

**YANGON UNIVERSITY OF ECONOMICS  
DEPARTMENT OF APPLIED ECONOMICS  
MASTER OF PUBLIC ADMINISTRATION PROGRAMME**

**A STUDY ON FARMERS' PERCEPTION OF THE  
ADOPTION OF GOOD AGRICULTURAL PRACTICES (GAP) OF  
RICE PRODUCTION IN SAGAING REGION**

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**EMPA – 3**

**EMPA 18<sup>th</sup> BATCH**

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A thesis submitted as a partial fulfillment towards the requirement for the degree of  
Master of Public Administration (MPA)

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**YANGON UNIVERSITY OF ECONOMICS**  
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This is to certify that this thesis entitled “**A Study on Farmers’ Perception of the Adoption of Good Agricultural Practices (GAP) of Rice Production in Sagaing Region**”, submitted in partial fulfilment towards the requirements for the degree of Executive Master of Public Administration (EMPA) has been accepted by the Board of Examiners.

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## **ABSTRACT**

Good Agricultural Practices (GAP) is a set of collection procedures and standards that comply with the methods to minimize the harmful infection in every production chain. The results of GAP are in safe and healthy food and non-agricultural products while carrying into account socio-economic and sustainable environment. The study proposes to know the barriers to be able to widespread the adoption of Good Agricultural Practices (GAP) and find the impact of the agricultural firm by using the adoption of Good Agricultural Practices in focused area. The findings of the study are producing agricultural products in a safe and sustainable way and with assurance is truly conforming to standards of Good Agriculture Practices but the planters don't dare to accept the sensitivity on GAP, GAPs can be spent the external costs when the social costs from a good or service outweigh the private costs incurred by the suppliers and Myanmar GAP adopters were facing with enormous challenges and risks such as lack of fertilizers, inadequate finance, extreme poverty, lack of education, vulnerable the access of GAP markets, threatens the disaster and rainfalls, and cost of production among others conventional farming system.

Keywords: Good Agricultural Practices (GAP), Socio-economic, Sustainable Environment

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## **LIST OF ABBREVIATIONS**

ASEAN	=	Association of Southeast Asian Nations
DOA	=	Department of Agriculture
FAO	=	Food and Agricultural Organization
GAP	=	Good Agricultural Practices
IFC	=	International Finance Corporation
IPM	=	Integrated Pest Management
M	=	Mean
MOALI	=	Ministry of Agriculture, Livestock and Irrigation
SD	=	Standard Deviation
SPS	=	Sanitary and Phytosanitary System

# **CHAPTER I**

## **INTRODUCTION**

### **1.1 Rationale of the Study**

The region has been the major production hub for several significant economic crops, including rice, fruits and vegetables due to the different of geography and climate. The agricultural trade in Asian is firmly established and considerable, whereas intra-countries trade on agricultural products is relatively underdeveloped. Roitner-Schobesberger et al. (2008) meant that food scares related to high levels of pesticide residues on mainly vegetables and fruits contributed to consumers, increasingly demanding safe foods and the subsequent display of initiatives and labels for pesticide-free vegetables. The food safety risks can be minimized through the adoption of good agricultural practices (GAP) in all cultivation layers (Laosutsan et al., 2019a).

FAO introduced to GAP which is implementing in many agricultural producing countries. In the world, GAP standard is one of the consistence standards for pursuing high quality food safety for the agricultural food producer countries. The new GAP is complex and time-consuming process to be able to adopt in which adopters' knowledge and willingness play a vital role dealing with knowledge-intensive technologies (Laosutsan et al., 2019a).

Utilizing of chemical fertilizer in agricultural sector is significantly raised to increase crop production globally after the green revolution. By the side of science and technology, the usage of chemical pesticides for the control of disease, pest, and weed had also obviously increased. By using the wide application of chemical fertilizer and pesticide in the cultivation is making them unsafe to consume, creating a threat to consumers and the producers as the health and social. The enforcement of Good Agriculture Practice (GAP) is ensuring to safe crop production, facilitate regional trade through the implementation of common GAP standards in the region and ensure acceptability of agricultural products in the international markets.

Otherwise, GAP system helps to produce quality goods with high yield that comply with the standards of national and international regulations by (TOPIC, 2020).

Agricultural Development has been shifting from the typically method to modernization method toward the more production output rate and not able to side effect on health. Myanmar is an agricultural country which paddy is the priority crops and it is also the sensitive agricultural products for the domestic market and foreign market. The paddy is the main raw material product and some of foods products are making with the rice in country. Otherwise, government has laid down the necessary economic policy and agricultural policies to increase the yield of crops, to reduce production cost and to safe for consumer. Therefore, using the GAP system in paddy cultivation is the best reforming of the Myanmar Agricultural sector and to be able to possess the plenty of the benefits on it. GAP was chosen as an important public standard to increase paddy farmers' competitiveness and guarantee food safety for domestic consumption and the export markets. Adoption of the GAP in paddy cultivation has limitations of GAP extension services and acceptance of farmers the change to GAP theme.

## **1.2 Objectives of the Study**

The objectives of this study as below:

- (1) To analyze the Good Agricultural Practices (GAP) of rice production in Sagaing Region
- (2) To find the effect of the adoption of Good Agricultural Practices (GAP) in rice production in Indaw, Sagaing Region

## **1.3 Methods of Study**

This study used the descriptive method by collecting primary data and using relevant secondary data. For the primary data, the selected respondents were surveyed with only quantitative questionnaires format and constructed by Likert scale. The secondary data was taken out from the related Township Department, the reports of government office, official website, journal, articles, paper and other senior student's research paper.

#### **1.4 Scope and Limitation of the Study**

This study approached on the perception of farmers and impact of the GAP in Indaw Township, Sagaing Region. Sagaing region consist 12 districts and 37 townships in which the study focused only Indaw Township because of there is one of the successful regimes of the paddy cultivation in the region. The study area included 50 wards and village tracts, the farmers are not only cultivation both monsoon and summer paddy but also other pulses in their farmyards. The study collected the data from 200 farmers using by random sampling method among them within the boundary of time limitations. The study collected the statistical survey to go to ground filed during July& August 2022. This paper mainly focused on the adoption GAP in study area between 2020 and 2022 based on data from Department of Agriculture, Indaw Township.

#### **1.5 Organization of the Study**

In this study, there are five chapters. Introduction is the first chapter in which the rationale of the study, the objectives of the study, the methods of the study, the limitation and scope of the study and the organization of the study are mentioned. In chapter two of the study, the literature review in which consists the concepts of GAP, Adoption of Good Agricultural Practices in Myanmar, the context of farmers' perception of the adoption of GAP and Previous studies. The Chapter three, Overview of Adoption of GAP in Myanmar discusses the implementing GAP in Myanmar, implementing GAP in study area and the benefits of the adoption of the GAP in Myanmar. The fourth chapter emphasizes on the analysis on the farmers' perception of the adoption of Good Agricultural Practices (GAP). In the chapter five, findings, discussion and suggestion of this study were presented.

## **CHAPTER II**

### **LITERATURE REVIEW**

#### **2.1 The Concepts of Good Agricultural Practices**

GAP is a set of collection procedures and standards that comply with the methods to minimize the harmful infection in every production chain from the cultivation and land improvement to the customer acquisition.

Good Agricultural Practices (GAP) is cohesive the principle of agriculture to apply for on-farm production and post production processes, the results of GAP is in safe and healthy food and non-agricultural products while carrying into account socio-economic and environmental sustainable (Technical & Working, 2006). The best practice for the agricultural sector to reduce the use of agrochemicals in agricultural production before advancing further to conduct organic farming is the GAP system (Supapunt et al., 2021).

According to the mention of Technical & Working, 2006, the objective of the adoption of GAP is to recognize the best practices through mutual recognition as like as benchmarking, to enhance the credibility of all farm assurance by enforcing robust processes for non-compliances and harmonizing follow with technical criteria, to encourage non- participating producers to embrace farm assurance, to consume the good ramification on the adoption of GAP widely, to increase market access of horticulture product in foreign and local markets, to empower farmers to respond to the demands of consumers that specific criteria to achieve the food safety to conserve the health of human, to attain the ability of the agricultural products of non-agricultural products to compete among the global market.

Good Agricultural Practices (GAP) has evolved due to the rapid changes of increase globalization in food economy and the trust and confidence of stakeholders to safety control and quality assurance of food production, environmental sustainability of agricultural systems (FAO, 2013) ; Pongvinyoo et al., (2014). The concept of GAP addresses two different issues: improving environmental sustainability for permanently farm products and ensuring the food safety and other

agricultural products during on-farm practices and post production processes (Malkanthi, et al., 2021).

Good Agricultural Practices (GAPs) can be described as the practices that address environmental, economic and social sustainability of on farm processes and produce safe and quality food and nonfood agricultural products (FAO, 2013). According to the study of Banzon et al. (2013) , GAP refer to approach sustainability agriculture, safety and quality food and enables farmers to take new market advantages by improving supply chain control, natural resource utilization, workers health, and working conditions, consumers and farmers families' health and creating new market opportunities for farmers in developing countries. Good agricultural practices (GAPs) may improve efficiency of farming practices and improve livelihood of vegetable farmers and the impacts of GAP are enhance the profitability and sustainability of farms (Lazaro et al., (2017) ; (Nirmala, 2015). Therefore, Rezvanfar & Razzaghi Borkhani (2018) said that GAPs play an important role to strengthen competition in the market, promote export markets, develop export revenues, and provide the rural economy.

Moreover, it can also provide to social and economic sustainability and its practices are required to be applied from the farm in order to ensure the safety of agricultural products. The adoption of GAP has become increasingly important in light of increasing domestic and international trade in food and other agricultural products. Pongvinyoo et al., (2014) reported that the success of GAP is depended on the effectiveness of farmers' implementing GAP procedures. In addition, implementing GAP also helps promote sustainable agriculture and contributes to meeting national and international environmental and social developmental objectives.

The objectives of promulgating the guidelines are to encourage sustainable farming, maximize food safety, strengthen protections for labourers, and increase profits for farmers by reducing input costs, increasing productivity, improving quality, and accessing better markets and thus high GAP. GAP is a guideline for the management of agricultural produce, from seed preparation, planting, maintenance, harvesting through to post-harvesting. To create the safety standards for both domestic and international markets while minimizing environmental damage, the bottom line in agricultural trade is that manufacturers are demanding agricultural products that are produced safely and sustainably and with the assurance that they are

truly conforming to standards of Good Agriculture Practice (GAP). Towards this objective, attention has been given to sustainable agricultural productions.

GAP methods seek to improve safety and sustainability in the following areas;

- (1) Farmer safety: Improved working conditions for producers and their families by reducing the harmful effects of chemical fertilizer and pesticides through systematic and careful use, as well as poverty alleviation resulting from reduced input costs and higher and fairer prices for crops.
- (2) Environmental safety: Reduction of chemical fertilizers and pesticides over time is the first step towards organic or pesticide-free farming, and limits the contamination of soil, lakes, and rivers, thereby maintaining Argo-biodiversity in farming systems.
- (3) Consumer safety: The product is cleaner, safer, more nutritious, and can improve health for the general population.
- (4) Animal welfare: In animal product value chains, animals are housed in improved conditions with better treatment. Implementing GAP requires clear documentation of procedures and should be applied throughout the value chain using integrated pest and disease management and integrated crop management her market prices.

## **2.2 Influencing of GAP on Agricultural Sector in Developing Countries**

Most of Asian Countries are rely on the agricultural product to earn the foreign income such as Thailand, Indonesia, Malaysia, Vietnam, and Myanmar so on. Food safety certificate is core evidence in tariff as the third party while it is exporting the agricultural products to other nations and to create the safety standards for domestic customers. The adoption of good agricultural practices (GAP) can be reduced to less the risk of food security but other countries has progressed at an extremely slow pace. Krasuaythong (2008) concluded that the adoption of GAP is more complex and time-consuming process than conventional agricultural system in which the adopters' knowledge and willingness is the most importance to print GAP especially regarding knowledge-intensive technologies. The important factors influencing adoption of GAP and improve policy outcomes from food safety issue linking the effective land use practices and efficient use of quality water use (Laosutsan et al., 2019b).

Pasadilla et al., 2013 described that the measurement of quantity control is predominantly identification standard the prohibitions for sensitive products and non-automatic import licensing as well as Sanitary and Phytosanitary System (SPS) relates as the measures of the technical regulations for instance in Malaysia, Philippines, Thailand and Vietnam so on. The farmers of adoption of GAP should not regret to prepare themselves for more trade liberalization by tracking the market information, consumer behavior, production-related information in other countries.

(Korpraditskul, 2010) meant that ASEAN GAP standard was initiated for agricultural trades in the region and is currently still under development in 2006. In addition, Thai GAP was identified Level 1 for manufacturers who want to export and Level 2 for domestic sales.

GAP is not only to prove of the food safety certificate but also to drop down the guideline for the management of agricultural produce, seed preparation, planting, maintenance, harvesting through to post-harvesting. Akkaya et al. (2005) also commented that adoption of GAP is fundamental principles of the risk prevention, risk analysis, sustainable agriculture using integrated pest management (IPM) and integrated crop management (ICM) for the constantly improvement of farming systems towards the targeted option.

Regarding with the adoption GAP, the farmers' financial conditions would be improved due to the lower production cost partly attributable to the smart use of chemicals and pesticides; and to the higher prices commanded by the GAP crops relative to the non-GAP. Nevertheless, rising quality standards and traceability requirements is a significant challenge for small-scale farmers to benefit from GAP crops trading (Laosutsan et al., 2019b).

Adoption GAP system in agricultural sector is overwhelming on pesticides and chemicals to protect the crops and increase yields thus it is attributable to the heavy reliance of the country's agricultural sector (Panuwet et al., 2012). The importers are more confident in quality of GAP products and are willing to pay more charge for food safety on these products. By summarizing, good agricultural practices are preference for human health it is followed by the economic value of the products. GAP helps in controlling abuses of natural resources, and having regional GAP is one important aspect of securing field to health of entire citizens and can be decreased the



ground water contamination through participation of local communities (Laosutsan et al., 2019b) .

Most of agricultural regime is leading the small-scale producers than monopolized planters; GAP standards have the potential to be the major alternative GAP approach by encouraging a much broader inclusion of small-scale producers towards the attainment of various social, economic, and environmental benefits. The exporters had collected the outsourcing their output from small-scale producers that include producers' loan defaults, side-selling to alternative markets, management complexities to train, monopoly on small owners and poor roads and unreliable transport in rural areas (Amekawa, 2009).

GAP influence on food safety, environmental protection, worker health, safety and welfare, and animal welfare that are purported to converge into the ideal of “the global partnership for safe and sustainable agriculture”(Amekawa, 2009).

### **2.3 The Context of Farmers' Perception of the Adoption of GAP**

The study will analyze the four main indicators of the perception of farmers to adopt GAP, all factors will be decided on the results of empirical perception of the farmers. All indicators will not be distinguished by gender and seasonal cultivation which is acceptable for only the farmers cultivating the paddy.

- 1) Attitude of farmers
- 2) Farmers' Knowledge
- 3) Awareness
- 4) Willingness

#### **2.3.1 Attitude of Farmers**

An attitude is a positive, negative, or mixed evaluation of an object expressed at some level of mental feeling. It is an expression of a like or dislikes evaluation of the adoption of GAP. These are fundamental determinants of farmers' perceptions and actions toward all aspects of agricultural processing. Frank Freeman said that an attitude is acceptable to be ready to respond to the new standards, and institutions in farmers who have learned and become a typical mode of adoption (Anon., 2022).

Farmers' attitude is the main dimension in understanding their behavior and coping strategies in reducing the environmental and marginal risk that influences

farmers' decision-making and adoption of sustainable GAP practices defined by (Zeweld et al., 2019) and (Supapunt et al., 2021).

### **2.3.2 Farmers' Knowledge**

Ensor & Berger (2009) said that farmers' ability for the adoption of changed circumstances and different livelihood strategies are limited because of having little access to resources, new knowledge and opportunities for learning new skills. The education, awareness and knowledge has become critical components in improving farmers' understanding to increase post-harvests, improve farming and speedy efforts in adaption, and understanding of climate change and variability (Lorenzoni, Nicholson-Cole, & Nicholson-Cole 2007). Farmers who have participated in agricultural activities on their land for a long time may have better personal awareness of the impact of soil erosion on productivity. Farmers manifest the best practices with their long-term experiences (Senanayake & Rathnayaka, 2015).

If the lack of farmers' knowledge and awareness, it should be mandatory to implement the adoption and the benefit of GAP. Lack of knowledge and education of stakeholders and producers are vital obstacles to the application of good agricultural practices (Banzon, Mojica, & Cielo, 2013). Education can improve the farmers' ability to learn new things and adjust to the changes, and farmers with better to know are the early adopters of modern technologies and apply modern inputs more professionally throughout the adoption process (Joshi, Kalauni, & Tiwari, 2019). Farm productivity may be enhanced by education with skilled labors, increasing the ability to adjust to inequality, and also its effect on the ability of farmers to successfully adopt innovations (Herbert, 2004).

### **2.3.3 Awareness of Good Agricultural Practices System**

Prior awareness is the peak importance for the adoption of any agricultural technology. Good Agricultural Practices (GAP) is a new concept for farmers, and most of them are unaware of it. Extension activities are the things that need to be conducted to increase the awareness of the GAP. According to the study of (Joshi, Kalauni, & Tiwari, 2019), emphasis on education and training has great effects for the awareness of GAP.

Awareness creation activities should be done to enhance the farmers' education level in turn, improve the adoption of GAP through increasing farmers'

level of understanding on the varietal attributes and farmers' perceptions towards improved GAP system defined by Wake et al., 2019 .

Awareness as a training is one of the effective climate change information communication strategies which enhance learning. Such training gives farmers a platform for seeking clarifications and feedback on farming activities related to climate change (Elia, 2017). Delivering research-based information, educational programs and technologies on farmers' needs consistently provides an opportunity for awareness, transfer of skills and accurate information which allows farmers to make an knowledgeable decision and facilitate adoption (OI & SS, 2010) (Adesiji, Akinsorotan, & Omokore, 2010). Most of the farmers have already possessed outstanding knowledge and skills in their areas of crop cultivation. Some farmers, however, may need the guidelines in technical aspects of GAP, especially if they deal with chemical or biological input elements. Such training exercises and technical advice are key components of the Quality Management System (QMS) for individual farmers or for cluster groups which are willing to implement GAP practices. Patt (2005) noted that farmers in Zimbabwe, who received training, were good at adapting farming methods than those who had not.

#### **2.3.4 Willingness to Adopt GAP**

Farmers' participation in agricultural planning is regarded as an important factor for successful sustainable agricultural development (Aref, 2011). The issues of the farmers' participation are the areas of concern at national and local level (Subedi, 2008). If the farmers have no willingness to participate, there are obviously no partnerships, no developments, and no program. Therefore, the lack of farmer's participation in the decision to implement an agricultural policy can lead to failure for the agricultural development.

In rural area in the west, participation can be hampered by some factors including the residents' lack of knowledge, confidence, time and interest (Cole, 2006). Additionally, the lack of ownership, capital, skills, knowledge and resources all constrain the ability of communities to fully control their participation in agriculture development (Scheyvens, 2002).

Piñeiro, et al., (2020) said that three kinds of incentives such as market and non-market, regulations and cross-compliance, as well as their compulsory or voluntary nature, are evaluated the kinds of incentive affects farmers' willingness to

adopt. Moreover, there will also have the relationship between farmer's adoption of sustainable practices and three types of outcomes: environmental, productivity and economic. According to the study done by Piñeiro, et al., (2020), the effectiveness of incentives and the adoption of sustainable farming practices are able to achieve the desired outcomes. Moreover, they found that that regardless of the incentive type, linking to economic benefits (productivity or profitability) is having great effects for farmers to adopt sustainable agriculture practices in the short term (Caviglia-Harris, 2003; Garbach, et al., (2012). In the long term, perceived positive outcomes of adoption for their farm or the environment is one of the strongest motivations for farmers to adopt and maintain sustainable practices (Winters, et al., 2004; Gibbon & Bolwig, 2007; Khanna, Isik, & Zilberman, 2005; Himberg, et al., 2009).

## **2.4 Review on Previous Studies**

The study approached some of the research papers which are being correlated with the fundamental ideology about this topic, there has been reviewed on the literature side according to their empirical findings of local and international dissertations as the following.

Mtsweni et al., 2020 and Fakkhong & Suwanmaneepong, 2017 reported that the implementation of good agricultural practice among rice farmers in eastern region of Bangkok, Thailand using semi-structured questionnaires in 230 selected farmer sample. The results found that GAP implementation for rice production is directly significantly correlated with the literacy of farmers, farmer-owned lands, and membership of farming organizations.

According to the study on Factors Influencing Intention to Adopt Sustainable Agriculture Practices among Paddy Farmers in Kada, Malaysia, found that the farmers were applying sustainable agriculture organic farming but the newer farmers were more willing to be involved in sustainable agriculture and had more pro-environmental attitudes than the older farmers, the knowledge of farmers is motivation towards adopting agricultural practices and increasing the awareness and knowledge of farmers can lead to adopt sustainable farming practices as a high intention. This study suggested that the relevant agencies should provide more information, training and extension to the paddy farmers the intention to behavior in practicing sustainable agriculture and demonstration plot of sustainable practices need to be established to see and experience the real sustainable agricultural practices for the paddy farmers.

According to the conduction of (Oo & Usami, 2020) on farmers' perception of GAP of the rice production in MyaungMya, farmers' perception was significantly influenced gender, education, farmland size, access to credit, income from crop production, contact with extension agents, receiving agricultural information, and training furthermore, enhancing farmers' perception of the compatibility require to agricultural policies and extension activities. The suggestion of the study the implementation of GAPs in rice production should focus mainly on low-income farmers as well as small amounts of own farmland, MOALI should reform the credit plan for farmers who wish to accept GAPs in rice , extension workers should have regular contact with farmers to enhance farmers' perception of the compatibility and more agricultural information should be provided, especially for farmers who have larger farms and higher incomes, concerning the advantages of using GAPs in rice production.

As the researching of (SOE HLAING, 2020) on Adopting GAP for green gram production in Tatfone township, the study found that appropriate use of pesticides and chemical fertilizers is recommended, suitable post-harvest techniques and hygiene standards of agrochemicals are socially acceptable and economically affordable and Myanmar GAP was designed to prevent or minimize the risk of harms. Suggestions of the research that the results of the study are like as training of Integrated Pest Management (IPM) is essential in GAP system, government should provide the necessary infrastructures to green gram growers to be extendable the growing area of green gram by using GAP and DOA should support monitoring process of GAP for agricultural on-farm workers and post-producers.

## **CHAPTER III**

### **OVERVIEW OF THE ADOPTION OF GOOD AGRICULTURAL PRACTICES IN MYANMAR**

#### **3.1 Implementing Good Agricultural Practices in Myanmar**

In 2017, International Finance Corporation (IFC) provided the department of Agriculture behalf of Government of Myanmar to launched Good Agricultural Practices (GAP) Protocol and Guidelines for certifying 15 crops (rice, peanuts, avocado, watermelon, mango, melon, tomato, chilly, cabbage, onion, pulses, corn, sesame, coffee, and pomelo) those are boosted the productivity and economy of farmers for sustainable farming. The farmers account as 53 percent of the labour force in Myanmar is placing the agricultural sector in which included 70 percent livelihood of the rural population. GAP Protocol and Guidelines is not only supported to boost the farmers' livelihood but also to develop the agriculture sector that is affected on the economy in one way. The Myanmar Good Agricultural Practices were implemented based on the ASEAN GAP and Global GAP to be produced the crop without any risk. Myanmar GAP aims the crop products not only to sell domestic market but also to export ASEAN region by implying good Agricultural Practices Standards.

#### **3.2 Adoption of Good Agricultural Practices in Myanmar**

Good Agricultural Practices are being practiced in crop production in other countries to ensure food safety. And, in Myanmar, fifteen crops have been implemented by Myanmar good agricultural practices since 2017. In Myanmar agriculture, the oilseed crop is being the third most important crop group after cereal and pulses. There are many kinds of oilseed crops such as groundnut, sesame, sunflower, mustard, and Niger. Oilseed crops also play a vital role in Myanmar because of the high consumption of cooking oil compared to other neighboring countries. Traditional production practices and weak linkages among stakeholders are major barriers to expand Myanmar's export share in the world market.

As Myanmar is a least developing country, the farmers with less farming experience tended to consider personal and economical barriers, lack awareness and information barriers, and weak institutional support more important than farmers with higher farming experience. Farmers with low experience lacked knowledge of the contemporary farming context and hence failed to cope with GAP. In addition, the poor contribution of the government can be affected by the adoption of GAP in Sagaing. Also, the insufficient infrastructure facilities will make a lower annual farm income and less quality of products in Myanmar. To enhance farmers' skills, knowledge, living standards farmers are required for efficient and effective adoption of good agricultural practices following food international standards (Kassem et al., 2021).

GAP implementation is very low compared with other countries. If we will evaluate the cause of the lowest GAP implementation, it can be measured that farmers' perception is low or normal in GAP cultivation. The government is lack of supporting for farmers on GAP implementation in Myanmar. The farmers are ignoring GAP. The farmers' forgetfulness is due to, lack of knowledge and awareness, lack of communication because they don't have well communicate with the Department of Agricultural office. The government is needed to support farmers by training them to manage farms and on how to communicate the concerns with all stakeholders and how to use GAP practices. This study will analyze the relationship between farmers' perception to adopt GAP, and factors as attitude, awareness, knowledge, willingness will be or not to widely use Good Agricultural Practice in the Sagaing region. This research will be carried out as a sample model to be overcome the above situation and GAP can be more general use throughout the country. The outcomes of this research will help farmers to use GAP like other ASEAN countries.

### **3.3 Geographical and Population of Indaw**

Indaw is situated in Katha District, Sagaing region and the total population was 120266 and 47% of the total population was male and the 53% of female respectively. Most of the people in Indaw are addressing in rural areas for 93% and the rest 7% are surviving in the urban regime whereas the main livelihood in study area is agricultural, especially paddy and several of pulses. The population density of Indaw Township is 63 persons per square kilometer and 70.6 % for 41973 of employed persons aged 15-64 by industry was working in agricultural, Forestry and

fishery regime, these result can be concluded the highest proportion of employed persons working in all sector in otherwise, there are 61.6 percent of employed population working in “Agriculture, forestry and fishing” industry in Sagaing Region according to 2014 census (Department of Population Ministry of Immigration and Population, 2015).

In study area, paddy is the crucial crops and it is cultivated almost all of total cultivated land in township area, in generally the growers was seedling by plantation for 95 % and direct seedling ways for 5 % of monsoon paddy on the farm. The below table shows the net cultivated land in total agricultural land in focus township as:

**Table (3.1) Situation of Plateau of Cultivated Area in each Year**

Sr No	Variety of Land	Net Cultivated Land		
		2020-2021	2021-2022	2022-2023
1	Farmland/ Riceland	42849	43318	19300
2	Dry Land	16268	16720	200
3	Alluvial Land	10102	10102	1235
4	Garden Land	116	116	
5	Unofficial Land			400
	<b>Total</b>	<b>69335</b>	<b>70256</b>	<b>21135</b>

Source: Collected data from 2020-2021, 2021-2022 Official Report of DOA, Indaw

### **3.4 Implementing Good Agricultural Practices in the Study Area**

The study area is composed in the Sagaing region: there are planting monsoon paddy and summer paddy. Department of Agriculture has explored the special farming zones for variety of crops in each area in region. Shwebo and Kanbalu townships are the main cultivation area for quality paddy which is very popular in country as Shwebo Pawsan and Ayarmin. The responsible of the department of agriculture in all townships in the region are seedling to produce the crop by using GAP system. As the ruler in the entire region, about 870000 acres of monsoon paddy and almost 300000 acres of summer paddy have been cultivated annually in 2014 currently, as the agricultural land extended to new town as becoming developed in country so that the valuable agricultural land is diminishing than before. Likewise, there is cultivated



both monsoon and summer crops such as oilseeds, pulses and paddy in the study area (Department of Population Ministry of Immigration and Population, 2015).

The following table describes the generous of rice cultivation in rainy and summer season from year 2020-2021 to until year.

**Table (3.2) List of the Cultivated Acres in Kinds of Rice**

Sr No	Variety	Cultivation Acres				
		2020-2021		2021-2022		2022-2023
		Monsoon	Summer	Monsoon	Summer	Monsoon
1	Hmawbe – 2	20135	117	20350	170	4535
2	Sin Akare -3	34883	655	34925	597	16540
3	Ayar Min	450	-	460	-	-
4	Lone Thawe Hmwe	120	-	140	30	-
5	Days 90	80	20	100	-	-
6	Sticky	312	-	315	-	60
	<b>Total</b>	<b>55980</b>	<b>792</b>	<b>56290</b>	<b>797</b>	<b>21135</b>
	<b>Grand Total</b>	<b>56772</b>		<b>57087</b>		<b>21135</b>

Source: Collected data from 2020-2021, 2021-2022 Official Report of DOA, Indaw and As at July 2022 Data of DOA

Our country is constructed with the agricultural regime that is sensitive on the water resources and it is overriding on the enhance productivities of agricultural products but the study area has been encircled by the sufficiency of water investment for the entire of farming crops as the contribution of irrigation system such as dam, pool pond and lake called underground support system, river, stream and canal system, rain falling and so on. Overall, the water resource management system of study area can be contributed whenever all crops is been seeded in any season and it can be seemed that able to be sufficient allocation on the water drinking for adoption of GAP, the below table proved it (3.3) .

**Table (3.3) Cultivation the Monsoon Paddy in Study Area and  
Water Resource Management**

Sr No	Variety	Cultivation Acres	Water Resource			
			Dam	Pool, Pond, Lake	River, Stream, Canal	Rain Water
1	Hmawbe – 2	<b>4535</b>			150	4385
2	Sin Akare -3	<b>16540</b>	3920	635	992	10993
3	Ayar Min					
4	Sticky	<b>60</b>				60
	<b>Total</b>	<b>21135</b>	<b>3920</b>	<b>635</b>	<b>1142</b>	<b>15438</b>

Source: Collected data from Official Report of DOA, Indaw

Department of Agricultural, Indaw had been demonstrating by GAP system as the testing for experimental model annually in line with governing under the local government and department. The adoption GAP in paddy production is unable to be feasible as not prevail cultivation in citywide for consumption not only local consumer but also foreign export, it is unable to adopted the GAP system except testing step in study area yet. The following table show GAP experimental practicing as;

**Table (3.4) Experimental Cultivation Model with GAP System**

Sr No	Crop	Cultivation Acres		
		2019	2020	2021
1	Monsoon Paddy	150	300	350
2	Summer Paddy		20	25
3	Autumn Groundnut		20	35
4	Autumn Sesame			20
5	Autumn Sunflower			30
	<b>Total</b>	<b>150</b>	<b>340</b>	<b>460</b>

Source: Office Report of DOA Indaw, 2020-2021 Budget Year

The small holder manufacturers in study area are lead the farming place as the core partial between the land owners, it can be imagined the small holders are gearing

the local farm products market. The situation of the land ownership by the cultivators in the study area is addressed at the below data;

**Table (3.5) Class of Farmland Owners in Study Area**

No	Holders Category	Growers	Remark
1	Less than 5 acres	26364	Small-holders is 64 % out of owners
2	Between 5 to 10 acres	28347	
3	Between 10 to 20 acres	25208	
4	Between 20 to 50 acres	4824	
5	Between 20 to 50 acres	403	
	<b>Total</b>	<b>85146</b>	

Source: Office Annual Report of DOA Indaw, 2020-2021

### **3.5 The Benefits of the Adoption of the Good Agricultural Practices in Myanmar**

For adoption of the GAP, the incentive for farmers is access to markets (e.g farmers cannot supply fresh produce to export and local customers without a third-party certified GAP program) and food safety regulations for primary production to be introduced in the future identified by (Technical & Working, 2006).

Technical & Working, 2006 presented that the encourage to adopt the GAP among the farmers expand awareness created through mass media and training the effective course and food safety training course for developed, financial support provided to farmers by central and local government up to 75 % of implementation cost, guidelines adjusted to reduce confusion and improve consistency for adoption and widely usage.

The benefits of adoption to the GAP are (i) reduce the pollutant residues in the soil, water and air thus the environmental damage arrested or reversed (ii) the adopting farmers' financial conditions would be improved due to the lower production cost partly attributable to the smart use of chemicals and pesticides; and to the higher prices commanded by the GAP products relative to the non-GAP (iii) farmers are better equipped with the knowledge and information on the organic fertilizers, farm management and water management. Athipanyakul and Pak-Uthai (2012) described that the improved farmer's knowledge with the program participation could be the one of successful of the program adoption. However, the

participation in the GAP program of some farmers is still hesitate because the GAP implementation is relatively costly and time-consuming (Laosutsan et al., 2019a).

The benefit by adoption GAP in agricultural sector are management improvement of farms, value added for products to more income, integrity building of connection the certificate system with other abroad countries, embraces small scale farming to market access, cost effective solution for the whole industry (Technical & Working, 2006). To adopt national GAP schemes, for fresh products and food safety on a set of GAP standards by the government and stakeholders and the GAP certification is needed to be identified for the proof of producers described by Commission & Escwa, n.d. The certified farmers have more market access to sell larger quantities of their agricultural products due to the exporters' confidence and the improved product quality and quantity by cultivation with GAP.

According to the finding of Karagkiozi et al., 2019, to succeed in improving the quality of agriculture, the quality of agricultural procedures needs to be adopted to GAP system which should be eventually result in qualitative and competitive production. There is no doubt that the change towards quality production should take place under certified and supervised the GAP agricultural system.

## CHAPTER IV

### ANALYSIS OF THE STUDY

#### 4.1 Profiles of Indaw Township

Indaw is the one of the townships of, Katha District, Sagaing Region and she is enormous cultivated a lot of crops especially paddy and pulses are capturing the huge area. It' shape is narrow area and the condition of the geographical is possessed the dry season for exist in dry zone.

**Table (4.1) Quantity of Population and Household in Indaw Township**

No	Ward/ Village Tract	Population (Adulthood)	Household
1.	Aung Min Ga Lar	1444	353
2.	Aung Chan Thar	1012	255
3.	Aung Zay Yar	1502	353
4.	Aung Myit Tar	2173	704
	<b>Urban</b>	<b>6131</b>	<b>1665</b>
5.	Nant Khin	2262	594
6	Nat Ma Hoke	1945	521
7	Se	1071	275
8	Thet Kei Kyin	1588	372
9	Lel Pyin	2749	771
10	Na Bar	3991	1162
11	Seik Thar	1639	444
12	Kyan Taw	1338	417
13	Ta Khun Taing	1512	395
14	Myauk Kone (Man Lel)	3068	833

**Table (4.2) Quantity of Population and Household in Indaw Township**  
(Continued)

<b>No</b>	<b>Ward/ Village Tract</b>	<b>Population (Adulthood)</b>	<b>Household</b>
15	Me Zar	5586	1435
16	Oke Shit Kone	1207	296
17	Kha Yan Sat Kone	1399	362
18	Nat Yae Twin	1030	293
19	Ah Lel Seik	1347	385
20	Lel Naung	1401	408
21	Ma Gyi Pin	655	187
22	Gyone Gyone Kya	780	206
23	Nyaung Kone	1092	320
24	Kyaung Kone	1758	510
25	Let Pan Tan	1029	290
26	Thaung Myin	1358	362
27	Ma Au Kone	1558	417
28	Maw Teik	1731	442
29	Nant Thar	3230	858
30	Tar Paw	946	275
31	Thoke Khar	1737	516
32	Man Hton	1430	384
33	Ah Lel Kyun	2415	714
34	See Maw	2935	817
35	Pone Hon	3335	828
36	Haung Tone	763	226
37	Na Mee	1692	500
38	Kone Khar	1294	408

**Table (4.3) Quantity of Population and Household in Indaw Township**  
(Continued)

<b>No</b>	<b>Ward/ Village Tract</b>	<b>Population (Adulthood)</b>	<b>Household</b>
39	Gwayt Gyi	1514	405
40	Thu Yaung	1440	451
41	Man He	3610	1204
42	Pin Wei	2069	630
43	Bago	1251	386
44	Nar Khwin Gyin	359	137
	<b>Rural</b>	<b>73114</b>	<b>20436</b>
45	Min Yarzar	1506	379
46	Min Zayar	1050	279
47	Min Chanthar	596	209
48	Min Thukha	661	167
49	Min Thitsar	1763	490
50	Min Thiri	966	335
	<b>Maw Lu Town</b>	<b>6542</b>	<b>1859</b>
	<b>Total Population/Households</b>	<b>85787</b>	<b>23960</b>

Source: From Sept, 2022 Report of Administrative Department, Indaw Township

The above villages are situated in Indaw Township of Katha District, there is a total population of 85787 persons who get over eighteen years old and 23230 households all kind of level of people involved all several clusters according to the report of Township Administrative Department, Indaw. The study focused the preference 4 wards and 4 village tracts out of all 50 groups by thinking the criteria as where it is situated at distance of the arm and where has it almost of cultivators addressed by utilizing GAP system.

## 4.2 Survey Profile of Study

The study area has 50 wards and village tracts in Indaw that is so widely area to collect the data around the study area, 200 respondents from selected 4 quarters and 4 village Tracts are collected through convenience sampling method by surveying with the set of described quantitative questionnaires. It is divided into two main sections: demographic characteristic of the respondents in part I, the partition of part 2 for variables analysis questions in which revolved in five sub-sessions as Perception on Attitude of Farmers, Dimension of Farmers' Knowledge, Awareness of farmers, Willingness of farmers, and Adoption GAP. The detail respondents are illustrated in the below table (4.2).

**Table (4.4) List of Villages and Respondents**

Sr No.	Ward/Village Tract	Village	Respondents
1	Aung Min Ga Lar		20
2	Aung Chan Thar		20
3	Aung Zay Yar		15
4	Aung Myit Tar		15
5	Nant Khin	Nant Khin	25
6		Let Pan Kone	15
7		Inn Ywar	15
8		Kyar Inn	10
9		Sin Haung	8
10	Nat Ma Hoke	Nat Ma Hoke Kyi	10
11		Nat Ma Hoke Kalay	8
12	Lel Pyin	Lel Pyin	12
13		Thipar	5
14		Nan Kin	6
15		Nar Khar	7
16	Kyan Taw	Kyan Taw	5
17		Nar Naung	4
	<b>Total</b>		<b>200</b>

Source: Collected survey data in 2022



To be acquainted the actual situation of the perception of the respondents between the urban and rural sided, it is divided in to eight parts of respondent's location in Indaw which can be split two main types of four quarter and four village tracts (13 villages). As describing to the above table, 20 interviewees are from Aung Min Ga Lar, 20 respondents are from Aung Chan Thar, 15 respondents are from Aung Zay Yar, 15 respondents are from Aung Myit Tar, 25 respondents are from Nant Khin Village , 15 respondents are from Let Pan Kone Village, 15 respondents are from Inn Ywar Village, 10 respondents are from Kyar Inn Village, 8 respondents are from Sin Haung village, 10 respondents are from Nat Ma Hoke Kyi Village, 8 respondents are from Nat Ma Hoke Village, 12 respondents are from Lel Pyin Village, 5 respondents are from Thipar Village, 6 respondents are from Nan Kin Village, 7 respondents are from Nar Khar Village, 4 respondents are from Kyan Taw Village and 4 respondents are from Nar Naung Village respectively, the grand respondents is 200.

#### **4.3 Characteristics of Respondents**

The characteristics of respondents are floor supported data in researching of the GAP study, the questionnaire from was formatted the demographic condition of the respondents at part I section as gender, respondents 'age (Years), education level, monthly income, cultivation crops, farming experience, cultivating land area (Acres), land property and have GAP markets for rice production in your environment? Does an accessible market to sell for rice production? The detail demographic characteristics of the research surveyed respondents were described with descriptive analysis by using SPSS system as below:

**Table (4.5) Demographic Characteristics of the Respondents**

**Sample Size- 200**

<b>Description</b>		<b>No. of Persons</b>	<b>Percent</b>
<b>Gender</b>	Male	163	81.5
	Female	37	18.5
	<b>Total</b>	200	100.0
<b>Respondents 'Age (Years)</b>	36 - 45 years	56	28.0
	46 - 55 years	69	34.5
	56-65 years	59	29.5
	Above 65 years	16	8.0
	<b>Total</b>	200	100.0
<b>Education Level</b>	Primary School	54	27.0
	Secondary School	106	53.0
	High School	29	14.5
	Graduate	11	5.5
	<b>Total</b>	200	100.0
<b>Income (Monthly)</b>	Less than 150000	134	67.0
	150001-300000	66	33.0
	<b>Total</b>	200	100.0
<b>Livelihood</b>	Rice production	70	35.0
	Other crops and rice production	130	65.0
	<b>Total</b>	<b>200</b>	<b>100.0</b>
<b>Farming Experience</b>	3 - 5 years	13	6.5
	6 - 8 years	10	5.0
	9 - 10 years	36	18.0
	More than 11 years	141	70.5
	<b>Total</b>	<b>200</b>	<b>100.0</b>

**Table (4.6) Demographic Characteristics of the Respondents (Continued)****Sample Size- 200**

<b>Description</b>		<b>No. of Persons</b>	<b>Percent</b>
<b>Cultivating Land Area (Acres)</b>	1-5 acres	123	61.5
	6 - 10 acres	70	35.0
	11 - 15 acres	3	1.5
	More than 16 acres	4	2.0
	<b>Total</b>	<b>200</b>	<b>100.0</b>
<b>Land Ownership</b>	Own	194	97.0
	Rent	6	3.0
	<b>Total</b>	<b>200</b>	<b>100.0</b>
<b>Have GAP markets for rice production in your environment?</b>	Yes	38	19.0
	No	162	81.0
	<b>Total</b>	<b>200</b>	<b>100.0</b>
<b>Does an accessible market to sell for rice production?</b>	Yes	194	97.0
	No	6	3.0
	<b>Total</b>	<b>200</b>	<b>100.0</b>

Source: From collected Survey Data, 2022

The above table (4.3) shows that male respondents are more than female respondents on gender whereas Male respondents answered four times of women because the farmers is more leading than women in the agricultural area as a phenomenal.

According to the respondent' age, the majority of respondents are age between 46-55, accounting for (34.5%). The remaining respondents are age between (36-45) year with (28%), between (56-65) year for (29.5%) and above 65 years old respondents are (8%) respectively. Regard with the results of age of respondents, the middle age level of potential workers is influencing in the cultivation area as the mainly conductors, those are the best powerful age-level in human life and they have good experience around the agricultural regime.

Regarding with education level of answers, 106 respondents are middle school level as was accounted for (53%), followed by basic school level with (27%), high

school level with (14.5) and 5.5% of all graduated. In this area, the educational issue is able to influence the fostering GAPs, the moderate literacy rate should be more encourage the awareness and training than normal situation.

The situation of the monthly income of the farmers shows that 134 people with (67%) earned not more than 150000 MMK kyats in monthly and the rest 66 for (33%) accounted between 150001 to 300000 MMK kyats in monthly, the results prove that although the income generation of the majority of planters is sufficient for their daily being live but they desire to more income from livelihood.

Moreover, the 70 respondents for (35% of all) are cultivating only paddy but 130 farmers with (65%) are producing not only rice but also other pulses on their farmyards due to the peasants in study area are planting as the supplementary crops with rice and pulses.

Regards with the detailed results, the 141 respondents with (70.5%) have farming experience in more than 11 years, other 36 farmers for (18%) account on experience years within 9 to 10 years, between 6 to 8 years working experience is conducted by 10 farmers with (5%) and the remain 13 persons have no more than 5 years farming experience. The surveyed data able to definitely contributed to get the nearest reality analysis on the study goal because third- fourth of respondents have appropriate experiences and field knowledge in agriculture.

Notable cultivation land area for ration in the city, the cultivators account for (61.5%) by cultivation in 1 to 5 acres, (35%) is accounted for 6 to 10 acres, growing in 11 to 15 acres are conducted by (1.5%) and 4 farmers are cultivation in above 16 acres respectively.

Regarding with the ownership of farmyards, they are working in their own land by 194 farmers with (97%) and a few people in 200 answers don't have own land in their farm work that is accounted 6 peoples for (3%). The sample cultivators able to manipulate in the farmland by their desire and have the right to participate freely by themselves as their wishes in adoption of GAP.

As results on "yes, no" question of having GAP markets for rice production in their circumstance, there have no GAP market by 162 respondents with 81% but other 38 farmers proper GAP market for their products.

In next question, 194 respondents with 97% have the accessible market to sell for their produced paddy while other 6 respondents with 3 % were not access the market road. As the regardless with the detail results of surveyed question, the

peasants anticipate to proper more market shares and extend to market place to achieve the best price for their farming products therefore they wish to be acceptable of shifting to the modern technique.

#### **4.4 Analysis of the Study**

The study might to be manifested by examining the descriptive statistics that mainly describe a variable's central tendency (the 'middle' or expected value). So that SPSS software had calculated descriptive analysis even if the measure of central tendency especially the mean is a statistical average (the summation of all data values divided by the number of data) these central tendency is appropriate for different levels of measurement (Anon., n.d.).

The study on farmer' perception of the adoption of (GAP) in rice production had analyzed in (4) independent variables, those are perception on attitude of farmers, dimension of farmers' knowledge, measurement on awareness of farmers and willingness of farmers on GAP adoption. On the other hand, feasibility to be able to put out the good research was pursued and analyzed on Adoption GAP called the dependent variable thoroughly.

The quantitative questionnaire form was set by using the alphabetised method to get the manifest for respondents to ease with 5 points Likert scale as 1 for Strongly Disagree, 2 for Disagree, 3 for Neutral, 4 for Agree and 5 for Strongly Agree by ascending order.

##### **4.4.1 Perception on Attitude of Farmers**

The detailed results of perception on Attitude of Farmers can be seen in under Table (4.4). The study includes obtaining basic information for GAP system from available environment and revealing the emotional feeling of core planners in order to identify in the attitude section.

**Table (4.7) Perception on Attitude of Farmers**

Items		Mean	Std. Deviation
1.	I would like to practice GAP on my farm.	3.85	.695
2.	I believe that it is beneficial to practice.	4.05	.489
3.	I believe that there is adequate information on GAP on farms.	3.96	.583
4.	I believe that I can successfully practice GAP in my farming rice production.	3.88	.623
5.	I trust that there will be good demand in the export market for GAP products.	3.82	.519
6.	I always follow good agricultural practices when I cultivate rice in my framing.	3.76	.601
<b>Overall mean Value</b>		<b>3.89</b>	

Source: From collected Survey Data, 2022

The above table (4.4) announced that the result of mean and standard deviation value of the six statements: Perception on Attitudes of Farmers variable was such as ‘I would like to practice GAP on my farm’ with (M= 3.85 and SD =.695), the question of ‘I believe that it is beneficial to practice’ was conducted with (M= 4.05, SD=.489), it is the maximum mean value in all indicators, the third item of ‘believing about there has adequate information on GAP on farms’ with (M= 3.96, SD=.583), the next item was ‘believing on successfully practice GAP in my farming rice production’ with (M= 3.88,SD=.623), the fifth statement of ‘trust on there will be good demand in the export market for GAP products’ with (M= 3.82, SD=.519), the last item was ‘follow good agricultural practices when I cultivate rice in my framing’ with (M= 3.76, SD=.601) and the total mean values for the variable is (3.89). The result show that the representative farmers in study area have the good perception to promote in the agricultural techniques to be able to compete with modernization.

#### **4.4.2 Dimension of Farmers’ Knowledge**

The following table shows the results in detail of the measurement of Farmers’ Knowledge related with GAP knowledgeable for growers. Before adopting GAP system, local farmers couldn’t have the knowledge and awareness for the kind of

GAP method. After launching the GAP system, stakeholders now have the way how to utilize it from the training of Department of Agriculture to the community and how to re-grow it in their work place so as “Seedling aubergine for testing ground”.

**Table (4.8) Dimension of Farmers’ Knowledge**

Items		Mean	Std. Deviation
1	I know how to practice GAP in my rice production farming.	3.87	.474
2	My farming knowledge of GAP will be a successful method of farming to earn more profit.	3.94	.650
3	I believe that having GAP certification will increase my income/profit.	4.05	.775
4	I believe that practicing GAP is an environmentally friendly method of farming.	4.26	.560
5	I know the instructions for GAP.	3.87	.470
6	The government provides small loans for GAP to rice farmers.	3.78	.584
Overall Mean Value		3.96	

Source: From collected Survey Data, 2022

According to the description of above table ( 4.5 ), the result of mean and standard deviation value of the six statements of Farmers’ Knowledge for growers were such as ‘knowing how to practice GAP in my rice production farming’ with (M= 3.87, SD=.474), the second item of ‘Knowledge of GAP will be a successful method of farming to earn more profit’ with (M= 3.94, SD=.650), the next item was ‘Having GAP certification will increase my income/profit’ with (M= 4.05, SD=.775), the another item was ‘practicing GAP is an environmentally friendly method of farming’ with (M=4.26, SD=.560) it is the maximum mean value in all indicators, regard with “know the instructions for GAP” was answered for (M=3.87, SD=.470), the final item of ‘government provides small loans for GAP to rice farmers’ was described (M= 3.78, SD=.584) and the total mean values for the variable is 3.96. As the result of the response on knowledge for villagers, they would like to desire more providing from the regional/union government and other non-government organization which is sharing information and techniques

#### 4.4.3 GAP's Awareness of farmers in the Study Area

The below table (4.6) described the detailed of results on awareness of farmer in the adoption of GAP in Myanmar and in their campus, it is involved in these part as the residents in the study area how to gained the benefit on alternatively cultivation system and distribution from the responsible of governmental employment.

**Table (4.9) Awareness of Farmers**

<b>Items</b>		<b>Mean</b>	<b>Std. Deviation</b>
1	Department of Agriculture in Indaw provides technical assistance training for GAP development to the farmers.	4.22	.541
2	I recommend attending GAP training with my farmers' friends.	3.99	.535
3	I know how I can successfully practice GAP on my farm by applying my learning through training.	3.87	.626
4	I believe that it is beneficial to practice GAP for both farmers and marketers.	4.00	.419
5	I am willing to attend GAP training.	4.02	.506
6	I have awareness of extension services for GAP to start GAP on farms.	3.80	.578
<b>Overall Mean Value</b>		<b>3.98</b>	

Source: From collected Survey Data, 2022

The above table (4.6) showed that the result of mean and standard deviation value of the six statements of Awareness of farmers were such as 'DOA provides technical assistance training for GAP development to the farmers' with (M= 4.22, SD=.541) it is the maximum mean value in all indicators,, the second item of 'Recommend to attend GAP training with my farmers' friends' with (M= 3.99, SD=.535), the next item was 'Knowing how I can successfully practice GAP on my farm by applying my learning through training' with (M= 3.87, SD=.626), the another item was 'benefit to practice GAP for both farmers and marketers' with (M=4.00, SD=.419), the next one of 'willing to attend GAP training' was described (M= 4.02, SD=.506), the final item of 'awareness of extension services for GAP to start GAP



on farms' was analyzed ( $M= 3.80$ ,  $SD=.578$ ), it is the minimum mean value in all indicators and the total mean values for the variable is 3.98. As the result of descriptive analysis on their aspiration, all the people want to accelerate the general knowledge related with GAP more than merely their seized perception in present.

#### 4.4.4 Willingness of farmers on GAP Adoption

The detailed results of the willingness of growers on GAP adoption can be found in the below table (4.7). The study has been investigated that whether or not the respondents have the willing to adopt the GAP system in their farming and they accept to change modern technique instead of their conventional agricultural system.

**Table (4.10) Willingness of Farmers on GAP Adoption**

Items		Mean	Std. Deviation
1	I am willing to adopt the GAP system in my farming.	3.87	.617
2	The using GAP system in rice production will gain benefits for both consumers and farmers.	4.25	.657
3	I don't use pesticides for my rice farming.	3.45	1.173
4	I am willing to farm the traditional way without using fertilizers to enhance productivity.	3.39	.902
5	I decided to use GAP for further production of rice on my farms.	3.95	.735
6	My regions need to have the Central Lab to control the GAP farming.	4.27	.698
<b>Overall Mean Value</b>		<b>3.86</b>	

Source: From collected Survey Data, 2022

The above table (4.7) expressed that the result of mean and standard deviation value of the six questions of Willingness of farmers on GAP adoption measurement were such as 'willing to adopt the GAP system in my farming' with ( $M= 3.87$ ,  $SD=.617$ ), the question of 'using GAP system in rice production will gain benefits for both consumers and farmers' was answered with ( $M= 4.25$ ,  $SD= .657$ ), the third item of 'don't using pesticides for my rice farming' with ( $M= 3.45$ ,  $SD=1.173$ ), the next item was 'willing to farm the traditional way without using fertilizers to enhance productivity' with ( $M= 3.39$ ,  $SD=.902$ ), the fifth statement of 'decision to use GAP

for further production of rice on my farms.’ with ( $M= 3.95, SD=.735$ ), another item was ‘The regions need to have the Central Lab to control the GAP farming’ with ( $M= 4.27, SD=.698$ ) it is the maximum mean value in all indicators and the total mean values for the variable is 3.86. According to describing of residents, the paper can able to be comment that the respondents have no desire to abandon utilizing the fertilizers to enhance productivity in the traditional way because the mean value is 3.34 and it does not reach the satisfy scale 4.

#### 4.4.5 Results of Adoption GAP

The detailed results of the dependent variable **Adoption GAP** can be found in the below table (4.8). The respondents were accepted to adopt GAP system in their field practicing because GAP can be produced not only a good synergy for Myanmar Agricultural Sector and enormous benefit on food safety on customers but also rigid provided to FDA certificate for traders on local and especially export aboard countries. The respondents are appreciating to adopt GAP in their field area because they have imagined any ramifications of utilizing GAP strategy.

**Table (4.11) Adoption GAP**

Items		Mean	Std. Deviation
1	I have a desire to practice GAP for rice production.	3.93	.676
2	The GAP system is better than the traditional farming system.	4.26	.711
3	I am sure that the GAP system makes to improve our livelihoods.	4.12	.589
4	Adoption GAP system is reducing chemical residue helps consumer’s health.	4.61	.600
5	Enough agricultural products can be supported rice farming with GAP.	4.09	.569
6	I am sure I will adopt the GAP system in my rice production.	3.95	.784
Overall Mean Value		4.16	

Source: From collected Survey Data, 2022

The above table (4.8) described that the result of mean and standard deviation value of the six questions of dependent variable Adoption GAP measurement were such as ‘having desire to practice GAP for rice production’ with (M= 3.93, SD=.676), the question of ‘GAP system is better than the traditional farming system’ was answered with (M= 4.26, SD= .711) that is the maximum mean value in all indicators, the third item of ‘Ensure GAP system makes to improve our livelihoods.’ with (M= 4.12, SD=.589), the next item was ‘Adoption GAP system is reducing chemical residue helps consumer’s health’ with (M= 4.61, SD=.600), the fifth statement of ‘Enough agricultural products can be supported rice farming with GA’ with (M= 4.09,SD=.569), the final question was ‘I will adopt the GAP system in my rice production’ with (M= 3.95, SD=.784) and the total mean values for the variable is 4.16. As the finding on the result of mean value, almost of surveyed farmers also dare not to change from chemical agriculture to GAP system immediately according to the proof of their mean value on question 1 and question 5.

#### **4.4.6 Overall Mean Value for Farmers’ Perception of the Adoption of GAP of Rice Production**

The following table shows the results in summary of mean value on each dependent and independent variables of the topic of Farmers’ Perception of the Adoption of Good Agricultural Practices of Rice production in Sagaing Region.

**Table (4.12) Overall Mean Value for Adoption of GAP**

<b>Measurement</b>		<b>Mean</b>
1	Attitude of Farmers	3.89
2	Farmers’ knowledge	3.96
3	Awareness of Farmers	3.98
4	Willingness of Farmers	3.86
5	Adoption GAP	4.16

Source: From collected Survey Data, 2022

According to the above table (4.9), the study found that the overall mean value of Attitude of Farmers is 3.89. The attitude of respondents is almost feasibility to accept adopting GAP in the study area and normally, they believe that GAP will be successfully practice in rice production as well as can be launched export market.

The study found that the overall mean value for Farmers' knowledge is 3.96. With regard to the result of the response on farmers' knowledge, they have proper knowledge related to the GAP ideology and might be ever perceived from training, discussion, meeting and etc. under the management of DOA and other opportunity exist.

Likewise, the study observed that the overall mean value of Awareness of Farmers is 3.98. This means that the farmers have proceeded with the available awareness from DOA and other information entrances, whereas it is the adoption of GAP and how to promote their farming life and cultivation technologies.

Similarly, the study showed that the overall mean value of Willingness of Farmers on adoption of GAP is 3.86. This indicates that the uppermost respondents have a willingness to practice GAP agricultural system to get more positive output to enrich their farming life.

Eventually, the overall mean value of main dependent variable Adoption GAP is 4.16. The reason is the responded residents have willing to practice the offer which is the adoption of GAP in Myanmar Agriculture processes.

According to the result, the study found that the adoption of GAP in the study area can be feasible to launch GAP but it will be necessary to motivate affordably and to share more information, even though it cannot be succeeded in the short-term but need to take a sufficient period and draw a practical programme for the adoption of GAP to start implementation.

#### **4.5 The Impact of the Adoption of Good Agricultural Practices in Indaw, Sagaing**

The fact of occurrence on the adoption of Good Agricultural Practices can be became positive, negative or nothing impact on agricultural society. The government's policy towards agriculture focuses on increasing production in order to achieve food safety, self-sufficiency in local and to develop exports. However, most of farmers in this sector are smallholders with uneconomic-sized farms, the cost of production of the least owner is high, with low input, low yield and poor-quality produce. According to the finding of Tiraieyari et al., 2010, building the capability of extension workers in agricultural sector have to be stimulated to more feasible for adoption GAP in study area furthermore competency correlated with performance, the link between competency and performance is well established new technologies.

By founding GAP method in our destination, the positive impact for farmers includes economic incentives such as increasing and/or stabilising revenue, reducing average costs, enriched market access, increased capital valuation of farm assets, reduced vulnerability to poor agricultural practices of other farmers; regulatory or legal incentives including changes in ownership rights or tax burdens, liability rules, subsidies; and human capital incentives including access to new skills. Contrary, the adopters don't release the negative impact to adopt GAPs include economic disincentives such as: increased production costs, extra investment in assets that are specific to one buyer and/or cannot be recovered if the buyer-seller relationship breaks down; institutional constraints including inadequate quality monitoring infrastructure, weak or corrupt related public institutions for administration GAPs, and; human capital constraints such as literacy limits on documentation capabilities; constraints on labour or management time, weak public extension, etc (Ανυφαντάκης, 1994).

. No doubtful that GAPs focus on reducing soil erosion, reducing run-off or protecting water resources. But in some of developing countries, this may not be the case given limited resources and infrastructure for monitoring. An ineffective or corrupt regulatory system will weaken the credibility of public sector-driven GAPs (Ανυφαντάκης, 1994).

In order to the empirical findings of (Montagn et al. 2007; FAO 2010), GAPs uncover a range of maintaining soil fertility, water resource and irrigation management, cropland management, degraded land restoration, animal production and welfare, integrated pest management, integrated fertilizer management and conservation agriculture. GAPs explicitly aim to increase the supply of safe and high-quality food by promoting more sustainable crop production (Ali 2014) while also helping to improve market access and farmers' livelihoods (Poole and Lynch 2003; FAO 2010). Although GAPs have the potential to play a significant role in improving agricultural practices, there is currently limited empirical evidence on the level of awareness and implementation of GAPs in study area (Road et al., 2020).

## **CHAPTER V**

### **CONCLUSION**

This chapter composed of finding, conclusion and suggestion session on based of the outcomes from analyzing. The topic of the paper is opinion of adopters in implementation of GAP in paddy manufacturing, Indaw Township. The purpose of the current study was to analyze the constraints on the farming to adopt Good Agricultural Practices (GAP) of rice production in surveyed area or study the prevailing barriers to be able to widespread the adoption of Good Agricultural Practices (GAP) in rice production in study area and reveal the effective in firming by adopting Good Agricultural Practices (GAP).

#### **5.1 Finding**

The study was able to survey on the 200 respondents from four wards and four village tracts in Indaw Township, it can be collected from 163 male and 37 female for this analysis. Regarding with the age situation of the respondents that 56 respondents are between 36-45 years old, 69 answers are the interval of 46 to 55 years old, the range of 56 to 65 years old was been 59 persons and the last 16 growers was above 16 years old. By reporting the educational level of the respondents, the primary level completed farmers was recorded with 54, the secondary school was educated with 106 respondents, accomplished the high school level was noted by 29 villagers, and 11 persons graduated the degree. According to the detailed results of analysis, most of respondents earn the monthly income as less than 150000 MMK and 66 of all were between 150001 to 300000 MMK per month. In the interviewees, 130 planters cultivate both rice and other crops in their firm accordance with the season while 70 people grow only paddy. As the collected data, 141 farmers have over 11 years farming experiences in agriculture sector. However, the study counted the 123 small holders of fields for 1- 5 acres of land area in other hand all farmers are careering in their own land expect 6 persons. According to the practical answers of the

respondents, they have accessible to sell for paddy but the GAP market for rice production in their region does not have a comprehensive demand market.

Regarding with Attitude of Farmers, even though they would like to satisfied on adoption GAP in firm place generally but they are scaring to accept the change from conventional procedure to new innovated process due to the respondents are lack of educational level. The mean value for aspiration of adopters can be found as (3.89) not over satisfied option.

The result related with concerning the Farmers' Knowledge, they have knowledge about general conceptualization of GAP without detail instructions and procedures furthermore they desire to provide the affiliate of government and other organizational groups to step the new agriculture reforming system. The mean value for general knowledge regarding with GAP method can be noted as (3.96) it is merely close to satisfied scale.

As regards Awareness of farmers in the adoption practice, they have fostered meeting, training, public talk related basically GAP theory under the arrangement of DOA and other related parties in industry. Continuously, the respondents are being expected the awareness of extension services for GAP to start GAP on farming in study area. The mean value of awareness of adopters in GAP can be reported as (3.98).

Concerning with Willingness of farmers on GAP adoption, the adopters have pleased to start-up GAP system but utilizing pesticides for the rice farming was not completed satisfied in another side, willing to farm the traditional way without using fertilizers to enhance productivity also definitely satisfied on the statement. Of course, the mean value for willingness of members can be seen as (3.86) it cannot be reaching the holistic satisfied Likert scale.

Based on the findings on the transmission from the receiver, even though the respondents are demanding agricultural products that are produced in a safe and sustainable way and with assurance that they are truly conforming to standards of Good Agriculture Practice, they don't dare to accept the sensitivity on GAP. GAPs can be spent the external costs when the social costs from a good or service outweigh the private costs incurred by the supplier. Integrated Production and Pest Management programmes will reduce negative spillover effects with respect to farm workers' health, the environment and chemical residues on food because integrated Production and Pest Management encourage the use of non-chemical production and

management techniques using naturally-occurring beneficial insects to control insect crop pests suggested by Ανυφαντάκης, 1994. GAP is not only to protect the health and safety of consumers and producers but also guards the retail sector and the exporting areas from the possibility of a health crisis that could threaten the global reputation and marketability of their export products described by Amekawa, 2009.

Myanmar GAP adopters were facing with enormous challenges and risks which inhibit them from implementing the identified GAPs, lack of fertilizers, inadequate finance, extreme poverty, lack of education, vulnerable the access of GAP markets, threatens the disaster and rainfalls, and cost of production among others conventional farming system according with criticism of (Road et al., 2020). Also, FAO (2010) asserts that financial cost and specialized knowledge while GAPs will be implementing such as water purification equipment or record-keeping technology more difficult for smallholder manufactures in developing countries.

## **5.2 Conclusion**

Adoption GAP in the study area is unable to be harmful for succeeding during short time period there has uncover challenges on farmers and local or abroad market place for instance lack of provide union and local government and other related non-governmental organization, risk of access in communication and technologies distributions, poor natural resources and water resources system, vulnerable of literacy rate in residents. Nevertheless, adoption of GAP in Naypyidaw will be obviously embraced more effectiveness of GAP in agricultural platform due to having the sufficient necessary resources and infrastructure, capturing the closely monitoring from the governmental organization reach to practical field areas, providing the assistance of budget, training, technologies, launching to the local or foreign market easily, and possessing the good communication and facilitation from the union level government.

Meanwhile developing a set of competencies for extension workers and incorporating competencies into GAP training and meeting, the capacity of an agricultural organization to better serve in adoption GAP can be improved and can be interested than current situation in study area.

The developing countries include our country are relying on foreign currency it can be earned by exporting agricultural products, tariffing in trade sector, and accepting the assistance aid, loan, grant and other sources. To exporting agricultural



products, food safety is a major concern for all food producers and handlers in that the third-party GAP certificate is mandatory require for all exporters. According to the describing of Laosutsan et al., 2019b,

Microbial contamination that results in unsafe food is the focus of much of this concern that can come from many sources: the use of unsanitary harvesting and handling equipment, contamination caused by chemical-infested irrigation water that is due to heavy and unsafe use of pesticides upstream, inadequate personal hygiene by employees, improper fertilizer and soil amendment use, and a variety of other obvious and not-so-obvious sources.

The increasing incidence of chronic disease and the widespread problem of food security and rural poverty is one of the fundamental challenges confronting the government and international institutions (Road et al., 2020). Therefore, implementing the adoption GAP in study area can be solved incidence of chronic disease and the widespread problem of food security in order to literature evidence of Laosutsan et al., 2019b.

By underling the conclusion of Long and Sworzel 2007; Oladele 2010; Adesope et al. 2010, the educational programs and technologies on farmers needs which invariably provides an opportunity for transfer of skills, knowledge and accurate information which enables farmers to make an informed decision and facilitate adoption GAP. By summarizing conclusion for this paper, implementing and setting the educational programmes for GAP system with the new strategy ensure to be attained more profitable for complete mission the GAP and poverty reduction for our country.

Nowadays, the COVID-19 pandemic is obviously outbreaking in the worldwide so it is being interfered to extension, healing on all of social, economic enterprises in other hand GAP adopting in Indaw also is still existing at the level of empirical GAP adopting under leading the government policy. Therefore, the extension GAP in study area need to more affordable, facility aids from authorized institutions to be able successful with acceleration in targeted period whatever it is essential devoted with participation of private and public, fascination of main performers.

According to the literature review from the vary of scholar' analyzed on empirical researches and the heart-word speaking of the respondents in study area, the

study composed of the suggestions for providing to adoption of GAP in Indaw, Sagaing Region as the follow:

- (1) Central and Local Governments are the main supporters for the public GAP programs by providing financial and technical assistance for growers through technical training, free certification, and export market-access and accreditation. Those public GAP approaches help reduce transaction costs and some of barriers on the part of growers, thus facilitating a much broader inclusion of small-scale producers in the mainstream market toward the attainment of various economic, social, and environmental advantages therefore, the government of Myanmar should be arranged more necessary facilitations to users for accelerate GAP rapidly.
- (2) The government should bear the superb extension workers to problem solving or decision-making development competency to be measured by the extent of extension workers' ability to provide clients with problem solving or decision making to prompt immediately.
- (3) The related governmental office should embark to issue the GAP certificate for adopter without hesitate and sticky restricted prohibitions, GAP certificate is an independent third party plays a critical role in assuring the credibility of GAPs, the credible monitoring and certification can be performed the key to the successful implementation of sustainable GAPs systems for product attributes that cannot be easily (or economically) detected after the fact through testing.
- (4) DOA should train the effectiveness training and awareness arrangement in study area country by planning the new affordable practicing and theoretical courses for embedding and sustainable development of GAP standards which invariably will create more awareness of the GAP system among rural communities and massive public enlightenment campaigns and mass information mobilization in the rural communities across the nation.
- (5) All of related stakeholders should perform the implementation of GAP becomes part of the private sector standard to solve the win-win solution by using Private, Public Procurement of GAP products in

Local and Foreign demand. The collaboration of public and private might encourage smallholder farmers to be more aware and make better informed decisions which encourages comprehensive implementation of the system.

- (6) The government should be embraced the entrepreneurship prototype of GAP adoption farming in Naypyitaw towards it can be prevailing to other area to hierarchy of GAP adoption as GAP model in order to intensify its efforts in the pilot communities' development projects and expanded its Adopted Village concepts.
- (7) Simultaneously, the government and related organizations should be enthusiastic to enrich the export market of GAP products to seize the confidence from the agricultural stakeholders including the small-holders farmland on GAP project.

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2020-2021 Annual Office Report of Department of Agriculture, Indaw Township

2021-2022 Annual Office Report of Department of Agriculture, Indaw Township

## **Farmers' Perception of the Adoption of Good Agricultural Practices (GAP) of Rice Production in the Sagaing Region**

Dear Participant,

I am a Master's Degree student at Executive Master of Public Administration Student in the Yangon University of Economics. I am surveying my dissertation focusing on “Farmers' Perception of the Adoption of Good Agricultural Practices (GAP) of Rice Production in Sagaing Region”. The questionnaire will take around ten minutes to complete and please help to answer the questions carefully. Thank you very much.

### **Section One: Profile of Participants**

Question 1: Gender	<ul style="list-style-type: none"><li><input type="radio"/> Male</li><li><input type="radio"/> Female</li></ul>
Question 2: Age	<ul style="list-style-type: none"><li><input type="radio"/> 20-35years</li><li><input type="radio"/> 36 - 45 years</li><li><input type="radio"/> 46 - 55 years</li><li><input type="radio"/> 56-65 years</li><li><input type="radio"/> Above 65 years</li></ul>
Question 3: Education Level	<ul style="list-style-type: none"><li><input type="radio"/> Primary School</li><li><input type="radio"/> Secondary School</li><li><input type="radio"/> High School</li><li><input type="radio"/> Undergraduate</li><li><input type="radio"/> Graduate</li></ul>
Question 4: Income (Monthly) (MMK)	<ul style="list-style-type: none"><li><input type="radio"/> Less than 150000</li><li><input type="radio"/> 150001-300000</li><li><input type="radio"/> 300001-450000</li><li><input type="radio"/> 450001 and above</li></ul>
Question 5: Livelihood	<ul style="list-style-type: none"><li><input type="radio"/> Rice production</li><li><input type="radio"/> Other crop and rice production</li></ul>
Question 6: Farming experience	<ul style="list-style-type: none"><li><input type="radio"/> Less than 3 years</li><li><input type="radio"/> 3 - 5 years</li><li><input type="radio"/> 6 - 8 years</li><li><input type="radio"/> 9 - 10 years</li><li><input type="radio"/> More than 11 years</li></ul>



Question 7: Cultivating Land area (acres)	<input type="radio"/> 1 - 5 acres <input type="radio"/> 6 - 10 acres <input type="radio"/> 11 - 15 acres <input type="radio"/> More than 16 acres
Question 8: Land Ownership	<input type="radio"/> Own <input type="radio"/> Rent
Question 9: Have GAP markets for rice production in your environment?	<input type="radio"/> Yes <input type="radio"/> No
Question 10: Does an accessible market sell for rice production?	<input type="radio"/> Yes <input type="radio"/> No

## Section Two: Attitude of Farmers

Please choose your opinion on each of the following questions by using the Five Likert scales. (1= Strongly disagree, 2= Disagree, 3= Neutral, 4=Agree, 5=Strongly Agree).

	Attitude of Farmers	1	2	3	4	5
1	I would like to practice GAP on my farm.					
2	I believe that it is beneficial to practice.					
3	I believe that there is adequate information on GAP on farms.					
4	I believe that I can successfully practice GAP in my farming rice production.					
5	I trust that there will be good demand in the export market for GAP products.					
6	I always follow good agricultural practices when I cultivate rice in my framing.					

### Section Three: Farmers' Knowledge

No.	Farmers' knowledge	1	2	3	4	5
1	I know how to practice GAP in my rice production farming.					
2	My farming knowledge of GAP will be a successful method of farming to earn more profit.					
3	I believe that having GAP certification will increase my income/profit.					
4	I believe that practising GAP is an environmentally friendly method of farming.					
5	I know the instructions for GAP.					
6	The government provides small loans for GAP to rice farmers.					

### Section Four: Awareness of Farmers

	Awareness of Farmers					
1	Department of Agriculture in Indaw provides technical assistance training for GAP development to the farmers.					
2	I recommend attending GAP training with my farmers' friends.					
3	I know how I can successfully practice GAP on my farm by applying my learning through training.					
4	I believe that it is beneficial to practice GAP for both farmers and marketers.					
5	I am willing to attend GAP training.					
6	I have awareness of extension services for GAP to start GAP on farms.					

**Section Five: Willingness of Farmers**

No.	Willingness of Farmers	1	2	3	4	5
1	I am willing to adopt the GAP system in my farming.					
2	The using GAP system in rice production will gain benefits for both consumers and farmers.					
3	I don't use pesticides for my rice farming.					
4	I am willing to farm the traditional way without using fertilizers to enhance productivity.					
5	I decided to use GAP for further production of rice on my farms.					
6	My regions need to have the Central Lab to control the GAP farming.					

**Section Six: Adoption GAP**

No.	Adoption GAP	1	2	3	4	5
1	I have a desire to practice GAP for rice production.					
2	The GAP system is better than the traditional farming system.					
3	I am sure that the GAP system makes to improve our livelihoods.					
4	Adoption GAP system is reducing chemical residue helps consumer's health.					
5	Enough agricultural products can be supported rice farming with GAP.					
6	I am sure I will adopt the GAP system in my rice production.					

**Thank You Very Much!**

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