



Young Smart Farmer (YSF) Program

A Case Study in Thailand

A SERIES OF ACTIVITIES IN THE FRAMEWORK OF THE UN DECADE OF FAMILY FARMING

Activity 2. Documentation and systematic analysis of case studies about policies, strategies, initiatives, and programs successfully supporting family farming





Thailand's Young Smart Farmer (YSF) Program

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Acronyms and Abbreviations

ADB	Asian Development Bank
ALRO	Agriculture Land Reform Office
ARDA	Agricultural Research and Development Agency
ARBOs	Agrarian Reform Beneficiary Organizations
AsiaDHRRA	Asian Partnership for the Development of Human Resources in Rural Asia
BAAC	Bank for Agriculture and Agricultural Cooperatives
DA	Department of Agriculture
DOAE	Department of Agricultural Extension
FAD	Farmer's Federation Association for Development
FAO	Food and Agriculture Organization
FFT	Farmer Foundation of Thailand
FGD	Focus group discussion
FWG	Farm Women Group
ICT	Information Communication Technology
KII	Key informant interview
MDES	Ministry of Digital Economy and Society
MHESI	Ministry of Higher Education, Science, Research and Innovation
MICT	Ministry of Information and Communication Technology
MOAC	Ministry of Agriculture and Cooperatives
MOC	Ministry of Commerce
MOST	Ministry of Science and Technology
NESDP	National Economic and Social Development Plan
NETC	National Electronics and Computer Technology Center
NFG	Network of Farmer's Group
NGO	Non-governmental organization
NRF	NR Instant Produce Public Company Limited
NSTDA	National Science and Technology Development Agency
PSM	Propensity Score Matching
SF	Smart Farmer
SOFI	State of Food Security and Nutrition in the World
TAFTA	Thailand-Australia Free Trade Agreement
THB	Thai baht
WB	World Bank
YFG	Young Farmers Group
YSF	Young Smart Farmer

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I. INTRODUCTION

Background

In its continuing bid for a “quality life” for its people, Thailand has long pushed for agriculture development by harnessing its resources. This is not only to meet year-round food requirements and ensure sufficiency but also to address social disparities and ensure economic stability. This is accompanied by needed investments in technology and innovations that enhance agriculture’s performance nationally and globally.

Thailand's challenges in the agricultural sector are not unique to the country. Globally, similar challenges are being experienced by millions of people. According to the 2022 Edition of The State of Food Security and Nutrition in the World (SOFI), about 828 million people were affected by hunger globally as of 2021. This is 46 million higher than in 2020 or 150 million higher than in 2019 (WHO, 2022; WFP, 2022). Further, more than 70 percent of the world’s food-insecure population lives in rural areas in developing countries, many of whom are low-paid farm laborers or subsistence farmers. A 2021 United Nations report stated that four out of every five people facing extreme poverty live in rural areas (DESA, 2021).

This is exacerbated by the new challenges brought about by climate change, land degradation, water shortage, and other adverse environmental risks. To address these pressing challenges, there is recognition to search for farming systems that are sustainable and inclusive while at the same time promoting increased food access for the poor. Family farming, considered a sustainable food production system, was placed at the forefront when the United Nations declared 2014 the International Year of Family Farming. The Food and Agriculture Organization of the United Nations (FAO) underscored the urgent need for innovation in family farming, considering the diversity of farming groups, inclusivity, the complexity of objectives, and an enabling environment. Increased public investment in agricultural research and development, extension, advisory services, and education and training is also highly encouraged. (FAO, 2014). This is relevant to Thailand as the country’s agricultural land of around 23.88 million hectares is predominantly small-scale, family-run farms (Kwanmuang, 2020).

Thailand plays a key role in global agriculture as well. It has positioned itself as the “kitchen of the world”, a major producer and global supplier of key agricultural commodities, and a leader in product innovation and development. Moreover, the country is aware that a lot of potential exists in terms of smart agriculture, which, if tapped, will ensure food security and economic stability and propel Thailand on the global agricultural map.

However, Thailand understands all these gains are at risk, given its aging farming population and the declining interest of its younger population in going into agriculture. The potential of the youth in agriculture, both in tapping potentials and addressing a growing concern on aging agriculture, is greatly being recognized, not only in Thailand but in developing countries in general. Around half of the 1 billion youth in developing countries reside in rural communities, and investing in them can contribute to poverty reduction, employment generation, and food and nutrition security. The youth are vital to achieving Sustainable Development Goals, as they have the potential to transform food systems, feed the world, help rural communities, and thereby contribute to solving global challenges (IFAD, 2019).

Thus, the country prioritizes strengthening the farmers and their institutions and working towards transformation and digitalization as embodied in the National Economic and Social Development Plan (NESDP) 2017 to 2022 and NSDP 2023 to 2027, respectively.

Cognizant of the risks that need addressing and the potentials waiting to be tapped, Thailand, through the Thai Ministry of Agriculture and Cooperatives (MOAC), focused on developing smart farmers, more

specifically, the younger farming sector, through two (2) major programs launched a year apart less than a decade ago.

First was the Smart Farmer (SF) Program, managed by the Agricultural Land Office, launched in 2013. The SF Program sought to integrate data, communication, and other emergent technologies into its agricultural production systems. This is to institute efficient farming methods, higher crop yields, better crop management, greater crop protection, and ultimately, better income for Thai farmers. The program utilized modern technological solutions to traditional agricultural concerns spanning pre-planting activities to post-harvest endeavors.

The second was the Young Smart Farmer (YSF) Program, managed by the Department of Agricultural Extension (DOAE), launched in 2014. The YSF Program was envisioned to counter the decline in the number of young people involved in farming, given the country's aging farming population.

The YSF Program was launched after a preliminary program that started in 2008, where it was said that only 10 percent of the 750 young farmers nationwide could farm successfully for reasons of difficulty in start-up and insufficient income derived from less than a hectare of land provided. This YSF is seen as an enhancement of the preliminary program offering in terms of support provision.

Established to support young farmers, the two programs officially define young farmers as those under 45. While there is no official statement on why the upper age limit is 45, there were assertions that older farmers (or those beyond 45) are no longer inclined to introduce operational efficiency-enhancing innovations.

The YSF Program

The YSF featured training programs, seminars, workshops, and field visits to entice young people to continue, return to, or enter farming to replace older farmers. Entirely a separate program and not just an extension of SF, the YSF engages young farmers who are:

- Between 17 and 45 years old and have started their farming.
- Determined to improve their farming capability and quality of life.
- Willing to participate and join all activities throughout the program period.
- Registered farmers with the DOAE, which developed a national identity card in 2009 to help assisted smart farmers access facilities or support services, welfare, and benefits.

Each year, 25 to 30 young farmers are recruited to participate in the program in each province. Between 2014 and 2018, a total of 12,569 participants nationwide were recruited.

Research Methodology

To gain insights into the YSF's program implementation and performance, YSF stakeholders were engaged in key informant interviews (KII) and focus group discussions (FGD), starting with institutional stakeholders, the DOAE, the Bank of Agriculture and Agricultural Cooperatives (BAAC) and the National Science and Technology Development Agency (NSTDA).

With the assistance of DOAE, the primary coordinating body of YSF, key specific farmer sites to be visited for the KIIs and FGDs and down to the farmer and community level were identified in pre-selected key agricultural provinces of Prachinburi and Chiangmai. Prachinburi is in the eastern region of Thailand, a neighbor to the biggest province, Nakhon Ratchasima, just 178 km from Bangkok. It is known for rice and fish farming as well as fruit growing. On the other hand, Chiangmai is in the northern part, close to the neighboring country Myanmar and another province, Chiang Rai.

A total of 10 YSF members, four from Prachinburi and six from Chiangmai, served as respondents together with community leaders and program implementers from each visited site. The insights gained from the members were used in assessing the extent of objective achievement of the YSF program and enhanced by

the perspectives shared by the community leaders and program implementers. The study likewise validated issues and concerns previously documented in varying literature.

II. PROGRAM DESCRIPTION AND ANALYSIS

Agenda Setting

Enhancing quality of life while achieving balance in social, economic, and environmental concerns are the embodiments of His Majesty King Bhumibol Adulyadej. The King's sufficiency economy is the foundation of Thailand's agricultural development. This sufficiency economy stance was the key feature of the 9th - 10th (2001-2011) NESDP, where the focus shifted from "for the people, by the government" to "people participation" (NESDB, 2011). The aim was to reinforce the administration's structure, mechanisms, and processes based on good governance and democracy to create a resilient society. This primary people/farmer-centered approach invested in harnessing their resources to produce food year-round for their own good, reduce social disparities, and ensure a stable economy for their country.

Sufficiency economy was continually pursued in the 11th National Economic and Social Development Plan (2012-2016), commanded by His Majesty King Bhumibol Adulyadej and counter-signed by Prime Minister Yingluck Shinawatra (NESDB, 2011). The government of Thailand has recognized as one of its major risks the shift in the demographic structure towards an increasingly older population. Consequently, the number of younger people and working age is decreasing. It is projected that by 2025, Thailand will be an aging society. The declining skilled labor has become a critical concern in the country. Further, the migration rate from rural to metropolitan areas dramatically increased from 31.1 percent in 2000 to 45.7 percent in 2010 (NESDB, 2011). The aging population and increasing migration have resulted in a labor shortage, particularly in agriculture, putting family farming at risk. It is unlikely that aging farmers who will retire will be replaced by their children who have migrated to the metropolitan areas, so there will even be a considerable segment of the younger generation, trained or not, to take up farming to ensure their family's food security or simply as an income source.

Agriculture, when compared to other sectors, particularly the industrial sector, is recognized as the poorest. The production value and productivity are generally lower than in other sectors, widening the inequality gap. The low productivity in agriculture is brought about by several factors, including drought, natural disasters, water shortage, land infertility, and the high cost of inputs such as chemical fertilizers and pesticides. For agricultural households, this meant having relatively low income, exacerbated by challenges from lack of education, job security, and eligibility for social security. Extended families with more dependent children and the elderly experience even worse conditions. Data from 2007 showed that 5.4 million individuals live under the poverty level, and 56.9 percent were farmers (NESDB, 2011). This condition makes agriculture unattractive to the labor market, particularly the youth.

In terms of land holding, ownership is concentrated among a few people. In Thailand, approximately 4,000 people own over 480,000 square meters of land, while only 100 own more than 1,600,000 square meters. It is estimated that about 660,000 poor farmers do not have land for farming (NESDB, 2011). The average farm size of family-run farms in Thailand is around 4.04 hectares and is declining. It is estimated that there are 5.9 million farms with an area of 4.04 hectares or less. The next generation of farmers will inherit smaller farm sizes brought about by factors such as industrialization, urbanization, land policy, and the custom of dividing lands as inheritance, among others (Kwanmuang, 2020). Adding to this constraint is the rapid urbanization and expansion of housing development, which has encroached into arable lands.

Despite these problems and challenges, the government of Thailand recognizes the crucial role of the agriculture sector in the country's overall economy. Agriculture is the primary source of income for most Thai people and a source of raw materials for creating value-added products (NESDB, 2011). More importantly, according to a World Bank study, developing the agriculture sector is the most powerful tool to end extreme poverty, boost shared prosperity, and feed a projected 9.7 billion people by 2050. Growth

in the agriculture sector is two to four times more effective in raising incomes among the poorest compared with other sectors, according to the same study (World Bank, 2021).

In reports published by the Asian Development Bank (2020) and World Bank (2016), similar issues recognized by the government of Thailand were highlighted following their assessments. These challenges include low productivity due to unsustainable farming practices and natural resource degradation, low and unstable income, increasing household debt, income disparity among sectors, soil and water-related challenges, climate change, and natural disasters, and in addition, limited private sector investment and limited funding for public agricultural research and extension. The Asian Development Bank (ADB) and the World Bank (WB) have provided technical and financial assistance by working closely with government agencies, such as the MOAC, to bring forth these problems at the national level and provide solutions.

In Thailand, changes in the political atmosphere and more open politics encouraged the proliferation of rural development and non-governmental organizations (NGOs) by the mid-1980s. Further, the challenges caused by the 1997 Asian financial crisis have emphasized “people-centered development” and “sufficiency economy” as adopted by the government’s planning agencies. The changes in policies, which decentralized power at the local level, have allowed NGOs and civil society to have more voice in national decision-making, particularly in promoting sustainable farming practices with the end goal of rural community development. Likewise, through assistance from international NGOs, local NGOs have refocused their attention on the rural poor left behind from decades of rapid economic growth (Kelly, 2012). A study conducted by the Asian Partnership for the Development of Human Resources in Rural Asia (AsiaDHRRA) and Agriterra on people’s organizations in Thailand has identified five (5) major farmers’ organizations, namely: Farmer Foundation of Thailand (FFT), Farmer’s Federation Association for Development (FAD), Network of Farmer’s Group (NFG), Farm Women Group (FWG) and Young Farmers Group (YFG). All these farmer’s organizations aimed toward socioeconomic and political empowerment of farmers. YFG, a government-initiated organization, recognizes the need to prepare the rural youth to become the next stewards of agricultural land, encourage agricultural graduates to practice farming and introduce young farmers to new farm technologies (AsiaDHRRA & Agriterra, 2002).

The government of Thailand has also recognized the growing involvement of both public and private sectors in national improvement. This is evident in the creation of corporate social responsibility networks among companies listed in the stock market and increasing social enterprises to promote social prosperity. The private sector is encouraged to collaborate with farmers, scholars, and communities in establishing guidelines and plans for enhancing agricultural production toward food and energy security (NESDB, 2011). This has encouraged and fostered cooperation between the public and private sectors (e.g., Public-Private Partnership) (Thai Union, 2016; Department of International Organizations, 2021).

Efforts were taken by the public and private sectors as well as universities in Thailand, as cited by Manalili and Dugal, 2018 (Manalili, 2018), to encourage young people’s reentry or re-engagement in the agriculture sector, while national plans have been put forward a strategy to stimulate/foster a new intake in the agriculture sector such as:

- Integrated activities to encourage youth entry into farming;
- Private sector initiatives fully supporting the government’s entry of youth in farming and
- University initiatives
 - Incorporating farming orientation during the primary years
 - Curriculum to develop new-generation farmers
 - Curriculum to develop farmer entrepreneurs

At the very onset, Thailand started with the fundamentals and groundwork by ensuring that infrastructures and support strategies accompany programs and that growth is distributed outside development centers. This is continually sustained by ensuring that succeeding five-year plans complement previous strategies and reinforce gains. The 12th NESDP (2017-2022) pushes the agriculture sector forward through technology and innovations, market-led production, quality life for farmers, and balanced and sustainable natural resources (Office of the National Economic and Social Development Board, 2016). Under this plan, the MOAC has identified five (5) main strategies, which include 1: Strengthening the farmers and their institutions; 2. Enhancing the Management Efficiency of Agricultural Commodities through the Supply

Chains; 3. Increasing the Competitiveness of the Agriculture Sector with Technology and Innovations; 4. Balanced Sustainable Management of Agricultural Resources and the Environment; and 5. Development of Public Sector Management System. The 13th Plan (2023-27), which is still in the pipeline, is geared toward transforming and digitalizing the agricultural sector.

The strategies of YSF are an outcome of a long process of analysis of agricultural development and performances in the country. As cited by Filloux et al. (2019), “Only a limited number of young people graduate in agricultural studies in institutions where becoming a farmer is one of the career options (fewer than 4,000 graduates per year), and many of these students do not become farmers. In contrast, according to national agricultural censuses, the number of farm owners aged less than 35 decreased by an average of 44,000 per year between 2003 and 2013. Supporting agriculture graduates to become farmers will, therefore, probably not be sufficient to slow the aging of Thailand’s farmer population. However, thanks to their farming skills, their interest in becoming farmers in the future, and their proactive attitude, these young people may become fully-fledged partners in identifying and testing innovative farm models able to provide sustainable livelihoods to a new generation of farmers and in identifying and testing policies that could be set up to support them in starting such farms” (Filloux et al., 2019).

While no evaluation process of the preliminary young farmer’s program was undertaken, the new YSF program benefited from several published independent studies where young farmers were interviewed in terms of what will make them go into farming and what tools they consider crucial in setting up and operating a farm (Salvago et al., 2019) (Phiboon et al., 2019). “In Thailand, associations of young farmers mainly exist at the local level and have little say in policy processes or program design. Consequently, the present ex-ante analysis of policy tools to support young farmers also included workshops for young people and farmers in Thailand.” (Faysse, Phiboon, & Filloux, 2019).

Formulation

At the national level, the NESDP (2012-2016) and the Strategic Framework for Food Management (2012-2016) served as the primary institutional policy and strategic framework which provided a guide in planning and defining areas for national development for all related sectors, including agriculture (Kuworno, 2017). The 11th National Economic and Social Development Plan underscored the need to strengthen the agricultural sector to foster food and energy security, emphasizing the sustainable management and use of natural resources. The strategies include promoting efficiency and productivity in agriculture while assuring farmers' career and income security (NESDB, 2011). On the other hand, the Strategic Framework for Food Management envisions “Thailand to produce safe and high-quality food and have sustainable food security for the people of Thailand and the world”. The framework consisted of four (4) strategic themes: Food Security, Food Quality and Safety, Food Education, and Food Management. Strategies for each strategic theme were identified to achieve the framework’s objectives. Some of the strategies relevant to addressing the challenges of agriculture include (1) land reform and agricultural area protection, (2) water and land resources management, (3) improvement in production efficiency, (4) promotion of food access among households and at the community level, (5) fostering collaboration between government agencies, private sector, and the Thai people, and (6) research and develop technologies and innovations in agricultural production. It is important to highlight that one of the strategic interventions identified is to create motivation for agriculture as an occupation and increase the number of young agriculturists (Thai National Food Committee, 2012).

At the ministerial level, relevant ministries in the country have integrated the NESDP and the Strategic Framework for Food Management into their operational guidelines (Kuworno, 2017). The MOAC is at the forefront of addressing the challenges of agriculture and the food systems in Thailand. Relevant policies and strategic framework of MOAC include the 11th Agricultural Development Plan (2012-2016), Strategic Framework for Food Security (2013-2016), and Agricultural Commodity and Food Safety Standards Strategy (2010-2013) (Kuworno, 2017).

The vision of the 11th Agriculture Development Plan, which laid the groundwork for the policy under study, is to provide a good quality of life for the farmers, food security for the Thai people, and a basis for national income building for farmers and the country as a whole (Asian Development Bank, 2015)

(Jongsakul, 2015). Under this plan, MOAC has identified three (3) main strategies: Strategy 1. Development of Farmer's Quality of Life; Strategy 2. Building Competitiveness in Agricultural Production, Agricultural Commodity Management, and Food Security; and Strategy 3. Efficiency, Balance, and Sustainable Management of Agricultural Resources (Jongsakul, 2015). Strategy 1 focused on stabilizing farmers' incomes through crop insurance programs, supporting the National Farmers Council, and encouraging young farmers. Strategy 2 focused on increasing agricultural productivity, quality, product management, and food security through cost reduction, research and development, and value-added. Strategy 3 focused on expanding irrigated areas, developing fishery resources, soil improvement, and land development (FAO, 2018).

On the other hand, the Strategic Framework for Food Security served as a guiding document to support food security, food safety, food quality, and food education in the country. It served as an initial step in integrating the cooperation activities among agencies from different sectors to maintain national food production and consumption and to attain food security at the community level (FAO, 2018).

In an assessment conducted by the World Bank to revive growth and secure prosperity for all in Thailand, recommendations were made to boost agricultural productivity in the country. To achieve higher productivity, a change in mindset is required to stop viewing agriculture as a social safety net. There is a need to create good-paying jobs in rural communities, inside and outside agriculture. Legal and regulatory changes in the land rental market are also seen as a solution for farm operations to function more efficiently. Removing restrictions in the tenancy market will allow many small absentee farmholders to have their land rented by more capable and entrepreneurial farmers. In terms of natural resources management, the assessment highlights the need to increase the efficiency and sustainability of irrigation investments. Funding for agricultural research and extension also needs to be increased, which in the past has contributed significantly to helping the agriculture sector increase its competitiveness and productivity. Improvements in agricultural research and extension were also highlighted, such as complementing project-based research funding with core funding, promoting innovative technology transfer mechanisms by non-government actors, and encouraging more inclusive value chains by helping smallholder farmers (World Bank, 2016).

In Thailand, non-government organizations are among the first development-supporting organizations which sought an alternative approach to agriculture. As early as the 1950s, private organizations participated in social development voluntarily, and their early work was characterized by social welfare and charity. In the 1980s, alternative agriculture gained more attention from development agencies and the private sector. This was brought about by persistent problems faced by smallholder farmers. Sustainable agriculture, focusing on the sustainable farming of smallholder farmers, was at the forefront of the NGOs' agenda, and eight (8) agriculture-related NGO networks were formed during this decade. In the succeeding decades, several Thai NGOs shifted their focus from community work to policy development at the national level. There was an increasing recognition that social, environmental, and agricultural issues must be addressed at the policy level (Traimongkolkul, 2002).

Adoption

To put forward the vision of the 20-year Agriculture and Cooperative Strategies (2017-2036), which defines the country's future of smart farming, a steering committee under MOAC was created in 2018. Envisioned to spearhead the development of smart farming, members of the steering committee were identified, namely, the Ministry of Higher Education, Science, Research and Innovation (MHESI), Ministry of Digital Economy and Society (MDES), and Ministry of Commerce (MOC) with the latter brings with it collaborative linkages with corporate partners, including agrifood and Information Communication Technology (ICT) subsectors, to name a few (Thailand Board of Investment, 2022).

As to specific roles of steering committee members, MOC was relied on for its big data systems to support agricultural trade and support farmers in their farming decisions, initially prioritizing five major export crops (rice, palm oil, rubber, corn, and tapioca). In addition to these members. The National Electronics and Computer Technology Center (NETC) and MOAC developed a large farming database that systematized farmer registration, including household and land information details. The NSTDA, an agency under the

MHESI, takes care of research-generated technological innovations to contribute to the smart farmers program.

The DOAE, one of the fifteen departments under MOAC, envisions Thai farmers who are self-reliant, have good well-being, utilize technology and innovation, and have secured income. Its mission is to empower farmers, increase their capacity, provide agricultural services and farm inputs, and conduct agricultural extension research and development, working collaboratively with all stakeholders. DOAE focuses on five main issues:

- Promotion and expansion of the outcomes of royal initiative projects
- Improvement of organization efficiency and working adjustment to the new normal
- Promotion of agricultural commodities in line with “market-oriented”
- Development of farmers, community enterprises, and other farmer organizations, including roles of village agricultural volunteers
- Development of agricultural technology and innovation

To achieve its vision and mission, DOAE initiated the YSF and has been implementing it in every province of Thailand since its establishment in 2014. YSF is the new generation of farmer entrepreneurs exhibiting six qualifications in good agriculture: Knowledge, Data/Information, Product Management, Standardization of Quality, Environment and Society, and Dignity. It is governed by new technology, creativity, and agri-business innovation that lead to self-reliance and promote linkages.

According to a report from the Farmer Development Division, the YSF Program was designed to develop young farmers’ business capabilities. It is based on a bottom-up approach where farmers are at the center of development. Knowledge sharing and network building among farmers is vital for development. They must be determined to improve their farming knowledge, skills, capabilities, and quality of life. Another requirement to qualify for the program is to participate voluntarily and participate in all activities throughout the program's implementation. For each province, 25 to 30 young farmers are recruited to join the YSF Program (Jansuwan & Zander, 2021).

The objectives of the YSF Program are as follows:

- To increase the number of young farmers by motivating young people to continue, return to, or enter farming to replace older farmers;
- To help young farmers become agricultural leaders in their communities and
- To create collaborative networks among relevant stakeholders for the development of the agricultural sector of the country.

Through the YSF Program, young farmers are expected to become financially independent with their farming business and adopt innovative farming methods to optimize yields and market their products. Most of all, Young Smart Farmers are expected to become leaders in their communities and expand the network of smart farmers in the country.

The table below summarizes the plan to drive the development of a new generation of farmers in the Thailand 4.0 era (DOAE, 2017):

Table 1. Plan to drive the development of the new generation of farmers in the Thailand 4.0 era (Young Smart Farmer Thailand 4.0)

Plan to drive the development of the new generation of farmers in the Thailand 4.0 era (Young Smart Farmer Thailand 4.0) Farmer Development Division, Department of Agricultural Extension	
Principle	Develop a new generation of farmers by using the network as a goal and mechanism for developing strong and self-reliant farmers following the principle of lifelong learning participation and sustainable self-reliance
Guidelines	<ul style="list-style-type: none"> • Farmers are at the “center of learning and follow self-learning design” • Agricultural extension workers are the “Learning Managers”
Goals	<ul style="list-style-type: none"> • Motivate the new generation to farm

	<ul style="list-style-type: none"> • Replace the elderly farmers • Be a leader in local agriculture • Connect networks at all levels and sectors
Development Goals	To be a leader in modern agriculture, be proud and self-reliant, and dependable to fellow farmers
Target Audience	<ul style="list-style-type: none"> • A new generation of farmers, aged 17-45 years, started farming and have chosen to pursue a career in agriculture; they want to develop their potential and quality of life
In-depth development Four steps	Step 1: Getting the Idea. Step 2: Setting up the Project. Step 3: Starting up the Business. Step 4: Going Global.
Development process network	Support to be an advisor to young farmers
	Promote and support the establishment of a learning exchange center for the new generation of farmers. (Network Centers of the Center for Enhancement of Agricultural Product Production Efficiency)
	Build a strong new farmer network and link allied agencies, including the government, the private sector, educational institutions, and independent organizations

The YSF Program showcases the use of ICT to enhance the coordination of access to support services and knowledge, leading to innovative initiatives. It involves improving the generational sustainability of family farming by engaging a new breed of smart young farmers. These features address the main concerns in family farming, those of a) the need to harness ICT to promote better service provision and encourage innovation, and b) to counter the trend of an aging farming population and declining involvement of new farmers (also young generations) by providing a conducive policy/program environment to entice them to go into farming. Moreover, it provides a model of (smart) farmer-to-farmer extension service provision.

In relation to the UN Decade of Family Farming Pillars, the YSF Program contributes to Pillar 2: Support youth and generational sustainability of family farming and Pillar 4: Strengthen family farmers' organization and capacities to generate knowledge.

As per experience in Thailand, the budgets of specific programs are usually taken from the implementing institutions, DOAE in the case of YSF, and any other fund commitment from participating institutions, the BAAC, for instance. Usually, statements of commitments (documented in minutes of meetings) are legal basis enough to ensure fund support.

As cited by Jansuwan & Zander (2021), from 2014 to 2018, the YSF program was allocated an annual budget of 3,843 USD (128,082 baht) for its implementation in Prachin Buri province. The YSF program was overseen by six officials from the Prachin Buri Provincial Agricultural Extension Office, with additional experts from external organizations such as the Prachin Buri Agricultural Research and Development Center, the Office of Prachin Buri Provincial Commercial Affairs, and the Bank for Agriculture and Agricultural Cooperatives, invited to deliver lectures as part of the program (Jansuwan & Zander, 2021).

Implementation

The YSF Program was implemented just two years after MOAC launched the Smart Farmer Program in collaboration with the Ministry of Information and Communication Technology (MICT) to turn ordinary farmers into new-generation farmers or smart farmers. As designed, the Smart Farmer and the Young Smart Farmer Programs are different. The Smart Farmers Program targets farmers over 45, while the YSF Program targets young farmers between 17 and 45 years old who have just started their farms. DOAE has developed a "Smart Farmer" assessment criteria form and has categorized farmers based on eligibility into (a) Developing Smart Farmer, (b) Developing Young Smart Farmer, (c) Smart Farmer, and (d) Young Smart Farmer (Urban Possibilities, n.a.). The Smart Farmer Program's main objective is to improve farmers' livelihood by improving their agricultural production skills and competencies. On the other hand, the YSF Program's main objective is to develop the new generation of farmers in the Thailand 4.0 era.

In a study by Jansuwan & Zander 2021, a result chain was outlined for the YSF Program implementation in the Prachin Buri Province between 2014 and 2018. The figure demonstrates the linkage between the program's input, activities, outputs, outcomes, and aims. As input, aside from the participation of young farmers, the DOAE and Provincial Agricultural Extension Office are directly responsible for the implementation of the YSF Program. Further, experts from various agencies provide relevant support.

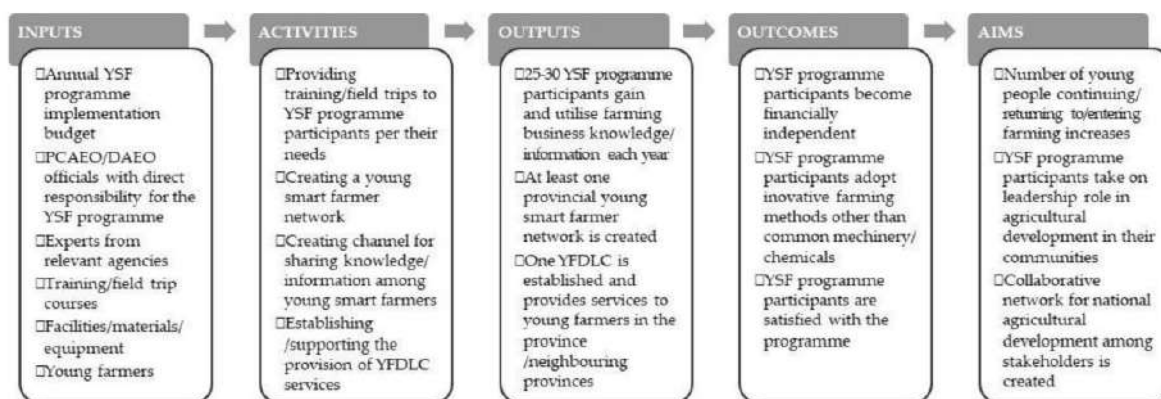


Figure 1. YSF Program Implementation in the Prachin Buri Province (2014-2018)

To implement the YSF Program, DOAE has developed operational guidelines categorized at the country and provincial levels (DOAE, 2017).

At the country level, the operational guidelines being implemented are as follows:

- Increase the potential of Young Smart Farmers to become professional agricultural entrepreneurs. Developing young farmers through agricultural innovation and using ICT for Smart Farm and Digital Market development;
- Increase the potential of the YSF network to drive the development of farmers and the agriculture sector and to become a model for success; and
- Connecting the YSF network by organizing fora for learning exchange and showcasing successful results from developing new farmers to become Young Smart Farmers.

On the other hand, the operational guidelines of the YSF Program at the provincial level, through the Provincial Agricultural Extension Office, are as follows:

- Select thirty new farmers per province to become Young Smart Farmers;
- Organize learning exchange activities by focusing on the new generation of farmers to be the center of learning and self-learning design; and
- Agricultural extension officers provide mentorship to Young Smart Farmers.

The provincial offices of the DOAE oversee YSF implementation at the provincial level. They work in close coordination with the young farmers, who are usually organized with a set of officers. Concerns and issues are discussed and jointly acted upon during the YSF's regular monthly meetings.

To drive the development of a new generation of Young Smart Farmers and entrepreneurs, DOAE has come up with a four steps process (Nation Thailand, 2021):

Step 1: Getting the Idea. The young farmer will find his or her concept and motivation. This is the first step in developing Young Smart Farmers through knowledge sharing, networking, and linkages.

Step 2: Setting up the Project. Smart agricultural activities such as innovation, smart farms, and digital markets are developed and implemented by preparing a preliminary agribusiness plan.

Step 3: Starting up the Business. The Young Smart Farmers are developed into agricultural entrepreneurs by adopting smart technologies in farm management and innovative marketing of products. This step ensures a stable income for the Young Smart Farmers.

Step 4: Going Global. The Young Smart Farmers should be able to adapt to global principles and standards and create products that are suited for the international market.

The collective Young Smart Farmers will be part of a network that will be strengthened and encouraged to cooperate with various organizations, such as the government, non-government, private, educational, and financial institutions. The YSF network will be supported by the Young Smart Farmer Academy, which will showcase successful models to develop young farmers into agri-business entrepreneurs. The YSF Academy is the center for new agri-technology, agri-innovation, agri-business, big data, and networks.

The implementation of YSF is supported by several institutions, which, among others, include the following:

1. Bank for Agriculture and Agricultural Cooperatives (BAAC) - on the extension of credit and post-harvest support as an auxiliary mechanism
2. National Science and Technology Development Agency (NSTDA) - on technological innovation and adoption
3. Ministry of Science and Technology (MOST) - on technological innovation and adoption
4. Agriculture Land Reform Office (ALRO) - on awarding of public lands to startup YSF members as the primary support mechanism
5. Trade and Industry agencies - on market mechanisms supporting farmers/cooperatives
6. Other specialized agencies that have integral roles in the success of program participants (irrigation, fertilizer, organic farming, etc.).

The mechanism through which ALRO supports YSF members is through the assignment of farmland according to the Agriculture Land Reform Act. ALRO provides a six-month training program to provide participants with skills and knowledge in agriculture and, upon completion, offers farmland of approximately 8,000 sqm. (maximum of five rai) to start their agricultural careers. After six months, the farm business enterprise is evaluated (Kamondetdacha, 2021). The Rice Department of MOAC and the Ministry of Commerce developed the Rice Policy and Strategy for 2020-2024 to strengthen farmers and farmer organizations, increase the efficiency of rice production management, and increase the potential for research, rice breeding, and rice production technology. The Rice Policy targets at least 130,000 Smart Farmers and Young Smart Farmers (Buddhaboon, 2022).

Other specialized agencies contribute to the success of YSF. The Agricultural Research and Development Agency (ARDA), for example, provides a Bachelor's Degree Scholarship Program "Inheriting the Royal Initiatives of Rama IX for Young Smart Farmer" (ARDA Scholarships and Training Programs, n.a.). Under the Thailand-Australia Free Trade Agreement (TAFTA), one of the cooperation in agriculture is the Pilot Cooperation on the Thai Young Smart Farmer Development Project. In 2018, six YSF participants were selected for three-month on-the-job training in Australia (Department of the Americas and the South Pacific, 2021) (Australian Embassy Thailand, 2018). The Ministry of Digital Economy and Society, through its National Digital Economy and Society Development Plan and Policy for 20 years (2018-2037), also contributed to YSF. Through YSF, the program aims to improve digital skills and utilize digital technology in smart farming systems and commercial aspects to reduce agricultural marketing and labor risks (Lilavanichakul, 2020).

Private companies also contributed to the YSF Program through various initiatives and projects. DTAC, one of Thailand's largest mobile operators, supported YSF by applying modern technology to enhance management efficiency, marketing of agricultural products, capacity building, and strengthening linkages (Urban Possibilities, n.a.). The NR Instant Produce Public Company Limited (NRF) provides training through knowledge sharing from the company's specialists on agricultural technology, market channels, sustainable living, and fertilizer production, among others (NR Instant Produce Public Company Limited, 2019).

Of the said institutions, two were visited, namely, the BAAC and NSTDA, and details of their involvements are as follows:

The BAAC's commitment to engaging the youth dates back to 1993, long before YSF was established. With their "Heirs of Professional Farmers Program, they orient, train, mentor, and evaluate potential role models in agriculture. However, even if they have completed six batches in this program, the 632 graduates (chosen from 27,671 applicants) are a tiny percentage of the then 70 million population. So, they have had a series of programs promoting sustainable agriculture, starting with farmers' children, given that most farmers cannot read. Thus, they help their kids while they are still young so they will grow up better than their parents, with a better life, better communities, and better pride. So, their being part of the present-day YSF Program comes naturally by collaborating with DOAE, who has the YSF Program idea but without the funds. Thus, BAAC provides funds to YSF members through their branches in each region that deliver supervised credit to farmers. With fund provision comes monitoring of the bank's field officers to ensure the credit provided is appropriately used.

For its part, The NSTDA, an autonomous government agency tasked to accelerate science, technology, and innovation development in the country, implemented the Big Rock Project, intending to upskill and re-skilling Young Smart Farmers to acquire skills and knowledge in modern agriculture. The project assesses the area and farmers' needs and cooperates with various stakeholders to transfer, develop, and upgrade technologies to support YSF. This is done through online media, courses, and e-learning to achieve its objectives. The project also supports the expansion of the program through the development of learning resources that will generate impact in two to three years, such as high production efficiency, high standard agricultural production, increased income by 10 percent, value-adding of agricultural products by two to three times, reduce production losses by 20 percent, and a five-time increase in economic, social, and health impact. These key performance measures form part of the assessment of the success or failure of the YSF Program.

Over the years, DOAE policies have progressed since the implementation of the YSF Program in 2014. The figure below shows the yearly development of the program:

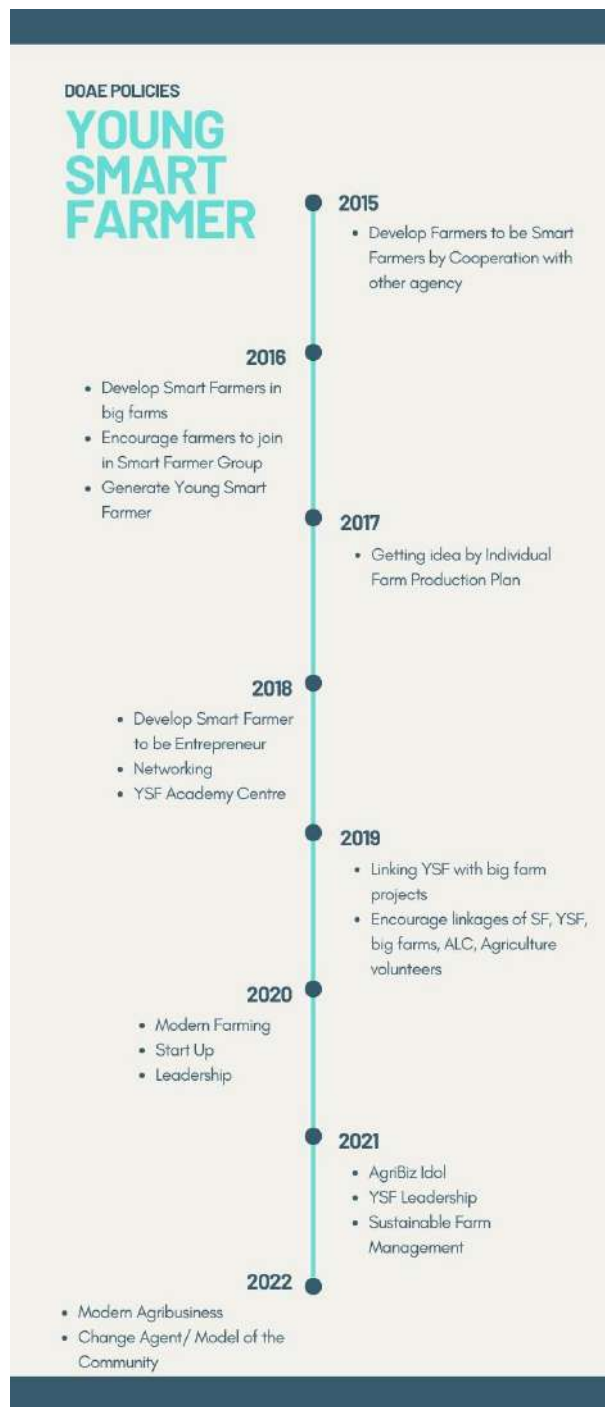


Figure 2. Yearly Development of YSF Program Implementation (2015-2022)

The good thing about YSF is that varying institutions, public and private alike, including academe, support its programs and believe in youths' potential, that even without being called upon by DOAE or MOAC, they initiate programs on their own.

Monitoring and Evaluation

After the development process of transforming young farmers into Young Smart Farmers, their success is assessed as follows:

1. Have a total agricultural income of not less than 180,000 baht/household/year;

2. Have knowledge of what is being done;
3. Having information to support decision-making;
4. There is production and marketing management;
5. Being aware of product quality and consumer safety;
6. Responsible for the environment/social; and
7. Have pride in being a farmer (DOAE, 2017).

As early as policy formulation, indicators were already identified, including the manner of measurement/monitoring. Moreover, they were strictly followed. For instance, non-completion of the required training programs is basis enough for a young farmer candidate to be dropped from the list. The presence of strong YSF organizations at provincial and national levels contributes a lot to proper monitoring and evaluation.

In addition, the summary of the results of the learning exchange is evaluated and used as the basis for planning for the future development of the YSF Program. The figure below shows the process of developing new Young Smart Farmers, which is characterized as being a cycle rather than a linear process:

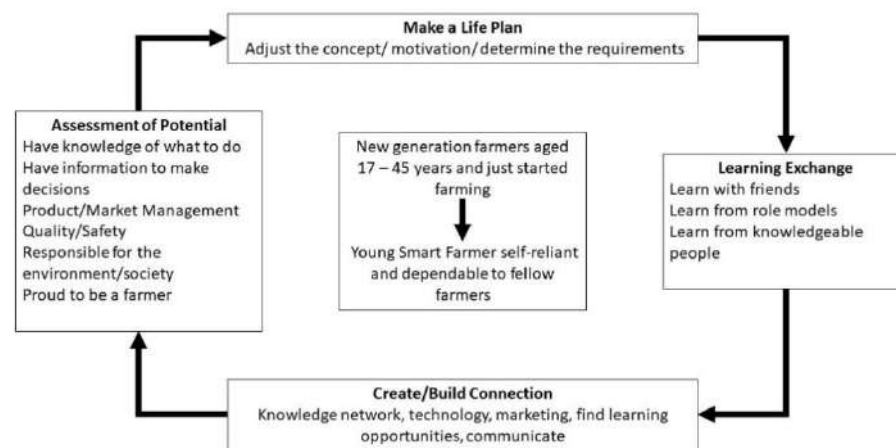


Figure 3. Process of Developing New Young Smart Farmers

Following the implementation of the YSF Program and learning exchanges conducted, DOAE has identified gaps in knowledge and agricultural practices that need further development and improvement. To further optimize production and improve the quality of agricultural products, the following are the academic and technological needs of Young Smart Farmers (DOAE, 2017):

1. Translating research into practice
2. Smart farming system
3. Value-added development and agricultural standards
4. Post-harvest management
5. Packaging design and development
6. Writing a business plan for young entrepreneurs
7. Creativity and innovation throughout the supply chain
8. Shipping, data, and resource management (Logistics)
9. Marketing channels, alternative markets, and online markets
10. Use of information technology

Data collection was done in two phases. The first phase is through interviews (using semi-structured questionnaires) of YSF members from a list provided by the Prachin Buri Provincial Agricultural Extension Office and DOAE. The second phase is an interview of the control group who are nonparticipants of the YSF Program. Propensity Score Matching (PSM) was used to evaluate the impact of the YSF Program on members' net farm income and adoption of innovative farming methods. On the other hand, perceived satisfaction levels with the YSF Program were evaluated using a 4-point scale questionnaire. The study results showed that most participants (~79%) expressed satisfaction with the overall program. In particular,

the participants highlighted the training, field trips, and networking opportunities the YSF Program has provided. However, the study's findings also showed that the program did not increase financial independence and adoption of innovative farming methods compared to YSF Program participants and non-participants. To address this gap, recommendations were provided, such as expanding the program beyond providing knowledge and information and offering additional monetary and non-monetary support, such as loans for technology investment, to YSF Program participants to expand their farms and increase their competitive advantage.

For purposes of firsthand feedback on the YSF Program, various stakeholders of the program were interviewed. A sampling of 10 YSF member farmers in Prachin Buri (4) and Chiangmai (6) was undertaken. The areas were selected primarily for being the major agricultural areas of Thailand and secondly for accessibility. Similarly, provincial/district officers of DOAE who were directly involved in the project implementation and community leaders (one each for Prachin Buri and Chiang Mai) were interviewed.

Highlights of the field activity are as follows:

- a. The YSF program is entirely a stand-alone program and not part of the SF, and they are not part of the total 22,402 SF as of 2022.
- b. The initial link, though indirect, is the creation of a YSF Academy Center in 2018, which is under the learning centers of their technology transfer mechanism. Then, in 2019, the link between SF and YSF Programs started through the Big Farm Project and the Agribiz Idol and YSF Leadership Program initiated in 2021. However, these leads still need to follow up via email with specific questions after the field activity, as most documents on hand are in Thai, though the KII respondents were gracious enough to outrightly translate policy developments from 2015 to 2022.
- c. Program monitoring of YSF Centers is mainly focused on the increase in the number of members and not much on the program's contribution to production increases and other agriculture sector enhancement. This was based on the responses of the KIs when asked about what is primarily used as performance indicators as far as DOAE is concerned.

III. CONCLUSION AND RECOMMENDATIONS

When asked about the program's measure of success, the respondent YSF member farmers cited an increase in income to a monthly level ranging from 16,000 THB to 100,000 THB, mainly resulting from increasing production (intensity and area expansion) and productivity due to enhanced efficiency. This income range is above 180,000 baht/household/year and is a lot better than the previous income of the farm. At the onset, most respondents are not fully knowledgeable of farming, as they only assist when needed on the farm, given that they are employed elsewhere (staff in an electric company, welder, IT professional, teacher, etc.). The necessity to help and take over operations from their parents or inherit the farm made them learn the ropes of farming by themselves. Realizing that the once traditionally operated farms must be made more productive, they did self-study until they became familiar with and hands-on in farm operations. Diligence in learning, either through their research on YouTube or attending YSF Program-sponsored training, helped them address farm issues on hand (irrigation, crop trimming, pest prevention, etc.). On the other hand, the more educationally and financially endowed Young Smart Farmers, as in the case of Chiang Mai respondents, get to be in farming by choice. Either they want to be living proof of how good it is to be a Young Smart Farmer or be able to be part of the solution, seeing that traditional farmers are unable to get assistance when needed, or be a model farmer. By all indicators, all YSF member respondents in Prachin Buri and Chiang Mai passed the rest of the success measures (informed decision, applying production and marketing management, being conscious of product quality, consumer safety, and environmental responsibility). More importantly, they take pride in being a farmer and even have plans to expand operations and or go into product development and become an entrepreneur or a businessman more than just a farmer.

The YSF member respondents echoed most of the DOAE-identified needs to enhance program performance. These include a) the need to translate research into practice (most appropriate water facility to address irrigation needs, renewable energy, etc.); b) smart farming system (production planning in consideration of drought and other climate-related risks water information system for promising crops); c)

value-added development and agricultural standards (new product development in case of mulberry production, linking up with institutional buyers in the case of hydroponics vegetable production, good agricultural practices (GAP) standard compliant, network development, etc.); d) postharvest management (better crop management); e) packaging design and development (as in the case of the melon, mulberry other fruits, and handicrafts). Writing a business plan is a much sought-after training together with marketing, specifically when most respondents want to avail of added support technically and financially, where business plans are a major requirement.

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