

**YANGON UNIVERSITY OF ECONOMICS
DEPARTMENT OF ECONOMICS
MASTER OF DEVELOPMENT STUDIES PROGRAMME**

**A STUDY ON
SOCIO-ECONOMIC CONDITIONS OF FISHERMEN
(Case Study: Selected Villages in Sittwe Township, Rakhine State)**

**SWE ZIN
MDevS - 10 (16th BATCH)**

SEPTEMBER, 2022

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(Case Study: Selected Villages in Sittwe Township, Rakhine State)

A thesis submitted as a partial fulfillment of the requirements for the degree of
Master of Development Studies (MDevS)

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ABSTRACT

The objectives of the study are to analyze the livelihood, socio-economic status of fishermen and their challenges in fishing in Sittwe Township. The descriptive method is used in this study and both primary data and secondary data will be collected through the qualitative and quantitative methods. Primary data will be collected by conducting a survey with structured questionnaire for livelihood and socio-economic status of fishermen and problems of fishing activities in Sittwe Township. The population in the rural areas of Sittwe Township has improved year by year. Aged from 18 years to 60 years, they were working in the fishing area and are struggling to survive with health, nutrition, and sanitation problems on a day-to-day basis. The fishing villages are totally deprived of the basic infrastructure such as housing, educational institution, connectivity of road, and street electrification. On the other hand, the government and non-governmental organizations (NGOs) should take the necessary steps to raise awareness among fishermen. All of the fishermen had no training for fishing, saving, or health education. The Stakeholders including government, local organizations, non-governmental organizations, international organizations and private organizations should encourage and promote the livelihoods of fishermen and also support their socio-economic conditions of fishermen in Sittwe Township.

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LIST OF ABBREVIATIONS

CESD	Center for Economic and Social Development
CPUE	Catch Per Unit Effort
DFID	Department for International Development
DOF	Department of Fishery
FAO	Fisheries and Aquaculture Organization
GAD	General Administration Department
GDP	Gross Domestic Product
HYV	High Yielding Variety
IAA	Integrated Aquaculture Agriculture
ICTs	Information and Communication Technologies
UNESCO	United Nations Economic and Social Council Organization
US	United States

CHAPTER I

INTRODUCTION

1.1 Rationale of the Study

Fishing is one of the most important economic sectors after agriculture and is an important contributor to the improvement of the socioeconomic condition of Myanmar. Fishing is one of the major economic activities for rural areas in Myanmar. Generally, fisheries in Myanmar are classified into three categories, such as marine fishery, freshwater fishery, and aquaculture. Around the world, the fishing and aquaculture sectors are a major source of employment. The primary sector of fishing and aquaculture employed an estimated 59.5 million people (FAO, 2018). In total, about 20.5 million people were employed in aquaculture and 39.0 million in fishing, a slight increase from 2016.

Most of the fishermen are found in Myanmar's coastal areas in Ayeyarwady Region, Mon State, Tanintharyi Region, and Rakhine State. It focuses on small-scale fishermen who earn their livelihood from the Rakhine's coastline and marine resources. In fact, inland fisheries play an important role in contributing to fresh fish supply for domestic consumption in rural areas in Myanmar. In 2016 (according to government statistics reported to FAO) the fishing sector in Myanmar provides employment to 3.2 million people, with inland and marine fisheries making up nearly 78% of Myanmar's fish production. Most of the fish used as food are usually sold throughout fish markets.

Rakhine State is rich in natural resources and fisheries. It is located on the western coast of Myanmar along the Bay of Bengal. Sittwe Township is the capital of Rakhine State and is located between 20° 10' 01" N Latitude and 92° 47' 06" E and covers 36,778 square kilometers. It is located on an estuarial island created at the confluence of the Kaladan, Mayu, and Lay Mro rivers, which empty into the Bay of Bengal (Wikipedia, 2008). The total population of Sittwe was 338,203 in 2021, and among them, 7.5% of people are fishermen. The fishing sector is important for Myanmar's economy. It constituted 4.6% of the GDP in Sittwe Township during

2020–2021 and generated the sixth largest revenue (along with livestock). In Sittwe, the population of rural is higher than the population of urban. Rural resident in Sittwe is largely dependent on fishing and agricultural casual labour as the main sources of income. Casual labour accounts for 26% of the income source. The agriculture sector hires the highest number of casual workers during the harvest season and during the rainy season for land preparation. Fishing also accounts for 26% of the income source, while small non-agricultural businesses account for around 15% of the income source.

Small-scale fishermen earn their livelihood from the Rakhine's coastline and marine resources. Far in the Western Myanmar, Sittwe is the capital of Rakhine State. The fishing market is opened from dawn until noon and loading, sorting, displaying then selling fish. There are 18 villages located on small remote islands that specialize in fishing in Sittwe Township, but most of the fishermen in the coastal areas engage in farming to supplement their income. The fishery sector in informal sectors consists of small-scale fishermen, mostly at a low level of community and technology, and activities of self-employed with the lowest incomes, struggling to survive in their daily lives. In this sector, consisting of skilled, semi-skilled, and unskilled people, but they are not fully support their family. So, their living standards are still low. Their daily lives are so difficult and struggling to live with living standard. There are difficulties and challenges in fishing .Mainly the fishermen's income are depended on fishing as their only source.

Climate alterations have a multi-dimensional effect on fishing activities. When it suddenly undergoes into radical change, the productivity of fish is also affected. In this following, the impact of unpredictable climate change has emerged as a miserable condition of fisherman. Fishermen play a significant role to improve economic status of their families. Majority percentage is participating in fishery activities where they exhibit fish harvesting, processing and pricing, credit, borrowing, accounting, saving etc. The study mainly focused on fishermen's activities and their livelihood. Thus, this study aims to analyze fishermen's living standards and to study the socio-economic condition of fishermen.

1.2 Objectives of the Study

The objectives of the study are to analyze the livelihood, socio-economic status of fishermen and their challenges in fishing in Sittwe Township.

1.3 Method of Study

The descriptive method is used in this study and both Primary data and Secondary data collected through the qualitative and quantitative methods. Primary data collected by conducting a survey with structured questionnaire for livelihood and socio-economic status of fishermen and problems of fishing activities in Sittwe Township. Data were collected both by physical observation and interview with fishermen at house, fields, fishing places and market. A two-stage sampling design is used in the survey. Among 18 villages in the rural area of 88 villages, a sample of 5 villages is selected by simple random sampling in the first stage. In the second stage, the sample households are proportionately chosen from the sample villages selected in the first stage by simple random sampling.

Secondary data from Department of Fishery Sittwe Township, Planning Department of Sittwe Township, General Administration of Sittwe Township, books and Internet Websites. The secondary information for study is collected from various journal, books, magazine and web-sources.

1.4 Scope and Limitations of the Study

It focuses on socio-economic conditions of fishermen in Sittwe Township during the period of July 2022. There are 33 wards and 88 villages in Sittwe Township. Most of the 18 villages in Sittwe Township where small scale fishermen have been lived there. Among them, Kyi Te, Ohnyayphaw, Shwe Pyi Thar, Kyar Ma Thauk and Aung Daing, 5 villages mentioned in this study but they do not represent the entire of Sittwe Township. Of these, about 150 small-scale fishermen were selected by using simple random sampling. It analyzes the socio-economic conditions of fishermen in Sittwe Township. And also, it focuses on the current situation, fishing activities, socio and economic activities of fishermen in Sittwe Township.

1.5 Organization of the Study

This study consists of five chapters. The chapter one includes the rationale of the study, objective of the study, method of the study, scope and limitation of the study and organization of the study. The chapter two includes literature review concerning the study area and the chapter three is socio-economic conditions of fishermen in Sittwe Township. Chapter four presents the survey data analysis from analysis on socio-economic conditions of fishermen in Sittwe Township and the fifth chapter concerns with findings and suggestions.

CHAPTER II

LITERATURE REVIEW

2.1 Fisheries Production

Generally, a fishery is an entity engaged in raising or harvesting fish which is determined by some authority to be a fishery (Fishery Wiki, 2019). This object takes According to the FAO, a fishery is typically defined in terms of the "people involved, species or type of fish, area of water or seabed, method of fishing, class of boats, and purpose of the activities or a combination of the foregoing features" (D. Manoharan, 2017). The definition commonly combines the capabilities of fish and fishers in a region, the latter fishing for similar species with a place about fish as food for human being. Generally, sea life can be seen seafood. For fish supply to other fish, see as commercial fish feed and aquarium fish feed. There are two types of fisheries production; (1) fresh water fisheries production and (2) marine water fisheries production.

A fishery may involve the capture of wild fish or raising fish through fish farming or aquaculture (Nelson, Joseph S, 2006). The livelihood of over 500 million people in developing countries depends on directly or indirectly fisheries and aquaculture. Fish stocks and employment are decreasing due to overfishing, which is catching fish beyond levels that have been sustainable, in many regions of the world (Fishery Wiki, 2019).

2.1.1 Fresh Water Fisheries Production

Freshwater fisheries are those in freshwater bodies including rivers, streams, ponds and lakes of permanent or temporary nature. With 1.5 million tons of freshwater fish yielded in 2015, Myanmar's freshwater capture fisheries are the largest in Southeast Asia and represent 28% of the total national fish production. Freshwater fisheries provide job opportunities to 1.5 million people and 27% of the fresh fish consumed.

There are two management regimes of inland fisheries: leasable fisheries where exclusive exploitation rights of delimited water bodies are auctioned and open fisheries for which fishing gears licenses are issued by the Department of Fisheries. There is evidence of a rapid reduction in the catch per fisher (catch per unit effort) and in the abundance of high market value fish species. In Myanmar, the freshwater fisheries are fundamental for livelihoods, food security, and the economic system. Yet significant threats to the resource base and public demand call for the development of management initiatives, legal adjustments and a people-centered approach. This brief identifies a series of options and priorities that could help improving freshwater fisheries management towards a more sustainable and equitable exploitation of inland fish resources. These include knowledge of the resource base; integrated land and water management; the creation of opportunities through developing Region/State legislation; the improvement of existing capture production systems and the development of new fish production systems. The inland capture fish resource is considerable and very significant to the national economy, food security and rural livelihoods.

2.1.2 Marine Water Fisheries Production

The developing, maintaining, and harvesting of aquatic plants and animals is referred to as marine aquaculture. It can start happening in the ocean, or on land in tanks and ponds. Salmon, shrimp, oysters, clams, mussels, and other marine species are the popular things of American marine aquaculture. Marine aquaculture generates livelihood, helps maintain working waterfronts and coastal communities, and expands opportunity for international trade. As aquaculture has grown to complement our wild fisheries, living and dead fishermen are using aquaculture to supplement and promote fishing livelihoods.

Aquaculture currently accounts for 21% of the value of domestic fisheries landings. Farmed fishery products already make nearly half of the global seafood supply, but U.S. production lags behind much of the worldwide, resulting in a \$16.9 billion seafood deficit in the United States in 2020. Tens of thousands of livelihoods might be provided in coastal regions by doubling present production. In addition to and in support of our wild fisheries, marine aquaculture offers a domestic source of economically and environmentally sustainable seafood.

Even as the world's population is increasing, the level of wild-caught fisheries has continued to remain stable for more than 20 years. Approximately 70 to 85 percent of the seafood consumed in the World today is imported, and about half of this imported seafood is farmed. Seafood is really in growing market both domestically and internationally. Even while we keep up with and rebuild our wild fisheries, we can no longer rely solely on them to provide the rising domestic demand for seafood. For consumers in the United States and around the world, shellfish, finfish, and seaweed farming offers a reliable source of seafood that is nutritious, sustainable, and safe.

For some commercial fisheries and aquaculture, hatcheries offer the seed. In tanks in a hatchery, all fish and shellfish are born. In a hatchery, where fish and shellfish are born, hatched, and cared for, a combination between a lab and a farm is created. They stay in the hatchery until they are big enough to be moved to a farm for raising fish or shellfish or to be released into the wild as part of a stock improvement effort. In order to continue functioning and to produce a reliable product, commercial fish and shellfish farms need a consistent, credible source of small fish and shellfish from aquaculture industry.

Furthermore, hatcheries are used for stock enhancement, also referred to as "restoration aquaculture," in which fish and shellfish are produced in a hatchery until being released to supplement the populations of species that are vital for commercial, recreation, and the environmental.

2.2 The Importance of Fisheries Sector

Since people consume fish in various ways at every meal, the fisheries sector has long been fundamental for social and economic development. According to assessments, in addition to being a significant source of animal protein, fish and prawns were also one of the country's major exporters. According to a 1992 publication by Intermediate Technology Publications, fish is a good source of high-quality protein and contains a variety of vitamins and minerals. Sustainable, productive fisheries and aquaculture improve food and nutrition security, increase income and improve livelihoods, promote economic growth and protect our environment and natural resources (World Fish, 2015).

3.2 million of them engaged in the fishing industry in Myanmar. Communities of fishermen have not received sufficient attention from the government or the policy

sector, although playing an important role in the nation's food security, nutrition, and economy (Islam et al., 2011). Moreover, it has been reported fishers are one of the most vulnerable communities as they suffered from poor living standard, mass illiteracy, lack of proper health facility, debt and loan, low income, lack of capitals, inadequate alternative job opportunities etc. (Mo Zahid et al., 2018; Islam et al., 2013; Kabir et al., 2012; Islam et al., 2018).

Improving the productivity of fisheries and aquaculture is vital to reducing hunger and poverty for millions in the developing world (FAO, 2017). Sustainable, productive fisheries and aquaculture improve food and nutrition security, increase income and improve livelihoods, promote economic growth and protect our environment and natural resources. Our natural resources will be protected and fish stocks will be maintained for future generations if fisheries and aquaculture are managed effectively. Fish stocks are currently declining due to overfishing, poor management techniques, industrial development, and agricultural waste. While property fisheries management could be a challenge, solid global and regional governance of these vital resources will ensure that we can produce enough fish for those living in poor regions.

Aquaculture, in particular, has tremendous potential to enhance food security and be environmentally sustainable. Small-scale cultivation is very necessary for meeting the world's growing demand for fish. As fish need a smaller environmental footprint than different animal supply food, cultivation could be a lot of environmentally property possibility for meeting the world's food wants than different animal supply foods.

In both national development and poverty reduction strategies and also international cooperation, the contributions of fisheries and aquaculture to development has frequently been underestimated. FAO (2005) identify two factors which influence the degree to which fisheries are included in development policy in a given country: the sector's contribution to foreign exchange earnings and its contribution to food security and nutrition (measured by dependence on fish protein). The more reliant a country is on fisheries for its foreign exchange earnings and food security, the argument goes, the more likely that policy makers will recognize their importance and that this will be reflected in development policy.

Historically, the fishing industry provides a huge economic advantage to coastal regions. Small-scale coastal fisheries' relative dispersion helps keep rural areas

economically viable and counterbalance the movement toward rising coastal development. In history, fisheries have often been the basis for human settlements and coastal development in both the rural and urban environments. The infrastructure developed for fisheries (feeder road, landing sites and coastal havens, water-retaining ponds) tend to trigger further economic developments in other sectors such as tourism or agriculture.

As farming and terrestrial livestock often, both generate more foreign exchange and are perceived to make a larger contribution to food security than other renewable resource sectors such as forestry and fisheries, they generally receive much more attention in national development strategies and donor priorities. When faced with resource allocation decisions, many governments' priorities water use for human consumption, agriculture, hydropower, and industry over inland fisheries and aquaculture (FAO, 2017). This is largely due to assumptions of each sector's role in development as well as the popularity of single-use water systems.

But encouraging different uses of water can boost its output and enable the simultaneous growth of numerous industries. Integrated aquaculture-agriculture (IAA) systems have been proven to boost the productivity of agricultural activities on farms that feature ponds, demonstrating that the use of freshwater for aquaculture and agriculture is not always mutually exclusive. IAA ponds enable small farms be more adaptive so they can keep producing some food even during droughts (Brummett, 2006).

2.3 Defining Socio-Economic Development

So, socio-economic development is the process by which a society develops both economically and socially. The continuous rising of peoples' living standards and well-being is referred to as social-economic development. It is measured using measures like GDP, life expectancy, literacy, and employment rates. Regulations, the physical setting, and climate events all change as a result of socioeconomic development. Laws, the physical environment, and ecological changes all change as a result of socioeconomic development.

According to CESD (2017), the socio-economic objectives are to promote self-reliance in development and build capacity for self-sustaining development, accelerate socio-economic development to achieve sustainable development and poverty eradication, strengthen policies, delivery mechanism and outcomes in key

social areas, ensuring affordable access to water, sanitation, energy, finance (including micro finance), markets, ICT, shelter and land to all citizens, especially the rural poor. Progress towards gender equality in all critical areas of concern including equal access to education for girls at all levels. Encourage broad based participation in development by all stakeholder levels.

Economic development is the growth of a nation's or region's financial resources for the welfare of its people. It is typically argued that effective growth reflects economic development. It is the procedure by which a country promotes the social, political, and economic well-being of its citizens. As a result, socio-economic development is a complicated process of improvement. It must have an impact on every part of life for people in that nation.

In order for anybody to behave to their best potential, social development aims to improve their well-being. The happiness of every citizen is essential to society's success. Investing in humans is essential to social progress. Barriers must be taken down in order for all citizens to pursue their goals with dignity and self-assurance. This is to do with refusing to believe that those who are impoverished would always be thus. Helping people grow on their path to self-sufficiency is the objective.

Economic development is generally defined to include improvements in material welfare, especially for persons with the lowest incomes; the eradication of mass poverty with its correlates of illiteracy, disease, and early death; changes in the composition of inputs that generally includes shifts in the underlying structure of production away from agricultural toward the correspondingly greater participation of broadly based groups in making decisions about the directions, economic and otherwise in which they should move to improve their welfare.

The social services constitute developmental services and what is called social development is both a part of and the cause of economic development and not a mere follow-up of economic development, does not wholly explain the relation between social and economic development. It's also vital to consider that economic development has social consequences, some of which are not always paid for by those who profit from it. Economic development is the persistent rise in a population's standard of living from a primitive, low-income economy to a contemporary, high-income economy. It would also be improved if the local quality of life could be raised. Its focus covers the standards and policies by which a country enhances the social, political, and economic well-being of its people.

Socio-economic development and empowerment of disadvantaged groups is an imperative area that needs to be taken into consideration in order to lead to effective growth and development of the area. It is primarily concerned with bringing about improvement in the system of education, employment opportunities, lifestyles, incomes, skills development and cultural factors. Guidelines have been developed to help them catch up to the larger community. The biggest barriers to their socioeconomic development and empowerment include issues with poverty, illiteracy, and unemployment. The government has formulated a number of projects and strategies that help people get an education, seek employment, generate income, and generally maintain their living standards. Cultural and environmental factors consist of social and economic transformation processes. (Eurostat, 2015)

2.3.1 Involvement of Socio-Economic Status of a Community

Socio-economic development is the process of social and economic development in a community. Indicators used to determine socioeconomic progress includes GDP, life expectancy, access to education, and employment. Changes in less tangible criteria are also taken into account, such as the degree of civil society participation, personal safety, free association freedom, and safety from physical harm. New technology, modified legislation, alterations to the physical environment, and ecological changes are a few examples of the variables that leads to socioeconomic impacts. According to Orunsolu, A.A., O.R., Adebayo, A.A., and Bamgboye (2010).

Socio-economic development of any region or area depends upon various factors or components, which belong to different parameters and it is very difficult task to discuss each and every component of socio-economic development in detail. However, here, few major components of socio-economic development are worked out. These are the following major components of socio-economic development:

- (i) Income Per Capita
- (ii) Level of Agriculture Development
- (iii) Level of Industrial Development
- (vi) Level of Urbanization
- (v) Occupational Structure
- (vi) Level of Educational Development
- (vii) Health Status

(viii) Transport and Communication

(ix) Population Characteristics

Per capita income is widely accepted as a general measure of development. It is customary to identify whether a region has been backward or advanced in the levels of development using the estimates of per capita income. States or regions with low per capita income are thought to be less developed than those with higher per capita income. In general, per capita income was calculated using today's exchange rate. This metric or element is frequently used to measure economic growth. The low per capita income of underdeveloped economies defines them other than industrialized economies. (Rao, H. 1984)

In addition for our nation to have economic progress, agricultural development is required. Agriculture is crucial for providing food for livestock, raw materials for the non-agricultural sector, employment possibilities for the rural population, and raising the standard of living. It also attempts to satisfy the world's expanding and urgent demand for food and fibers for human use.

An expert group representing UNESCO suggests that agriculture may stimulate economic growth by increasing health efficiency and freeing up resources for other sectors by optimizing consumption and agricultural production in line with the rise in both internal and external demands. Rising agricultural productivity supports and sustains industrial development in several important ways; firstly, to permit agriculture to release part of its labor force for industrial employment while meeting the increasing food needs of the nonagricultural sectors. Secondly, it raises agricultural incomes, thereby creating the rural purchasing power needed to buy the new industrial goods and rural savings and which may then be modified by direct or indirect means of finance industrial development. (Sen, A., 1982)

Agricultural development also brings social and cultural developments, as increased per capita income in rural areas invariably results in increased literacy and level of education which are conducive for social transformation. It is evident that agricultural productivity always makes an important contribution to regional development and that, within some boundaries at least, it is one of the criteria that must be achieved before a step into identity economic growth is practicable. It is equally clear that social and cultural change necessary to integrate new industrial and technological development is possible through increased agricultural production. Agricultural development can be measured both in terms of inputs such as High

Yielding Variety (HYV) seeds, chemical fertilizers, irrigation, mechanization, etc. (Malassis, L. 1975)

Industrialization is a major factor in the quick economic growth of the country. The majority of economists recognize that the most essential part of economic development strategies is industrialization. Industrial units of organize sectors generally provide life blood to the economic system by their leading role in transmitting growth impulses to the surrounding area through their backward and forward linkages. The majority of infrastructure facilities, including banking, power, and transportation and communication systems, grow along with industrial development, while their proximity to one another leads to industry concentration. Urbanization, which is a result of industrialization, not only creates economic possibilities and reduces the workforce's dependence on agriculture, but it also influences socio-cultural change.

The improvement of society, the economy, and culture all rely heavily on education. It offers employment opportunities and aids in removing social obstacles. Through the improvement of skills and knowledge for a variety of possibilities and jobs, it also improves people's earning potential and productivity. Thus, the level of education determines the quality of people and development of a region. Importance of education hardly needs any elaboration. Investment in human resources is more important than in any other resources.

Education has a significant effect to improving people's circumstances from one of poverty to one of affluence. Education is regarded as a great equalizer in income distribution, lowering poverty, and inequities because it not only provides a huge range of benefits to the person but well as to society in the form of a detailed reports of externalities. (D.G. Mandelbaum)

The impact of education on higher population constraint and altering the nature of labor forces is what gives education its social significance. Because it offers as the foundation for a multi-level educational pyramid, literacy is important. A literate person can separate right from wrong and make the proper judgment. The founding father of the Indian constitution advised that education be made free and essential due to the crucial role that literacy plays in the socioeconomic development of individuals. The universalization of literacy and primary education has been recognized as one of the major goals of planning in our country.

WHO mental health is defined as a condition about whole physical and mental well-being. Consequently, a person is in a state of health when his or her heart and soul are both healthy and devoid of any kind of disease. Sickness discomfort and healthy organ function are helpful for an effective and prolonged lifetime. The most significant and fundamental part of societal concern concerns health and nutrition. These are the fundamental elements for social well-being since maintaining a functional society requires a good physical and mental health. Likewise, the proper nourishment is also pre requisite to maintain both sound physical and mental health. The proximity to health care facilities is of paramount importance, because this is one of the most noteworthy social facilities in which geographical space creates impurity. (Smith, D.M., 1984)

The country should incorporate a health perspective into all of its socioeconomic plans, provide the public basic health education, and provide the community with high-quality healthcare. Public health services like hospitals, dispensaries, clinics, doctors, nurses, health centers, etc., should go to the rural areas and our village folks should have easy accessibility to these services. Health sector should develop along with other sectors of economy. In many countries a large proportion of the health resources are expanded in a few cities for the benefit of a small proportion of the population.

2.4 Factors Contributing to Livelihoods

The term “sustainable livelihood” has been defined in a variety of ways by various authors in the context of natural resource management, poverty alleviation and agricultural development. Depending on the different conditions in which the analyses are conducted, there are some similarity and conflicts in these definitions. A sustainable livelihood, however, can be discussed as people's ability to maintain a living by surviving shocks and stress and improving their quality of life over the long term (i.e., both now and in the future) without negatively impacting the livelihood options of others (Chambers, 1987; Hoon et al., 1997; Wanmali, 1997; Sing and Wanmali, 1998; Wanmali, 1998; Baumann, 2000).

Participatory methods have been used to identify the factors affecting sustainable rural livelihoods, providing an important means of addressing the problems and priorities of the people under study (Wekwete, 1998; as cited in Karunanayake, 2001; Pasteur, 2001). Measured changes in the various factors that

affect livelihoods are highlighted by DFID's conceptual framework, including the five capital assets (human, social, financial, physical, and natural), institutional methods, organizational structure, livelihood resilience or vulnerability, livelihood strategies, and livelihood outcomes (Pasteur, 2001). Because it can be implemented to a variety of scales, including individuals, households, groups, villages, regions, or nations, the DFID structure has been used by numerous researchers as an analytical tool for addressing, monitoring, and evaluating different livelihood resources at the micro and macro level (Scoones, 1998; Ashley, 2000; Pasteur, 2001).

In order to measure the capital assets in a few selected Sri Lankan villages, the study utilized the DFID livelihood framework. Each capital asset is formed of key indicators, such as physical assets that reflect market, energy, road and transit, and agricultural machinery. A single asset can provide numerous benefits; for instance, if a household has safe access to land, they are also likely to be well off economically because they can use the land for both loan collateral and productive purposes. (Chambers, 1987; Cline-Cole, 1995; DFID, 2000; Nicol, 2000). Among the various assets, natural resources are quite valuable to those whose livelihoods depend on resource-based activities like farming, fishing, gathering in forests, and the mining of minerals such as sand or jewels. Physical assets are very important, for example, without transport services inputs such as fertilizer and planting materials may not be easily available for farming and this may result in a decrease in agricultural yield, it is then difficult and expensive to transport produce to the market.

There are differences between countries in the socioeconomic growth of villages, districts, and agro climatic zones, especially in the capital assets. The Colombo Metropolitan Region (CMR), which includes Colombo, Kalutara, and Gampaha districts, and the periphery, which includes parts outside the core and 22 administrative districts of Sri Lanka, stand in opposition to one another (Wanasinghe, 2001). More natural assets such as land and forest are apparent in the Intermediate and Dry Zone compared to the Wet Zone, due to differences in population density and urbanization.

In contrast, the development of physical assets such as roads, transport and energy sources are better in the Wet Zone compared with the Intermediate Zone (Thennakoon, 1998; Wanasinghe, 2001). Using five capital assets, people engage in various livelihood strategies in order to achieve livelihood objectives (Chambers, 1987; Scoones, 1998; Zoomers, 1999; DFID, 2000). For example, land-poor farmers

intensify agriculture by either growing a mixture of crops, (Rodrigo et al., 2001b) or investing more inputs such as labor or fertilizer, whilst land-rich people extend more land for permanent or short-term cash crops (Lee and Barrett, 2001). Many labels have been used interchangeably to describe how people are responding to their circumstances, including income-generating or income-earning activities, household coping, adaptive or survival methods, and livelihood strategies (Wanmali, 1998). (Chambers, 1987; Cline-Cole, 1995; Hussen and Nelson, 1998; Scoones, 1998).

"Livelihood strategies" is the title used for this study. Depending on the goals and priorities of the household, livelihood strategies are concentrated within the core activities of farming, laboring (which would be the act of selling one's labor to a third party through the waged labor), selling of timber and fuel wood, mining, trading, building work, and raising livestock (Tuson, 2001). (Wanmali, 1998; Zoomers, 1999). Outside of Colombo, however, farming—including the cultivation of tea, rubber, coconuts, home gardens, and paddy—represents the main economic activity for the great majority of Sri Lankan households (Abhayarathna, 2001; Wanasinghe, 2001). The overall aim of this paper was therefore to analyze the capital assets and livelihood strategies of households and understand the variation of capital assets and livelihood strategies within and between selected villages.

2.4.1 Five Capitals Model

The Five Capitals Model provides a conceptual framework for comprehending sustainability in terms of monetary idea of market capitalization. To deliver its goods or services, every organization will need five different sorts of capital. Instead of depleting or deteriorating these stocks of capital assets, a sustainable organization will keep them up and, where possible, increase them. The model allows business to broaden its understanding of financial sustainability by allowing business to consider how wider environmental and social issues can affect long-term profitability.

Natural capital (also sometimes referred to as environmental or ecological capital) is the natural resources (energy and matter) and processes needed by organizations to produce their products and deliver their services. This includes sinks that absorb, neutralise or recycle wastes (e.g., forests, oceans); resources, some of which are renewable (timber, grain, fish and water), whilst others are not (fossil fuels); and processes, such as climate regulation and the carbon cycle, that enable life to continue in a balanced way.

Human capital includes an individual's drive, knowledge, abilities, and interpersonal and intellectual outputs. It's also about happiness, passion, empathetic attributes, and spirituality.

Social capital is any value added to the activities and economic outputs of an organization by human relationships, partnerships and co-operation. For instance, society's standards, values, and trust as well as networks, communication channels, families, communities, businesses, trade unions, schools, and nonprofit organizations.

Material assets and infrastructure that have been owned, leased, or controlled by a company and that support its operations in terms of production or service provision are described to as manufactured capital. Buildings, infrastructure (such as transportation networks, communications networks, and waste disposal systems), and technologies are the key aspects (from simple tools and machines to IT and engineering).

Financial Capital: Those assets of an organization that exist in a form of currency that can be owned or traded, including (but not limited to) shares, bonds and banknotes. Financial capital (shares, bonds, notes and coin) reflects the productive power of the other types of capital.

2.5 Reviews on Previous Studies

Hossain FI, Miah MI, Hosen MHA, Pervin R and Haque MR (2015) Studied on the Socio-Economic Condition of Fishermen of the Punorvaba River under Sadar Upazila, Dinajpur in Bangladesh. The study's methodology involved collecting both primary and secondary data. A draft questionnaire was constructed before to obtaining the primary data, and that was pre-tested with a small number of fishermen. This study found that the most of the fishermen were belonged to the age groups of 36-45 years (40%), over 45% of the fishermen primarily engaged in fishing. Among them 50% was illiterate and 7% was SSC and above group. Above 40% of the fishermen received health service from village doctor, 23% from upazila health complex and remaining 7% got health service from MBBS doctors.

Jonwal Nutan Ramesh and Deshmukh D.R. (2016-2017) examined on socio-economic status of fishermen community of Paithan area in India. The study was conducted during 2016- 2017 to develop socio-economic status of fisher folk community of the Paithan area, district Aurangabad. The primary data was collected through survey of fish market with the help of observation, quaternary and

interviewing. This study discovered that fishermen age 15 to 60 years involved in fishing industry and 13% are female and 87% are male. Fishermen in survey area have been using traditional method. Especially women play a significant role and they were selling fishes on the road side without maintain hygienic conditions.

Herry Boesono, Nur Bambang Azis, Ali Husni Iqbal (April, 2018) Studied on Socio-economic characteristics of fisheries communities and environmentally friendly fishing equipment in Batang District, Indonesia. The study of socio-cultural characteristics uses qualitative research methods. After the data is collected, it was then compiled, analyzed and concluded and finally presented in the form of a research report. The results of social-economic characteristics of fishing communities indicate that there are socio-economic stratification, dependence on natural and seasonal resources, hard workers, strong customs and beliefs, but many are low educated.

S Hossain, M T Hasan, M T Alam and S K Mazumder (November,2014) Studied on Socio-economic Condition of Fishermen in Jelepara Under Pahartoli of Chittagong District in Bangladesh. To analyze the socio-economic conditions of fishermen, face to face personal interview with structural questionnaire was done. The results of the assessment was found that the number of school going children was 1.9 per house and 54% were school dropout boy and 46% were girl. Eighty-eight percent of homes were entirely katcha, 12% were semi-pacca, and all families had access to electricity. Different kinds of net, including the set bagnet, tong jal, current jal, tanajal, etc., were employed. They used boats with engines ranging in power from 8 to 22 HP. A group of fishermen used a boat to catch 35 to 80 kilograms each day on average.

Shuva Bhowmik, Md., and Solaiman Hossain. In August 2015, Tamim Hasan focused at the socioeconomic circumstances of Jatka fishermen in a few key locations along the Meghna Estuary in Bangladesh. The goal of the research was to determine the methods and reasons behind Bangladesh's Meghna River's irregular Jatka fishing. The aim was to assess catch per unit effort and abundance of Jatka in three spots of Meghna River and the livelihood of fishermen in the study areas. Data were collected randomly interviewing, arranging focus group discussion and participatory rural appraisal (PRA) among fishermen and market chain members. In the study 90% of fishermen were Muslim and majority belonged to nuclear family. As for standard of living, nearly half (47-55%) of fisher's family do not uses sanitary latrine. In study 100% have access to tube-well water. About 59% of fishers' family had corrugated

tin-shed house in all study areas. It was found that in average 55% are workers in fishing boats. Literacy rates within fishermen were found to be one-third. In terms of general health care, roughly one third get access to medical public or other form of Medicare.

CHAPTER- III

SOCIO-ECONOMIC CONDITIONS OF SITTWE TOWNSHIP

3.1 Historical Background

According to the Myanmar Population Census 2014, Rakhine State has a total population of 3.19 million. The eighth largest state in Myanmar and the second most populous state after Shan is Rakhine State. In the southwest of Myanmar, Rakhine State borders Bangladesh and Chin State to the north, the Magway and Bago Regions to the east, the Ayeyarwady Region to the southeast, and a significant portion of the Bay of Bengal coastline to the east. Rakhine is rich in natural resources and its main economic activities are agriculture and fishing. The population who lived in urban is (121,829) and the population who lived in rural is (210,374). The ratio 16% of the population lives in urban areas, and the remaining 84% in rural areas in Sittwe (GAD, 2021).

Sittwe, which is pronounced site-tway in Rakhine, is situated on a coastal island that was formed when the rivers Kaladan, Mayu, and Lay Mro combined and joined the Bay of Bengal. Local development in Rakhine is complicated and affected by the conflict in the state, which predates the violent incidents of 2012 that resulted in deaths, significant population displacement, destruction of public property, loss of livelihoods, and the disruption of public services. Numerous issues, such as persistent poverty and competition for limited resources, threats to human security and human rights, conflicts between the federal government and the interests of the local Rakhine population, and discrimination against the state's various ethnic groups all contribute to the conflict.

Rakhine State is rich in natural resources. The city of Sittwe is situated on an estuarine island that was formed when the rivers Kaladan, Mayu, and Lay Mro joined and flows into the Bay of Bengal. It is connected to the ocean and has a lot of rivers, lakes, and ponds. There are good ports, and as road networks are improved, trade and local and foreign investments are increasing. The government is placing a strong emphasis on investment and trade in effort to increase manufacturing and agricultural

product output, as well as to provide more local jobs through increasing both domestic and international trade.

The exports of Rakhine States are such as agriculture products; foodstuff, fishery products; fresh and dried fish and natural resources; oil and natural gas. Among the export items, the main exports items are fishery products to increase the export products of Rakhine State such as fresh and dried fish. In 2017, Maungtaw was used to export aquatic goods valued more than \$3 million USD. According to a report on economic potential in Rakhine State, fresh fish, saltwater prawns, and different types of dried fish total 3,539.18 tons and are exported through Maungtaw trading station for a value of US\$ 3.946 million (Thiha, 2017). Bangladesh is interested to import Rakhine State's natural gas, oil, mineral, marine, and agricultural products. Rakhine State has been provided oil and gas resources by nature. As travel sector develop in Rakhine State, existing hotels and guesthouses are given permission to extend and added 5 hotels and 4 motels in Sittwe (GAD, 2021)

Sittwe port is constructed with investment from India and was completed in (2016-2017). Once the port is in operation 3,500-4,000 tons can be transported between Sittwe and Paletwa while up to 20,000 tons can be transported from Sittwe to Kolkata (2016-2017). Prawn and crab breeding is conducted with foreign investment near Ponnagyun beside the Ponnagyun-Sittwe road. Prawn and crab breeding is a successful business in Rakhine State and many local and foreign investors had invested in it. The products were exported abroad as well as being locally distributed.

According to selection by the key respondents from 12 business sectors, the top five prospective business sectors with investment opportunity in Rakhine State include: (1) Fisheries & Live-stock, (2) Agriculture, (3) Hotel & Tourism (4) Forestry (5) Energy. The major sectors that mainly contributed to the state's GDP were agriculture (13.47%) and livestock and fisheries (11.82%) in Agriculture Sector, manufacturing (11.22%) in the Industrial Sector and transport (27.81%) and trade (15.93%) in the Services Sector (Rakhine State Investment Opportunity Survey, 2019).

3.2 Location and Area

Sittwe is a small coastal city situated in Rakhine State, in the north-western part of Myanmar. The natives of the Rakhine culture founded the historic city at the beginning of the 18th century. As a result, the state and city still employ the language and traditions that date back to those times. The largest and capital city of Rakhine State is Sittwe. There are around 200,000 people living in the city altogether. The city is home to a bustling port as well as numerous intellectual and cultural institutions like Sittwe University and Technological University. Sittwe Central Market and other bazaars exist in the Sittwe area. Rakhine State Cultural Museum, Shwezedi Monastery, and Lawkananda Pagoda are regarded as the tourist attractions of Rakhine in Myanmar. The latitude of Sittwe, Rakhine State, Myanmar is 20.14, and the longitude is 92.89. Sittwe, Rakhine State, Myanmar is located in Myanmar (Burma) country in the Cities place category with the gps (Global Positioning System) coordinates of 20° 8' 39.9984 "N and 92° 53' 48.9912" E. (Sittwe-Wikipedia)

3.3 Topography, Climate and Environment

There are three distinct seasons in Myanmar: The cold and dry season lasts from November to February, with average monthly temperatures that range between 20 °C (68°F) and 24 °C (75°F). The hot-dry season is from March to April, with average monthly temperatures of between 30 °C (86°F) and 35 °C (95°F). The wet season is between May and October, with an average temperature of 25°C (77°F) and 30°C (86°F).

Myanmar has a tropical monsoon climate. This means it is characterized by strong monsoon influences and a high rainfall rate. It also experiences a considerable amount of sun. However, it might occasionally seem extremely uncomfortable due to the heavy temperature. The year-round average temperature is between 22 and 27 degrees Celsius, or 72- and 81-degrees Fahrenheit, accordingly.

Table (3.1) Climate of Sittwe Township

Year	Rainfalls		Temperature	
	Number Raining of Days	Total Rainfall (inches)	Summer Maximum(C)	Winter Maximum(C)
2018	129	182.23	37.0	6.5
2019	119	182.64	36.5	8.0
2020	135	186.09	39.8	9.7
2021	122	168.09	38.5	9.0

Source: Annual Report of General Administration Department of Sittwe Township, 2021

According to table (3.1), in 2018, Sittwe Township's rainfall situation was 129 rain days and 182.23 average annual inches. The rainfall conditions decreased marginally in 2019, and the number of rainy days decreased from 129 days to 119 days. The temperature was 37.0 degrees centigrade in 2018 and 36.5 degrees centigrade in 2019. The temperature fell drastically in 2019.

The temperature is 39.8 degrees centigrade in 2020 and 38.5 degrees centigrade in 2021. In 2020, there was a large rise in temperatures. The mean average temperature is 39.8 degrees Celsius and 9 degrees Celsius is the lowest temperature. While annual rainfall in the delta region is approximately 2,500 millimeters (98.4 inches), while average annual rainfall in the dry zone is less than 1,000 millimeters (39.3 inches), the coastal regions receive over 5,000 millimeters (196.8 inches) of rain annually (Thiha,2019). Myanmar is best visited between December and March. It is then mostly dry, very sunny and pleasantly warm, although it can get very warm inland in March.

3.4 Demographic Characteristic of Sittwe Township

The Rakhine people are the largest ethnic group in Sittwe. Sittwe Township is located in the north-western part of Myanmar. Table (3.2) displays the population and number of conventional households by gender, as well as urban and rural areas. It analyses the male to female ratio, religion, and the number of residents of each race in Sittwe Township.

Table (3.2) Number of Houses and Population in Sittwe Township (2021)

Year	Place	No. of Conventional Households	Population		Total	Percentage
			Under 18	Above 18		
2018	Urban	19,905 (48.87%)	45635	78851	124,486	54
	Rural	20,818 (51.13%)	45920	59907	105,827	46
2019	Urban	24,550 (39.08%)	44094	80585	124,679	39
	Rural	38,263 (60.92%)	87758	106077	193,835	61
2020	Urban	24,430 (38.90%)	37092	84294	121,386	37
	Rural	38,370 (61.09%)	97199	112820	210,019	63
2021	Urban	30,652 (43.71%)	37230	84599	121,829	37
	Rural	39,472 (56.28%)	97320	113054	210,374	63

Source: Annual Reports (2018 to 2021) General Administration Department of Sittwe

According to Table (3.2), the demographic structure based on sex and age is shown in the table. In 2021, there were 43.71% of households in urban areas and 56.28% of households in rural areas. There are more females in Sittwe Township than males in both situations. This situation shows that male labor migrates to foreign countries for jobs and that there is a need to generate job opportunities. The total population of urban is 36.67% and rural is 63.32%. Percentage of male and female is 48.55% and 51.44% respectively.

Because there are refugee camps in the villages, the rural population is more than the urban population. Moreover, the General Administration Department collected population statistics inside refugee camps in 2019. So, a more accurate population was obtained due to the efforts of the staff.

3.4.1 Race and Religious

Race and religion are important parts of any country. The Rakhine tribe constitutes the majority of the population, with minorities including the Kachin, Kayin, Chin, Bamar, and Mon. Most of the people are Buddhist, but Christians, Hindus, and Muslims also reside there. The number of religious images in Sittwe Township is 140, and pagodas are 40, and there are 301 monasteries in Sittwe Township. And there are 4 churches, 122 mosques, 6 Hindu temples, and 1 Chinese temple. Table (3.3) shows the population of Sittwe Township by race and religion.

Table (3.3) Ethnic Population Living in Sittwe Township (2021)

No	Race	Resident Population	Total Population	Percentage of Total Population
1	Kachin	4	332,203	0.001
2	Kayah	-	-	0.000
3	Kayin	8	-	0.003
4	Chin	213	-	0.064
5	Burma	546	-	0.160
6	Mon	2	-	0.0006
7	Rakhine	146819	-	44.20
8	Shan	-	-	0000
	Total	147,592	332,203	44.43

Source: Annual Report of General Administration Department of Sittwe Township, 2021

According to the table (3.3), there are (146819) Rakhine residences, in which estimation its percentage is at 44.2%. Among the various ethnic groups, the majority ethnicity is Arakanese; the second largest group is Burmese; and the third largest group is Chin. In that township, Arakanese is the most populated. Various races live well integrated within the state.

3.4.2 Religion in Sittwe Township

Race and religion are a vital part of every nation in the world. The government of Myanmar helps the township to free itself. Among Myanmar's regions and states, races have been divided into national races, foreign ethnic races, and foreigners. There are many religions in Sittwe Township. The four main religions are Buddhist, Christian, Hindu, and Islam. Table (3.4) shows the distribution of religion in Sittwe Township.

Table (3.4) Religion in Sittwe Township (2021)

No.	Religion	Number of Population	Percentage of Population
1	Buddhist	147512	44.40
2	Christian	213	0.06
3	Hindu	2423	0.73
4	Islam	182055	54.80
5	Other	-	-
	Total	332203	99.99

Source: Annual Report of General Administration Department of Sittwe Township, 2021

According to the table (3.4), the largest religion is Islam; Buddhism is the second largest religion; Hinduism is the third largest religion; and Christianity is the fourth religion. It can be shown that the percentage of the Muslim is 54 % in the township of Sittwe Township. The total population of Sittwe is 99.99% and then 0.06% is Christian, 0.73% is Hindu and 44.4% is Buddhist and 54% is Islam.

3.5 Social Sector in Sittwe Township

The factor of the social sector, such as education, health, welfare and social security, plays a key role in the overall growth process in the development of a region's nation. Therefore, the upward trend of reforms in the social sector needs to be progressed, since the social sector and economic sector are mutually dependent on each other.

3.5.1 Education Sector in Sittwe Township

A major factor in the development of human resources is education. Education enhances the capacity of people to fulfill their needs by increasing their efficiency, their ability to achieve a better standard of living and their trust in all facets of life to develop and innovate. One of the strongest long-term investments is education. Education is the core of the human resource development process for any country. It contributes to national economic growth and nation-building. Education affects productivity and growth through several channels.

Table (3.5) Education Level in Sittwe Township (2021)

No.	Types of School	Number of Schools	Teacher	Students	Teacher-student Ratio
1.	Primary School	58	355	7,794	1:22
	Primary School Branch	28	286	14,363	1:50
2.	Middle School	11	183	3,670	1:20
	Middle School Branch	4	42	2,295	1:55
3.	High School	11	485	14,258	1:29
	High School Branch	6	196	4,138	1:21
4.	Monastic Education	7	114	2,750	1:24

Source: Annual Report of General Administration Department of Sittwe Township, 2021

A teacher-student ratio is the number of students to one teacher during a particular class period. The ratio of students to teachers is not fixed. According to the table (3.5), one teacher is responsible for teaching more than 20 students in primary school and middle school in Urban. However, primary school branch and middle school branch in rural is responsible for teaching 50 students. The shortage of teachers in rural school in Sittwe has become an important issue affecting the development of rural basic education. High school in Urban, one teacher is responsible for teaching 29 students, so they can get enough teaching. But, high school education is more important than others. High school branch in rural, one teacher is teaching 21 students and it is seen that the student can be cared for more.

Table (3.6) Matriculation Pass Rate (2016-2017 and 2020-2021)

Year	Enroll of Students	Number of Students	Pass-students	Students Pass-percentage
2017-2018	4,219	3,915	615	22.32%
2018-2019	5,527	5,135	1483	26.93%
2019-2020	5,300	5,300	1641	30.96%
2020-2021	5,490	5,150	2827	54.89%

Source: Annual Report of General Administration Department of Sittwe Township, 2021

According to the table (3.6), there were a small number of teachers who were teaching in Primary school. There is a gap in teacher and student ratio. This means that the increase in the teacher-student ratio was not followed by any improvement in the standard of education. Moreover, matriculation exam is a step to the higher education.

Above table (3.6) show that the matriculation pass rate is increased from 28.41% in 2016-2017 to 22.32% in 2017-2018. That highlighted the improvement of Education Sector in Sittwe Township. It came about because a decent effort to get this result was made due to good management and instruction by educators, head of education and understudies. It is also because of the (14) private high schools that emerged in (2013-2014). According to the instructions of the state government, University teachers support facts about matriculation. Parents' priority on education is also a basic requirement for matriculation pass rate.

3.5.2 Health Sector in Sittwe Township

A fulfilling and meaningful existence depends on both education and health, which are key goals of human development. Both are also crucial to the broader idea of enhanced human capacities, which is at the core of what development means. Education also has a significant impact on a developing nation's capacity to adopt new technology and attain self-sustaining growth and development. Health is a prerequisite for increases in productivity; successful education relies on adequate health as well. Health and education are closely related in economic development (Todaro, M.P. (2012) Economic Development).

Great health capital may improve the return to investments in education, in part because health is an important factor in school attendance and in the formal learning process of a child. The investment in health and education is called in the human capital approach. A substantial role in economic growth is characterized by good health. Health is an important part of growth in society. Healthy workers to cause productivity increase also health students because enrolled rate, pass rate increases.

Table (3.7) Hospitals Health Care Center and Clinic in Sittwe Township (2021)

No.	Particular	Number of Health Facility
1	Public hospital	3
2	Private hospital	2
4	Private dispensary	22
5	Rural Health Department	15
6	Rural Health Division	9
7	Private dental clinic	3
8	Vision clinic	3
	Total	57

Source: Annual Report of General Administration Department of Sittwe Township, 2021

There is public hospital in Sittwe Township, moreover several private clinics exist. The rapid increase in the number of rural health department, Rural Health Division, pharmacies and hospitals and other health care facilities is expressed in the growth of health status, a primary goal of social development. According to the (3.7), there are 3 public hospitals, 2 private hospitals, 22 private dispensaries and 15 rural health department, 9 rural health division. It also can be seen that there are 3 private dental clinics and 3 vision clinics. These health facilities are to provide the public in Sittwe Township. The improvement of the health conditions of rural and urban residents is dependent on health facilities in Sittwe. These health facilities have improved the social welfare of the city's population and improved the economy.

3.6 Economic Sector in Sittwe Township

Sittwe Township is located in the Rakhine region and is an economically developed suburb. Local people in the municipality mainly engage in agriculture. In addition, they also commercialize livestock. Sittwe Township is a municipality with excellent roads, waterways, and waterways to other provinces and territories. The main domestic products are rice and fish, in Yangon and other regions, so most of them are exported. Sittwe Township mainly imported human goods from the Yangon region. The agriculture sector and the fishing sector are mentioned as economic sectors.

Although Rakhine State is not in Myanmar's heartland geographically, it plays a vital role in the country's economy because it holds enormous economic potential

with a richness in natural endowments such as oil reserves, natural gas fields, and maritime resources, as well as recreational hotspots, beaches, and historical sites. For people in Rakhine State, such natural endowments are things that will create employment opportunities and better living conditions in the future if they are exploited by responsible investment. One of the country's economic three special economic zones is located in the coastline Kyaukpyu Township in western Rakhine State. At present, the economy of Rakhine State heavily relies on agriculture and fishing. In the agriculture sector, rice cultivation takes the major share of total agricultural land, occupying 85% of total land. Fishing is a key industry, with most of the catch being transported to Yangon currently.

3.6.1 Land utilization

The total landmass area of Rakhine state covers 9,088,053 acres, whereas 18% of the total area is arable land. However, the government data shows that only 14 % of the total arable land is used for cultivation currently. And according to records, 1,099,853 acres are used for large estates while 1,138,506 acres are used for agricultural in during rainy season.

Table (3.8) Land Utilization

No	Types of Land	Acre	Percentage
1	Total arable Land	25,219	34.49
2	Fallow Land	951	1.30
3	Pasture Land	1,690	2.31
4	Industrial Land	71	0.10
5	Rural land	1,106	1.51
6	City land	2,233	3.05
7	Other Land	7,959	10.89
8	Waste Land	63	0.09
9	Uncultivated Land	33,824	46.26
	Total Area	73,119	100

Source: Annual Report of General Administration Department of Sittwe Township, 2021

Land use is basically the utilization of the physical land and its resources by humans for various purposes; land can be used for commercial, industrial, agricultural and other relatively natural use. Total arable Land in Sittwe is 25,219 acre and farmers cultivated main crops such as rice, bean and sesame. On the other hand, coconut and nipa palms plantations are also essential for the Rakhine state's economy.

3.6.2 Agriculture Sector in Sittwe Township

Agriculture sector is one of the backbone sectors of Rakhine State's economy. The rainy season is when paddy (rice) is primarily harvested. Rakhine State currently cultivates more than one million acres of paddy during the wet season, but only 0.20 percent of the total area may be utilized for high-yield seed (Myanmar Investment Commission, 2019).

For rural households to have access to enough food, the agriculture sector is crucial. The majority of rural residents are also employed by it. Although being one of the most important economic sectors in Rakhine State, agriculture is still in the subsistence farming stage. The primary socioeconomic sector in Myanmar, including Rakhine State, is agriculture, which provides jobs opportunities in rural areas as well as economic growth.

Agriculture contributes not only in productivity but also in market expansion which supports major economic system in the country. There are a total 1.1 million acres are producible land areas in Rakhine, but the lands are not well-utilized for food production due to the shortage of inputs supported by Government. The largest percentage of lands is being used for only rice production during rainy season, and farmers are having very limited profit.

As a result, it provides the majority of Myanmar's population with their primary means of survival and income. About 70% of people in Rakhine State earn their livings doing businesses related to agriculture while fishery sector is the second largest business sector. Rakhine State possesses an over 360-mile-long strategic coast to access to the Indian Ocean.

Table (3.9) Total Production of main Crops Sown in Districts in Sittwe Township (2021)

No	Types of Crop	Cultivation (Acre)	Harvesting (Acre)	Production (Basket)
1	Rice	22,423	22,423	1,409,369
	Rainy Rice	22,372	22,372	1,406,304
	Summer Rice	51	51	3,065
2	Matpe (Black-gram)	68	68	923
3	Pedisein (Green gram)	8	8	98
4	Bean	14	14	595
5	Sunflower	14	14	289
6	Sesame	13	13	55

Source: Annual Report of General Administration Department of Sittwe Township, 2021

There are 10 types of crop specialized by Ministry of Agriculture in Myanmar and 6 types of crops are grown in Sittwe. The main crops in Rakhine State include paddy (rice), green gram, cashew nut, and different types of oilseed crops. Rice (Paddy) is a mainly cultivated crop throughout Sittwe Township. The most popular type of rice among farmers are Paw Sann Hmwe and Paw Sann Yin. For investors who interested in doing investment in Agriculture sector, contract farming is the prospective businesses in Rakhine State.

3.6.3 Fishery Sector in Sittwe Township

Fisheries are one of the key business sectors in Rakhine State's economy. Basically, Fisheries sector can be divided into three categories which are (1) Inland fisheries (2) Marine fisheries and (3) Aquaculture. In 2016-2017, the contribution of fisheries sector to the Rakhine State's GDP represents about 12% of the total GDP (Report on Rakhine State Investment Opportunity Survey-2019).

Rakhine state is home to a wide range of fish species because of its huge coastline and tidal rivers. It has an enormous opportunity to develop fish and prawn farming grounds throughout the coastal areas as well as in farming method to meet the market demand and widen its export market. However, the people are still using traditional method in fishing, fish and prawn farming. As a result, the production rate is generally low compared with other coastal regions like Ayeyarwaddy and

Tanintharyi Regions. Regarding the processing and manufacturing of fishery products, there are 9 cold storage factories in Rakhine State.

Basically, the Fishery Sector can be divided into three categories in Rakhine State, which includes (1) Inland fishery, (2) Marine fishery (3) Aquaculture.

Inland fisheries: Inland fisheries in Rakhine State are divided into two types (a) Open water fishery and (b) Flooded water fishery. The coastal area of Rakhine State is rich in alluvial tidal areas where fishing is carried out with traditional method.

Marine fishery: Marine fishery is divided into Coastal and Offshore fishery. The Rakhine State government is authorized to manage and supervise the coastal fishery while the offshore fishery is supervised and managed by the Union Government. Fishing boats are required to register for license for both fresh water and sea water fishing business.

Table (3.10) Marine Fish and Shrimp

Year	Numbers of Large-Scale Fishermen	Marine Fish (viss)	Marine Shrimp (viss)
2017-2018	363	3,453,000	1,119,000
2018-2019	441	7,150,000	2,394,000
2019-2020	356	7,150,000	2,394,000
2020-2021	325	7,100,000	2,402,000

Source: Annual Report of Department of Fishery, Sittwe Township, 2021

Large-Scale Fishermen: By the Union Fisheries Law, offshore fishing grounds are open to boats over 30 feet and over 25 horsepower, mostly trawlers and purse seiners. Licensing is done by the union-level DOF. No new offshore licenses are being issued, but offshore fishery is already overcapitalized (that is, too many boats). There are no effective limits on harvest levels and are restrictions, including encroachment into inshore fishing areas, are not effectively enforced. Fishing does appear to be reduced during the closed season, but each year a certain percentage of the fleet are allowed to fish legally which makes gaming the system possible (Fisheries Sector Report-2019).

Each boat holds 5 to 10 fishermen, depending on the size of the boat. Large Scale Fishermen usually catch marine fish and shrimp in the sea. Marine fish includes Rohu, Live Eel, Ribbon Fish, Hilsa and Big Eye Croaker. Marine shrimp means Tiger shrimp and pink shrimp. Then, and they export to domestic markets (Yangon,

Mandalay) and foreign market. Depending on the amount of employees and the type of labor they do, fishermen earn money per trip. In this way, large Scale fishermen earn their money. And they can get employment and social wellbeing in fishery sector.

Coastal fisheries: There are two types of coastal fisheries in Rakhine State, which are (a) fresh water fishery and (b) sea water fishery. Individuals routinely use small, non-motorized fishing boats and general ideas in the freshwater fishing industry. The districts of Sittwe, Mrauk-U, and Maungdaw are where this commerce is primarily conducted. Fishing in the sea is a common activity in Rakhine State. Both drifters and non-powered fishing boats are used by people. Fishing boats are licensed to run within 10 nautical miles of the coast in coastal fisheries. Coastal fishing boats are limited to a maximum length of 30 feet and a maximum engine power of 25 horsepower. In coastal fisheries, driftnet, gillnet, and long line are frequently employed.

Table (3.11) Common Catch

Year	Number of Small-Scale Fishermen	Common Catch (viss)
2017-2018	622	216,000
2018-2019	803	430,000
2019-2020	397	430,000
2020-2021	178	440,000

Source: Annual Report of Department of Fishery, Sittwe Township, 2021

Small Scale Fishermen: Inshore fishery is reserved for boats under 30 feet and 25 horsepower, licensed by township officers of the DOF. There are no restrictions on the number of vessels, licenses for fishing gear, or harvest levels inshore. The fishery is essentially open access except for some inshore tendered areas. Although some fishing equipment, such baby trawls, is unauthorized, enforcement is thought to be inefficient since so many illegal gears are used. Even if the regular extreme storms that happen from mid-May to mid-August during the closed season may lessen fishing pressure for extended periods, the closed season is not enforced. Lax enforcement is often justified by township DOF officers as necessary to enable fishers to be able to maintain their livelihoods (Fisheries Sector Report-2019).

There is only one fisherman in each boat. Small Scale Fishermen usually catch marine fish and shrimp in the sea. Common fish consists of Nga-mae-lone, Nga-Shwe, Nga-kone-nyo, Nga-wun-pu, Ka-ka-tid, and Nga-ni-tu. Then, they export to

domestic markets (especially Sittwe Market). Fishermen earn money from selling fishes. In this way, Small Scale fishermen earn their money. And they can get employment and social wellbeing in fishery sector.

Aquaculture: The main businesses in aquaculture in Rakhine State include fish and prawn farming and crab farming (Soft shell).

Table (3.12) Livestock Shrimp

Year	Number Shrimp Farmers	Acres of Shrimp Farms	Livestock shrimp (viss)
2017-2018	202	2783.35	328,000
2018-2019	100	1685.74	826,000
2019-2020	133	1955.52	810,000
2020-2021	126	1979.91	816,000

Source: Annual Report of Department of Fishery, Sittwe Township, 2021

Crab (soft shell) farming: Crab farming is a common practice in Rakhine State. Sand crab farming and soft-shell crab farming are profitable businesses with strong domestic and international markets. Sand crab breeding is carried out on small scales by local people in villages. Soft crab farming is carried out in Sittwe and Kyaukphyu Districts to export to foreign markets.

Table (3.13) Crab (soft shell) Farming

Year	Salt Prawn		Salf Fish		Sand Crab	
	Raw Material (viss)	Value Added (Tan)	Raw Material (viss)	Value Added (Tan)	Raw Material (viss)	Value Added (Tan)
2017-2018	139287.50	21893	16479.00	26.78	-	-
2018-2019	473021.07	697860.20	14795.65	24042.76	24203.20	39330.17
2019-2020	445660.26	733019.76	125448.40	203854.41	67136.86	109097.35
2020-2021	484013.16	1080704.23	221771.31	376008.99	90707.89	98363.01

Source: Annual Report of Department of Fishery, Sittwe Township, 2021

Dry Rack-fishery business: A possible sector of the fishery in Rakhine State is the dry rack-fishery business. In recent years, either domestic consumption or the market for dried fish have grown quickly. The towns of Sittwe, Kyaukphyu, and Thandwe are heavily marketed. When compared to other dried aquaculture goods, perch has the largest market demand on the domestic market.

Table (3.14) Dry Rack-fishery Business (2018-19 to 2020-21)

Year	Soft Crab		Dry Prawn	
	Raw Material (Viss)	Value Added (Ton)	Raw Material (Viss)	Value Added (Ton)
2018-2019	19395.66	31518.04	3682.00	5983.25
2019-2020	59675.08	96972.00	20447.30	33226.85
2020-2021	90707.89	98363.00	51703.15	72014.93

Source: Annual Report of Department of Fishery, Sittwe Township, 2021

3.6.4 GDP in Sittwe Township

The role of per capita income and GDP is significant in studying economic growth. Economic growth refers to quantitative changes and is commonly measured as a per capita output or income rise. The most common measured of production in an economy over the cost of a year. Therefore, in the economic field, GDP is critical.

The value of final goods and services in an economy is known to as GDP. It also means the quantitative changes of economic growth and describes the condition of each economic sector. As the country's GDP is increasing, it is more productive which leads to more people being employed (Zar Ni Su Hlaing). GDP of Sittwe Township can be studied from Table (3.15).

**Table (3.15) Real Gross Domestic Product in Sittwe Township
(2018-2019 and 2020-2021)**

(Kyat Million)

No.	Year	Production Thousand (Millions of Kyats)	Services Thousand (Millions of Kyat)	Trade Thousand (Millions of Kyat)	GDP Thousand (Millions of Kyat)	GDP Growth Rate
1	2017-2018	87312.7	207581.1	39308.8	334,202.5	-
3	2018-2019	119097	216759.5	25707	361,563.5	8.187
4	2019-2020	120582.7	198268.7	25560.9	344,412.3	-4.743
5	2020-2021	116739.2	189424.5	25623.9	331,787.6	-3.665

Source: Annual Report of General Administration Department of Sittwe Township, 2021

According to Table (3.15), the GDP rate of Sittwe Township is decreasing from year to year. In 2020-2021 its GDP become significantly decreased. So, GDP growth rate was decreasing slightly from 120.835% in 2018-2019 to 96.33% in 2020-2021. The GDP growth rate of Sittwe Township is decreasing in each sector year by year.

3.6.5 Per Capita Income

Using per capita income estimates, it is customary to asses whether an area has been behind or advanced in development levels. Table (3.16) shows per capita income in Sittwe Township.

Table (3.16) Per Capita Income in Sittwe Township (per month)

No	Number of Year	Population	Income Per Capita
1	2017-2018	230,358	45,910 kyats
2	2018-2019	318,514	113,516 kyats
3	2019-2020	331,405	103,925 kyats
4	2020-2021	332,203	99,875 kyats

Source: Annual Report of General Administration Department of Sittwe Township, 2021

In the table (3.16), General Administration Department of Sittwe Township, the Income Per Capita of Sittwe Township is MMK 45,910 in 2018. Income Per

Capita of Sittwe Township is decreasing by year by year. In 2020-2021 fiscal year, the Income Per Capita of Sittwe Township is MMK 99,875.

3.6.6 Labor Force

Sittwe Township is a relatively economically prosperous township. Local citizens in the township operate mostly as employees of Government Staff, Services, Agriculture and fishery sector. The number of people working under in the different sectors of Sittwe Township as shown in table.

Table (3.17) Number of People Working in the Different Sectors of Sittwe Township (2021)

No	Types of Work	Population	Percent
1	Government Staff	2,629	1.3
2	Services	3,914	1.9
3	Agriculture	3,466	1.7
4	Husbandry	1,630	0.8
5	Own Business (Self-employee)	19,290	9.7
6	Industrial Business	9,810	4.9
7	Fishery	15,012	7.5
8	Seasonal work	90,526	45.8
9	Other	51,376	25.9
	Total	197,653	100

Source: Annual Report of General Administration Department of Sittwe Township, 2021

According to the Table (3.17), in the township, the number of people who are working husbandry is higher and second group is government staff because Sittwe Sittwe Township is the capital city of Rakhine state. Sittwe Township has a lot of government department. So, most of the people are doing Agriculture sector, Sittwe Township. Sittwe Township is a commercial township and there are a lot of people who are working in the Own business and Services. And then, there are also few people who are working in Industry and fishery sector. There are few people in Seasonal works and other. Labor force participation in Sittwe Township is (207,383) employed workers are (197,653) and unemployment rate is (4.9%) in 2021.

CHAPTER IV

SURVEY ANALYSIS

4.1 Survey Profile

Rakhine State is bordered on the north and west by the People's Republic of Bangladesh and Chin State, on the east by Magway and Bago Region, on the south and east by Ayerwaddy Region, and on the west by the Bay of Bengal. The capital of Rakhine State's townships, Sittwe Township, has a lot of employment opportunities as well as development challenges. Sittwe Township, Pauk Taw Township, Ponnagyun Township, and Rathedaung Township are all included in the Sittwe District. There are 88 villages and 33 wards in Sittwe Township. There are 18 riverbank fishing villages in Rakhine State among them, however the mass of the fishermen in the coastal areas also farm to support their income. There are 18 villages in total, including Ah Myint Kyun, Par Da Leik, Kywi Te, Chi Laing Hpin, Nga Tauk Tet, Thein Tan, Yar Tan, Taw Kan, Kyar Ma Thauk, Ohnyayphaw, Thae Chaung, Chaung New, Kyay Taw, War Bo, Nyo Yaung, Shwe Pyi Thar, Myint Nar, and Aung Daing. In Sittwe Township, there were mostly (376) fishermen living in (18) villages. Kywi Te, Ohnyayphaw, Shwe Pyi Thar, Kyar Ma Thauk, and Aung Daing are the selected five villages.

This study focuses on the socio-economic conditions of fishermen and challenges for their livelihood in Sittwe Township, Rakhine State where an estimated 43% of the population relies on fishing or a combination of fishing or aquaculture and agriculture (Small Scale Fishermen in Rakhine State, Saw Eh Htoo).

4.2 Survey Design

The survey was conducted to examine the socioeconomic condition of fishermen in Sittwe Township, with a particular focus on five villages where fishing is the primary source of income. They are Aung Daing, Kywi Te, Ohnyayphaw, Shwepyithar, and Kyar Ma Thauk. 150 respondents who currently depend on fishing for their living were chosen in order to represent the entire population of fishermen. In

order to acquire quantitative data, a survey involving face-to-face interviews was conducted in 2022 all across the months of June and July.

4.2.1 Target Population

Target population is intended to the fishermen who is 18 years old and above and living the five villages located in remote islands that specialize on fishing in Rakhine State, but most of the fishermen in the coastal areas engage in farming to supplement their income. Various species of marine resources, shrimps and crabs is carried out the Kalatan, Lay Mro, Naaf and May Yu rivers. Fishery is an important economic activity in Rakhine State.

4.2.2 Study Area

The study area focuses on the socio-economic conditions of fishermen in Sittwe Township including livelihood of fishing activities, socio-economic status of fishermen and challenges and difficulties of fishermen in Sittwe Township. Survey areas are Kywi Te, Ohnyayphaw, Shwepyithar, Kyar Ma Thauk and Aung Daing. The survey used face to face interview with sample random sampling method. Survey period was from June to July 2022. To cover the whole fishermen, 150 respondents were selected who are current working fishing activities for their livelihood.

4.2.3 Questionnaire Design

The questionnaire is conducted in four parts. To first part includes related to demographic characteristics of fishermen and second one is Livelihoods of fishermen in Sittwe Township and the third is socio-economic conditions of fishermen and the fourth is challenges of fishing in Sittwe Township. For analyzing the demographic characteristics of fishermen in those regions. To study age, sex, race, religion, education and income level including (6) questions. Also, to analyze livelihood of fishermen and studying the livelihood of fishing activities including (16) questions. To analyze the socio-economics conditions consisting of (29) questions and the challenges of fishermen have (5) questions. This survey has totally (56) questions.

Researcher could deal with local closely and interpret survey data in details. The questionnaire was described in Myanmar language and questionnaires are shown in Appendix A. Secondary data and information from the township administration

office, as well as publications such as books, journals, articles, research, reports, and documents, are used to replenish the study.

Data were collected by using sample random sampling method and face to face interview methods in this study. Primary data are obtained from the survey and interviews conducted by the author and secondary data are obtained from Township General Administration Department and publication.

4.3 Determination of Sample Size

A two-stage sampling design is used in the survey. Among 18 villages in the rural area of 88 villages, a sample of 5 villages is selected by simple random sampling in the first stage. In the second stage, the sample households are proportionately chosen from the sample villages selected in the first stage by simple random sampling. According to Cochran's (1977), the required minimum sample size is calculated using the following formula. Cochran, W. G. (1977). Sampling techniques (3rd ed.).

$$n = \frac{Z^2 p(1-p)}{e^2} = \frac{(1.96)^2 \times 0.174 \times (1-0.174)}{(0.08)^2} = 150$$

Z = 95% confidence level = 1.96

e = desired level of precision = 0.08

p = 0.5

Hence, a sample of 1367 households is chosen, and sample households from each village are allocated as follows.

Table (4.1) Sample Size Allocation

No	Name of Villages	Household	P _i	Sample Household
1	Kywi Te	332	0.2429	36
2	Ohnyayphaw	100	0.0732	11
3	Shwepyithar	285	0.2084	31
4	Kyar Ma Thauk	260	0.1902	29
5	Aung Daing	390	0.2853	43
Total		1367	1	150

Source: Survey Data, 2022

4.4 Livelihood of Fishing Activities

Struggle for existence is an innate need for each and every human being. People have to do various activities for survival. Right from the birth, a child slowly learns skills, acquires knowledge which helps in making a living as an adult. Livelihood comprises the capacities, assets which include both material and social resources and activities necessary for acquiring means of living. The concept of livelihood emerged in the late 1980s as an alternative to the technocratic concept of 'employment' to better describe how people struggle to make a living (Scoones, 2009). Large Scale Fishermen go out to the fishing grounds two times per month and each trip could last 8-10 days depending on the weather and the amount they caught. Small Scale Fishermen go out daily for squid and smaller fisheries. Generally, they return home when the volume of the catch goes down.

4.4.1 Fishing Area and Duration of Fishing Trip

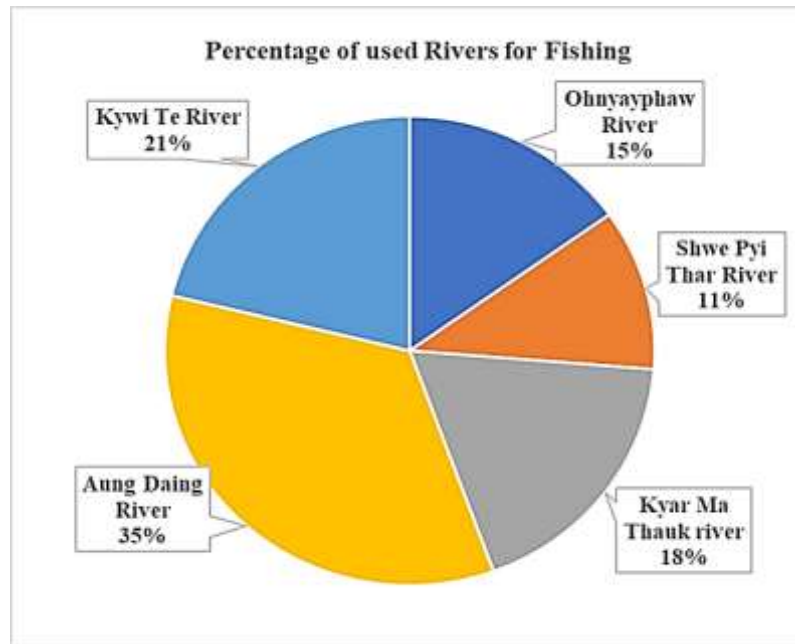
Fishing area is an important characteristic especially for commercial fishing due to the habitats of the fish in the sea is not available everywhere. So, fishing area should choose widely which is economically more viable for fishing. In study area, fishermen who have been lived near the bay of river. Most of the fishermen in the study area were found to go to near river from their villages for fishing. Duration of the fishing trip depends on availability of fish and catch. Depending on various factors, duration can be one day to one month.

Table (4.2) Percentage of Used Rivers in Sittwe Township

No.	Name of Rivers	Frequency	Percentage
1.	Ohnyayphaw River	23	15
2.	Shwe Pyi Thar River	17	11
3.	Kyar Ma Thauk river	27	18
4.	Aung Daing River	51	34
5.	Kywi Te River	32	21

Source: Survey Data, 2022

Figure (4.1) Percentage of Used Rivers in Sittwe Township



Source: Survey Data, 2022

The Kaladan River is a river in eastern Mizoram State of India, and in Chin State and Rakhine State of western Myanmar. The Mayu is a river in Rakhine State and is connected nearly Aung Daing River. So, 34% of Fishermen catch in Aung Daing River and 21% of Fishermen catch in Kywi Te River. Fishermen can get large fish from Aung Daing River. Thus they choose in fishing it among all of these rivers. The surface of Aung Daing River and Kywi Te River are large and wide. The Fishermen can harvest freely no need to negotiate with others. 15%, 11%, 18% of fishermen go to Ohnyayphaw River, Shwe Pyi Thar River, and Kyar Ma Thauk River respectively. Most of the fishermen used Aung Daing River, Kywi Te River, Kyar Ma Thauk River for fishing activities and accounted 73% of the total respondents for their livelihood in this study.

4.4.2 Fishing Boat, Net, Gear Machine Operated in the Survey Area

Different kinds of nets were used in the study area. It was reported that the fishermen are very poor. Some of fishermen do not possess their own net but carried out fishing by borrowing net. So, 85% fishermen can use their own net but 15% of them cannot use. Sometimes they sleep in the boat near to their nets, which they have to carefully guard against stealing and cutting by other fishermen. They are trying to buy fishing boat and net to get a loan but few can borrow. In the study area, 73%

fishermen were found as owner and 27% fishermen were worked as employee. There is high cost in fishing activities for owner during this year as the high cost of petrol and high price of products. Other workers could get wages based on the percentage of the catch.

Table (4.3) The Study of Fishing Boat, Net, Gear Machine Operated

No.	Particular	Frequency	Percentage
1.	Owners of fishing boat or row boat	118	79
2.	Owner of gear machine	115	77
3.	Owner of fishing net	128	85

Source: Survey Data, 2022

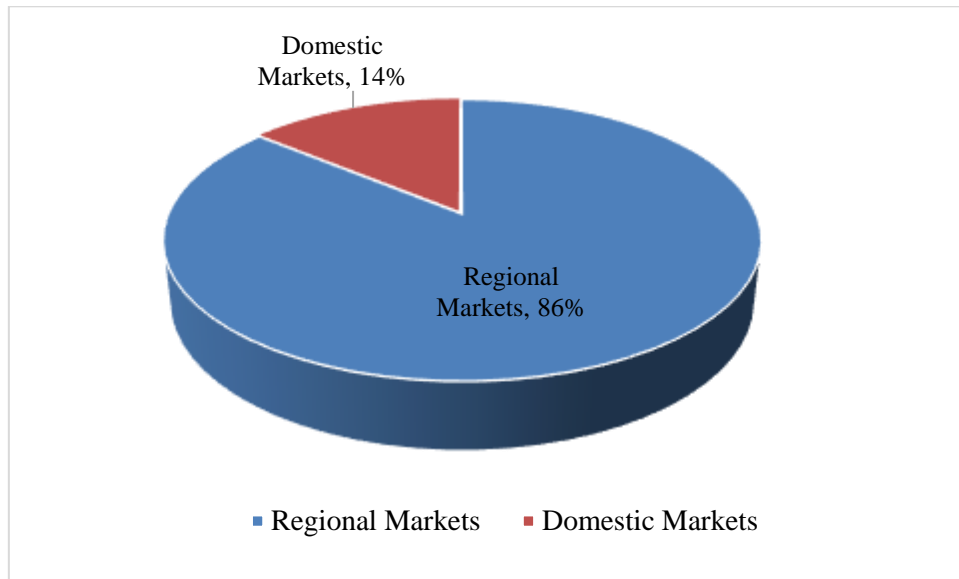
According to Table (4.3), 79% and 77% are owners of fishing boat and gear machine. On the other hand, 21% and 23% Fishermen didn't possess their boat and gear machine. Most of them work on the other boat as worker. Moreover, 85% owns their fishing net for their livelihood in the study area, Sittwe Township. Mostly, 86% of the fishermen go for fishing two times per day, small amount of people (13%) go for fishing above five times and one respondent is answered three times due to the weather condition and all respondents cannot catch bad weather situation in Sittwe Township. Generally, fishing deepens on the weather condition if the weather is bad, fishing will not be done.

4.4.3 Types of Market for Fish

The market for fish may include regional and domestic markets. The value of the items and cost or price is traded by people mainly depend on supply and demand in the markets. The nature of different markets can be a physical body or might be virtual; it may also be a global market or local market, perfect market, and imperfect market.

In survey area, there are two types of market: regional market and domestic market. One type of market, the fishes' market, is located inside of Sittwe market. Market prices of the fishes were high but fishermen were paid a little in relation to the market price.

Figure (4.2) Percentage of Types of Fish Markets



Source: Survey Data, 2022

Income earned by the small fishermen in Rakhine state is selling to the markets. Fish is mostly consumed fresh domestically (especially Sittwe Market), but export quality catches are sent to Yangon. Local processing focuses on less sophisticated methods like salting and drying. Poor quality and unsold fish are processed into dried fish, ngapi (fish paste), salted fish and animal feeds and are sent to Yangon's Bayin Naung wholesale center. Many of these activities are small-scale and home-based. Dried fish and shrimp are sent to Yangon and upland remote areas, while non-processed chilled prawn and black tiger are exported to other market. Lack of processing technology and skills has contributed to low quality fisheries and undermined export quantity.

4.4.4 Catch per Unit Effort

In fisheries and conservation biology, the catch per unit effort (CPUE) is an indirect measure of the abundance of a target species. The catch per unit effort (per day/per unit effort or boat) of the fishermen was found to be between 1kg to 5kg.

Table (4.4) Catch per Unit Effort (per day)

	Kg (1.6viss = 1kg)	Frequency	Percent
Caught fish per day (Viss)	1 kg	43	29
	2 kg	47	31
	2.5 kg	15	10
	3 kg	23	15
	3.5 kg	5	3
	4 kg	10	7
	4.5 kg	2	1
	5 kg	5	3

Source: Survey Data, 2022

The Department of Fishery in Rakhine State estimated that 12% (28,425 tons) of the captured fisheries were wasted or turned into trash due to lack of post-harvest handling technology, insufficient equipment on the fishing boats, poor road conditions, and lack of electricity (Interview, Managing Director, Department of Fishery, Rakhine State, 2011). They usually catch 1 kg, 2 kg, 2.5 kg, and 3 kg per day. So, their income decreases slowly. This year, expensive fuel has been mentioned as a major constraint in the fishing sector. They didn't have enough money to buy fuel, so they couldn't get into the sea. Most of the fishermen find resources in one place again and again. Vice versa, they all can't get a sufficient amount. 3.5 kg, 4 kg, 4.5 kg, and 5 kg have been caught by tiny fishermen who can use them for fuel.

4.4.5 Size of Fishes

Small-scale fishermen usually catch small types of fish. Moreover, it is related to size of fishing net and the fishing area. In survey area, small-scale fishermen cannot use high technology tools and fishing net.

Table (4.5) Size of Fishes

No.	Types of Fish	Frequency	Percentage
1.	Small	68	45
2.	Middle	39	26
3.	Large	43	29

Source: Survey Data, 2022

In fisheries, small types of fish include those of Nga-Mae-Lone, Nga-Shwe, Nga-Kone-Nyo, Nga-Wun-Pu, Ka-Ka-Tid, and Nga-Ni-Tu. Middle fish includes Rohu, Live Eel, Ribbon Fish, Hilsa and Big Eye Croaker. Large means Tiger Shrimp and Pink Shrimp. Small Scale Fishermen can use low quality fishery equipment's such as boat, net and gear machine. So, they can catch small types of fish. Large Scale Fishermen could find middle and large and they exported to the foreign market.

4.5 Socio-Economic Conditions of Fishermen in Survey Area

The aim of this study was to determine the socio-economic status of fishermen. A survey was used to study the socio-economic conditions of fishermen in Sittwe Township. The most marginalized segment of the population of this area, especially landless people and their children, were involved in fishing and trading for their livelihoods. Their levels of income fluctuate from time to time depending on the peak and lean seasons as well as on banned and non-banned seasons. Required data for socio-economic conditions is collected from primary data. Primary data include housing type, fuel source for cooking, water usage, household health status, and household transportation. In this study, the socio-economic condition of Sittwe Township is shown.

4.5.1 Demographic Characteristics of the Respondents (Fisherman) in Sittwe Township

Demographic Characteristics of the Respondents Regards Age, Gender, Race, and religious.

Table (4.6) Demographic Characteristics of the Fisherman in Sittwe Township (n = 150)

		Frequency	Percentage
Range of Age (Years)	18-25	4	3
	26-30	24	16
	31-35	23	15
	36-40	35	23
	41-45	13	9
	45-50	24	16
	50-60	27	18
Gender	Male	150	100
Race	Rakhine	150	100
Religion	Buddhism	150	100

Source: Survey Data, 2022

Table (4.6) shows that the age group of fisher men in Sittwe Township. To determine the status and the roles of a fisherman in his community and to know their behavior, age structure is an important factor of responsibilities, privileges, rights and duties, hard workers etc. are closely related with the age. The most of the respondents are between 36-40 years of age which is 23% of the sample. 16% of the sample is between 26-30 years of age, 16% is between 45-50years of age and 18% is between 50-60years of age. Age is an important attribute and dominant in fishing of survey area in Sittwe Township. Result showed that the highest number of fishermen was in between 36-40 age group indicating middle age group.

Concerning the gender, male take a majority share in the sample which is 100%. Most of the fisher men in study area are Rakhine. 100 percent of fishermen whose livelihood are fishing for their earnings. Moreover, religion can play a very important role in the socio-cultural environmental life of people and can act as a notable constraint modifies in social changes. The survey was conducted among the fishermen of which 150 were male. Generally, women were involved in household

works and they could not afford to go out for fishing in a large scale due to housework and others social problems. On the other hand, male was free from those barriers and engaged themselves in fishing.

They all are Rakhine race and fishing is their according to relation. On the other hand, they all are lived Remote Island so fishing is familiar with them. Most of the fisher men in study area are Rakhine race. The observed annual income of the respondents can get from fishing.

In Sittwe, selected area was mostly dense with Buddhist families and most of them are involved in fishing as a profession of their ancestries. They all are head of family. Moreover, they all are Rakhine race and Buddhists. It was observed that Arakanese were featuring as the absolute majority of the fishermen in the survey area.

4.5.2 Types of Housing in Sample Households

The basic necessary of human life is the standard of housing situation. Because it is necessary to have a good shelter and to prevent from the natural disasters. The following table (4.7) show that the type of housing of sample household in Sittwe Township.

The house condition of villages can be group on the basic of the survey data. In Sittwe Township, 32 houses used brick with zinc roof, 68 houses used wood with zinc roof and 50 houses used bamboo with thatch.

Table (4.7) Types of Housing in Survey Area

No.	Types of House	Quantity (Unit)	Percentage
1.	Good house (brick with zinc roof)	32	21
2.	Normal house (wood with zinc roof)	68	46
3.	Bad house (bamboo with thatch roof)	50	33
	Total	150	100

Source: Survey Data, 2022

Table (4.7) shows that 21 percent of houses have a good structure made of brick with a zinc roof.46 percent of houses in Sittwe Township live in fair-strong structures, which are made up of wood with a zinc roof, and 33 percent of houses live in poor structures, which are made up of bamboo with a thatch roof. In Sittwe Township, the condition of the type of house is fair because of their income level.

4.5.3 Sources of Fuel for Cooking

In Sittwe Township, most of households use electricity to cook for food items. Some of households use coal fuel, wood fuel and electricity. The following table (4.8) show that the sources of fuel for cooking in Sittwe Township.

Table (4.8) Sources of Fuel for Cooking

No.	Type of Fuel	Quantity (Unit)	Percentage
1.	Wood Fuel	82	55
2.	Coal Fuel	23	15
3.	Electricity	45	30
	Total	150	100

Source: Survey Data, 2022

According to table (4.8), 45 percent of households use electricity to cook food items, 23 percent use coal fuel, and 82 percent use wood fuel because they collect firewood along the river and other villages far from Sittwe Township do not have electricity. So, households in this village used wood, coal, and electricity to cook food items.

4.5.4 Utilization of Water in Survey Area

In Sittwe Township, most households get water from the dug wells to meet the needs of their households. Some get water from tube wells. The following table (4.9) shows the sources of the water supply system in Sittwe Township.

Table (4.9) Utilization of Water in Sample Households

No	Type of Well	Quantity (Unit)	Percentage
1	Purified water	18	12
2	Well/Lake	78	52
3	Hand- made well	54	36
	Total	150	100

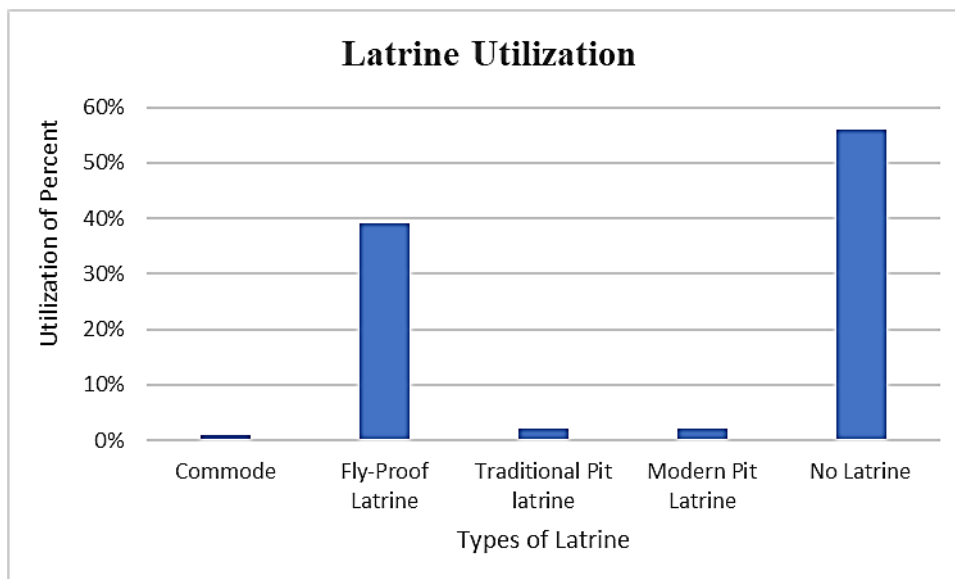
Source: Survey Data, 2022

According to table (4.9), 12% of households in Sittwe Township can get purified water, 78% of households can get drinking water from wells, and 36% of households get from tube wells. Most of the respondents depend on wells for water resources that are useful for their daily life situation.

4.5.5 Sanitation of Survey Area

Toilet is essential needed for households because of their health. The figure (4.3) show that the utilization of sample household.

Figure (4.3) Conditions of Latrine Utilization of Sample Households



Source: Survey Data, 2022

Figure (4.3) shows that 56% of sample households have no toilet, 39% use fly-proof latrines, 1% use commode latrines, and 2% use traditional toilet pit latrines and modern pit latrines, respectively. 56% of fishermen noted that the households of fish farmers often suffered from diarrhea and cholera due to a lack of good sanitary facilities. Toilets are important for sanitation and to improve the health conditions of fishermen. To improve socio-economic development, the utilization of toilets is important for their daily lives.

4.5.6 Health Status of Survey Area

In Sittwe Township, there are 3 government hospitals. Sometimes, although patients who are in poor families are admitted to these hospitals, some patients who are in rich families go to treat their diseases at the other private clinics and hospitals that are in Sittwe Township. The major leading causes of morbidity are shown in table (4.10).

Table (4.10) Major Leading Causes of Morbidity in the Survey Area

No.	Types of Disease	Quantity (Unit)	Percentage
1.	Simple Fever	92	61
2.	TB	7	5
3.	Diarrhoea	9	6
4.	HIV/AIDS	4	3
5.	Malaria	11	7
	Other	27	18

Source: Survey Data, 2022

According to table (4.10), 61 % of the households are suffering from simple fever, 5 % are TB, 6 % are diarrhea, 3% are HIV/AIDS, 7 % are malaria and another 8 % are other diseases. And only 8% are suffering from heart disease, diabetes mellitus, and high blood pressure. Most of the inhabitants usually go to government hospitals to treat their diseases when they are suffering from illness.

4.5.7 Health Access of Survey Area

Development of the health sector is basic for the production sector. Educated people and healthy labor can increase the skill and productivity of labor. In Sittwe Township, most people are treated for their diseases at Sittwe Civil Hospital due to their income. Some households go to other private hospitals that are located in the middle township.

Table (4.11) Conditions of Health Access of Survey Area

No.	Types of Hospital	Quantity (Unit)	Percentage
1	Government Hospital	59	39
2	Private Hospital	27	18
3	Traditional Hospital	4	3
4	Clinic	15	10
5	Regional Health Department	45	30
Total		150	100

Source: Survey Data, 2022

Table (4.11) shows the condition of health access for sample households. According to table (4.11), 39 percent of people rely on Sittwe Civil Hospital for treatment and diagnosis and 18 percent go to other private hospitals. And 30% rely on the regional health department, which is located near villages. Health facilities can provide the public health in Sittwe Township.

4.5.8 Transportation Status of Survey Area

Table (4.12) shows that 3% of households use the taxi to go from one place to another, 65% make use of public transportation, 25% utilize Toat-Toat, and 8% of households use their own cycles. Some local people own cycles. They use cycles to go to other villages.

Table (4.12) Transportation Status of Households

No.	Types of Vehicles	Quantity (Unit)	Percentage
1.	Taxi	4	3
2.	Hijet Car	97	65
3.	Toat-Toat	37	25
4.	Motorcycle	12	8

Source: Survey Data, 2018

The income of fishermen is not sufficient or predictable, so they must supplement their income with other activities to feed their families. So, they didn't own motorcycle, car and bicycle. Small number owned motorcycle but they can't afford cost of petrol. They usually use Hijet car transportation especially they take a small car. It costs 1000kyat from Sittwe to Ponnagyun. Thus they use 65% in survey area for this private transportation and they rarely use others.

4.5.9 Households' Assets

Buildings, furniture, household appliances, electronic equipment, and livestock reared on a commercial basis are all considered household assets. They are a household's assets. The households in the Sittwe Township own house assets. Some of the households have a TV, a motorcycle, an electric fan/iron, and a VCD/DVD. The assets of households in Sittwe Township are shown in table (4.13).

Table (4.13) The Assets of Households

No	Ownership	Quantity (Unit)	Percentage
1	Nothing	59	39
2	Radio	10	7
3	TV	19	13
4	VCD/DVD Player	1	1
5	Swing Machine	3	2
6	Electric Fan/Iron	10	7
7	Bicycle	21	14
8	Motor Water Pump	3	2
7	Motorcycle	24	16

Source: Survey Data, 2022

According to table (4.13), 30% of the households in the survey area have electricity, of which 13% own a TV, 7% can get serviced electric fans or irons, 7% own a radio, and 14 and 16% own bicycles and motorcycles, respectively. Local people use bicycles to go to nearby villages and go to other villages. Most households use bicycles and cycles for their transportation. And then, most of the households live in their own houses. Most of the households' 39 percent of people owned nothing. Therefore, their level of social status is low and they are poor. Thus, 77% live in owned houses but about 23% live in relative houses. Fishermen who catch the amount of which is set depending on the type of fishing nets and the nature of the boats further plunge small-scale fishermen into deeper poverty.

4.5.10 Family size

In rural areas, families are found in one type: nuclear families: married couples with children. A nuclear family consists of the members of two generations (parents and children). Children make up 87 percent of households, and married couples with no children make up 13 percent.

Table (4.14) Family Size

No.	Particular	Quantity (Unit)	Percentage
1.	1 Kid	57	38
2.	2 Kids	41	27
3.	3 Kids	30	20
4.	4 Kids and above	3	2

Source: Survey Data, 2022

According to table (4.14), 38% of married couples have one child, 27% of married couples have two children, 20% of married couples have three children, and 2% of married couples have four children or above. The fishermen, who have a small number of family members, will have sufficient income. If they were a big family, they didn't equal their income and expenditure. 79 percent of people depend on their head of family, and 21 percent of people are employees or workers.

4.5.11 Education Status of Fishermen

Table (4.15) describes the education level of fishermen in the study area, Sittwe Township.

Table (4.15) Education Level of Fishermen

No.	Level of Fishermen Education	Frequency	Percentage
1.	No education	20	13.3
2.	To read and write only	7	4.7
3.	To pass primary education	90	60.0
4.	To pass middle level education	27	18.0
5.	Tertiary	5	3.3
6.	To pass matriculation	0	0.0
7.	Monastic Education	1	0.7

Source: Survey Data, 2022

Educational qualification deeply influences on individuals' preferences and behavioral patterns. It is also influencing on one's performances, skillness and capabilities. In the present study education status of the fishermen and their families have been group in seven categories. In case of fishermen, the highest (60%) has primary education and no one can pass matriculation examination. Eighteen percent was to pass middle level and thirteen percent was illiterate. It might be due to the majority of the fishermen had primary education. Most of the sampled fishermen were compelled to enter into the fishing profession in their early stage due to poor economic status of their parents and lack of awareness about education.

69% of children can't be able to effort school fees andp

4.5.12 School Attending and Dropout Children of Fishermen

The following Table (4.16) shows school going and dropout children of fishermen in the study area, Sittwe Township.

Table (4.16) School Attending and Dropout Children of Fishermen

No.	Particular	Frequency	Percentage
1.	Drop-out School	62	41
2.	1 student- Drop Out	28	19
3.	2 students-Drop Out	24	16
4.	3 students- Drop Out	6	4
5.	4 students and above- Drop Out	3	2
6.	5 students and above- Drop Out	2	1

Source: Survey Data, 2022

From the study, it was found that the number of school-going children was per house. It was observed that 41% were school dropouts and 59% were school-going. Fishermen do not want their children to be fishermen. A few fishermen have tried to send their children to Sittwe University or to get vocational training for jobs such as mechanics or drivers. However, 19% of one child and 16% of two children drop out of school, respectively. There are two main reasons: (1) the first is that I am unable to pay school fees; and (2) to satisfy primary education.

4.5.13 Sample Households' Income and Expenditure

The major source of data on expenditure and income is the households' survey. These household's survey are useful in meaning the economic well-being of household members. The selected fish farmers were grouped into seven categories based on the level of their annual income. In economics, savings is the amount that is left after spending. Actually, fishermen in survey area have 'no saving' and they need to get 'loan' with cheap interest.

4.5.14 Average Income Level of Fishermen

Table (4.17) shows the average income level of fishermen in the study area in Sittwe Township.

Table (4.17) Average Income Level of Fishermen (per month)

No.	Average Income Level of Fishermen	Frequency	Percentage
1.	100,001 - 150,000 Kyat	43	29
2.	150,001 - 200,000 Kyat	47	31
3.	200,001 - 250,000 Kyat	15	10
4.	250,001 - 300,000 Kyat	23	15
5.	300,001 - 400,000 Kyat	5	3
6.	400,001 - 500,000 Kyat	10	7

Source: Survey Data, 2022

Better understanding of socio-economic status of fishermen, their income level is most important factor for their livelihood status. 29% percent of fishermen earns 100,001 to 150,000 Kyats, 31% of fishermen earns 150,001 to 200,000 kyats, 10% of fishermen earns 200,001 to 250,000 kyats and 15% of fishermen earns 250,001 to 300,000 kyats. Most fishermen get 100,001 kyat to 300,000 kyats and it accounts on 80% of total respondents in the study area, Sittwe Township.

Therefore, it is the middle-income class level are more than of higher income class level and lower income level. Moreover, the lowest income family has not only one or two employs but also working in seasonal worker. Thus, there are known that the gap between income group by their own fishing assets and investment. The income of fishermen is not sufficient or predictable, so they must supplement their income with other activities to feed their families. Apart from fishing, they glide along the river to cut and collect the firewood from mangrove forests for family

consumption and sale. Firewood is in demand in region since they do not have electricity for cooking and drying fish. The price of the firewood varies depending on the season and the availability of forest resources.

4.5.15 Sample Households Monthly Consumption Expenditure

The cost of household consumption of a commodity or service either for the whole members of the households or for individual member of the household is the household expenditure. The monthly households' expenditure item groups are presented in table (4.18).

Table (4.18) Sample Households Monthly Consumption Expenditure

No	Average Expenditure of Fishermen	Frequency (Unit)	Percentage
1	100,001 - 150,000 Kyat	15	10
2	150,001 - 200,000 Kyat	29	19
3	200,001 - 250,000 Kyat	33	22
4	250,001 - 300,000 Kyat	26	17
5	300,001 - 350,000 Kyat	6	4
6	350,001 - 400,000 Kyat	30	20
7	400,001 - 450,000 Kyat	6	4
8	450,001 - 500,000 Kyat	5	4

Source: Survey Data, 2022

Based on the above table (4.18), it is found that the number of households having the expenditure of between 100,001 to 300,000 kyat is 68 at the highest percentage of among all consumption expenditure. The expenditure of between 300,001 to 350,000 kyat is 4 percentage, 20 percentage is expenditure more than between 400,001 to 450,000 and expenditure between 450,001 to 500,000 is lowest as 4 percentage. The expenses of the households mean the expenditures on basic necessities such as rice, cooking and other.

The above table describes the expenses of the sample households for education, healthcare and social activities. The expenses for education means the expenditure of the households that have students in their families including from primary education to higher education. It is generally stated in the study about the expenses of the households that have students without the detailed mentioned of the

costs of the students for each class. Expenses for healthcare means the expenditures of the families for the health of the individuals without the mentioning of the costs of treatment for each illness. Expenditure for social activities includes all types of social gatherings and activities.

According to the collection data, most of the household are wooden houses with zinc roof and most of the household rely water from dug well. Most of the household have no toilet and fly-proof latrines. The most of the household properties bicycle, motor cycle and electronic equipment. Therefore, the living standards are low and not very high.

4.5.16 Savings

It was found that 25% of respondents had saving. The fishermen could save some from agriculture, fish culture, business, service and other activities. However, the remaining 75% of fishermen could not save money due to poor assets and household expenses.

4.5.17 Credit Facilities

The economic condition of the villagers was not so good. The villagers mainly invested their money on buying nets and boats and on their repair and maintenance. They had to borrow for their investment as they did not have sufficient capital. The sources of borrowing were the Microfinance Fund, government loans, and money lenders. Most of the fishermen had taken loans for investment, with 81%, and only 19% of the fishermen invested their own money in purchasing boats and nets. In the survey, it was found that 81% of the fishermen borrowed money from money lenders and microfinance funds.

4.6 Difficulties and Challenges of Fishermen in Survey Area

Fishermen have increasingly faced precarious and unpredictable living situations. They can't guess weather conditions and other factors. Since, high price of fuel can be affected by fishermen to go out for fishing. They catch near river and they use one boat by sharing. There are some problems have been identified by asking the relevant questions to the fishermen. Such as lack of boat, insufficient fishing gears, marketing of fishes, flooding of river, lack of credit and banned fishing gears etc.

Table (4.19) Difficulties and Challenges of Fishermen in Survey Area

No.	Challenges of Fishermen	Quantity (Unit)	Frequency
1.	Flood	71	47
2.	Disaster	135	90
3.	Total	150	100

Source: Survey Data, 2022

In survey area, Sittwe Township, fishermen always face challenges in fishing area. Thus, 100% of fishermen answered their difficulties. They all almost face disaster and some people lost their live in the sea. Moreover, some widow can be found but her son is catching for their earnings. They have low opportunities and they are uneducated. Finally, they have been reached into fishery sector. Although they scare disaster and uncertain situations.

CHAPTER V

CONCLUSION

5.1 Findings

Sittwe Township is the capital of Rakhine State. It is located to the north of Ponnagyun, Rathedaung, and east of Pauktaw. It is 25 miles from Ponnagyun. This focused on the socio-economic conditions of fishermen in Sittwe Township. It used a two-stage sampling method in the survey. Among 18 villages in the rural area of 88 villages, a sample of 5 villages is selected by simple random sampling in the first stage. In the second stage, the sample households are proportionately chosen from the sample villages selected in the first stage by simple random sampling.

In the part livelihood of fishing activities, they go out to the fishing grounds two times per day, and each trip could last eight to ten hour depend on the weather and the amount they catch. Sometimes they sleep in the boat near to their nets, which they have to carefully guard against stealing and cutting by other fishermen. Fishermen lived on the riverside, and they went fishing near the river. The fishermen's livelihood was not so good. Most of them had no gear engine, fishing assets, etc. Over the centuries, little has changed in the lives of fishermen in Sittwe—although engines in boats take the traditional small boats. When the high cost of petrol can't be afforded by fishermen, they were using it for two fishermen in one boat. They sold their fish in the regional market, and they caught a small amount of fish.

The population in the rural areas of Sittwe Township has improved year by year. In the part of the demographic characteristics of the respondents (fisherman), almost all of them are male. Aged from 18 years to 60 years, they were working in the fishing area because they were not educated people. Thus, they have no choice in their lives. The income of fishermen is not enough or predictable to survive, so they must supplement their income with other activities to support their families. In the survey area, most of the fishermen are of the Rakhine race and they are Buddhist. The Rakhine people made their living through fishing and agriculture. Moreover, the

primary purpose of fishermen is a lack of employment opportunity. This is true both in relation to jobs and to subsistence.

In the part of socio-economic conditions of fishermen in the survey area, fishermen also faced various problems such as child education, health facilities, food consumption, and lack of micro-finance for fishermen. Almost all fishermen mentioned lack of capital and lack of viable alternatives during the ban period as their main problems. Actually, the fishermen of Sittwe Township are socially disadvantaged and unable to fulfill their basic needs. They also live below the poverty line and are struggling to survive with health, nutrition, and sanitation problems on a day-to-day basis. Most fishermen had no toilet, and they solved their problem by going beside the river. The fishing villages are totally deprived of the basic infrastructure such as housing, educational institution, connectivity of road, street electrification, and good sanitation. On the other hand, the government and non-governmental organizations (NGOs) should take the necessary steps to raise awareness among fishermen. All of the fishermen had no training for fishing, saving, or health education.

The final part of the Difficulties and Challenges of Fishermen in the Survey Area negatively affects the fishermen and their villages. Due to climate change, cyclones are happening more frequently and fiercely, devastating the coastal area and destroying the fishermen's houses, boats and nets. Changing in climate makes them seasonal unemployment. So they indebted mostly from relatives and merchant where the interest rate is high and this lead them difficulties. This is reflected in poor intake of food, poor health care, increased alcoholism, gambling and fight among men. Small number of fishermen died and countless people lost their shelter and their livelihood.

5.2 Suggestions

As a summary of conclusion, the following points of suggestion should be considered in the future socio-economic conditions of fishermen in Sittwe Township. The government should support fishermen to raise their living standards. They are uneducated and their children's education was weak. There are a few young children who have passed the matriculation exam. I think that the children's education is not improving because the teachers on duty also move frequently. Move over, the fishermen couldn't afford school fees thus their children often dropped out school. Teachers and head master of these villages ought to command and handle in this case.

Households in that village can live in a house with a bamboo and thatch roof. Because their income is low and are unpredictable. Some small-scale fishermen have no engine power for fishing. They have no capital to invest in fishing. The government should manage microfinance for only fishermen. They can get extra income, but they have no savings. Thus, microfinance should not only lend for capital but also develop habits of saving. They are facing difficulties because of the high cost of fuel. The government should balance with traders fuel prices. They have to sell fish freshly and they must know how to store fish in refrigerator. They should prepare a fish tank for drying. They have to find market for value-added dried shrimp by trading.

In practical, they rely on traditional clinics. Almost mothers lost their babies at least once in their lives. When they wanted to go to Sittwe Hospital, they used a small boat. Recently, the bridges and roads have been conducted by the government. It has more advantages than the last. There is a gap between health workers and patients. The government should fill health worker vacancies in regional clinics. There are no toilets in survey area, so everyone in this village needs health knowledge. Sometimes they should attend health education managed by Department of Health. And they have to duty for cleaning and hygienic environment so they should form a group for their socio-welfare.

The Stakeholders including government, local organizations, non-governmental organizations, international organizations and private organizations should encourage and promote the livelihoods of fishermen and fishing activities and also support their socio-economic conditions of fishermen in Sittwe Township. Non-governmental organizations plan to reduce poverty in poor coastal communities, improve food and nutrition security and increase household incomes in the Sittwe Township, coastal fisheries communities and a healthy marine environment.



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APPENDIX

Research on Fishermen's socio-economic condition in Sittwe Township Demographic Information

Name of fisherman : -----

Name of Village : -----

1. List of households

Please fill the data in the following Column (b), (c) and (d).

No	(a)	(b)	(c)	(d)
	Age	Male/Female	Befitting with the head of family	Race/Religious
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				

(b) 1 = (Male) 2 = (Female)

(c) 1 = (Head of family) 2 = (Wife/Husband) 3 = (Son) 4 = (Daughter)
5 = (Father)

(d) 1 = (Rakhine/Buddhist) 2 = (Chin/Christianity) 3 = (Maramar/Buddhist)
4 = Other

(Fishery Information/Activities)

1. (Name of river) -----
2. What is the primary purpose of your involvement in fishing?
 - (1) To subsistence
 - (2) To consume and to sell in the local market
 - (3) To consume and to export foreign market
 - (4) Labor (employed by others)
 - (5) According to relation job
 - (6) Causes of poor job opportunities
3. Main Job
 - 1 = (Fish workers/Fisherman) 2 = (market seller) 3 = (Farming/farm)
 - 4 = (Trader) 5 = (General worker)
 - 6 = (Cycle Rickshaws/Carrier)
4. What kinds of fishing status they do in fishing field?
 - (1) Motor boats owner (2) Day Laborer/fishermen
5. Do you own fishing and ski boat or row boat?
 - (1) Yes (2) No
6. Do you own gear engine?
 - (1) Yes (2) No
7. Do they own fishing net/hooks?
 - (1) Yes (2) No

(Mention types of fishing net) -----
8. How many times do they catch in month?
 - (1) One time (2) Two times (3) Three Times
9. Where market does they sell fishes?
 - (1) Regional market place (2) Domestic Market place (3) Foreign market
10. What kind of fish do they catch when they go to catch?
 - (1) Other

11. How many do visses they catch
 (1) Between 10 viss and 10 viss
 (2) Between 10 viss and 20 viss
 (3) Between 20 viss and 30 viss
12. Average Income of fisherman per month
 (1) Under one lakh
 (2) Between one lakh and two lakh
 (3) Two lakh
 (4) Between two lakh and three lakh
 (5) Three lakh and four lakh
 (6) Other
14. Do they face challenges?
 (1) Yes (2) No
 ----- If yes, then why
 (1) High fuel prices (2) Expensive vestment
 (3) By using fishing big boat (4) Inadequate update technology
 (5) With-Strong-windy (6) Bad weather
15. To borrow money for investment
 (1) Yes (2) No
 If yes
 (1) Government loan (2) Private loan (3) Borrowing from pawn shop
 (4) Friendly loan (5) Borrowing from relatives
 (6) Microfinance (Microfinance Institutions)
16. Do you have tax to the government?
 (1) Yes (2) No
17. How much per year do you tax to government annually?
 Estimated Amount -----
18. Do you often attend training courses for fishing?
 (1) Yes (2) No
 If yes, -----
19. Which title have you discussed in that training?
 For example- Do and Don't -----

Socio-economic conditions Information

1. Mention Dependent family member.
(1) Yes (2) No
If yes, mention number -----

2. Total income per month
(1) Under 1 lakh
(2) Between 1 lakh and 2 lakh
(3) Between 2 lakh and 3 lakh
(4) Between 3 lakh and 4 lakh
(5) Between 4 lakh and 5 lakh
(6) Between 5 lakh and 6 lakh
(7) Others

3. Average expenditure per month.

4. Saving

5. Social expenses

6. Other
(1) Head of Households (2) Wife/Husband (3) Other

7. Number of Children between the ages of 5 and 15 in the family
(1) 1 = 1 person (2) 2 = 2people (3) 3 = 3people
(4) 4 = 4people or more

8. Do you have out of School Youth?
(1) Yes (2) No
If yes, -----
(1) 1 = one (2) 2 = two (3) 3 = three (4) 4 = four and above
The reason for not attending school
1. Unable to afford school fees
2. Far from the school
3. with bad health
4. Bad Transpiration
5. Need to do housework

6. Satisfied with reading and writing
 7. Other
9. Level of fisherman's education
1. Illiterate
 2. To write/read
 3. To pass Primary Education
 4. To pass Middle Education
 5. To pass High Education
 6. To pass Tertiary
 7. Other
10. Utilization of Drinking Water in Sample Households
1. Pure water
 2. Well, Lake
 3. Tap water
 4. Tube well by government
 5. Deep well
11. Toilet Utilization of Sample Households
1. Commode latrine
 2. fly-proof latrine
 3. Traditional Toilet pit latrine
 4. Modern pit Latrine
 5. No latrine
12. Number of Clinic visit
1. 1 = one
 2. 2 = two
 3. 3 = three
 4. 4 = four
 5. 5 = five
 6. 6 = six
 7. 7 = Other

13. Health Access of Sample Households
1. Public hospital
 2. Private hospital
 3. Traditional clinic
 4. Simple pharmacy
 5. Small Clinic
 6. Other -----
14. Health Status
- | | | | |
|------------------|-----------|--------------|--------------|
| (1) Simple Fever | (2) TB | (3) Diarrhea | (4) HIV/AIDS |
| (5) Malaria | (6) Other | | |
15. Infect morality in the past year
- (1) Yes (2) No
16. Death of a child under 1 year in the past year
- (1) Yes (2) No
17. Maternal death in the last year
- | | |
|------------------------|-------|
| (1) Food | ----- |
| (2) Clothes | ----- |
| (3) Furniture, Tools | ----- |
| (4) Expenditure | ----- |
| (5) Education | ----- |
| (6) Health | ----- |
| (7) Electricity | ----- |
| (8) Socio-economic fee | ----- |
| (9) Taxes, Rent | ----- |
18. Adequate income or Not
- (1) Yes (2) No
19. Monthly saving
- (1) Yes (2) No

20. Who organizes the following expenses in your family?

No	Content	Organizer
1	Daily expenses	
2	School fee	
3	Saving	
4	Social expenses	
5	Other	

21. Owner of house

(1) Own (2) Rent (3) Other

22. Type of Housing

(1) Excellent! House in good structure (brick with roof)
(2) Good! House in fair strong structure (wood with roof)
(3) Bad! House in poor structure (bamboo with thatch roof)

23. Household's Assets

(1) Own radio cassette (2) TV (Own TV) (3) VCD, DVD
(4) Sewing machine (5) Own electric fan/radio (6) Own air corn
(7) Bicycle (8) Cycle (9) Own car for business
(10) Own car for home used (11) Motor Water pump

24. Household's smart phone Assets

(1) Yes (2) No

25. Internet, Facebook & Email (Usage of Internet, Facebook, Email)

(1) Yes (2) No

26. Electricity

(1) Yes (2) No

Average hour per day

(1) 1 = 4hr (2) 2 = 8hr (3) 3 = 12hr (4) 4 = 16hr
(5) 5 = 20hr (6) 6 = 24hr

27. Sources of Fuel for Cooking
 (1) Wood (2) Charcoal Coal (3) Electricity (4) Natural Gas
28. Transportation Status of Household
 (1) Own car (2) Taxi (3) Cycle (4) Bicycle
29. How is your transportation from your village to Sittwe?
 1. Last -----
 2. Now -----
30. It there a flood?
 1. Last -----
 2. Now -----
31. Have your ever experienced a storm?
 (1) Yes (2) No
 It only means death related to pregnancy
 (1) Yes (2) No
32. Discussion about health among family members
 (1) Yes (2) No
33. How do you get knowledge about health?
 1. Newspaper
 2. TV/Radio
 3. Health worker
 4. Facebook
 5. Department of Rural Health
 6. Health Lecture
 7. Vinyl
 8. Friends
 9. Other
34. Do you usually wash your hands before eating any food?
 (1) Sometimes (2) Always (3) Never

35. Have you ever done charity work?

(1) Last -----

(2) Now -----

36. To summarize the experience of the storm -----

Thank you!

MAP OF SITTWE TOWNSHIP

