The H-L statistic, $\hat{C}$, is a Pearson Chi-square statistic, calculated from a g x 2 table of observed and estimated frequencies, where g is the number of groups formed from the estimated probabilities.

Cox and Snell's define R square as a transformation of the statistic of $-2ln\left[L\left(M_{Intercept}\right)/L(M_{Full})\right]$ that is used to determine the convergence of a logistic regression. The ratio of the likelihoods reflects the improvement of the full model over the intercept model (the smaller the ratio, the greater the improvement).

It adjusts Cox and Snell's so that the range of possible values extends to 1. To achieve this, the Cox and Snell's R-Square is divided by its maximum possible value, $1 - L(M_{Intercept)})^{2/N}$.

$$R^2 = \frac{1-\left[\frac{L(M_{Intercept})}{L(M_{Full})}\right]^{2/N}}{1-(M_{Intercept))^{2/N}} \quad (3.23)$$

Then, if the full model perfectly predicts the outcome and has a likelihood of 1, Nagelkerke R-Square will be equal to one.

To evaluate the other performance of a binary logistic regression model, the following measures should test.

1. AIC (Akaike Information Criteria)

The analogous metric of adjusted R^2 in logistic regression is AIC. AIC is the measure of fit which penalizes model for the number of model coefficients. Therefore, the model with minimum AIC value is a better model.

2. Null Deviance and Residual Deviance

Null Deviance indicates the response predicted by a model with nothing but an intercept. Lower the value, better the model. Residual deviance indicates the response

predicted by a model on adding independent variables. Lower the value, better the model.

3. Confusion Matrix

It is nothing but a tabular representation of Actual vs Predicted values. It helps to find the accuracy of the model and avoid overfitting.

Table 3.3 Confusion Matrix

		Predicted	
		Good	**Bad**
Actual	Good	True Positive (d)	False Negative (c)
	Bad	False Positive (b)	True Negative (a)

The accuracy of the model with:

$$Model\ Accuracy = \frac{True\ Positive + True\ Negative}{True\ Positive + True\ Negative + False\ Positive + False\ Negative} \quad (3.23)$$

From confusion matrix, specificity and Sensitivity can be derived as illustrated below:

$$True\ Negative\ Rate\ (TNR), specificity = \frac{A}{A+B} \quad (3.24)$$

$$False\ Positive\ Rate\ (FPR), 1 - specificity = \frac{B}{A+B} \quad (3.25)$$

$$True\ Positive\ Rate\ (TPR), specificity = \frac{D}{C+D} \quad (3.26)$$

$$False\ Negative\ Rate\ (FNR) = \frac{C}{C+D} \quad (3.27)$$

4. ROC (Receiver Operating Characteristic) Curve

Receiver Operating Characteristic (ROC) summarizes the model's performance by evaluating the tradeoffs between true positive rate (sensitivity) and false positive rate (1-specificity).

ROC Curve

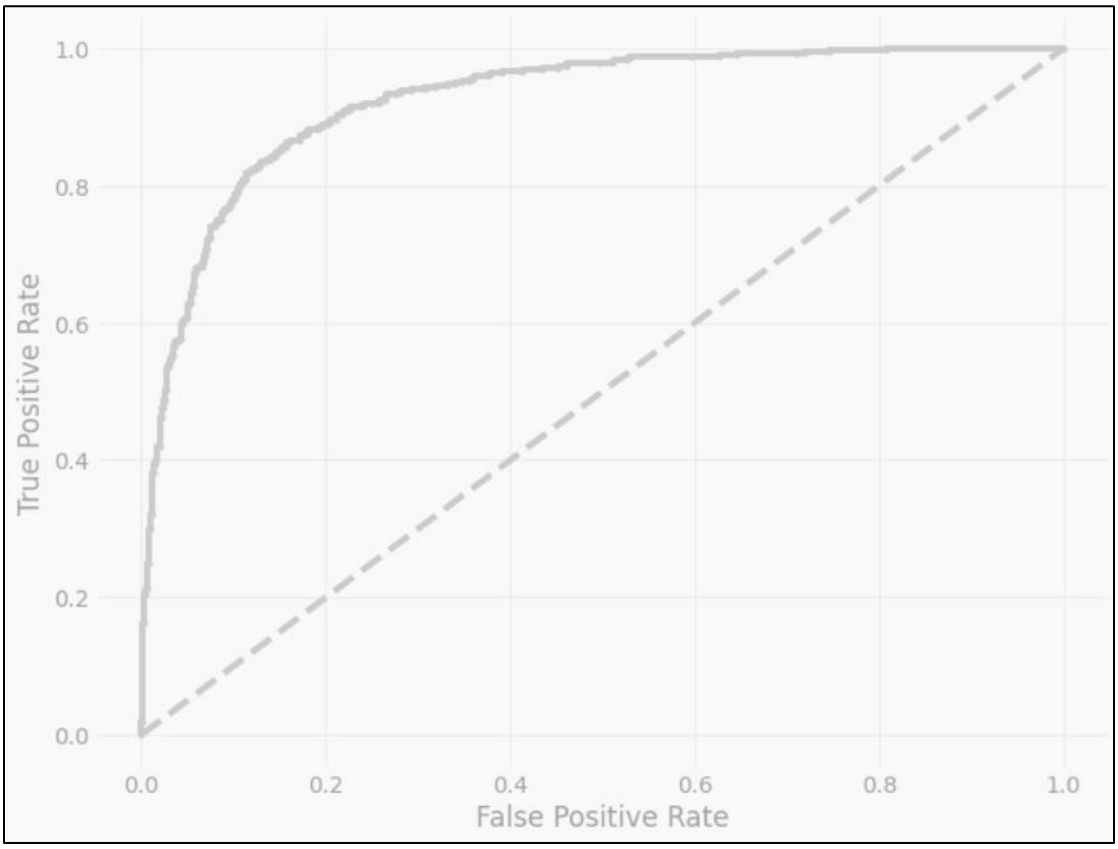


Figure 3.1 ROC Curve

For plotting ROC, it is advisable to assume p>0.5 since more concerned about success rate. ROC summarizes the predictive power for all possible values of p>0.5. The area under curve (AUC), referred to as index of accuracy (A) or concordance index, is a perfect performance metric for ROC curve. Higher the area under curve, better the prediction power of the model. Below is a sample ROC curve. The ROC of a perfect predictive model has TP equals 1 and FP equals 0. This curve will touch the top left corner of the graph.

CHAPTRE 4
ANALYSIS OF SOCIO-ECONOMIC FACTORS ON POVERTY LEVEL OF HOUSEHOLDS IN PANDAUNG VILLAGE

The following chapter described the results from the study on socio-economic status on paddy's farmer households. In this chapter, the following description are presented: first, history of Pandaung village; second, the sample based on demographic characteristics and third, the measurement model was evaluated for its reliability. In this section, data collected from the survey through questionnaire administration is systematically analyzed and interpreted according to methods and procedures.

4.1 Profile of Pandaung Village

The modern history of Shwebo begins with the rise of Alaungpaya, the founder of the last Burmese dynasty, which ruled for nearly a century and a half, from 1753 to 1885. The Shwebo township is located in the south of the Sagaing Region, which is the administrative region situated in north-west of Myanmar. Shwebo township has 62 villages and 10 wards (Ministry of Labour Immigration and Population, 2017). Shwebo was called its name as Moksobo, Yadana-Theinhka, Konbaung, Yangyi-Aung. Shwebo township is famous in Myanmar as a rice-growing region. Pandaung village is one of the villages in Shwebo township.

This village is located 3 miles and 6 furlongs away from Shwebo township. This village is surrounded by Phwint Hlaing village in South and Taung Tin village in North. The area of this village is 1200 acres. Number of houses are 240. The main occupation is farming. Skilled works include carpentry, masonry, handicraft and livestock cultivation. The major income for Pandaung village comes from agriculture. In accordance with the seasons of the year the inhabiting people grow peanut, sesame, chili, corn, pigeon pea, sunflowers and seasonal crops. Moreover, Thanaka is also cultivated.

The races inhabiting in Pandaung village are the most Bamar. The religion is Buddhism in Pandaung village. At present, in Pandaung village, it has one Basic Education Middle School. There are 11 teachers and 203 pupils. There has one Health Care Center in this village. In Pandaung village, there are sufficient roads and electricity that would increase access of agriculture inputs and income. So, this village can be

assumed fairly economic condition and the average monthly income of farmers was high as compared to the standard income of farmers.

4.2 Demographic Characteristics of Households in Pandaung Village

The following tables are demographic characteristics of households in Pandaung village.

4.2.1 Gender of Household Heads

The following table shows gender of household heads in Pandaung village.

Table 4.1 Gender of Household Heads

Gender	Frequency	Percent
Male	138	89.6
Female	16	10.4
Total	154	100.0

Source: Survey Data (2019)

In table 4.1, there are 138 males of household heads and 16 females of household heads in 154 respondents which is 89.6% and 10.4% respectively. So, the numbers of male are more than the numbers of female. According to this data, most of the household heads are males.

4.2.2 Age of Household Heads

The age group between 53 to 65 years is largest with 40.3% and the age group between 79 to 85 years is smallest with 1.9%. Out of the total population, the proportion of working age i.e. between 15 to 64 years was 121 and 78.6%. Therefore, the number of persons in working age group was larger than that of dependents in this village. The volume of the labor force was high in this village. According to this data, most of the household heads age is between 53 to 65.

Table 4.2 Age of Household Heads

Age	Frequency	Percent
27-39	13	8.4
40-52	46	29.9
53-65	62	40.3
66-78	30	19.5
79-85	3	1.9
Total	154	100.0

Source: Survey Data (2019)

4.2.3 Education of Household Heads

The following table describes the education of household heads in Pandaung village, Shwebo township.

Table 4.3 Education of Household Heads

Education	Frequency	Percent
Monastic	19	12.3
Primary	95	61.7
Middle	20	13.0
High	17	11.0
Graduate	2	1.3
Post graduate	1	0.6
Total	154	100.0

Source: Survey Data (2019)

Table 4.3 shows the total number of household head is 154. Monastic education persons were 19, 12.3%. According to this table, total population completed primary school were 95, 61.7%. Middle School level populations were 20, 13.0%. High School level populations were 17, 11% and Graduate level populations were 2, 1.3%. And then postgraduate level populations were 1,0.6%. The educational level in village is most in primary level due to the limited access to higher education opportunity in past.

4.2.4 Family Size of Households

The following table 4.4 shows the family size of households.

Table 4.4 Family Size of Households

Family Size	Frequency	Percent
1-3	32	20.8
4-6	85	55.2
7-9	35	22.7
10-12	2	1.3
Total	154	100.0

Source: Survey Data (2019)

The size of family numbers 4 to 6 is in 85 household heads and its percentage is 55.2%. The second largest size of family numbers 7 to 9 is in 35 households and its percentage is 22.7%. According to this data, most of 85 households have between four to six family members, it is 55.2%. The lowest of 2 households have between ten to twelve family members, it is 1.3%. The second lowest of 32 households have between one to three family members, its percentage is 20.8%.

4.2.5 Number of Students of Households

The following table shows the number of students of Households.

Table 4.5 Number of Students of Households

Number of Students	Frequency	Percent
0	73	47.4
1	49	31.8
2	27	17.5
3	5	3.2
Total	154	100.0

Source: Survey Data (2019)

According to the households in Pandaung village, the largest amount of household heads do not have student, and its percentage is 47.4%. There is one student in 49 households, and its percentage is 31.8%. In this data, the most households do not have students and the second highest is 49 households and it has only one student, it is 31.8%. The lowest of the 5 households have three students, it is 3.2%.

4.3 Properties of Households in Pandaung Village

The following sections are shown by home ownership, housing type of households.

4.3.1 Home Ownership of Households

The following table shows home ownership of households in Pandaung village. According to the table, almost all of the households owned house are 148 and 6 households are renter. In this data, most of the households are owner.

Table 4.6 Home Ownership of Households

Home ownership of household head	Number of households	Percent
Own	148	96.1
Rent	6	3.9
Total	154	100.0

Source: Survey Data (2019)

4.3.2 Housing Type of Households

Table 4.7 shows the housing types of households.

Table 4.7 Housing Type of Households

Housing type	Number of households	Percent
RC	2	1.3
Brick	37	24.0
Wood	66	42.9
Bamboo	49	31.8
Total	154	100.0

Source: Survey Data (2019)

It can be found that, most of the houses are wood and bamboo houses and it is 42.9% and 31.8% respectively. The brick houses are 24.0% and the other 1.3% are RC houses. In this data, most of the households own wood houses and least type of housing is RC houses.

4.4 Economic Conditions of Households

Economic condition of households in Pandaung village, is shown with monthly income of household and monthly expenditure, determinants of poverty of households according to the survey data of this village.

4.4.1 Monthly Income of Households

The following table shows the monthly income for households. According to the table, the monthly income of 19 households is under 250000 Kyats. At least monthly income is Kyats 100000. Only 3 households are between 1000000 Kyats and 1150000 Kyats and 54 households are between 400000 Kyats and 550000 Kyats. The most of the households earn income between 400000 Kyat and under 550000 Kyat, its percentage is 35.1%. It can be assumed that the economic condition of household in this village is fairly good condition.

Table 4.8 Monthly Income for Households

Income (Kyats)	Number of households	Percent
100000-250000	19	12.3
250000-400000	52	33.8
400000-550000	54	35.1
550000-700000	19	12.3
700000-850000	7	4.5
1000000-1150000	3	1.9
Total	154	100.0

Source: Survey Data (2019)

4.4.2 Monthly Expenditure of Households

This table shows monthly expenditure for households.

Table 4.9 Monthly Expenditure for Households

Expenditure (Kyats)	Number of households	Percent
20000-113000	8	5.2
113000-206000	47	30.5
206000-299000	33	21.4
299000-392000	34	22.1
392000-485000	17	11.0

485000-578000	9	5.8
578000-900000	6	3.9
Total	154	100.0

Source: Survey Data (2019)

In table 4.9, the monthly expenditure of 8 households is under 113000 Kyats. At least monthly expenditure is Kyats 20000. The monthly expenditure of 6 households is between 578000 and 900000 Kyats and 47 households are between 113000 and 206000 Kyats. According to this data, most of sample households have expenditures between 113000 Kyat and under 206000 Kyat, its percentage is 30.5%.

4.4.3 Wealth Index of Households in Pandaung Village

Table 4.10 Wealth Index of household heads in Pandaung Village

Wealth Index	Frequency	Percent
Poorest	30	19.5
Poor	32	20.8
Middle	30	19.5
Rich	31	20.1
Richest	31	20.1
Total	154	100.0

Source: Survey Data (2019)

According to this table, 19.5% of the households are poorest, 20.8% of the households are poor, 19.5% of the households are middle, 20.1% of the households are rich and 20.1% of the households are richest. Therefore, the most of the households in Pandaung village are poor.

4.5 Multiple Regression Model for Effects of Factors on Expenditure of Households in Pandaung Village

Multiple regression analysis is applied to investigate the factor affecting of total expenditure of sample households in Pandaung village. To develop the multiple regression model, log of monthly expenditure of sample households is used as dependent variable and monthly income, level of education, drinking water and properties of paddy farmers on phone are used as independent variables.

Multiple Regression Equation is

$$\widehat{Y}_i = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \beta_3 X_{3i} + \beta_4 X_{4i} \quad (4.1)$$

In constructing the model, the variables are noted as;

Y_i = Log of expenditure of households

X_i = Symbol of independent variables

X_1= log of income of households

X_2= Level of Education

= 1, if paddy farmers education is monastic and primary

= 0, if paddy farmers education is middle, high and graduate

X_3= Drinking Water

= 1 if drinking water is purified water

= 0 if drinking water is tube well,

X_4= Properties of phone

Table 4.11 Results of Multiple Regression Model

Independent Variable	Coefficient	Standard Error	t test	Sig	VIF
Constant	0.185	0.092	2.013	0.046	
Ln Income	0.853***	0.050	17.060	0.000	1.070
Education	0.094*	0.049	1.922	0.056	1.005
Drinking Water	0.144**	0.044	3.242	0.001	1.061
Phone	0.123*	0.068	1.814	0.072	1.077
Adjusted R square	0.673				
F-value	79.693				

Source: Survey Data (2019)

*** denotes significant at 1% level, ** denotes significant at 5% level, * denotes significant at 10% level.

Multiple Regression Equation is

$$\widehat{Y}_i = 0.185 + 0.853X_1 + 0.094X_2 + 0.144X_3 + 0.123X_4 \quad (4.2)$$

Results show that F value is 79.693 that is significant at p=0.000(<0.01), suggesting that independent variables have significantly. Adjusted R^2 is 0.673. This means that the specified models explain the variation of expenditure of paddy farmers is predicted by four independent variables as the value of adjusted is nearly 67.3%.

It had been found that monthly income is statistically significance at 1 percent level, source of drinking water of paddy farmers at 5% level and education level of

paddy farmers at 10%, properties of paddy farmers on phone at 10% level respectively. The result shows that average monthly expenditure of households is 0.185.

The multiple regression equation shows that, log of monthly income will be increased by 1% the total expenditure of paddy farmers will be increased by 85.3%. It implies that the more increase income of the paddy farmers the more expenditure can use for socio-economic of farmers.

The regression coefficient between education level of paddy farmers and log of monthly expenditure is 0.094 (t = 1.922, p = 0.056). The regression coefficient between source of drinking water of paddy farmers and log of monthly expenditure is 0.144 (t = 3.242, p = 0.001). As these result, ceteris paribus, as income goes up by 1 Kyats, on average, paddy farmers expenditure goes up by about 0.85 Kyats. Controlling for spending on education. The differential intercept coefficient is significant for either education is monastic or drinking water is purified water and primary or education is middle, high and graduate or drinking water is tube well, of paddy farmers.

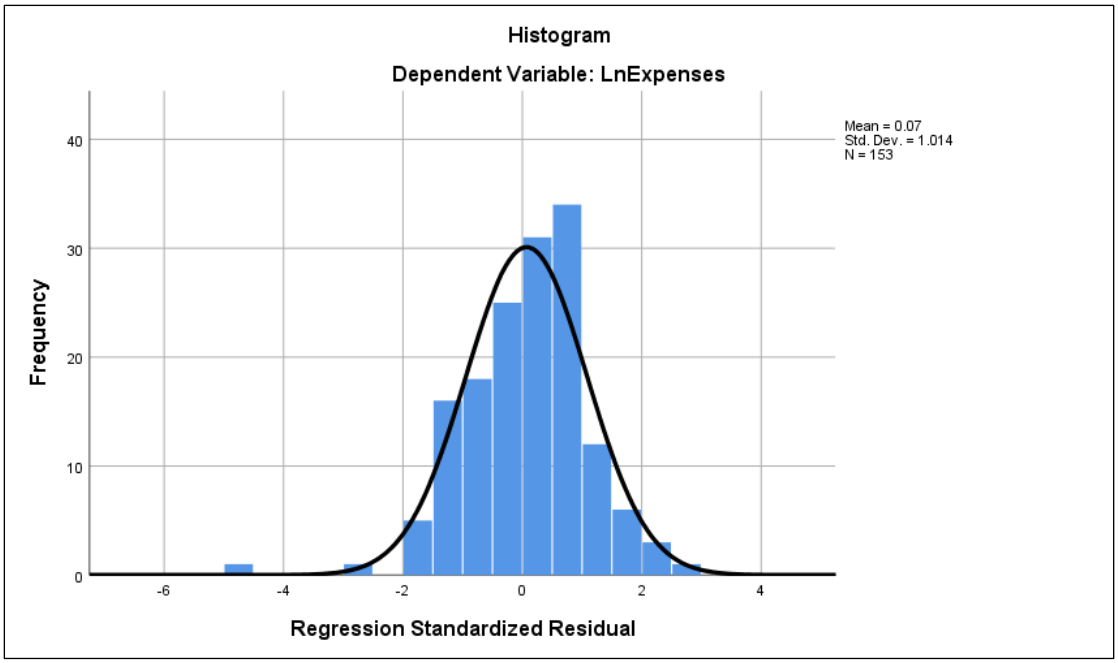
The regression coefficient between properties of paddy farmers on phone and log of monthly expenditure is 0.123 (t = 1.814, p = 0.072). When the number of possessed of phone increased by 1 % the total expenditure is increased by 66%. The higher possessing of phone, the higher the expenditure, because phone bill are used to increased expenditure. This shows that there is direct relationship between properties of phone and log of total expenditure.

4.6 Testing for the Assumptions about Multiple Regression

To determine the violation of required assumption from multiple linear regression model for socio-economic status of households, the following procedures have been used.

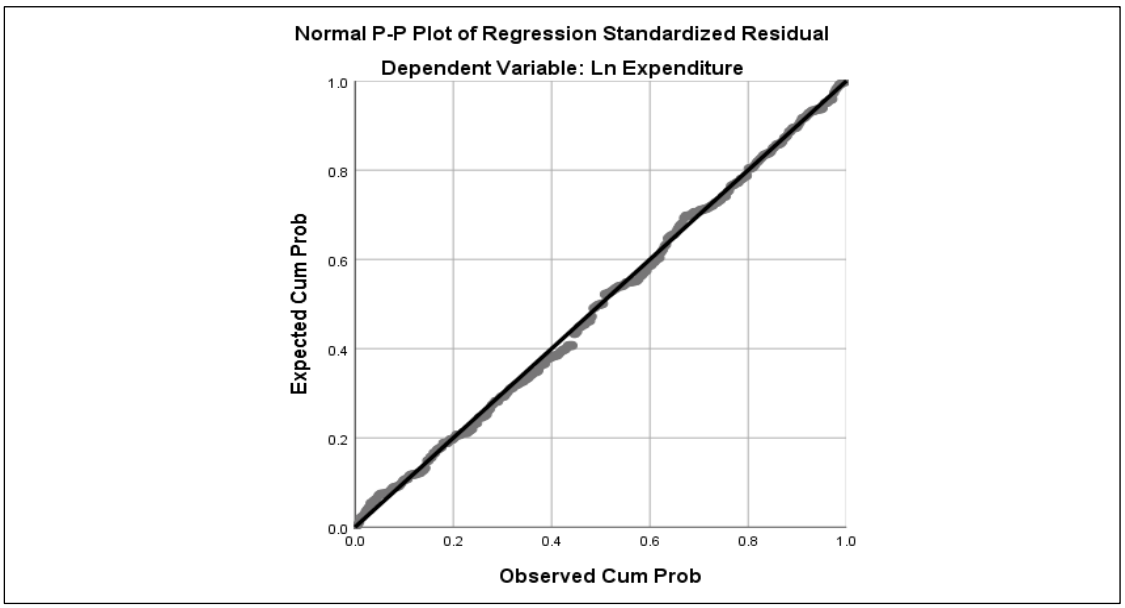
(1) Testing for Normality of Disturbances

One of the basic assumptions is that disturbances are normally distributed with zero mean and constant variance. To check whether the disturbances are normally distributed, histogram, and Normal P-P plot of the disturbances can be constructed. They are histogram of the standardized residual and Normal P-P plot of the standardized residual for socio-economic status of households. These plots are shown in Figure (4.1-4.2).



Source: Appendix (B)

Figure (4.1) Histogram for Residuals



Source: Appendix (B)

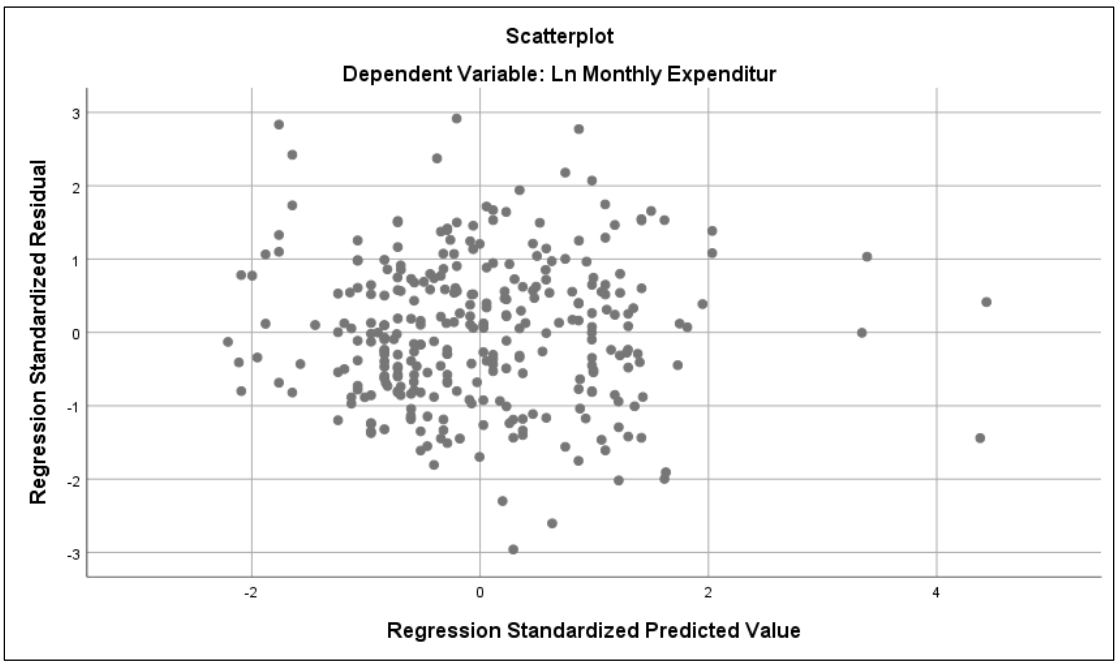
Figure (4.2) Normal P-P Plot for Residuals

The Normal P-P plots virtually straight line. According to histogram and Normal P-P plot, it can be concluded that the normality assumption appears to be generally reasonable.

(2) Testing for Homoscedasticity of Disturbances

Another basic assumption of the multiple regression models is homoscedasticity. In the presence of heteroscedasticity, the regression coefficients

become less efficient. Heteroscedasticity can often be detected by plotting the estimated Y values against the disturbances. If any pattern is displayed, heteroscedasticity is likely present. Figure (4.3) represents the predicted expenditure of paddy farmers on X axis and the residual for total cost of paddy farmers on Y axis.



Source: Appendix (B)

Figure (4.3) Residual Pattern for Heteroscedasticity

This figure shows that heteroscedasticity appears to be absent.

(3) Detecting Multicollinearity

Multicollinearity arises when one of the independent variables is linearly related to one or more of the other independent variables. Such a situation violates one of the assumptions for multiple regression. Specifically, multicollinearity occurs if there is a high correlation between two independent variables.

To detect multicollinearity, the variance inflation factor (VIF) can be used. It measures the degree of multicollinearity contributed by independent variable. In the multiple regression model, the VIF for total income, education level of paddy farmers, source of drinking water, properties of paddy farmers on phone are 1.070, 1.005, 1.061 and 1.077 respectively. The sum of VIF for these independent variables is 4.213. Since the sum of the VIF is less than 10, then it is concluded that multicollinearity is not serious problem in the multiple regression model for socio-economic status.

4.7 Binary Logistic Model for Effects of Socio-Economic Factors on Poverty Status of Households in Pandaung Village

Poverty of households in Pandaung village is used as dependent variable, and 1 is coded to show the poor and poorest level of paddy farmers and 0 is coded to describe the middle, rich and richest levels of paddy farmers in Pandaung village.

The equation of Binary Logistic regression model is

$$Logit(p) = \ln\left(\frac{p}{1-p}\right) = \beta_0 + \beta_1 X_1 + \cdots + \beta_k X_k + \varepsilon \quad (4.3)$$

Where, β_j = Scalar of coefficients of independent variables

Y_j = Dependent variables

Y = 1 if the poor and poorest households

Y = 0 if the middle, rich and richest households

X = Vector of independent variables

X_{ki} = The observed value of kth variable for ith individual, k = 1, 2,…

X_{1i} = Rice Income

X_{2i} = Rice Expenses

X_{3i} = Housing Type

= 1 if housing Type is RC

= 1 if housing Type is Brick

= 1 if housing Type is Wood

= 1 if housing Type is Banboo

X_{4i}= Hand Tractors

Table 4.12 Model Fitting Information

Model fitting criteria	χ^2 value	Df	*p*-value
Omnibus Tests of Model Coefficient	23.624	6	.001
Hosmer and Lemeshow (H-L) Tests	6.536	8	0.587
Cox & Snell R^2	0.142		
Nagelkerke R^2	0.227		

Source: Survey Data (2019)

To determine the adequacy of the estimated, the Omnibus test of 23.624 on 6 df, significant beyond 0.001. In Hosmer and Lemeshow test, a chi-square statistic is

computed comparing the observed frequencies with those expected under the linear model. The value of chi-square test is 23.624. The alternative hypothesis is accepted since p-value < 0.01. The value of Cox & Snell R^2 is 0.142 means that 14.2% of the variation in poverty is explained by independent variables. The value of Nagelkerke R^2 is 0.227 means that 22.7% of the variation in poverty is explained by independent variables. Therefore, the predictions made by the model fit perfectly with observed group memberships. The results of estimated binary logistic model were shown in the following table.

Table 4.13 Results of the Binary Logistic Regression Model

Variables	B	S.E.	Wald	Df	Sig.	Exp(B)
Constant	0.339	0.779	0.189	1	0.664	1.403
Income	-3.841**	0.000	5.726	1	0.017	1.000
Expenditure	5.447**	0.000	5.110	1	0.024	1.000
Type of House			9.461	3	0.024	
Type of House (1)	-20.583	27694.931	.000	1	0.999	0.000
Type of House (2)	-1.624**	0.708	5.254	1	0.022	0.197
Type of House (3)	-1.433**	0.514	7.773	1	0.005	.238
Hand Tractors	1.199**	0.475	6.363	1	0.012	3.318

Source: Survey Data (2019)

*** denotes significant at 1% level, ** denotes significant at 5% level, * denotes significant at 10% level.

It can be found that the coefficient of income, expenditure, housing type and hand tractor are statistically significant at 5% level.

It has been found that the coefficients of rice income of paddy farmers are statistically significant at 5% level and its sign is negative. It can be said that the more income may be, the poorer level will reduce.

If the expenditure of paddy farmers is positive sign, if the expense is more used the poor level of paddy farmer is increased.

The coefficient of housing type group (2) housing type is brick and group (3) housing type is wood that are statistically significant at 5% level. It has been found that there is negative influence on the reduction poverty level. The odds ratio of the appears to be more reduce about 2 times to poverty level that are compared to bamboo housing type of group (4) reference category.

If there is more increasing in the hand tractor used, the poor level of paddy farmer is more increasing in 1.199. Because using hand tractor is more cost than others. So, it can be increased the poor level of paddy farmers.

CHAPTER 5
CONCLUSION

This chapter consists of three sections. The first section presents how the research study was conducted, what are the main components for this study. The key findings to consider are based on what appeared and the analysis of the overall results. The second section described recommendations and suggestions, and the last section is needs for further study.

5.1 Findings and Discussion

In this study, according to the main objective: to examine the socio-economic factors on poverty level of household in Pandaung village, it can be found that the age distribution of the households' head as shown that 40.3% were between 53-65 years. The mean age of the households' head was approximately 59 years, which implies that the households head were mostly high aged people who are still within the age group of economically active. Gender is an important factor in assessing poverty level because it affects individual gender in diverse way. The result indicates that there was more (89.6%) males' headed household than females (10.4%). The higher percentage of male headed households in the study area, suggests that these males serve as leadership to household's members. Osowole et al. (2012), Habyarimana et al. (2015), Peng et al. (2019) and Sugiharti et al. (2022) pointed out that a household headed by a female was more likely to be poor than a household headed by a male.

Family size is a function of the number of persons staying with the household head. The result showed that 55.2% had 4-6 persons in most families. This could be because people in this village had learnt about family planning and so did not give birth too many children. The primary occupation of the respondents were farmers. This implies that majority of the respondents earn their living from farming activities.

The mean monthly income of the respondents was 475,000(Kyats). Furthermore, the result of the analysis also showed that most (35.1%) of the respondent earned between 400,000(Kyats) and 550,000(Kyats) which is an indication that they are fairly income earners. The income of the household is a function of number of persons working in the household and at-times the level of education. The result of the analysis showed that, the households spent an average amount of 159,500(Kyats)

monthly to take care of their families and other essential personal needs. The results showed that majority (30.5%) of the households spent between 113,000(Kyats) and 206,000(Kyats) monthly. This is an indication expenditure was low and this could be because of low level of income earned by the respondents.

The education result showed that 61.7% of the respondents were primary education while 1.3% were graduated. And then, it can be assumed that the higher the level of education attained by the heads of household, the lower the probability of the households being to be poverty. Policy that would ensure sustained and improved access to education will go a long way to reduce poverty in the study area. The role of capacity building and human capital development in eliminate poverty cannot be over emphasized. It has been established that access to education has significant impact on human capital development (Akerele and Adewuyi, 2011), in the forms of improve labor productivity and wages which in turn results in reduction of poverty among households.

According to the objective two, by using multiple regression model, the relationship between the natural log of total expenses of paddy farmers and the natural log of total income of paddy farmers are direct relation. The expenditure of households of paddy farmers depends on income of households, expenditure of household, housing types and properties of paddy farmers on hand tractor.

The average monthly expenditure of households is 0.185. It implies that the more increase income of the paddy farmers, the more expenditure can use for socio-economic of farmers. The differential intercept coefficient is significant for either education is monastic or drinking water is purified water and primary or education is middle, high and graduate or drinking water is tube well, of paddy farmers. The higher possessing of phone, the higher the expenditure because the spending of phone bills are increased expenditure. This shows that there is direct relationship between properties of phone and log of total expenditure.

According to the study, binary logistic regression model is applied to find the relationship between wealth index and the independent variables of income, expense, housing type of household and hand tractor. When the poverty level is defined as dependent variable, the poverty level can be measured by using five categories such as poorest, poorer, middle, rich and richest. The expenditure of households of paddy farmers depends on income of households, expenditure of household, housing types and properties of paddy farmers on hand tractor.

It has been found that the more income of paddy farmers may be, the poorer level can reduce. The expense is more used, the poor level of paddy farmer is increased. The housing type of brick and housing type of wood have been found that there is negative influence on the reduction of poverty level. The odds ratio of the appears to be more reduce about 2 times to poverty level that are compared to bamboo housing type of reference category. There is more increasing in the used of the hand tractor, it can be increased the poor level of paddy farmers.

People's participation in social organizations plays an important role in improvement of social environment and also social welfare. Although the involvement of social organizations in this village is less. So, the villagers in Pandaung village must be encouraged to involve in social organizations and to emerge more social organizations.

To achieve all round being good for socio-economic status of households, government sectors, local authorities, non-government organizations and entrepreneurs should create job opportunities for youth in Pandaung village. In the educational development, the number of schools should be uplifted to raise the number of educated persons, and educational facilities should be upgraded and set up the schools in this area. The middle school should be upgraded to high school as education is one of the best investments any country can make.

To have more self-confident in household head, to support farmers families, to reduce the families' poverty and the financial distress in the lives, awareness training of family planning which can reduce the household size must be practiced and job opportunities have to be created to increase economically active members in families. The higher the number of economically active member, the expenditure of household for per person will increase. Electricity, pure drinking water, and proper sanitation systems need to be primed. Need to be more creation of education opportunities and awareness training of new technology for agriculture. Due to the creation of education opportunities, there will be good job opportunities and families' business will become better. Regarding the more economic development in the region, if poverty can be decreased, the economy of urban and rural will be increased. And then it can help the economic development and poverty reduction of the whole country.

5.2 Suggestions and Recommendations

The study identified the socio-economic variables influencing poverty among the households to include: age, sex, educational qualification, household size, income and properties of households. It is suggested that government should initiate educational programs for improving the socio-economic attributes of the households as a way of enhancing poverty level of the households. Such programs could include adult educational programs that will improve knowledge and skills of households, which will enable them to take advantage of livelihood opportunities within and outside of the immediate environment to improve the standard of living.

Good, reliable transport and communication facilities should be provided. Multiple cropping and intercropping should be actively encouraged. The government must make major moves to create permanent assets with farmers and provide infrastructural support for meeting input, credit and marketing needs. Trainings should be provided to the farmers with different income generating activities. The role of middle man should be reduced for more benefit to the farmers. By introducing facilities of modern technology, the households' socioeconomic standard can be improved. Therefore, it is recommended that the policy makers need to weight the sustainable development of education sector and to create job opportunities for the people who live in Pandaung village order to decrease the poverty level of their village.

5.3 Needs for Further Study

This study identified the socio-economic status of households in Pandaung village by using face to face interview to collect data. It is recommended that the researchers should conduct the comparative analysis studies. In addition, the researchers should analyze these studies to the impacts of rice production on household's livelihood of paddy farmers. The needs for further studies were recommended to carrying out the role of paddy farmers in the economic development and determinants on increasing number of paddy farmers. However, further studies are required to know more about of paddy farmers.

REFERENCES

Abas, M. A., Abdull, R. M. N. A., & Muhammad, S. A. S. (2021). The impact of climate change disaster to the socio-economic of paddy farmer in Malaysia. *Disaster Advances*.

Ahmad, A.A. (2015). Economic Wealth Index: A tool to study the Economic Healthof Districts of selected States in India. *International Journal of Scientific and Research Publications.*

Aishi, I., Malik, R., Baba, S. H., Bhat, B. A., Tariq, S., Rather, T. A., & Islam, M. A. (2020). Socio-economic Correlates of Attitude of Youth of Fishing Communities towards Fishing Occupation in Kashmir Valley. *Int. J. Curr. Microbiol. App. Sci*, *9*(10), 172-178.

Alabi, O. O., Oladele, A. O., & Usman, M. B. (2021). Determinants of agricultural loan decision making process for rice (Oryza sativa) farmers in Abuja, Nigeria. Applications of Heckman two-stage model and factor analysis. Journal of Agribusiness and Rural Development, 59(1), 29-38.

Alam, M., Ullah, R., Mirza, A. I., Elahi, M., Saleem, W., & Sultan, H. (2020). Impact of Microcredit Scheme on Socio-economic Status of Farmers (A case study of PRSP in District Gujranwala). *South Asian Studies*, *29*(1).

Bidarti, A. (2021). Survive of the Indonesia farmers in during the Covid-19 Pademic: Findings of the South Sumatra. In *E3S Web of Conferences* (Vol. 232, p. 01019). EDP Sciences.

Das, P. K., Panda, G., & Majhi, S. K. A Study on Socio-Economic Background of Rice Growing Farmers in Balasore District of Odisha.

Dawadi, S., Khanal, A., Bhandari, T., Chalise, P. P., & Poudel, S. COMPARISON OF POVERTY STATUS AMONG PADDY GROWERS IN MID-HILLS, NEPAL USING PRINCIPAL COMPONENT ANALYSIS.

Dekker, M., (2006). *Estimating Wealth Effects without Expenditure Data:* Evidence from rural Ethiopia by using by using both factor analysis and principal component analysis.

Diaz, C., & Tatiana, L. (2020). Socio-economic analysis of aquaculture groups in Hta Naung Wun Village and Shwe Baw Kyun Village in Shwebo Township, Myanmar.

Douidich, M., Ezzrari, A., Van der Weide, R., & Verme, P. (2016). Estimating quarterly poverty rates using labor force surveys: a primer. *The World Bank Economic Review*, *30*(3), 475-500.

Habyarimana, F., Zewotir, T., & Ramroop, S. (2015). Analysis of demographic and health survey to measure poverty of household in Rwanda. *African population studies*, *29*(1), 1472-1482.

Howe, L.D., (2009). *The wealth indexas a measure of socio-economic position* (Doctoral dissertation, London School of Hygiene & Tropical Medicine).

Jouini, N., Lustig, N., Moummi, A., & Shimeles, A. (2018). Fiscal policy, income redistribution, and poverty reduction: Evidence from Tunisia. *Review of Income and Wealth*, *64*, S225-S248.

Khudri, M. M., & Chowdhury, F. (2013). Evaluation of socio-economic status of households and identifying key determinants of poverty in Bangladesh. *European Journal of Social Sciences*, *37*(3), 377-387.

Lakra, P. K., Chaturvedi, M. K., Yadaw, K. N., & Verma, L. R. (2012). Socio-economic status of hybrid rice growers in surguja district of chhattisgarh. *Journal of Plant Development Sciences Vol*, *4*(4), 511-516.

Linn, T., & Maenhout, B. (2019). Measuring the efficiency of rice production in Myanmar using data envelopment analysis. *Asian Journal of Agriculture and Development*, *16*(1362-2019-4201), 1-24.

Maji, R., & Biswas, S. (2020). A relationship study between socio economic status and growth status of school students. *International Journal of Physiology, Nutrition and Physical Education*, *5*, 146-50.

Malik, R., Rather, M. A., & Abubakr, A. (2013). Socio-economic status of fishermen community of Kashmir, India. *Journal of Extension System*, *31*(2), 67-79.

Naing, T. A. A., Kingsbury, A. J., Buerkert, A., & Finckh, M. R. (2008). A survey of Myanmar rice production and constraints. *Journal of Agriculture and Rural Development in the Tropics and Subtropics (JARTS)*, *109*(2), 151-168.

Po, J. Y., & Subramanian, S. V. (2011). Mortality burden and socioeconomic status in India. *PLoS One*, *6*(2), e16844.

Rutstein, S. O., & Staveteig, S. (2014). *Making the demographic and health surveys wealth index comparable* (Vol. 9). Rockville, MD: ICF International.

Sri, J. (2019). Poverty level of farmers based on total income and feasibility of rice farming. *World Journal of Advanced Research and Reviews*, *4*(2), 082-089.

Vanlalhmuliana, H., Rachael, C., Sehgal, M., Malik, M., & Chander, S. Demographic and Socio-Economic Status of the Farmers of North Eastern Part of Country: A Case Study.

Win, C. S. (2018). A STUDY ON PADDY PRODUCTION IN MYANMAR (From 2007/2008 to 2016/2017) (Doctoral dissertation, Yangon University of Economics).

Win, S.L (2019). R for basic statistics and R for advanced statistics.

https://www.mm.undp.org/content/myanmar/en/home/countryinfo.html

https://www2.gnb.ca/content/gnb/en/departments/esic/overview/content/what is poverty.htm

APPENDIX (A)

QUESTIONNAIRE

SOCIO-ECONOMICS AND AGRICULTURAL CONDITIONS OF HOUSEHOLDS IN PANDAUNG VILLAGE

Date ……..... Questionnaire No. ……

1. Address

Township…… Village……

2. Respondent

(a) Name…… (b) Age ……

(c) Male/Female……. (d) Education……..

(e) Occupation……. (f) Kinship with householder……

3. Head of Household

(a) Name……. (b) Age…… (c) Male/Female……

(d) Education…… (e) Occupation……

4. Family Topics

(a) Number of family

Sir No.	Name	Gender	Religion	Relation with Household Head	Age	Education	Marital Status	Occupation	Income

(b) Number of Student

Level of Education	No. of Students		Total
	Male	Female	
Primary			
Middle			
High			
University			
Total			

5. Questions concerned with Cultivation/Farming

(a) (1) land owner (2) tenant (3) lease (4) Others

(b) Land Ownership

Farmland (acres)	Yar (acres)	Others	Total

(c) Paddy Cultivation

No.	Type of Paddy	Dura -tion	Cultiva- tion acres	Yield per acre (basket)	Total Yield (basket)	Total income	Total expenses	Net income (one month)

(d) Materials used in cultivation

(1) Human

(2) Cattles

(3) Hand Tractor

(4) Tractor

(5) Rice Trans planter

(6) Harvester

(7) Threshing Machine

(8) Grain Dryer

(e) Condition use of fertilizers and pesticides

(1) Fertilizers

(2) Pesticides

(3) Organic fertilizers

6. Livestock Condition

No.	Animal	Duration	Total Income	Total Expense	Net Income per Month

7. Difficulties of production

□ Capital

□ Labor shortage

□ Insects and viruses

□ Irrigated Farming System

□ Cultivation Technique

□ Weather/ climate condition

8. How type of support does you get from government and other organization?

□ Technical Support

□ Machine

□ Irrigated Farming System

□ Seeds

9. Have the farmers support from Government and NGO?

□ Yes □ No

If have, which type of support?

……

……

10. Properties of Sample Households

(a) Car (b) Cycle (c) TV (d) VCD, DVD, EVD

(e) Satellite (f) Radio, Cassette (g) Sewing machine

(h) Transformer (i) Bicycle (j) Rice Cooker (k) Iron

(l) Telephone (m) Others

11. Expenditure

No.	Type of Expenditure				Expenses (kyats)		
					One week	One month	One year
1.	Expenses for kitchen		Price	Amount			
	1.	Rice					
	2.	Oil					
	3.	Market (one week)					

2.	Fruits/ Beverages	Fruits				
		Juice				
		Beverages				
3.	Shoes/ Clothes					
4.	Education	School fees				
		Books				
5.	Repair Cost	Home				
		Car				
		Cycle				
		Bicycle				
6.	Recreation	Vacation				
		Pilgrim				
		Movies				
		TV				
7.	Social Cost	Compassionate				
		Donation				
8.	Health Cost	Man				
		Children				
9.	Allowance	Man				
		Children				
		Student				
10.	General Expenses	Phone				
		Electric				
		Soap				
		Drinking Water				
		Toothpaste				
		Beauty expenses				
Total						

12. Did you get loan? □ Yes □ No

If you get loan; describe detail

Name of organization	Amount of loan	Interest	Reason of getting loan	Period

(a) Does income support by getting loan? □ Yes □ No

If not support, please tick the following:

Less amount	High interest rate	Short loan period	Not use with correctly

13. Housing Condition

(a) Own □ (b) Rent □ (c) Others □

Housing Type	R.C	Brick	Wooden	Bamboo
Toilet Type		Water closet	Normal	No

14. Distance Condition

Distance	Near	Far
School from home		
Shop from home		
Clinic from home		
Hospital from home		

15. Drinking Water

Please tick	Well	Tube well	River	Lake	Others

16. Condition of Cooking

Please tick	Electricity	Wooden	Charcoal	Gas	Others

17. Energy Condition

Please tick	Electricity	Battery	Solar	Generator	Others

18. Garbage System

Please tick	Dust-cart/dustbin	Fire/Underground	River	No Stable	Others

APPENDIX (B)

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.826[a]	.681	.673	.26657

a. Predictors: (Constant), LnIncome, Dummy Education, Dummy Drinking, Phone

b. Dependent Variable: LnExpenses

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	22.652	4	5.663	79.693	.000[b]
	Residual	10.588	149	.071		
	Total	33.239	153			

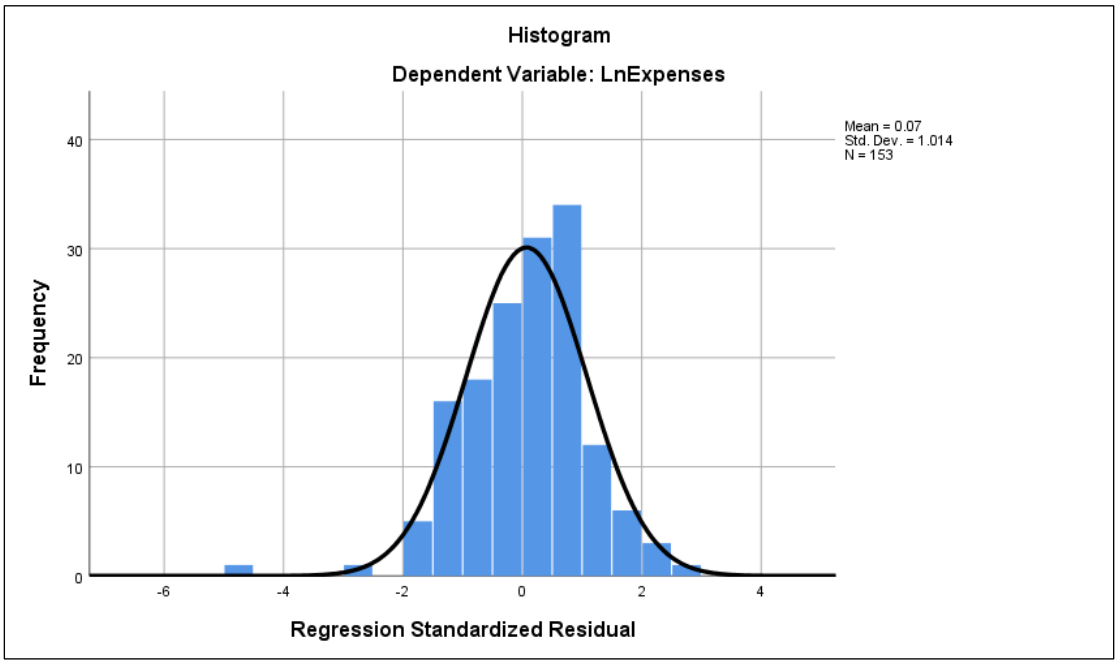
a. Dependent Variable: LnExpenses

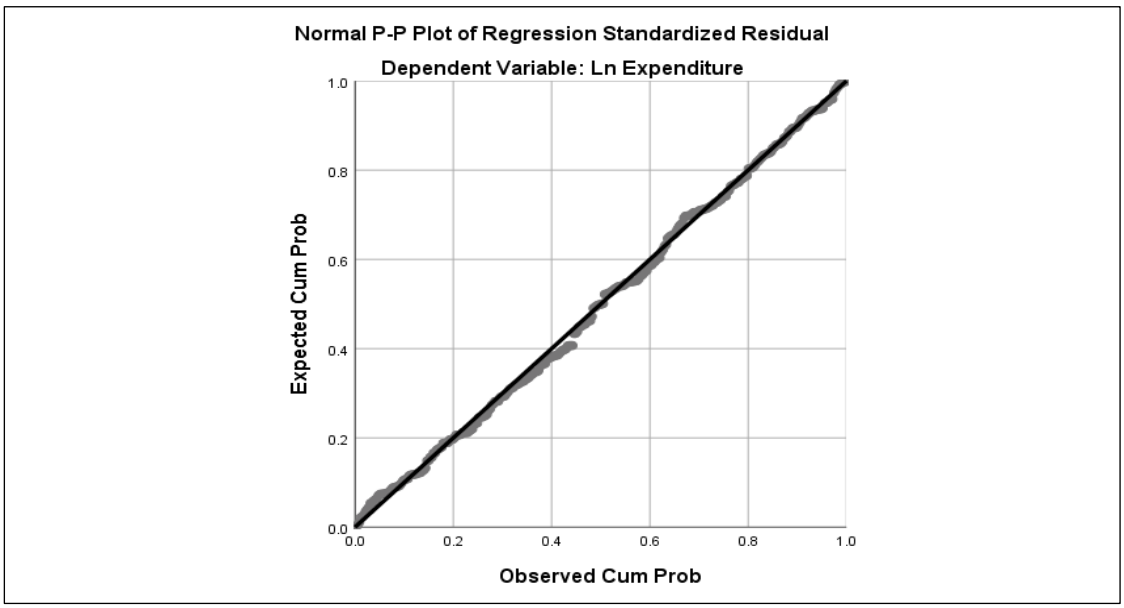
b. Predictors: (Constant), LnIncome, Dummy Education, Dummy Drinking, Phone

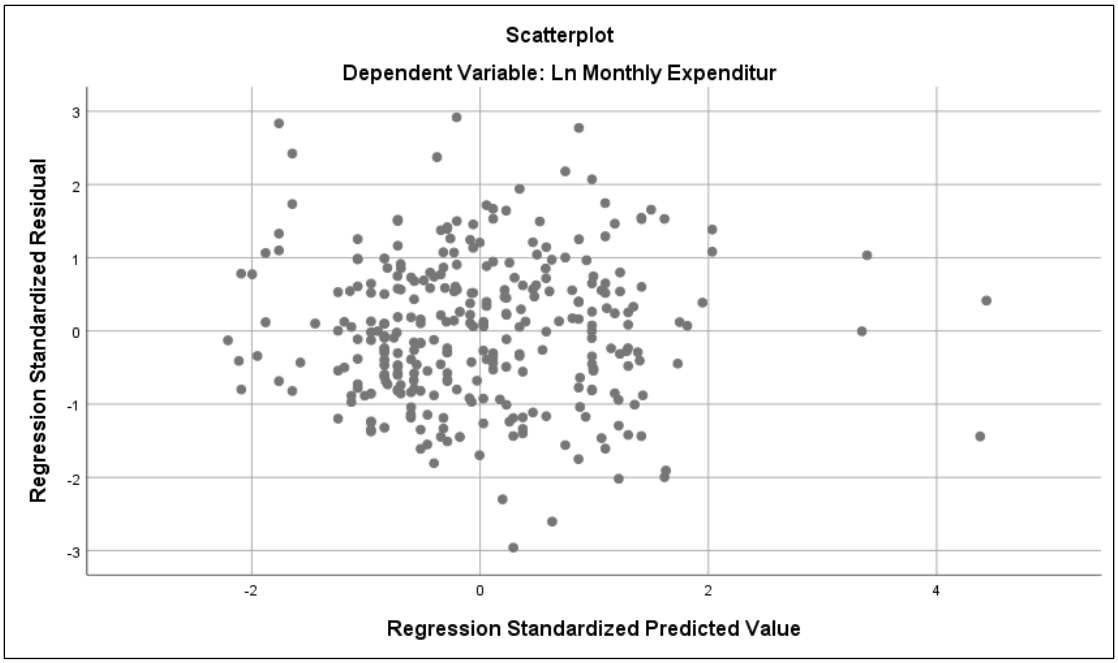
Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	.185	.092		2.013	.046		
	Dummy Education	.094	.049	.089	1.922	.056	.995	1.005
	Dummy Drinking	.144	.044	.154	3.242	.001	.943	1.061
	Phone	.123	.068	.087	1.814	.072	.928	1.077
	LnIncome	.853	.050	.816	17.060	.000	.935	1.070

a. Dependent Variable: LnExpenses


Histogram
Dependent Variable: LnExpenses
Mean = 0.07
Std. Dev. = 1.014
N = 153
Frequency
40
30
20
10
0
-6
-4
-2
0
2
4
Regression Standardized Residual


Normal P-P Plot of Regression Standardized Residual
Dependent Variable: Ln Expenditure
Expected Cum Prob
1.0
0.8
0.6
0.4
0.2
0.0
0.0
0.2
0.4
0.6
0.8
1.0
Observed Cum Prob



Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	23.624	6	.001
	Block	23.624	6	.001
	Model	23.624	6	.001

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	128.255[a]	.142	.227

a. Estimation terminated at iteration number 20 because maximum iterations has been reached. Final solution cannot be found.

Classification Table[a]

			Predicted		
			Poverty		Percentage
	Observed		.00	1.00	Correct
Step 1	Poverty	.00	121	3	97.6
		1.00	22	8	26.7
	Overall Percentage				83.8

a. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	Rice Income	.000	.000	5.726	1	.017	1.000
	Rice Expense	.000	.000	5.110	1	.024	1.000
	Type of House			9.461	3	.024	
	Type of House(1)	-20.583	27694.931	.000	1	.999	.000
	Type of House(2)	-1.624	.708	5.254	1	.022	.197
	Type of House(3)	-1.433	.514	7.773	1	.005	.238
	Q543	1.199	.475	6.363	1	.012	3.318
	Constant	.339	.779	.189	1	.664	1.403

a. Variable(s) entered on step 1: Rice Income, Rice Expense, Type of House, Hand Tractors.

Classification Table[a,b]

			Predicted		
			Poverty		Percentage
	Observed		.00	1.00	Correct
Step 0	Poverty	.00	124	0	100.0
		1.00	30	0	.0
	Overall Percentage				80.5

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	-1.419	.203	48.645	1	.000	.242

Variables not in the Equation[a]

			Score	df	Sig.
Step 0	Variables	Rice Income	3.458	1	.063
		Rice Expense	.178	1	.673
		Type of House	8.466	3	.037
		Type of House(1)	.490	1	.484
		Type of House(2)	2.334	1	.127
		Type of House(3)	1.380	1	.240
		Q543	5.172	1	.023

a. Residual Chi-Squares are not computed because of redundancies.

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	23.624	6	.001
	Block	23.624	6	.001
	Model	23.624	6	.001

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	128.255[a]	.142	.227

a. Estimation terminated at iteration number 20 because maximum iterations has been reached. Final solution cannot be found.

Hosmer and Lemeshow Test

Step	Chi-square	df	Sig.
1	6.536	8	.587

Contingency Table for Hosmer and Lemeshow Test

		Poverty = .00		Poverty = 1.00		
		Observed	Expected	Observed	Expected	Total
Step 1	1	14	14.737	1	.263	15
	2	15	14.329	0	.671	15
	3	14	13.843	1	1.157	15
	4	12	13.389	3	1.611	15
	5	13	13.012	2	1.988	15
	6	13	12.468	2	2.532	15
	7	14	11.875	1	3.125	15
	8	11	11.253	4	3.747	15
	9	9	10.120	6	4.880	15
	10	9	8.973	10	10.027	19

Classification Table[a]

			Predicted		
			Poverty		Percentage
	Observed		.00	1.00	Correct
Step 1	Poverty	.00	121	3	97.6
		1.00	22	8	26.7
	Overall Percentage				83.8

a. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	Rice Income	-3.8411E-	.000	5.726	1	.017	1.000
	Rice Expense	5.4473E-7	.000	5.110	1	.024	1.000
	Type of House			9.461	3	.024	
	Type of House(1)	-20.583	27694.931	.000	1	.999	.000
	Type of House(2)	-1.624	.708	5.254	1	.022	.197
	Type of House(3)	-1.433	.514	7.773	1	.005	.238
	Q543	1.199	.475	6.363	1	.012	3.318
	Constant	.339	.779	.189	1	.664	1.403

a. Variable(s) entered on step 1: Rice Income, Rice Expense, Type of House, Hand Tractors.