IMPACT OF RAINFALL VARIABILITY ON PADDY CULTIVATION AND PRODUCTION IN HLEGU TOWNSHIP, YANGON REGION, MYANMAR

Tin Tin Mar[1]

Abstract

According to the 2014 census, the total population of Myanmar is (51,486,253) persons of which about 70 percent are rural dwellers, Myanmar is agro-based country. Paddy is the main crop in Myanmar. About 80 percent population of Hlegu Township are engaged in agricultural. Paddy is the main crop cultivated in rural areas of Hlegu Township. Seasonal variability of rainfall effects on paddy cultivation and local farmers' livelihood are study area of Hlegu Township. Rainfall Variability results in low productivity. As a consequence, it is important to know the socio-economic characteristic of paddy farmers and their linkage with agricultural productivity as well as farmers' livelihood. The primary data were collected through focus group discussion and semi-structured questionnaire surveys to understand farmers' perceptions of Climate Change and its impacts. The research paper was presented by using quantitative and qualitative methods. The results obtained from this research project is significant in planning sustainable agriculture and rural, regional development of the study area.

Keywords: Rainfall, Seasonal variability, paddy production, local farmers' livelihood, rural areas

Introduction

The UN Intergovernmental Panel on Climate Change (IPCC) stated significant scientific proofs in its 4th report on Climate Change (2007) and there have become clearly recognized worldwide. Literature on the economics of Climate Change suggests that global crop production may be boosted slightly by global warming in the short term but it will ultimately turn negative over the longer term.

Myanmar mainly produce the most common crops such as rice, pulses and beans, and maize. Rice is the main staple food crop, cultivating nearly 50% of Myanmar's agricultural land (NAPA, 2012). The majority of the farmers are small-scale landholders with an average lot size of 2.27 ha (5.60 acres). Small-scale farmers face a series of challenges, to which Climate Change will be risk multiplier. Agricultural production directly depends on weather and Climate Change. (Seinn Seinn,2015)

At the national level, Myanmar produces a food surplus. However, as a result of geographical differences there are many areas or villages suffering from inadequate food supplies. Agriculture and crop production in Myanmar are strongly affected by rainfall as crop cultivation is mostly rain-fed (NAPA,2012).

Agriculture plays a vital role in economy of Myanmar and contributes around (20.9%) of the total GDP and is a source of employment for rural population of the country (European Chamber of Commerce in Myanmar, 2019). The Climate Change largely affects Myanmar agriculture and have become a challenge for future agricultural production in Myanmar (Agriculture Guide, 2020) due to the reason that Myanmar is one of the top ten nations prone to Climate Change and extreme events like drought. Frequent extreme weather events have caused a decrease in productivity of agriculture and thereby leading to decrease in GDP and household income as well as a decrease in food security (Myanmar National Census Report, 2014). Tin Hlaing (2004), revealed that the country's agricultural sector is still characterized by: (a)

[1] Department of Geography, Hinthada University

consisting of small farmers,(b) deteriorating soils, water and forest resources, (c) diverse farming system, (d) decreasing farmlands due to non-agricultural uses, (e) limited farm capital, (f) limited research and extension programme, (g) limited agricultural support services such as credit, marketing, and post-harvest facilities, (h) low yield, (i) low technology inadequate farm inputs; eg. Fertilizer, pesticides etc., (j) lack of agricultural diversification.

In Hlegu Township, rainfall variability or unreliable (untimely) rainfall is one of the major factors affecting agriculture and crop cultivation. The farmers encounter crop damage due to Climate Change and heavy rain in the harvest time. Rainfall variability or untimely rainfall brings about low paddy production in the study area and accordingly this situation will lead to low quality of paddy, low paddy price, less income, less profit and/or no profit to the farmers and their families. This will eventually impact the socio-economic life of peasants' families so that they are unable to get out of the vicious circle of poverty. All these conditions encourage research project on the relationship between Climate Change and rainfall variability or untimely rainfall and paddy cultivation in Hlegu Township of Yangon Region in Myanmar.

Research Question

How do rainfall variability effect on the paddy cultivation and production of the study area?

Aim and Objectives

The main aim is to focus on the relationship among rainfall variability, paddy cultivation, production and socio-economic life of the farmers. The objectives are to assess the impact of rainfall variability on paddy cultivation and production, to discover the influencing factors for paddy production in Hlegu Township and to examine the linkage of between rainfall variability, paddy production and local farmer's livelihood.

Data and Methods

This study is in-depth study to determine the impact of rainfall variability or untimely rainfall on paddy cultivation and local farmers livelihood in Hlegu Township, Yangon Region, Myanmar. This study mostly relies on primary data that will be collected from a field survey on paddy farmers in the selected villages. Secondary data are taken from the various departments concerned: agriculture data are obtained from the Department of Agriculture, Hlegu Town; irrigated acres gathered from the Department of Irrigation, Hlegu Town; meteorological variables received from the Kabaraye Weather Station, Yangon City. The reason for taking the Thirty -year (1994-2023) period is that the farmers of the study area have witnessed five consecutive years for the adverse effect of Climate Change. The Climate Change causes heavy rain once in 5-year period, particularly by the end of October, November and early December, the harvest time of paddy in the study area, causing problem to the farmer. Untimely rain causes difficulties in harvest of ripening paddy in the field.

In Hlegu Township, there are 52 village tracts in which 20 village tracts are selected. Questionnaires are distributed to 10 households in each village tract for the purpose of getting the primary data. To get a thorough understanding on paddy cultivation, open interviews and focus group discussion were conducted with farmers who have cultivated paddy for more than 20 years and authorities of the village tract as well as authorities of the Department of Agriculture. This study is an in-depth study to determine the impact of rainfall variability or

untimely rainfall on paddy cultivation. The data obtained are analyzed by using tabular form, the quantitative and qualitative methods are based on the survey data.

Results and Findings

General Background of the Hlegu Township

Hlegu Township, is located in the Hlegu District, Yangon Region. It is composed of 5 wards of urban area and 52 village tracts including 167 villages in the rural area. The main of township area is 577.73 sq km. The total population of Hlegu Township is 268321 persons in 2022. The relief of the northern part of the township is characterized by mountain sparse and low hill of Bago Yoma and the area under paddy cultivation is verry limited. The main streams of the study area are Ngamoeyeik and Bala creeks. Paddy is cultivated extensively and intensively grown in the low plain of the southern part in Hlegu Township. The study area experiences Tropical Monsoon (Am), according to Koppen's Climatic Classification. The soils of Hlegu Township are classified as 10 types in which alluvial soils and alluvial meadow soils are most suitable for paddy cultivation in Hlegu Township.

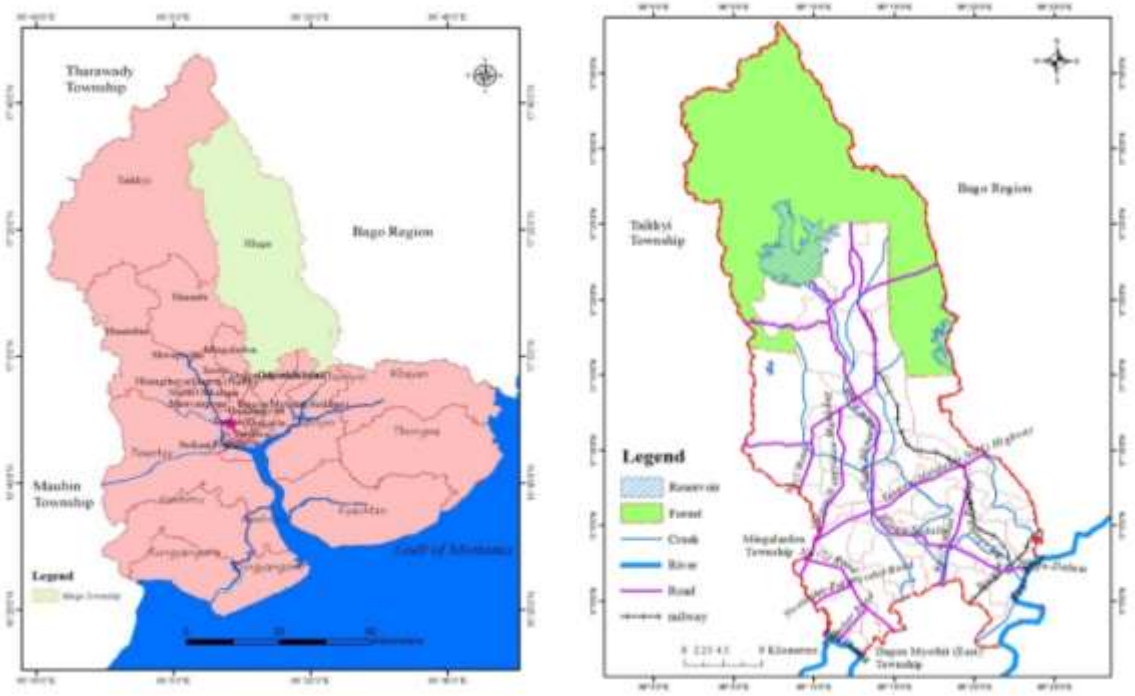

Figure 1. Hlegu Township in Yangon Region, Village Tracts in Hlegu Township

Source: Myanmar Survey Department, Naypyitaw

Climatic Conditions of the Hlegu Township

Although the amount of daily rainfall is recorded within the study area, other climatic data is accquire from Hmawbi which is 20 km away from Hlegu. The climatic regime of the study area is largely controlled by the seasonal shifting of monsoon wind and partly by location and low relief. The temperature and rainfall distribution of Hlegu Township has been analyzed by taking 30 year from Hmawbi Weather Station.

Table 1. Temperature and Rainfall of Hlegu Township (1994-2023)

Temp/Rainfall Months	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg/total Rainfall
Maximum Temperature(°C)	31	35	37	38	34	30	29	29	30	31	30	31	32.08
Mean Temperature(°C)	24	26	28	31	29	27	27	27	27	27	26	24	26.92
Minimum Temperature(°C)	16	17	20	23	25	24	24	24	24	23	21	17	21.50
Rainfall(mm)	7	5	15	36	283	503	564	502	381	174	51	8	2529

Source: Hmawbi Station, Department of Meteorology and Hydrology, Yangon

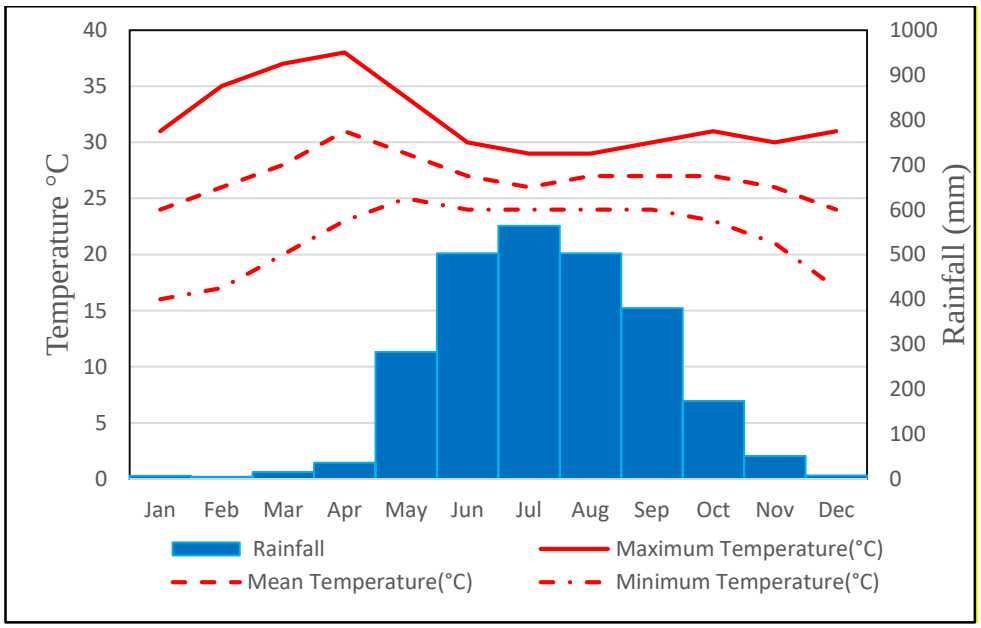

Figure 2. Climograph of Hlegu Township

The average annual mean temperature is 27°C (80.6°F). The mean monthly temperature is the highest temperature in April with 38.00°C (100.4°F) and lowest in January with 16°C (60.8°F). Therefore, the annual range of temperature is 22°C (71.6°F) and the low range of temperature is due to being fairly close to the sea. Temperature is usually high in the daytimes of hot dry period, often reach 40°C (104°F). The monthly mean maximum temperature is the highest temperature in April with 38°C (100.4°F) and lowest temperature in July with 29°C (84.2°F) due to thick cloud covers.

The average annual rain fall is 2529 mm (99.88 inches) during the thirty years period, received mostly in the period from May to October from the southwest summer rain-bearing monsoon wind. Climate Change is manifested by unseasonal rains, heavy rain in the late rainy season, early on late on- set of southwest monsoons, early on late retreat of monsoon and heavy rain in the harvest time of paddy, resulting in the low paddy production that affects the socioeconomic life of the farmer. The climate change causes heavy rain once in 5-year period,

particularly by the end of October, November and early December, the harvest time of paddy in the study area, causing problem to the farmer. Examining the rainfall of the graph and table, there is more rain in the months of September, October and November. More rain in the months of October and November causes farmers to face difficulties during the harvest time and reduced paddy production. Rainfall variability, untimely rainfall, less rain, heavy rain and floods are the effects of Climate Change.

Rainfall Distribution Patterns in Hlegu Township during 30 Years

Table 2. Total Rainfall of 30 Years (1994-2023) in Hlegu Township

Year	Total Rainfall(mm)	Year	Total Rainfall(mm)	Year	Total Rainfall(mm)
1994	2722	2004	2900	2014	2390
1995	2452	2005	2341	2015	2272
1996	2744	2006	2250	2016	2395
1997	2696	2007	3011	2017	2642
1998	2004	2008	2668	2018	2583
1999	2939	2009	2410	2019	2333
2000	2348	2010	1892	2020	2017
2001	2526	2011	2680	2021	2434
2002	2837	2012	2738	2022	2249
2003	2314	2013	2997	2023	2624

Source: Department of Meteorology and Hydrology, Yangon

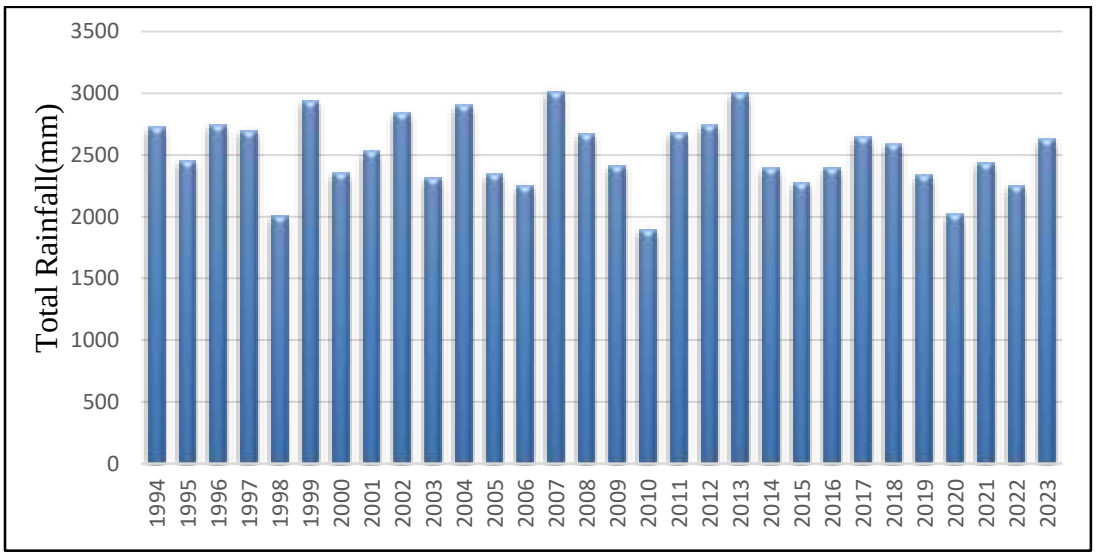

Figure 3. Total Rainfall of 30 Years (1994-2023) in Hlegu Township

Source: Department of Meteorology and Hydrology, Yangon

Figure 3 and table 2 show the rainfall distribution pattern that varies years by years from 1994 to 2023.During the 30-year period, the lowest total rainfall was 1892 mm in 2010. In 1998 with a total rainfall is 2004 mm. In 2020, the total rainfall is 2017 mm with due to reduce of rain, there will be no irrigation water to grow summer paddy in Hlegu Township. The highest rainfall is 3011 mm in 2007. After that, the rainfall decreased until in 2012 and rises again in 2013 with the total rainfall of 2997 mm. After 2013, rainfall decreased and in 2023, 2624 mm rainfall was received in Hlegu Township. In Hlegu Township, rainfall variability or untimely rainfall is one of the major factors affecting agriculture and crop cultivation. In the past 30-year period from 1994 to 2023, the average annual rainfall was 2532mm. In that period the rain began from February and ended in December with relatively high amount of monthly rainfall. The rainfall pattern in the 30-year period from 1994 to 2023 has changed. Although the on-set of monsoon was late and the retreat was early in the past decades, the amount of rainfall after the retreat of monsoon was fairly high.

Paddy Cultivation and Production in Hlegu Township

Table 3. Cultivated, Harvested and Production of Paddy, Hlegu Township

Year	Cultivated (acre)	Harvested (acre)	Yield per acre (basket)	Total production (basket)
2012-2013	89061	88860	68.75	6109125
2013-2014	89029	89029	68.83	6127899
2014-2015	89056	89056	68.84	6130616
2015-2016	88831	88831	68.13	6052056
2016-2017	83625	83625	64.71	5411101
2017-2018	83629	83324	63.88	5322418
2018-2019	83257	83055	64.3	5340639
2019-2020	81918	81329	62.93	5118034
2020-2021	81991	81991	66.56	5457714
2021-2022	82123	82123	66.79	5485754

Source: Department of Agriculture, Hlegu Township

According to the table 3, figure 4 and 5, Paddy cultivated area and yield per unit area slightly decreased in Hlegu Township. According to interviews and field observation, climatic variability especially rainfall variability such as untimely rain and irregular rain affect paddy productivity. After the adoption of market-oriented economic policy, a number of factories were established within and around the study area. Some small holder's family members left the farm and engaged in the factories as employees. As the land price was high, they sold off their lands.

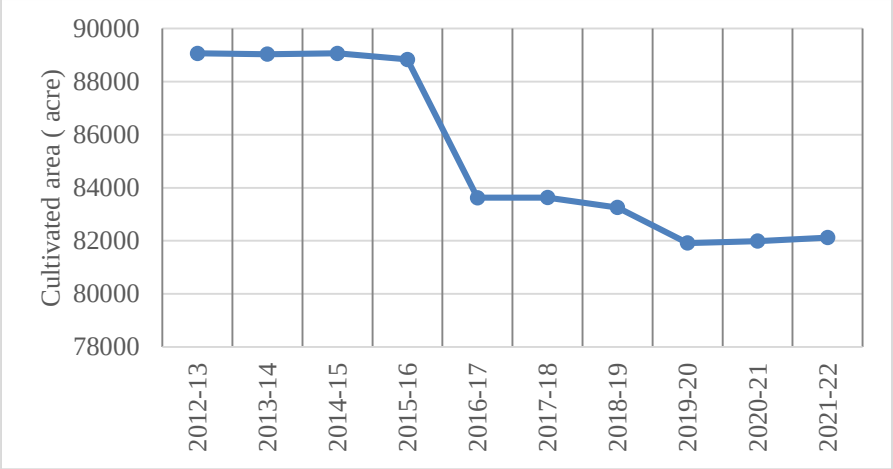

Figure 4. Paddy Cultivated Area of Hlegu Township (2012-2022)

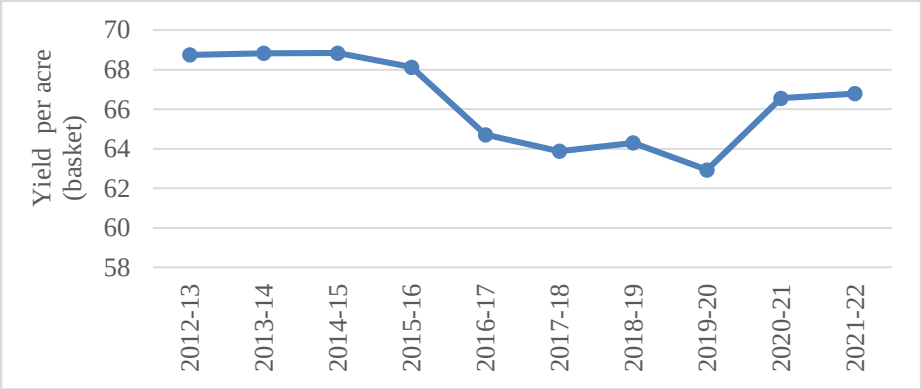

Figure 5. Yield of Paddy in Hlegu Township (2012-2022)

Source: Based on table 3. 2)

In Hlegu Township, about 80 percent of the farmers are small holders of paddy land. Rainfall pattern affects the yield of paddy, but the yield mostly depends on inputs: rainfall, Chemical fertilizer, Pesticide, quality of paddy seeds and the soils are the determining factors of the yield of paddy. In the past 10 years, the yield per acre of paddy was between 30 and 40 baskets. In recent times, the choice of paddy varieties that conform with the changing rainfall pattern has recently resulted in the increase of yield to 50 and 69 baskets per acre, see the table 3.

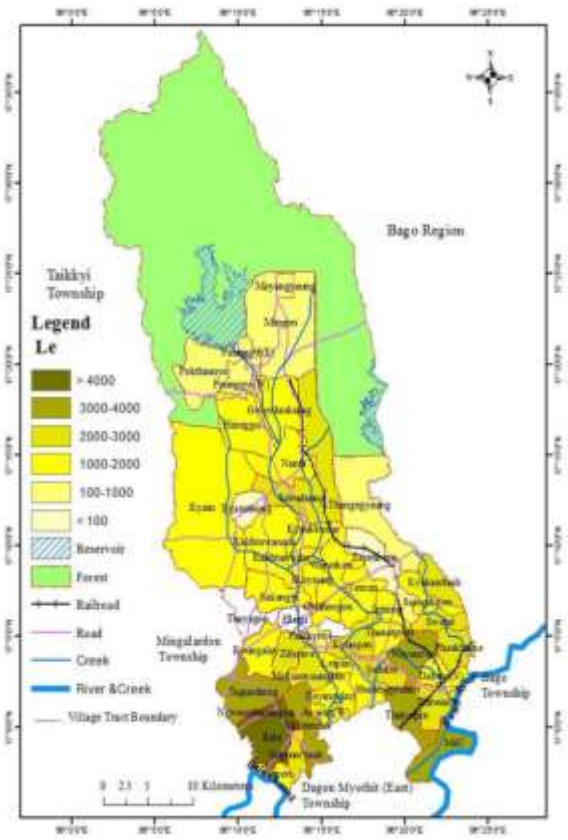

Figure 6. Distribution of Le Land in Hlegu Township (2023)

Cultivation Methods in Hlegu Township

In the past, most farmers practiced transplanting method due to easy availability of workers, low cost, comparatively high yield, and high weather resistance. The recruitment of workers has recently been difficult and most farmers practiced broadcasting method which needs lower amount of seeds, low labour for cultivation and hence low cost. A few farmers have been practicing seeding method, but it represents only 3 percent of farmers.

In transplanting method, paddy seedlings are pulled out when they are quite mature for transplanting and thus the plants can resist the negative effect of extreme weather conditions. As 4 to 5 seedlings are planted at a spot, they can stand upright and resist wind whipping. The plants can bear more seeds increasing the yield. Broadcasting method cannot resist extreme weather conditions and the yield is comparatively low, but the cost is much low, only half the cost of transplanting. At present, most farmers practice broadcasting method due to scarcity of labour.

Plate 1. Broadcasting plot

Plate 2. Transplanting plot

The Changes of Paddy Varieties

Table 4. Varieties Grown, 2010 and 2023 in Hlegu Township

Paddy Varieties (2010)	Paddy Age	Paddy Varieties 2023	Paddy Age
Taungpyan,	150	Taungpyan	150
Yarkyaw,	135	Pawsan	150
Shwewartun,	120	Thaiglutinus rice	130
Manawthuka	120	Byauthtun	120
Pawsan	150	Thaihnankauk	120
Ngasein	130	90 days	90
Mawbisan	125	Sinthuka	120

Source: Field Observation and Questionnaire

People all over the world are witnessing the negative effect of Climate Change due to global warming. The farmers have to face the impact of rainfall variability. The farmers change the variety of paddy to cope with the changing rainfall pattern. In the 10 years, most farmers of the study area cultivated long-live variety which matured in 150 days. Besides, they also cultivate Shwewarhtun, Manawthukha, Hmawbisan and Ngasein group which matured in 120 days. With the changing pattern of rainfall, the farmers choose to grow Thai Sticky rice, Byauthtun and Thaihnankyauk varieties.

The Causes of Low Paddy Production

There are four main causes of low yield in paddy production. Based on the responses to questionnaires, the yield decrease is 31 percent if it rains in pollination period, 50 percent due to unavailability of sufficient fertilizer, 10 percent because of the heavy rain at the harvest time and 9 percent being unable to harvest in time. These above- mentioned percentages indicate that insufficient fertilizer and rainfall in pollination period on paddy itself is high nutrient absorber. Since 1995 the main cause, both monsoon paddy and summer paddy are grown on the same

fields, thus rapidly exhausting the soil fertility. In order to boost the yield, it needs more fertilizer.

If the chemical fertilizer is applied in the rainy season; it drains out of the fields with floodwater. So, the farmers have to adjust the use of chemical fertilizer. Usually, they apply only a small amount in the cultivation of monsoon paddy, reducing the yield per unit area. More fertilizers are used in growing summer paddy. Small holder usually witnesses small amount of profit and even losses due to small land size, high cost of cultivation, lack of sufficient capital, low inputs and the negative effect of rainfall variability. Therefore, their socio-economic status is rather low.

Plate 3. Pollinating

Plate 4. Insufficient Fertilizer

Plate 5. Rain during the Harvesting period

Plate 6. Paddy cannot be Harvested in time

Focus on Group Discussion of Case Studies in Hlegu Township

The results of group discussion with the farmers of Thanutpyin village Tract, for detailed study Thanutpyin village tract is chosen which usually grow both monsoon (rainy season) paddy and summer paddy. The village has 809 households and 243 farmers with a total population is 3725 persons. The sown area of monsoon was 1953 acres (790.37 hectare) in 2019 and that it summer paddy 1953 acres (790.37 hectare). The on-set of monsoon usually being in the third week of May, but it has been burry uncertain in the recent year. If it set in early, the

summer paddy would be somewhat destroyed. The late retreat of monsoon and heavy unseasonal rain in the post- monsoon period would, to some extent, destroy the monsoon paddy. Unseasonal rains have been more destructive to the paddy cultivation. In the cultivation of monsoon paddy, the on-set of monsoons is important. If the on-set is late, preparation of nursery bed is late. So only short-lived varieties are suitable to grow. The early retreat of monsoon results in insufficient water in the paddy fields. By experience, most farmers learn how to grow monsoon paddy suitable to the changing rainfall pattern.

In the first phase of climate change, most farmers could not use agriculture machines. In recent years, they have used large machine in ploughing the land and short- lived varieties in growing and combined harvester in harvesting, trashing and winnowing. With the rising prices of nearly all useful things, the farmers have to spend more capital for paddy production. Although farmers with large area of land have their own capital and agriculture machine, the small holders have to hire such machine increasing the cost of production. As a result, the income as profit gained from the land is low for small holders leading to low socioeconomic status. Some small holders have already sold out their lands and some are waiting for the rise of the price of land.

Plate 7. Focus Group Discussion in Thanutpin Village Tract

Table 5. Changes in Precipitation, Agricultural Inputs and Practices between 2000 and 2022

Sir No.	Activities	2000-2005	2006-2010	2011-2015	2016-2022
1	Precipitation				
2	Fertilizer				
3	Rain-Fed	0 baskets	40 baskets	50 baskets	60 baskets
4	Summer paddy	75 baskets	80 baskets	85 baskets	85 baskets
5	Temperature				
6	Irrigation water	50 %	100 %	100%	100%
7	Pesticides				
8	Garment Worker	3 %	13%	30 %	60 %

Source: Based on Focus Group Discussion

For a comprehensive understanding of the changes based on group discussion, the 2000-2022 period was divided into 4 sub- period. In the 2000-2015 period the amounts of annual rainfall were high, until 2010. In the subsequent years the amount decreased, particularly in 2013, 2014 and 2015. The amount of rainfall was also low in 2016 and 2022, according to discussion and the available data.

The use of chemical fertilizer was one bag per acre during the period from 2000 to 2005. One and a half bags of chemical fertilizer were applied in the 2006-2010 period and 2 to 3 bags from 2011 to 2022. Repeated cultivation of paddy exhausted the soil fertility. In cultivating monsoon paddy only a few amounts of chemical fertilizer were used, as it would be lost somewhat with the floodwater. The farmers used more fertilizers in growing summer paddy, usually 2 to 3 bags per acre. The yield of monsoon paddy per acre was 60 baskets for short-lived varieties and 40 baskets for long-lived varieties.

The yield of summer paddy was 80 to 100 baskets per acre for short-lived varieties. In the 2000-2005 period, most rural people earned their living only on the farming. There were 15 people engaged in the factories,30 in the 2006- 2010 period and 60 in the 2016-2022 period. At present most rural inhabitants know the impact of Climate Change, the rise in temperatures particularly after 2010.

Farmer's Perception

According to Interview and Focus Group Discussion, unseasonal rain due to Climate Change, and heavy rain in the post-monsoon period caused difficulties to the farmers. They started to notice the change in climatic condition since ago. Such rainfall variability occurred in every 5- year time destroying the natured paddy. Therefore, they chose to grow the variety that could resist the impact of Climate Change. In the past, only a few farmers used machines. As the farmers could not harvest in time with manual labour, more farmers came to use agriculture machines in the subsequent years. To overcome the effect of Climate Change, the farmers practice suitable farming techniques and grow new short-lived varieties suitable to the changing conditions. They also come to share suitable varieties among them, decreasing the damage caused by rainfall variability.

Currently the farmers grow paddy varieties which can reduce the impact of extreme climatic conditions. Thai sticky rice and Byauthtun are such varieties. These varieties have hard stalk. The farmers also want to learn new scientific farming techniques. Seeding method (SRL) has to use only a small amount of paddy seeds. But only 3 percent of the farmers in Hlegu Township have such tool. In this period of Climate Change, most farmers hope to get better seeds that can resist the extreme climate with high yield potential, sufficient loan, sufficient support of fertilizers, purchase the paddy produced with fair price, hiring the necessary agriculture machines and seeding tool. These are the responses of farmers during field surveys.

Conclusion and Suggestions

Climate is the most important factor in crop cultivation. In Hlegu Township, about 80 percent of the farmers are small holders of paddy land. In Hlegu Township, paddy is a major crop and both monsoon paddy and summer paddy are cultivated. In order to reduce the negative

impact of rainfall variability, the followings measures should be taken. According to field surveys, the farmers and the personnel of the department, concerned should follow the following suggestions; the farmers should listen to the daily climatic news broadcast; the grower should choose and cultivate the paddy species that can resist the impact of extreme climatic conditions and that yield high amount of paddy, based on climatic conditions; the Department of Agriculture should help when to start growing to become 'Climate Smart Agriculturalists", in order to get paddy species competent to the changing climate; the Department of Agriculture should conduct research and the resultant species should be distributed to all the paddy growers. As more farmers grow both monsoon paddy and summer paddy, the soil fertility of le land has exhausted. The soils tests should be carried out to know exactly the deficiency of certain minerals in the soils to supply proper chemical fertilizer.

The development of agriculture sector will heighten the volume of gross domestic product (GDP) which is one of the basic criteria for evaluating a country's level of development. Rainfall variability due to Climate Change, heavy unseasonal rain and rainfall in the harvesting time have led to low yield of paddy and rural poverty. The low yield was also on account of low inputs and low price of paddy at the time of harvest. Although small holders had to face such problems, the farmers with large paddy land can somehow resist the changing conditions. They can use agricultural machines, they have sufficient capital for purchasing necessary inputs, they can apply sufficient chemical fertilizers, pesticide and used killer and they can store the paddy produced to be sold when the price is high.

Most farmers of the study area own small paddy land. Likewise, the average land holding of Myanmar is only 2.2 ha. So, the development of paddy production depends on the small holders. By providing sufficient loans to farmers with low interest rate, selling agriculture machine by installment and by fixing on controlling the price of paddy, and upgrading the roads in the rural remote areas, the small holders can increase the yield and earn more income from paddy production. If the socioeconomic status of the rural farmers has become somewhat higher, the study area as well as rural area of other parts of the country will witness speedy and higher development momentum. As such, this research paper may be somehow helpful in implementing the rural development projects being carried out by the government. This research paper is aimed to discover advance technology, quality of seeds and practicable solutions to mitigate the negative impacts of Climate Change on farmers' lives. The findings obtained from this research project will be of significance in planning sustainable agriculture and rural, regional development of the country.

Acknowledgements

First and foremost, I would like to acknowledge to Dr. Theingi Shwe (Rector, Hinthada University) for their kind permission to conduct this research work. I also thank to Dr. Khin Hnin Phyu (Professor and Head, Department of Geography, Hinthada University) for her kind permission carried out this research paper. Special thanks are due to Dr Zin Nwe Myint (Professor and Head, Department of Geography, University of Yangon) for her kind permission to conduct the project paper. Special thanks are due to members of Geography Steering Committee for their valuable suggestions, guidance and permission to carry out this research paper.

References

NAPA, (2012*). Myanmar's National Adaptation Programme of Action (NAPA) to Climate Change* 2012, p.20).

Seinn Seinn MU, et al., (2015). *Farmers' Adaptation to Rainfall Variability and Salinity through Agronomic Practices in Lower Ayeyarwady Delta, Myanmar;* Joural of Earth Science & Climatic Change, Thailand, Vol 6, Issue 2, pp1-12

Tin Hlaing, (2004). *Agricultural Research Extension and Rural Development in Myanmar.Rural Development Programmed in Myanmar;* Myanmar Academy of Agricultural, Forestry, Livestock and Fishery Sciences, Myanmar.

Tin Tin Mar, (2013). *Geographical Analysis on the Rural Development of Hlegu Township, Yangon Region,* unpublished PhD Dissertation, Department of Geography, University of Yangon, Myanmar.

ကျော်မြင့်၊(၁၉၉၈)၊ မြန်မာနိုင်ငံ၏ဆန်စပါး တိုးတက်စိုက်ပျိုးထုတ်လုပ်ရေးအတွက် ခေတ်ကာလအလိုက် ကြိုးပမ်းဆောင်ရွက်ချက်များ၊ လယ်ယာစိုက်ပျိုးရေးနှင့်ဆည်မြောင်းဝန်ကြီးဌာန၊မြန်မာ့စိုက်ပျိုးရေးလုပ်ငန်း။