Research Report

Agricultural extension system in Vietnam and its development: Comparative studies in Thailand and Philippines

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CERTIFICATION PAGE

I, Le Thi Thuy Dung, (Student ID 51218622) hereby declare that the contents of this Research Report are original and true, and have not been submitted at any other university or education an institution for the award of degree or diploma. All the information derived from other published or unpublished sources has been cited and acknowledged appropriately.

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ABSTRACT

In 2015, Vietnam began transforming its agriculture extension and advisory services to improve the efficiency and competitiveness of its agricultural sector and thus improve the livelihoods of its farmers. Despite these recent efforts, however, farmers continue to face many challenges and constraints such as lack of human resources, poor linkage and weak coordination, and lack of huge financial investment.

This research report provides an overview of the issues of Vietnam's agricultural extension system and emphasizes the roles and impacts of the agricultural extension system in Vietnam toward the development of the agricultural and rural areas. This research report uses scientific studies and references; and takes advantage of the results of previous studies relating to agricultural extension. This review paper is aimed at drawing the best practices and lessons learned about well-functioning aspects of agricultural extension systems in Thailand and Philippines. These lessons learned focus on agricultural advisory services, funding sources for agricultural extension services and extension providers so that Vietnam can learn and benefit from its neighbors.

This research report emphasizes that the agricultural extension activities in Vietnam have played a significant role in transferring the advanced scientific and technology to the farmers through the conducting demonstration sites and science-technology forums in the fields. Moreover, this report also reviews the current situation in Vietnam's agricultural extension system. These are the lacking in both quality and quantity of human resources are working in extension system. Thus, need more policies to train the extension workers not

only the knowledge but also the skills. Additionally, Vietnam government should have more solutions to improve the coordination among scientific research, policy and agricultural development. Based on the experiences from Thailand and Philippines, Vietnam government should encourage the active participation of stakeholders in agricultural extension activities. Then considering that the farmers as a central actor in order to promote their capacity in the agricultural cooperatives and farmer groups. With the Center for Technology and Agricultural Transfer Extension where I have been working, it is essential in promoting the cooperation among institution research, farmers and extension agent in researching and transferring the advantaged agricultural technology to the farmers.

CHAPTER 1: INTRODUCTION

1.1 Agricultural extension system

Benor et al. (1984) defined agricultural extension (AE) as "the process of carrying the technology of scientific agriculture to the farmer in order to enable him to utilize the knowledge and better the economy. Agriculture extension service seeks to impart the necessary skills to the farmers for undertaking improved agricultural operations, to make available to them timely information improved practices in an easily understandable form, suited to their level of literacy and awareness, and to create in them a favorable attitude for innovation and change". (page 138)

According to Samanta (1993), agricultural extension is an educational process for farmers aimed at the development of agricultural skills and knowledge, as well as to strengthen agricultural production in quantity and quality. Thus, in the process of agricultural development, agriculture extension became a central mechanism, both in terms of technology transfer and human resource development.

The rural development is a comprehensive term because it covers the general development of rural areas such as the development of allied agriculture and industry, socio-economic infrastructure, community services, infrastructure, and human resources, etc. Moreover, rural development is the interaction between different physical, technological, economic, socio-cultural, and institutional factors. And its significant target is to improve the quality of life for rural people (Singh, 1999).

Without doubt, rural development became a wide network that connects and coordinates all relevant entities and industries to serve and promote rural development. In fact, the agricultural extension system is one of the necessary options to solve this problem. Furthermore, agricultural extension services have been critical components of rural development efforts. They have contributed to the reduction of hunger and poverty, increased adoption of improved technologies, and increased productivity and capacity of their beneficiaries. This is often recognized by the multifaceted goals and the various functions of extension in various contexts (Swiss Agency for Development and Cooperation, 1997).

In some Asian countries like Thailand, Indonesia, Philippine, etc, agricultural extension is described as "a form of non-formal education for farmer and farmers-households to develop their dynamics and capacity to increase the quality of life and their role in and control over agricultural development" (Dinamis, 2002, p. 97).

Although it is difficult and complicated to assess the impact of agricultural extension on rural development, it has been proven that positive changes can be made by extension, in terms of awareness and knowledge, application, farmer productivity (Swanson et al., 1997; Rola et al., 2001).

Nowadays, agricultural extension has adjusted itself to adapt to the changing-oriented environment such as information technology breakthroughs, environmental concerns, and sustainable development. Qamar (2002) reviews that in some countries the global trends and challenges in agricultural expansion have appeared. These trends and

challenges include expanding the role of agricultural extension, decentralizing extension services, privatizing extension activities, engaging in and applying electronic information technology into agricultural extension, etc.

Agricultural extension programs and services have seen some new trends emerging across the world, such as privatization, decentralization, the participation of beneficiaries in the extension process, and pluralism such as multiple institutions and organizations delivering extension services. The general shift from top-down extension services to participatory and demand-driven programs is evolving. At the same time, there has been an increase in the need for broader and deeper levels of knowledge and skills for successful extension professionals (Suvedi & Kaplowitz, 2016).

The extension organization plays an important role in disseminating improved agricultural techniques to agricultural communities and their application. The extension unit was expected to play a key role in the overall development of agriculture but failed due to a number of weaknesses and challenges and was unable to achieve the desired goals (Jock and Feder, 2003).

Agricultural extension agents are responsible for transferring agricultural information to farmers. Increasing agricultural production to meet our needs largely depends on the availability of modern farming techniques and new technologies, applying modern agricultural practices and other necessary skills. The role of agricultural extension is crucial for the transfer of modern agricultural technology, but it still fails for a number of reasons such as encountered difficulties in developing grassroots agricultural extension

networks, as well as organizing training and training activities, building and replicating demonstration models and transferring technical advances (Eicher, 2001).

There are many reasons for not being capable to having a significant impact such as no incentives for extension personnel's, lack of agricultural planning, weak policies, and communication gaps among the researchers and farming community resulting low adoption of improved practices (Takenaka, 2006). Lack of proper communication system and weakness of extension system most of farmers are unaware about the modern agricultural practices which result in low production. Therefore, increase in agricultural production for fulfilling farmer's needs largely depends upon the availability of modern farming techniques and new technology, adoption of modern agricultural practices and other necessary skills (Inayatullah, 2007).

Agricultural extension has a long history and plays a key role in agriculture and rural development in many developing countries, of which Vietnam is one. According to Karbasioun, et al (2007), agricultural extension based on communication science, community development, rural development, and international development, and has strong linkages with agricultural research and practice. Furthermore, the extension is defined as:

> "current views circle more around multiple stakeholder processes of cooperative knowledge construction and participatory approaches in integrated rural development, combining scientific knowledge with indigenous or local knowledge, moving from subsistence farming to entrepreneurship."
>
> (Karbasioun, Mulder & Biemans, 2007, p. 4)

In Vietnam, agricultural extension plays a significant role in rural development. In fact, not only Vietnam but also other countries always give the reform on structural, financial, and regulatory in order to improve it. In addition, extension and that is the basis of the transfer of agricultural technologies to farmers and to persuade farmers to adopt those agricultural techniques (FAO & World Bank, 2000, as cited in Le, et al. 2008).

In fact, in developing countries, the transfer of technology is always emphasized in extension service. The target of the researches is transferred to the extension agency and thus the farmers apply them in their farms. Further, the extension agents give recommendations to farmers and encourage them to utilize the technology in agriculture production (Rahim et al., 2004, as cited in Le, et al. 2008). In addition, improving human resources in rural development is considered as one of the most important development sources. In recent years, the major problems which developing countries have faced are professional ineffectiveness and lack of motivation among their employees. The agricultural extension system is implemented by top-down mode. Thus, it cannot reach to poorer farmers and tending to focus on better-off farmers. Lack of knowledge and skills; the common practice of selecting local leaders as contact farmers; and agendas imposed from higher levels that conflict with local people's needs and wishes. Therefore, it causes activities not effective and loses the working motivation from the extension workers (FAO, WFP & IFAD, 2012).

Xuan (2012) illustrates that in sustainable agricultural development in poor rural regions like Vietnam, an agricultural extension system should be organized along a farming system approach to address the felt need of the poor farming communities. According to

Jock and Feder (2003), the farming system is an integrated set of activities that farmers perform in their farms under their resources and circumstances. This aim is to maximize the productivity and net farm income on a sustainable basis. Likewise, the farming system is combined with soil, water, crops, livestock, labor, capital, energy and other resources. They have a connection with the extension and agricultural services center.

Additionally, William (2003) defines that the farming system approach is not an in individual factor. It is relevant to the whole farm and the common welfare of farm households. The agricultural system associated with livelihoods as agriculture is still the most important component of most rural people. Thus, it makes a significant contribution in the lives of many people in semi-urban areas. The farming system approach could very well enable the members of the agricultural extension system to determine appropriate technologies that are: a) easy to apply by farmers, particularly the poor farmers; b) utilizing as much as possible local sources of inputs that could preferably be generated by the farmers themselves; c) environmentally least harmful; d) least costly to farmer's income; and f) yielding optimum products whose by-products can be integrated into the production system (Xuan, 2012).

1.2 Research questions

Agricultural extension has played a significant role in the development of the agricultural and rural areas in Vietnam. The policies for rural development have focus on overall growth and development of the rural economy, aiming at raising the living standards of the rural population as a whole. There are many reports and journal articles

discussing on the agricultural extension system in Vietnam such as Xuan, 1995; Bo, 2012; Friederichsen et al, 2013; Ngan and Suresh, 2018. In this research report, I will review the role, impacts as well as the current issues of the agricultural extension system in Vietnam toward the development of the agricultural and rural areas. I will focus on the Thailand and Philippine's agricultural extension system as comparative studies and their lessons for Vietnam.

I have worked at the Center for Technology and Agricultural Transfer Extension for more than 5 years. My mission is coordinating with the departments, the units to manage and perform science and technology tasks at all levels. Moreover, I also coordinate, implement the program of transferring science, and technology to farmers. Thus, I want to have overview about the current issues in Vietnam agricultural extension system and give the recommendations for the practice into my office. Therefore, this study aims to answer three following questions:

1. What are the roles and impacts of the agricultural extension system in Vietnam toward the development of the agricultural and rural areas?
2. What are the issues of Vietnam's agricultural extension system?
3. What lessons can be learned from agricultural extension from Thailand and Philippines to that of Vietnam, particularly for the Center for Technology and Agricultural Transfer Extension?

1.3 Methodology

In order to answer research questions, using the literature review via the methodological design of documentary research. Using the alternative reliable data collected from external sources and official documents such as past studies, journals, official websites, and statements as well as the newspapers or TV news. Moreover, I interviewed a professor in Vietnam, Pham Van Chuong, former director of Agricultural Science Institute of Northern Central Vietnam and included his opinions about agricultural extension system in my study.

Through comparative studies in Thailand and Philippines, this study will give the information about agricultural extension system in Vietnam as well as lessons from Thailand and Philippines and its developing orientation in the next time.

CHAPTER 2: VIETNAM'S AGRICULTURAL EXTENSION SYSTEM

2.1. Vietnam's agricultural extension system

2.1.1. History of Vietnam's agricultural extension system

Since 1993, as the development of Vietnamese public extension system, it was organized into five levels (central, provincial, district, commune, and village) (Bo, 2012). This system aims to increase production and reduce poverty through agriculture, forestry, and fishery extension programs for the development of rice, maize, industrial crops, food crops, and other crops. Key extension activities include establishing demonstration sites; conducting field work and training; and organizing science/technology forums on crops, livestock, veterinary care, forestry, water resource management, agroforestry processing, and engineering (Bo, 2012).

In Vietnam, the major reform in agricultural policy occurred in the late 1980s which changed county from planned to free-market economy (Stads and Nguyen, 2006), with the enactment of the Directive No. 10 (Thang and Linh, 2014). The significant impact of Doi moi, in 1988, it was institutionalized as a national policy and rewarded the producers (farmers) with the remarkable productivity increase (Vo, 2012). While Vietnam‘s constitutional amendment in 1992, recognized the role of the private sector in the economy, the subsequent success realized by implementing *Doi Moi* solidified involvement of private sector actors in the extension system.

Between 1995 and 2005, the agricultural shifted from a centralized planning mechanism to a developing household economy, the newly established agricultural extension system, mainly focused on developing farm households (Chuong, Interview 12 November 2019). Agricultural extension activities in this period focused on developing rice, maize, industrial crops, food crops.

From 2005 to 2010, the national extension system has focused on the agricultural sector restructuring plan, including developing rural areas, increasing food safety, and promoting hygiene. Dat (2010) stated that the public extension system is responsible for enhancing the capacity of agricultural extension staff and collaborators, strengthening the application of information technology in agricultural extension, increasing the connection between farmers and enterprises, and formulating policies on agricultural extension in line with requirements and production practices.

Since 2010, Vietnam agricultural extension has also focused on building and scaling up models of agriculture, towards good agricultural practices (GAP), application of high-tech agriculture, linking the value chain from production to consumption under the model "large model field". The model "large model field" is a model of linking efficient and sustainable rice intensive in the direction of GAP, towards building a high quality export rice material area, built according to the policy of Vietnam Ministry of Agriculture and Rural Development. Products made from fields are marketed with a common brand name, the quality, and quantity of products guaranteed by the manufacturer (Chuong, Interview 12 November 2019).

In 2015, the renewal of the agriculture extension system began. Currently, extension and agricultural production support is mainly responsible for implementing key policies of the agriculture sector, enhancing the quality of food hygiene and safety, and adopting/ climate-smart techniques (Ngan et al. 2015). In addition, the extension system provides farmers with information related to new policies and market prices, aimed at improving the sector's efficiency and competitiveness as well as farmers' livelihoods.

In 2017, Viet Nam's agriculture sector was transformed into a pluralistic system involving farmers, the private sector, and NGOs. Besides the government, research institutions, universities, private extension providers, and non-governmental organizations also provided extension services (Ngan et al. 2015).

2.1.2 Why agricultural extension is needed for agriculture and rural development and how it should be transformed

Most of the existing reports show that extension is an urgent need for agricultural and rural development in Vietnam (MARD, 2004; Bo, 2012). In 1992, Vietnam joined the FAO Regional Rice Integrated Pest Management (IPM) Program, which had piloted the so-called Farmer Field School (FFS) model for farmers. In Vietnam, the FFS emphasizes capacity building of farmers rather than transfer of technology. The extension workers help farmers have opportunities to adapt the agro-ecological knowledge, skills in rural development (Van de Fliert, et al. 2007).

In 1993, the government had a decentralized agricultural extension, bringing it from the central to the local level, in order to promote demand-driven extension services. Thus, the components were essential for Vietnam agriculture extension such as transferring technology for farmers, training professional skills for farmers; and supplying information on technology, management, and the market for farmers (Le, et al. 2008).

There have been many studies on Vietnam's agricultural extension. According to Bo (2012), Vietnam agricultural extension need to "shift from top-down, one-way to two-way information flow; from supply-driven to farmer-led, community-led and demand-driven and participatory agricultural extension; as well as from single technical recommendation to a holistic package of technical advice" (p.5).

Moreover, Friederichsen et al, (2013) suggest the innovation systems approach to analyze the Vietnamese case. According to Friederichsen (2013), improving extensionist's ability to mediate between the conflicting principles of farmers' self-organization and government control is identified as a key challenge for increasing innovative capacity in Vietnam rural areas.

Ngan and Suresh (2018) evaluate the performance of the current extension and advisory system. Since then, giving recommendations for both policymakers and practitioners regarding possible improvements in agricultural extension in Vietnam. According to Ngan and Suresh (2018), agricultural extension approaches such as involving enterprises have shown a positive impact on farmers. In extension models, it is necessary to involve local business owners because they understand current market demand, what

products to produce, the quality of the products, and the farming process. Such local companies will guide and encourage farmers to follow the process and at the same time sell the necessary products to farmers. This model has been proven in production practices in some provinces. Furthermore, improving collaboration between farmers, extension agents, and researchers is also a way to improve services. Strengthening the capacity of extension agents is required. Because incentives for extension agents are low, increasing incentives can improve the extension services provided.

2.1.3 The roles and impacts of the agricultural extension system in Vietnam

Agricultural extension has a long history in the in the development of the agricultural and rural areas in Vietnam. According to Decree 13 (1993), the role of the agricultural extension as defined such as: disseminate advanced technology in cultivation, animal husbandry, forestry, fisheries, processing industry, storage and post-harvest technology; develop economic management skills and knowledge among farmers for effective business production; and co-ordinate with other organizations in order to provide farmers with market and price information so that they can organize their production and business in an economically efficient way (as cited in Beckman, 2001).

In Vietnam, the work of agricultural extension is the basis for the development of the agricultural sector, and without agricultural extension, it does not have any benefit from modern agricultural techniques and modern agricultural information. In fact, in Vietnam agricultural extension workers are playing a major role in the transfer of agricultural technologies to farmers (Ngan and Suresh, 2018).

2.1.4 The current issues in Vietnam agricultural extension system

According to Beckman (2001), the agricultural extension in Vietnam now mainly focuses on the dissemination of technology for primary production, with 70–80 % of its funds being used for demonstration models. Now, it requires a concentration on the training of extension staff, both the currently active staff and the academic education of future staff.

In Vietnam, there are some programs in extension activities had not been realistic and appropriate according to farmer demand, their implementation was still mainly top-down. The system of monitoring and evaluation of extension activities is still limited and works improperly. The involvement of local authorities is still very limited. Farmers are not yet involved in the extension works at the stage of planning, therefore extension activities do not really meet the requirement of farmers as well as the reality of the agricultural production (Van de Fliert, et al. 2007).

According to Bo (2012), the human resources in agricultural extension departments were below the demands in both quantity and quality. Currently, the professional staff accounts for only 1 people per 280 farming households. Among extension workers, there are only 15% who received professional training in the field of extension, the rest have mainly shifted from other technical professions.

Ngan and Suresh (2018) stated that agricultural extension services in Vietnam currently concentrate on establishing demonstration models, and training of farmers. There is a focus on field work and training courses. In general, agricultural extension approaches

are still top down, supply-driven and one way information flow that has not been highly effective. Moreover, the role of link between research, policy, markets, environment and production in extension is weak and no strong connection. Extension is the last stage before reaching the farmers with production advice, and should combine all aspects and considerations. Extension should also have the role of recommending the appropriate direction for future research.

2.2 Administrative Structures of AE in Vietnam

In addition, the vital contributions made by the private sector, in 1993, public extension services were also established when the Ministry of Agriculture and Rural Development (MARD) developed the National Agricultural Extension Center (NAEC) through its National Agricultural and Forestry Extension Department (Thai et al., 2011). The result of the agricultural extension service in 2010, Vietnam government appointed officially the National Center for Agriculture and Fishers Extension officially to be the main actor directing the agricultural extension nationwide with cooperation with regional and international extension organizations in order to introduce a policy of socialization and diversification of agricultural extension services to mobilize resources from organizations, aiming at encouraging two-way information flow and build a farmer-led, demand-driven extension (Ngan and Babu, 2018).

In Vietnam, there are three main actors are playing roles in extension service delivery. Public actor, Ministry of Agriculture and Rural Development (MoARD), and 64 Provincial Agricultural and Forestry Extension Centers under the provincial Department of

Agriculture and Rural Development (DARD) (GFRAS, 2016). The responsibility and service delivery are flowing through the management hierarchy (Nguyen, 2012). NGOs and development partners are also playing active roles in delivery extension services through project or program activity base (GFRAS 2018). Global forum for rural advisory services (GFRAS) also highlights that there are several private companies providing the regular basis of agricultural extension service in Vietnam.

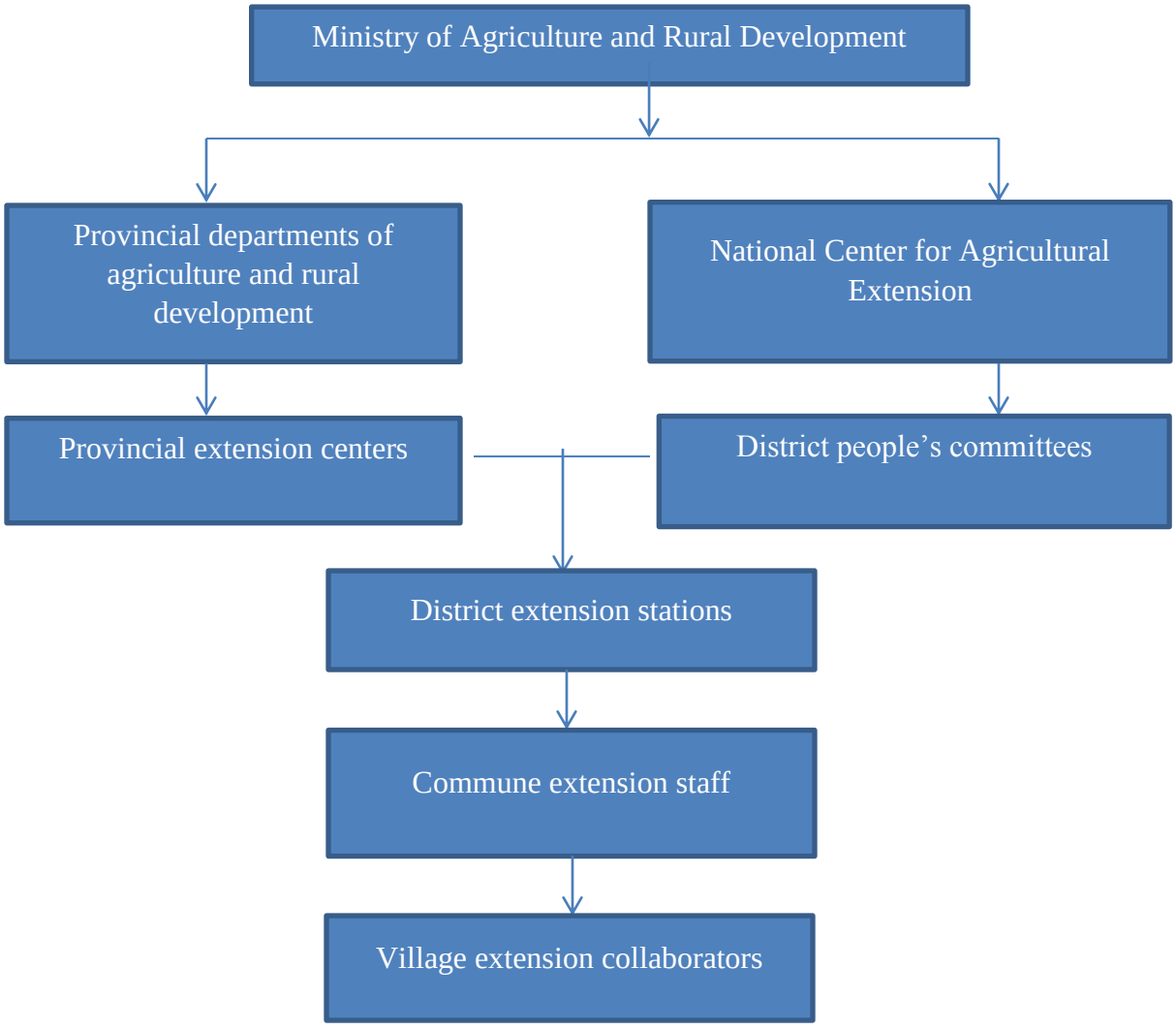

Figure 1. Administrative structure of agricultural extension in Vietnam

Source: Author

2.3 Rural credit in Vietnam

In Vietnam, farmers who want to access the credit meet some difficulties because of the nature of the rural credit markets and the lending procedures (Khoi et al, 2013). In the rural Vietnam, there are 3 kinds of credit such as informal, formal and semi-formal market. The form rural credit is provided by most of financial institutions. Informal credit comes from relatives, individual lenders, and associations. The semi-formal sector includes microfinance institution or NGOs. However, the informal credit sources are dominant in rural markets (Duy et al, 2012).

Indeed, according to Pham et al. (2007), the poor and low-income farmers request for formal credit are often refused, because they do not have collateral and cannot borrow money base on their income. This is due to vulnerable farming activities and inefficient agricultural policies.

2.4 Resource for AE in Vietnam

Vietnam government is a main found source of research and development and advisory service (GFRAS 2016). Ngan and Babu (2018) indicated that between 2011 and 2014 the annual disbursement of the Vietnam government on agricultural extension work was approximately 10 million USD. This budget was allocated through the National Agricultural Extension Center (NAEC) with 65% total budget and the Ministry of Agriculture and Rural Development (MARD) with 35% of total budget. The private sector and NGOs were also reported as the funding sources for support extension service in

Vietnam. The contribution of the private sector was 64% in the advisory services (FAO, 2013) and NGOs spent almost 2.3 million USD on nine projects within the country (GFRAS, 2016, and Nguyen, 2012).

2.5 Stakeholder involvement in Vietnam

Vietnam's advisory service is being transformed from trickle down into a pluralistic system involving farmers, the private sector, and NGOs (Ngan and Babu 2018). MARD is taking lead in all activities of the provincial departments of agriculture and rural development as well as the National Center for Agricultural Extension. The extension service is decentralized to subnational level that each provincial agricultural extension centers (PAEC) and flow its service through the management hierarchy (GFRAS, 2016). The National Center for Agricultural Extension is taking lead in the divisions of planning, finance, training, communication, and technical transfer as well as a branch for the Central Highlands and South Central Region, a branch for the Southern Region, and the Center for Training and Technical Transfer.

2.6 Influence of Green Revolution on Vietnam's Agricultural Extension

The term "Green Revolution" refers to a series of research and development, and technology transfer initiatives, occurring between the 1940s and the late 1960s, that increased agricultural production worldwide, particularly in the developing world. According to Borlaug (2000), the most important elements for green revolution include high yield variety, use of the chemical fertilizers, irrigation system and mechanization.

The Green Revolution began as the Mexican Agricultural Program (MAP) in 1943 under the auspice of the Rockefeller Foundation before it was extended worldwide and the name “Green Revolution” was coined (Bengaly, 2017).

Gaud (1968) defined green revolution as “developments in the field of agriculture contain the makings of a new revolution” (p.126). Green Revolution began in irrigated favorable areas and spread to the less favorable areas in Vietnam like Thailand, Philippines, and Malaysia. The national agricultural research systems have also played a critically important role in developing location-specific and appropriate technologies for using chemical fertilizers, and pesticides.

In Vietnam, Green Revolution is a revolution based on plant and technical measures mainly derived from the outside, from scientific and technical achievements. Therefore, on the one hand, it can help farmers have more opportunities to access the markets; on the other hand, externally, it weakens internal linkages and resources, forcing farmers to rely more on seed, chemical fertilizer and pesticide companies. The above societal change of the farmer has shown a positive side, but also a negative side (Bui, 2000).

Moreover, the Green Revolution as an industrialization process in agriculture, marketization has really affected rural society and farmers. According to Vo (1995), the poverty and loss of traditional agricultural knowledge, along with its corresponding social structures, beliefs and social connections, has formed a new social structure, social connection corresponding to the fundamental change based on the agricultural technical revolution. It also means the loss of traditional social capital to form new social capital.

Thus, green revolution affects Vietnam agriculture in a negative way. The farmers overuse chemicals, fertilizers, and pesticides due to lack of knowledge. From that it can be lead to the land degradation, environmental pollution in agriculture production. In Vietnam, during the Green Revolution, the use of pesticides unwanted side effects on human health and environment (Duy et al, 2012).

2.7 Center for Technology and Agricultural Transfer Extension

Center for Technology and Agricultural Transfer Extension belongs to the Agricultural Science Institute of Northern Central Vietnam. It is established on September 9, 2005, and located in Nghi Kim commune, Vinh city, Nghe An province, Vietnam. This center is my office where I have worked in for five years. This center has the aims to research and application and transfer of new technical and technological advances in the field of agriculture and agricultural development, investment consultancy in the field of agriculture and agricultural development. Moreover, import and export of plant varieties, supplies, and equipment for agricultural production. Another target of the Center for Technology and Agricultural Transfer Extension is testing services for new products for agricultural production. The joint venture, association with domestic and foreign organizations and individuals in the field of agriculture and agricultural development.

CHAPTER 3: THAILAND'S AGRICULTURAL EXTENSION SYSTEM

3.1 Thailand's agricultural extension system

3.1.1 Historical Evolution of AE in Thailand

In 1967, agriculture became the top priority of Thailand's national policy with the establishment of the Department of Agricultural Extension (DOAE) within the Ministry of Agriculture and Cooperatives (MOAC) (Suphannachart and Warr, 2011). Amidst the green revolution, agriculture was a leading segment of Thai economic growth. Obviously, the core objective of DOAE were set to help farmers to become self-reliant and sustainable (DOAE, 2003). 'New Theory' and 'sufficiency economy' (SE) concept promoted by Thailand's King in the wake of the 1997–1998 Asian financial crisis. First, SE theory complied with the international agriculture concept, and integrated in the goal and lexicon of the Eighth National Economic and Social Development Plan 1997-2001 of Thailand and carried it out, but in practice there was conflict with existing development models (Nelles & Visetnoi, 2016). SE is the ideal of self-sufficient agricultural communities brought into national disclosure (McCargo, 2001 and Kelly et al., 2012).

However, SE ideas have not been consistently applied while business interests (not necessarily Thai small farmers) have appropriated SE concept to serve profitmaking, capitalist interests (Chanyapate and Bamford 2009). Regarding to extension system, DOAE has adopted the participatory extension approach of "people centered development" where

people, sustainability, decentralization and participation by community members themselves are at the center. It carried out the new theory of self-sufficiency by prominent late King Bhumiphol Adulyadej in 1993 and designed as new theory of farming for smallholders in Thailand (Keely et al., 2012).

3.1.2 Administrative Structures of AE in Thailand

The Department of Agricultural Extension of Thailand (DOAE), established in 1967 during the "Green Revolution" with the aims to help farmers develop their farm activities for good living standards and secured income. This is the major government organization working closely with the farmers. The main department is located in Bangkok and there are provincial offices located in all the provinces. Under the provincial offices, there are agricultural extension offices providing extension staffs for each sub-district. The DOAE normally promotes farmers to produce crops that bring about high economic efficiency, and also advises them to solve production problems (Sharma, 2006).

DOAE is divided into 2 levels such as central state management and local administration. Central state management is responsible for guiding, directing, coordinating and supporting local units in implementing agricultural extension programs and projects. Poapongsakorn (2008) mentioned that the local administrative level is responsible for promoting, and developing farmers, farmer organizations, and community enterprises in the province to manage and coordinate the transfer of technical advances in agriculture.

Local extension levels include provincial and district levels. The Provincial Agricultural Extension Office with the task of promoting and developing farmers, farmer organizations and community enterprises in the province, coordinating the transfer of technical advances in agriculture, fisheries and livestock. The District Agricultural Extension Office with the task of planning, promoting and supporting district agricultural production, encouraging and develop farmers, farmer organizations, community businesses in each district and conduct other agricultural production support activities (Sukprasert, et al, 2003).

In 2002, with the Bureaucratic Restructuring Reform, DOAE in Thailand has a comprehensive with correlative units merged into one division or bureau. Besides, DOAE of Thailand has some unique organs, like the Agricultural Extension Research and Development Division, Bureau of Technology Transfer Development, Bureau of Farmers Development. The purpose of these organizations improves the farmer's abilities and enhances the participation of farmers in agricultural extension service (Falvey, 2000).

In Thailand, the organizations of DOAE make a significant role in helping local communities in agricultural production, natural resource management, and marketing plan formulation. DOAE has also promoted its role in transmitting information and experiences among communities. As a consequence, the farmers can gain access to improved technologies and sciences (Sukprasert, et al, 2003).

Agricultural Technology Transfer and Service Center (ATTC) was established in 1999. It has functioned to implement the policies of decentralization, participation, bottom-

up to top-down direction. ATTC derived from the sub-district level and it became the lowest level of extension institution in Thailand. The local farmers voted for the steering committee and it has responsibility to make developing plans. With support from governmental institutions and volunteer groups, ATTC has promoted its role well. In addition, by providing the opportunity to farmers in the community to analyze and solve existing problems by themselves, this organization implement various activities in community development (Sukprasert, et al, 2003). ATTC helped farmers by the steering committee to join together to make their own development plans and received any help by a one-stop service. Here, the extensionist became the important facilitator of organizing farmer's activities and linking farmers with various sources. In this sense, ATTC is no longer the conventional extension agency that focuses on technology transfer.

Regarding extension system, DOAE has adopted the participatory extension approach of "people centered development" where people, sustainability, decentralization and participation by community members themselves are at the center (Sukprasert et al., 2003) and designed as new theory of farming for smallholders in Thailand.

Furthermore, many government organizations worked on agricultural extension program including Department of Agriculture (DOA), Department of Animal Husbandry, and Department of Fishery. Recently, the representatives of these organizations have been working together in the district areas and the working unit named Mobile unit (MU). The responsibility of the MU team is to stimulate and support the initiation idea of farmers, advice the farmers to solve the principal problems and to contact a specialist to help farmers solve difficult problems (Falvey, 2000).

Robert (2000) stated that mechanism of agricultural extension activities in Thailand is the Department of Agricultural Extension has a close relationship with the Department of Agriculture. The Department of Agriculture is an agency directly under the Thai Ministry of Agriculture and Cooperatives. Department of Agriculture mainly manages and researches, does not directly transfer technical advances, research results to farmers, these tasks are assigned to the Department of Agricultural Extension to carry out the transfer activities and deliver to farmers.

Moreover, the conceptual of development in Thailand has shifted from technology-base, resource-base to human resource-centered one, and rural human resource has been attached more importance through participation in various trainings and farmer's organizations (Visetnoi & Nelles, 2017).

In 1972, farmer's cooperatives were initiated by Ministry of Agriculture and Cooperatives, and developed rapidly after that. There are two important types of farmer's organization: agricultural cooperatives and farmer groups; both of which receive support from the Ministry of Agriculture and Cooperatives (Falvey, 2000). Nowadays farmer organizations in Thailand almost cover half of farmers. They are not only the objects of agricultural extension service, but also the important facilitators for agricultural extension and rural development.

There are four types of main actors in providing agricultural extension services, public, private, NGOs and higher education institutions. For public sector, Department of Agricultural Extension (DOAE) under the Ministry of Agriculture and Cooperative

(MOAC) and its sub-departments play role in providing extension services to farmers. Private sectors are including both local and international private companies providing extension services to farmers/producers in term of contract faming. Likewise, none government organization (NGOs) and development partners also provide extension services related activities in support of government programs (GFRAS, 2018). There are 9 higher education institutes considered to be core extension service delivery actor for sustainable agricultural development agricultural (Visetnoi and Nelles, 2017).

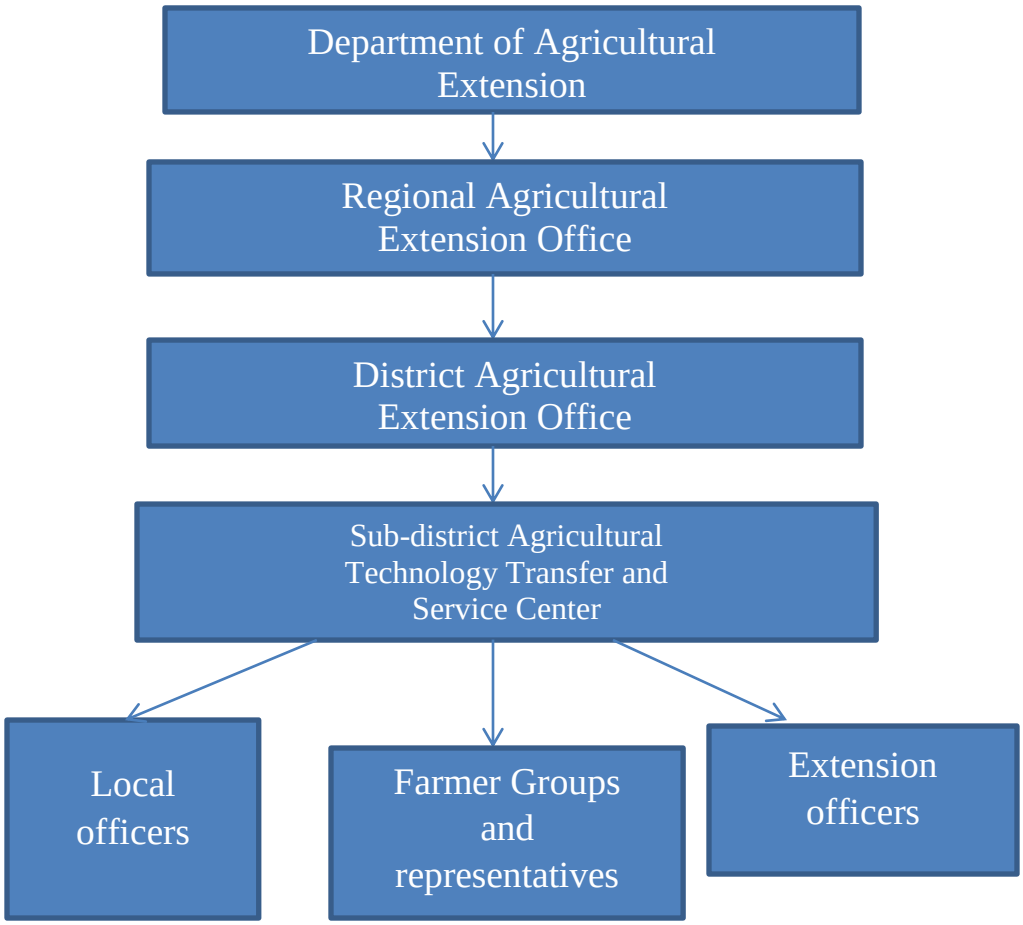

Figure 2. Administrative structure of AE in Thailand

Source: Author

3.1.3 Rural Credit

The highlight of Thai extension activities is the Rural Credit Fund. The voluntary credit mechanism of Thailand helps people feel secure about capital sources for development of household-scale production. Rural credit fund is managed by the Cooperative Office of the province. Extension workers are responsible for supporting people to access rural credit to develop production (Poapongsakorn, 2008). In my opinion, this is a good opportunity for Thai farmers can access funds in their farms.

3.1.4 Resources for Thai AE

Research funding and communication systems that generate and convey knowledge about agriculture also have a critical role in developing sustainable agriculture systems. In Thailand, the government is a main financial supporter of research and development. Thai government invests a huge portion of its budget to fund general research and development with a particular focus on the agriculture sector. Suphannachart, 2016 claimed that most R&D investments are allocated through public research institutions where the return on public research investment has been high (Suphannachart and Warr, 2011, 2012). These include the Agricultural Research Development Agency (ARDA), the Highland Research and Development Institute (HRDI), the Sugarcane and Sugar Institute and the National Centre for Genetic Engineering and Biotechnology (BIOTEC) (Suphannachart, 2016). Academic institutions also actively fund a significant amount of research and development. Suphannachart (2016) highlighted that annually, universities spend approximately 33.13% on research and development based off 2011 estimates. Public universities with a focus on

agriculture include Kasetsart University, Chiang Mai University, Khon Kaen University, Prince of Songkla University and Maejo University. Furthermore, in 2011, the private sector contributed a notable 17.90% of the expense on agricultural research and development, while additional small contributions from public sector enterprises and NGOs accounted for 1.76% and 0.51%, respectively for activities involved in agricultural research and development (Suphannachart, 2016).

3.1.5. Stakeholder involvement in Thailand

Thailand adopted the pluralistic approach for extension service delivery that all relevant potential actors are involved in the advisory service system. Public agencies under the supervision of Ministry of Agriculture and Cooperative (MOAC) dominate the system (Suphannachart and Warr, 2011). Thailand has adopted the participatory extension approach, called "people centered development" (Keely et al., 2012), yet, the management structure of research and extension is very top-down (CAPSA-ESCAP, 2014). Department of Agricultural Extension (DOAE) is under umbrella of the Ministry of Agriculture and Cooperative (MOAC). MOAC supervises and coordinates the extension system, while the department of agricultural extension is responsible for managing and operating the extension system by coordinating with different levels, including academic, institutions, private sectors, NGOs and the offices under its supervision (Sukprasert et al., 2003). District agricultural extension office is responsible for direct extension advisory service delivery to communities, particularly to farmer groups and entrepreneurs (FAO, 2011).

3.2. Influence of green revolution on Thailand's agricultural extension

The green revolution has had enormous economic and social effects in Thailand, however it has also caused many negative impacts. Due to the demand for food, the cultivation area has been expanded, many areas of the forest have been cleared for food crops, especially the infinite use of inorganic fertilizers and pesticides has made the land erosion, inorganic, fertility is reduced, biodiversity of arable land is depleted. This is a never ending race, a vicious circle with no way out: the more intensification of crops, increased crops, more fertilizer investment to increase productivity, the more the land is depleted, the more investment is required. In Thailand, after a period of cultivation, the land is degraded, decertified and cannot be cultivated anymore. The speeds of deforestation to get arable land, the planet's forests have been narrowed, the more directly affecting climate change (Robert, 2000).

Thailand introduced modernization in 1960s and it has steered its agriculture to be export-orientated also is prone to be impacted by the international market. This situation deeply affected agricultural extension system in Thailand (Visetnoi & Nelles, 2017).

CHAPTER 4: PHILIPPINES' AGRICULTURAL EXTENSION SYSTEM

4.1 Philippines' agricultural extension system

4.1.1 Historical Evolution of Administrative structure of AE in Philippines

The agricultural extension in the Philippines started during the Spanish colonization period through the establishment of the model farms or the "Granjas Modelos" that were later transformed into Settlement Farm Schools. In 1902, the Americans created the Bureau of Agriculture. Meanwhile, during the American regime, the division of Demonstration and Extension Service was created under the Bureau of Agriculture in 1910 to provide extension services including cooperative farmers' associations, rural credit and animal insurance. In 1929, the Bureau of Plant Industry and the Bureau of Animal Industry were created. The Agricultural Extension Division remained with the Bureau of Plant Industry Under the Commonwealth Government, Commonwealth Act No. 85 was enacted in 1936 which created the provincial agricultural extension service (Albert, et al. 2016).

In 1952, Republic Act. No. 680 created the Bureau of Agricultural Extension (BAEx) which integrated the agricultural extension services of the Department of Agriculture and Natural Resources (DANR). Upon recommendation of the Bell Mission in 1953, BAEx was given the mandate of implementing an agricultural extension program designed for farm management, home management and rural youth development. In 1963, upon the enactment of Republic Act No. 3844, otherwise known as the Land Reform Code, BAEx was made into the Commission on Agricultural Productivity and placed under the

Office of the President. The promotion and development of agricultural cooperatives was intensified while the programs, projects and activities of the Commission were realigned to support the agricultural land reform program (Sharma, 2006).

In 1967, Republic Act No. 5185, otherwise known as the Decentralisation Act, empowered the local government to undertake agricultural extension services. About 16 other government agencies were found doing agricultural extension service in view of the increased demand for such services brought about by the small-scale farming system in the land reform areas and the series of re-organizations. In 1968, Executive Order No. 128 implementing the Decentralisation Act of 1967, rationalized the implementation of the Agricultural Extension Service (Albert, et al. 2016).

In 1972, the Integrated Reorganisation Plan mandated by Presidential Decree No. 1 everted the Commission on Agricultural Productivity to its original name- Bureau of Agricultural Extension, back to the DANR. Gradually, the line bureaus established regional offices and Regional Directors were appointed. In 1974, Letter of Instruction Nos. 447 and 448 authorized the Ministers to delegate substantial powers/responsibilities to the Regional Directors. The Ministry of Agriculture was among the first to delegate such powers and responsibilities to the Ministry of Agriculture Regional Directors (Sharma, 2006).

In May 1980, Executive Order No. 595 transferred the Bureau of Cooperatives Development (BCOD) from the Ministry of Local Government and Community Development (MLGCD) to the Ministry of Agriculture. This mandated the Ministry to strengthen community-based organizations for agricultural cooperation toward programs on

savings and reinvestments to complement income-generating projects. Sharma (2006) argued that agricultural extension service was called upon to transfer appropriate technology for farming systems; accelerate institutional development and put in massive efforts on human resource development.

On June 30, 1984, Executive Order No. 967 renamed the Ministry of Agriculture into the Ministry of Agriculture and Food (MAF) and transferred the Bureau of Fisheries and Aquatic Resources (BFAR) from the Ministry of Natural Resources (MNR) to MAF. Accordingly, MAF was made responsible for the formulation of policies and goals for promoting the production of agricultural crops, livestock, poultry and fish through the implementation of appropriate programs and projects and the provision of suitable services for administration, research, regulation and extension (Dely, 2006).

The agricultural extension in the Philippines is governed by RA 7160 known as the Local Government Code of 1991, which decentralized the extension function, from one central government that would supervise and facilitate agricultural extension and training services for farmers, fishers and other beneficiaries –extension and training activities were passed on to the Local Government Units (LGUs). The LGUs inherited the general agriculture extension. The largest proportion of the country's agricultural extension force is with the LGUs which consist of 79 provinces, 84 cities and 1,525 municipalities (Sharma, 2006).

In 1997, National Extension System for Agriculture and Fisheries (NESAF) was established with three subsystems, namely: national government subsystem, local

government subsystem, and private sector subsystem. According to Dely (2006), NESAF encourages multidisciplinary participation for the delivery of extension services to involve the farmers, fisher folk, and their organizations, and those engaged in food and non-food production and processing, including the private and public sectors.

There are five major players in the agricultural extension systems of the Philippines. These are: a) bureaus and attached agencies of the Department of Agriculture, b) local government units of the Department of Interior and Local Government, c) state colleges and universities of the Commission on Higher Education, d) some non-governmental organizations and e) some private agri-business companies (Hayami & Kikuchi, 2000).

The growth and development of agricultural extension in the Philippines have always been associated with government reorganization. Extension service, which is a basic requirement to effect societal change especially among the disadvantaged sector is now the responsibility of Local Government Units (Pascual & Gapasin, 2003). More recently, some research and development institutions were mandated to do extension work such as Philippine Rice Research Institute, Bureau of Post-Harvest Research and Extension, and the Philippine Carabao Center. Sharma (2006) stated that agricultural extension in the Philippines is provided to different kinds of farmers by many agencies of the government and by the private agri-business companies and some NGOs. So far agricultural extension in the Philippines is dominantly government provided and publicly funded.

In Philippines, the Department of Agriculture, headed by the Secretary of Agriculture, is the national level institution responsible for agricultural extension.

Moreover, agri-business companies have been undertaking certain types of extension activities in the interest of promoting their products such as farm inputs and services such as export and import of agricultural items. According to GFRAS (2012), there are a large number of local NGOs in the Philippines involved in a variety of development activities like rural community development covering agricultural aspects including extension. A large number of farmers-based associations exist in the Philippines which provide a variety of services to their members including input purchase, extension advice, marketing, export, certification, etc (Asterio, 2012).

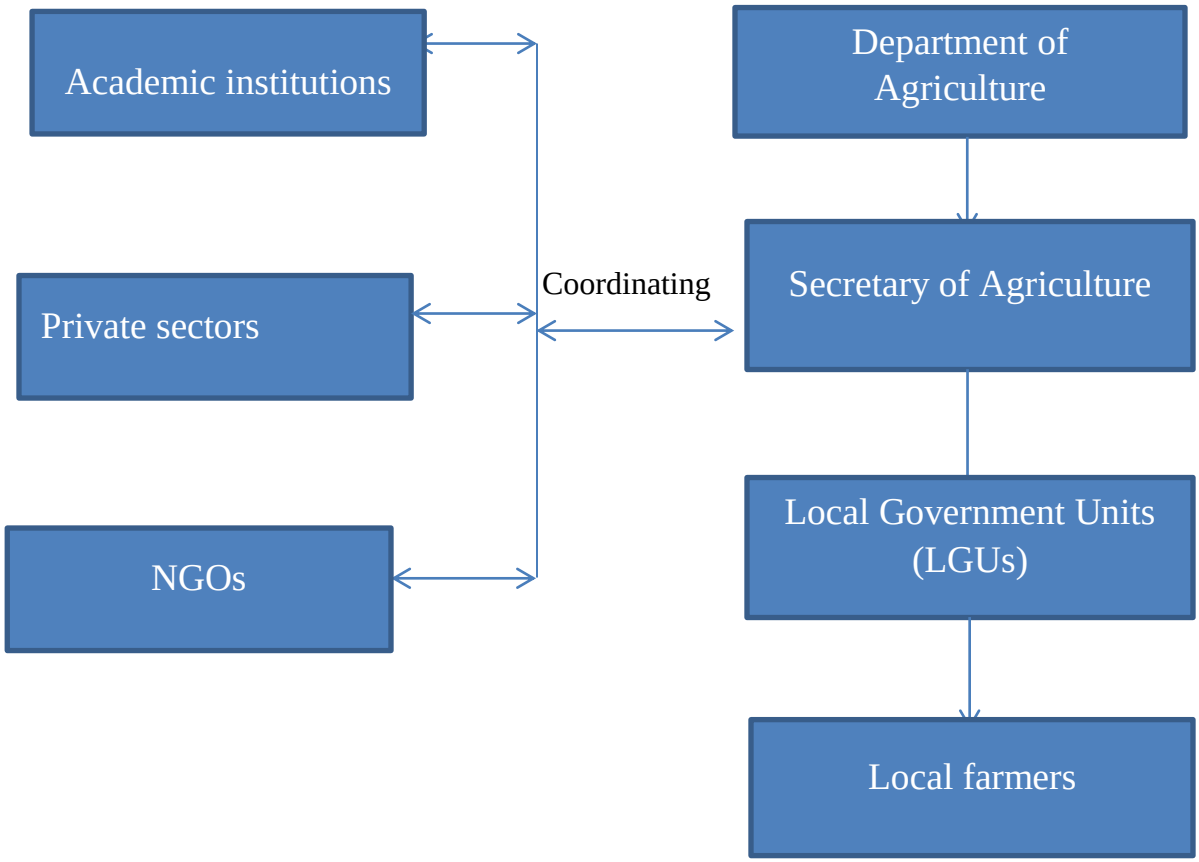

Figure 3. Administrative structure of agricultural extension in Philippines

Source: Author

4.1.2 Roles and needs of AE in the Philippines works

In Philippines, extension workers play an important role, connecting scientists - farmers and accompanying farmers to build many hi-tech agricultural models. According to Hayami & Kikuchi (2000), the extension system with training methods and transfer of technical advances will change the way farmers think and do; encourage and support them to apply new technologies to production. This has contributed to boosting Philippines's agricultural development. Thus, Philippines government engages private and public sectors in improving the activities of agricultural extension.

In Philippines, extension plays crucial role in bolstering growth in the agriculture sector. It is an important node that links research outputs to its ultimate beneficiaries. Research community has already been sensitized of the role of extension in helping the farmers to participate in technology development and transfer. In the Philippines, the importance of research-extension linkage is recognized by the government through different laws and administrative orders. Specifically, Philippines define extension as initiatives undertaken by the government and non-government organizations to improve the welfare of the various stakeholders in the agriculture sectors through provision of trainings and information and sharing of knowledge and skills (Albert, et al. 2016).

Since 2011, public funds are available for training and extension. Capacities are especially needed on value chains integration, climate change, and knowledge management. In future, extension should focus on good practices and best-fit solutions, coordinating pluralism in RAS, and climate change (Asterio, 2012).

4.1.3 Stakeholder involvement in Philippines

The Philippine extension development framework aims for empowering individuals, groups, and rural communities, which will contribute to achieving the Philippine development goals. It is based on six core programs: improving quality of knowledge products and services, enhancing extension capacities, strengthening partnerships, broadening innovations, strengthening capacity in climate change adaptation and mitigation, and improving quality of extension governance. Different actors groups interact and contribute to these programs. It is said that the key challenges for extension in the Philippines the diversity and archipelagic nature of the country, food security and rural poverty, the financial crisis, climate change, rural depopulation, and decentralization of extension functions. Successes in the Philippine's agricultural extension system are based on the involvement of stakeholders, the public consciousness of good governance, and the use of information and communication technology.

4.2 Influence of Green Revolution on Philippines's Agricultural extension

Green revolution in Philippines has caused several negative impacts. According to Pascual & Gapasin (2003), the Green Revolution is a revolution based on plant and animal breeds and technical measures mainly derived from the outside, from scientific and technical achievements, it is an open agriculture because it brought many new methods to farmers. However, green revolution weakens internal linkages and resources, forcing farmers to rely more on seed, chemical fertilizer and pesticide companies. Thus, farmers

must depend on the companies which provide plant breeds, fertilizer, etc and the profits flow into the pockets of companies rather than in the peasants' pockets (Hayami & Kikuchi, 2000).

In the Philippines the introduction of heavy pesticides to rice production, in the early part of the Green Revolution, poisoned and killed off fish and weedy green vegetables that traditionally coexisted in rice paddies. These were nutritious food sources for many poor Filipino farmers prior to the introduction of pesticides, further impacting the diets of locals (Bengaly, 2017).

CHAPTER 5: COMPARISION AMONG VIETNAM, THAILAND AND PHILIPPINES'S AGRICULTURAL EXTENSION SYSTEM

5.1. The administrative structure

Through the structure and organization of organs in Thailand, it can be seen that the Agricultural Technology Transfer and Service Center (ATTC) become a good lesson for Vietnam. Because it is organized and implemented in elected from local farmers and represent the community. From that Thai farmers have capacity to analyze and solve their problems. Additionally, farmer's cooperatives were initiated in both Philippine and Thailand have played an effective role as important facilitators for agricultural extension and rural development.

Farmer's cooperatives in Thailand were established in 1916 due to the government attempted to improve the livelihood and alleviate the dept problem of Thai farmers. In Thailand, the cooperatives have become one of the key market actors, especially in food supply chain. Furthermore, through farmer's cooperatives, the connection between the cooperative and the private sectors such as traders, wholesales and middlemen helped the farmers can have more opportunity to access the market (Thuvachote, 2006). In Thailand, the main business of agricultural cooperatives are saving and deposit, purchasing, and credit. According to the Cooperative Auditing Department (2016), the total asset in saving and deposit are $ 14,507 million, purchasing are $ 13,849 million, and credit are $ 6,059.

In Thailand, the coordination among farmer's cooperatives in Thailand base on the financial linkage. This connection has been supported from the Thai government in order to help the farmers open the market linkage. In 2016, the government has established a new initiative to promote the farmer's cooperatives more popular among the local business and industries. They are promoting the cooperative venue as well products to corporate groups to improve visibility and king the connection between farmer's cooperative and corporates for improved business returns (Suphannachart, 2016).

5.2 The pluralistic advisory services

In short, not only Thailand, Vietnam, but also Philippines adopted the pluralistic advisory services for agricultural extension. Policies in all of these three countries have encouraged diverse stakeholders in delivering extension services to farmers. The government of each country has made their effort to mobilize all relevant stakeholders, particularly private sectors for both agricultural advisory services and agricultural research and development. Moreover, according to Montpellier (2013), agriculture can be grow sustainability is based on the institutional capacity farmers, private sector actors, the public sector and other organizations. Besides that, gathering the institutional capital is also a good way to access technologies and the information and after employing resources.

5.3 The role of public sector and private sector in research and development investment

The public sector and private sector in both Vietnam and Thailand has invested significantly in research and development in agriculture. In Thailand, the most research and development investments are allocated through public research institutions. Moreover, Thailand also involved private sector in research and development in order to strengthen the research collaboration among major actors (Suphannachart, 2016). While in Vietnam, besides public sector, private agencies, particularly the input suppliers and mass organization (such as farmers-based associations, cooperatives and societies) as well as development partners through program basis, also plays important role in delivering regular extension service to farmers.

5.4 Rural credit

Regarding the rural credit, Thailand emphasizes the role of rural credit in developing agricultural section. Access to credit for farmers is considered as an important part in the promotion of agricultural production, and it forms an essential element of any poverty oriented strategy for the future development of the financial system.

The farmers in Vietnam often meet some difficulties when they want to access the credit. So that, the model from Thailand rural credit fund is a good lesson that Vietnam need improve. This credit provides loans to the poor farmers who are customers of informal financial institution (Menkhoff & Rungruxsirivorn, 2009). Thus, the rural credit fund in

Vietnam should be organized and managed by the farmer's cooperatives in order to Vietnamese farmers can be easier to have opportunities to access the loans and develop agricultural production.

5.5 Stakeholder involvement

Both Vietnam and Thailand have the combination of all relevant potential actors are involved in the advisory service system. However, Vietnam also maintains the top-down approach while Thailand has adopted the participatory extension approach, called "people centered development". So it gives many opportunities for Thai farmers can access the information, advantaged technology easier.

CHAPTER 6: CONCLUSION

This chapter summarizes information has been reviewed in the previous chapters:

(1) The roles, impacts and the problems of the agricultural extension system in Vietnam.

(2) Some experiences of Thailand and Philippine's agricultural extension for Vietnam and some recommendations to my work.

6.1 The roles and impacts of the agricultural extension system in Vietnam toward the development of the agriculture and rural areas

The agricultural extension focuses on communicating the technology of scientific agriculture to the farmers. In Vietnam, the extensions emphasize conducting demonstration sites, organizing science-technology forums in the fields of crops, livestock and agro-forestry processing. The advantaged technology and science often come from the research institutions, universities and abroad. In Vietnam, agricultural extension services have played an important role in agricultural development and poverty reduction.

6.2 The issues of Vietnam's agricultural extension system

Human resources in the agricultural extension system are limited in both quality and quantity. And the extension staff should be trained in both the knowledge and skills. The extension approach in Vietnam is also top down so that the famers cannot be encouraged take part in all activities. Furthermore, the linkage between the research, policy, markets, environment and production need be more improved.

6.3 The lessons can be learned from agricultural extension from Thailand and Philippines to that of Vietnam

In Philippine, the agricultural extension system has an effective connection of many stakeholders as well as empowering of individuals, groups and rural communities. Besides that, with the good management from Philippine's government and the usage of the information and communication technology have led to the success of the Philippine's agricultural extension system. Therefore, based on the experience of Philippines, Vietnam's situation can be improved by proactive participation of stakeholders to best support for agricultural extension activities. Vietnam government should increase the coordination in local and international as well as encourage the public-private partnerships.

The structure and organization of some of originations in Thailand is potential lesson for Vietnam in taking the farmers become a central. From that, establishing the farmer's cooperatives such as agricultural cooperatives and farmer groups, and create the best conditions for farmers to take the initiative in solving existing problems.

In conclusion, in Vietnam, improving the extension system activities is necessary for increasing agricultural growth. By raising the ability to access the knowledge, skills and inputs for the farmer, the extension and advisory service can become the main support for them. In Vietnam, with the efforts to develop the agricultural extension, they require the huge combination in develop the methods of technology transfer and the stakeholder engagement.

Regarding my work, from the experience of Philippines and Thailand, it is necessary to improve collaboration between farmers, extension agents and institution research in every local. This is helpful to improve agricultural extension service to Vietnamese farmers. Vietnamese government should release more policies to support science research and extension workers as well as investment for developing the information technology systems.

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