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COMPETITIVENESS
ADAPTATION OF
THAI AGRICULTURE IN
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ECONOMIC COMMUNITY

THE ROLE OF
THE PRIVATE SECTOR
IN HUMAN CAPITAL
AND SKILL DEVELOPMENT
IN THAILAND

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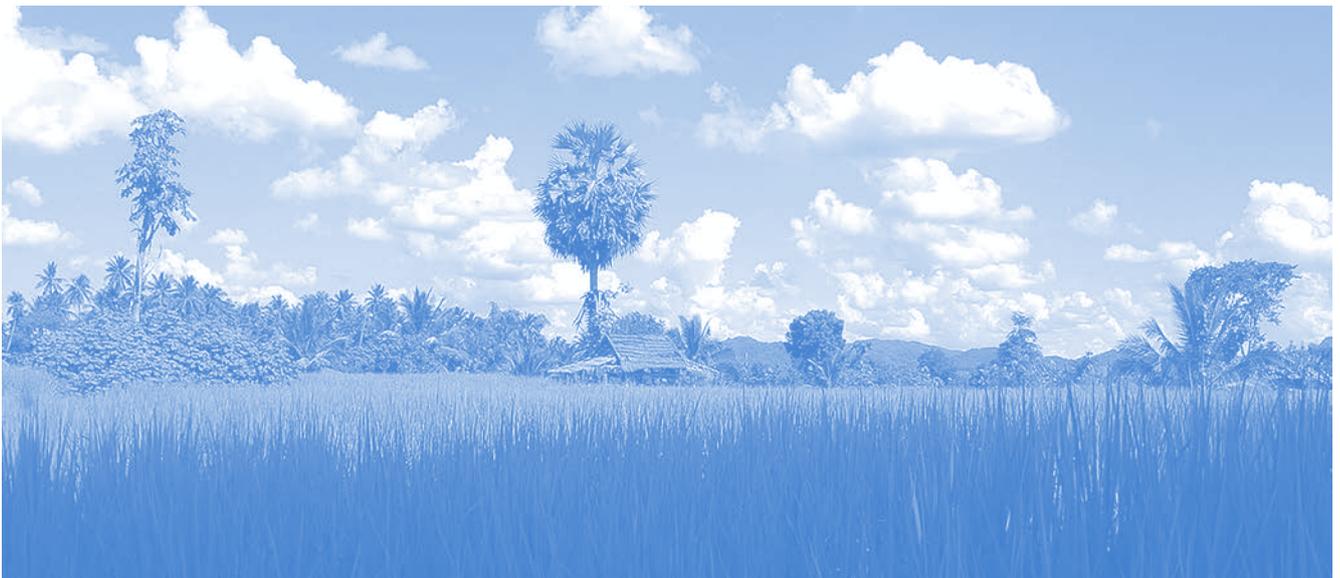
CONTENTS**COMPETITIVENESS
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ECONOMIC COMMUNITY**

-PAGE 2

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-PAGE 20





COMPETITIVENESS ADAPTATION OF THAI AGRICULTURE IN RESPONSE TO THE ASEAN ECONOMIC COMMUNITY*

**The article is the executive summary of the research report with the same title. The research team was led by Dr. Nipon Poapongsakorn, Distinguished Fellow and Research Director for Economic Transformation Study and Modern Agriculture Policy, Thailand Development Research Institute. The final report was submitted to the Office of the National Economic and Social Development Council in January 2018.*

The main objectives of this study are to analyze the impacts of trade liberalization in the agricultural sector as a result of ASEAN Economic Community (AEC) agreements, and to suggest adaptive strategies that will (a) lessen any negative impacts, (b) increase competitiveness, and (c) open up future opportunities for the Thai agricultural sector.

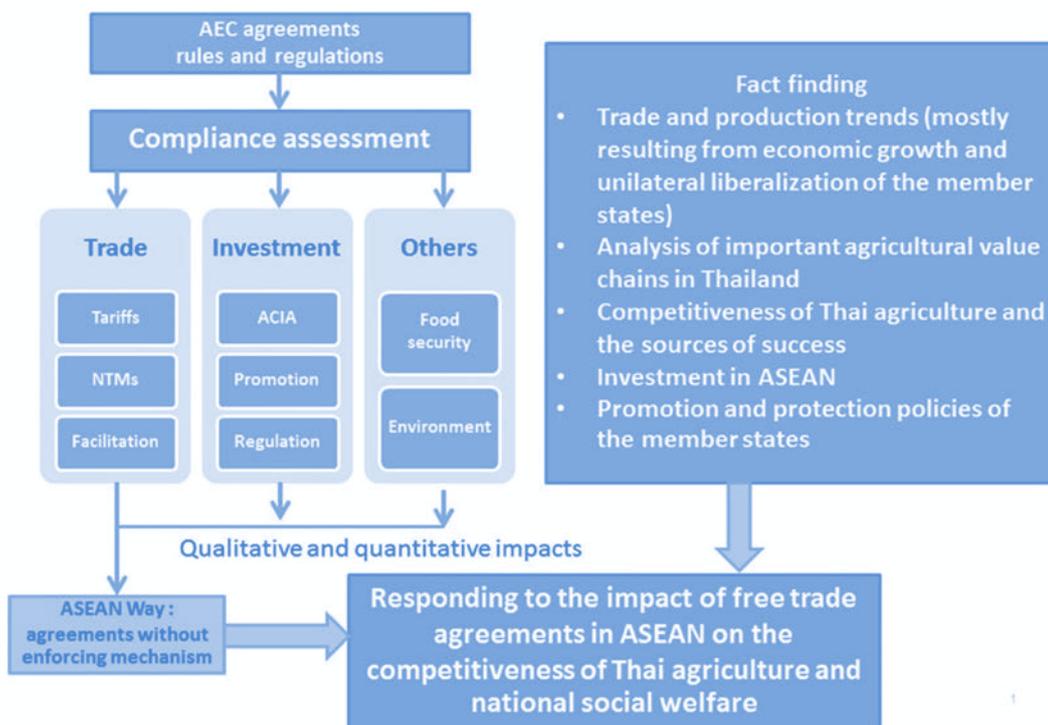
The study consists of three sections. **The first section** compiles AEC agreements, rules, regulations, and conditions toward AEC integration. Compliance with the following agreements is evaluated, trade (tariffs, non-tariff measures, and trade facilitation), ASEAN Comprehensive Investment Agreement and national investment policies, environmental conservation and food safety. The results suggest that the terms of many agreements are not met due to the lack of proper enforcement. The problem is that the ASEAN community generally makes agreements

and resolves conflicts through the “ASEAN way,” which values national autonomy above collective agreements. As a result, compliance tends to be accomplished on a voluntary basis.

The second section uses both qualitative and quantitative methods to draw a particular picture about production, trade, and investments of agricultural markets in ASEAN. Factors governing past competitiveness of Thai agriculture were analyzed together with a study of eight major Thai agricultural value chains. Investment of Thai firms in neighboring countries is qualitatively observed and analyzed. Promotion and protection policies in each country are also reviewed.

The third section combines the result of the previous sections in order to address the impacts of trade liberalization as a result of AEC agreements on the future competitiveness of Thai agriculture and the effect on Thailand’s social welfare. Conclusions

Figure 1: Concept and methodologies



Source: Authors.

are made, along with suggested solutions and policy recommendations aimed at increasing the competitiveness of Thai agriculture, while mitigating the negative impacts that will be forced upon Thai farmers.

Findings from this study indicate that AEC member countries do not follow AEC agreements and regulations rigorously. This is mainly due to the impact of the “ASEAN Way”—a mutual understanding among member states that, unlike the Eurozone, favors national autonomy and does not have an enforcing mechanism to ensure strict compliance. While the AEC scorecard has rated the success of AEC agreements at about 90-100 percent,¹ in truth, member states often do not follow what had been agreed because there is no enforcement or punishment. Compromises often become the solution of choice, and actions are often on a voluntary basis.

Despite clear difficulties in enforcing agreements, agricultural trade among AEC member states has increased faster than for any other products due to four reasons.

First, income per capita of the AEC member states increased significantly in the past few decades due to each member’s national development policies, resulting in increased demand for agricultural products. At the same time, unilateral liberalization during the 1990s also played an important role in increasing the throughput of agricultural trade in ASEAN, enabling some countries to become net exporters of agricultural products.

Second, AEC member states have comparative advantages in different production portfolios—for example, rice production in Thailand and Vietnam, palm oil production in Indonesia and

Malaysia, sugarcane plantation in Thailand, coffee-growing in Indonesia, the Lao People’s Democratic Republic, and Vietnam, pepper production in Cambodia and Vietnam, the growing of various tropical fruits in different countries, and intensive shrimp farming in Indonesia, Thailand, and Vietnam. Moreover, some crops are grown in one place but not another. The result of the varying portfolios has enabled trade in the surpluses to other ASEAN countries where demand is high.

Third, the global economic boom in the 1990s and the Uruguay Round of multilateral trade negotiations (MTNs) were the primary drivers of agricultural trade. Liberalization, especially in Cambodia, Lao PDR, Myanmar, and Vietnam (CLMV), also means that there are shifting import needs for some processed agricultural products from China and Thailand, such as animal feed, ready-to-eat foods, and beverages.

Fourth, tariff reductions under the ASEAN Free Trade Area (AFTA agreement) also played an important role in increasing the volume of agricultural trade within ASEAN, which effectively improved the ratio of intra-ASEAN trade to the overall trade to other destinations. However, the ASEAN agriculture market still applies tariffs for many sensitive products, and uses non-tariff barriers and non-tariff measures to a certain degree, thus limiting the future growth of intra-ASEAN trade.

The major trends in agricultural production and trade among AEC member states show great similarity in terms of crop diversification owing to the mix of crops. It is important to note a significant increase in palm oil production in the last 40 years in Indonesia and Malaysia. After adoption of the AFTA and AEC agreements, food and agricultural trade within ASEAN became more open, except in Thailand (and Malaysia) where the trend seems to have leveled off.

There are two major concerns for Thai

¹ *ASEAN Secretariat. 2012. ASEAN Economic Community Scorecard: Charting Progress towards Regional Economic Integration, Phase I (2008-2009) and Phase II (2010-11). ASEAN Secretariat: Jakarta.*

agriculture with regard to intra-ASEAN trade. **First**, the ratio of agricultural exports between ASEAN members to their total exports to the world remains at only 23 percent, which is lower than that of non-agricultural products. This shows that the region still employs protectionist policies in the agricultural sector. In the case of Indonesia, Malaysia, and Thailand, tariffs on sensitive products and non-tariff measures are being used extensively. At the same time, Indonesia, Malaysia, and the Philippines also pursue a food self-sufficiency policy aimed at improving their national food security situation. **Second**, Vietnam has become more competitive in the high-value processed food to China and the United States. In contrast, Thai exports to ASEAN and China are mostly low-value non-processed products, such as rice, rubber, palm oil, maize, and cassava to name a few.

In this study, **the impacts of tariff measures and trade facilitation on intra-ASEAN trade** were analyzed using the Global Trade Analysis Project (GTAP) model. Results show that the impact of tariff reductions is insignificant because the number of products on which high tariffs are still being imposed is relatively small. A gravity model is used to quantitatively determine the impact of non-tariff measures, where the results reveal minimal impact on trade. However, a qualitative approach, such as focus group discussions and interviews, suggests otherwise as many member states still employ a high degree of protectionist policies, especially Indonesia. By using GTAP, it was also found that the impact of trade facilitation contributed significantly to the growth of intra-ASEAN trade when measures were fully in effect. In reality, most member states still do not agree on facilitation rules and regulations, and there is no formal agreement on transport facilitation and logistics.

The impact of the ASEAN Comprehensive Investment Agreement (ACIA) on agricultural investment is insignificant because the sector is

still highly protected, resulting in relatively lower investment when compared with other sectors. However, many Thai investors have invested in ASEAN countries in order to secure emerging markets and the sourcing of raw materials. Most of the AEC member states have investment support policies and different rules and regulations varying by country that are more important considerations than the ACIA agreement.

Results from the econometrics model show that the aggregate welfare effect in Thailand as a result of AEC agreements would increase slightly. Free trade agreements of major agricultural products will, in effect, reduce the price of some agricultural products in Thailand—a benefit for consumers, but a loss for farmers who cannot compete. The increasing level of welfare depends on the elasticity of agricultural supply and an assumption that product price will be reduced to a level close to that of the neighboring countries. It is important to note the limitations of this analysis because partial equilibrium does not account for spillover impacts to other sectors. The calculated loss of farmers may be overestimated for two reasons: first, Thailand still employs protectionist measures along its borders, which limit the import of certain products; second, many Thai products have higher quality and cannot be entirely replaced by imported counterparts.

The AEC has common agreements on food security and environmental protection in the region. The goal is to utilize natural resources of the member states in an efficient and sustainable manner. Regarding quality and food safety standards, these aspects are overseen by 21 agreements, 152 measures, 6 ministerial bodies, and 4 high-level official meetings along with various working groups. However, cooperation between member states is still on a volunteer basis. Moreover, each country regulates these issues according to a different set of national laws. To conclude, there are no enforcement bodies to ensure meaningful action from member

states and still no agreement about a water footprint. Solving environmental problems in ASEAN will prove to be difficult, because these issues are often multi-dimensional, as shown in the case of haze spreading over other member states due to fires in Indonesia.

By analyzing the revealed comparative advantage (RCA), the competitiveness of Thai agricultural products can be compared with that of other competitors in ASEAN. Results show that there are 26 Thai products that are highly competitive and able to maintain growth, 157 products are still competitive but growth has begun to stagnate, and 56 products have already lost their competitive edge. Normalizing the RCA index yields an unfortunate result: it is clear that Thai agricultural products are losing their competitive edge when compared with those of the major competitors.

There are four reasons why Thai agriculture began to lose its competitive edge. First, the cost of production is increasing. Second, Thailand's major competitors were able to catch up on past developments by employing free trade deals, investing in supporting infrastructure and research. Meanwhile, Thailand's research system has been degraded due to decreasing and fluctuating spending on research. A new generation of researchers lacks incentives and is often obstructed by an outdated evaluation system that values their ability to publish over the practicality of their research results. Third, Thailand deployed multiple populist policies to guarantee prices and fix the market, resulting in the loss of national income while creating disillusion that diminishes the adaptive capability of farmers. Fourth, Thailand's natural resources have been degraded as a result of monoculture, intensive farming, pesticide overuse, deforestation, and pollution.

It has become clear that the solution for Thai agriculture in going forward is to invest in research and support the use of modern technologies in order

to increase the country's competitive edge and the adaptability of all actors in the value chain.

Proposed strategy: improving the competitiveness and the adaptive capability of the Thai agricultural sector

In order to address the challenges imposed by disruptive changes, the entire Thai agricultural system must increase its competitiveness and adaptive capability through the use of scientific knowledge and modern technologies to create new product innovations and make market-led decisions. This structural shift will require solid and proactive cooperation among four major actors: the public sector, the private sector, academia and NGOs, and farmer groups.

The main objective of the proposed strategy is to enable adaptation for every actor in the food and agricultural value chain, in order to increase farmers' income and to increase total factor productivity of the sector to be at least 30 percent higher than today's level. This implies cost reduction and adding value, standardization and quality assurance to meet market demands (such as food safety standards, environmental and social standards, and animal welfare), risk management and capacity-building to develop resilience against market volatility and the adverse effects of climate change.

Until now, the Thai agricultural sector has shown clear signs that it has begun to lose its competitive edge. Constructing and sustaining the sector's competitiveness will require alternative approaches to what had been done in the past. The only way forward is through agricultural research and agricultural extension services, particularly by introducing the use of scientific knowledge and modern technologies throughout the value chain—from production to processing and marketing. These are the means by which to achieve higher productivity that would sustain Thai farmers and increase their income.



There are eight sub-strategies to support the proposed strategy: (1) complying with the AEC agreements; (2) restructuring of the agricultural research system; (3) providing scientific knowledge and extending technologies; (4) using standardization and traceability; (5) establishing a steering and funding institution; (6) supporting mechanisms for farmers' adaptation; (7) reducing income disparity; and (8) conserving and making sustainable natural resources.

1. COMPLIANCE WITH THE AEC AGREEMENTS

The Thai government should follow AEC agreements strictly to set a good example for other member states, while pushing for region-wide compliance through negotiations and other diplomatic means.

In particular, the Thai government should:

(a) Through diplomatic channels, encourage ASEAN member states to comply with existing agreements, especially on removing non-tariff

barriers and implementing trade facilitating measures to accelerate intra-ASEAN trade in agricultural products.

(b) Streamlining non-tariff measures, especially technical barriers to trade (TBTs) and Sanitary and Phytosanitary Measures, and enforcing them only if they are necessary and are supported by scientific reasoning. By opening up to neighboring countries, it is possible to encourage cross-border investment and to establish a co-production base so that the strength of each country can be combined and utilized.

In terms of investment, most Thai investors that succeed in ASEAN are still large corporations. Small and medium-sized investors still find it difficult to access necessary information, such as investment rules, regulations, and foreign policies. The Department of International Trade Promotion should provide intelligence information for Thai investors—similar to the services provided by the Japan External Trade and Research Organization (JETRO) and economic officers of Australia and the United States Embassy.

Table 1: Objectives, strategies, and policies to improve competitiveness of Thai agriculture

Sub-strategy	Policy	Prioritization	Duration	Responsible agencies
1. Compliance with the ASEAN Economic Community agreements	1.1 Reduce the use of non-tariff measures. Set examples for other state members.	Secondary	3-5 years	Ministry of Commerce
	1.2 Promote investments that link low-value agriculture with high-value food industry sector. Reduce import quota to support food industry's growth.	Secondary	3-5 years	Ministry of Commerce, Ministry of Industry
	1.3 Shift the role of the Department of International Trade Promotion to provide business intelligence for Thai businesses, similar to Japan External Trade and Research Organization, Australia and the United States Embassy	Secondary	3-5 years	Ministry of Commerce, the Board of Investment of Thailand
2. Restructuring of the agricultural research system	2.1 Increase and stabilize research funding	Urgent	Long-term	National Research Council of Thailand, the Thailand Research Fund, and Agricultural Research Development Agency
	2.2 Shift research funding from being project-based to 3-5 years long, program-based ones	Very urgent	Long-term	National Research Council of Thailand and special research committee composed of experts from different fields
	2.3 Reform the agricultural research system to include incentives for researchers	Very urgent	1-3 years	Related departments in the Ministry of Agriculture and Cooperatives
	2.4 Reform the agricultural data system and launch a data initiative	Very urgent	1-3 years	Related departments in the Ministry of Agriculture and Cooperatives, and the Ministry of Commerce
	2.5 Create funding mechanisms to promote the use of scientific knowledge, technologies, and social engineering to solve problems in agricultural production and marketing	Within 2 years	1-3 years	Office of the Prime Minister, Bureau of the Budget, the Thailand Research Fund, Ministry of Agriculture and Cooperatives, and Ministry of Commerce
3. Provision of scientific knowledge and technology extensions	3.1 Study breeding and genetics to match market demand and preferences, research, development and extension to farmers	Very urgent	3-5 years	Rice Department, and private associations
	3.2 Monitor and select the use of technologies in other countries; adopt or adapt to local specifications	Within 3 years	3-5 years	National Research Council of Thailand, the Thailand Research Fund in collaboration with universities.
	3.3 Reduce the cost of using precision agriculture technologies	Within 3 years	3-5 years	National Research Council of Thailand, the Thailand Research Fund in collaboration with universities and IT businesses
	3.4 Shift the role of governmental units to become facilitators. Employ the private sector, universities, and NGOs to do extension services aimed at using scientific knowledge and modern technologies. Governmental units provide funding and evaluation.	Within 3 years	Long-term	Related agencies that provide agricultural extension services, and Bureau of the Budget

Sub-strategy	Policy	Prioritization	Duration	Responsible agencies
4. Standardization and traceability	4.1 Create an ecosystem for private businesses to provide GAP certification and other standards as services. Related governmental units provide accreditation to private businesses.	Very urgent	1-3 years	Department of Agriculture
	4.2 Support NGOs, private businesses, and the public sector to build consumer trust in Thai food.	Very urgent	1-3 years	Food and Drug Administration, Department of Agriculture, Office of the Consumer Protection Board, NGOs, and retail businesses
	4.3 Provide financial support to the ThaiGAP Institute, provide training for farmer groups on standardized production and harvesting.	Very urgent	3-5 years	ThaiGAP, local universities, and Department of Agriculture
5. Establishing a steering and funding institution	5.1 Establish a steering committee aimed at improving competitiveness.	Urgent	1-3 years	National Research Council of Thailand, and the Thailand Research Fund under the Office of the Prime Minister
	5.2 Establish a steering committee aimed at promoting the use of scientific knowledge and modern technologies.	Urgent	1-3 years	Ministry of Agriculture and Cooperatives, the private sector, universities, NGOs, and the public sector
	5.3 Create new capability of governmental units to evaluate extension programs provided by the private sector, academia, and NGOs.	Urgent	1-3 years	Related governmental units
6. Support mechanisms for farmers' adaptation	6.1 Limit/ban market intervention, such as price fixing	Very urgent	Long-term	The government under constant scrutiny by academia, the private sector, and the media
	6.2 Create adaptive mechanisms for less competitive farmer groups. Structural shift in the production of palm oil, dairy products and maize, among others.	Secondary	3-5 years	Office of Agricultural Economics and related governmental units
7. Reducing income disparity	7.1 Development of secondary cities	Secondary	5-10 years	Office of the National Economic and Social Development Council, Ministry of Education, and Ministry of Labour
	7.2 Improvement of education and retraining of rural labor for high-value non-agricultural jobs	Secondary	5-10 years	
8. Natural resource conservation and sustainability	8.1 Comply with ASEAN Economic Community's environmental agreements, and promote sustainable production and investment in Thai agriculture	Secondary	5-10 years	Office of Agricultural Economics, and Ministry of Natural Resources and Environment

Notes: The goals of the sub-strategy are:

- (1) Increase farmers' income per capita by accelerating the total factor productivity growth to be 30 percent higher than today's level and by increasing the products' value.
- (2) Enable public mechanism and market structure that enable those farmers who cannot compete to adapt.
- (3) Conserve natural resources in order to maintain competitiveness of the agricultural sector.
- (4) Reduce income disparity between the agricultural sector and other non-agricultural sectors. Easing political tension to limit the need for market intervention and price controls, which can negatively affect the competitiveness of the agricultural sector.

Source: Authors.

2. RESTRUCTURING OF THE AGRICULTURAL RESEARCH SYSTEM

The goal of this sub-strategy is to seek modern technologies and innovations that are suitable for Thai smallholder farmers and the small and medium-sized enterprises (SMEs), in order to increase productivity, add value, and increase the income per capita of those in the agricultural sector. This sub-strategy consists of four key actions:

(a) Increase research spending in the agricultural sector, and stabilize annual public research budget.

(b) Shift research structure from a project-based one to one that is more systematic and program-based, which is focused on key issues. Each program would last between five and eight years and be driven by a steering committee. Research topics must be prioritized and determined with the utmost scrutiny based on fact-finding and through scientific reasoning. This approach is in high contrast to the current method that typically uses a focus group of experts to drive research decisions.

(c) Reform research structure within governmental units, such as in the Department of Agriculture, Department of Livestock Development, and Department of Fisheries. The new structure requires an incentive system that opens up a career path for researchers, and limits the opportunity of some non-research staff who seek higher positions in the research division before moving back to management positions. Moreover, the research system must incorporate a learning mechanism that provides time as well as access to new knowledge and technologies.

(d) Reform agricultural data collection methods and forecasting techniques in order to improve the reliability, accessibility and timeliness of the dataset and information in order to gain trust from various actors in the value chain. The Ministry of Agriculture and Cooperatives needs to prioritize

the reform of the agricultural data system because reliable and timely data will affect the business decisions of farmers and agri-businesses. The lack of accurate data can cause an imperfect market and losses, as shown in the case of the *hom mali* rice forecast in 2016 that was much lower than the actual output. Subsequent faulty speculations resulted in a drop in prices—reaching lower than US\$550 per ton prior to the harvest season. To transform the agricultural data system, the following actions are necessary:

a. Types of data and information

- Improve data collection methods to accurately reflect production (volume, values, value added, production capacity, spatial and timely information of production and processing) and logistical information. This requires centralization of digital resources and the creation of a large agricultural data ecosystem by combining available data from the public sector and the private sector from various local to the national levels.

- Consolidate food consumption data from nine different governmental units in charge. Integrate available data from the public sector with private data from modern retail businesses. Investigate and research the demand preferences of various export markets to realize potential products. Combine domestic consumption data and export data as a tool to manage and plan production that follows the market.

- Make the generation of trade and investment data a process more accessible to small businesses, which currently is a process overseen by the Department of Foreign Trade and Board of Investment.

- Compile information on the use of modern technologies and innovative cultural practices in other countries. Monitor technical progress and identify opportunities to adopt or adapt the technologies to

meet the context of Thai agriculture.

- Reform methodologies and methods through which environmental and climate data are collected by different governmental units. Integrate, centralize and disseminate data for future use—both in the public and private sectors.

- Optimize and utilize the farmers' registry. Currently, the Department of Agriculture Extension together with the Geo-Informatics and Space Technology Development Agency and National Science and Technology Development Agency are revolutionizing the way in which inputs to the farmers' registry are being collected. However, such information is still not open to the public.

b. The responsible agencies

- The Ministry of Agriculture and Cooperatives together with the Digital Government Development Agency should initiate a pilot project to formulate a framework to reform Thailand's agricultural data system. The target is to improve the capability of government officials to estimate and predict production, consumption, trade, and investment in order to improve the management of agricultural production and marketing.

c. Modality framework of data management

(1) Improve and develop data collection, data processing, data analysis, and forecasting tools and techniques toward attaining state-of-the-art international academic standards.

(2) Invest in and introduce new technologies to assist the central statistics unit to use innovative data, such as biophysical data from satellite and drone imagery, weather data, and on-the-ground sensors. Such technology as blockchain can be used to coordinate decentralized data-gathering systems from local areas, and to enable aggregate data or summaries to be transmitted efficiently to the cen-

tral authority while ensuring the trustworthiness and reliability of the information. Artificial intelligence (AI) can also be used to process a large amount of data for gaining insights, and to predict yields and market preferences. Mobile applications could support various agricultural services while transferring knowledge and technologies to small-holder farmers. They can also be used to track the real-time price of inputs and can enable the creation of an online marketplace for agricultural products. The agricultural data system would also require a centralized authority to fact-check and gather data from various sources and integrate those data into a single platform.

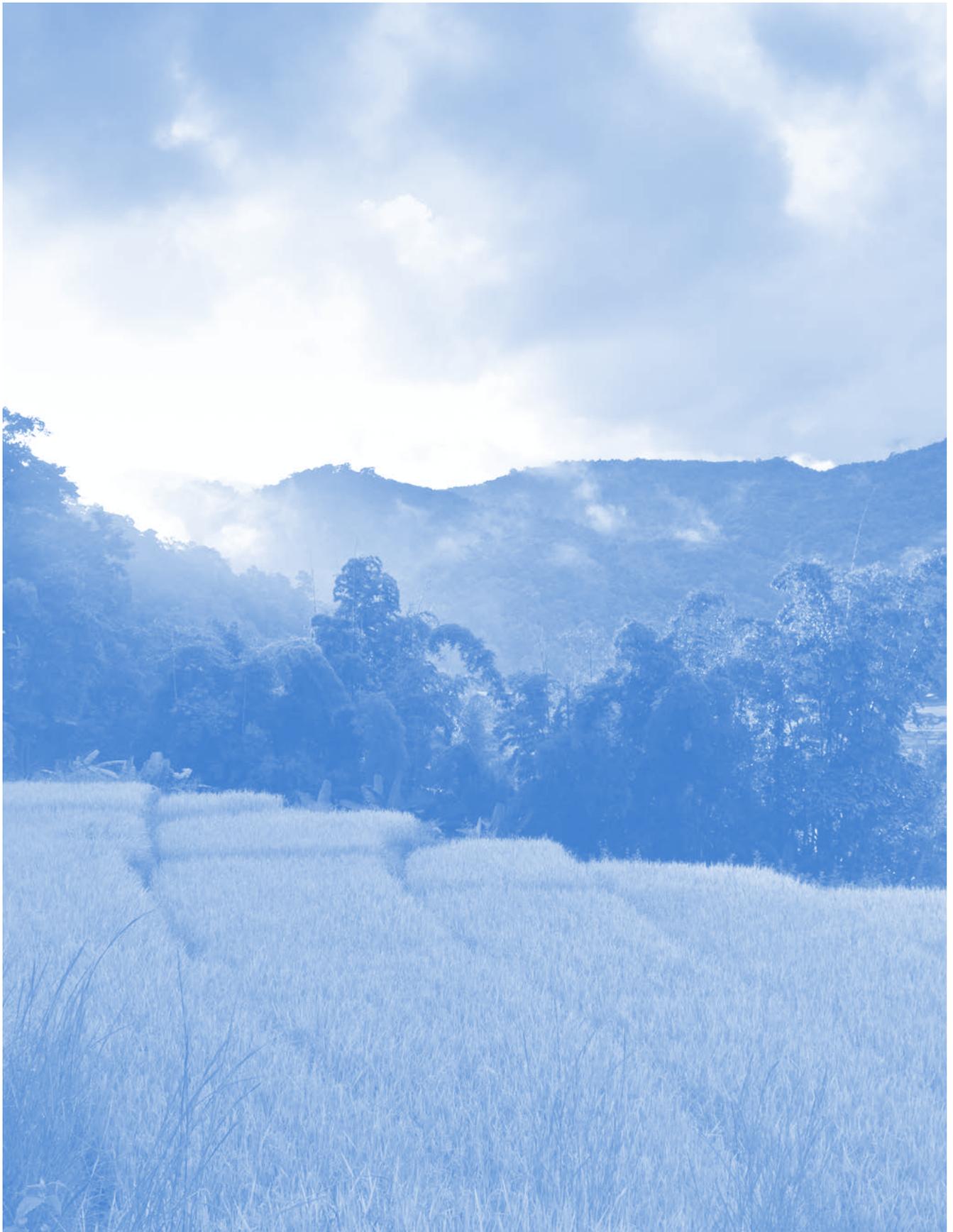
(3) Improve the capability of human resources in data analytics and information and communication technologies.

(4) Construct an incentive system for government officials working in statistics and data analytics in order to attract new talent. Grant awards according to pre-defined objectives and key performance indicators, and severely punish corruption in order to maintain the integrity of officers and thus the reliability and accuracy of the data being collected and processed.

(5) Set up good governance practices in data management. Create cross-checking and evaluation processes that shield the integrity of data from any outside political influence. Initiate an open data scheme to disseminate data regularly to the public. Ensure accountability from government officials who work with sensitive data.

3. PROVISION OF SCIENTIFIC KNOWLEDGE AND TECHNOLOGIES EXTENSIONS

One of the main reasons that the Thai agricultural sector began to lose its competitiveness relative to its competitors is due to the significant advances of scientific knowledge and technologies that are leading the world into the second "Green



Revolution.” Modern farming techniques, such as precision farming, combined with digital technologies will enable farmers to make better decisions at critical moments—to reduce costs and increase yields and values.

The problem is that the use of modern technologies in Thailand is still limited to large-scale cooperate farming and some high-value products, such as orchids, flowers, and organic vegetables. Most farmers do not have access to modern technologies due to their lack of knowledge and realization of the benefits of technologies. Imperfect information along with high investment costs mean that smallholder farmers would not be able to access new technologies.

To make matters more complicated, modern technologies are often specific to locations and contexts, which vary according to local considerations, such as soil types, water availability, weather, and access to markets, among other factors. Government officials lack the knowledge to make the transition and cannot deliver modern technologies to farmers. Other competitors, especially the least developed countries in Africa, began to adopt modern technologies quickly through technical assistance from the major developed countries as part of humanitarian aid efforts. Others, such as in China, Malaysia, and Vietnam, invest heavily in research and development of technologies and extend their discoveries to local farmers. For example, the government of Vietnam has successfully introduced a low-amylose breed of rice for mass production, with the intention of reaching the Chinese market. Today, China is importing this type of rice from Vietnam through both official and unofficial channels, with the volume reaching approximately 1-2 million metric tons per year.

To provide agricultural extension to increase the competitiveness of Thai agriculture’s, the following actions should be considered:

(1) Conduct marketing research into consumers’ demands and preferences in major export

markets, such as rice markets in China, Indonesia, African countries and those in the Middle East, and develop research plans that complement emerging markets. In terms of product development, the government should not support small niche markets and leave business development in the hands of the private sector. The niche markets should not be expanded into a mass market because doing so lowers prices, as shown in the case of the Riceberry market—when overproduction brought the price down from 100 baht per kilogram to only 50 baht per kg. To a limited extent, the government may provide simple incentives for niche markets, but that will need strict evaluation and follow-up, as well as profit sharing to recover the government’s initial investment. The Rice Department and associated governmental units should be the responsible agencies working closely with the private sector.

(2) The government, in particular, the Ministry of Agriculture and Cooperatives and the National Agricultural Research Committee, should hire universities to monitor technological progress in other countries, and to analyze the economic and business potential, benefits and bottlenecks, in adopting or adapting technologies for the benefit of Thai farmers.

(3) Organize pilot projects to test the feasibility of modern technologies in Thailand through close collaboration among academia, farmers, private businesses, and the public sector. Projects must be market-led, which means initiation must come from private businesses, and be locally integrable, which means pilot test programs must be established with local farmers. Once successful, the program would require adaptation for mass dissemination. Demonstration, knowledge transfer, and financial support can be combined into a support package that would provide adaptive options for farmers to make decisions, enabling them to weigh whether to increase their profit or risk failure.

(4) Create a public data ecosystem which

would reduce the cost of doing business for digital start-ups—by absorbing the cost of data collection, the cost of data transmission, and the cost of developing software and related applications. Cost reduction will result in more affordable services for farmers and farmer groups, enabling modern technologies to solve farmers' specific problems. Hackathons, designed as sprint-like events, may be employed to kick-start projects.

(5) Shift the role of government officials from providing extension services, such as sourcing new seeds and inputs, disseminating knowledge or organizing training, toward a new role of facilitation. This is because the private sector, academia, and NGOs are now far better able to provide extension services as they have access to capital, scientific knowledge, and technologies. In contrast, government officials no longer have the necessary knowledge and time to break through to farmers. Their extension efforts do not solve farmers' specific problems, because most of their time is spent in driving political policy, which is often a one-size-fits-all oversimplification of a solution.

In this new role, government officials could shift toward facilitation by providing competitive funding to whomever is interested in providing extension services, whether it be private businesses, academia, or NGOs. Government officials would evaluate and approve projects by reviewing objectives, deliverables, and the potential impact of the projects, as well as constructing key performance indicators for monitoring their implementation and ensuring project completion and success. This new approach would push extension services toward localism—where efforts are devoted to solving specific local issues.

4. STANDARDIZATION AND TRACEABILITY

With the rising demand for high-quality and safe foods, most importing countries now require

private global good agricultural practices (GAP) standards to ensure food safety for consumers. There are also multiple environmental standards that are becoming more well recognized, such as carbon footprint, water footprint, and illegal, unreported and unregulated fishing; and social standards, such as labor rights and animal welfare.

In order to verify the validity of these standards, a traceability system is required so that consumers could trace their food back to the farm on which it was grown. Standardization and traceability are becoming vital policy implications to ensure continued export growth and to increase the value of Thai agricultural products. To speed up the transition and create public trust, relevant organizations and agencies, such as the Thai Chamber of Commerce, the National Bureau of Agricultural Commodity and Food Standards, the Department of Agriculture, and the Food and Drug Administration, should cooperatively develop a platform to reduce the cost of issuing standards for farmers.

The platform should include rules, regulations, and mechanisms that would enable privatization of standardization services. Information and communication technologies and digital measuring tools should be researched and developed to increase the speed and precision of the quality control process. To encourage rapid transition, the government should:

(1) Provide financial support to the ThaiGAP Institute, the Thai Chamber of Commerce and universities to organize training programs for farmers on how to achieve private global GAP standards, and to develop an evaluation mechanism to measure and ensure the success of the program.

(2) Encourage privatization of standardization services. Privatization enables the quality control process to scale up rapidly. Facilitate and ensure a competitive market that would keep service costs within an affordable range for farmers.

(3) Shift the role of government officials,

such as those in the Department of Agriculture, the National Bureau of Agricultural Commodity and Food Standards, and the Food and Drug Administration, to provide lab services and accreditation to the private businesses that provide standards.

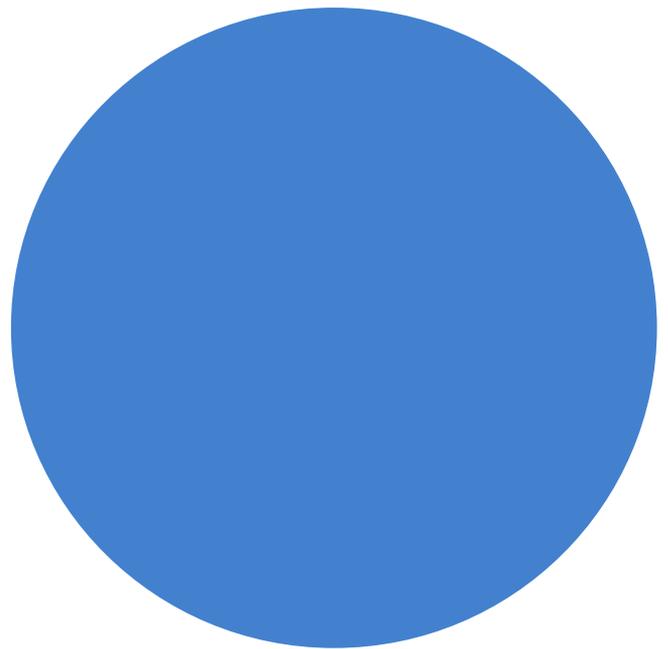
(4) Organize a public-private partnership, particularly between related governmental units and modern retail businesses, to campaign and monitor food safety, and to quickly respond to any food safety-related incidents in order to create public trust in Thai agricultural products. Some measures are: to randomly check the quality of foods and agricultural products in the markets; to make a regular report on findings and disseminate them to the public; to stipulate punishment for non-compliance; and to establish a common framework to solve unexpected problems.

5. ESTABLISHING A STEERING AND FUNDING INSTITUTION

To drive changes, it is very important to establish a steering institution to work under the *pracharath* (or public-private cooperation) committee on modern agriculture. The four-prong parties—public agencies, private businesses, academia and NGOs, and farmers—require a collaborative platform to work together and a systematic approach to determine the direction, policies, and tools to drive future progress. The institution's main objective is to increase the competitiveness of the Thai agricultural sector by pushing for key technological drivers.

The potential structure of this institution should be led by a steering committee and operated by the Office of Agricultural Economics, the Agricultural Research Development Agency, and the Thailand Research Fund. Close ties with academia and NGOs should be established to drive on-the-ground research that follows market demands, information provided by inputs from the private sector.

The steering committee would have two



objectives: first, to determine the priority concerning which research topic would solve immediate short-term problems in the sector, in particular to reduce costs, to increase productivity, and to mitigate risks. In order to solve problems which are largely specific to each local area, the steering institution should also establish a communication channel that enables farmers to voice their problems and to contact relevant experts from universities. Moreover, the system must allow farmers to be incorporated into the research process, which means that the Comptroller General's Department should revise its financing mechanism to be more flexible.

Second, the system must allow private businesses to voice their concerns about trade requirements and product specifications to match consumer demands. Therefore, inputs from private businesses should be incorporated into the decision-making process during research funding allocation. This step is to ensure that future research topics will have practical value and can truly be used.

The government officials must also transform their role and function from being operators

to becoming facilitators—by providing funds and evaluating results. Research and extension services should be driven by the private sector, academia, and NGOs, as previously discussed. Funding allocation should require a rigorous assessment process and accountability.

Another key function of the steering institution would be to support farmers who cannot compete as a result of AEC free trade agreements. The incentive system for government officials should also be revised, by changing the key performance indicators to reflect the productivity and income per capita of farmers in each local area. Incentive bonuses should be given to reflect their efforts, while corruption of any kind should be treated with extreme prejudice.

6. SUPPORTING MECHANISMS FOR FARMERS' ADAPTATION

While many of the AEC agreements are not being enforced and free trade among ASEAN countries is still limited largely by non-tariff measures, it is quite clear that the future direction will be characterized by a more open trade regime in ASEAN. When those days arrive, cheaper agricultural products will flow into the country and negatively affect Thai farmers.

For those farmers who cannot compete, there are only three choices: to increase productivity; to switch to growing a more profitable crop; or to move out of the agricultural sector. The government should anticipate such events, and begin measures to provide adaptability for Thai farmers.

(1) First and foremost, Thailand should set an example by complying with the AEC agreements. Upon compliance, many farmers will not be able to compete and will have to adapt. In the short term, compensation could be paid out in order to maintain the well-being of the lives affected. In the long term, an agricultural adaptation fund could be

drawn upon to assist farmers to find an alternative means of living, by offering adaptive packages that farmers could choose for themselves. The package should include knowledge transfer, accessibility to funding and markets, and technical support. The information and communication system will be of paramount importance to provide reliable information so that farmers can make sound decisions regarding the mitigation of risks that are based on empirical evidence.

(2) The political force must limit market interventions, especially in the form of price controls, to let the market mechanism work itself out. This is a very important issue because price fixing can disillusion farmers through conflicting market signals. In a capitalist market economy where the stronger survives, prices are the sole signal that farmers can use to understand that they must adapt in order to compete.

(3) The reality is that the government does not have the ability to control the agricultural market. For example, the price of rubber in Indonesia, Malaysia, and Thailand is determined by the global market, in particular through the Tokyo Commodity Exchange and Malaysian Rubber Exchange. While manufacturers often buy rubber directly from suppliers, the price would still be determined by the commodity futures exchanges. This means that the rubber price would be similar in all major producing countries, such as in China, Indonesia, Malaysia and Thailand. Any attempts by the government to control or support prices would be futile.

(4) Market control is an impossible task in a globalized world, especially in the agricultural sector, because the global market is complex as a result of having numerous producers and buyers. Moreover, many agricultural products can be substitutable to some degree. The scale and volume of production and consumption also varies greatly according to shifting climate conditions and changing demands. By trying to do the impossible, the

government may lose more than society could gain.

7. REDUCING INCOME DISPARITY

At the moment, there is great income disparity between the agricultural sector and the non-agricultural sector. Given the small contribution of agriculture to GDP (8%) but the large share of agricultural employment (32%), enhancing agricultural productivity within agriculture alone would be inadequate to close the income gap without re-allocation of labor to higher productivity jobs in the non-agricultural sector.

The government should formulate a strategic plan to decentralize and develop large cities and secondary cities to create more jobs outside of the agricultural sector. Successful implementation requires cooperation from various sectors and institutions. Unfortunately, the details of this sub-strategy are beyond the scope of this study and thus cannot be discussed further.

8. NATURAL RESOURCE CONSERVATION AND SUSTAINABILITY

Natural resources are the key factor that would determine the competitiveness of the agricultural sector. The government should systematically manage the ecosystem and the environment to ensure the future sustainability of the Thai agricultural sector. Natural resource degradation will be the key issue that affects the production side. Such problems as monoculture, intensive farming, chemical and pesticide overuse, degrading water and soil quality, and deforestation will ultimately result in the loss of bio-diversity and wildlife in the ecosystem, making the system more prone to natural disasters.

Conservation of natural resources and sustainability are imperative to ensure future security in domestic consumption and to increase the value of exports. While the policy mechanism within ASEAN

on natural resources conservation, environmental protection, and food safety exist to a certain degree, enforcement is still lacking. Cooperation occurs on a volunteer basis.

For Thailand, the government should make it a priority to leap toward the sustainable production of agricultural products. It should introduce a carrot-and-stick approach to encourage public action. Taxation and incentives can be employed, with the goal being to increase future opportunities and competitiveness of the Thai agricultural sector while decoupling future growth from the exploitation of natural resources. The Office of Agricultural Economics and the Ministry of Natural Resources and Environment should be the responsible agencies that spearhead this movement.

POLICY RECOMMENDATION: CASE STUDIES OF 8 AGRICULTURAL VALUE CHAINS

This study analyses the following agricultural value chains in Thailand: shrimp, dairy products, palm oil, maize, broilers, paddy rice, sugarcane and sugar, and residue-free vegetables. The main objective is to identify the strengths and weaknesses of the existing value chains and the capability of actors in each value chain.

These will be the most critical issues in future development, particularly quality improvement. Dairy production could reduce significantly once the free trade agreement with Australia is put into effect. This signals a need to adapt toward higher milk quality and high-value niche products, such as organic, residue-free products with global private standards, or high-nutrient products.

Palm oil production in Thailand has long been established, even without having a comparative advantage in terms of regular rainfalls. Cultural practices are not efficient due to smaller farm size in Thailand. The lack of water resources in some areas remains a chronic problem for farmers, resulting in



high production costs and low yields. Moreover, the ratio of extracted palm oil to total weight is low due to mismanagement during the process of gathering palm fruit. The government's previous policy was aimed at expanding the production area to another region of the country; this should be reconsidered under strict scrutiny over climate compatibility. Solutions must be revised to support farmers who are not competitive so that they can adapt sustainably.

Maize production has been in demand for the past several decades in response to the growth of the poultry and fishery sectors and the price support policy. The policy recommendation is to allow tariff-free imports, which will significantly improve the livestock sector. Moreover, maize production in protected forest areas should be banned and adapted to other occupations because it has resulted in deforestation and haze which has serious health effects.

Broiler production is a rising star among Thailand's agricultural products. Vertical integration has enabled the control of the entire production chain through technology transfer, farm management, and contract farming. This would enable high-quality products that gained significant market share in the global market. However, the lack of protein animal feeds and shortage of maize continue to be an obstacle to future growth; the import policy must be fully liberalized if this situation is to be remedied.

The shrimp industry still cannot regain momentum following outbreaks of the disastrous Early Mortality Syndrome (EMS). Lack of knowledge and resilience against EMS remains a critical risk for this sub-sector. Despite the limitation in production, the Thai industry has gained trust in the global market through quality assurance, standards, and traceability.

For residue-free vegetables and organic vegetables, consumers' trust is still the major issue. The Thai Chamber of Commerce is now campaigning for ThaiGAP standards for smallholder

farmers to serve the rising demand for safe food for the expanding middle-income population both in the domestic market and abroad.

Paddy rice remains one of the most important sub-sectors in Thai agriculture. A large ratio of harvested area per household and a suitable climate provide Thailand with a comparative advantage, resulting in high labor productivity. Through long-term development in the past, actors within the value chain gained expertise, which in effect reduces the cost of doing business. Through efforts in breeding and genetic research, competition in the input market and the availability of machinery in the hire-market enables smallholder farmers to thrive despite the lack of cheap labor. While Thai rice has gained significant trust in the global market and has enjoyed huge comparative advantage in global trade through the country's endowments and enabling policies, policy miscalculations in the past decade have created multiple problems in a once highly competitive market.

For sugarcane production and the sugar industry, private businesses are leading the charge in development, introducing modern digital technologies to solve labor problems and logistical management. Variation in rainfall remains an uncontrollable factor. The industry is currently under pressure from Brazil, through a World Trade Organization-complaint mechanism, to eliminate cross-subsidy for export. Finally, it has also become increasingly difficult to attract a new generation of people to replace aging farmers.

THE ROLE OF THE PRIVATE SECTOR IN HUMAN CAPITAL AND SKILL DEVELOPMENT IN THAILAND*

Boonwara Sumano Chenphuengpaw^{**}

Nuthasid Rukkiatwong^{***}



ABSTRACT

In Thailand, the government has traditionally been the main service provider of education and skill development as part of its basic social welfare program. Since the government has limited resources and many other responsibilities, such as healthcare and physical infrastructure development, the development of human capital in Thailand faces various limitations. Among them are low scores in mathematics and science among students as measured by various international tests, and unsatisfactory feedback from employers of young graduates. In order to improve this situation, the government needs support from other sectors, particularly the private sector, which is the key stakeholder in human resources development. This paper presents some experiences of the private sector in human capital and skill development in Thailand. It is focused on two case studies: LearnEducation, a social enterprise offering educational software, and a dual vocational program, which offers a combination of vocational education and apprenticeship. A policy

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recommendation to promote the role of the private sector is to set up an intermediary that will foster collaboration among the parties concerned and scale up their impact.

1. INTRODUCTION

Education, which is the key foundation of human capital and skill development in Thailand, faces various limitations. In 2008, a study by the World Bank found that one of the reasons why industries in Thailand made low investments in innovation was the scarce availability of capable workers.¹ This situation signals the problem both in terms of the quality and quantity of human resource in the country. Piriya and Pangpond (2014) found that employers in the industrial sector were unsatisfied with four skills of workers, namely English language (95%), information technology

(85%), mathematics (60%), and creativity (52%).² It could be said that these are all cognitive skills that should be acquired during school years. This suggests that the problem is the quality of education in the country. Furthermore, there is a problem of skills mismatch, both in horizontal (a graduate in one field is employed in another field) and vertical (a person employed in a position requiring a degree/qualification lower than the person possesses).

Education in Thailand can be divided into five stages, starting from kindergarten, which takes three years (3 to 6 years of age) to complete. Primary school spans a period of six years (7 to 12 years of age), and is followed by three years of junior high school (12 to 15 years of age). Afterwards, students can choose between high school and vocational training, both of which take another three years to complete. Then they may go to university or enroll in two-year higher vocational certificate programs.

¹ World Bank, "Thailand Investment Climate Assessment Update," <http://documents.worldbank.org/curated/en/268141468120847586/pdf/442480ESW0P1061C0disclosed071281091.pdf> (accessed on July 14, 2018).

² Piriya Polpirul and Pangpond Rukumnuaykit. 2014. "ทุนมนุษย์กับผลิตภาพแรงงานในภาคอุตสาหกรรมไทย [Human capital and labor productivity in Thai industry]," http://beyond.library.tu.ac.th/cdm/ref/collection/trf_or_th/id/30750 (accessed on July 14, 2018).

Compulsory education ranges from primary to junior high school, while basic education covers the period from primary school to high school. This is according to the Thai Constitution, which stipulates that the government must provide at least 12 years of free basic education that is overseen by the Office of the Basic Education Commission (OBEC).

Improving the quality of education and training may seem to be an obvious solution to the problem of poor education quality; however, this task cannot be left to the government alone. Although the government has traditionally been the main provider of educational services, it has many other responsibilities, such as healthcare, and economic and infrastructure development. Moreover, as the modern economy has become more and more complex and fragmented, the government is unable to obtain accurate information about skill configuration demanded by employers. As an employer of workers, the private sector knows better than anyone which skills are needed. Often, businesses can offer innovative answers to social problems as they tend to be more flexible and specialized than the government. Therefore, the private sector should be encouraged to take part in the development of national human resources.

This paper presents the experience of the private sector in human resources and skill development in Thailand focused on two cases, LearnEducation and a dual vocational program. The presentation of this paper is divided into four sections. The present section provides an introduction to the paper. Section 2 presents the case of LearnEducation, a social enterprise that helps solve problems in basic education by offering e-learning in schools. Section 3 presents the case of a dual vocational program which is a combination of vocational education and apprenticeship. The last section concludes the research and provides policy recommendations aimed at promoting the role of the private sector in human resources and

skill development.

2. LEARNEDUCATION: A SOCIAL ENTERPRISE WITH A SOLUTION TO PROBLEMS IN EDUCATION

This section is divided into two topics. It starts with overall problems in basic education in Thailand, then presents how LearnEducation helps in solving such problems.

2.1 Problems in basic education

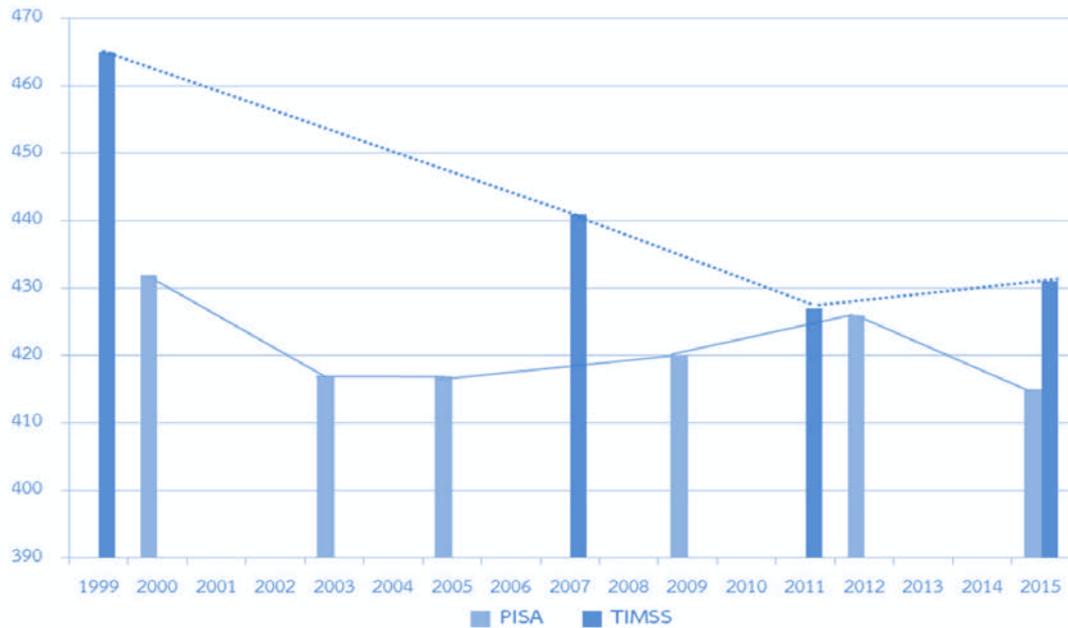
As previously mentioned, all Thai citizens are entitled to 12 years of free basic education. OBEC is in charge of implementing this policy, both in terms of access to education and quality of education. However, some limitations exist in both areas.

Because of the compulsory education and free 12-year basic education policy, access to education in Thailand is quite high, especially during primary school years, which has a students-to-population ratio of 100 percent, before dropping to 88 percent in junior high school, 72.7 percent in high school, and 56.3 percent in university.³ This high degree of access is not surprising since primary school years account for half of the compulsory education period. One of the reasons behind the 12 percent (approximately 300,000 children) decrease in junior high school enrollment, despite the compulsory education requirement, is probably due to the availability of schools that offer programs higher than the primary level. In 2015, 31,955 schools in Thailand offered primary education while only 11,615 offered junior high school programs.⁴ The limited availability of schools prevents access

³ *Office of the Education Council, Ministry of Education, "สถิติการศึกษาของประเทศไทย ปีการศึกษา 2557-2558 [Education statistics of Thailand 2014-2015],"* <http://backoffice.onec.go.th/uploads/Book/1497-file.pdf> (accessed on July 15, 2018).

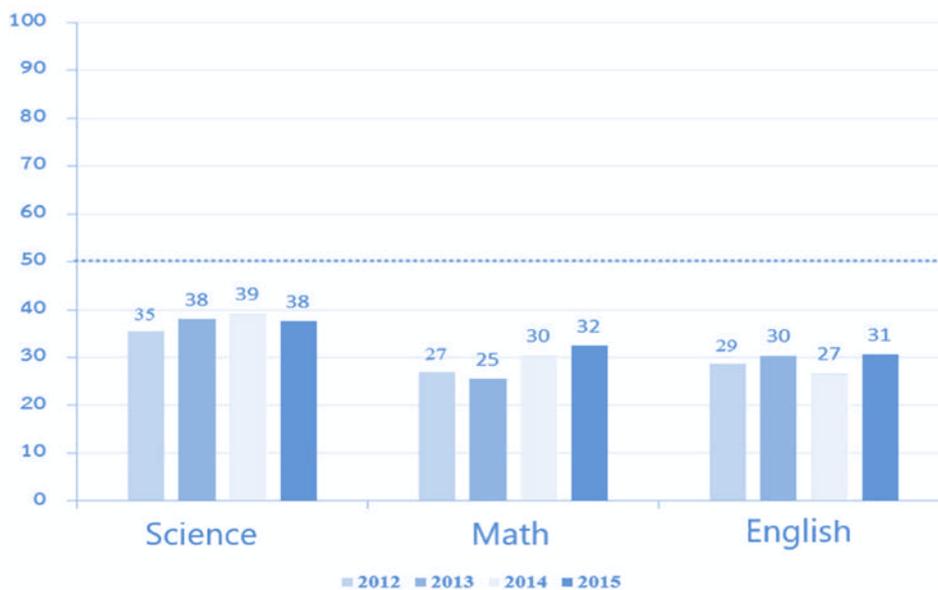
⁴ Ibid.

Figure 1: Mathematics scores of Thai students in TIMSS and PISA, 1991-2015



Source: Trends in International Mathematics and Science Study (TIMSS), and Programme for International Students Assessment (PISA), various years.

Figure 2: Average O-Net scores in mathematics, science, and English language, 2012- 2015



Source: National Institute of Educational Testing Service (NIETS).

to education, especially among the disadvantaged population who live far away and cannot afford to commute to schools.

Quality of education can be measured by international assessment, such as the Trends in International Mathematics and Science Study (TIMSS) and the Programme for International Students Assessment (PISA), as well as the national test, Ordinary National Educational Test (O-Net).⁵ Figure 1 shows that the average TIMSS and PISA scores in mathematics for Thailand from 1991 to 2015 have not improved very much. It also shows that Thai students scored below the median in TIMSS, which is set at 500, in both mathematics and science. This is similar to the results of Year 9 students in O-Net, in which the average scores in mathematics, science, and English language never reached 50 (see Figure 2). In considering its severity, the problem of education quality in Thailand should not and cannot be left to OBEC to solve alone.

2.2 LearnEducation

LearnEducation is a social enterprise that aims to improve education in Thailand by using an innovative approach in e-learning. The company offers teaching software for mathematics and science subjects that students can learn using computers in schools in a one-on-one style. The content is fully integrated into a school's curriculum and is in line with national guidelines. Real-time assessment is also provided in the form of pre-tests and post-tests, so students and teachers can get immediate feedback. Other services include training for teachers before using the software, one-on-one coaching, as well as other support, such as planning lessons and group

⁵ Started in 1995, TIMSS is used to assess mathematics and science achievement every four years, at the fourth and eighth grades, in more than 60 countries. PISA measures 15-year-old pupils' scholastic performance in mathematics, science, and reading every three years. Countries are allowed to combine PISA with complementary national tests. O-Net is Thailand's national test in eight subjects for students in Years 6, 9, and 12.

conferences to discuss ideas and new techniques.

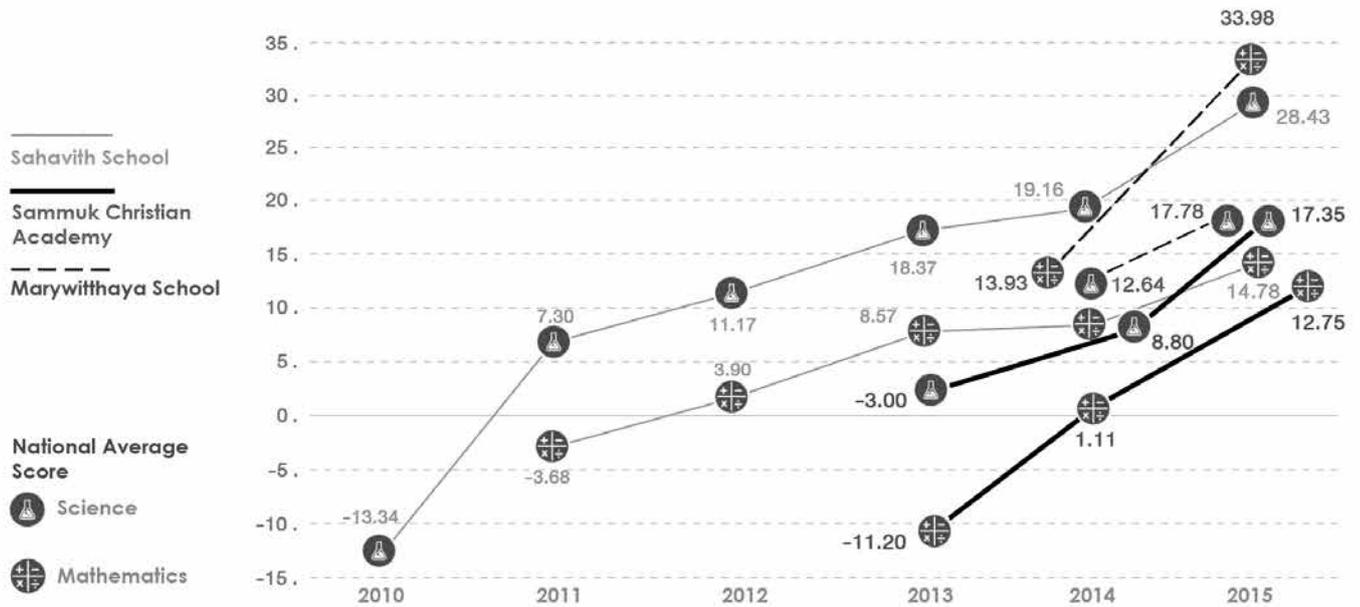
Adopting the LearnEducation model means changing the role of the teacher from lecturing in front of the class, which is difficult for all students to pay sufficient attention as each one has a different speed of learning, to coaching individual students who do not fully understand the subject after learning with computers by using real-time feedback from the software. Students can also concentrate better as they would have fewer opportunities to talk to each other or to be interrupted during class. They can also repeat the lessons, if needed, and learn at their own pace.

The O-Net results among schools that adopted the LearnEducation service have increased impressively. Sahavith School, which is the first school in Thailand to have integrated this approach, has seen its students' scores rise from -13.37 below the national average score in science and -3.68 in mathematics in 2010, to 28.43 above the national average in science and 14.78 in mathematics in 2015 (see Figure 3). Other schools using this service show similar positive results, which attests to the effectiveness of this approach.

LearnEducation helps to improve problems in basic education both in terms of access to education and quality of education. In terms of access to education, providing educational software with appropriate content that is aligned with national standards should facilitate schools' operations and thus may increase the number of schools that offer higher-than-primary education. Furthermore, as a social enterprise, LearnEducation collects fees from schools nationwide that use its service (100 schools in 2016) and spend some of the profit to provide disadvantaged schools in rural areas with free computers and software.

The company won: the Social Enterprise Award from the Thai Social Enterprise Office (TSEO) in 2014; and the Social Venture Challenge Asia, and the Edtech Excellence Award in 2015.

Figure 3: Results in schools adopting the LearnEducation service



Source: LearnEducation, <https://www.learneducation.co.th/results/>.

It hopes to reach 3,000 schools in Thailand over the next five years, and plans to expand to other countries in Asia.

Despite its success, this social enterprise has encountered a limitation. It can be seen that, in the list of schools that have adopted the LearnEducation approach, most are private schools. This may be because private schools have more flexibility in terms of curriculum management and setting tuition fee, which might have to be increased after including the cost of purchasing LearnEducation services. Public schools wanting to use LearnEducation may need to find sources of extra funding to cover the service fee since their budgets from the government would not be sufficient. Asking for more budget from the government may not be possible, considering the resource constraints and other responsibilities of the government. These two points suggest that the social enterprise might have difficulty scaling up nationwide, or reaching the majority of schools in Thailand as most of them are public schools.

The lack of funds to adopt LearnEducation's service could be solved by financial donations. The Thai government has tried to promote social enterprises by offering tax reductions to companies or limited partnerships that support social enterprises, either by holding common shares in social enterprises or giving assets to social enterprises for the purpose of providing social benefits. Furthermore, individuals or any legal entity can receive a tax reduction as much as two times the amount of money donated to approved schools for the cause of education.

According to the World Giving Index 2017, Thailand ranked fourth among the countries with the highest percentage of population who donated money.⁶ In 2016, about 88,416 million baht (about US\$ 2.6 billion) in donations were circulating in

⁶ Charities Aid Foundation, "World Giving Index 2017," https://www.cafonline.org/docs/default-source/about-us-publications/cafworldgivingindex2017_2167a_web_210917.pdf?sfvrsn=ed-1dac40_10 (accessed on July 27, 2018).

the country.⁷ This is undoubtedly an important source of funds. The drawback in using donation money is that it is usually scattered to a variety of places, often unplanned and spontaneously given for immediate causes, and has no impact on monitoring or evaluation. This is because in order to do otherwise philanthropists who donate would need to bear the cost of finding the desirable target of their donations, arranging continuous transactions, as well as impact measurement. Hence, people continue to donate in a traditional way, and donation money remains an untapped source of funding for social development.

3. DUAL VOCATIONAL PROGRAM: COMBINING EDUCATION FOR APPRENTICES

This section is divided into two topics. The first topic covers the overall situation in vocational training; the second topic presents the dual vocational program in Thailand.

3.1 Vocational education

It is a commonly held belief that the major problem of vocational education in Thailand is the insufficient supply of students and therefore graduates to meet the market's demand. Chaiyut (2008) pointed out that the reasons why many do not choose vocational education are that the average wage rate received by vocational degree holders is generally lower than the wage of university graduates, who often get higher positions as managers and supervisors, as well as the public attitude toward vocational students, which is generally not very positive—they are often viewed as delinquents who could not get into high school or university.

However, in looking more closely into these issues, it is found that the problem does not

actually reside in the size of the supply of vocational students per se, but rather, it is the mismatch that causes the shortage of skilled labor. For example, according to the National Statistical Office (NSO), of the higher vocational certificate holders who had majored in industrial craft/technician studies, only 14 percent actually worked as technicians or skilled craftsmen in 2013, while 47 percent worked in positions that paid lower than the average salary of technicians and skilled craftsmen, 20 percent were unemployed, and 19 percent chose to continue their education. The reasons why vocational certificate holders had to take lower paid jobs was because they could not perform to the standard of such positions.⁸ Employers then incur extra costs to train inexperienced workers, which in turn reduces the companies' competitiveness. Vocational education cannot be an attractive educational option as long as only 14 percent of the graduates will benefit from it. Not only would increasing the number of vocational students not solve the market's need, but it would also actually be very difficult, if not impossible, to achieve. The only way to solve the vocational education problem is to address the issue of quality.

3.2 Dual vocational program

The dual vocational program incorporates apprenticeship into a vocational education curriculum. The main objective of dual vocational education is to prepare students with practical knowledge and skills for employment by moving the classroom into the workplace. This approach offers at least four advantages. First, specialization as well as some important skills, such as precision, problem-solving, and work attitude, cannot be properly taught in the classroom. Learning-by-doing is thus a way to shape students into professionals.

⁷ TDRI calculation based on the 2017 Socio-economic Survey conducted by the National Statistical Office of Thailand.

⁸ Nuthasid Rukkiatwong, “มองลึกคุณภาพอาชีพชาวไทย สู่ทางแก้ไขตรงจุด [An analysis on the quality of Thai vocational training],” *Bangkokbiznews*, August 11, 2016, <http://www.bangkokbiznews.com/blog/detail/638574> (accessed on July 18, 2018).



Second, when having the chance to experience real working conditions, students can decide and make plans about their future career path. Third, employers would have the opportunity to know and recruit their future employees and thus be able to assign them to appropriate positions. Last but not least, students can earn some money during their apprenticeship, which could save them from possibly dropping out of the program because of financial problems.

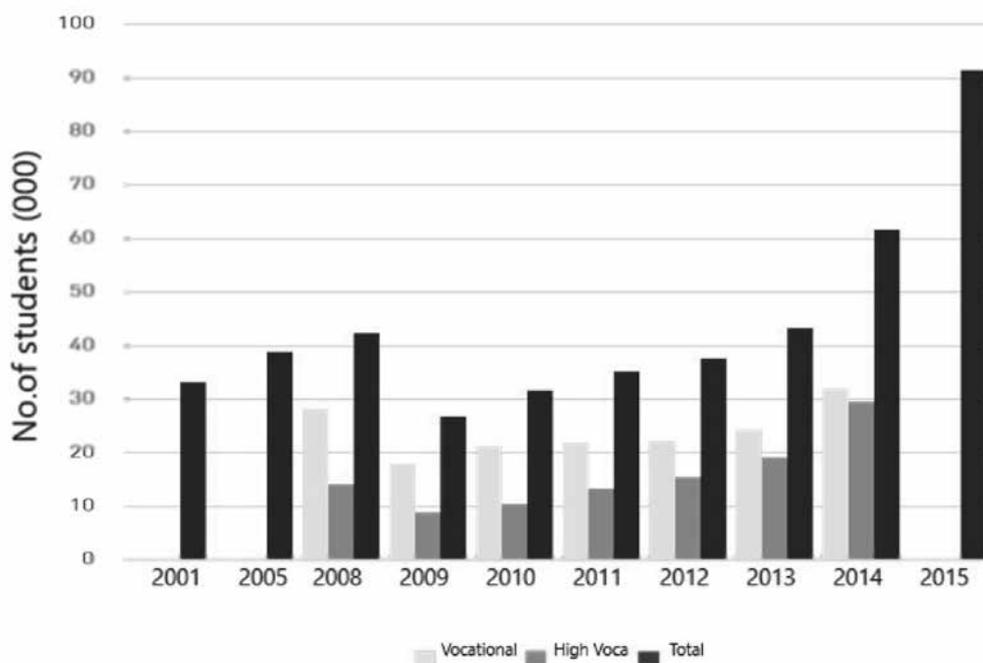
Thailand first adopted dual vocational education in 1984 with support from the Deutsche Gesellschaft für Technische Zusammenarbeit GmbH (GTZ) by running a pilot project in a public vocational school in Ayutthaya Province, before expanding the program to another three vocational schools in Bangkok, Samut Songkram, and Rayong. In the early stage, the government did not officially approve the “school-workplace” approach, which resulted in those who graduated from this program not receiving a certificate specifying that they had passed their apprenticeship. However, those who had

been in the dual vocational program tended to get a higher salary than average vocational certificate holders. In 1995, the Department of Vocational Education revised the curriculum to support the credit transfer from apprenticeship, and hence the full dual vocation program officially started.⁹

Despite its long history, the overall dual vocational program in Thailand has not been successful. Figure 4 shows that the growth of the dual vocational program has not been stable, with some years seeing improvement and some not. In 2015, there were about 90,000 students joining the dual vocational program, or approximately 14 percent of the total 650,000 vocational students in that year. This is considered not high compared to other countries that also implement the dual vocational program (see Figure 5).

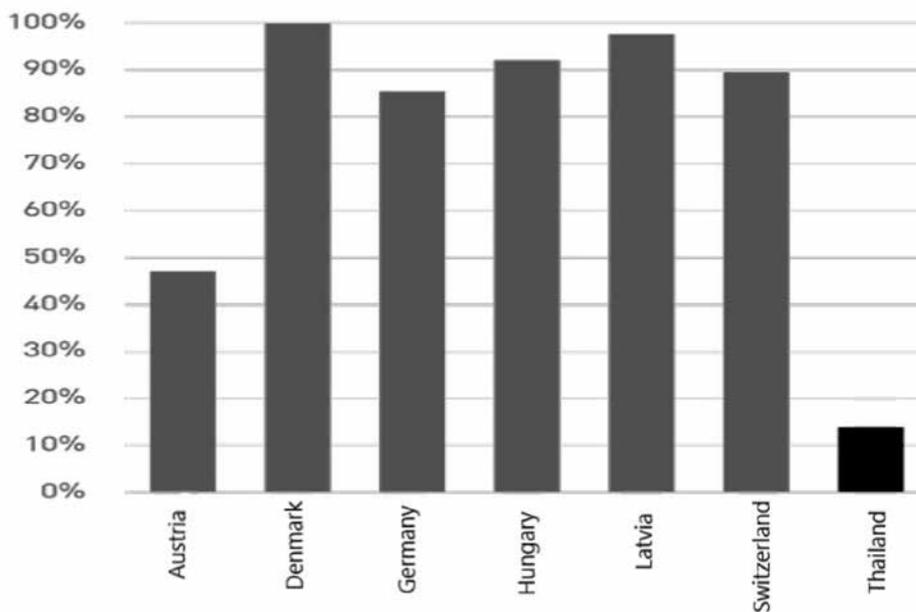
⁹ Office of the Vocational Education Commission, แนวทางปฏิบัติ การจัดการอาชีวศึกษาระบบทวิภาคี [Guideline to dual vocational program management] (Bangkok: Office of the Vocational Education Commission, 2013).

Figure 4: Number of vocational students who joined the dual vocational program in Thailand



Source: Pokpong and Supanutt (2013), Information Technology and Vocational Manpower Center (2014), Office of the Vocational Education Commission (2015).

Figure 5: Ratio of vocational students who joined the dual vocational program to total vocational students in countries other than Thailand



Source: OECD (2016), Office of the Vocational Education Commission (2015).

Note: The term “students participating in the dual vocational program” refers to vocational students who receive training in workplaces for no less than 25 percent of their school time.

There are at least four reasons behind the slow progress in the dual vocational program. First, businesses joining the program have to bear costs of training, such as facilities, consumables, and utility bills. Although businesses can expect to get some return from this investment in a form of having capable workers with desirable skills, they may also consider the probability of loss when their trained personnel go to work somewhere else. Although expenses incurred in providing training as part of the dual vocational program can be used to obtain a tax deduction of 200 percent of actual expenses, many companies find it difficult to realize the tax deduction due to strict conditions, such as the requirement that the proposed expense for tax deduction must be approved by the Revenue Department of the Ministry of Finance, and the Skill Development Department of the Ministry of Labour.

Second, for students to gain the most useful experience and skill set, the program must be run in the school and enterprise simultaneously. For example, in the retail and international trade dual vocational program in Germany, students spend about 3.5 days in the workplace and 1.5 days in school weekly. This enables students to reflect on how their real work experience relates to what they learn in class, and vice versa. Moreover, students should be rotated to as many different positions as possible in order to develop a comprehensive skill set and realistic expectation about their future career. However, these aspects may be problematic for enterprises as their work organization and schedule, as well as production process, could be interrupted. From interviews, it has been found that businesses prefer receiving students for a consecutive period, such as half a year or a full year. Some enterprises that do not want the training to interfere with their production process end up assigning students to menial tasks, and thus preventing them from acquiring actual technical skills.

Third, there is currently no systematic quality

assurance system in dual vocational education in Thailand. Quality assurance serves all parties in the dual program as students can be assured that they will receive useful skills and not be treated as cheap labor for menial jobs, while businesses face less risk of accepting students who are not prepared for the apprenticeship. In 2014, the Ministry of Education issued the Standard for Dual Vocational Program Management B.E. 2557, which stipulates many rules and conditions in managing the dual vocational program and thus, in a way, they act as a tool of quality assurance. However, this standard does not indicate an evaluation framework for the program, which is still absent in Thailand. Since businesses are heterogeneous in terms of size, technological and human resource readiness, and management style, as well as products and services, setting up one standard evaluation system acceptable for all businesses is extremely difficult to do. Furthermore, evaluating the quality of training requires businesses to disclose some information about production processes and management, which could involve trade secrets. Hence, enterprises might be reluctant to allow this.

Finally, the dual vocational program involves several parties, such as schools, enterprises, students, and future employers, and thus creates transaction costs in collaborating between these parties. Examples of transaction costs are advertising for and screening of applicants (for businesses), searching for available and suitable positions (for students), arranging agreements and evaluations (for schools). Since transaction costs rise when the number of participants increases, this could eventually discourage efforts to scale up the approach.

Despite the above-mentioned limitations, there is an example of a successful dual vocational program in Thailand. Denso (Thailand) Co., Ltd is an auto-parts company in the network of Denso Corporation, one of the world's largest auto-parts

producers. Denso (Thailand) comprises seven factories and two business administration companies. In 2013, Denso (Thailand) employed 7,700 people in total.¹⁰ Despite being the leader in the auto-parts industry in Thailand, the company continues to increase its competitiveness in order to keep the level of investment from its headquarters in Japan. One strategy to do so is acquiring qualified human resources through the dual vocational program, which the company has adopted since 2013. Each year, about 20 students graduate from the Denso program, 90 percent of whom are employed by the company, while the rest choose to continue their education.

The key reason why Denso (Thailand) uses the dual vocational program to find new employees instead of recruiting newly graduated students is because the company thinks that normal vocational education cannot train workers so that they will develop satisfactory skills. The dual vocational program enables the company to decide and arrange training that is applicable to the nature of its work, and thus those who pass the program can start working straightaway.

There are three factors why Denso (Thailand) successfully used the dual vocational program to meet its demand for human resources. First, the company has the capacity to arrange a good-quality training program through its own in-house training facility called DENSO Training Academy (Thailand). Second, the company can afford to offer the students 9,400 baht per month, plus other benefits, such as lunch and a bonus. This helps to attract high-performing students into its apprenticeship. Third, Denso (Thailand) is among the highest paying employers of technicians and has a policy of lifelong employment. This means that students who pass Denso's program are less likely to go to work somewhere else.

The success of Denso (Thailand) implies that enterprises wishing to take part in and benefit from the dual vocational program may need to be large firms with adequate resources. This is somehow ironic since large companies tend to have no problem in recruiting skilled human resources. Small and medium-sized enterprises (SMEs) may not be able to arrange a qualified training program or attract talented students in the first place. Unless the transactional costs associated in the dual vocational program can be absorbed by another party, it would be difficult for SMEs to use the dual vocational program to find future capable employees with a desirable skill set.

4. CONCLUSIONS AND POLICY RECOMMENDATIONS

This paper describes how the private sector in Thailand can take part in human resources and skill development. It raised two cases: basic education, and vocational education.

Basic education in Thailand has been facing limitations both in terms of availability of schools and quality of education. LearnEducation, a social enterprise that offers e-learning as a solution to both problems, has demonstrated good results in many private schools that seem to share particular characteristics. However, it is doubtful whether its service can be adopted by other types of schools, particularly public ones which tend to have less resources but constitute the majority of schools in Thailand.

Vocational education in Thailand also faces many challenges, such as the limited quantity of graduates who hold vocational certificates, as well as the quality of the graduates themselves that enterprises find unsatisfactory and not ready for the jobs they need to fill. The dual vocational program was thus introduced to address such challenges. Despite starting more than three decades ago, the

¹⁰ *Thai Denso Group, (n.d.).*



dual vocational program has seen slow progress due to such issues as the lack of quality assurance systems, the reluctance of businesses to invest in training, and the transaction costs in arranging details with all the parties concerned.

Although the two cases have different contexts and details, a mutual solution may help to improve the situation in both cases and hence advance human resources and skill development in Thailand. The solution is an intermediary agency.

In the case of LearnEducation and other social enterprises, an intermediary can act as a capital allocation mechanism and platform to link all the parties interested in social investment. For social enterprises, such an intermediary can help to raise funds by finding suitable investors or campaigning among the general public. For investors, an intermediary can monitor how the social enterprise uses the donation money, and can arrange impact assessments in order to show the social return from their investment. Having an intermediary may encourage a change from traditional donations to social investment with

scalable and sustainable impact.

In the case of the dual vocational program, an intermediary will act as a clearinghouse that helps to reduce the students' cost in finding appropriate apprentice positions, the schools' cost in finding partner businesses and linking the curriculum and the businesses' cost in finding and screening potential students. It can also design and provide a professional qualification standard as a quality assurance mechanism in the dual vocational program. Thus, an intermediary can lessen the transactional costs for SMEs and help them to tap into the benefits of the dual vocational program.

Therefore, a policy recommendation for the government is to facilitate the establishment of an intermediary agency to serve each particular purpose. This should be an independent organization and not be under any governmental organ to ensure flexibility in operation. The government should play the role of facilitator, for example endorsing the intermediary to increase its credibility. Each intermediary may comprise representatives of those involved in a respective sector. For example, an

intermediary for the dual vocation program should comprise business associations, such as the Thai Chamber of Commerce, and the Federation of Thai Industries. In the long run, an efficient intermediary will be the key to scale-up, replicate, and sustain the desirable impacts: capable human resources with desirable skill sets that meet the demand of the private sector and national economic development.

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