



Modernization of Agrofood Sector for Food Security in Malaysia

Rozhan Abu Dardak
Malaysian Agricultural Research and Development Institute (MARDI)
Persiaran MARDI-UPM, 43400 serdang, Selangor, Malaysia.
Email: rozhanabudrdak@gmail.com

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ABSTRACT

Food security is one of the main concerns of the Malaysian Government since the effect of the world financial crisis in 2008. Despite increased local production, the supply of agrofood products is still unable to meet the local demand. As a result, the dependency toward imported agrofood products is increasing every year. Malaysia has introduced four agricultural policies that contain many sets of strategies and action plans. The objectives of these policies are to sustain food security in Malaysia. The current National Agrofood Policy will complete at the end of 2020, but yet, many of the targets are not achieved. At the end of 2018, the Ministry of Agriculture and Agro-based Industry (MOA) launched a new set of agricultural directions that could enhance the agrofood sector before the end of 2020. One of the new directions is to modernize the agrofood sector through the application of innovation and technologies. Three new initiatives were introduced that include spreading the application of technologies through mechanization and automation; introduction of a modern agrofood model; and the development of a National Agrofood Data-based (AgF). With these new initiatives, the MOA also sets new Key Performance Index (KPIs) that could ensure the targets of the National Agrofood Policy will be achieved.

Keywords: Modernization, agrofood sector, food security, economic development, Agrofood policy

INTRODUCTION

Agrofood remains an important sector for food security and sustainable economic development in Malaysia. Food security becomes the national agenda since the world financial crisis in 2008. Some challenges in the domestic, as well as in the global arena have influenced the government to focus on this issue. Furthermore, Malaysia is the net importer of food products, and the value of import has increased continually from around RM45.3 billion (US\$11.24 billion) in 2015 to more than RM51.3 billion (US\$12.73 billion) in 2017. As a result, the deficit of the balance of trade (BOT) has increased from -RM18.0 billion (US\$4.46 billion) in 2015, to RM19.5 billion (US\$4.84 billion) in 2017.

The Ministry of Agriculture and Agro-based Industry (MOA) is committed to develop this sector to be a dynamic and progressive sector, as stated in the National Agrofood Policy (NAP 2011-2020). The NAP has outlined seven strategic directions as guidelines for all departments and agencies to take actions and implement programs and projects that could enhance this sector. New strategies and action plans were set to ensure that the agrofood sector will remain competitive and support the economic development in Malaysia. The MOA will reform the sector through the application of new technologies, mechanization and automation that could improve the efficiency and productivity of this sector. This paper highlights initiatives and strategies created by the MOA in modernizing the agrofood sector as the efforts to sustain food security in

Malaysia.

MODERNIZATION OF AGROFOOD SECTOR

Modernization of the agrofood sector is the process of transforming this sector into a dynamic, technologically advanced, and competitive, yet centered on human-resource development, guided by the sound principles of social justice (Kanady, 2010). It is a process of evolution in producing agrofood products. For example, in the early years, the process of getting food is through hunting and collecting fruits from the jungle. However, with the increase of population, the supply of food through hunting and collecting from the jungle is not sufficient and sustainable, as the demand is increasing, while the supply is limited. A further increase in population density, encourages a transition in agricultural methods, from shifting cultivation to annual cropping. The scarcity of arable land is also another factor that requires modernizing the agrofood sector. The application of technologies and new methods of farming could overcome the issues of land shortage and the effect of climate change.

In the context of Malaysia, the government recognized the importance of innovation and technologies as a strategy to modernize the agrofood sector. The government started to invest in the development of innovation and technologies after Malaysia got its independence from the British in 1957. In general, innovation and technologies are the products of Research and Development (R&D). In the early years after independence, the R&D was carried out by the Department of Agriculture (DOA). The British government left some laboratories and research stations that were managed by the officers from the DOA. At that time, R&D only functioned to overcome pests and diseases that attacked the crops. Over time, the advanced research generates the new variety of crops that could produce more yields, new agricultural production system that could increase farm productivity, and post harvest technologies that could improve the quality of the products. The government also provides input subsidies that include seeds, fertilizers and chemicals for every farmer who cultivate agrofood crops. The subsidies were given through the Farmers Association, and the value is determined by type of crops. For example, a farmer will receive around RM2,800 (US\$667) for every acre of land cultivated with paddy. The government also provides grant as an incentive for vegetable, fruit growers and livestock growers. For example, the government provides more than RM580 million (US\$138.1 million) for more than 300,000 farmers and breeders in 2008-2010. This incentive will encourage farmers and breeders to produce more vegetables, fruit and meats for local consumption.

Innovation and technologies are important for the transformation of the agrofood sector toward a modern, dynamic and progressive industry, and for socioeconomic development. Innovation and technologies will address the challenges faced by this sector, such as limited arable land, low farm productivity and efficiency, and higher cost of production.

The Malaysian government recognized the importance of innovation and technology as the engine of economic development. Investments in R&D in Malaysia is relatively high and increasing every year. For example, the government has invested more than RM1 billion (US\$0.25 billion) for R&D in 2018, as compared to RM666.8 million (US\$165.46 million) in 2010. At the same time, the number of researchers involved in agrofood R&D has also increased to more than 1,600 personnel, from 1,209 (2000).

In general, all research related to agrofood is carried out by public research institutions and public universities. Currently, around 40 agencies are involved in agricultural research. Among these research institutions, the Malaysian Agricultural Research and Development Institute or MARDI is one of the leading agricultural R&D institutions in Malaysia. MARDI falls under the Ministry of Agriculture and Agrobased Industry (MOA) and is governed by its board of directors. It is the largest government research institution in terms of development and operational budget received from the government, and the number of R&D personnel employed. MARDI accounted for about one-third of the country's agricultural research staff and a quarter of its agricultural R&D spending in 2018. During the Eleventh Malaysian Development Plan (2016-2020) MARDI received more than RM1.4 billion (US\$0.35 billion) fund for R&D and operational expenditure. Research conducted by MARDI is focused on scientific, technical, economic and sociological issues related to production, processing and use of crops and livestock. The research covers all commodities

(excluding cocoa, rubber and oil palm), such as rice, fruits, vegetables, horticultural crops and livestock. Cocoa, rubber and oil palm are industrial crops, and thus fall under a different category. With this fund, MARDI has carried out more than 120 research projects that could generate more than 500 new technologies, innovation and new knowledge. These innovations, technologies and new knowledge are transferred to farmers, breeders and entrepreneurs.

The technologies transferred include the new variety of crops, new agriculture machinery and new processed agrofood products. For example, MARDI released a new variety of paddy in 2019 that could increase the yield to around 12 MT per hectare and has a better quality in terms of physical and nutritional value. The new variety of rice will improve the farm productivity, and increase the total production of rice in Malaysia.

In the same year, MARDI has also commercialized a new pesticide that could control the papaya dieback disease. The disease has destroyed the papaya industry since 2003, and the application of this technology will revitalize the papaya industry in Malaysia. The government hopes that the technologies generated by MARDI will transform the agricultural sector into a progressive and dynamic sector in the near future.

PERFORMANCE OF THE AGROFOOD SECTOR

In terms of contribution to economic development, the performance of the agrofood sector in Malaysia is increasing every year. In 2018, the agriculture sector in general, contributed around RM99.5 billion (US\$24.69 billion) or 8.2% of the Gross Domestic Products (GDP). Out of this amount, the agrofood sector contributed RM37.2 billion (US\$9.23 billion) or 3.2% of the GDP. The contribution of the agrofood sector to the GDP of Malaysia is in the range of 3.3% every year. However, the growth of the absolute value of the agrofood sector has contracted between 2015-2017. For example, the annual growth rate of the GDP in 2017 has reduced to 1.8% as compared to the value in 2015 and 2016, which is 2.4% and 3.6%, respectively. The performance of GDP for 2015 to 2017 is presented in Table 1.

Table 1. Performance of GDP (2015-2017)

GDP (RM Billion)	2015	2016	2017	
Agriculture	94.4	89.5	96.0	
Agrofood	35.3	36.6	37.2	
GDP (% Contribution)				
Agriculture	8.9	8.1	8.2	
Agrofood	3.3	3.3	3.2	
GDP (% Annual Average Growth Rate)				CAGR (2016-2017)
Agriculture	1.5	-5.2	7.2	0.83
Agrofood	2.4	3.6	1.8	2.71

Source: Department of Statistic Malaysia

The reduction in production is highly contributed by paddy, vegetables, fruits and fishery industries. On the other hand, the livestock industry showed an increased around 1.7%, in which the production of eggs has contributed the highest growth (4.2%), followed by broilers (1.0%) and dairy products (1.4%) (Table 2).

Table 2. Production of agrofood commodities, 2015-2017 ('000 tons)

Commodities	2015	2016	2017	Annual average Growth rate 2016-2017 (%)
Crops	6,892	6,623	6,115	-5.8
Paddy	2,741	2,740	2,571	-3.2
Fruits	1,769	1,665	1,493	-8.1
Vegetables	1,373	1,196	1,004	-14.5
Cash crops	227	219	218	-2.0
Herbs and spices	70	65	72	1.4
Industrial crops	712	738	658	3.2
Livestock	2,702	2,846	2,799	1.7
Cattle and buffalo	50	48	46	-4.1
Mutton	4	5	4	0
Broiler/ducks	1,633	1,755	1,665	1.0
Swine	223	195	218	-1.1
Eggs	796	842	865	4.2
Milk (million liter)	36	37	37	1.4
Fisheries	1,998	1,988	1,897	-2.6
Marine captured	1,486	1,574	1,465	-0.7
Aquaculture	506	407	427	-8.1

Source: Ministry of Agriculture and Agrobased Industry, 2018

Self Sufficiency Level (SSL)

SSL is one of the measures for food security. It is defined as the ability of a nation to produce a certain percentage of food commodities and imports other portions from other countries. In the context of Malaysia, the MOA has set a certain SSL based on the ability of the industry players to produce. In 2017, Malaysia has achieved in producing more than 100% of some commodities, such as broilers and ducks (103.7%), eggs (114.7%), while some other industries still stagnant below 80% of the domestic demand (Table 3).

In the case of rice, the production has decreased to 2.571 million tons in 2017, from 2.741 million tons in 2015. The decrease in production and increase in demand has led to the decreased in the SSL from 70.3% to 70.0% in the same period. As a result, the dependency toward imported rice is higher, unless the growth of the local production increases significantly.

Table 3. The achievement of the SSL for selected commodities

No	Commodity	Achievement (%)		
		2015	2016	2017
1	Rice	64.8	70.3	70.0
2	Fruits	80.6	79.1	77.5
3.	Vegetables	52.4	51.5	46.6
4.	Fish	93.1	95.2	92.8
5.	Beef	23.1	23.0	22.2
6	Mutton	11.5	13.0	10.2
7.	Fresh milk	64.4	64.9	58.3

Source: Ministry of agriculture and Agrofood Industry, 2018

In general, Malaysia is still struggling in providing food for its people. Many food commodities were recorded a drop in production, while some commodities show a marginal increase. The lower in total production has affected the SSL for many commodities. On the other hand, despite increased in real production, the demand by local consumers is higher than the supply. The increase in population also contributed to the higher demand for some commodities. For example, the increase in consumption of beef, and mutton is higher than the increase in supply of fresh meat. In 2017, Malaysia produced 49,598 tons of beef against 200,000 tons of local consumption. At the same time, Malaysia only produced 4,609.4 tons of mutton against 40,388 tons of the local requirements. As a result, Malaysia needs to import more than 65% of beef and 88.5% of mutton as to meet the local consumers demand.

The demand for beef and mutton is also influenced by the change of diet, especially the youngsters who like to eat fast food like burgers, steaks and meat-based products. The consumption per capita of beef has increased to 6.5 kg in 2017, from 5.3 kg in 2007. Despite more expensive as compared to chicken and fish, people are still buying beef and mutton.

Malaysia relies on products from other countries, and this will deteriorate the nation's sovereignty like during the financial crisis in 2008. The global financial crisis during that time has affected the supply of food commodities, especially rice, when many exporting countries refused to sell their rice to Malaysia. In this regard, the Malaysian government has to send a special delegate to Viet Nam and Thailand to get their support. Both countries finally agreed to sell rice to Malaysia.

The dependence towards imported agrofood is increasing every year. For example, in 2017, import of agrofood products grew 6.4% to RM51.3 billion (US\$12.73 billion), as compared to RM45.3 billion (US\$11.24 billion) in the previous year. In the same year, the export of agrofood products has grown 7.8% per year, and has contributed more than RM31.8 billion (US\$7.89 billion), as compared to RM27.3 billion (US\$6.77 billion) in 2015. Malaysia practices an open economy. Malaysia imported raw materials, processed or manufactured them in the country and export back to the world markets. For example, Malaysia imported cocoa bean and cocoa-based product value around RM4.37 million in 2018. These raw materials were processed and re-export to the world markets at value more than RM5.55 billion (US\$1.32 billion). Despite higher growth of export, the absolute value of imported agrofood products is more superior. As a result, the deficit in the balance of trade has increased to RM19.5 billion (USD4.84 billion), as compared to RM18.0 billion (US\$4.46 billion) in 2015 (Table 4).

Table 4. Performance of agrofood trade, 2015-2017

Agrofood trade	2015	2016	2017	CAGR 2016-2017
Import of agrofood products				
Billion (RM)	45.3	46.7	51.3	
Import growth (%)	6.4	3.1	9.7	6.4
Contribution to the total national import (%)	6.6	6.7	6.1	
Export of agrofood products				
Billion (RM)	27.3	30.2	31.8	
Export growth (%)	6.8	10.4	5.3	7.8
Contribution to the national export (%)	3.5	3.8	3.4	

Source: Department of Statistic, Malaysia

ISSUES AND CHALLENGES

Malaysia has been a net importer of food products since the 1980s. The balance of trade for food products is increasing continuously due to higher demand, and lack of supply by local producers. Despite its rich in biodiversity and natural resources, Malaysia is unable to produce agrofood commodities sufficiently. The agrofood sector is often characterized by substantial volatility in productivity, with fluctuations in climatic situation, such as droughts and floods that occur in the same year. The weather condition also affected the productivity and the quality of the products.

There are several issues and challenges faced by the agrofood sector, such as 1) Increase in population, 2) Competition in land usage, 3) Manpower and productivity, 4) Application of technology, 5) Investments and financial issue.

Increase in population

The population of Malaysia is estimated around 32.4 million people in 2018, increased around 1.1% as compared to 2017. Malaysia is classified as a young nation and very productive. Around 68.35% of the population is in the age group of 15-64 years old or known as working group. While the young age (age between 0 and 14 years old) is 26.81% and the composition of senior citizens of more than 65 years old is only 4.84%. In general, the working group people consume more food, practice modern lifestyle and prefer to eat at outside of their home. It is very common to see youngsters in Malaysia dine at the restaurant until midnight while watching football match on the big-screen television.

Malaysia is an upper-middle income developing country. The people of Malaysia in general, have a higher standard of living, and thus, have a higher purchasing power. A report by the World Bank revealed that Malaysia's net income per capita in 2017 was US\$7,864, compared to Singapore (US\$47,166), the Philippine (US\$3,289), Thailand (US\$4,968) and Indonesia (US\$2,934). According to the Report of Household Income and Basic Amenities Survey 2016, the income distribution among Malaysian households has improved, as indicated by the decline of the Gini coefficient index from 0.401 in 2014 to 0.399 in 2016. The demographic of population will determine the consumption pattern and the demand for food. Studies show that the determinants of consumption of food to be generally attributed to household income, urbanization, age of people, household size and race. In fact, the growth of economy in Malaysia is contributed by the robust consumer spending on food products. Increased in the magnitude of spending has resulted in higher demand of agrofood products such as meat based products and temperate fruits and vegetables.

The increase in population has increased the demand of agrofood products. At the same time, the production growth of agrofood increased in the amount less than the consumption.

Competition in land usage

In Malaysia, the production of agrofood is still carried out in semi-modern method. Farmers prefer to cultivate their crops in open area or on the field. Many jobs are carried out by labor, while some activities are performed by machines. The competition with other sectors such as industrial crops, manufacturing and housing development has reduced the arable land for cultivation of agrofood crops. The small area of production has resulted with uneconomic of scale. The average size of land area for agriculture is 2.5 acres, and they are owned by small-scale farmers. This small land area is less productive and difficult to manage if it is operated in conventional method. As a result, many agricultural lands become idle, or converted into housing estate or industrial areas that give better return to the owner. It is estimated, that around 2-3% of the agricultural land is converted to other purposes every year. At the same time, new areas are opened for agrofood sector, but in a smaller percentage. The total land area for the agrofood sector is projected to decrease to 825,200 hectare in 2020 from 869,600 hectare in 2010. As a comparison, the land area for industrial crops is projected to increase to 6.91 million hectare in 2020, from 5.90 million hectare in 2010.

Manpower and labor productivity

Currently, the average age of farmers in Malaysia is around 55 years old, and they are considered traditional farmers who are reluctant to adopt new technologies. At the same time, people have the perception that agrofood sector is a 3D job. The 3D job is defined as Dirty, Dangerous and Difficult jobs that are not attractive, especially to youths. The statistics by the Department of Statistics revealed that only around 14% of employment in the agrofood sector is carried out by youths, in 2017. Many university graduates are reluctant to work in this sector because the ecosystem is not attractive enough to pull them toward this industry.

In 2016, the agriculture sector recorded a labor productivity growth of 3.4% to RM55,485 (US\$13,767) from RM53,676 (US\$ 13,319) in 2015. Its growth was mainly driven by industrial commodities such as palm oil and rubber. The application of technologies and effective use of inputs helped the sector to record productivity improvement. However, Malaysia's agricultural productivity level is generally still lagging far behind other high-performing countries such as USA and Australia. In 2015, the agriculture productivity in Malaysia is only 49.3% that of USA and 48% that of Australia. Thus, Malaysia needs to benchmark these two countries should it wanted to be at the same level as the developed countries.

Application of technologies

The application of technologies is very important as it could increase productivity, reduce operational cost and the number of labor. Currently, the application of technologies by farmers, breeders and fishermen is still moderate. One of the factors that hinder the application of technologies is the cost of purchasing the technologies. Most of farmers, breeders and fishermen are small-scale entrepreneurs and cannot afford to purchase the technologies, such as machines, automation devices or new agricultural production system. At the same time, the old generation of farmers, breeders and fishermen still prefer to use conventional methods or techniques. On the other hand, the transfer of technologies from government research institutions or universities is also very low. For example, a report by the Ministry of Science, Technology and Innovation revealed that the rate of technology transfer in Malaysia is between 10% and 12%. In other words, out of 100 technologies generated by public research institutions, only between 10 and 12 technologies are fully transferred and adopted by farmers, breeders and entrepreneurs.

Investments and financial issues

The agrofood sector is considered as high risk but low in returns on investments. The investments in the

agrofood sector also take time to get back the returns. Thus, not many people like to invest in this sector in Malaysia. People prefer to invest in the industrial crops such as palm oil that promise higher and sustainable return. This sector is dominated by small and medium enterprises and always needs supports from the government. They are lack of capital should they wanted to expand their business. At the same time, no commercial banks are willing to provide soft loan or financial assistant. Most of the banks require guarantor or capital as collateral. Thus, every year the government provides billion of subsidies and grants that could help the small and medium enterprises (SMEs) to sustain in this industry.

Way forward

The duration of the National Agriculture Policy (NAP) will complete at the end of 2020. Toward the end of the period, the performance of the agrofood sector is still far below the target; and it becomes the main concern of the government. Despite higher production of the agrofood commodities, they still could not meet the local demand. In other words, the growth of the production is less than the growth of the demand. Thus, Malaysia needs to import almost all agrofood commodities.

In line with the current scenario, the government sets new strategies that could enhance the development of the agrofood sector in Malaysia. One of the strategies is to modernize the agrofood sector through the adoption and application of technology. The application of technology, mechanization and automation could help farmers, breeders, fishermen and entrepreneurs reduce the manpower or workers. The application of big data in the data-base, on the other hand, could help the department and agencies to set new policies and directions, as well as to help farmers, breeders and entrepreneurs identify the demand of their products. Thus, they can produce products in accordance with the demand. Under these new strategies, the government has set three initiatives as follows:

1. Spread the application of technologies (mechanization and automation)
2. Develop a modern agrofood model
3. Develop a National Agrofood data-base (AgF)

Spread the application of technologies (mechanization and automation)

The initiative aims to increase the ownership of agricultural machinery and agricultural devices by farmers, breeders and entrepreneurs. Under this initiative, the Agrobank will provide financial assistance called the Mechanization and Automation Financial Scheme. The financing facility provides fund to purchase agricultural and manufacturing machineries, equipment or utility vehicles that are used directly or indirectly for the production, processing and marketing of agricultural or agrobased products. The Agrobank offers soft loan with a lower interest rate (3.75% per year), and the loan is guaranteed by the MOA. Under the financial scheme, farmers, breeders and entrepreneurs could increase their productivity and enhance the quality of their products.

At the same time, the government will carry out studies on the awareness of farmers toward new technologies, the application of technologies at the farm and factories and the impact of technologies on the productivity, efficiency and competitiveness of the products. The application of big data and the Internet of Things (IoT) will help the industry in understanding the supply and demand of the agrofood commodities in the markets; and thus enable the industry to address the supply and demand more accurately. The government provides information on agriculture activities through mobile application (Mobile App) that can be downloaded freely from their hand phone. The information includes supply of commodities at district and state levels, price of commodities and initiatives by departments and agencies. For example, farmers, breeders, fishermen and entrepreneurs could access the price of commodities from the data-base provided by the Federal Agricultural Marketing Authority through Internet application in their mobile phone. The government hopes that the adoption and application of agrofood technologies will transform the agrofood sector into a modern, dynamic and progressive sector.

The last few years had seen a shift towards more intensive farming, which also had a greater impact on the productivity of the sector. This trend was reflected in the structural shift to entrepreneurs using more

intensive production systems and the adoption of more intensive production techniques such as the increase in the use of feeds, chemicals and new technologies.

Develop a modern agriculture model

A modern agriculture model will be developed as a reference for farmers. This model has many characteristics such as good agricultural practices, the application of technologies and the management of data that can provide information on supply and demand of agricultural products at real time. This model will encourage youngsters to participate in the agrofood sector. One of the modern agriculture models, which was developed by the Malaysian Agricultural Research and Development Institute (MARDI) is the commercial-scale plant factory with the following characteristics:

1. Use energy-saving infrastructure that complies with the Malaysian Good Agricultural Practices (MyGAP) and Good Manufacturing Practices (GMP);
2. The parameter of the plant factory is 30x80 feet that enables the entrepreneur to produce more than two tons of high-value vegetables in a month, which is equivalent to two acres of open farming;
3. The production system uses the vertical hydroponics planting system with the light emitting diod or LED, which is specifically formulated for high-value crops. The hydroponics planting system is also provided with automated irrigation system and under the environmental control; and
4. The plant factory also contains meeting room for monitoring purposes, grading and packaging areas.

Develop the National data-base for agrofood (AgF)

This initiative is a continuation and improvement of the existing project. Under this initiative, six primer scopes were underlined as follows:

1. Management of profile (stakeholder and industry);
2. Incentives and subsidies;
3. Market information;
4. Development of small and medium-scale industries (SMIs);
5. Human-resource development; and
6. Research, development and technology transfer (R&D&C)

The AgF project will be implemented in two phases. In the first phase, the secretariat will collect, monitor and verify all data related to agrofood industry. Under this phase, it aims to produce five outputs that include the development of Enterprise and Business Intelligence Portal, Information system profile, Subsidy and Initiative Management system, Dashboard Executive Application and Agricultural Services Application.

Phase two of this project will involve the development of Big Data and Data Analytic, Technology Management System and Smart Farmers Management System. This project will use all media social platforms, such as blog, Facebook, twitter and what-app application. This project is expected to speed up the sharing of information and help the managers and top management team in making critical and important decisions.

Through these initiatives, the MOA sets new Key Performance Indicators (KPIs) that must be achieved at the end of 2020. The initiatives will increase the contribution of the agrofood sector to the GDP amounted to RM39.7 billion (US\$9.85 billion) in 2019 and RM41.1 billion (US\$10.20 billion) in 2020. The new KPIs for agrofood sector are as follows:

Table 5. The production of commodities 2019, 2020 ('000 MT)

Commodity	2019	2020
Paddy	2,803	2,830

Meat	47	51
Broiler	1,768	1,830
Eggs	950	1,001
Marine fish	1,469	1,474
Aquaculture	425	430
Vegetables	1,085	1,113
Fruits	1,683	1,654

The new KPIs also sets a target to reduce post-harvest loses for paddy through the development of a new Standard Operating Procedure (SOP) of paddy and enforcement in operation of the harvester through the introduction of new act and terms.

CONCLUSION

Food security has been the main agenda of the Malaysian government since more than a decade ago. The government wants to ensure that the supply of agrofood products is available all the time, affordable by all people, and nutritious for health. In order to provide a secured food supply to its people, the government always makes new efforts and strategies to improve the sector. The modernization of the agrofood sector through the application of innovation and technology is timely and in-line with the initiatives introduced by developed countries in the world.

Innovation and technologies are important wheels for modernization of the agrofood sector in Malaysia. These elements could improve the performance of the agrofood sector in Malaysia. The application of innovation and technologies could have resulted in the increase of production, improve the socioeconomic of the farmers, breeders, fishermen and entrepreneurs, and enhance the economic development of Malaysia. At the same time, a modern agrofood sector will improve the competitiveness of the industry and to ensure the sector will be sustainable in the long run.

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