

**YANGON UNIVERSITY OF ECONOMICS
DEPARTMENT OF ECONOMICS**

A STUDY ON SALT PRODUCTION OF MON STATE

**A thesis submitted as a partial fulfillment of the requirements for the
Degree of Master of Economics**

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ABSTRACT

Salt is the essential food for basic need of human. Cooking salt plays an important role to provide the ion for need of body. To analyze profit of salt production in Panga salt enterprises. To identify effect of business owner education in salt production. This study use both primary and secondary data. Primary data were collected for the interview of 40 business owner with prepared questionnaires. The secondary data were also collected from all available sources Department of Mining, branch department of salt, salt enterprise office, Mawlamyine. This study period will be for the period from (2005-2006) to (2015-2016). The main difficulty of salt production is lack of seasonal labor due to the labor flow into foreign countries. The size of salt field upper 51 acre is the suitable size by calculating the average net profit per acre, yield per acre. To solve the lack of labor, the businessmen should persuade the workers by paying them more salaries for the lease. The government should reduce to think the rates of taxes when they collect from the salt businessmen.

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Chapter 1

Introduction

1.1 Rationale of the Study

Salt is the essential food for basic need of human. Salt is used as the main input as in Livestock and Myanmar Traditional Food preparation. Salt is mostly used not only in cooking but in keeping foods not to be rotten and to last longer. For examples, salt is mostly used in making Ngapi, dried fish, fish sauce, dried shrimp and other dried meats which are eaten by most of our ethnic groups, in keeping vegetables to last longer.

Furthermore, it is found that salt is also useful for humans' health. Although urban people use toothpaste and toothbrush while washing their faces in the morning, salt is daily used in oral cleaning by rural people. Salt is used as matching with cathartic. In case of eye pain, salt is mixed in water and dripped into eyes. In case of cold and fever, salt is put into the betel leaf soup and drunk. People who perspire too much must eat more salt to refill worn out internal body salt. In Myanmar traditional medicine, salt is recommended to be used together with them. Cooking salt plays an important role to provide the ion for need of body.

The reason that salt is essential is not only being foods without salt light in taste. Salt is needed by our body that requires health, activities. 0.5% of human body is salt. In other words, after staying without eating salt for a few days, knees and knuckles will have swelling and the body will be weak. Therefore, salt has to be eaten not to decrease that salt level. This salt turns to hydrochloric acid and assists the digestive system in the stomach. And it eliminates the bacteria which came into the body.

People get shock while getting accidents, serious wounds, and fire burns. Doctors usually inject plasma or sodium chloride not to get such shock. But plasma and sodium chloride do not used to be available easily. In this situation, salty liquid is injected into the body and it is absorbed by colon, and then wasted blood is refilled. Therefore, someone who is unconscious has to be fed a big bottle of water with a tea spoon of salt to get relief.

In the world, salt is used in huge amount as a chemical raw material, it is also used in making meats not to be rotten, soap production, iron melting procedures,

leather production, textile painting, meat freezing, metal rust cleaning, agriculture, formulating drugs for medications, ammunition productions and glass blowing.

Salt is fed to cattle which are used in agriculture. Salt is used to keep straw to last longer. In industries, workshops and washing workshops, salt is used to make soft water and in road construction, salt is used as a hard substance.

And the chemical name of the cooking salt is Sodium Chloride, (NaCl) in Chemical. Salt can be produced in various parts of earth, underground, sea water. One gallon of sea water contains four ounce of salt, topical sea water contains more salt because of the heat.

To fulfill the domestic need, the main producing places are Ayeyawady Region, Rakhine State, Yangon Region, Thanintharyi Region and Mon State. The production of salt in Myanmar was only for domestic need and distributed to all over the region. Sun-dried salt is the major producing salt and produced by the sea water. Salt production expands from production for domestic need to production for export.

This study the salt production from Panga Village, Thanphyuzayat Township, Mon State which is the historically and currently famous for salt production. The study of salt production in Panga Village can be illustrated the sun-dried/ saltwater salt production of Myanmar and the progress and the barriers of the production in economic point of view.

1.2 Objectives of the Study

The objectives of the study of the production of salt from Panga Village, Thanphyuzayet Township are as followed.

1. To analyze profit of salt production in Panga salt enterprises.
2. To identify effect of business owner education in salt production.

1.3 Method of Study

This study use both primary and secondary data. Primary data were collected for the interview of 40 business owner with prepared questionnaires. The secondary data were also collected from all available sources Department of Mining, branch department of salt, salt enterprise office, Mawlamyine. Every collected data are analyzed to least errors.

1.4 Limitation and Scope of the Study

The study is conducted about salt production in Mon State. This study period will be for the period from (2005-2006) to (2015-2016).

1.5 Organization of the Study

This study comprises six chapters. Chapter 1 is the introduction with the rationale of the study, objectives of the study, method of the study, limitation and scope of the study and organization of the study. Chapter 2 concern with the literature review. Chapter 3 include method of the salt production. Chapter 4 mentions the salt industry in Mon State. Chapter 5 is salt industry in Panga Village (2017). Chapter 6, conclusion is described by the findings and suggestions.

Chapter 2

Literature Review

2.1 Meaning of Salt

Salt is the sodium chloride which is produced from seawater, salty underground water, spring water, lake water and sand water. Sodium chloride which exists underground or surface also includes.

Although it cannot be exactly expressed when and which era salt production has started in Myanmar, can't refuse the fact that salt was produced since long times ago. Along the coast of Myanmar, salt is produced from sea water, the salted water which comes from the natural springs of inner regions and the salted water from salted wells long times ago.

2.2 Salt Production in Pre-war Era

During 1914-1918 of World War I, domestic salt production became alive again because the salt imports from foreign country decreased a lot. However, as Bago Division and Ayeyarwady Division were restricted of salt production according to the policy of colonial government, the salt production became a big business in inner Myanmar and Thanintharyi Division which was easy to communicate. Thus, salt was able to produce from 256 thousands mounes per year in 1911 to 1million mounes per year in 1919 and 1920. After World War I, although development of domestic salt production was stopped because of salt imports from foreign country became alive back, salt production in Thanintharyi Division became the most developed and increased stage.

A problem with the development of salt production was using a lot of wood for fire. Thus, salt production in Thanintharyi Division which became as a big production, made the iron pan for salt boiling as big as it could, and also made the fireplaces stronger with bricks from the fireplaces with clay and straw. They also set up the chimneys to get the best heat from the firewood which was used in fireplaces. Salt tax department educated the salt producers not to waste the heat of firewood by making the standard fireplaces in Dane (Kyaukphyu) and Paga (Kyaitkhami).

In 1925, Mawlamyaing-Ye Railroad was started opening, so the salt from Thanintharyi Division could be directly exported to upper Myanmar. World War II happened on September 1939 so salt imports from foreign gradually decreased.

Because of this condition, a lot of new salt fields arose in Kyaitkhami and Yay during 1939-1940 and 1941-1942 when the war came to Myanmar.

Because of arising new salt fields and development of fireplaces, the salt production of Thanintharyi Division increased into 87% of the salt production of the whole country. The salt production of only Kyaitkhami District during 1939-1940 was 30.3 million peittha and the production of the whole country was only 34.8 million peittha. When we studied about the working acres, only Kyaitkhami District had 2220 acres among 2715 acres of the whole country, which were licensed, in 1939-1940. As the salt production became bigger, a lot of businessmen who afforded investments entered. The business of taking seawater improved a lot along with the development of building fireplaces for salt. The business of taking seawater was made by 'kha-nwe' or 'buu-sat' or 'chat-khote-sat'. Kha-nwe was a waterwheel with a lever and a bucket which was used for taking seawater. Buu-sat is a millwheel which was made up of hnee and had buckets. But the business of taking seawater with kha-nwe and buu-sat disappeared and taking seawater with chat-khote-sat developed a lot.

When chat-khote-sat was started using, it took seawater with manpower by rotating with hands or using two men's feet. However, as the salt productions became wide, machines were used in Kyaitkhami District instead of using a lot of man powers when they needed a lot of water since 1932.

2.3 Salt Production of After War Era

As the salt imports from foreign completely stopped during World War II, Myanmar government supported at the salt production in Thanintharyi Division and Ayeyarwady Division for the fulfillment of domestic salt. Because of those supports, the salt production in Thanintharyi Division and Ayeyarwady Division obviously developed during World War II.

However, the salt production of Thanintharyi Division decreased because it was unbearably affected by war in the last years of World War II. But, the salt production of Kyaitkhami District lowered from 49.151 million peittha in 1940-1941 of prewar era to 22.3042 million peittha in 1946-1947 of after war era. The salt production of Pathein District developed from 3.956 million peittha in 1949-1941 of prewar era to 6.302 million peittha in 1946-1947 of after war era.

The salt production places of Pathein District were villages on Thonegwa Island after getting independence. Myaungmya District which didn't produce salt

before the war became an important district. In 1961-1962 before the revolution, Ayeyarwady Division came to the front line of salt production over Thanintharyi Division.

(A) Pathein District	49.245630 million (peittha)
(B) Myaungmya District	8.967400 million (peittha)
<hr/>	
Total	58.213030 million (peittha)

On the other side, Thanintharyi Division which was on the top in the production of salt during prewar era had to rival Ayeyarwady salt which could easily export to the inner Myanmar by using waterway, so the salt production became decreased after the war. In 1961-1962 before the revolution started, the condition of the salt production of Thanintharyi Division was as follow.

(a) Kyaukse District	28.719810 million (peittha)
(b) Dawei District	2.527000 million (peittha)
(c) Myeik District	0.637550 million (peittha)
<hr/>	
Total	31.884360 million (peitthar)

Source: Department of Mining branch department of salt, salt enterprise office, Mawlamyine

Before 1962, the salt production in Myanmar improved and also had the exports to foreign. 28240 tons of salt was sold from 1956-1960 to 1961-1962.

2.4 Changing into Sun-dried Salt

Domestic salt production improved steadily after the war and in 1955-1956, it became the level which could fulfill the domestic needs completely. However, the basic way of salt production was still the system of boiling with wood fire. This system was used before the revolution had started. Because of boiling with wood fire, a large amount of wood was used so large forests were decimated.

On the other side, chemical factories were built for the development of the country after getting independence, and the salt that the factories need were the pure salt which was cleanse from other salts and had absolute sodium chloride. But, the amount of sodium chloride in the field of salt production was only around 90% and mixed with other salts so it was not qualified for level of factory salt.

Therefore, salt tax department tested an 11.85 acres sun-dried salt field in Panga region in 1947-1948 after the war and it succeeded. But, salt productions damaged a lot because of the insurgence after getting independence and sun-dried salt

production stopped from initiation. But, sun-dried salt production was implemented as soon as possible to support the pure salt, needed for chemical industries which appeared after the revolution, and to protect from forests decimation.

The region, tested for sun-dried salt production first was Kyiakhami District of Mon State. The field of standard fireplace was chosen in this region in 1963-1964. After the sun-dried salt was tested and produced successfully in this region, it was tested and produced in Magyeepin village which located at the center of salt production regions in Ayeyarwady in 1964-1965. In 1965-1966, sun-dried salt was tested and produced successfully at Pyontain camp which was about 5 miles far from Sanae village of Kyaukphyu Township, Rakhine State.

The reason why sun-dried salt was better than boiled salt was the difference of the amount of labors. When boiled salt was produced, the labors got heat from the wood fire, had to work in big smoke if the wood got wet, had to breath in the hot vapor of salt, and only strong male workers could work because it had to work beside the wood fire tiringly 24 hours. Sun-dried salt production was better than boiled salt production according to the business or kinds of salt or the limit of tiredness of the labors so sun-dried salt production spread wider within the farmers.

After sun-dried salt was produced successfully in 1963-1964 with the guidance of sun-dried salt production committee in Kyiatkhami salt fireplace, sun-dried salt was produced successfully in 1964-1965 and 1965-1966 too so it could successfully produce for 3 years. In 1964-1965, it was produced in Magyeepin standard salt fireplace of Magyeepin village, Middle Island, Ngaputaw Township, Ayeyarwady Division. At the same time, 'Ways for Sun-dried Salt Production' book, written by sun-dried salt production committee members were distributed to the people and with the guidance of Farming and Forests Ministry Department, sun-dried salt shows were displayed at Kyaitkhami standard salt fireplace on 21st January 1965, and Magyeepin standard salt fireplace on 5th May 1965. The ways to produce sun-dried salt and the fact that sun-dried salt was better than boiled salt were explained in those shows. In 1965-1966, sun-dried salt was successfully produced for the second time in Magyeepin salt field.

After producing sun-dried salt in Thanintharyi Division and Ayeyarwady Division, sun-dried salt was successfully produced in Sanae standard fireplace of Kyaukphyu Township, Rakhine State in 1965-1966. Sun-dried salt was successfully produced 3 times in Kyaikkhami, 2 times in Magyeepin and once in Sanae from 1963-

1964 to 1965-1966 as follow and distributed the ways to produce sun-dried salt so it was spread the whole country as it was better than the way of salt production by using wood fire.

Myanmar salt production developed depending upon the policy of government. In colonial government era, foreign salt monopolized domestic salt market because of only getting tax was concentrated and not supporting the domestic salt production. After getting independence, national government supported the domestic salt production. Because of those supports, domestic requirements could be supported by government in 1955-1956. When it was 1963-1964, the salt production started changing into sun-dried salt production from boiled salt production. Nowadays, Myanmar salt production is mainly working the sun-dried salt production.

2.5 Taxation, Rules and Regulation

Salt tax collecting was done by salt tax department during early colony era. The tax was collected one mue for one moun of salt at that time. But, after the World War II, salt tax was collected as one kyat per pot, five kyats per pan after the whole lower Myanmar was organized as British Myanmar. However, in 1900, the salt tax was increased into 25 kyats per pot and 125 kyats per pan.

On 25th May 1928, Myanmar government had to relay the salt tax collecting to India central government. In 1937, salt tax collecting was transferred to Myanmar government as Myanmar was separated from India. Since then, salt tax was collected as 6 kyats 13 pe for 1000 peittha.

The main duty for salt tax department was getting tax from domestic salt production as much as possible. The necessary instructions to get the tax (Myanmar Salt Act Rules and Instructions) were released too. Salt production was only able to produce in the limited coast regions to keep the salt production easily. The owners, licensed for salt fireplace, couldn't store the salt freely without permit and would be able to transfer to the salt storages which were built according to rules after giving tax.

The rate of salt tax collecting after war era was 7 kyats for 1000 peittha. After the revolutionary government took office, factory salt production and qualified salt production got priority than salt tax collecting. Salt tax department had changed into salt production department since 27th October 1968. That salt production department made to produce more sun-dried salt and control private salt production in addition to

giving the salt production licenses, and collecting salt tax. On 1st October 1972, salt production department was organized into salt production corporation. Salt tax collecting was transferred to Domestic Tax Department from 1st April 1974.

As income tax had started since 1976, 20% tax of salt production was collected according the law of goods services tax. Salt production cooperation was transferred to Ministry of Mine Department on 2nd April 1985 and on 1st April 1989, salt production corporation was organized as Myanmar Salt and Marine Chemical manufacturer and trading business. When tax rates were imposed to salt producers, they were imposed according to Revenue Section 17(b) during salt fiscal year.

Imposing tax rate means they don't wait till salt are sold and collect the tax with the rate of 10 pyar for one peitthar after the salt is produced. If a person wanted to produce salt, he or she had to send the inform form to the respective department with the title of ' Inform form of salt production according to Revenue Rule 56' 7 days before produced salt. The exception about that form was informed form for 1st April 1976 had to send with form (amakha-25) before 30 June 1976. In Revenue Rule (57), every salt producer had to send the form once a week to the respective department and had to send in 3 days after that week. The setup form was (amakha-26) so it was displayed with the title of ' Advertisement for salt production according to Revenue Rule'. That advertisement could be send with the permission of respective department once a month to the respective department according to Rule (57). In rule (58), if a salt producer, who was valid for Myanmar Salt Art Law regarding to tax collecting, hadn't paid the salt tax for produced but haven't sold yet salt on 31st March 1976, that salt was defined as the salt produced on 1st April 1976. The production around that date had to include in the advertisement of salt production and send to the respective department. According to that rule, the tax was not collected at the stage of salt production and was collected at the stage of salt selling according to 1917 Myanmar Salt Act Law.

Controlling to succeed the aims of the laws, testing the salt and salt materials, spreading the right ways to the businessmen if the unqualified materials were found, giving licenses, denying, setting up the license duration, extending the license duration, adjusting according to law if someone had issues about the case of extending license duration or changing name of a person who had already got license, carrying on with domestic and foreign professionals to get the help about salt production technology, setting up the amount of fine for overdue and license, giving duties to the

testing committee to help in salt production according to Law Section 15, Sequence 25, freedom from license fees if the damages had happened because of natural disasters, the amount of salt production for business or for family use were specified. This law was released according to salt and salt materials Law Section 30, Sequence (a) in 2014.

In the rules that restricted to the salt producers, assessment team guessed and specified the salt tax, basing on the advertisement, sent by the salt producers or the lists, sent by Ward or Village Executive or other data.

Myanmar salt production carried on giving licenses for the salt production. Businessmen who wanted to produce salt or extra salt could apply the license with the specified methods of Myanmar salt production. The salt production for family use didn't need the licenses. Myanmar salt production specified the license duration.

Licensed producers could carry on getting the investments for the extended salt production, could change the salt fields that produced the salt continuously into salt production land to get the salt production permit license, and could show the procedures, orders and instructions for qualified salt and salt materials to the government team.

The licensed producers had to give the tax according to the specified ways of Myanmar salt production as follow. Those taxes were

- (a) License fees
- (b) Exchanging new license
- (c) Overdue fees

As the licensed producers, produced salt or extra salt could freely be sold domestically. Then, also had permission to export produced salt or extra salt to foreign with the specified rules. Chemical materials and tools for working could be imported with the foreign income that got from exports. If someone wanted to extend salt production, he or she had to ask for permission from Myanmar salt production.

2.6 Global Salt Production

Some countries produce rock salt and some countries produces table salt. Few countries produce both. Modern technology can produce hundreds of tons but traditional methods can produce millions of tons.

The necessity of salt increases because of the development in population and industry. Except the human consumption, huge amount of salts are used in chloralkali

production. In developed countries, salt is needed many times more than human consumption. For example, almost 97% of the total production of salt of USA is for industries. The necessity of salt for industries in developing countries became a few years ago.

There is nothing to substitute salt to recover economically. In ice removing and some chemical industries, chemical salts such as calcium chloride, calcium, magnesium, hydrochloric acid and potassium chloride can be used instead of salt but they are very expensive.

During 1985-2006, the global salt production was strangely increased to 200 million matrix ton within ten years. They were salt and salt in brine. One third of them are produced from sea water and another one third of them are produced from underground salty soil. The final one third of them are produced by solution mining. Until 2005, USA was the most productive country and later, China became most productive with 48 million matrix tons in global production 240 million matrix tons.

Chapter 3

Methods of Salt Production

In this chapter, types of salt, salt production by entirely sun-dried method which is mainly used in Myanmar among several methods of salt production, are presented specifically. Additionally, procedures that must be carried out seasonally to produce sun-dried salt, production of ORS (Oral Rehydration Salt) and others by mixing salty liquids which came out from sun-dried salt production, are presented.

3.1 Types of Salt

There are 4 types of salt production.

1. Sea-Salt

Evaporation of sea water makes the sea salt. Sea-salt are produce in the lake region where natural evaporation rates higher than rainfall. This method is used in coastal countries.

2. Rock Salt

Rock salt can be mine as mining of char-coals. Underground salt layers are sunk in many countries, especially in middle Europe and Russia, and then United Kingdom. The biggest underground salt layer is sunk below the Cracow, Poland.

3. Brine-Well-Salt

Bring well salt are produced in Underground salt layers or Rock Salt layers as the oil mining. To melt the salt, the fresh water are poured into well and pumped the salt-water to the earth. These salt-water are evaporated and produced salt.

4. Lake Salt

Lake salts are usually produced in Austria and United State of America. There are a lot of salted-lakes and these salt-water are produced as the sea salt.

World salt resources are practically unlimited. The countries which are rich to produce rock salt and brine well salt are east north, middle west and coastal countries. Lake salt and sun dried salt factory are found near the populated region of western United State of America. Almost every country has underground salt layers or various size of sun-dried salt firms.

3.2 Salt Production Methods

There are 3 methods of salt production in the world. They are-

- (1) Resource salt production or salt rock mining
- (2) Producing salt from salt land
 - (a) Boiling with huge pan method
 - (b) Vacuum method
- (3) Producing from sea water method.

Salt is produced in 3 ways in Myanmar as followings;

- (1) Producing from salty wells in upper Myanmar region
- (2) Sea water is half-dried by sunlight and half-heated by burning wood

This is the method which is mostly used by salt productions along the coast line of the country.

- (3) Producing by entirely sunlight.

3.3 Methods of Production

3.3.1 Producing from Salty Wells

There are many natural salty wells in upper regions of Myanmar such as Sartaung village of Saging District, Watlat, Thouttaw, Hanlin villages of Shwebo District, Sarlingyi from Moneywar District, Myitchae from Pakokku District, Thibaw Township, Bawkyo Township and Kathar District, GabarMawKwin within Minbuu Township and Inndaw region. In those regions, there are hand-made wells and salty water is taken out by using pulley rope and container. The salty water is about 5° to 7°Bomae. The production method of those regions is that a land space is created near the salt field. The space is raked and then salt water is poured down to the land space. After pouring for several times, the land space is made to dry by sunlight. Next day, the salty clods are put into the conic shape filter basket called "Karr" which has 3 feet width and 2 feet height mad by mire and mixed with water. The salty water which come out from "Karr" has the concentration about 13° to 15°Bomae. They are collected by a clay pot and then boiled by rice husk fire in a pan which has 5 feet of length, 2 inches of breadth and 6 inches of depth.

This method is mostly used in salt region of upper Myanmar. Since salty water near Hanlin village of Shwebo District is naturally flowing, the ground is naturally salty. Salty water from Thibaw and Bawkyo has the concentration of 24°Bomae, so it can directly be boiled. Salt which is gained from that method is not clean and contains

dirt. Furthermore, since wells have 2 feet diameters and they are too deep, a lot of labor power is used to pull out the salty water. Some wells are out of water in the evening and it is not sure for getting salty water.

To boil the salty water with rice husk fire, at that time a cart of rice husk is about 3 Kyats. That amount of rice husk can produce 7 pithar of salt, so the cost for fuel is 5000 Kyats. Additionally, the repairing cost for fire place, zinc cup to make salt, pure water, clay pot container can cost a lot, it can be said as the expenditure is very expensive.

Since salt produced regions which are mentioned above are located in arid or rainless part of the country and their highest rainfall is just 33 inches per year and they are dry regions for 8 months of the year, they are more suitable to produce sun-dried salt than coastal regions of the lower Myanmar. The more work done may be accomplished if Kubota pumps are used to pull up salty water instead of using man power, and loading salty water to the containers by using air power used machines. Therefore, the advanced typical sun-dried salt production method was tested in Thautaw salt wells of Shwebo District.

3.3.2 Half-dried by Sunlight and Half-heated by Burning Wood Method

The second method that dry the salty water to higher its concentration and dry by fire woods, is the method which is used along the coastal regions such as Rakhine Region. Then, at 21° to 25°Bomae, salty water are heated in the huge iron pan by wood fire. The reason of using this method is that Rakhine, Mon, Thanintharyi Regions have 200 inches of rainfall and the deltas regions have 100 inches of rainfall. Another region is that Myanmar had a lot of forests and there were plenty of woods to be used as fuel.

It was found that the salt production method was by the use of wood as fuel until 1969. Salt which is produced by this method is only 90% clean and it contains other chemical types of salts.

For that case, the forests gradually got decimation, and drought and flood occurred due to the weather deviation. For the purpose not to suffer these natural disasters any longer, the method which uses fuel oil instead of wood was tested by government at Kyaikkhami typical salt production in 1963-64. In that period, sun-dried salt production was activated in coastal regions to release the forest decimation.

3.3.3 Producing by Entirely Sunlight

Since the conventional methods such as methods with woods and fuel oil can cost huge amount of production cost in mass production, since it is not able to send to the market cheaply due to high production cost, since natural disasters can occurs due to the forest decimation by using woods as fuel, since the labor usage in sun-dried method is saver than that of heating method, sun-dried production method was tested in 1963.

The experiments were tested in Kyaikkhami typical salt industry (1963-64), Makyeeepinstandard salt industry of Pathein District (1964-66), Snae standard salt industry of Kyautphyu District (1964-65) with the pilot plans of governments and they were success.

The main method of sun-dried salt production is choosing the location of sun-drying field. Therefore the location of sun-drying field must be chosen according to the following facts;

- (1) To get the concentrated salty water before it is mixed with clean water, the field must be located in a distance which is neither too near nor too far from the sea
- (2) The soil must be the one which salty water soaks
- (3) The condition must be able to input sea salty water easily
- (4) The land must not be suitable for any cultivation according to government policy
- (5) To consider the transportation to be convenient to distribute to the market, including small vehicles.

3.4 The Multiple Procedures of Sun-dried Salt Production

In sun-dried salt production, firstly, sea water must be put into the salty water storage lakes. In this case, there are two input method, they are pumping with machines and making the paths to flow salty water with automatic gates. The pumping method is used for some locations where sea tide cannot reach. In the method of automatic input, the salty water will flow to the storage lakes through the gates when the sea tide rises and the gates will close automatically when the storage lakes are full of salty water.

Salty water from the storage lakes are put into the drying places and then they are dried. These step-by-step dried salty water are measured by Bomae Hydrometer.

Salty water which are at 25°Bomae are put into special salt places with the thickness of 2 inches and dried again. 7 days later, salts appear and there are few salty water on the place. These retained salty water are measured by Bomae Hydrometer again. Drying the salty water must not be over the 29°Bomae. If it is over the limit, other chemical salts will include and it will be less in purity. It has to be ware foe salty water not to be over 29°Bomae. Salty water which are over 29°Bomae are called Kyattatyee and they must be removed from drying place and put them into Kyattatyee storage.

In sun-dried salt production, the number of drying place may be varied as 5 steps, 6steps, and 7 steps according to the condition. The type of soil, the concentration of salty water, and mass of salty water according to the steps of drying places are shown in Table 3.1, 3.2, 3.3.

Table (3.1) 5-Steps of Drying Process

Step	The ratio of soil inclusion (percentage)	Salty water Bomae(degree)	The mass of Salty water(inches)
First Step	40.0	3°-6°	5
Second Step	20.5	6°-9°	4
Third Step	18.5	9°-19°	3
Fourth Step	12.5	16°-25°	2
Fifth Step	8.5	25°-29°	1
	100		

Source: Satsae Salt Enterprise

Table (3.2) 6- Steps of Drying Process

Step	The ratio of soil inclusion (percentage)	Salty water Bomae (degree)	The mass of Salty water (inches)
First Step	25.0	3°-5°	5.25 to 5.5
Second Step	21.5	5° -8°	4 to 4.5
Third Step	18.0	8° -11°	3 to 3.5
Fourth Step	15.0	11° -16°	2 to 2.5
Fifth Step	12.0	16° -25°	1.25 to 1.5
Sixth Step	8.5	25° -29°	0.5 to 1
	100		

Source: Satsae Salt Enterprise

Table (3.3) 7-Steps of Drying Process

Step	The ratio of soil inclusion (percentage)	Salty water Bomae (degree)	The mass of Salty water (inches)
First Step	22	0.5° -3°	6 to 6.5
Second Step	19	3° -6°	5 to 5.5
Third Step	16	6° -9°	4 to 4.5
Forth Step	14	9° -13°	3 to 3.5
Fifth Step	12	13° -18°	2 to 2.5
Sixth Step	10	18° -25°	1.25 to 1.5
Seventh Step	7	25° -29°	0.5 to 1
	100		

Source: Satsae Salt Enterprise

In producing with 5 steps, 40% of total soil is used in the first step. There has to be 3°Bomae of salty water concentration and 5 inches mass or depth of salty water in this step.

In second step, 20.5% of total soil is used. There has to be 6°to 9°Bomae of salty water concentration and 4 inches mass or depth of salty water in this step.

In third step, 18.5% of total soil must be dried. There has to be 9°to 16°Bomae of salty water concentration and 3 inches mass or depth of salty water in this step.

In forth step,12.5% of total soil is used. There has to be 16°to 25°Bomae of salty water concentration and 2 inches mass or depth of salty water in this step. So many sodium chloride crystals occur in step 4. If the salty water is over 29°Bomae, other chemical salts will contain and it is not suitable to eat.

Although there are many steps in sun-dried salt production, the methods of production are the same. The methods with 6 or 7 steps are not much different from that of 5 steps. But 7-step production method is the best. By comparison, 6-step production is better than 5-step production. It takes 3 weeks (21 days) from putting sea water into drying places to appearing salt crystals.

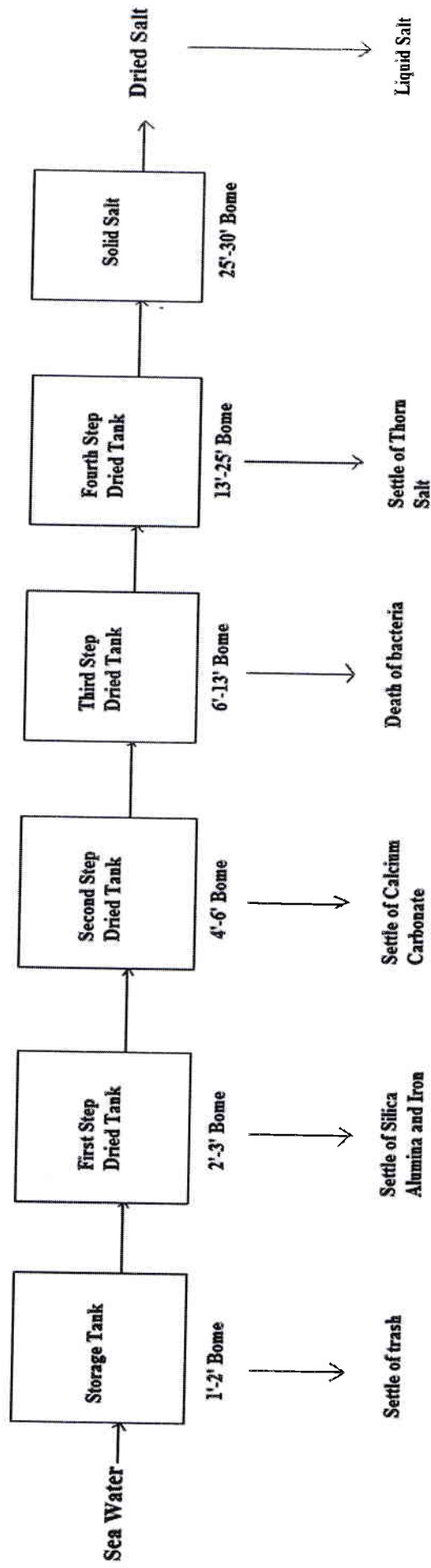
After drying for 3 times in the drying place, salts are ready to be collected. After salt crystals appear, Kyattatyee which has 29°Bomae of concentration is made to be flown through the Kyattatyee drain that is systemically made. As mentioned above, salts are ready to be collected after drying for 3 times in the drying place.

In case of gathering salts, salts are taken from the drying places by using wood plates called "Gig" and bank them up systemically. In accumulation matter, it is important not to contain soil. If soil includes in the salt, the salt will be brownish.

After gathered salts are banked up in rows, they are sent to purifier machine which is located near the storage to be purified. In this process, a lot of labor is used with containers that are made of bamboowith the capacity of 20.25 pithar of salt. There are several kinds of labor in transportation case. The powerful male workers can carry one container per person. Women and children worker can carry as one container per two persons.

Salts which are carried from drying places are banked up with cups on the purifying machine located near the storage. Salts are purified by salty water which has $23^{\circ} - 25^{\circ}$ Bomae to retain nothing but sodium chloride as known as table salt. Wasting can be avoided by using $23^{\circ} - 25^{\circ}$ Bomae salty water since it is full solution and no more salt will solute in it. Salts which are purified by the machine are banked up and dried. Next day, they are sent to storage. Salts in the storage are ready to be sold.

Figure (3.1) Depositing process of sea water in Sun-dried salt production



Source: Satsae Salt Enterprise

3.5 Seasonal Procedures of Salt Production

The season of sun-dried salt production is summer and normally, it is from October to May. In this period, monthly producers that must be carried out are as follow,

- (a) September: Collecting required skillful soil technicians and salty water technicians since salt season is about to start and make plans to hold opening ceremony of salt business in October.
- (b) October: Embankments around the salt field must be filled with soil not to occur leakages. In the second week of October, water that remains from rainy season in the field has to be put out of the field by pumps. Sea water is available at the end of October. Make the field dry and fill the frames of lakes with soil. The drains must be maintained before sea water enters.
- (c) November: Harrowing, raking, bulldozing, rolling with wood roller, closing the water leakages with wood hammer must be carried out on the field. Drains have to be maintained to avoid the waste of salty water while transferring from one place to another.
- (d) December: The old salts must be cleaned out since new salts will be collected in the first week of January. The depot has to be maintained with roof and floor repairing to keep new salts. Setting new salt purifying machine, re-digging the salty water storage lakes have to be carried out. Drying places must be repaired and salty water must be dried till the salt crystals occur. After the final preparation, salty water is sent into salt collecting places. The more pumps and pump operators have to be added. Additionally, workers and tools for next salt production will be collected.
- (e) January: In the first week of this month, ropes and bags must be collected since salts are ready to be packed and distributed. The total production of this month is only 5% of the total production of the whole season.
- (f) February: After salt collecting area is extended, the output increases due to the weather is getting hotter. The more salt collecting workers are needed. In this month, salt can be collected for two times and each time of collection takes 15 days. The total production of this month is only 15% of the total production of the whole season.
- (g) March: In this month, salt production will get higher and there will be a problem with the storage for more salts. Therefore, salts are kept in bags,

tractors, and trollers. In this month, salt can be collected for three times and each time of collection takes 10 days. The total production of this month is only 25% of the total production of the whole season.

- (h) April: Mostly, Thingyan rain can occur and there would be damages in salts. Although there is a highest production in this month, since there is long holiday of thingyan, the time is not enough for complete salt collection. The total production of this month is 45% of the total production of the whole season.
- (i) May: Salt can be collected only the first week of this month. The total production of this month is only 10% of the total production of the whole season. Tools of the salt production will be kept back. Since the season ends in this month, workers who are hired since October will be settled.
- (j) June, July, August: In these months, pumps, vehicles and boats are repaired and kept for the next season. There can be flood, embankment breaking, so required care is needed to be carried out.

3.6 Side Products from Salt production

Salt which is produced all over the world by several production methods such as salty rock mining, mixing the salty soil and drying them, half-drying and half-heating the sea water are generally over 300 million tons a year. Among them, human consumption is only 5% of them and most of them are used in industrial businesses. There are so many chemical businesses which are based on the ordinary salt.

The ordinary salt is a compound of sodium and chlorine. It is called NaCl in chemical term. If salty water is decomposed by electric, the sodium metal and chlorine gas will come out. Chlorine gas is used in paper production and water purifying. Sodium is used in chemical elements productions which include sodium and dye businesses. The biggest business which uses ordinary salt at most is washing-soda production. It is also used in detergent powder production, and glassblowing industries. The second biggest businesses are textile dye industry, soap factory which uses sodium hydroxide as known as soda. Sodium hydroxide is gained by passing electric through salty water. Caustic soda is used in imitative silk production.

Kyatatyae, one of the side products of sun-dried salt production, is gained from salt crystal lake. Since Kyatatyae of final lake has 30°-33°Bomae, it contains many unclean salts. It is useful in freezing machines and leather industries. One chemical

salt which can be produced from Kyatatyae is Epsom salt (magnesium sulphate). It can be gained by heating Kyatatyae to reach 34°Bomae and cooling to zero degree naturally or by machines. It is used for painting, paper, textile, fertilizer and pharmacy productions.

Another chemical salt, magnesium chloride is gained by heating or vaporizing the Kyatatyae to reach 39°Bomae. This chemical salt is used in metal production, cement production and ceramic production. The remaining Kyatatyae after producing Epsom salt can produce fertilizer called potassium chloride. Sun-dried salt productions of Myanmar can produce not only table salt but also such chemical salts as side products. Especially, Panha salt industry, which is located in Mon Region, the most productive in sun-dried salt in Myanmar, is success in producing side chemical salts.

3.7 Sun-dried Salt Production in Myanmar (2015-2016)

The states and regions of Myanmar which produce sun-dried salt are Ayeyarwady Region, Yangon Region, Thanintharyi Region, Mon State and Rakhine State. There are 13 enterprises in Myanmar which produces sun-dried salt, and Mon State is the third most salt productive region. The cost to produce 1 ton of salt in salt production enterprises of Myanmar will be compared and studied. The cost to produce 1 ton of salt in production enterprises of Myanmar.

Since Mon State is bounded with Andaman Sea, sun-dried salt production from sea water can be carried out. Salt productive regions along Myanmar coast line are Ayeyarwady Region, Yangon Region, Rakhine State, Thanintharyi Region and Mon State. Mon State is less in cost of repairing salt field due to less in freshwater flower not like Thanintharyi Region, being early in saltwater entering, being harder in lands of salt field and able to resist the weather damages, being less in flood times than any other coastal regions, and being less in wild grass. Because of these conditions, Mon State has medium yield per acre in sun-dried salt production and the production cost is cheap. Therefore, the salt production of Mon State is the third most in Myanmar.

By studying the production cost per ton of the sun-dried salt production of Myanmar salt enterprises in 2015-16 with table 3.4, the salt enterprise which cost at most to produce 1 ton of salt is Pulaw salt enterprise, one of the salt enterprises of Thanintharyi Region. The cost per ton of that enterprise is 39806 Kyats. This is

because of being less in yield of salt, less in salt field area, and high in labor cost. The salt enterprise which cost second most is Thayatchaung enterprise of Thanintharyi Region. The cost per ton of that enterprise is 36744 Kyats. The cost per ton is high because it has not been a long time for establishing that enterprise, the yield is low, salt field area is less and the labor cost is high.

The salt enterprise which cost at least to produce 1 ton of salt is Kyaukphyu salt enterprise of Rakkhine State. The cost per ton of that enterprise is 26333.2 Kyats. Kyaukphyu salt enterprise is a medium-sized enterprise and the expenditure of that enterprise is less than other enterprises. Additionally, increasing in yield of salt can reduce the cost of production per ton. Therefore, Rakkhine State is a State which can produce salt with the least cost of production per ton.

Table (3.4) Salt Production of Cost per unit in Myanmar (2015-2016)

Salt Enterprises	Total Yield of Salt (Matrix ton)	Total Cost (Kyats)	Cost per Unit (Matrix ton) (Kyats)	Cost per Unit (Peitthar) (Kyats)
Mon State				
Panga Salt Enterprise	19399	534597642	27558	45
Satsae Salt Enterprise	3700	106496360	28782.8	47
Kyiatkhami Salt Enterprise	202	6185240	30620	50
Rakkhine State				
Kyaukphyu	32200	487929040	26333.2	43
Thandwe	2150	59004740	28782.8	47
Sittwe	4650	139535340	30007.6	49
Yangon Region				
Kwonchangone	815	24955300	30620	50
Ayeyarwaddy Region				
Ngaputaw	77719.92	2339804823.55	30105.6	49.16
Latputta	37199.10	1153387845.78	30105.8	50.63
Phyarpon	25366.79	875374946.07	34508.7	56.35
Thanintharyi Region				
Longlone	182	5353037.6	34906.8	57
Pulaw	195	7762170	39806	65
Thayatchaung	1035	38030040	36744	60

Source: Department of Mining, branch department of salt, salt enterprise office, Mawlamyine

Chapter 4

Salt Industry in Mon State

This chapter includes how salt production of Mon State is important for the salt production of Myanmar, and the comparison of salt production conditions of 4 enterprises in Mon State. It was observed that Panga salt production is the biggest in salt field acre and the total production, Kyaikkhami salt production is the smallest in salt field acre and the total production, and Htanepinchaung salt production stop from 2012 to 2016.

4.1 The Importance of Mon State in Salt Production

In studying the salt production of Mon State, there are two large sectors, government sector and private sector. In Mon State, salt production was act as government owned till 2009-10, then transformed to private owned later 2010-11. In 2015-2016, the salt production of Mon State was 23301 tons and the total salt production of the country was 204803.81 tons. Therefore, that was the 11% of total salt production.

In private salt production of Mon State, Thanphyuzayat Township is the town where private salt enterprises are located. In Thanphyuzayat Township, the villages where private salt enterprises are located are Pagna, Kyaikkhami, and Satsae.

Therefore, it was found that the salt production of Mon State is the main role of Myanmar salt production. By studying the current conditions of running this business, the salt production of Mon State is an important business. The total population of Mon State is 1.043 million and the quantity of population who work in salt industry is over 15000. So, 1.4% of the total population is working in salt industries.

Furthermore, Mon State is a region which is also good in transportation. Mon State is a region which has road, waterway and air way. Mawlamyine, the capital of Mon State, is a fine port and the waterway is mainly used.

Waterway is mainly used in distribution of salt from Mon State. Salts of the region are sent to Mawlamyine by waterway, road and railway. From there, salts are sent to Yangon by using railway and road. Sometimes, they are distributed to upper region and high land region. Salts are distributed to Meiak and Dawei by using waterway. 4898.75 tons of salts are sent yearly from salt industries of Mon State to

Sittaung Paper production industry. Salts of Mon State are also sent to military as army ration 2939.25 tons per year. The remaining salts are sent to ShweNyaung, Lashio, Myitkyinar, Kalaywa, and Saging.

Salts of Mon State are bought by Myanmar Salt Business. In buying case, salt has to be sold according to the specified price of Myanmar Salt Business. In 2015-2016, the fixed price of salt specified by Myanmar Salt Business was 33682 kyats per ton.

4.2 Salt Enterprise in Mon State

There are (4) salt enterprises in Mon State. They are-

- (1) Panga salt enterprise
- (2) Satsae salt enterprise
- (3) Htanpinchaung salt enterprise
- (4) Kyaikkhami salt enterprise.

1. Panga Salt Enterprise

Panga salt enterprise is located between Panga village and Karupi village of Thanphyuzayattownship, and beside Mawlamyaine-Ye railway. It is 46 miles 7 furlongs away from Mawlamyaine and south 5 miles from Thanphyuzayat.

Panga salt enterprise was established on 22nd January, 1969. Sun-dried salt production was started in 1969-70. During that year, over 300 acre of salt land was carried out with both heating salt and sun-dried salt. In 1970-71 the salt land was extended to 560 acre and now the salt land area is about 1763.39 acre.

Panga salt enterprise mainly produces raw salt and it also produces pure salt and extra chemical salts. In extra chemical salt production, permanent workers, seasonal workers, special seasonal workers are needed.

The nature of sun-dried salt production of Panga salt enterprise is depending on the weather. Salt production season is generally termed from October to May. During this production period, the salt production will increase unless there were much raining, and it will decrease if there were much raining. Some salt fields can start salt collecting process in December. Mostly, salt collecting process is carried out from January to 15th May, salt productive period is only 4.5 months. Among these months, April is the most productive month, can produce 35% of total product unless there were weather obstacles can produce 10-15 matrix ton per acre depending on salt field repairs.

Panga salt enterprise is the most productive enterprise in four salt enterprises of Mon State, and it is the most in salt field area.

2. Satsae Salt Enterprise

Satsae salt enterprise is included in Thanphyuzayat Township, and it is 5 miles 4 furlongs to the south of Kyongadat village which is located beside Thanphyuzayet-Kyaikkhami road. 1055 acre of ruined paddy land which is east of Sangyi creek of Satsae village was occupied to be carried out sun-dried salt production according to a project in 1967-68.

In 1967-68, to establish the salt enterprise, by the 2-year project, public pearl and fishery organization made wood disposal, embankment, land flatness which are provided by department of irrigation. 467 acres of land were created by the department of irrigation in 1968-69. Later 1967-68, in total land area 1055 acre of paddy land 929 acre and salt land 126 acre, salt productive area is only 750 acre. The remaining areas are embankment, water gates, roads, seawater pumps, offices, residents, and depots, salt unproductive grass fields, wastelands, sand lands and land where freshwater lands. Salt productive land is only 750 acre. In 2015-16, it is found that 300 acre of salt land decreased.

Satsae salt enterprise of Mon State was transferred to military supply and transportation regiment in March 2017. Satsae salt enterprise is an industry which can produce in second most yearly.

3. Htanpinchaung Salt Enterprise

Htanpinchaung salt industry is located 6 miles 5 furlongs to the west of Paung Township, near the Htanpinchaung village. Minelongriver in the north, Pyitawthar creek in the south, Htanpinchaung village in the west are located and it is situated over 3 miles away from Mottama gulf. That area was pasture land but it was made as trespass rice cultivation. In December 1968, 50 acres of 500 acres pasture land were survey to use as sun-dried salt field by a government's project. Salt productive area of that year was 224.5 acre and the yield was 1148 tons. In 2000-2001, salt field was extended to 900 acre and the yield increased to 6060 tons. And it was found that the enterprise was stopped from 2012-2013 to 2015-2016.

Htanpinchaung salt industry of Mon State was transferred to Myanmar Economic Holding Limited in September 2010.

4. Kyaikkhami Salt Enterprise

Kyaikkhami salt enterprise is included in Thanphyuzayat Township, it is situated 13 miles away from Thanphyuzayat Township. Watthoe creek and Wargayu River in the north, bay of Bengal in the west, Thanphyuzayat- Kyaikkhami road in the east, and Kyaikkhami Township in the south are located. Kyaikkhami was the beginning place of sun-dried salt production of Myanmar. Before sun-dried salt production is widely started, heated salt was largely produced in Panga, Karuoi of Kyaikkhami Township and then forest decimation occurred. For the purpose of preventing forest decimation and producing standard quality salt, Kyaikkhami was defined as typical field to produce sun-dried salt in 1957-1958, but it was not success in that year. It could successfully after the rise of revolutionary government. The reasons of choosing Kyaikkhami as typical salt field are that surrounding areas of Kyaikkhami are regions where conventional salt were produced, soil of Kyaikkhami is difficult to repair since it is loose, creek water which enters from the sea in Kyaikkhami has 1.5° bomae and that of Satsae, Panga are 2 ° Bomae and then it can be more successful than any other places.

Sun-dried salt production of Kyaikkhami was started in 1963-64, at that time, the salt field was 30.29 acre and the production of sun-dried salt was over 59 tons. In 1967-68 the salt field was extended to 120 acre for both sun-dried salt and heated salt. As sun-dried salt can produce more and more year after year, heated salt production was released, then in 1970-71, there was only sun-dried salt production. In 1973-74, the salt field was extended from 120 acre to 152 acre, then there was no extension from 1979-80 till now. Buildings and residents include in that area and the real salt field was 116 acre. Kyaikkhami was the beginning place of sun-dried salt production, other chemical salts are tested in there and it was the original place of kitchen goods. It is also the place where the key to success of sun-dried salt production, technicians were created. Kyaikkhami salt enterprise is carrying out not only sun-dried salt production but changing into table salts as kitchen goods by milling them. Salts are turned to table salts and sent to shops in Mawlamyine yearly. The production of Kyaikkhami salt enterprise is 5% of the salt production of Mon State.

The salt production conditions of the four enterprises of Mon State are described Table 4.1.

Table (4.1) Yield Per Acre of Salt Enterprises in Mon State

No	Years	Panga salt enterprise			Satsae salt enterprise			Htanpinchaung salt enterprise			Kyaikkhami salt enterprise					
		Acre	Yield of salt (Matrix ton)	Yield per acre (Matri x ton)	Yield of salt (Matrix ton)	Acre	Yield of salt (Matrix ton)	Yield per acre (Matrix ton)	Yield of salt (Matrix ton)	Acre	Yield of salt (Matrix ton)	Yield per acre (Matri x ton)	Yield per acre (pithar)			
1	2005-06	816.8	10210	12.5	1475	446	3.31	2027	900	6060	6.7	4121	192.36	1010	5.25	3215
2	2006-07	816.8	10350	12.67	2314.37	446	5.19	3178	900	6000	6.7	4085	192.36	1020	5.3	3247
3	2007-08	816.8	8800	10.77	4000	446	9	5493	900	5000	5.6	3405	192.36	1200	6.24	3820
4	2008-09	816.8	10440	12.78	2820	446	6	3870	900	5850	6.5	3981	192.36	990	5.15	3154
5	2009-10	816.8	6000	7.4	-	-	-	-	900	2550	2.8	1715	116	370	3.2	1953
6	2010-11	816.8	1100	1.4	950	679.52	1.4	857	600	700	1.2	717	116	34	0.29	178
7	2011-12	1900	8677	4.6	8164.6	679.52	12.02	7361	550	1580	2.9	1776	116	408.23	3.52	2155
8	2012-13	1813	12742	6.9	2449	679.52	3.6	2205	-	-	-	-	116	245	2.1	1293
9	2013-14	1352.35	13597.08	10.05	3511	679.52	5.2	3166	-	-	-	-	20	115	5.75	3521
10	2014-15	1519.19	13990	9.2	4500	679.52	6.6	4054	-	-	-	-	10	30	3	1837
11	2015-16	1763.39	19399	11.0	3700	450	8.2	5022	-	-	-	-	20	202	10.1	6185

Source: Department of Mining, branch department of salt, salt enterprise office, Mawlamyine.

In salt production of Mon State, Panga salt enterprise started producing sun-dried salt in 1969-70. In this case, it was observed that the yield was always over the target limit except the years with bad weather. In 2010-2011, all salt enterprises were transferred to private owners.

By studying Table 4.1, the development of salt production of Pagna enterprise increasing but some year of decreasing. According to the nature of salt business, although existing the elasticity of salt production depends on weather, price, the rest amount of salt, labor conditions, the main reason is the weather. Salt produced increased in years with normal weather, and it decreased in years with bad weather. It was found that the salt production and yield per acre decreased in 2010-11 because of bad weather. From 2005-2006 to 2015-2016, the yield had elasticity although the salt field area were not the same. The main reason is that salt produced increased in years with normal weather, and it decreased in years with bad weather. It is found that increasing in yield in 2011-2012 was because of salt field area extension. In studied period of 11 years, the year 2015-2016 was the most productive year. In this year, the salt production of private sector was also high because of high temperature, late rain, and releasing the salt field area. Therefore, Panga salt enterprise is the most in salt field area and salt production, led as the most productive salt enterprise of Mon State.

In studying Satsae salt enterprise which is the second most productive enterprise in Mon State, sun-dried salt production is being carried out as the main product. During 11-year period, from 2005-06 to 2015-16, the most productive year was 2011-12 because in that year, the weather was in good and the least productive year was 2010-11 because the reason of decreasing in salt production was weather decimation although the salt field area was extended. 2009-10 was the year with the lack of labor and decreased price, and it is found that owners stopped their business due to the cost did not recover. It is also found that increasing and decreasing of salt yield depend on of weather condition, availability of labor, availability of supply, fuel situation.

After studying the above table, the year with the same salt field area, 2010-11 to 2014-15, there were elasticity in yield per acre since there were elasticity in total yield. But it was found that there were few differences in decreasing and increasing of yield per acre year after year. Therefore, by studying the yield per acre of Satsae salt enterprise, it can be said as a successful enterprise.

Table 4.1, in studying sun-dried salt production condition of Htanpinchaung salt enterprise. The least productive year was 2010-11 and the yield was 700 tons. That was the year salt enterprises were transferred from government sector to private sector. The yield per acre of Htanpinchaung salt enterprise, the year of the most yield per acre was 2005-06. That year, the salt production decreased due to the late rain. Later 2012-13, Htanpinchaung salt enterprise was stopped because lack of labor and decreased price.

In salt production of Mon State, Kyaikkhami salt enterprise which is the least in salt field area will be studied. The least productive year of that enterprise was 2010-11 because of the heaviest rains in 11 years and it causes damages to salts to melt down and the yield decreased. The most productive year was 2007-08. The yield of salt from Kyaikkhami salt enterprise highly depends on weather. The yield would decrease if the rain occurs during the operation period due to the weather decimation. Therefore, being less and much in yield depends on sun, wind, and rain.

By studying the yield per acre of Kyaikkhami salt enterprise, the year of the least yield per year was 2010-11, and that was the worst year of 11 years. All enterprises decreased in salt production in that year. That was because of November rain. The rain came again in February and March and the yield of salt decreased. In studying the yield per acre of Kyaikkhami salt enterprise, it depends on weather condition. Rain can change the production of salt and yield per acre.

Furthermore, there will be delay in salt production of December and January if the rain was much in November. Similarly, the production of salt and yield per acre can change if there were rain in February and first week of March. Therefore, the yield per acre of Kyaikkhami salt enterprise does not depend on salt field area, it depends on weather.

4.3 The Cost of Production Per Unit in Salt Enterprises of Mon State

The cost of production per ton of Mon State in 2015-16 is shown in Table 4.2.

Table (4.2) Cost of production per unit in Salt Enterprises of Mon State

Particular	Panga Salt Enterprise	Satsae Salt Enterprise	Kyaikkhami Salt Enterprise
Direct process	58441063.61	11640045.59	676046.73
Overtime wages	2138739.75	425985.2	247409.6
Things to be used	141477634.3	28153308.08	1636614.5
Field repairing cost	99558335.27	19829611.06	1131691.69
Transportation cost	3742794.56	745474.1	43296.68
Vehicle repairing cost	29193797.56	581468.16	337714.1
Changes cost	2833830.17	564430.39	32781.77
Indirect cost	9624328.87	1891119.9	111334.32
Salary	19161362.23	295823.05	222668.64
Insurance fees	1138878.92	226837.12	13174.56
Constant cost of Industry	28659112.62	5708201.68	331528.86
Maintain cost	101590138	20234297	1175195.6
Resell	-	-	-
External buying	-	-	-
	497560015.9	90296601.33	5979457.05
Depreciation	+37037626.1	16148332.27	+205782.95
Opening balance	-	+252500	-
		106697433.6	
Closing balance	-	-201073.6	-
Total cost	534597642	106496360	6185240
Yield of salt (ton)	19399	3700	202
Cost per unit (ton)	27558	28782.8	30620
Cost per unit (pithar)	45	47	50

Source: Department of Mining, branch department of salt, salt enterprise office, Mawlamyine.

Therefore, since Mon State is facing the problem with the lack of labor power, the cost which is spent on labor increase year after year and the cost of production per ton also increase year after year.

In table 4.2, it is found that Htanpinchaung salt enterprise was stopped in 2015-16. The cost per ton of Kyaitkhami salt enterprise was 30620 Kyats, and that was the highest cost per ton of the salt enterprises of Mon State. That was due to being high in labor cost, the expenditure on vehicles for the business was higher than the previous year. The cost per ton of Panga salt enterprise was 27558 Kyats. For that enterprise, salt field area and the quantity of labor were high and the wages and costs for labor were low.

By observing the above conditions, being different in cost of production per ton of 3 enterprises depends on the use of labor power, wages and the quantity of labor. Being high in the cost of production per ton causes to cost the more wages on labor and competing with other owners. Local employees are willing to work at abroad and the labor supply for salt enterprises deceased. Especially, since there are traditional festivals in salt collecting season such as March and April, there are difficulties with lack of labor and the enterprises hire the workers from further villages. The wages as much as workers want to get must be paid.

4.4 Comparison of the Salt Enterprises of Mon State

Comparison of the salt enterprises of Mon State in 2015 and 2016 is shown in table 4.3.

Table (4.3) Revenue per acre of Salt Enterise in Mon State (2015-2016)

No	Salt Enterprise	Field acre	Yield per acre (tons)	Average income per acre (Kyats)	Production cost per acre (Kyats)	Revenue per acre (Kyats)
1	Panga Salt Enterprise	1763.39	11.0	370502	303138	67364
2	Satsae Salt Enterprise	450	8.2	276192	236021	40171
3	Kyaitkhami Salt Enterprise	20	10.1	340188	309262	30926

Source: Department of Mining, branch department of salt, salt enterprise office, Mawlamyine

By studying the salt production per acre of the 3 salt enterprises of Mon State with table 4.3, Panga Salt Enterprise with the most salt field area is at the most in salt production and yield per acre. The yield per acre was 11 tons. The second most productive was Kyaithkhami Salt Enterprise and its yield per acre was 10.1 tons. It has the least acre of salt field. Since that enterprise was the first one which started the sun-dried salt production, its salt fields are perfect to increase the yield of salt. Least productive was Satsae Salt Enterprise and its yield per acre was 8.2 tons. The yield of salt is mainly depending on weather. Therefore, unlike other kinds of productions, it cannot be said that the yield of salt will be high if the labor capital and supply are fully used. Generally, the yield is good if the weather is fine and it is bad unless the weather is fine. The yield of salt will highly decrease if the rain occurs in the highest productive period of the season such as March, April and May, and the yield of salt will decrease a little if the rain occurs in January and early February.

By studying the cost of production per acre of the 3 salt enterprises of Mon State, Panga Salt Enterprise was the most in productivity and least in cost of production. The second most in cost of production per acre was Kyaikkhami Salt Enterprise and it has the least salt field area. Therefore, it was observed that the cost of production per acre and salt field area are not directly related. But it is also found that the total cost of production and salt field area are directly related.

To be continued, by studying the average incomes of the 3 salt enterprises of Mon State, since all of 3 enterprises are private enterprises, they sell salt according to the price defined by Myanmar salt enterprise. In 2015-2016, the price defined by Myanmar salt enterprise was 33682 Kyats for 1 ton. The revenue per acre was 67364 Kyats of Panga salt enterprise was the highest since it has the most salt field and the most productivity. The second most revenue per acre Satsae salt enterprise was 40171 Kyats. The least in revenue per acre Kyaikkhami salt enterprise was 30926 Kyats. Therefore, it can be said that the average income per acre of salt production depends on the yield of salt per acre. The average income per acre will be high if the yield per acre is high and the average income per acre will be low if the yield per acre is low. The average income per acre is directly related with the yield per acre. In this situation, the price of salt for 3 enterprises is set as constant and the same.

Chapter 5

Salt Industry In Panga Village (2017)

5.1 Survey Method

This study used a survey method of research employing primary data sources. A questionnaire survey is carried on salt enterprises from Panga Village. Key informant Interview were conducted using an interview guideline on village headmen.

5.2 Collecting Data

Every 40 salt enterprises were met in person, asked them and collected data by using prepared questions. In case of collecting data, small, medium, and large industries of Panga village were included and the data were collected from the utilization of labor and capital, availability of other input, yield of salt and the price of salt which represent the whole sector of salt production. The collected data were checked as mutual and listed with the minimum of mistake.

5.3 The Structure of Research

Studying private salt industry of Panga Village aims to figure out yield per acre, cost of production, mid-sized business, and elasticity of production function. It is expected that those facts assist to increase the salt production, and they are able to be visible the advantages and disadvantages that are concerning with current salt industry.

1. Unit of Study

In studying the salt industry, in every step of production, the method of production with putting seawater into the salt fields and dried by the sunlight is defined as the basic unit. It means that if a salt producer does only the first step although he is included in other steps such as salt milling and salt trading, or he extends other steps including the first step, is defined as studied unit.

2. Labor and Wages

In studying the employees of salt industry, it means monthly paid workers, permanent daily paid workers, temporary daily paid workers, seasonal daily paid

workers. It also includes people who are owners, or family members of owner if they consist in the business full time or part time or seasonal. They are also defined as workers of the salt industry.

The wages are calculated for not only the hired workers but also family members who are involved in the business.

3. The Revenue of the Business

In calculating the revenue of the salt production business, it has to be considered the revenue of selling salt, the revenue of hiring charges of milling machine and depot. In calculating the revenue, it was calculated by yield of the period and price.

4. The Expenditure

In calculating the expenditure of salt production industry, rental for the land that are hired to run the business, damage cost for the investment, and interest for the running capital are included.

Fixed cost and variable cost are included in calculating the production cost of salt enterprise. According to economic concept, fixed cost is generally defined as the changing cost which is depending on capital and variable cost is generally defined as the changing cost which is depending on production.

In fixed cost, the salary of the chief of the industry is included, and the costs of milling machine, pumps, the depreciation and interest of push-tractor, and rental are added to calculate. In variable cost, the wages of workers such as seasonal daily paid workers and seasonal piecework workers, tax on the yield of salt, other supply costs such as diesel and lubricant, other costs for operation tools of salt production such as wood rollers, salt collecting rake, salt carrying container, and the repair cost of depot are added to calculate.

5.4 Social Status of Salt Business Owners

(1) Status of Houses of Salt Business Owners

In studying the 40 houses of salt business owners, all of them are owned houses and are one-story and two-story houses. Houses are classified into first class, second class, and third class. The first class includes building with metal roof sheets and wood floor. The second class includes roof sheets, wood floor and wood shield or

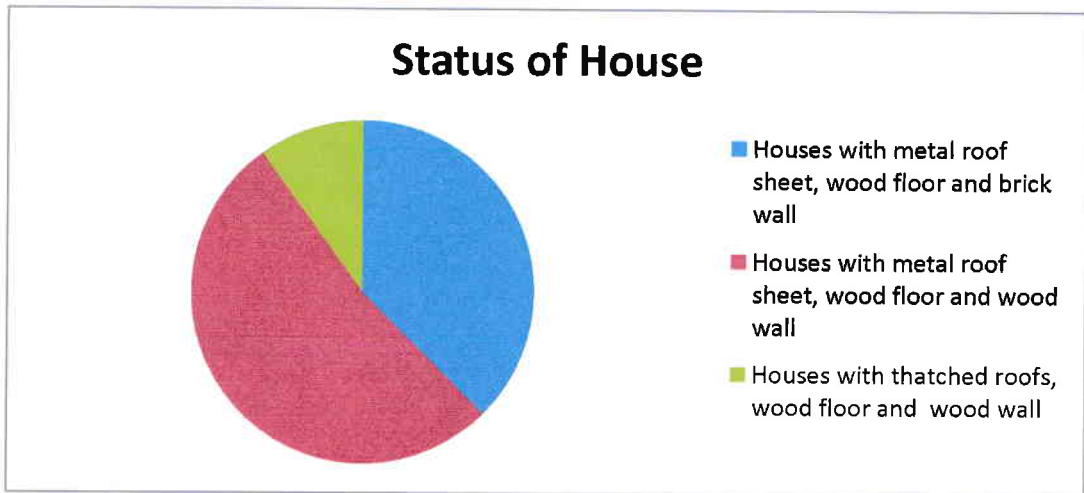
wood wall. The third class includes thatched roofs, wood floor and wood shield. The second class is 52.5 % of the total, the first class is 37.5% of the total and the third class is 10% of the total. The status of the houses of salt business owners is shown in table 5.1.

Table (5.1) Status of Houses of Salt Business Owners

Status of house	Quantity	Percentage (%)
Houses with metal roof sheet, wood floor and brick wall	15	37.5
Houses with metal roof sheet, wood floor and wood wall	21	52.5
Houses with thatched roofs, wood floor and wood wall	4	10
Total	40	100

Source: Survey Data

Figure (5.1) Status of Houses of Salt Business Owners



Source: Table (5.1)

(2) Ages of Salt Business Owners

In studying the ages of salt business owners, the owners who are aged 30-40 years are 7.5 % of total owners. The owners who are aged 41-50 years are 40 % of total owners. The owners who are aged 51-60 years are 35 % of total owners. The owners who are aged 61-70 years are 12.5 % of total owners. The owners who are

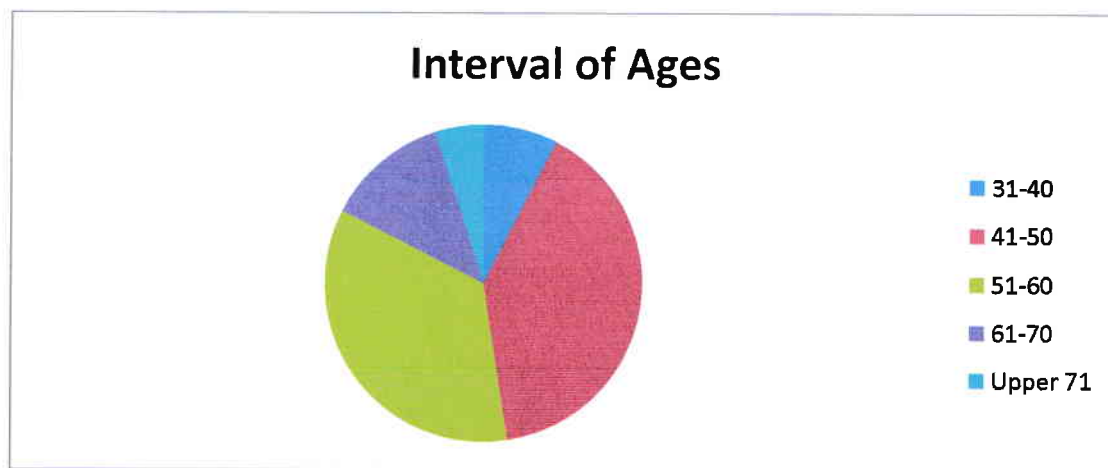
aged upper 71 years include 5% of the total owners. The status of the ages of salt business owners are described in table 5.2.

Table (5.2) Ages of Salt Business Owners

Interval of Ages (Years)	Quantity	Percentage (%)
31-40	3	7.5
41-50	16	40
51-60	14	35
61-70	5	12.5
Upper 71	2	5
Total	40	100

Source: Survey Data

Figure(5.2) Ages of Salt Business Owners



Source: Table (5.2)

(3) Educational of Salt Business Owners

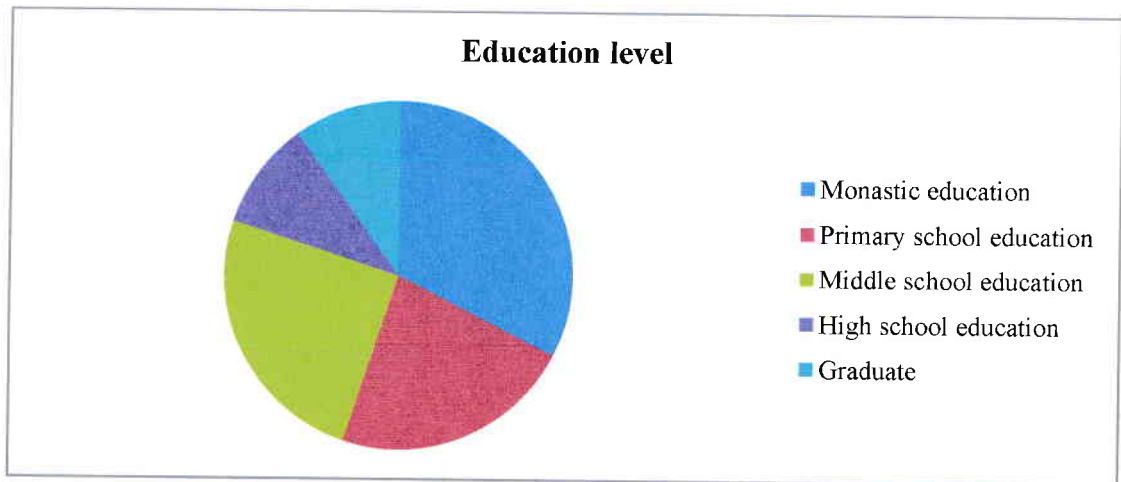
In studying the education of salt business owners, people who are with monastery education level and middle school education level and much and there are 9 people of primary school education level, 4 people of high school education level and 4 people of graduate level. These graduate persons started running the salt business after market economic system has been act. Because the salt production business is their traditional business and it is economically effective, and it was known that these are why they are running salt business. The education qualifications of salt business owners are shown in table 5.3

Table (5.3) Educational of Salt Business Owners

Education level	Quantity	Percentage (%)
Monastic education	13	32.5
Primary school education	9	22.5
Middle school education	10	25
High school education	4	10
Graduate	4	10
Total	40	100

Source: Survey Data

Figure (5.3) Educational of Salt Business Owners



Source: Table (5.3)

(4) Ownership of Salt field of Salt Business Owner

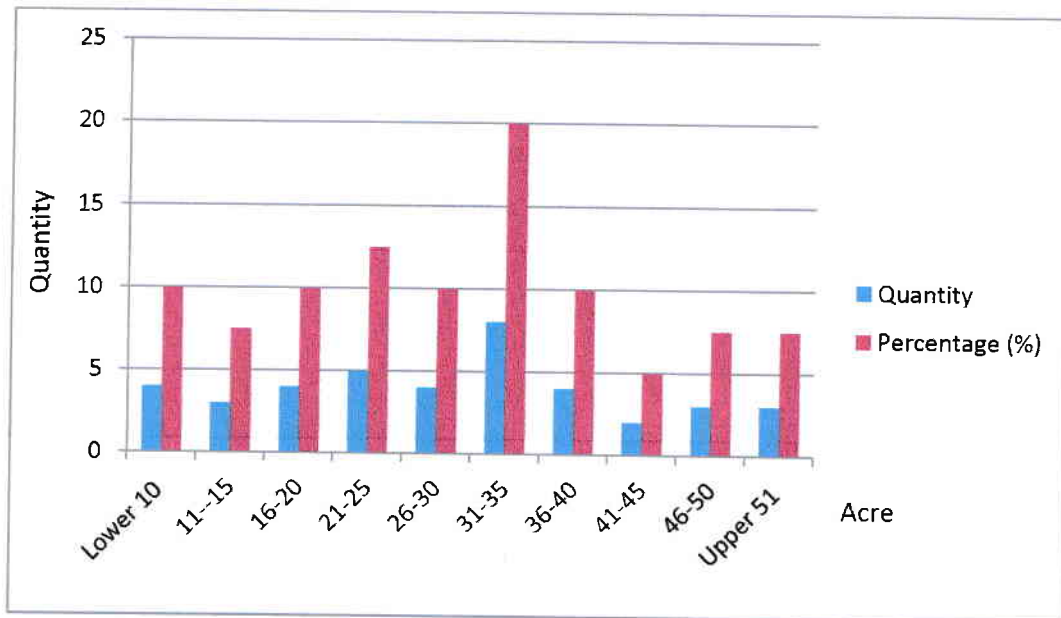
In studying the quantity of salt business owner according to the size of salt field of blocks of salt fields, there are; 4 owners who own less than 10 acres of salt field, 3 owners who own 11-15 acres of salt field, 4 owners who own 16-20 acres of salt field, 5 owners who own 21-25 acres of salt field, 4 owners who own 26-30 acres of salt field, 8 owners who own 31-35 acres of salt field, 4 owners who own 36-40 acres of salt field, 2 owners who own 41-45 acres of salt field, 3 owners who own 46-50 acres of salt field, and 3 owners who own more than 51 acres of salt field. The quantity of salt business owner according to the size of salt field is shown in table 5.4.

Table (5.4) Ownership of Salt field of Salt Business Owner

Size of Salt Field(Acre)	Quantity	Percentage (%)
Lower 10	4	10
11-15	3	7.5
16-20	4	10
21-25	5	12.5
26-30	4	10
31-35	8	20
36-40	4	10
41-45	2	5
46-50	3	7.5
Upper 51	3	7.5
Total	40	100

Source: Survey Data

Figure (5.4) Ownership of Salt field of Salt Business Owner



Source: Table (5.4)

(5) Production of Salt and Sectors of Productions

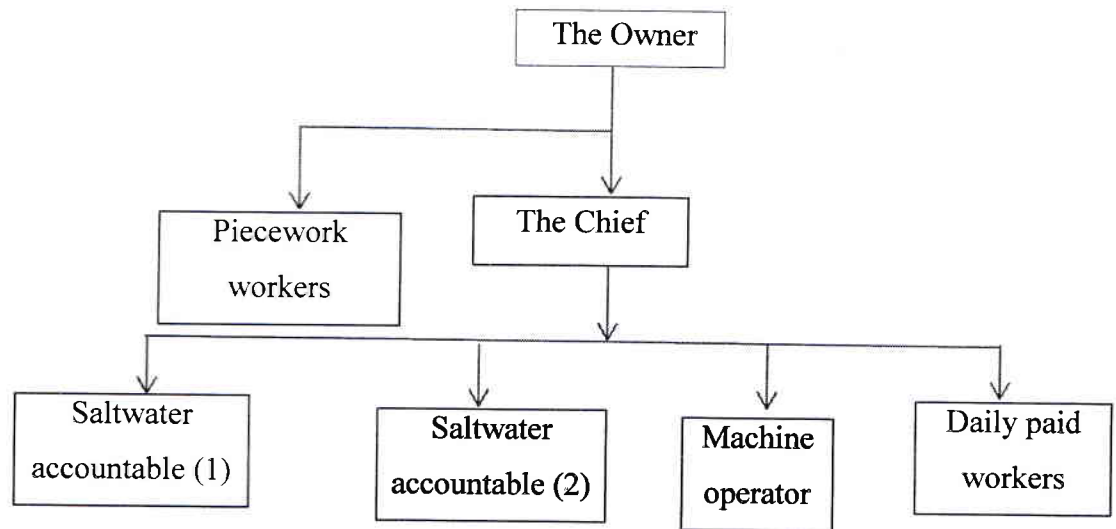
In salt production, the land of salt field, manufacturing tools such as salt milling machine, pumps, push-tractor, wood rollers and salter collector, mattock, salt collecting rake and salt carrying container are used as capital. Small vehicles to carry

salt from salt field to storage depot, small water carrying vehicles to carry freshwater for workers who are working in the salt field, are used. As the types of workers, monthly paid workers, seasonal daily paid workers and seasonal piecework workers are used.

In monthly paid workers, they are divided in to 3 types such as the chief of industry or workshop, the salty water accountable and machine operator. The responsibility of the chief of industry is to handle everything concerned with salt production. The salty water accountable and machine operator are working under the management of the chief. The salty water accountable is a worker who measures the degree of saltwater change as the temperatures getting higher while sun-drying the saltwater by using baume hydrometer, and puts the saltwater step by step to the sun-drying places until the saltwater reaches to the final sun-drying place. Machine operators are to handle the pumps to upload seawater, carry the drinking water for workers, and to operate small vehicles to carry salt from salt field to storage depot. The duties of seasonal daily paid workers are soil filling the embankment around the salt field, clearing the grass, hitting the frames with wood hammer, plowing the land, drifting with rake, adjusting the land, and recreating the drains for salty water from October when the salt business starts to early January.

Piecework workers must work as salt collecting, carrying, accumulation, sending salt to the depot, and salt packing into bags. These piecework workers are hired as groups in order to do the above tasks by the owners from villages Balukyun, Mudon, lalotthot, Karupi and Zinnkyaik at the last week of December. In a seasonal period of salt production, the more quantity of seasonal daily paid workers is used then the quantity of piecework workers. Piecework workers are used in salt collection season. It is observed that there is a direct relation between the owner of salt business and the chief, saltwater accountable, machine operators, daily paid workers, piecework workers. The management process of Pagna salt enterprise of Mon State is shown in Figure 5.5.

Figure (5.5)
The management process of salt production (Operation Manager)



Source: Survey Data

(6) Wage Rates of Salt Workers

In salt business, the salary of the chief who works as one of the monthly paid worker is at most 240000 or at least 180000. The duration of work is 12 months. The salary of saltwater accountable is at most 150000 or at least 120000. . The duration of work is 8 months. The daily wage of a male daily paid worker is 5000 and that of female daily paid worker is 4000.

Seasonal piecework workers are hired as groups. In January, the month that starts producing salt, seasonal piecework workers are hired at most 10 workers or at least 7 workers. As the production increase, they are hired as a group which includes 30 workers. The wage rates are 190000 Kyats for 1.6 tons of salt in January, 230000 Kyats for 1.6 tons of salt in February, 270000Kyats for 1.6 tons of salt in March, and in April, the highest productive month, 30000 Kyats for 1.6 tons of salt.

(7) Duration of Production Running

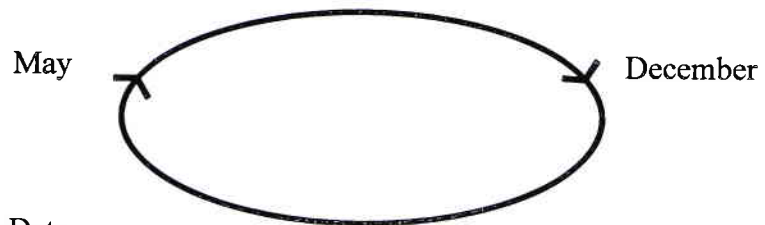
In studying the period or duration of production, it takes 8 months, from October to early May. From October to the first week of January, the 4-month period, soil filling the embankment around the salt field, clearing the grass, hitting the frames with wood hammer, plowing the land, drifting with rake, adjusting the land, and recreating the drains for salty water, are carried out. The 5-month period, from the

first week of January to the first week of May, it is the salt collecting season. The first yield of January is 19.2% of the total yield of the whole season, the second yield of February is 23.3% of the total yield of the whole season, the third yield of March is 27.2% of the total yield of the whole season, and the fourth yield of April is 30.3% of the total yield of the whole season. Therefore, it is found that the production period takes 8 months and the most productive yield is April. The process of salt production is shown in the following Figure 5.6.

Figure (5.6)

The process of salt production

Preparation Period



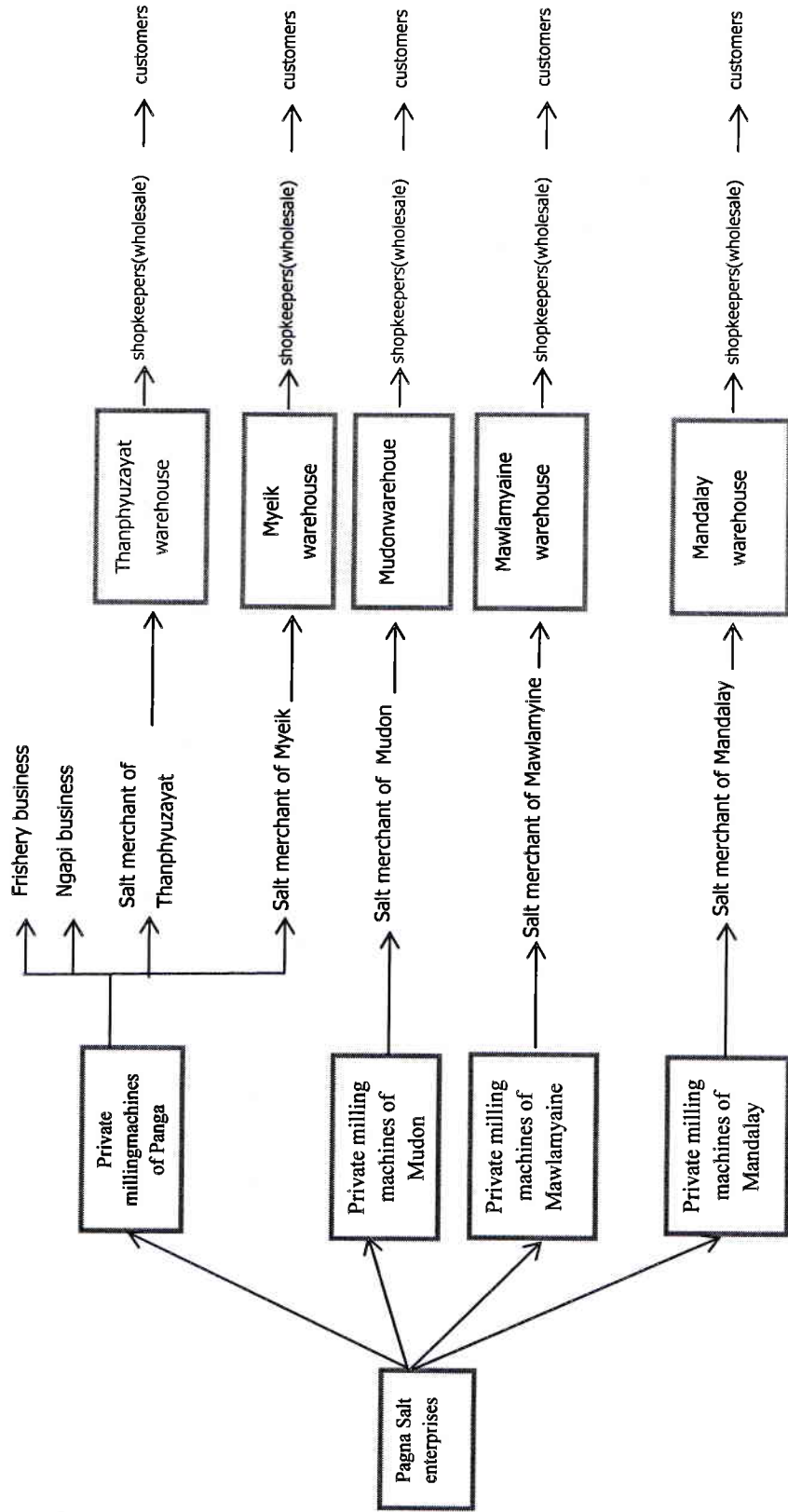
Source: Survey Data

(8) Salt Production and Distribution

Salt production can be studied by dividing into production section and distribution section. The production section is being carried out by every owners of every size of salt field. The distribution section is being carried out by owners who own more than 51 acre of salt field. In studying the distribution structure of Panga salt industry, salts are bought by private milling machines of Panga, private milling machines of Mawlamyine Township, private milling machines of Mudon Township, and private milling machines of Mandalay. Milling machines of Panga sell purified salts to fishery, Ngapi, dried fish businesses and salt merchants from Thanphyuzayat Township, and salt merchants from Myeik Township. Purified salts of Mudon milling machines are bought by salt merchants from Mudon Township. Purified salts of Mawlamyine milling machines are bought by salt merchants from Mandalay. Private milling machines of Mandalay distribute salts to salt merchants of upper Myanmar.

Then, salts are distributed from salt merchants of Thanphyuzayat Township to warehouses of Thanphyuzayat Township, from salt merchants of Myeik Township to warehouses of Myeik Township, from the merchants of Mudon, Mandalay, and upper Myanmar to respective warehouses. From those warehouses, salt are distributed to shopkeepers (wholesale). Furthermore, salts are also distributed to Ngapi, dried fish business, paper production business and cloth dyeing business.

Figure (5.7)
Distribution Pattern of Private Salt Enterprises of Pagna Village



Source: Myanmar salt enterprise

5.5 Status of Yield Per Acre, Production Cost Per Acre and Net Profit Per Acre

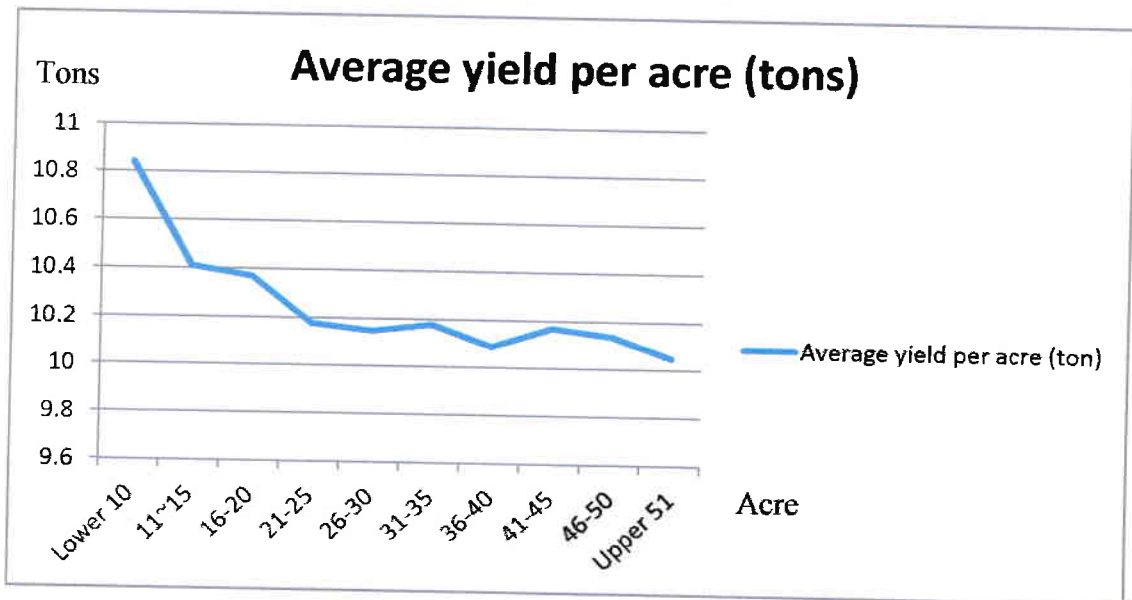
In studying the collected data, the difference of yield according to the size of salt field is described in Table 5.5, the use of capital per acre is described in Table 5.6, average total labor cost per acre is described in Table 5.7, average total cost per acre is described in Table 5.8 and the net profit per acre is described in Table 5.9.

Table (5.5) Yield of Salt per acre by the Size of Salt Field

The size of salt field (acre)	Average yield per acre (tons)
Lower 10	10.84
11-15	10.41
16-20	10.37
21-25	10.18
26-30	10.15
31-35	10.18
36-40	10.09
41-45	10.17
46-50	10.14
Upper 51	10.05

Source: Survey Data

Figure (5.8) Yield of Salt per acre by the Size of Salt Field



Source: Table (5.5)

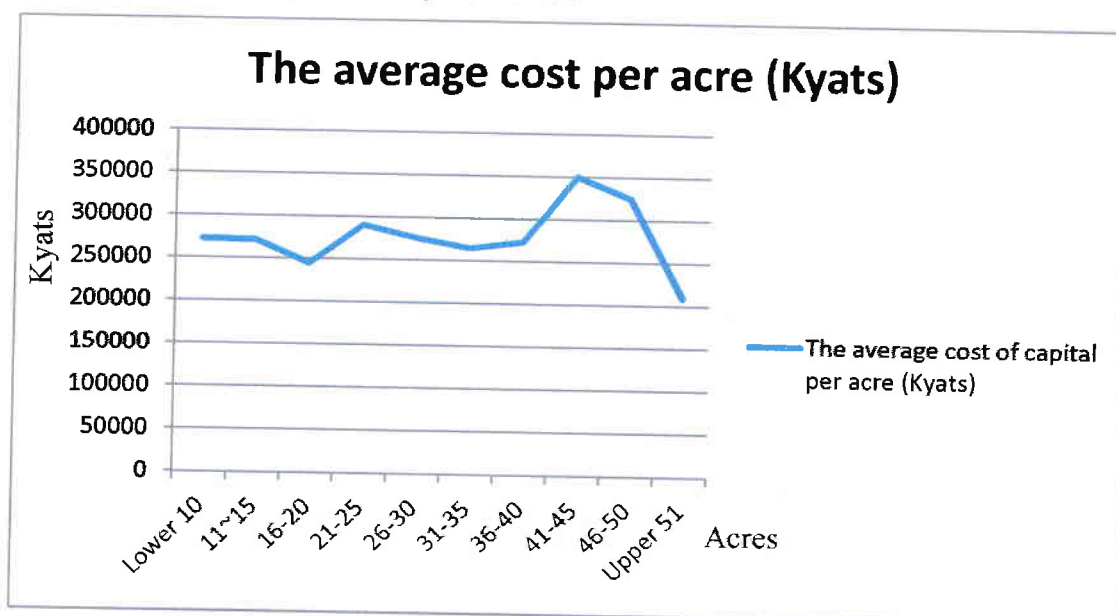
In studying the difference of salt yield depending on the size of salt field, the average salt yield for salt field size more than 51 acre is 10.05 tons, and it is the size with the least yield. The average salt yield for salt field size less than 10 acre is 10.84 tons, and the average yield of the size of 11-15 acre is 10.41 tons, and it is the size with the second most yield of salt. Therefore, according to the above table, the salt which is less than 10 acre with the most yield. The production can be higher because of the lower acres and can be doing more management. Output increase at the lower acre because of using modern technology systematically. Outputs decrease at the acre which are many, it can not maintain to less the damage of saltern when the rain is coming.

Table (5.6) Cost per acre by Salt Field

The Size of Salt Field (acre)	The Average Cost per acre (Kyats)
Lower 10	272179.85
11-15	271208.51
16-20	245216.92
21-25	290748.12
26-30	276435.18
31-35	265173.63
36-40	272800.21
41-45	350251.43
46-50	325245.05
Upper 51	209434.47

Source: Survey Data

Figure(5.9) Cost per acre by Salt Field



Source: Table (5.6)

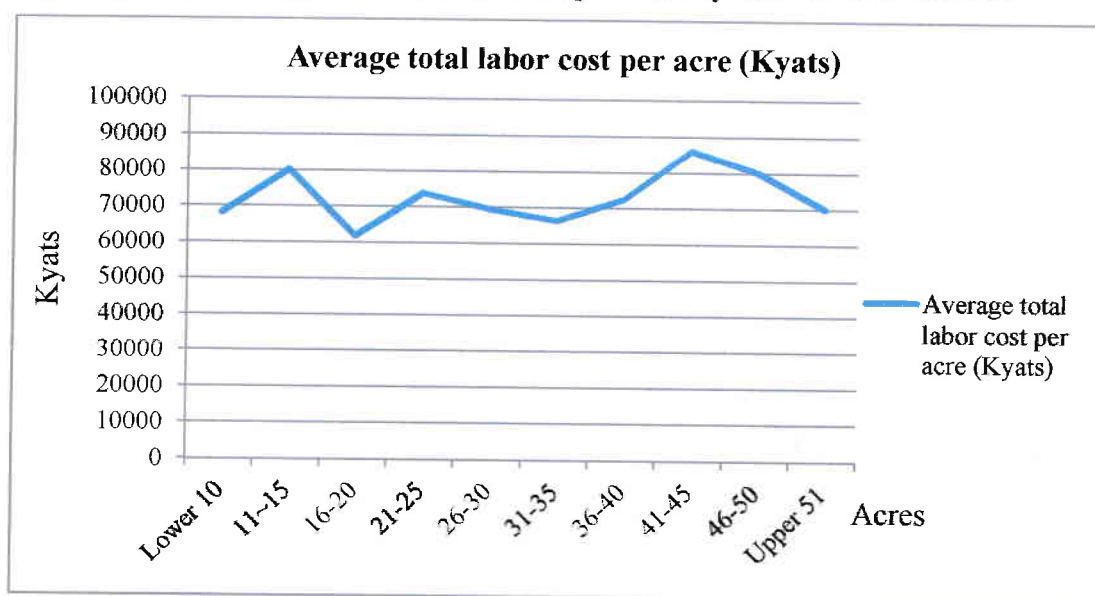
In studying the cost of capital per acre by the salt field, the average cost of capital for the salt field size upper 51 acre is 209434.47 Kyats, and it is the least use in capital. The salt field which is the most cost of capital per acre is the salt field with the size of 41-45 acre, and its average cost of capital per acre is 350251.43 Kyats. The second most in average use of capital per acre is the salt field with the size of 46-50. Although the more capital, outputs is low because of the weakness of management and the weather-beaten. Although the acre salt field are more due to soil destory capitaldecrease and output low.

Table (5.7) Average Total Labor Cost per acre by the Size of Salt Field

The Size of Salt Field (acre)	Average total labor cost per acre (Kyats)
Lower 10	68245.68
11-15	80277.72
16-20	61977.90
21-25	73926.52
26-30	69625.37
31-35	66456.67
36-40	72546.14
41-45	86188.75
46-50	80197.41
Upper 51	70212.98

Source: Survey Data

Figure (5.10) Average Total Labor Cost per acre by the Size of Salt Field



Source: Table (5.7)

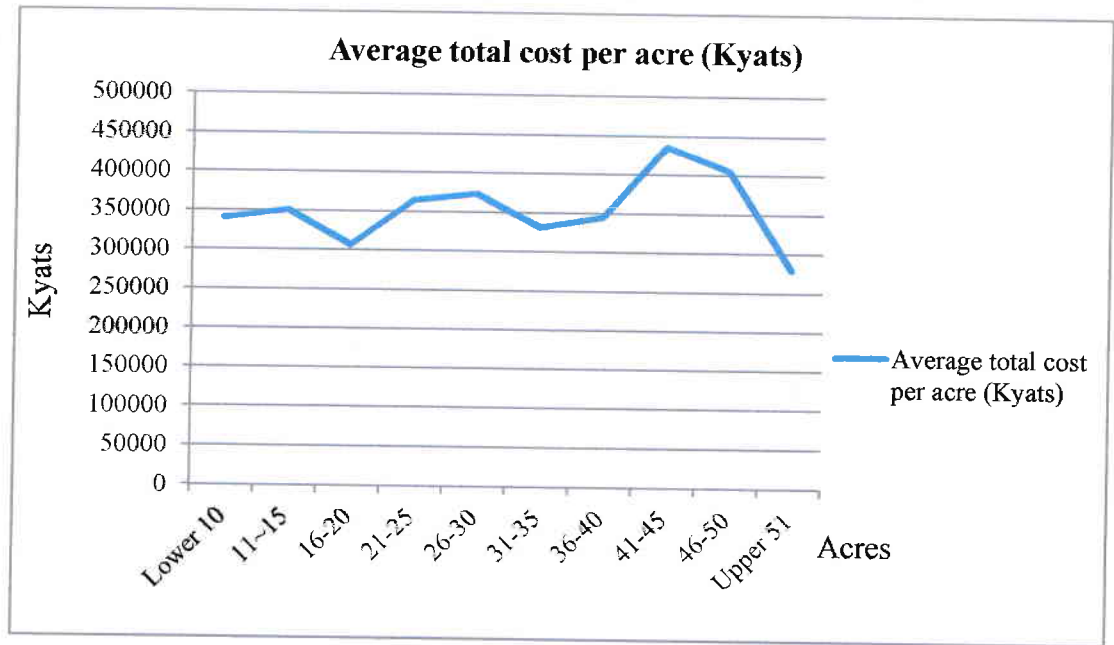
In studying the average total labor cost per acre by the size of salt field of Pagna village, the average total labor cost per acre of salt field size 16-20 acre is 61977.90 Kyats, it is the least in the average total labor cost per acre. In salt field size 11-15 acre, the average total labor cost per acre is 80277.72 Kyats, and it is the second least. In salt field size 41-45 acre, the average total labor cost per acre is 86188.75 Kyats, it is the most in the average total labor cost per acre. Outputs are low because of the weak of technology and unskill labor. Due to the participation of skillful labor and their family participation although the labours are low, outputs increase.

Table (5.8) Average Total Cost per acre by the Size of Salt Field

The Size of Salt Field (acre)	Average Total Cost per acre (Kyats)
Lower 10	340425.53
11~15	351486.23
16-20	307194.82
21-25	364674.64
26-30	373360.55
31-35	331630.3
36-40	345346.35
41-45	436440.18
46-50	405442.46
Upper 51	279647.45

Source: Survey Data

Figure (5.11) Average Total Cost per acre by the Size of Salt Field



Source: Table (5.8)

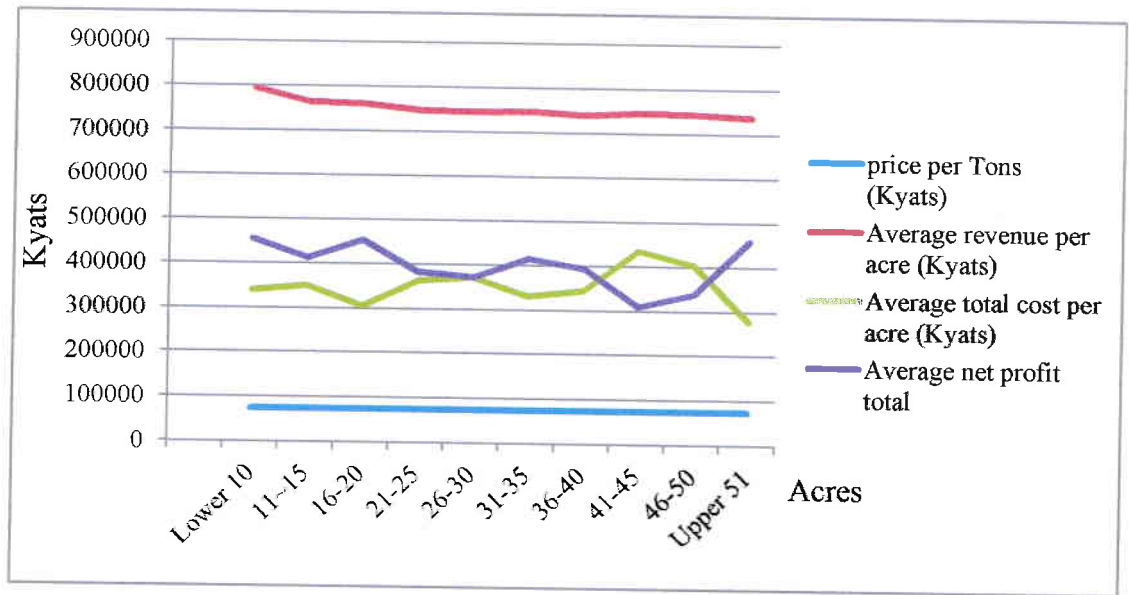
In studying average total cost per acre by the size of salt field, the average total cost per acre of the salt field with the size more than 51 acre is 279647.45 Kyats, and it is the salt field size with the least amount of average total cost per acre. The salt field size which is between 41 and 45 acre is the most in amount of average total cost per acre, 436440.18 Kyats. The second most is the salt field with the size of 46-50 acre, 405442.46 Kyats.

Table (5.9) Average Net Profit per acre by the Size of Salt Field(2017)

The size of salt field (acre)	Price per Tons (Kyats)	Average revenue Per acre (Kyats)	Average total cost Per acre (Kyats)	Average net profit total per acre (Kyats)
Lower 10	73488	796609.92	340425.53	456184.39
11-15	73488	765010.08	351486.23	413523.85
16-20	73488	762070.56	307194.82	454875.74
21-25	73488	748107.84	364674.64	383433.2
26-30	73488	745903.20	373360.55	372542.65
31-35	73488	748107.84	331630.30	416477.54
36-40	73488	741493.92	345346.35	396147.57
41-45	73488	747372.96	436440.18	310932.78
46-50	73488	745168.32	405442.46	339725.86
Upper 51	73488	738554.40	279647.45	458906.95

Source: Survey Data

Figure (5.12) Average Net Profit per acre by the Size of Salt Field



Source: Table (5.9)

In studying average net profit per acre by the size of salt field, the average net profit per acre of the salt field with the size 41-45 acre is 310932.78Kyats, and this salt field is the least in average net profit per acre. The salt field which is the second most in average net profit per acre is the salt field the size which is lower 10 acre and its average net profit per acre is 456184.39 Kyats. Therefore, the salt field upper 51 acre which is the most in average salt yield per acre is also the most in average net profit per acre is 458906.95 Kyats.

Chapter (6)

Conclusion

6.1 Findings

In this thesis, salt sector fills a number of roles in Myanmar. If Salt Sector develops, business owner and the labor in Salt production, develop their living standards, develop international technology, reduce unemployment and salt is the best to provide nutritional support for the body. In these salt production, there are study the situation of salt business owner income and the effect of labor in salt production such as: education, salary and etc.

In Panga Salt Production, it can be found out that the act of using machines, yield salt per acre of salt production and the income of business owner are obviously and continuously developing. By developing salt production, it can find out the machine and equipment are widely used in the process of gathering up the salt, rolling them up by rollers and washing them up.

According to the current situation, there are problems to hire of seasonable workers and then we can observe that the law of landmarks makes the extension of salt production becomes to have obstacles. But the salt production is familiar with the investments and it can be seen that only the people who are running the salt production process as a tradition within the region, extend the investments and keep putting in the capitals.

Salt production season can partly solve the problems of the seasonally rare careers for the salt workers as it is an external period of cultivation land process. However, people who go to the foreign country and work become abundant and that is why, it can be said that the problems of the rareness of seasonally workers within the region are encountered.

When study the economically salts plot land's sizes of private salt production process in Panga Village, it can be found out that the ratio of the use of salt plot land acres is the least and but the yield per acre is the most. Besides, according to the salt plot land acre which is one of the inputs, and the marginal product of salt production, it can be observed that the yield of salt can be produced over 10 Tons whenever the plot land is extended to another one acre.

6.2 Suggestions

In Panga Village, Thanphyuzayat Township, in Mon State, the salt plot lands have to be unsuitable for the needs to be ochre and to grow rice. It's necessary to be in a situation to easily import sea water. Nowadays, the chances to extend the salt plot lands which are sufficient with the above situations become fewer. For the producers, they should systematically repair and maintain their salt plot lands in the preparing time for the next salt season, whenever a season ends. It means that systematically mending the soils to make the yield faster and to boost the product rate. Besides, they should watch and take care of the dykes around the salt fields, not to be broken and crashed.

The main difficulties that the salt businessmen in Panga Village encounter are the rareness of workers. It is caused because the workers go to foreign country and there they can get more income rather than the salt production process. To solve this matter, the businessmen should persuade the workers by paying them more salaries for the lease when they run the process with the other businesses competitively during the salt season. Besides, the rareness of workers can be solved by giving bonus them, to make all the workers' families be able to work for the purpose to make them stay lastingly and count on the process, by opportunely supporting the workers with eating rice and by forming the groups for the worker's social occasion. By this way, the persuaded workers will get business profession and will help make the business's developments, a lot.

In the matter of the government, they should reduce the rates of taxes when they collect from the salt businessmen. The business owners should pay the tax their limited amount instead the amount of salt production. Because, there will be losses if the production has to give salts when the prices are getting higher. If the weather gets worse because of the natural disasters, the yield of salt will be less as it can affect the production although there are plenty of acres. In this situation, as paying salt as a tax can also affect the salt businessmen, it is suggested for the government to think of paying taxes by some other ways.

The observation is learning the salt production from the business point of view and according to the observer's time, expenses and the limitations, this won't be a perfect observation but this can be considered as a supportive research in observing the salt production for long term periods.

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APPENDIX

စားလုပ်ငန်းလေ့လာရက်စာရင်း

ပိုင်ရှင်အမည် ဝန်ထူး
 စားကွင်းအက ဝန်ထမ်းအမည်
 နှစ်စဉ်ပေးဆောင်ရသည့်အခွန်
 အိမ်ထောင်စုစာရင်း

စဉ်	အမည်	ကျား/မ	ဦးစီးနှင့် ဖော်စပ်ပုံ	အသက်	ပညာ အရည်အချင်း	အဓိက အလုပ်အကိုင်		တွဲဖက် အလုပ်အကိုင်		မှတ်ချက် စားလုပ်ငန်းတွင် ပါဝင်ခြင်းရှိ/မရှိ
						အမျိုး အစား	ငါးစဉ်	အမျိုး အစား	ငါးစဉ်	

- (၁) လုပ်ငန်းစတင်ထူထောင်သည့်ခုနှစ်
- (၂) စားလုပ်ငန်းစတင်ထူထောင်ခဲ့သည့်အရင်းအနှီး
- (၃) ယခုလက်ရှိအရင်းအနှီးပမာဏ (ကျပ်)
- (၄) စတင်ထူထောင်ခဲ့စဉ်က အရင်းအနှီးရရှိခဲ့ပုံ
- (၅) နှစ်စဉ်အရင်းအနှီး တိုးတက်ပြည့်စည်းခဲ့ခြင်း (ရှိ/မရှိ)
 - ရှိပါက - လွန်ခဲ့သည့် (၅)နှစ်အတွင်း ပြည့်စည်းခဲ့ပုံ
- (၆) လုပ်ငန်းကို ဆက်လက်တိုးတက်လိုခြင်း (ရှိ/မရှိ)
 - ရှိပါက - ဘာကြောင့်လဲ
 - မရှိပါက - ဘာကြောင့်လဲ

- (၇) လုပ်အားစရိတ်
 - စားကွင်း ပြုပြင်ခြင်း
 - မိုးခရေဓာတ်ထုတ်ခြင်း
 - စက်ပြင်ထွန်းခြင်း
 - စက်ပြင်ပြင်ဆင်ခြင်း
 - ပြက်ရှင်းခြင်း
 - သံကူတ်တိုက်ခြင်း
 - ကန်သင်းအဘင် ပြုလုပ်ခြင်း

- ကန်သင်းအဘင်သစ်သားတူပြင်ထုပြင်ခြင်း
- လှူပြင်အချောကိုင်ကူတ်တိုက်ခြင်း
- သစ်သားအလိမ့်တုံးပြင်လှိမ့်ခြင်း
- ဆားရည်ပြောင်းပြောင်းများ ပြုပြင်ခြင်း
- ဆားရည်သွင်းခြင်း
- လှန်းကန်များအတွင်းသို့ ဆားဝန်ရည်သွင်းခြင်း

- ဆားလှန်းခြင်း

- ဆားကနူးခြင်း

- ဆားစားခြင်း

- ဆားများ ဆိတ်သွပ်ခြင်း

- အချောကိုင်ကြိုက်ခွဲခြင်း

- ချောကွက်သို့ တင်ပို့ရောင်းချခြင်း

(ခ) လုပ်သားအရင်းအနှီးပိုင်ဆိုင်မှု

စဉ်	စက်အမျိုးအစား	ချောကွက်ပုံ	အချောကွက်	ဝယ်ယူရည်က တန်ဖိုး (ကျပ်)	ယခုတန်ဖိုး (ကျပ်)

(၉) ဆားရောင်းရမည့်

အချိန်ကာလ	ရောင်းချသည့်ပမာဏ	ဈေးနှုန်း (ကျပ်)	ရောင်းရမည့်

ဆားလုပ်ငန်းရှင်၏သဘာဝဘာဝမေးခွန်းလွှာ

(၁) လုပ်ငန်းဆက်လုပ်ရန် ချုပ်ချယ်ချက်ရှိပါသလား။

- ရှိပါက

၁။ လက်ရှိအတိုင်းဆက်လုပ်ရန် ချုပ်ချယ်ချက်ရှိပါသလား။

- ဘာကြောင့်လဲ။

၂။ တိုးချဲ့လုပ်ကိုင်ရန် ချုပ်ချယ်ချက်ရှိပါသလား။

- ဘာကြောင့်လဲ။

၃။ လျှော့ချလုပ်ကိုင်ရန် ချုပ်ချယ်ချက်ရှိပါသလား။

- ဘာကြောင့်လဲ။

- မရှိပါက

- ဘာကြောင့်လဲ။

(၂) ဆားလုပ်ငန်းကို တိုးတက်အောင် နည်းလမ်းကြံဆမှုရှိပါသလား။

(၃) တိုးတက်အောင်လုပ်နိုင်သည့် နည်းလမ်းရှိ မရှိ။

- ရှိပါက - ကြံဆောင်နေခြင်း ရှိ။

- မရှိပါက - ဘာကြောင့်လဲ။

(၄) ဤအလုပ်ကို သားသမီးများ ဆက်လက်လုပ်ကိုင်ရန် ချုပ်ချယ်ချက်ရှိပါသလား။

- ချုပ်ချယ်ပါက - ဘာကြောင့်လဲ။

- မချုပ်ချယ်ပါက - ဘာကြောင့်လဲ။

(၅) ဆားလုပ်ငန်း လုပ်ကိုင်ရာတွင် တွေ့ကြုံရသော အခက်အခဲများ။

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