
# EE489: Seminar in Industrial Economics

# Why Thai SMEs in Agricultural sector cannot reach higher efficiency?

# Comparing with the case of Japan

**Presents**

**Dr. Wanwiphang Manachotphong**

**By**

**Raiwin Suwannaparisut 5604641372**

**Sittinut Wattanalaowit 5604641570**

**Thiti Setthachinda 5604641919**

**Semester 2/2016**

**Faculty of Economics, Thammasat University**

# I. Introduction

Small and Medium Enterprises (SMEs) plays a major role for Thai economy as it up to 41 percent of national income (GDP) and 80 percent of total employment in 2015 for Thailand. SMEs can create some important opportunities to the country in the future. The important role of SMEs is being the base of sustainable development and the main mechanism for economic recovery as well as strengthens economic progress and reduces the poverty (OSMEP, 2002). So both public and private sectors should concern about the role of SMEs.

There are many sectors of business such as production, construction, trade, service, infrastructure, and the important one, agricultural sector. With some 20.4 million hectares of farmland, about 10 million hectares are under rice cultivation, Agricultural sector is important for Thailand economy which accounted for 9.14 percent of GDP in 2015. Thailand is the 12$^{nd}$ largest exporter of food and agricultural product in the world which is the 3$^{rd}$ largest in Asia following China and India. This shows that agricultural sector has an important role for Thai economy (Knoema, 2017).

As we can see that both SMEs and Agricultural sector are important for Thai economy, this paper will focus on SMEs in Agricultural sector. The statistic, policies, problems, opportunities, and many interesting issues will be discussed in this paper. The important question that this paper wants to address is **"Why Thai SMEs in Agricultural sector cannot reach higher efficiency?"** To answer the question, the paper relies on earlier works and data analyzed from secondary market data about SMEs in Agricultural sector.

The rest of the paper is to discuss the definition and characteristics of Thai SMEs, challenges that Thai SMEs face, national policy for Thai SMEs, and remaining gap for Thai

SMEs. After that we compare with the case of Japan that success in management of SMEs in Agricultural sector. Finally, we will conclude and give some suggestion.

## II. General overview of SMEs and Agricultural Sector

There are various studies on small and medium-sized enterprises (SMEs) that both developed and developing countries consider SMEs as important factor for economic development. SMEs play a crucial role and found in every sector of the economy. They are important for long-term growth, employment, dynamism, and sustained. Over the past thirty years, globalization has contributed enormously to the booming of SMEs in developing countries including Thailand (Bulumac and Bendis, 2001). Quader (2008) said that privatization and deregulation by governments have created new niches for SMEs.

The definition of SMEs depends on each country because of some using the number of members, business capital or turnover as a standard. However, the most accepted definition is based on the numbers of member that around one hundred, stated by Asia-Pacific Economic Cooperation (2002). Another kind of SMEs is family run businesses. They are often managed, owned, and run by family members. This kind of SMEs has a simple management, does not take high-risk jobs, and usually involved in the subcontracting market. However, they still lack of resources and skilled manpower (Hillary, 2000; Scott, 2000).

Thailand's definition of SMEs depends on the number of employees, fixed asset or paid up capital labeled in ministerial regulations (Piriya and Veera, 2009). There are 4 business types: manufacturing, service, wholesale, and retail. Any firm is considered a small firm or a medium firm if either one of the above two variables meets the requirement.

**Table1: The definition of Thailand Small and Medium Enterprises**

| | **Employees** | | **Fixed Asset** (excluding land) | |
|---|---|---|---|---|
| | **Small** | **Medium** | **Small** | **Medium** |
| **Industry Type** | | | | |
| Manufacturing | 50 or fewer | 51-200 | 50 million THB or less | 51-200 million THB |
| Service | 50 or fewer | 51-200 | 50 million THB or less | 51-200 million THB |
| Wholesale | 25 or fewer | 26-50 | 50 million THB or less | 51-100 million THB |
| Retail | 15 or fewer | 16-30 | 30 million THB or less | 31-60 million THB |

**Source: SME Bank**

For Thai SMEs characteristics, information shown in Table1. The size of labor force ranges from 1-200 workers. Most of SMEs are owned by family members and use simple management so that there is a little number of employees. Most of Thai SMEs produce for the local and domestic market.

Apart from SMEs, we also consider in the issue of Agricultural sector. It turns to be a large and crucial sector that the income from which spent on domestically produced goods and services. This sector creates many jobs and most of it are created in nearby small enterprises which often employ the poorer or less education. So improving agricultural sector not only increases the welfare of agricultural household and the food supply, but also has the very important impact of supporting pro-poor who is non-farm employment in the rural areas (Sarah and Gary, 2002).

Thailand has been an agriculture based economy and the role of agricultural sector becomes the important factor for overall economic development. During the 1960s and 1970s, the agricultural sector was the “economy’s engine of growth", but in 1980s, the role of agricultural sector was replaced by the manufacturing sector. After that, during 1986 to 1990, since the structural change toward an industrialized economy and many external factors,

including a worldwide depression in major agricultural product prices, it causes the agricultural growth to drop sharply (Poapongsakorn, 2006).

Therefore, although there is declining in agricultural sector, it still be an important factor of economic development because overall economic growth still using resources from agriculture. Warr (2009) stated that Thai agricultural sector has never been dormant and its role continues to design a basis for development in economy of Thailand.

Agricultural SME is the enterprise that has completed company registration or business registration for agricultural operations such as cultivation, fishery, animal husbandry, or any activities that involve with forest. For example, "Suan Lamai" in Rayong is the one of agricultural SME because they change from the normal garden to the new agri-tourism. They have the homestay for the travelers who visit the garden and also have the fruit buffet. For another example, "Nucha Farm" is the agricultural SME that produces the watermelon and sells in both in and out of country. First, their watermelon can sell at price 8-10 baht/kilo. After that the price of watermelon falls down to 3 baht/kilo since there has a large number of the same type of watermelon. So, Ms. Nongnuch, who is the owner of Nucha Farm, researches the new type of watermelon which is YAYA watermelon. This new type of watermelon can sell at 35 baht/kilo which is the high price and can generate high profit to Nucha Farm. Nowadays, Nucha Farm has 13 types of watermelon and can generate profit up to 2.5-3 million baht per month. Therefore, both Suan Lamai and Nucha Farm are the example of success agricultural SME in Thailand.

## III. Literature review

For the wide perspective, our paper is related to three main issues which are meaning and importance, ways to gain more competitiveness and higher efficiency, and problems and obstacles of SMEs and Agricultural sector.

First, there are many existed papers that stated the meaning and importance of both Thai SMEs and Agricultural sector. For Thai SMEs, over the past thirty years, globalization has contributed enormously to the booming of SMEs in developing countries including Thailand (Bulumac and Bendis, 2001). Quader (2008) said that privatization and deregulation by governments have created new niches for SMEs. The important of Thai SME is creating more employment, being the place for practicing and learning new skill from the real situation, creating the connection with the big firm in the same sector, increasing the value of raw material since most of SME uses resource in the country, creating revenue to country especially the production for export and tourism, and protecting the monopoly in economic system (OSMEP, 2001).

Apart from SMEs, we also consider in the issue of Agricultural sector. It turns to be a large and crucial sector that the income from which spent on domestically produced goods and services. So improving agricultural sector not only increases the welfare of agricultural household and the food supply, but also has the very important impact of supporting pro-poor who is non-farm employment in the rural areas (Sarah and Gary, 2002). Warr (2009) stated that Thai agricultural sector has never been dormant and its role continues to design a basis for development in economy of Thailand.

Second, there is a literature that state ways to gain more competitiveness and higher efficiency of both SMEs and Agricultural sector. Agricultural businesses become more competitive because of the cost leadership and product differentiation (Porter, 1980). Harrison (1997) further pointed out that product differentiation, production economies, technology attributes of purchased inputs, and external factors are the essential sources of competitiveness.

Kennedy (1998) supported this point by state that these factors affect a firm's cost, profits, market share, and the degree of product differentiation.

So, according to the literature above, our group interested in the Thai SMEs in agricultural sector and ability to reach higher efficiency. Now we will look at the strategy that gain competitiveness in Thai SMEs in agricultural sector. From Thailand Information and Communication Technology (ICT) Policy Framework (2011), they said that ICT is the major factor for Thailand competitiveness. The objective of this strategy is to use ICT as an essential driving force for creating knowledge, creativity and innovation in services and goods. In developing ICT for strengthening the production sector which Thailand has an advantage, especially the agricultural sector, the trend is driving towards "smart agriculture".

According to Thailand Information and Communication Technology Policy Framework (2011), to drive towards smart agriculture, Thai SMEs must use ICT-enabled innovation to increase both the potential of agricultural products and productivity in the production process. However, to strengthen agricultural cooperatives, farmers must understand the basic of ICT and able to use of knowledge and information. To improve the performance of the agricultural sector, Thai SMEs should promote research and development to build up knowledge that can be used to mitigate risk, together with applying ICT in conjunction with technology in other field, improve efficiency in both agricultural product standards and quality control to gain power in export potential.

Third, there is a large literature on problems and obstacles of SMEs and Agricultural sector. For SMEs, Buranajarukorn et al (2003) divided problems into internal and external problems. Internal problems that Thai SMEs face are; First, inefficient in management control, marketing, production system, and personnel management; Second, lack of investment for

human resource management, R&D, advanced technology, continuous improvement program, additional infrastructure development, and management support development; Third, lack of organizational competitiveness. For the external problems, most of them are areas of uncertainty in management innovation, customer needs, supplier capacity, government support, and technology changes. Nuttawat and Nathasit (2014) said that insufficient government support, high R&D and innovation development costs, and difficult access to financial resources also be the obstacles for Thai SMEs. Sakulsurarat (2002) further said that the government designs to support the SMEs, but its response are too slow when compared with other countries. Moreover, the government uses public policy to support large firms more than small firms which cause several small firms to face a problem with difficult to access financial support from financial institution (Hall and Jenkins, 1995). The problems that Thai SMEs still face are high turbulent and dynamic business environment in the international market. So, the only way to survive and adapt business environment is to develop the innovation. However, most of technologies in Thailand usually come from outside country and sometime through foreign direct investment channels (OCED, 2011).

Moreover, Intarakamnerd et al. (2002) said that most of innovation system in Thailand is not well-organized in various areas, example in R&D and technology capabilities, macro-environment, and innovation infrastructure. Therefore, Thai SMEs lack of attention to innovation. This may come from low level of education of employees that lack of ability in creative activity. Sometimes, financial institutions are not confident in ability to innovate of SMEs. This result leads to difficult access to financial resources, Loewe P. & Dominiquini J. (2006).

From the survey conducted by the National Economic and Social Development Board (2004), they said that the different sizes of firms are the main obstacles for difficulties getting credit access from financial institutions. Most of small firms are lack of information and advice from financial institution, complexity and inconvenience of borrowing procedure, inadequacy of loan collateral, not enough qualifications as well as high expense, fee, and interest rate. Compared with the large firms that have more percentage of SMEs without access mention more about the former than latter. Moreover, it is difficult for SMEs in practice for financial loan because it has a large number of conditions and documentation requirements (Hall and Jenkins, 1995). Furthermore, a survey by Peterson, Kozmetsky and Ridgway (1983) confirmed similar conclusion that crucial factor of failures was a lack of management knowledge. Therefore, the survey suggested that the solution for reduce failure of small business was to improve management education. According to The Office of SMEs Promotion of Thailand, there are 1,420 SMEs decide to close down the business and counted for 18 percent increasing.

For agricultural sector, the problems that Thailand has faced for many years are shortage in water and inefficient use of pesticide. Water is the important factor for all type of agricultural production and essential for the growth of crops (Martin, 1998). Another concern about water is pollution. Many rivers are now severely polluted because the manufacturers leave the bad pollution into river and people drop the garbage which cause the gaining a high salt content in the river. Another problem is that Thai farmers inefficiently use of pesticide which has two aspects, a large number of negative externalities on consumers and environment and the application are technologically inefficient that do not maximize farmers' expected profits. The developing technological efficiency of pesticide application will increase farmers' profits and

competitiveness. So, shortage in water and inefficient use of pesticide are the problem of agricultural sector.

Therefore, the rest of this paper is arranged as follows: first, we analyze the data of Thai SMEs in agricultural sector and the current situation that related to agricultural SMEs. Then, we discuss about the factors that hinder Thai SMEs in agricultural sector to reach higher efficiency. Finally, we compare with the case of Japan. This is to see how the SMEs in agricultural sector has been promoted in Japan and whether the lesson can be applied to the case of Thailand.

## IV. Methodology

As this paper discuss mainly about SMEs in Agriculture sector, we will analyze the data and also situation review about interesting policies, plan, or action that related to SMEs in Agricultural sector. As a conclusion, we will separate the process that we use to find the answer into two parts; data analyzed and the situation review part. So this part of paper will state and analyze the data and situation of SMEs in Agricultural sector and then we will thoroughly discuss in the next part.

### Data Analyze

The first part of the methodology is the part that we collect data from secondary market and then analyze it. It is undeniable that SMEs play an important entrepreneurial role in Thailand. The overview of data collected from The Office of SMEs Promotion which is the institute for taking care of Thai SMEs. We collect data from 2006-2015 which is the number of all enterprises, SMEs, employment for all enterprises, SMEs employment, agricultural enterprises, agricultural SMEs, amount of exports and imports for both enterprises and SMEs, GDP of country and SMEs, and Trade and Service Sentiment Index (TSSI). Moreover, there has

data about government spending and debt of farmer as well as the case of other country such as Japan in this part which is the example of country that successful from agricultural SMEs.

For the number of SMEs, almost all registered firms are SMEs which counted approximately 99% of all firms. Number of employment of SMEs count for two-third of total employment. GDP generated by SMEs is about 40 percent of GDP of country. These show that SMEs play an important role for country.

For more specific into agricultural SMEs, agricultural SMEs are about 96.48% of all agricultural firms in country while there are only 20,065 enterprises which are only 0.73 percent of all SMEs in Thailand. However, agricultural sector generated 11.5 percent of all GDP. These show that even the number of agricultural SMEs is low but this sector can generate up to 11.5 percent of GDP.

Trade and Service Sentiment Index (TSSI) is the index that measures a confidence of the enterprise for analyzing the trend in the future. For percentage change of TSSI, comparing between all enterprises and SMEs, we can see that all enterprises still more stable than SMEs. We can conclude that SMEs still more volatile in confidential of people (OSMEP, 2011). There are diagrams that explain these in the appendix.

There are more data that we analyzed which shown in the discussion part later. These are all about the data that we analyzed and used these results in discussion part. For more data analyzed are available in appendix.

## Situation review

The situation review part, we will state the recent policies, plan, or action that related to agricultural SMEs which including national plan for SMEs promotion and interesting policies from government.

**The National Plan for SMEs Promotion**

As a result of the economic crisis in 1997, the Thai government has turned to SMEs as an alternative engine for economic recovery and sustainable growth. The national plan for SMEs promotion was launched in 2002. There are 3 plans, 1st plan for 2002-2006, 2nd plan for 2007-2011, and 3rd plan for 2012-2016. We will mainly look into 3rd plan (OSMEP, 2011).

The recently plan in the plan for 2012-2016, the goal of the plan is to push forward SMEs to be the main engine for Thai economy by using knowledge, creativeness, innovation, and cultural identity to generate the growth of SMEs by cover all areas of the country.

There are 4 main strategies; 1. Support environment that related for SMEs, 2. Reinforce the competitiveness of SMEs, 3. Promote SMEs for higher potential, and 4. Strength SMEs for the world market. For more detail about agricultural sector, these are the aims for this sector.

- Develop entrepreneur and employees by improve capability and efficiency
- Develop the production and management system
- Support specific product, concern more value added, higher standard
- Develop and support for market channel and logistics
- Support more about relationship between agricultural and industrial

Agricultural sector also be one of 5 sectors that government focus to support besides technological, creativeness industry, retail and wholesale, and service and tourism.

**Policies of SMEs in Agricultural sector**

**Table2: There are many policies that influence and related to SMEs in agricultural sector.**

| **Policies** | **Aims** |
|---|---|
| **Thailand 4.0** | Apply technology in their production in order to create higher efficiency for agriculture and SEMs |
| **1 Tambon, 1 Agricultural SMEs** | Support financial credit to make SMEs in Agricultural sector more stable and gain more value added for agricultural product |
| **Big firm helping Small firm for Tax reducing** | allow a Big firm can double reduce tax expense to support more on SMEs firms |
| **Soft Loan for adjusting machine and increase efficiency of SMEs** | project provides a low interest loan for purchase a new machine for SMEs |
| **Guaranteed of credit for start-up and innovation** | helping a new SMEs and for a firm that want to create or using technology in their firm |
| **Restore SMEs by SMEs fund** | Government subsidy to The Office of SMEs Promotion for helping and restore SMEs that facing problem such as sue by a court or behind the payment |

**Source: Ministry of Finance**

## V. Thesis Discussion / Argument

From what has been described in the previous section, there are many issues that make Thai Agricultural SMEs cannot reach higher efficiency. So this part, we will discuss about these issues and we also give a solution by refer to the case of other countries. Problems can be

manifested into 3 main issues which are ability to access financial credit, performance of entrepreneur, and applying technology in agricultural sector.

## Financial Access

As we know that there is high cost for this industry, not only production and raw material but also technology, R&D, and innovation. For Thailand, a problem of debt for farmers existed for a very long time. According to the methodology part, TDRI found that each entrepreneur has average debt of 158,000 THB per year which growth rate of 5 percent per year shown in Table3.

**Table3: Amount of debt of agricultural entrepreneur for each financial institutions**

| Source of investment fund | Debt Remaining (2011) | Debt Remaining (2014) | % change |
|---|---|---|---|
| Bank for Agriculture and Agricultural Cooperatives | 756,177 | 826,001 | 9.23% |
| Agricultural Cooperatives | 88,014 | 83,828 | -4.76% |
| Farmers' Reconstruction and Development Fund | 2,875 | 3,496 | 21.60% |
| Revolving Fund of Ministry of Agriculture and Cooperatives | 11,945 | 10,401 | -12.93% |
| Commercial Banks | 330,596 | 398,906 | 20.66% |
| Total | 1,189,607 | 1,322,632 | 11.18% |

- Unit: Million THB

**Source: Thailand Development Research Institute (TDRI)**

The problem is the farmer borrowing money to buy the land or material for agriculture but they did not have enough money to pay back a loan. These make most of bank or financial institution not willing to lend to farmer. So farmer has to seek for the informal debt instead

which given a higher interest rate. These multiple more effect of this problem and in some case farmer decide to quit the business.

Nowadays, there are policies that Thai government have launched for financial helping for agricultural SMEs such as "1 Tambon, 1 Agricultural SMEs", a project that support more financial credit for SMEs in Agricultural sector, "Big firm helping Small firm for Tax reducing", allow a Big firm can double reduce tax expense by using not more than 10 percent of net profit to help SMEs which aim to support more on SMEs firms, "Soft Loan for adjusting machine and increase efficiency of SMEs", provides a low interest for purchase a new machine for SMEs, "Guaranteed of credit for start-up and innovation", guaranteed a credit for gain a capital to do the business for SMEs that want to create or using technology in their firm, "Restore SMEs by SMEs fund", government subsidy 2,000 million THB to The Office of SMEs Promotion for helping and restore SMEs that facing problem such as sue by a court or behind the payment. The result is that there are some policies that active in the appropriate proportion such as 43.4% for 1 Tambon, 1 Agricultural SMEs while there are also some policies that active just only 4.6% such as restore SMEs policy.

For the aspect from Japan, there is "Japan Finance Corporation for SMEs (JASME)" which is institution that financially support the development and growth of SMEs. The scope of operations of JASME are provide long-term business funds for SMEs, support innovation, overseas expansion and business turnaround, and acceptance of insurance on Credit Guarantee Corporation (CGC) guaranteed liabilities involving loans to SMEs. For long-term business fund, they provide loan with fixed interest rate which is important for supporting the SMEs' businesses. For credit insurance, the purpose is to facilitate the supply of finance required by SMEs which lack of adequate collateral and creditworthiness. Credit insurance system and

Credit Guarantee Corporation (CGC) will provide private financial institution with guarantee for debt obligations of SMEs. Government spends a lot of money for support agricultural sector because they give precedence to agricultural industry.

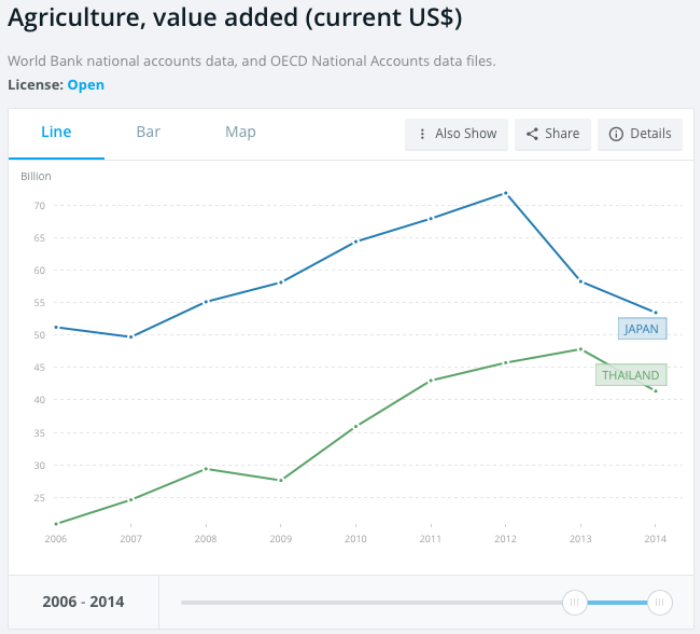
So we can learn from Japan that setup an institution that manage directly about financial credit for agricultural SMEs to make easily to manage and control of each player and also make it more formal to prevent the problem of debt. Moreover, we should provide more knowledge about financial management for agricultural entrepreneur to make more efficiency about managing their fund and also reduce a risk of debt.

## Entrepreneur

We divided problems into internal and external problems. Internal problems are inefficient in management control, marketing, production system, personnel management, and lack of investment for human resource management. For the external problem is mainly on government support. Nuttawat and Nathasit (2014) said that there is insufficient government support for agricultural SMEs. Intarakamnerd et al. (2002) said that the reason Thai SMEs lack of attention to innovation may come from low level of education of employees that lack of ability in creative activity.

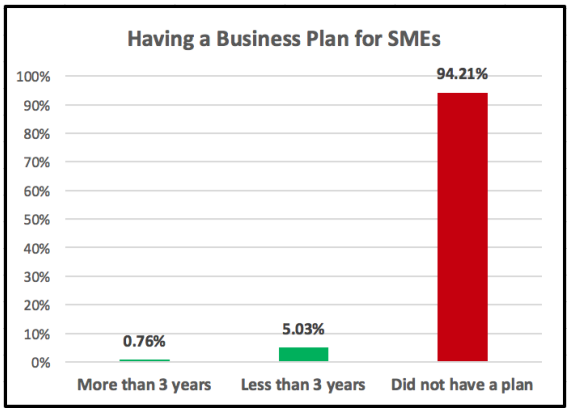
For entrepreneur, knowledge and skill are the things that they lack. They lack not only knowledge and skill for production or using technology but also business management, marketing strategy and the way to create value added for their product shown in Table 4-6. This is one of factor that cause Thai agricultural SMEs cannot reach a higher performance.

**Table4: Agriculture, value added (current USD)**



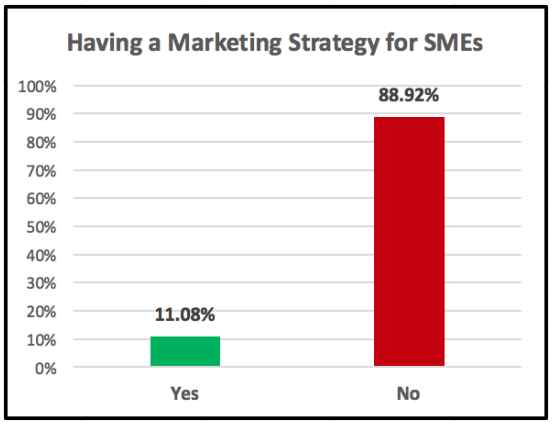

**Source: The World Bank**

**Table5: Percentage of SMEs that having a business plan**




**Source: Thailand Development Research Institute (TDRI)**

**Table6: Percentage of SMEs that having a marketing strategy**




**Source: Thailand Development Research Institute (TDRI)**

Moreover, there are undisclosed of data and information of SMEs and agricultural sector that make us cannot find out too much about the data analysis for this paper. Not only government did not provide information but also SMEs did not send information to government too.

We study from Smart SME Channel in the issue of "Supporting agricultural SMEs by Bank for Agriculture and Agricultural Cooperatives", executive of Bank for Agriculture and Agricultural Cooperatives said that factors that create a higher probability of successful agricultural SMEs entrepreneur are agricultural knowledge, create value added, and marketing strategy.

Depart from Thailand; there is interesting case from abroad that aims to support more performance of agricultural SMEs. In case of Japan, the government launches a project of "sixth' industrialization" which is combination of agricultural sector, marketing, production and processing. Aim of this project is to create value added for product, recovery rural farming, and increase performance of small agricultural firm. Entrepreneur must have not only agricultural knowledge, but also production, marketing strategy, and innovation to do business.

The example of Japanese agricultural SMEs is the fruit producing firm that using marketing strategy and innovation to produce abnormal shape fruit with high quality of fruit such as a square shape of watermelon. They also combine with strategy of marketing which produces just low quantity and makes it be a premium fruit with a very high price. This is to create value added for the product.

In the view of Thailand, higher knowledge and skill of agricultural SMEs entrepreneur are one of important factor in case of reaching the higher performance of agricultural SMEs. There are government policies that concern about this issue. "Smart Farmer" is the project that government will classify entrepreneur into 3 classes which are already smart farmer "Existing Smart Farmer", in processing of smart farmer "Developing Smart Farmer", and outstanding performance of smart farmer "Ideal Smart Farmer". Then, the government will give a support and determine a way of development. Aim of this project is to create more value and efficiency of agricultural sector in the future. "Young Smart Farmer" is the project that supports youth farmers who interest in agricultural sector to be the main engine for pushing forward Thailand 4.0 in the future. They provide scholarship and fund for new generation of agricultural entrepreneur. Moreover, Bank for Agriculture and Agricultural Cooperatives launch a project of "fromfarm.me" which is the website for marketing online for agricultural SMEs. They want to make agricultural SMEs to merge with social online market as their marketing strategy. However, the result does not work enough and not much active for this project.

So, to develop more for entrepreneur, the government should provide training session for better knowledge and skill for agricultural SMEs entrepreneur like Japan case to gain a higher efficiency of agricultural SMEs. There is existing government project that corporate with Japan Agricultural Exchange Council by sending Thai agricultural entrepreneur to stay with Japanese

agricultural family to live and learn with them. After that going back and spreading their knowledge and experience to Thai agricultural sector. For The National Plan for SMEs Promotion, the government has a plan for agricultural SMEs of development of entrepreneur and employees by improving the capability and efficiency, production and management system, market channel and logistics, and relationship between agricultural and industrial. Agricultural sector also be the one of 5 sectors that government focusing to support besides technological, creativeness industry, retail and wholesale, and service and tourism. This shows that government also concerns with this problem and recently launches some policies to deal with this problem.

So, the policies from government may be good policies, but we should provide more channels for distributing information about policies to make entrepreneur to access policies from government and there will be more probability to reach better performance for these firms. Encouraging more on entrepreneur to develop themselves can also cause more knowledge, not only agricultural sector, but also another important issue such as marketing and business strategy.

## TECHNOLOGY

For Thailand, lack of technology in agricultural SMEs causes high cost of production, low standard of quality, not efficiency for using resource, and cannot create value added. These problems would be solved by applying technology, R&D or innovation into agricultural sector. But there are many obstacles for Thailand to apply technology with agricultural SMEs such as high cost to reach technology, more import technology from abroad, lacking of knowledge and skill in using technology, fear to change agricultural system, and limited of resource. Thai

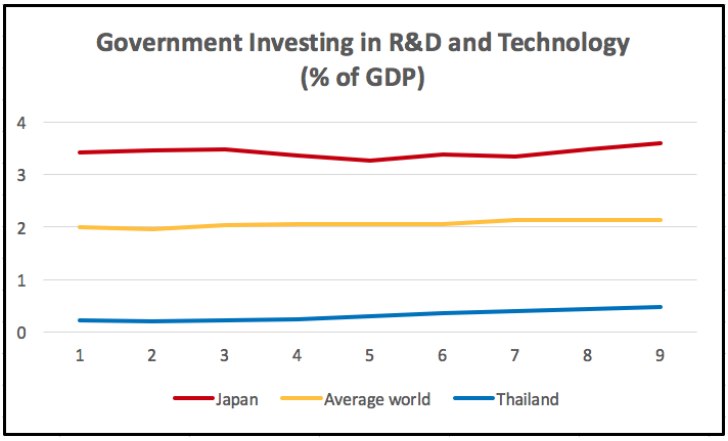
government also invests in R&D, technology and innovation in a very low proportion shown in Table 7-8.

**Table7: Thailand's Budget in Brief Fiscal Year 2016**

| Institute | Amount (million THB) | Proportion |
|---|---|---|
| Total Government Spending in 2016 | 2,720,000 | 100% |
| General Administration | 563,882 | 21% |
| Good governance | 361,878 | 13% |
| Ministry of Agriculture and Cooperatives | 86,404 | 3% |
| Development of R&D, technology and innovation | 26,856 | 1% |

**Source: Bureau of the Budget of Thailand**

**Table8: Government Investing in R&D and Technology compare with Japan and the world**




**Source: The World Bank**

Depart from Thailand, there are many foreign cases that apply technology into their agricultural production. For the interesting example of Japan agricultural SMEs, there is a SME that farms cabbage indoor by using LED bulb instead of natural sunlight. The main strategy of this firm is to apply technology, R&D, and innovation and then they end up with inventing LED bulb to grow indoor cabbage. The product grows 25 percent faster than normal case and reaches standard of cabbage from 50 percent to 90 percent. The firm also uses technology to control temperature, moistness, and water.

In China, government supports 450 billion USD for agricultural reformation. Aim of the project is to create more innovation, promote more in technology, support more SMEs and Startup for agricultural sector, and more training course of technology for farmer.

Germany, France, USA, Australia, Israel, and Japan are countries that in process of develop and study in the issue of using robot to farm instead of farmer in the future. These robots would plant, harvest, observe the farm, collect information, etc.

Government and private sector in USA established Science, Technology, Engineering and Mathematics for Food and Agricultural Council to support more agricultural education. IT industries such as Google, IBM, Oracle, Amazon, Instagram, Twister, and Paypal are alert and invest in agriculture and food industry.

Moreover, Vietnam recently corporates with Japan to use technology for agricultural sector such as using camera to observe a growing of plant and collecting data for analysis or automatic using of water and fertilizer. These make Vietnam precede Thailand for exporting of agricultural product because of their better quality of product, lower cost of production and lower price when compared with Thailand.

So, as we can observe that other countries around the world start studying or using technology and innovation to agricultural sector, Thailand has to push forward to adapt ourselves to apply the trend of technology in order to gain competitiveness in the future. The policy that government has launch is "Thailand 4.0" which has to support a long term plan of supporting farmer to reach more information, increase performance of agricultural production, study and develop innovation and technology and create value added for product.

To manage with this problem, we may attract specialist in agricultural technology from abroad to settle and develop agricultural technology at initial to make a stronger structure for applying technology in agricultural SMEs. We also should set a scope of investment in specific and important issue of technology for agricultural to make more efficiency in technology using for agricultural entrepreneur.

## VI. Conclusion

Agricultural SMEs in Thailand have an important role for Thai economy. It is not only generating GDP and employment, but also some opportunity for the future for Thailand. However, there are many factors that can cause Thai agricultural SMEs to unable reaching higher efficiency. By focusing on the study of this paper, the main problems and obstacles are ability to access financial credit, performance of entrepreneur, and applying technology in agricultural sector. Even though there are policies that aims to solve these problems, result is not effective enough. So, to reach higher efficiency for agricultural SMEs, we can learn from a successful case from Japan and we also give some recommendations from this paper.

**References**


→ Bulumac, E. and Bendis, R. A. (2001). *Utilizing Technology Transfer to Develop Small and Medium Enterprises*, Vol. 27, Science and Technology Policy, IOS Press.

→ Quader, M. S. (2008). "Human resource management issues as growth barriers in professional service firm SMEs", *Journal of Services Research*, Vol. 7, No. 2, pp. 3-15.

→ APEC Small and Medium Enterprises Working Group (APEC SME) (2002). "Profile of SMEs and SME Issues 1990-2000", APEC secretariat, available at: www.pecc.org/community/papers/sme/apec_sme_profile.pdf (accessed 21 July 2006).

→ Hillary, R. (ed), 2000. *Small and Medium-Sized Enterprises and the Environment: Business Imperatives*. Greenleaf Publishing Limited, Sheffield, UK.

→ Scott, A., 2000. Small-scale Enterprises and the Environment in Developing Countries. In Harvie, C. and B. Lee (eds.), *Globalisation and SMEs in East Asia and the Role of SMEs in National Economies in East Asia: Studies of Small and Medium-Sized Enterprises in East Asia*, Edward Elgar, Cheltenham, UK.

→ Pholphirul, Piriya and Veera Biatasevi (2009) "Why the Thai SMEs do not Want to Register for Their IPRs: Cost-Benefit Comparison and Public Policies", *Interdisciplinary Journal of Contemporary Research in Business*, Vol.1, No. 8, pp. 22-48.

→ Sarah, G. and Gary, E., (2002). *The Importance of Agricultural Growth to SME Development and Rural Employment in Egypt*, Executive Summary, No. 5, pp. 7.

→ Poapongsakorn, N. (2006). *The Decline and Recovery of Thai Agriculture: Causes, Responses, Prospects and Challenges, Rapid Growth of selected Asian economies: lessons and implications for agriculture and food security*. FAO Regional Office for Asia and the Pacific, Bangkok.

→ Johnston, B. F. & Mellor, J. W. (1961). The Role of Agriculture in Economic Development. *The American Economic Review*, 51 (4) 566-593.

→ Suphannachart, W. & Warr, P. (2009). *Research and Productivity in Thai Agriculture*. EconPapers 2009-11: Departmental Working Papers from Australian National University, Economics, RSPAS.

→ Porter, M. (1980). Competitive Strategy: Techniques for Analyzing Industries and Competitors. New York, USA: The Free Press.

→ Harrison, R. W., and P.L. Kennedy. (1997). A Neoclasical Economic and Strategic Management Approach to Evaluating Global Agribusiness Competitiveness. *Competitiveness Review* 7(1), pp. 14-25.

→ Kennedy, P. L., Harrison, R.W., and M.A. Piedra. 1998. Analyzing Agribusiness Competitiveness: The Case of the United States Sugar Industry. *International food and Agribusiness Management Review* 1 (2), pp. 245- 257.

→ Buranajarukorn, P. Arndt, G. and Godbole, A. (2003). Human Aspects of TQM for Manufacturing SMEs in Developing Countries: A Case Study on Thailand. *Proceedings of International Conference Manufacturing Excellence*. Melbourne, Australia.

→ Nuttawat, S. and Nathasit, G., (2014). *Challenges and Limitations of Driving Innovation for Small and Medium Enterprises in Thailand,* Journal of Research and Development, vol. 1., pp. 1.

→ Sakulsurarat, S. (2002). National Strategies for Developing SMEs in 2002-2007. *Research Report*. 2001- 2002.

→ Hall, C.M & Jenkins, J. (1995). *Tourism and Public Policy*. U.K., London: Routledge.

→ Intarakamnerd, P, Chairatana, P-a and Tangchitpiboon, T (2002), 'National Innovation System in Less Successful Developing Countries: The Case of Thailand', Research Policy, vol. 31, pp. 1445-1457.

→ Loewe, P., Dominiquini, J. (2006), Overcoming the barriers to effective innovation. Strategy & Leadership, Vol. 34, No. 1, pp. 24-31.

→ Peterson, R. A., Kozmetsky, G., & Ridgway, N. M. (1983). "Perceived causes of small business failures: A research note'. *American Journal of Small Business*, 8(1), pp. 15-19.

→ Martin, R., Nipon, P. and Sumana, T. (1998), *Problems and Outlook of Agriculture in Thailand,*Vol. 13 No. 2, pp. 3-14.

→ Policy steering committee (2014). *Policy guide of Smart Farmer and Smart Officer*, available at: www.opsmoac.go.th/ewt_dl_link.php?nid=7762

→ Office of Small and Medium Enterprises Promotion (2016). *Report on the situation of small and medium enterprises, a*nnual report, Thailand.

→ Office of Agricultural Economics (2016). *Agricultural Statistics of Thailand 2015*, guidebook, Thailand.

→ Office of Small and Medium Enterprises Promotion (2010). *Survey of Debt and Access to Funding Resources of Small and Medium Enterprises,* Thailand.

→ Bureau of the budget (2016). *Thailand's Budget in Brief Fiscal Year 2016*, annual report, Thailand.

→ Board of Investment (2016). *Foreign Investment Cooperation Division,* research paper, Thailand.

→ Bank of Thailand (2017). *Key Economic Indicator,* statistic report, Thailand.

→ Office of Small and Medium Enterprises Promotion (2001). *Small and Medium Enterprises Business Situation Report*, Thailand**.**

→ Office of Small and Medium Enterprises Promotion (2002). *Small and Medium Enterprises Business Situation Report*, Thailand**.**

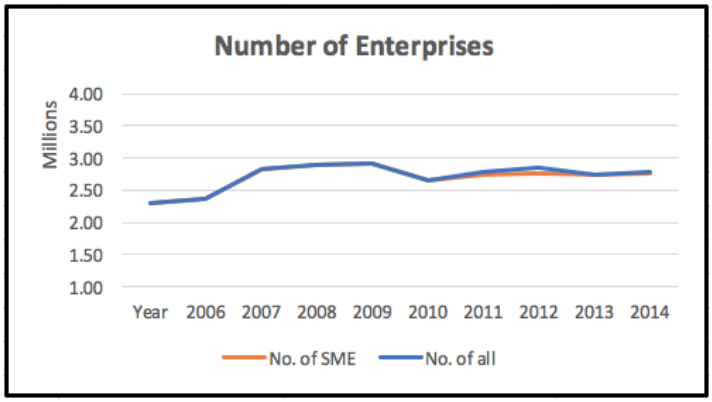
→ Knoema (2017). Thailand | Data and Statistics. Retrieved from https://knoema.com/atlas/Thailand

→ Puapongsakorn, N., Hengtragool, J., Anuchitvoravong, C., Intaravitak, C., Arayapong, A., Chunsiri, U., Nuntha, M. (2015). *Farmer Debt and Guidelines for Improving Operational Potential of the Fund under the Supervision of the Ministry of Agriculture and Cooperatives*, Thailand.

→ Office of Small and Medium Enterprises Promotion (2011). *Small and Medium Enterprise Promotion Plan*, Thailand.

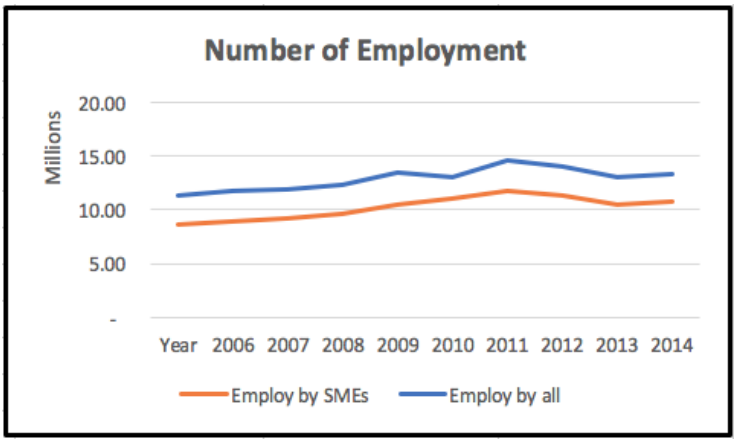
## Appendix

**Table9: For the number of SMEs**



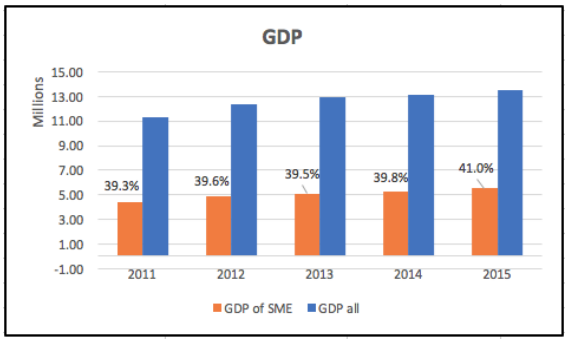

**Source: The Office of SMEs Promotion**

**Table10: Number of employment of SMEs count for two-third of all employment.**




**Source: The Office of SMEs Promotion**

**Table11: GDP generated by SMEs is about 40 percent of GDP of country.**

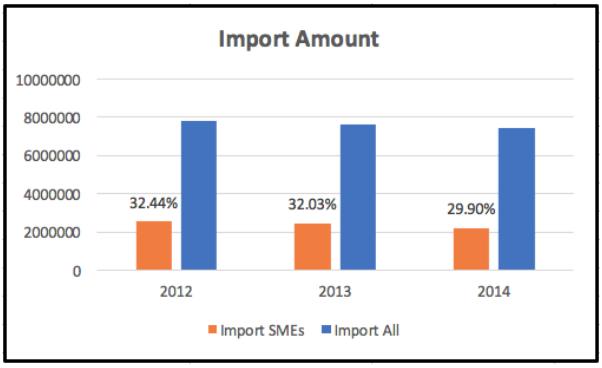



**Source: The Office of SMEs Promotion**

**Table12: Amount of export by SMEs is about 27 percent of all export value.**


**Source: The Office of SMEs Promotion**

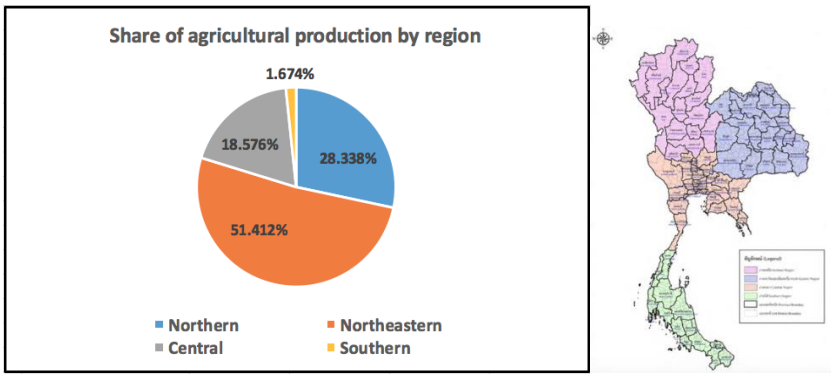
**Table13: Amount of import by SMEs is about 30 percent of all import value.**




**Source: The Office of SMEs Promotion**

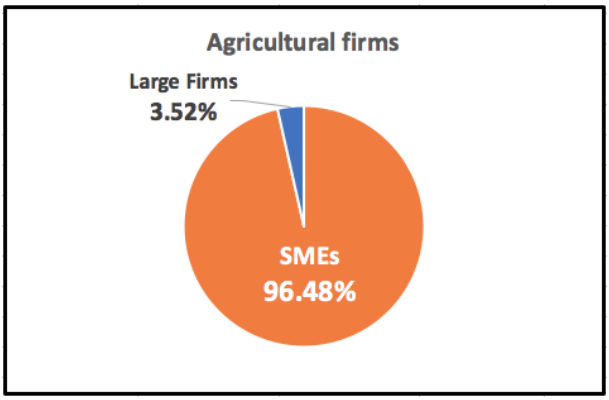
## Agricultural sector

**Table14: The highest agricultural production by region**



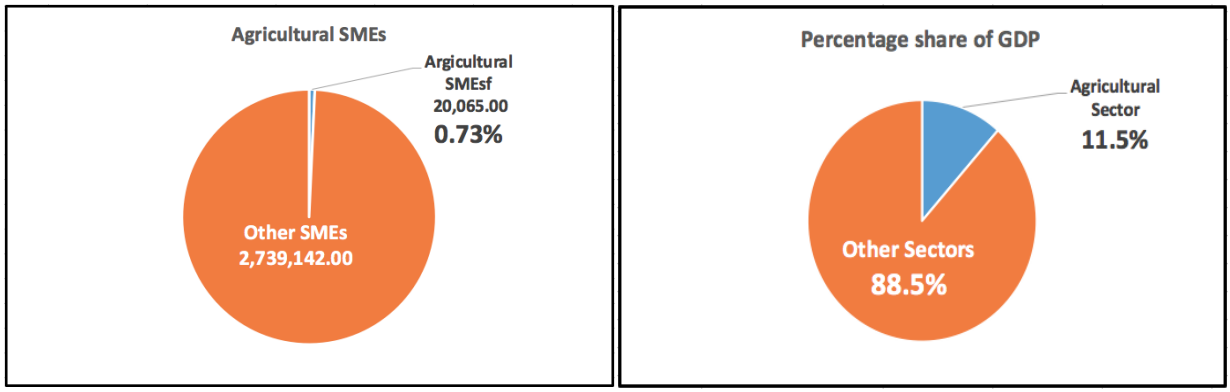

**Source: Office of Agricultural Economics**

**Table15: Agricultural SMEs is 96.48% of all agricultural firms in country.**




**Source: The Office of SMEs Promotion**

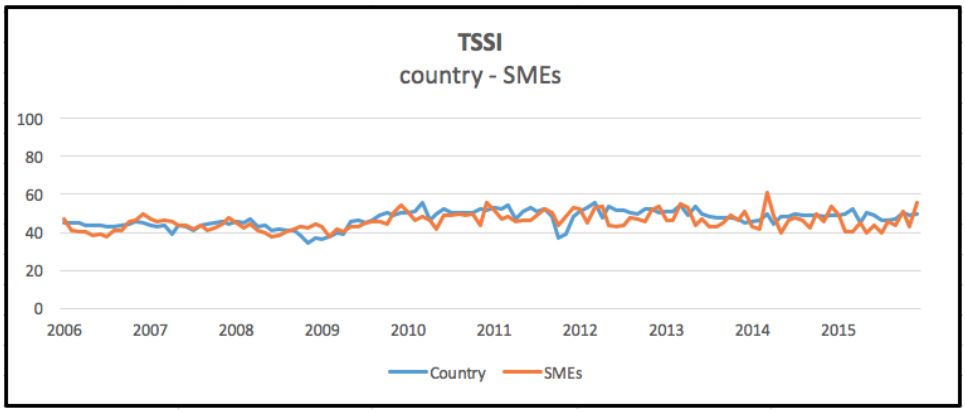
**Table16: Number of Agricultural SMEs and their Percentage share of GDP**




**Source: The Office of SMEs Promotion**

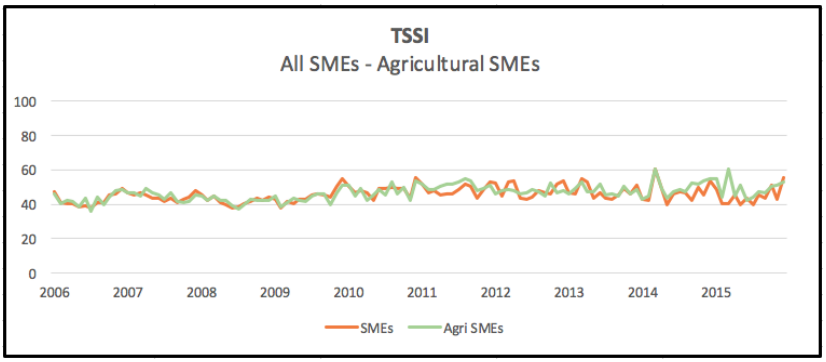
**Trade and Service Sentiment Index (TSSI)** is the index that measure a confidence of the enterprise for analyze the trend in the future. If TSSI > 50, it means that enterprise is better confidence, TSSI < 50 is lower confidence, and TSSI = 50 is stable.

**Table17: Compare between all enterprise and SMEs**



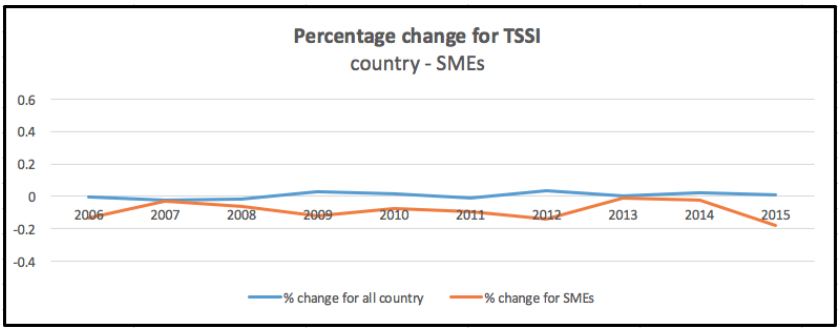

**Source: The Office of SMEs Promotion**

**Table18: Compare between all SMEs and Agricultural SMEs**



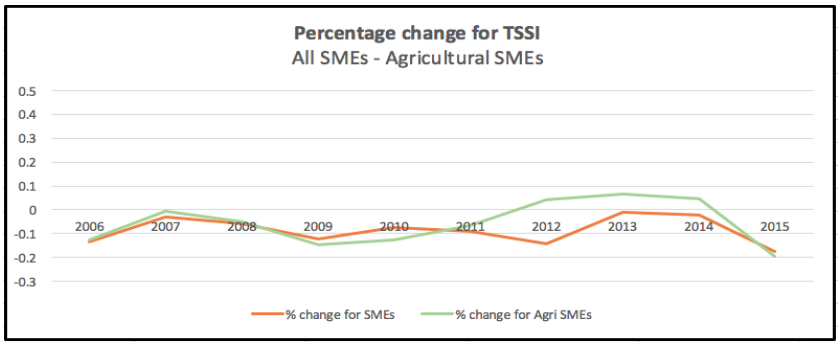

**Source: The Office of SMEs Promotion**

**Table19: Percentage change of TSSI, compare between all enterprise and SMEs**




**Source: The Office of SMEs Promotion**

**Table20: Percentage change of TSSI, compare between all SMEs and Agricultural SMEs**




**Source: The Office of SMEs Promotion**