

YANGON UNIVERSITY OF ECONOMICS

DEPARTMENT OF COMMERCE

Master of Accounting

**FACTORS INFLUENCING SUSTAINABLE AGRICULTURAL
PRACTICES OF FARMERS IN TAIKKYI TOWNSHIP, YANGON**

SHWE YEE PHOO WAI

DECEMBER, 2020

**FACTORS INFLUENCING SUSTAINABLE AGRICULTURAL
PRACTICES OF FARMERS IN TAIKKYI TOWNSHIP, YANGON**

This thesis is submitted to the Board of Examiners in Partial Fulfillment of the
Requirements for the Degree of Master of Accounting (M.Act)

Supervised by:

Dr. Phu Pwint Nyo Win Aung
Lecturer
Department of Commerce
Yangon University of Economics

Submitted by:

Ma Shwe Yee Phoo Wai
M Act II -2

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This is to certify that this dissertation entitled **“Factors Influencing Sustainable Agricultural Practices of Farmers in Taikkyi Township, Yangon”** submitted as the requirement for the Degree of Master of Accounting has been accepted by the Board of Examiners.

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Yangon University of Economics

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Yangon University of Economics

Dr. Than Soe Oo

(Examiner)

Lecturer

Department of Commerce

Yangon University of Economics

Dr. Phu Pwint Nyo Win Aung

(Supervisor)

Lecturer

Department of Commerce

Yangon University of Economics

ABSTRACT

The purpose of the study was to investigate the factors which influence the sustainable agriculture practices of farmers in Taikkyi Township, Yangon. This study has two objectives. These objectives were to examine farmers' perception and to analyze the factors influencing on sustainable agricultural practices in Taikkyi Township. To achieve these objectives, primary and secondary data were used. In this study, the primary data was acquired from 100 farmers among three village-tracts in Taikkyi Township by using simple random sampling. As the regression result, credit access, technology adoption and environmental awareness influenced on sustainable agricultural practices and input supply didn't significant influenced on sustainable agricultural practices. Therefore, farmers' access to credit is very important factors in sustainable agricultural development. In addition, this study suggests that government should provide the program or schemes of credit access for famers live in rural area. And also government, non-governmental organization and international non-governmental organizations and communities need to support more inputs, training to sustain agriculture sectors.

ACKNOWLEDGEMENTS

First of all, I would like to express my gratitude to Prof. Dr. Tin Win, Rector of the Yangon University of Economics, for his contribution and encouragement to the participants of the M.Act Programme. My heartfelt thanks go to Prof. Dr. Ni Lar Myint Htoo, Pro-Rector, Yangon University of Economics, for her supports to have an opportunity to study.

I would like to express sincere appreciation to Prof. Dr. Soe Thu, Head of Department of Commerce, and Yangon University of Economics for her monitoring, encouraging and guidance in carrying out this paper.

My deepest appreciation goes to my supervisor Dr. Phu Pwint Nyo Win Aung , Lecturer, Department of Commerce, Yangon University of Economics for her support and help to make my paper effectively and proficient supervision, kind guidance, suggestions, patience, sharing knowledge and valuable time for the accomplishment for my thesis.

Furthermore, I would like to thank to the following persons who are farmers in War Boo Su, Tha Pyay Tan, Aust Su, Taw La Tee and Sar Phyu Su for the necessary information.

Finally, I must express my very profound gratitude to my parents for providing me with unfailing support and continuous encouragement throughout my years of study and through the survey process and writing this thesis, this accomplishment would not have been possible without them.

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LIST OF ABBREVIATIONS

AFFM	Agriculture and Farmers Federation of Myanmar
CA	Conservation Agriculture
FAO	Food and Agriculture Organization
GDB	Gross Domestic Product
HATC	Hmawbi Agricultural Input Complex
NEED	Network for Environment and Economic Development
MHA	Ministry of Home Affairs
MRC	Ministry Of Religion and Culture
MSY	Mya Sein Yaung
MADB	Myanmar Agricultural Development Bank
ROI	Return on Investment
SAPs	Sustainable Agricultural Practices
SATC	Sustainable Agriculture Training Center
SMU	Seamaul Undong in Myanmar
TBP	Theory of Planned Behavior

CHAPTER 1

INTRODUCTION

The main industry in Myanmar is agriculture. Agriculture, which plays an important role in causing climate change, water scarcity, land destruction and other processes, has an immense environmental footprint. Environmental changes simultaneously cause and is impacted. Intensive agriculture has been practiced since 1960s has very high yields but it can cause the emissions of greenhouse gases, depletes soils and biodiversity. Farming can ultimately be seen as an ecological activity in which natural environments open to climate; wild biota and substrate factors are prepare to increase the yields of desired food and fiber products.

The use of many industrial inputs (i.e., plant protection products and mineral fertilizers) is required in intensive agricultural production and a major threat can be created by their excessive use to the environment, for example, animal welfare, biodiversity and soil quality. In farming activities, other factors can cause environmental degradation include improper manure management within the farm, dust substances and releases of gaseous from intensive agriculture or animal husbandry in to the air, and disposal waste management Agricultural production has a detrimental influence on the environment and this is dependent on the type of farm and the process of production. In order to have an environmental effect, agricultural production is crucial. When analyzing this diversity, mainly agricultural systems are taken into account.

Sustainable agriculture is an important concept for alerting farmers and is an alternative agricultural system to conventional farming methods. The methods are capable of achieving the objective of optimizing profitability of traditional agriculture and preserving the ecological dynamics of biodiversity and agro-ecosystems. Sustainable farming practices take into account not only the potential requirements for increased production, but also the quality of the climate, water, environment and soil. Sustainable agriculture is sustainable farming, which means meeting the existing food and textile needs of society without losing the capacity of present or future generations to fulfill their needs. It can base the awareness of resource in ecosystem. Sustainable farming can be improved in many ways. It is important to establish

flexible business processes and agricultural practices while developing agriculture in the sense of sustainable food systems.

Promoting sustainable farming practices as a way of resolving the problems facing agricultural growth and achieving the aim of sustainability has become a major issue among development planners, donor agencies and extension staff. The implementation of sustainable farming practices can reduce the undesirable effects of agricultural activities. In fact, various processing processes may be used in the production of plants to ensure their sustainability. They include, among others, conservation, precision production, agroforestry, organic agriculture, and integrated agro-farming systems. Sustainable practices can help ecosystem, sustain habitats, foster economic prosperity for farms and improve the quality of life of farmers.

Environmental sustainability in agriculture implies good management of the natural systems and resources on which farmers rely. Sustainable agriculture also uses techniques to protect water sources from contamination and aims to avoid pollution (pollution is considered to be 'waste' exiting the system in these systems), such as the use of filter strips in the area of bodies of water and contour farming. The practices of farmers generally reflect the experience and ethics of farmers. Implementing sustainable practices includes improving the awareness and capability of farmers. The farmers' perceptions regard the compatibility of sustainable practices with their agriculture systems emerged as the best predictors of adopting such practices. Before using them, farmers need to believe that sustainable practices are important. Understanding the perceptions of farmers toward sustainable agricultural practices and private sustainability approaches will help reduce the major environmental danger. In this study, the aim is to find out the many factors in which influence the farmers' intention to adopt sustainable agriculture practices (SAPs).

1.1 Rationale of the Study

Myanmar is an agricultural country, and the agriculture sector is the essential role of its economy. In spite of being limited pollution problems in Myanmar to the chemical industrialize areas; the use of chemicals in farming will increase the sustainability problems of environment, as the double cropping or intensive farming to improve the agricultural productivity. In view of the importance of environmental

protection, capacity building is urgently required for natural resource management in Myanmar. According to Myanmar Agriculture Development Strategy and Investment Plan (2018-23), Myanmar needs to change sustainable agricultural system due to competitive, climate change and food and nutrition secure. The sustainable agriculture system can contribute to the socio economic benefit of farmers and rural people.

In order to increase the efficiency and sustainability of agricultural production in line with market demand, agricultural productivity requires the introduction of appropriate technologies. The measures to raise agricultural productivity include: efficient use of agricultural inputs, efficient and sustainable practices, effective agricultural research and extension; increase resilience to climate change and disasters, and natural resource use (land, forest, water, soils).

Efficient practices, productive and competitive are adopt in sustainable agriculture while improving and protecting and improving global ecosystem and environment and also promoting local communities' socio-economic conditions in line with human dignity. Sustainable agriculture aims to minimize the use of resources at all production levels and not only adopts smart farming systems but also embraces less energy-intensive agriculture production tools. In Myanmar, small-scale rural farmers' large population pioneer sustainable agriculture. Sustainable agriculture promotes economic prosperity for farms and their quality of life with increased income from sustainable agricultural practices.

Sustainable agricultural loans, finance and fee predominate largely depend on the transition to or maintenance of sustainable agriculture that tools manage inherent risks in dependence on nature for ROI. Grants or loans often need to supplement transition to more sustainable production techniques. Considerable successes have been achieved in Sustainable agriculture because the usage and adoption of technologically advanced farming practices. Farmers need to adopt the different farm-level technologies to be economic social sustainable and ecological benefit and provide protective for rural environment. The level of farmers' perceptions of environmental awareness and issues are other barriers to adoption. Environmental innovations are likely to be adopted by farmer when they aware a risk of environmental deterioration by traditional practices. A barrier to adoption is often being regarded to the lack of farmers' information about sustainable agriculture

practices (Bell, Carolan, Mayerfeld, & Exner, 2001). Furthermore, the one of advantage in SAPs is the current availability of environmentally sustainable inputs supply. Sustainable agriculture manufactures its own inputs (fertilizers from animals and feed grown on the land). Sustainable farms do not use fertilizers, chemical pesticides, and genetically modified seeds. Chemical fertilizers affected the negative impact on soil, waters, plants, people and air than natural fertilizers. The positive perceptions will be had by farmers toward sustainable agriculture as they can access to physical inputs, negative impacts of agrochemicals on human health, marketing facilities and know-how in problems associated to protection of farm resources. The training on sustainable agriculture methods ensure that local farmers are able to adapt to natural conditions. Farmers are helps by the training opportunity decide how to boost the sustainability of their farms. In implementation of sustainable agriculture in practice, discussing strategies for solving or minimizing the issues on adoption sustainable agriculture practices provides a road map for the development of sustainable agriculture.

Taikkyi Township is one part of agriculture land in Myanmar and also leading productivity of agriculture sector. In the ancient period, paddy cultivation engaged by farmers based on production and rainy water and manual production methods. Now, famers used new machinery in harvesting and other production processes. The agricultural officers who are trained in foreign and local institutions or universities and then they provide guidelines and timely instructions to farmers to improve paddy sector. Modern technological techniques (chemical fertilizers, new farm machines, new paddy seeds and agrochemicals) are being adopted by the most traditional paddy farmers. As the result, the agricultural paddy sectors have been rapidly transformed from the traditional to the commercial status. Therefore, the new technology adoption is one of important factor to influence paddy yield and farmers used new agricultural or cultivation technologies and their perceptions to avoid risk in agricultural sectors. To support the agricultural sector of Myanmar in designing sustainable agriculture, the study focuses on farmers' perception and factors that influence on sustainable agriculture practices of farmers in Taikkyi Township, Yangon.

1.2 Objectives of the Study

The purposes of this study are:

- (1) To examine farmers' perception on sustainable agriculture practices in Taikkyi Township
- (2) To analyze the factors influencing sustainable agriculture practices of farmers in Taikkyi Township

1.3 Scope and Method of the Study

The overall scope of this research is to analyze farmers' perception and factors that influence on sustainable agriculture practices of farmers in Taikkyi Township, Yangon. This study was based on both primary and secondary data. Primary data was collected from farmers of selected three village-tracts (Ball la kwot, Min Hla wa and Taw la Tee) in Taikkyi Township, Yangon. The total population is (146) farmers in three villages in Taikkyi. The sample was selected 100 respondents of farmers from random five villages of three village-tracts in Taikkyi Township, representing 68% of population. Data are analyzed descriptively and inferentially. The descriptive analysis employs the mean score and standard deviation for all of the constructs. The inferential statistical tests are performed to examine the factors affecting sustainable agriculture practices of farmers using multi-linear regression.

1.4 Organization of the Study

This paper is formed with five chapters. Chapter one presents introduction in which rationale of the study, objectives of the study, scope and methods of the study and organization of the study. In Chapter two, presents the theoretical background regarding the conceptual framework. Chapter three describes background information for sustainable agriculture practices in Taikkyi Township, Yangon. Chapter four presents the factors influencing sustainable agriculture practices in Taikkyi Township. Finally, Chapter five is conclusion that comprises research findings and discussions and, suggestions and recommendations and then needs for further study.

CHAPTER 2

THEORETICAL BACKGROUND

This chapter presents about the theoretical background of this study. The chapter looks at definitions, the theories and previous studies in line with the study objectives. Specifically, sustainable agriculture practices, credit access, input supply, training of farmer, technology, environmental awareness, and finally conceptual framework of the study.

2.1 Sustainable Agricultural Practices

Sustainable agricultural practices (SAPs) are resource protection or conservation non-degrading in the environment, technically suitable, social acceptance and the potential economical. In general, SAPs are directed to the efficient use of natural resources. Due to the increase retention of organic matter, detected risk of soil erosion, to become to adopt tillage systems, covers crops and crop rotations (Chan & Pratley, 1998). Agricultural practices are a concept of guidelines for the implementation of agricultural production processes to enhance agricultural products and farming practices to promote agriculture sector. One of the sustainable agriculture is an organic farming (crop rotation, animal husbandry and manures etc.)

2.2 Theoretical Review

Ajzen's the Theory of Planned Behavior (TBP) (1991) inform the concepts of social norms, attitudes and agency which most use theoretical framework in environmental behavior research (Klockner 2015). TPB describes behaviors mainly as a result of individual behavioral intentions.

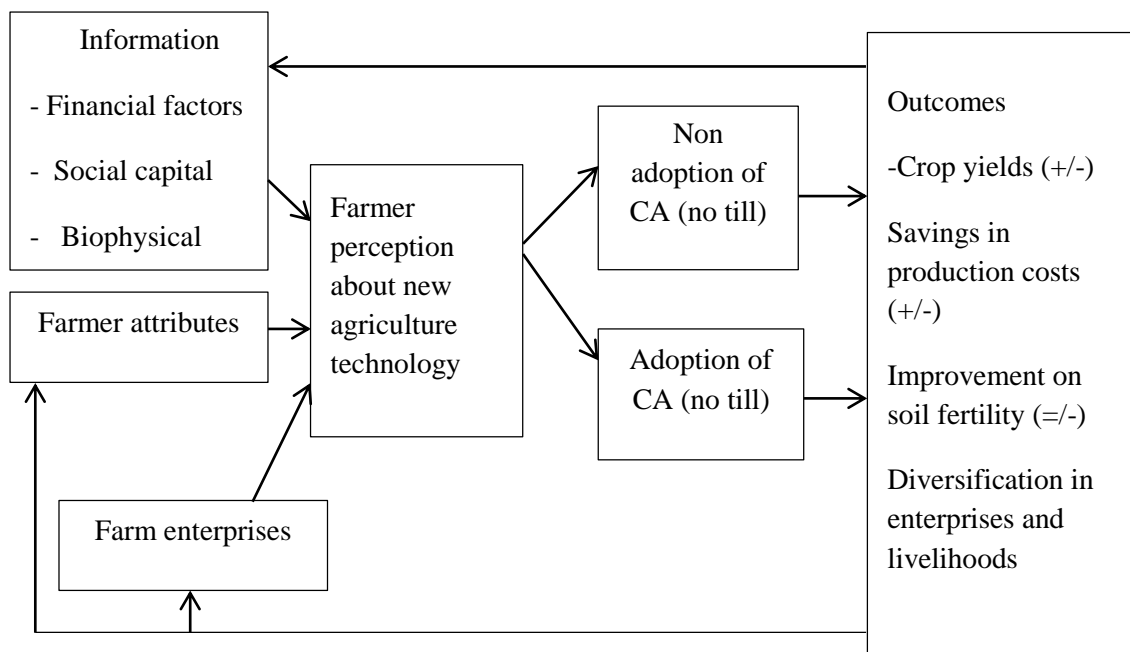
The FAO (2004) developed an ethical framework for agricultural sustainable intensification, using a simple schema of human action. Actors who explain actions under the some constraints can each characterize the associations or designated agents of organizations and individuals. These constraints describe as the potential behavior or action. There are three kinds of constraints. First constraint is the physical universe of possibility limit the physical of possible actions represents technology. Second is the law and policy also limits the universe of behavior and actions. Third is

individuals and associations constrain their behaviour may function very effectively to limit the universe of possible alternatives for action. These three constraints make up the chance or opportunity set – the class of behaviors or actions.

2.3 Empirical Studies

Ntshangase, Muroyiwa, & Sibanda (2018) studied Farmers’ Perceptions and Factors influencing the Adoption of No-Till Conservation Agriculture by Small-Scale Farmers in Zashuke. The purpose of this study was to determine the factors that influence the adoption of no-till (CA) and to explore farmers’ perceptions and impact of no-till on maize yield.

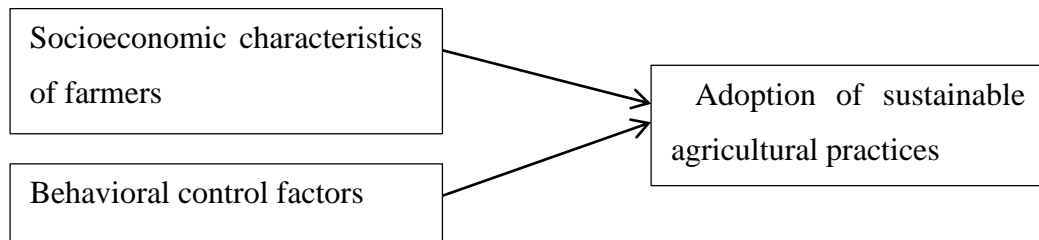
Figure (2.1) Farmers’ Perceptions and Factors Influencing the Adoption of No-Till Conservation Agriculture by Small-Scale Farmers in Zashuke



Source: Njabulo Lloyd Ntshangase, Brian Muroyiwa and Melusi Sibanda (2018)

Njabulo Lloyd Ntshangase, Brian Muroyiwa and Melusi Sibanda (2018) found that farmers’ perceptions were positively related with higher maize yields. While an increase in extension visits, education, age and farmers’ positive perceptions are related farmer sustainable farm an increase in land size was negatively related to no-till sustainable agriculture adoption.

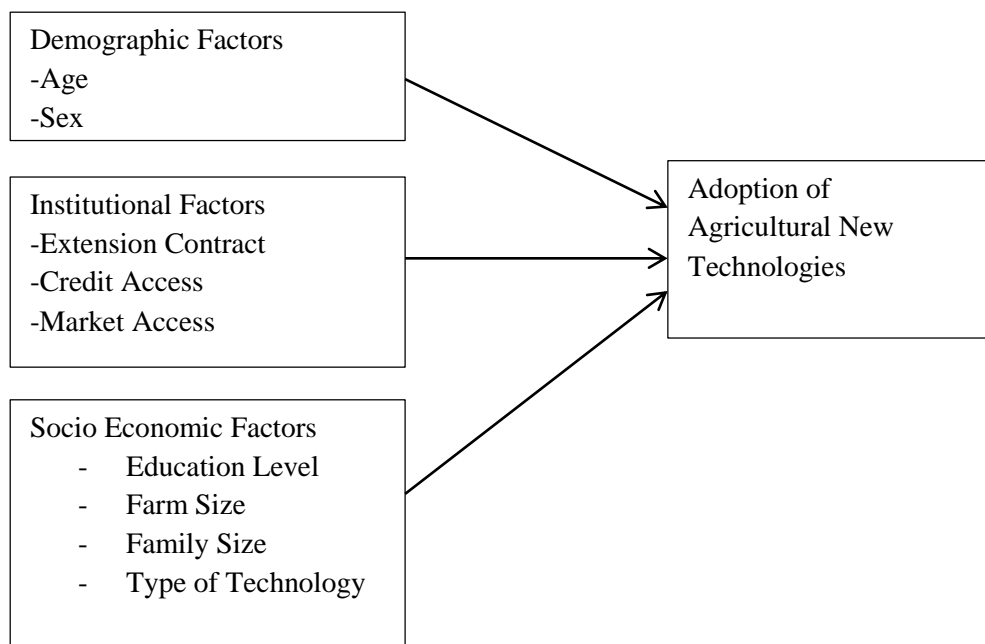
Figure (2.2) Factors Influencing Banana Farmer’s adoption of Sustainable Agricultural Practices



Source: Nguyen Van Thanh and Chinawat Yapwattanaphuna (2015)

In Figure (2.2), (Van Thanh & Yapwattanaphun, 2015) studied the factors influencing banana farmer’s adoption of sustainable agricultural practices (SAPs) in the uplands of Quang Tri province, Vietnam. The study found that the five factors had significant influenced on the adoption of sustainable agricultural practices (SAPs). Five factors include sustainable agricultural perception that these were most effective on banana farmers’ SAPs.

Figure (2.3) Factors Affecting Adoption of Agricultural New Technologies in Ethiopia

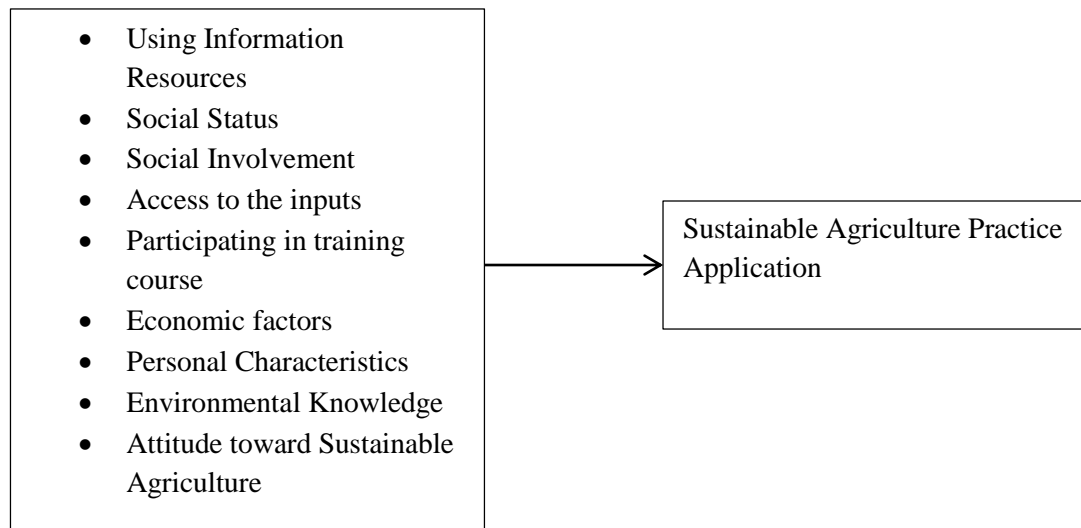


Source: Melesse B (2018)

Melesse (2018) studied a review on factors affecting adoption of agricultural new technologies in Ethiopia. This study developed that the adoption of agricultural

technologies were influencing the several interrelated components within the decision environment in which farmers operated. The lack of credit, inadequate farm size, and inappropriate transportation infrastructure, limited access to information, and human capital, absence of adequate farm equipment, tenure arrangements, and chaotic supply of complementary inputs was key constraints to rapid adoption of innovations technologies in less developed countries.

Figure (2.4) Effective Factors on Application of Sustainable Agricultural Practices by Paddy Farmers



Source: Amir Ahmadpour (2015)

Ahmadpour (2016) studied effective factors on application of sustainable agricultural practices by paddy farmers. The results showed that the application of SAPs was generally good. Moreover, the findings showed that there was a positive and significant relationship between family members, age, cultivating area, using information source, access to inputs, economic factors participating in extension training course and productions amount with the application of SAPs.

2.3.1 Credit Access

Credit is the important role in agriculture development and modern agriculture. Although credit can increase income and production, it cannot remove the financial constraint and may accelerate the adoption of technologies (Atieno, 1997). An agricultural household model indicates that farm credit requires not only self-financing constraints, but also ambiguity as to the level of production and the time lag

between inputs and outputs (De, Sadoulet, & De Anda, 1995). In developing countries, agricultural funding is the most important factors in the growth of rural area. Credit plays a key role in eliminating the financial restrictions of farmers from investing in farm operations, rising production and developing technologies. In general, access to credit is essential for improving the quality and quantity of agricultural products in order to increase farmers' income and prevent rural migration. The policy maker suggested that low interest rate credit payment to farmers will protect outcomes of agriculture development policies (Kohansal, Ghorbani, & Mansoori, 2008).

The presence of formal and informal credit markets is a common feature of rural credit markets in developing countries. (Ghate, 1992) Formal financial service providers are identified as registered companies licensed by a central monetary authority to provide financial services (Ghate, 1992). According to (Kashuliza, Hella, Magayane, & Mvena, 1998) , all sales, loans and deposits that take place outside the regulated 5 monetary system apply to informal financial services and this includes the operations of intermediaries such as relatives and associates, traders and money lenders. Semi-formal institutions are defined as institutions that are registered to provide financial services and are not managed by a central monetary authority (Steel & Andah, 2004).

Access to credit and timely access are necessary for farmers to obtain the inputs and machinery or equipment needed to carry out farm operations and activities. Restricted access to credit facilities is the key problem facing farmers, hampering the implementation of more effective and modern technology in farm operations. Farmers purchase most of their inputs in cash or from dealers on a credit-in-kind basis, leading to increased dependence of farm households on credit markets (Osabohien, Osuagwu, Osabuohien, Ekhaton-Mobayode, Matthew, & Gershon, 2020).

Access to and availability of sufficient, timely and low-cost institutional credit is of great importance, especially for small and marginal farmers. Along with the other inputs, credit is essential for developing sustainable and profitable agricultural systems (Maitima, Rakotoarisoa, & Kang'ethe, 2010). The majority of farmers are small producers engaged in farming activities in areas of varying potential. Experience has shown that easy access to affordable financial services has a positive

effect on the productivity, asset information, and revenue and food security of rural poor people. Therefore, the government's key concern is to put all farming households into the banking fold and to encourage full financial inclusion.

2.3.2 Input Supply

Restricted access to indispensable inputs such as improved seed varieties and fertilizers has been a major impediment to improving smallholder agricultural productivity in Africa. Simple help in the form of seeds and fertilizer to provide food for the family is an urgent need. In order to help these households become more efficient and enter commercial markets to generate income and improve their livelihoods, additional support in the form of properties, inputs, credit extension services and supportive policies is required (Muyanga & Jayne, 2006).

Input supply can be divided into three types of services that are fertilizers and chemicals, seeds and planting materials and machinery and equipment. Inputs, equipment and crops provide products because most are excludable. Fertilizers, pesticides and seeds have greatly enhanced the quality and yield of crops and food production.

The food production and marketing system input supply sector involves companies that produce and distribute myriad inputs used by the agricultural production sector. The agricultural input industry is large and involves a wide variety of firms providing agricultural producers with goods and services. Input suppliers are animal feed, seeds, machinery and equipment, fertilizer, crop safety, and credit and banking firms. Input subsidies tend to be the central theme in the agricultural input marketing controversy, and an effective agricultural input marketing strategy depends on how input subsidies are treated. As noted by (Dorward, 2008), in the 1960s and 70s, subsidies for agricultural inputs were a common element in agricultural production in poor rural economies, including successful green revolutions.

The significant issue for the agricultural sector and its stakeholders has always been the development of input markets. The comparative advantage of agricultural production between regions and types of production is affected by price and quality changes in input markets; these developments also affect farm household incomes and may have effects beyond the level of farming. Different stakeholder organizations,

including farmers' unions, advocacy groups, and policy makers, have raised concerns about concentration in input markets. Concerns arise, in particular, with regard to the market power of input suppliers, as this could lead to higher input costs and a distribution of rentals different from what would be created by a competitive market. Concerns related to concentration were also highlighted in the agricultural input markets.

2.3.3 Training of Farmers

Training for farmers is an important instrument commonly used by development programs in developing countries. (Birkhaeuser, Everson, & Feder, 2011). In rural farming societies, few people have had the opportunity to pursue formal education or technical training in best agricultural practice. Opportunity International helps to organize and provide farmers with suitable agricultural extension services. Farmer Support Agents or other local market players also promote these services and advise farmers on good agricultural practices based on their particular crops or livestock. As a result of these trainings, farmers also improved their farm management skills, obtained more profits and enhanced the local economy. These training courses develop the skills and knowledge of farmers in areas such as planting methods, irrigation, pesticides, crop rotation, and after-harvest crop storage. These skills help farmers to increase yields, protect their crops from weather-related shocks and increase their incomes.

2.3.4 Adoption to New Technology

An example of sustainable agricultural technology is the organic farming technology. Organic farming technology is defined as using traditional methods and original knowledge of agriculture while at the same time incorporating selected new technologies to increase diversity in the agricultural system (Bhatta, Doppler, & Bahadur, 2009). It is also an alternative to traditional agriculture that can support agricultural production, which can prevent a substantial negative impact of human activities on the environmental cause (Lankton, McKnight, & Tripp, 2015). Organic farming technology can be described as a production method that sustains the purity of soil, ecosystems and people. It blends tradition, creativity and science to foster a healthy atmosphere.

Sustainable agricultural technology or sustainable farming practices are also promoted to enhance the sustainability of agricultural systems (Tey, et al., 2012). There are issues regarding food safety and environmental friendliness is important. Concerned about the issue, the world is moving towards supporting a greener environment by manufacturing or producing in a secure environmental way. In the sector, sustainable farming is still a new form of farming. Sustainable farming is characterized based on the availability of inputs and the practices applied by farmers. Natural inputs and non-chemical materials that can be obtained from farms and households are used in sustainable farming (Pattanapant & Shivakoti, 2009). Many local farmers are still not familiar with this sort of method of farming. Sustainable farming gives our local farmers a lot of potential. Compared to traditional agricultural technology, sustainable agriculture also has a lower environmental impact (Tuomisto, Hodge, Riordan, & Macdonald, 2012). Some of the farmers have adopted such technology, however, failing to succeed because farmers are lack of knowledge and expertise (Hu, Zhang, & Wang, 2012).

The main driving force for rising agricultural production and fostering agricultural sustainability has been technological change. Due to the choice of technology and its implementation, production, efficiency and farm income have increased in the past.

2.3.5 Environmental Awareness

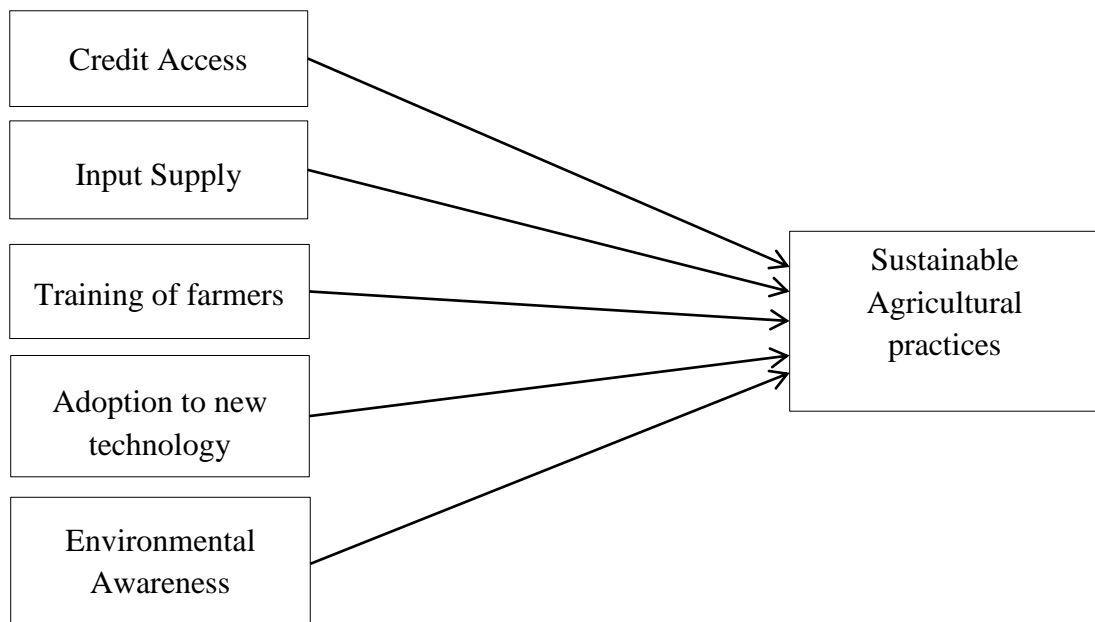
The extent to which farming has a positive or negative effect on the environment depends on the use of inputs and cropping patterns (Papadavid, et al., 2017). For and group, whether small or large, rural or urban, environmental protection is an immense challenge because its long-term effects have a significant effect on human life. (Shultsp & Zelenzy, 1999). One of the most significant preconditions for their survival and developments is the protection of soil, water and forest resources, which are crucial for the rural population. Agricultural and environmental relations are inevitable and may be positive and negative. Agriculture may improve, but also jeopardize soil fertility or the habitat of various species of plants and animals. (Murch, 1971). Application of various agrochemicals in the process of food production, without the prior education of farmers, risks not only the health and quality of life of a farmer and his family, but also the health of the public as well. (Miltojective, 2006).

Agricultural producers see themselves as individuals who care for the environment and are responsible for protecting it (Sarkovic, Cvejic, & Bogdanov, 2016). Research by Berenguer has shown that there is a certain difference between the ecological attitudes of people living in rural areas towards people living in cities and that research indicates that the rural population is more responsible for the environment and more likely to act in a way that is coordinated with environmental protection (Berenguer, 2005).

2.4 Conceptual Framework of the Study

Based on the above previous studies and conceptual framework of Amir Ahmadpour (2015), the conceptual framework are shown in Figure (2.5).

Figure (2.5) Conceptual Framework of the Study



Source: Adapted from Amir Ahmadpour (2015)

This study considered five factors influencing on the sustainable agricultural practices; credit access, input supply, training of farmers, adoption to new technology and environmental awareness. Sustainable agricultural practices were dependent variable.

Table (2. 1) Definitions of Variables Used in the Sustainable Agricultural Practices (SAPs)

NO.	Variables	Definitions
1	Credit Access	Credit access is the trust that enables one party to provide another party with money or services if the second party does not automatically reimburse the first party, but instead arranges to refund or return those resources at a later date.
2	Input supply	Agricultural production needs such as feed, fertilizers, crop chemicals and seeds are input supplies needed by farmers to generate income and improve their livelihoods.
3	New Technology	New technology is the series of methods or process, new techniques practiced by farmers to increase farm productivity.
4	Training of farmers	Training of farmers are agricultural developing or teaching in oneself or others, any knowledge and skills that relate to useful competencies
5	Environmental awareness	Environmental awareness shows that an individual has knowledge, information, perception of an environmental problem, which involves their answer to these problems (Ziadat, 2010)

CHAPTER 3

BACKGROUND INFORMATION FOR SUSTAINABLE AGRICULTURAL PRACTICES IN TAIKKYI TOWNSHIP

This chapter presents the overview of Myanmar agriculture industry, profile of Taikkyi Township and sustainable agricultural practices in Taikkyi Township.

3.1 Overview of Myanmar Agriculture Industry

In Myanmar, the backbone of the economy is the agriculture. In 2018, it accounted for 23.3% of GDP (USD 66.7 billion), 9% of exports (USD 14,851 million) and 50% of total jobs (22 million). However, compared to those achieved by farmers in other Asian rice bowls, Myanmar has lower agricultural productivity and the lowest rice production income. The outcome of the other multiple factors contributed to low productivity. This involves limitation on information and the data, on input quality and on timely, no invest in Research and Development (R&D), limited measure the quality control, farming techniques, climate change and also a limited quality seeds and limited irrigation. Despite the increasing awareness of higher export requirements for organic fertilizers, organic fertilizers are still not widely available on the market. The country, however, has the power of an increasing domestic market and a strategic place for global exports. Besides, some policy measures to improve the agriculture sector are strongly taken by the government. Myanmar's potential farming growth is expected to more foreign trade opportunities are opening up in the supply chain upstream and downstream.

3.2 Profile of Taikkyi Township

According to MHA and MRC, Taikkyi Township was established in 1972. It is located in the Yangon region's northern part. There were 61706 households in 2018, and the total population of Taikkyi was 26726777 (129333 males and 137934 females). Taikkyi Township's population was 269665 in March 2019, with 139,805 females and 129,860 males. According to Taikkyi Township population and housing measurement, 17,075 households live in the urban area and 45,150 households live in the rural area and 75 village tracts have in the Taikkyi Township that are 476 villages under these village tracts. In Myanmar, the village tracts include the smallest village's

subdivision. Among these 476 villages, 32 villages are implementing the MSY village project and 1 village is implementing the SMU project.

The occupations of population in Taikkyi are shown in Table (3.1).

Table (3.1) Occupations of Population in Taikkyi Township

NO.	Types of Work	Amount	%
1	Government Staff	5,236	3.00
2	Agriculture	26,381	18.00
3	Livestock	8,703	5.00
4	Trade	33,071	15.00
5	Factory	297	1.00
6	Casual	98,211	56.00
7	Other	3,210	2.00
Total		175,109	100

Source: Taikkyi Township General Administration Office, 2020

Many people in Taikkyi Township are casual employees, such as motor transport services and mason workers. Farmers raising corn, sesame, groundnut, and beans, cotton, maize, and sunflower, rhinoceros, are the second largest workforce. Sickles, coconuts, rubber and mangoes are some of the perennial crops.

3.3 Sustainable Agricultural Practices in Taikkyi Township

The situations of credit access which provided by formal and non-formal financial institutions, input supply which support by government, various training for sustain agriculture farmers' adoption of new technology innovation to sustain and farmers' awareness on environment are expressed as follow.

3.3.1 Credit Access

MADB is a major provider of farm loans to farmers. MADB loan products always cover the short-term needs of farmers for working capital (eg, purchase of seeds, fertilizers and pesticides). In Taikkyi Township, MADB is the essential lender of agricultural credit for farmers. To cultivate their seasonal crops and paddy, 100% of farmers borrow from MADB. The loan interest rate of MADB is most comfortable to farmer and receive maximum loan. Twice a year, MADB loans farmers to grow rainy crops and winter crops. Mya Sein Yaung project provide source of credit for farmers with low interest rate loans twice a year.

3.3.2 Input Supply

In Taikkyi Township, some farmers may use seed varieties and fertilizer. In order to help farmers become more efficient and enter commercial markets to generate revenue, government support policies and extension services. In its long-term development policy, the government has consistently emphasized growth in agricultural productivity and food security. The government aimed to increase access to modern inputs and extension services for the largely smallholder agricultural sector of the country. Smallholders are supplied with improved certified seed through input supply systems, regional, state-run extension that operate with a degree of MADB guidance.

3.3.3 Training for Farmers

In Taikkyi Township, farmers are trained in their community to become organic farmers and to create a strong network among farmers. Taikkyi Township has training centers to educate farmers in agricultural practices. These training centers have many objectives. There are (1) to disseminate agricultural technology skills and information through training and kind assistance, (2) research and implementation of modern, effective agricultural technology, (3) to build training opportunities for rural farmers, (4) food security, (5) self-sustainability and (6) to inform the environmental sustainability. Training program started since 2006. And also, a specific strategy was started by the Agriculture and Farmers Federation of Myanmar (AFFM) to define. The aim of the AFFM was to improve the creative skills or ideas of the youth and young farmers for improved sustainability and a safe modern agriculture sector. The

youth members were sent to the Next Generation Agriculture School by AFFM to help promote the agricultural sector's continued growth through youth participation.

A Training Center in Nyaung Bin Tharyar Village, Hmawbi Township, in Yangon Region was provided by the Network for Environment and Economic Development (NEED). More than 60 youth had been already graduated all over Myanmar by NEED-EVF about sustainable agriculture, Community Development and Environment conservation. Moreover, The Sustainable Agriculture Training Center (SATC) was started in August 2005 and is located in Hmawbi Township, approximately 46 km north of Yangon. Livestock, numerous on-farm crop and appropriate technology demonstrations and a variety of agriculture, training material and community development resource locally developed and distributed by SATC. SATC outreach to target organizations and serve the basis for training center.

3.3.4 Adoption to New Technology

In Taikkyi Township, rural famers use various farming technologies. Technology in agriculture can be used in different aspects of agriculture such as minimal tillage, no till, drip or sprinkler irrigation, crop rotation and mixed cropping. Traditional tillage system has been used as the method to modify for planting, reduce plant residue and decrease soil erosions and water pollution. Tillage can be an essential part in successful and minimizing mechanical operations, profitable agro-ecological enterprise and soil disruption in field can lead to benefits.

The Hmawbi Agricultural Input Complex (HAIC) was revealed by Myanma Awaba Group (Awba) located near Wa Nat Kyaung Village in Hmawbi Township, Yangon. Awba and Soilcares (Netherlands-based Company) have teamed up to deliver affordable, on-the-spot soil testing services to the Myanmar's smallholder farmers. More production facilities, solar farms and high-density warehouses, greenhouse and trial farms would include future developments for HAIC.

3.3.5 Environmental Awareness

Myanmar's Network for Environment and Economic Development (NEED) aims to resolve local environmental and food security concerns by educating young adults in permaculture practices from rural areas throughout country. In south of country, an eco-farm has been built by NEED and now, 60 students have completed the program of their 10 months environmental education. The challenge NEED is to help individuals and communities by improving traditional, practical skills and cultural and knowledge or ecologically sustainable and practices, community friendly agricultural techniques, processes.

Most of farmers in Taikkyi Township are more willing to protect the natural environment by forecasting the environmental problems. Farmers carry out their farming under different social and economic circumstances and impact of environment. Farmer need to understand the environmental impact of agriculture through practices applied and production made because they can significantly decrease or increase the negative impact of agricultural production on the individual elements of the ecosystem. Therefore, the environmental awareness of farmers is importance role in reducing the negative impacts of agricultural production.

CHAPTER 4

FACTORS INFLUENCING SUSTAINABLE AGRICULTURAL PRACTICES OF FARMERS

This chapter includes data analysis and findings from the questionnaires answered by 100 respondents of farmers from random villages among three groups of villages in Taikkyi Township, Yangon. Specifically the following subsections are included; research design, demographic profile of the respondent and mean and standard deviation scores of variables and regressions results.

4.1 Research Design

Descriptive method and inferentially uses in this study. Current study intended to examine farmers' perception on sustainable agriculture practices and to analyze the factors sustainable agriculture practices. This study uses a five point likert scale to measure farmers' perceptions. The data was gathered from the primary and secondary data. Primary data are collected from farmers of selected villages-tracts (Ball la Kowt, Min Hla Wa, and Taw La Tee). This research, the population included 68 percent of 146 famers from random five villages of three village-tracts in Taikkyi Township, Yangon. Secondary data are acquired from previous thesis, journals, internet website and also relevant books.

The questionnaire has two parts. First part included demographic profile of respondents which are farmer groups, gender, age, and educational background, type of possession, farm types and getting loan. Second part included sustainable agricultural practices with seven questions and also involved five influencing factors which are 7 questions of credit access, 5 questions of input supply, seven questions of training of famers, adoption to new technology which is five questions and 9 questions are environmental awareness. Final part included sustainable agricultural practices with seven questions.

4.2 Demographic Profile of Respondents

The following are profile of respondents in Taikkyi Township, Yangon. As using the questionnaire forms survey the farmers from random villages. Convenience

sampling is defined as a method adopted to reach responses on sample size. In Table (4.1) show that the profile of respondents.

Table (4.1) Demographic Profile of Respondents

Categories		Frequency	Percentage
Villages	Ball la kwot	14	14
	Min Hla wa	37	37
	Taw la Tee	49	49
Gender	Female	24	24
	Male	76	76
Age	18-25 years old	2	2
	26-35 years old	10	10
	36-45 years old	23	23
	46-55 years old	39	39
	Above 55 years old	26	26
Education	Primary Education (Basic)	12	12
	Middle Level Education (Basic)	37	37
	High level Education (Basic)	43	43
	Graduate	7	7
	PhD Holder	1	1
Possession	Farm Owned	98	98
	Hired	2	2
Type of Farm	Paddy	99	99
	Bean	1	1
Getting loan	Yes	100	100
Total sample (100) farmers			

Source: Survey Data (2020)

Table (4.1) describes that 24% of the respondents are female and 76% are male in this study. When the farmers are asked about their villages, the results indicate that 14% of respondents are Ball La Kwot (14), 37% are Min Hla Wa (37), 49% of the respondents were Taw la Tee (49). Age group of the farmers is classified into five groups: 18-25 years old, 26-35 years old, and 36-45 years old, 46-55 years old and above 55 years old. In these age groups, indicates that 2% of the respondents

were in the age group of 18-25 years, 10% are in age of 26-35 years group, 23% were in the age of 36-45 years, 39 % were in the age group of 46-55 years and 26% were in age group of above 55 years.

In educational background level include: Primary Education (Basic), Middle level education (Basic), High level education(Basic), Graduate and PhD Holder, in this level, shows that 12% of respondents are primary education level (Basic), 37% are middle level education, 43% of respondents are high level education, 7% are graduate, 1% can be PhD Holder. In possession of respondent, referred to 98% of the respondents are farm owned, 2% of farm hired in random villages.

According to types of farms, it is shows that 99% of the respondents are cultivated paddy, 1% is cultivated bean. In this study, respondents' getting loans are described as yes or no. In this study, indicates that 100% of farmers get agriculture loan.

4.3 Analysis on Farmers' Perceptions

For this study, many influencing factors may lead to sustainable agricultural practices of farmers in Taikkyi Township, Yangon. In this paper, five factors are counted to make a survey in which these factors are credit access, input supply, training of farmers, adoption of new technology and environmental awareness. These factors interpret mean scores and standard deviation of relative influencing factors that can be described in the Tables.

4.3.1 Farmers' Perception on Credit Access

The first question related to whether perception on credit access influence on sustainable agriculture practices. Table (4.2) shows that the perception on credit access and farmers' responses.

Table (4.2) Perception on Credit Access

NO.	Items	Mean	Standard Deviation
1	Accessing to adequate, timely and low cost credit to small and marginal farmers	3.36	0.482
2	Provision of soft loans to smallholder farmers	3.43	0.498
3	Paying incentive for farmers to repay the loans in time	2.79	0.456
4	Lacking information on the cost of obtaining such services	3.08	0.614
5	Lacking awareness of existing credit schemes	2.96	0.665
6	Having higher interest rates by institutions	3.39	2.035
7	Having lengthy and vigorous procedures for loan applications	3.01	0.745
Overall Mean		3.15	

Source: Survey Data (2020)

Table (4.2) indicates that the respondents are agreed to credit access. According to the seven items, the highest mean score is 3.43 in which the respondents agreed on provision for soft loans to smallholder farmers.

Besides, the lowest mean score is 2.79 in which the respondents said that they never get incentive for farmers to repay the loans in time.

4.3.2 Farmers' Perceptions on Input Supply

Respondents were asked their views on the main source of input supply. They pointed out that personal savings is the main source of input supply. Input supply's mean and standard deviation are shown in Table (4.3).

Table (4. 3) Perception on Input supply

NO.	Items	Mean	Standard Deviation
1	Accessing to indispensable inputs such as improved seed varieties and fertilizer	3.47	0. 502
2	Accessing to extension services and supportive policies to help these households become more productive and enter commercial markets to generate income	3.04	0. 315
3	Accessing to equipment	3.61	0. 490
4	Effectiveness of market of vulnerable households	3.67	0. 493
5	Lacking sustained contact and cooperation with other public organizations such as trade (labour) unions and farmer's groups	3.13	0. 93
Overall Mean		3.38	

Source: Survey Data (2020)

According to the Tables (4.3), indicated that the respondents agreed to the input supply. Among five items, the highest mean scores of this item is effective of market of vulnerable households with the mean score of 3.67. This mentions that farmers' households are effective to market.

On the other hand, the lowest mean score of the item is access to extension service and policies with mean score of 3.04. It means that access to extension service and policies help households become more productive and enter commercial markets to generate income.

4.3.3 Farmers' Perceptions on Training

Training was being measured with seven items by using five point likert scales. The mean and standard deviations of training of farmers are shown in Table (4.4).

Table (4.4) Perception on Training

NO.	Items	Mean	Standard Deviation
1	Sharing their knowledge	3.36	0.482
2	Training on the best agricultural practices	3.43	0.498
3	Training on practices of environment-friendly as an alternative to conventional agriculture	2.79	0.456
4	Trainings on new information and to correct misconceptions concerning use of fertilizer	3.08	0.614
5	Trainings on soil and water conservation	2.96	0.665
6	Training on post-harvest handling	3.39	2.035
7	Training on the best crops for your soils	3.01	0.745
Overall Mean		3.15	

Source: Survey Data (2020)

According to Table (4.4), the highest mean scores of the item is training the best agricultural practices with the mean score of 3.43. The lowest mean score of statement is training on practices of environmental-friendly with the mean score is 2.79 in which farmers said that they never receive training on these farming practices.

4.3.4 Farmers' Perceptions on New Technology Adoption

New technology adoption measured with five statements. The mean and standard deviation values of adoption of new technology are calculated in Table (4.5).

Table (4.5) Perception on New Technology Adoption

NO.	Items	Mean	Standard Deviation
1	Training and advising have been strong influences on the choice of technology	3.4	0.492
2	Defining research priorities and best technology to address current and future food demands by society	3.07	0.293
3	Collaborating research and extension organizations with groups and farmers' organizations	3.89	0.424
4	using various type of irrigation	4.14	0.427
5	using certified seeds	4.15	0.435
Overall Mean		3.73	

Source: Survey Data (2020)

According to Table (4.5), the highest mean value of the adoption new technology with mean scores is 4.15. This means that farmers are using certified seeds to achieve more productivity.

On the other hands, the lowest mean value of these items with mean sores is 3.07. It means that the respondents were defining research and best technology to address current and future food demands by society.

4.3.5 Perception of farmers on Environmental Awareness

From the respondent perceptive, environmental awareness is one of the factors on sustainable agricultural practices. It was measured with nine statements. These nine statements were constructed by using five point Likert scale. The mean and standard deviations of environmental awareness are calculated in Table (4.6).

Table (4.6) Perception on Environmental Awareness

NO.	Items	Mean	Standard Deviation
1	Having the right to modify the natural environment to suit their needs	4.01	0.577
2	Interfering with nature, it often produces disastrous consequences	3.71	0.715
3	Insuring farmers ingenuity that we do not make the earth unlivable	2.97	0.3
4	Abusing the environment	3.71	0.517
5	Having plenty of natural resources if we just learn how to develop them	3.25	0.458
6	Having the right for plant and animals as farmer to exist	3.71	0.537
7	Being the balance of nature delicate and easily upset	2.92	0.545
8	Having a good environmental awareness for sustainable environment	3.16	0.368
9	Learning enough about how nature works to be able to control it	4.13	0.544
Overall Mean		3.51	

Source: Survey Data (2020)

According to Table (4.6), the highest mean value of environmental awareness with mean scores is 4.13. This means that farmers will eventually learn enough about how nature works to be able to control it. On the other hand, the lowest mean scores are 2.92 that the balance of nature is very delicate and easily upset but other times it's the opposite that the balance of nature is so powerful that it can correct any imbalances on its own.

4. 3.6 Farmers’ perception on sustainable agriculture practices

Sustainable agricultural practices depend on influencing factors. It were measured that seven statements. These seven statements were constructed by using five point likert scales. The mean and standard deviation values of sustainable agricultural practices are calculated in Table (4.7).

Table (4.7) Perception on Sustainable Agriculture Practices

NO.	Items	Mean	Standard Deviation
1	Leading to improvements in food productivity	4.26	0.597
2	Using technologies and practices that do not have adverse effects on environmental	4.31	0.581
3	Incorporating sustainable in agricultural systems, concepts of systems to buffer shocks and stresses	2.92	0.506
4	Using water Saving practices to maintain the sustainable agriculture	3.77	0.446
5	Being Sustainable agriculture land management necessary for farmers	4.21	0.556
6	Reducing pesticide use and carbon balance	3.51	0.522
7	Avoiding environmental degradation	2.91	0.514
Overall Mean		3.69	

Source: Survey Data (2020)

According to Table (4.7), the highest mean score is 4.31 in which the respondents agree that farmers use technologies and practices that do not have adverse effects on environmental. On the other hand, the lowest mean score is 2.91 that sustainable intensification as an increase in the effective of the use of water, fertilizer and pesticides, while avoiding environmental degradation.

Although technologies and practices are used by farmers, these practices didn’t effect on the environment. Because of farmers are training on the best technologies and practices. The environmental degradation can be caused by improving the sustainable intensification.

4.4 Factors affecting on Sustainable Agriculture Practices

Regression analysis was conducted to study the variation of adoption sustainable agriculture practices explained by credit assess, input supply, training, new technology adoption and environmental awareness. Table (4. 8) represents the regression coefficient of independent variable i.e. individual credit assess, input supply, training, new technology adoption and environmental awareness on dependent variable. The results indicate that 32.6% variations in sustainable agriculture practices are explained by credit assess, input supply, training, new technology adoption and environmental awareness. In addition, the value of Durbin Watson in the table is 1.962, which suggested that there is evidence of positive correlation and no singularity or multi-collinearity problem as VIF <10.

Table (4. 8) Factors affecting on Sustainable Agriculture Practices

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	1.047	0.402		2.606	0.011		
Credit access	0.178***	0.060	0.279	2.947	0.004	0.762	1.313
Input supply	0.045	0.102	0.045	0.441	0.660	0.655	1.528
Training	0.137	0.092	0.138	1.479	0.142	0.783	1.278
New technology	0.196**	0.090	0.208	2.187	0.031	0.753	1.328
Environmental awareness	0.222**	0.088	0.227	2.529	0.013	0.846	1.181
R ²	0.598						
Adj R ²	0.323						
F-value	10.455***						
Durbin-Watson	1.962						

Source: SPSS output, Survey Data (2020)

Statistical Significance Indicate *** at the 1% level, ** at the 5% level and * at the 10% level

Table (4.8) provided results from the regression analysis. The credit assessment had a significant influence on adoption the sustainable agriculture practices at 1% significance level. All predictors are significant in describing the

relationships ($b = 0.178$, $p < 0.001$), the result indicated that the credit assess are positively related to adaptation the sustainable agriculture.

New technology adoption is related to sustainable agriculture practices at a significance level of 5% ($b = 0.196$, $p < 0.05$) providing support for relationship between them. Adoption new technology influenced to lead the agriculture productivity.

Awareness of farmer on environmental concern influenced on sustainable agriculture practices as the environmental awareness is related to adaptation sustainable agriculture practices at 5% significance ($b = 0.222$, $p < 0.05$). Sustainable agriculture is a system that increase environmental quality and resources on which agriculture depends.

Input supply and training to farmer are not related to adaptation sustainable agriculture practices as the p value are above 0.5. Farmers do not agree on input supply and training to change sustainable way in agriculture practices.

In conclusion, farmer will adapted the sustainable agriculture as getting credit or loan. Maximizing the agricultural outputs is very important in Myanmar because the economy depend on agriculture. Farmer will agree the sustainable agriculture practices as improving the output through technology. Sustainable agricultural practices are intended to protect the environment.

CHAPTER 5

CONCLUSION

This chapter presents the summary of findings and discussions, and suggestion and recommendations. Finally, Needs for future study is presented. This study is discussed with the purpose of analyzing the factors influencing sustainable agriculture practices of farmers in Taikkyi Township, Yangon.

5.1 Findings and Discussions

According to the result, most of rural people are farmers. This study finds that the factors influence on SAPs. Primary data was gathered by structuring survey questionnaire from 100 farmers from random villages in Taikkyi Township, Yangon. To achieve two objectives based on survey questionnaires that are used demographic analysis, mean and standard deviation scores.

In this study, influencing factors are credit access, input supply, training of farmers, adoption to new technology and environmental awareness. According to demographic analysis, most of respondents are male; age group is between 46-55 years old. Most of respondents' education level is high level education (Basic) and they have their own farms. Moreover, most of respondents were grown paddy and their financial for productive purpose mainly depends on agriculture loans.

According to regression analysis, credit access had mostly significant influence on the sustainable agricultural practices. Adoptions to new technology and environmental awareness have significant influence on the sustainable agricultural practices. In this study, independent variables of input supply and training have no significant influence on the sustainable agricultural practices. This shows that access to credit influences on the sustainable agricultural practices because it is decidedly linked with agricultural productivity. Access to improved inputs mostly depends on access to credit. Farmers' access to credit is critical in Taikkyi Township because agriculture play an important role in its economy. The agriculture sector provides income to 18 percent of the households in Taikkyi Township.

According to analysis, input supply has no significant influence on the sustainable agricultural practices. This is because of even government support

indispensable inputs such as improved seed varieties and fertilizers and equipment, the farmers have lack of sustain contact and cooperation with other public organization and their talents on sustainable agriculture program which provide by government.

According to the analysis, training has no significant influence on the sustainable agricultural practices. This result show that various trainings provided by farmers' groups and other public organizations are not effective for farmers in Taikkyi Township.

In this study, according to result, adoption to new technology has significant influence on the sustainable agricultural practices because of the low use of improve technology become low productivity in agriculture. Most of the farmers in Taikkyi Township use technology in their cultivation.

According to the analysis, environment awareness has significant influence on the sustainable agricultural practices. This means that farmers in Taikkyi Township have environmental awareness which is related to their farming. Therefore, credit access, adoption new technology and farmers' environment awareness are influence on the sustainable agricultural practices.

5.2 Suggestions and Recommendations

Based on the results, banks and non-bank financial institutions should provide individual and group credits/ loans to farmers. They should extend credit terms to famers who are unable to provide collateral. At the household level, the farmers' participation in formal credit significantly increases with crop diversity, access to extension service. Therefore, it is suggested that the coverage of formal credit should increase through establishing branches and expanding the staff of the financial institutions in the remoter rural areas. There is a need to design innovative credit programs targeting specifically poor and small farmers. Farmers should have awareness of credit schemes obtain formations about access to credit for them.

Although input supply is not fully affected to sustain agriculture for farmers, government and other farmer's organizations should provide input supply of fertilizers and chemical, seeds and planting material, machinery and equipment for

farmers. The sustainable development of Myanmar's rural sector needs an immense amount of funding.

Government and other farmers' organizations should share knowledge through training on practices of environment-friendly as an alternative to conventional agriculture, new information and to correct miss-conceptions concerning use of fertilizer, soil and water conservation, post-harvest handling, the best crops for their soils. Training objective should lead to aware environmental issue in sustainability farming. Therefore, government and farmers' union groups should support for farmers to make and follow these training for their farms.

In rural area, adoption of new technology is increasing year by year. The majority of farmers are interested in introducing modern technologies. Farmers are corporate with farmer organization for using various types of technology to improve sustainable agriculture. In the area of agricultural production, farmers' education, specialization, social network, peer group influence, the cost of acquiring the technology effect on new technology adoption. This suggests that government and other farmers' associations should clearly provide information about new technological innovations and programs that support the using of new innovation.

According to the result, most of the farmers in Taikkyi Township have environmental awareness. They modify the natural environment to suit their needs, and they have learned about how nature works to be able to control it. Therefore, most of the farmers have a good environmental awareness for sustainable agriculture. Government and other farmer 'organizations should provide an inform environmental forecast on time from TV program, newspapers, and radio.

Therefore, government and other farmers' association should provide more program of credit access for farmers in rural area and also need to support more input and training to adopt new technological innovation to sustain agriculture. Most of the farmers need to have environmental awareness to sustain their agriculture. Finally, government, farmers' organizations should effectively contain in the process for sustainable agriculture in Myanmar.

5.3 Needs for Further Study

This research is studied to investigate the factors that effect on sustainable agricultural practices of farmers in Taikkyi Township, Yangon. In this study, the factors of credit access, input supply, training of farmers, and adoption of new technology and environmental awareness are only used. Therefore, other influencing factors should be considered for further study, for example, crops, livestock, and inadequate knowledge.

These studies only focus on 100 farmers from five villages among the village-tracts in Taikkyi Township, Yangon. Therefore, the further researches need to investigate the farmers from other rural areas in Myanmar.

REFERENCES

- Ahmadpour, A. (2016). Effective Factors on Application of Sustainable Agricultural Practices by Paddy Farmers (Case of Rural Production Cooperatives Members). *International Journal of Agricultural Management and Development*, 6(1), 81-91.
- Atieno, R. (1997). Determinants of credit demand by smallholder farmers in Kenya: An empirical analysis. *Der Tropenlandwirt. Journal of Agriculture in the Tropics and Subtropics*, 98(1), 63-71.
- Bell, M. M., Carolan, M. S., Mayerfeld, D., & Exner, R. (2001). *Professional development for the adoption of sustainable agriculture on rented land*.
- Berenguer, J. (2005). Rural-urban Differences in Environmental Problem, Attitudes, and Actions. *Journal of Psychological Assessment* 21.2), 128-138.
- Bhatta, G. D., Doppler, W., & Bahadur, K. B. (2009). Potentials of organic agriculture in Nepal. *Journal of Agriculture and Environment*, 10, 1-14.
- Birkhaeuser, D., Everson, R. E., & Feder, G. (2011). the economic impact of Agricultural extention. A review. *Economic development and cultural change* 39(3).
- Chan, K. Y., & Pratley, J. (1998). Soil structure decline-can the trend be reverse. In *Agruculture and the Environmental Imperative* (pp. 129-163).
- Chan, K. y., Pratley, j., Pratley, J., & Robertson, A. (n.d.). Soil structure decline-can the trend be reversed. In *Agriculture and the environmental imperative*.
- De, J. A., Sadoulet, E., & De Anda, G. G. (1995). NAFTA and Mexico's maize producers. *World Development* 23(8), 1349-1362.
- D'Emden, F. H., Llewellyn, R. S., & Burton, M. P. (2008). Factors influencing adoption of conservation tillage in Australian cropping regions. *Australian Journal of Agricultural and Resource Economics* 52(2), 169-182.
- Dorward, A. (2008). *Evaluation of the 2006/7 Agricultural Input Supply Programme, Malawi*.
- Ghate, P. (1992). *Informal finance: some findings from Asia*. Oxford University Press.
- Hu, Q. H., Zhang, L. X., & Wang, C. B. (2012). Energy-based analysis of two chicken farming systems: A perception of organic production model in China. *Procedia Environmental Sciences*, 13, 445-454.

- Kashuliza, A. K., Hella, J. P., Magayane, F. T., & Mvena, Z. S. (1998). *The Role of Informal and Semi-formal finance in Poverty Alleviation in Tanzania: Results of a field study in two regions. REPOA.*
- Kohansal, M. R., Ghorbani, M., & Mansoori, H. (2008). Effect of credit accessibility of farmers on agricultural investment and investigation of policy options in Khorasan-Razavi Province. *Journal of Applied Sciences*, 8.
- Lankton, N. K., McKnight, D. H., & Tripp, J. (2015). Technology, humanness, and trust: Rethinking trust in technology. *Journal of the Association for Information Systems*, 16(10), 880-918.
- Maitima, J. M., Rakotoarisoa, M. A., & Kang'ethe, E. K. (2010). Responding to changing markets in a context of increased competition for resources. *Livestock in a Changing Landscape: Experience and Regional Perspectives*, 2, 4.
- Melesse, B. (2018). A review on factors affecting adoption of agricultural new technologies in Ethiopia. *Journal of Agricultural Science and Food Research*, 9(3), 1-4.
- Miltojević, V. (2006). [Ecological Culture and Rural Development]. *Zbornik radova* 2, 286-293.
- Murch, A. W. (1971). Public concern for environmental pollution. *The Public Opinion Quarterly*, 35(1), 100-106.
- Muyanga, M., & Jayne, T. S. (2006). *Agricultural extension in Kenya: Practice and policy lessons (No. 680-2016-46750).*
- Ntshangase, N. L., Muroyiwa, B., & Sibanda, M. (2018). Farmers' perceptions and factors influencing the adoption of no-till conservation agriculture by small-scale farmers in Zashuke, KwaZulu-Natal Province. *Sustainability*, 10(2), 555.
- Osabohien, R., Osuagwu, E., Osabuohien, E., Ekhatior-Mobayode, U. E., Matthew, O., & Gershon, O. (2020). Household access to agricultural credit and agricultural production in Nigeria: A propensity score matching model. *South African Journal of Economic and Management Sciences*, 23(1), 1-11.
- Papadavid, G., Neocleous, D., Kountios, G., Markou, M., Michailidis, A., Ragkos, A., et al. (2017). Using SEBAL to Investigate How Variations in Climate Impact on Crop Evapotranspiration. *Journal of Imaging*, 3(3), 30.
- Pattanapant, A., & Shivakoti, G. P. (2009). Opportunities and constraints of organic agriculture in Chiang Mai province, Thailand. *Asia-Pacific Development Journal*, 16(1), 115.
- Sarkovic, A., Cvejic, S., & Bogdanov, N. (2016). The Environmental Awareness of Agricultural Producers in Serbia: Attitudes and Practices. 729-745.

- Shultsp, W., & Zelenzy, L. (1999). Values as Predictors of Environmental Attitudes Evidence for Consistency Across 14 Countries. *J Environ.Psychol.*,19, 225.
- Steel, W. F., & Andah, D. O. (2004). Micro and rural finance in Ghana. *Evolving industry and approaches to regulation*.
- Tey, Y. S., Li, E., Bruwer, J., Abdullah, A. M., Cummins, J., Radam, A., et al. (2012). Adoption rate of sustainable agricultural practices. A focus on Malaysias vegetable sector for research implications. *African Journal of Agricultural Research*, 7(19), 2901-2909.
- Tuomisto, H. L., Hodge, I. D., Riordan, P., & Macdonald, D. W. (2012). Exploring a safe operating approach to weighting in life cycle impact assessment-A case study of organic, conventional and intengrated farming systems. *Journal of Cleaner Production*, 37, 147-153.
- Van Thanh, N., & Yapwattanaphun, C. (2015). Banana farmers' adoption of sustainable agriculture practices in the Vietnam uplands: The case of Quang Tri Province. *Agriculture and Agricultural Science Procedia*, 5, 67-74.

Appendix

Questionnaires

Factors Influencing Sustainable Agricultural Practices of Farmers In Taikkyi Township, Yangon

The questionnaire is for my M.Act thesis about factors influencing sustainable agricultural practices of farmers in Taikkyi Township, Yangon. Please kindly answer the following questions. Thank you for your time to complete the questionnaire.

INSTRUCTIONS

Please tick the box that matches your answer or fill the space provided

Part I: Respondents' profile

1. What is the name of your Farmer Group (optional?) ()
2. Gender
 - Female ()
 - Male ()
3. Age
 - Below 18 ()
 - 18-25 ()
 - 26-35 ()
 - 36-45 ()
 - 46-55 ()
 - 55and above ()
4. Educational background
 - Basic Education (Primary) ()
 - Basic Education (Middle) ()
 - Basic Education (High) ()
 - Bachelor Degree ()
 - Master Degree ()

- PH.D Degree ()
- 5. Occupation of Farm
 - Owned ()
 - Hired ()
- 6. Family members ()
- 7. Worked Farm () Acres
- 8. Type of Farm
 - Paddy
 - Bean
 - Fruit & Vegetables
 - Flower
- 9. Get the agriculture loan
 - Yes ()
 - No ()

PART II: Sustainable Agricultural Practices

For each of the questions, tick against your response or write your response in the blank space provided

1. To what extent are you conducting the following practices? Please describe felling or opinion concerning sustainable agricultural practices: Use the following scale (1), strong disagree, (2), disagree (3), neutral (4), agree and (5), strong agree

No	Statements	1	2	3	4	5
1	Sustainable agricultural practices lead to improvements in food productivity					
2	Farmers use technologies and practices that do not have adverse effects on environmental					
3	Sustainable in agricultural systems incorporates concepts of systems to buffer shocks and stresses					
4	Water Saving practices is used to maintain the sustainable agriculture					
5	Sustainable agriculture land management is necessities for farmers					
6	Sustainable agriculture practices outcomes can be reduced pesticide use and carbon balances					
7	Sustainable intensification in avoiding environmental degradation					

No.	Credit Access	1	2	3	4	5
1	Availability and access to adequate, timely and low cost credit to small and marginal farmers					
2	Provision of soft loans to smallholder farmers					
3	Pay incentive for farmers to repay the loans in time					
4	Lack of information on the cost of obtaining such services					
5	lack of awareness of existing credit schemes					
6	High interest rates by institutions					
7	lengthy and vigorous procedures for loan applications					

2. Please tick your main source of input Supply

Personal savings ()

Provision by the government ()

Provision by NGO' ()

No.	Input Supply	1	2	3	4	5
1	Access to indispensable inputs such as improved seed varieties and fertilizer					
2	Access to extension services and supportive policies to help these households become more productive and enter commercial markets to generate income					
3	Access to equipment					
4	Effectiveness of market of vulnerable households					
5	lack of sustained contact and cooperation with other public organizations such as trade (labour) unions and farmer's groups					

3. Have you ever participated in any training on agriculture?

Yes or No ()

4. If yes how many times

Once ()

Twice ()

Several times ()

No.	Training of Farmers	1	2	3	4	5
1	Sharing their knowledge s					
2	Training on the best agricultural practices					
3	Training on practices of environment-friendly as an alternative to conventional agriculture					
4	Trainings on new information and to correct miss-conceptions concerning use of fertilizer					
5	Trainings on soil and water conservation					
6	Training on post-harvest handling					
7	Training on the best crops for your soils					

5. Which of the following farming technologies (practices) ‘would you use’, ‘have used?’

Minimal tillage ()

No till ()

Farrow, drip or sprinkler Irrigation ()

Crop rotation ()

Mixed cropping ()

Others ()

No.	Technology	1	2	3	4	5
1	Policies for agriculture, trade, research and development, education, training and advice have been strong influences on the choice of technology					
2	Defining research priorities and best technology to address current and future food demands by society					
3	Research and extension organizations to collaboration with groups and farmers' organizations					
4	Extent of farmers using various type of irrigation					
5	Extent of farmers using certified seeds					

No.	Environmental Awareness	1	2	3	4	5
1	Farmers have the right to modify the natural environment to suit their needs					
2	When farmers interfere with nature, it often produces disastrous consequences					
3	Farmers ingenuity will insure that we do not make the earth unlivable					
4	Farmers are severely abusing the environment					
5	The earth has plenty of natural resources if we just learn how to develop them					

6	Plants and animals have as much right as farmer to exist					
7	The balance of nature is very delicate and easily upset					
8	Famers should have a good environmental awareness for sustainable environment					
9	Farmers will eventually learn enough about how nature works to be able to control it					