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KEMENTERIAN PERTANIAN
DAN INDUSTRI MAKANAN

zoom LIVE MafiMalaysia

WEBINAR SEKURITI MAKANAN NEGARA 2021

27 May 2021
Thursday

Published by:
Malaysian Agricultural Research and Development Institute (MARDI)
MARDI Headquarters, Serdang
Persiaran MARDI-UPM
43400 Selangor

First Published 2021

Printed by:
Malaysian Agricultural Research and Development Institute (MARDI)
Ministry of Agriculture and Food Industries, Malaysia

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27 MEI 2021 • KHAMIS

ZOOM

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INTRODUCTION

This webinar on National Food Security, organised by the Ministry of Agriculture and Food Industries (MAFI) and Malaysian Agricultural Research and Development Institute (MARDI) is indeed timely, considering that Covid-19 has led to severe and widespread increases in global food insecurity, with impacts expected to proceed into 2022. Other than affecting our day-to-day life, disrupting movements and trade, lockdowns imposed repeatedly has placed unprecedented pressure on food supply chains, undermining access to food and causing surging in food prices. According to World Bank (2021), the global food prices have risen by 38% since January 2020; wheat prices are 28% and maize prices are 80% higher than in January 2020.

This webinar will look at the impact of Covid-19 crisis on food security in Malaysia, deliberate on the mechanisms in place and examine viable solutions to support the nation and ensure they have access to safe and nutritious food. More than 1000 participants from all over Malaysia, both from the public and private sectors joined this very important event to both partake and broaden their knowledge on the issues, status and way forward of food security in our country.

To enrich the discourse of this webinar, four esteemed speakers deliberated on critical matters related to our national food security. These include the following:

- Food security challenges in the country
- Contribution of modern agriculture and related ecosystem in ascertaining food security
- Strategies, action plans and policies in Malaysia in securing food and nutritional security
- Role of logistic and food supply chains in food security

In addition to the above, eight more speakers from the various agricultural related industries shared their perspective and experiences in their respective business ventures, how Covid-19 has impacted their business and their way forward to remain resilient. To further enrich this event, two technologies and two books from Malaysian Agricultural Research and Development Institute (MARDI) were launched.

NATIONAL FOOD SECURITY: REALISING RAKYAT'S NEED

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Introduction

Covid-19 has brought about a crisis of a magnitude, rapidly affecting our day-to-day life and businesses, disrupting movements and trade to some extent. Countries are imposing lockdowns repeatedly and this has led to severe and widespread increases in global food insecurity, affecting vulnerable households in almost every country, with impacts expected to continue through 2021 and into 2022.

Most of the nation's food security matters are tackled via the National Agriculture Policies, as these policies place great emphasis on the availability of food in safeguarding the sustainability of our food system. The first National Agricultural Policy was initiated in 1984 and it focused on rural poverty and closing income gaps between commercial and traditional farmers. The second National Agricultural Policy focused on the productivity, competitiveness, Research and Development, human capital development, and private sector participation. The Third National Agricultural Policy was crafted to address the challenges post 1997-1998 Asian Financial Crisis, concentrating in the direction of enhancing food supply, productivity, intersectoral linkages, and sustainable development. The National Agrofood Policy 2011-2020 was designed to support the development of food commodities that contributes strongly towards food security, in addition to enhancing value-adding processes and higher value of agricultural export earnings.

However, the disruption in the food system in the early phase of Movement Control Order (MCO) revealed the existence of gaps within the food system. The pandemic laid bare the frailty of our food supply chains due to logistics disruptions, especially for farmers to get their produce to market. There were also challenges on imports due to protectionist policies from the regional trading countries, especially on rice. In addition, the agricultural workforce was found to be too dependent on foreign labour; as of 2019, foreign workers constitute 12.4% or 59,612 workers out of 480,557 total employments in the agrofood sector. In brief, the COVID-19 pandemic had tested

our food system resilience to cope with the economic shock. This in turn prompted the government to re-think on how to confront these challenges. In doing so, the Government established the Food Security Policy Cabinet Committee (FSCC). This committee is chaired by our Prime Minister with the aim of attaining a holistic and sustainable National Food Security Policy.

Consequently, four (4) clusters were established across ministries and agencies to monitor and recommend solutions to fulfill the need of Rakyat pertaining to Food Security. The Clusters role associates with the availability, accessibility, and utilisation of food, which is strongly connected to stability and sustainability of our food system. In line with the establishment of FSCC, a dedicated unit has been formed under MAFI and tasked to coordinate and monitor matters in relation to national food security.

Food Security Performance

Malaysia's Food Security performance still need improvements. Although, Malaysia have stepped up from 44th place in 2019 to 43rd place among 113 countries under the Global Food Security Index (GFSI) 2020 published by The Economist Intelligence Unit (EIU) Group, there is still room for improvement. As recommended by the EIU, there are some aspects that need to be addressed, such as volatility of agricultural production, food import dependency, dependence on natural capital, access to mobile data and financing as well as the resilience of natural resources.

Although most of the key food items are locally produced, Malaysia still rely on imported meat for domestic consumption. In addition, some food items are not economic to be produced locally, especially those that cannot flourish under our local tropical climate, while others are cheaper if imported rather than produced locally. Food consumption patterns including changes in diet and preferences also have a significant influence on the volume of food imports.

Food Security Challenges

From the recent lessons learnt from COVID-19 pandemic, and through the deliberations of the Food Security clusters, MAFI has canvassed Malaysia's food security challenges as the followings:

- population growth and increasing food demand;
- increasing cost of living and food price;

- undernourishment and double malnutrition; low productivity, labour intensive and aging farmer's population;
- lack of private investment and R&D;
- low adoption of technology and mechanisation; and
- climate changes and natural resources resilience.

One of the most pertinent aspects that has to be tackled is accessibility to safe and affordable food in the market. In this facet, the purchasing power is an important criterion as without it, the Rakyat would have difficulties accessing nutritious food to fulfill their dietary intake. Another crucial point is increasing the volume of domestically produced food to ensure food availability and food price stability. On the other hand, diversifying import resources is necessary to ensure a continuous supply of foods that cannot be produced locally.

One way the agriculture sector can maximise productivity and create a better food system while reducing dependency on food imports and foreign labours is through the adoption of modern technology in agriculture. This has to be supplemented with the cooperation and commitments from the private sectors, NGOs, and rakyat as they are imperative in successfully addressing the food security challenges, especially in waste reduction and resources optimisation. Above all, the country's preparation and readiness in overcoming the food security crisis is vital and this demands an integrated and holistic approach on crisis preparedness to combat future uncertainties including protecting and preserving our natural resources and addressing climate change.

National Food Security Action Plan

To address the urgent and pertinent issues, The National Food Security Action Plan is currently being drafted. This plan encompasses insights and strategies formulated from the deliberation of various ministries, agencies, academicians, private sectors, and NGOs. The action plans formulated will act as a catalyst for transformation in addressing food security challenges. The proposed action plan consists of five (5) strategic thrusts.

- Strategic Thrust 1: This thrust aims to increase the adoption of technology in the food system as a pragmatic approach to increase efficiency and productivity, concentrating on economics of scale and sustainable farming. Indirectly, this strategy is also adding value to the National Policy Framework for the Fourth Industrial Revolution (4IR) and Digital Economy Blueprint.

- Strategic Thrust 2: Thus thrust aim to intensify research and development on food security as means to increase domestic food production, focusing on the development of agriculture inputs such as animal feeds, breeds, and seeds locally. At the same time, R&D on potential alternative foods and climate-based technology for food production is also emphasised.
- Strategic Thrust 3: This thrust aim to gather and strengthen data towards creating a dedicated Big Data Analytics System for food security. This will enable the development of food security indicators in addition to monitoring and assessment of the level of food security at various localities in Malaysia.
- Strategic Thrust 4: This thrust translates the aspiration of "Food Security as a Shared Responsibility" aiming to expand strategic collaboration on food security among ministries, state governments and private sectors. Private sector participation in the food system will be facilitated through incentives to increase volume of local food production. Efforts will also be directed towards retaining targeted food imports and labour in the food system as a means for food diplomacy with foreign counterparts, both bilaterally and multilaterally.
- Strategic Thrust 5: This thrust aims to strengthen the Governance of the Department and Agencies by harmonising the grey areas and bridging the gap within the food system for better monitoring and governance. It involves a requisite development and upgrading of infrastructure, relooking and revising acts and regulations to empower the authority to protect and preserve the natural resources for the resilience and sustainability of our food system.

Securing Food Availability

MAFI will continue its efforts in ensuring the availability of nutritious food within the food system. In addition, emphasis will also be towards the sustenance, and competitiveness of agrofood sector; which involves retaining food producers through ensuring adequate income. Under the Twelfth Malaysia Plan 2021-2025, more serious efforts are geared towards improving productivity, support system, and services and strengthening the food value chain which will further contribute towards the resilience of the food system. The agrofood sector will be strongly driven by modernisation through IR4.0, mechanisation and technology adoption to increase the contribution of total agriculture value-added to gross domestic product (GDP). MAFI's pledge to uphold food security is also reflected through National Agro-food Policy (NAP), 2021-2030, better known as the NAP 2.0 or DAN 2.0.

NAP 2.0 is aimed at ensuring food security through:

- driving income growth and facilitate a better quality of life for food producers;
- raising production output with quality harvest by increasing productivity;
- establishing more agile and resilient value chain with high value-added activities;
- improving food safety and nutritional well-being of Malaysians;
- embracing greater economic, social and spatial inclusiveness; and
- encouraging greater adoption of sustainable consumption and production.

Conclusion

In addressing the challenges of food security, the whole government involvement and a strategic bottom-up approach is needed where the Rakyat's need is placed first. The Rakyat's perception and voice needs to be embraced. Through implementing the National Food Security Action plan, NAP, foresight analysis and other preemptive efforts, resilience for food security can be achieved which will be reflected through the domestic and international indicators such as Self Sufficiency Level (SSL), Import Dependency Ratio (IDR), Global Food Security Index (GFSI), and Sustainable Development Goals (SDGs).

IR 4.0, AGRICULTURAL TRANSFORMATION AND THE IMPLICATION ON FOOD SECURITY

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Introduction

The sphere of national food security is an invaluable pillar of the overall national development strategy via links to other spheres of social economy. Effective national food security strategy leads to greater food availability and affordability, lowers food expenditure, has a share of overall household spending and leaves a larger proportion of the national income available to be spent elsewhere. This in turn will have far reaching implications such as increase aggregate demand for other industrial goods and services, soaring national GDP, increase political stability and overall techno social economic progress and wellbeing of the nation.

The ability to thrive in a techno social economic reality of the current industrial revolution provides new tools to make national food security strategy even more effective and efficient. One unique feature of the 4th Industrial revolution 4IR is that it has incredible equalizing power. With the adoption, the effectiveness, efficiency and self-sufficiency can now be achieved at any level and at any scale across the industries. The agricultural industry is among the sector poised to benefit the most from 4IR in the years to come.

Empowered with 4IR, tech countries are now feeding the people better while reducing of resources. Some agricultural technologies have already become a common sight while others seem to come out of a science fiction movie. 4IR is a prerequisite and have become a necessary condition for food security. Countries that have long pledged technology to serve their society in all-encompassing ways lead global food security index. These countries include Finland, Ireland, the Netherlands, Austria, Germany, Japan, Singapore and South Korea and they also fall under the umbrella of society 5.0.

Success Stories Overseas

Analysis of leading countries in the global food security index reveals that all these countries focus on serious efforts in boosting agri-food technology; they place high importance on high-tech farming, precision engineering and circular economic principles as the core stone of the national food security strategy. The common trends seen in these countries are as follows:

i. Placing food security at the highest priority level by the state administration in the form of explicit national food security strategy with the involvement of dedicated ministries/agencies.

ii. Spearheading national food security priorities towards food self- sufficiency

iii. Heavy investment in the agri-tech research and development

iv. Particularly focus on small farmers and local agricultural owners via innovative financing, incentive schemes, and connecting them into extensive networks at e-commerce channels, thus allowing small players to collectively bring their produce to the local market to be price competitive.

v. Build an entire vibrant and healthy ecosystem around their agriculture sector infused with technology

vi. Irrespective of land and other natural resources, size and availability, these countries venture into the area of vertical complete control environment farming.

vii. Preparing local agri-tech specialist at scale

viii. Deploying various strategies to encourage youth to relocate rural areas and develop rural regions and turning these areas into attractive places to reside in making agri sexy for the youths.

a. Having a solid and clear national food security strategy

A solid and clear national food security strategy is considered as one of the most and foremost essential condition to have all other food security elements stack up together. It is also important to realise food security as a national security issue and not just another policy to be carried out. Countries that are highly ranked in the global food security index have clear awareness and prioritisation of the food security reflected in the presence of an explicit national security strategy. Putting the agenda on a high pedestal results in a “whole-of-government strategy” where there is a concerted effort across all agencies and ministries. Unhealthy competition should be limited; all actors/players in the food security ecosystem should work together. Such concerted effort results in effective policy implementation, creating an entire ecosystem of support including various players such as producers, academia and industry R&D, policy makers and even consumers

A good example to demonstrate how passionate a government can be about food security is our tiniest-land neighbor with stellar food security performance in Asia Pacific Region and worldwide—Singapore. Singapore has an explicit national food security strategy, marked with the highest order of priority by the government and a dedicated team of government agencies to spearhead serious efforts towards securing the country's ability to place food on the table. Singapore Food Agency (SFA) is the governmental agency tasked to oversee the national food security strategy implementation. This body closely cooperates with other relevant agencies and other food ecosystems to ensure that food security vision is consistently implemented at every level of the food security. Some of the important initiatives are:

- SFA works with Agriculture Productivity Fund to support local farmers in their tech adoption
- Singapore Land Agency identifies under- utilized urban spaces that can be converted into indoor farms and
- Ministry of Education develops and builds CURRICULA in relevant areas.
- SFA brought the industry and public together to create a new "SG Fresh Produce" logo. This campaign was warmly supported by the consumers.

b. Spear-heading national policies towards self-sufficiencies

Spear-heading national policies towards self-sufficiencies is another common trend shared by top league food security performer-countries. These countries probably have realised heavy-reliance on imports as a threat to their national security. Food security is a combination of many factors; the Global Food Security Index framework comprises four critical dimensions: availability, affordability, quality and safety, and natural resources and resilience. However, the COVID-19 pandemic has demonstrated that other dimensions such as prices or access to food via multiple foreign sources and favorable import tariffs may not matter as much as self-sufficiency in times of a global crisis. For example, Japan despite being ranked number nine in GFSI 2020 currently imports roughly 60% of its food. However, it is among the Japan's goals to increase food self-sufficiency rate to 45% in 2030 on a calorie basis.

Another country where more serious efforts are geared towards self-sufficiency is Singapore. According to the Singapore Food Agency (SFA), the overall strategy is to diversify food security risk into "three food baskets"; that is:

- Diversifying global supplier network (currently more than 170 countries),
- Growing locally
- Growing overseas

Although, Singapore has almost no arable land, she makes an ambitious goal to increase its local food production from 10 to 30 per cent by 2030. Notably, the country's immediate reaction to the COVID-19 crisis was the decision to grow even faster in the following 6—24 months. This threefold ambitious increase is planned to be achieved through heavy investment in agri-tech, agri-tech infrastructure, research and development.

c. Heavy investment in agri-tech research and development

Heavy investment in agri-tech research and development is another common approach among the global food security leading countries to boost food production, increase food safety and nutrition and mitigate potential impacts of climate change. This results in an inevitable transformation in the agriculture, animal husbandry, and aquaculture sector, given the advent of the Fourth Industrial Revolution, and the backdrop of growing population, reduced arable land, pollution of waterways, soil nutrient loss, increased public awareness on health and climate change issues.

For example, China has embarked on nationwide technology upgrade across the agricultural sector for the purpose of achieving a higher level of self-reliance. On the technological front, Japan is leading the way with the use of robotics, sensors, big-data simulations, microbes and genomics. Japan has already been a pioneer in the development of sensors, actuators and auto-navigation technologies for farming, where astonishing results has been observed. In fact, a single farm in Kyoto has been growing 30,000 heads of lettuce daily, and in Fukushima, a vertical farm in an abandoned semiconductor factory can produce up to 10,000 heads of lettuce per day, amounting to 100 times the productivity – measured per 0.1 square metres of land – of traditional farming methods. Another example is witnessed in Australia where innovation advancement is considered as one of its five pillars for growth. This was identified in the National Farmers' Federation (NFF) 2030 Roadmap, which includes a plan for agriculture to achieve $100 billion in output. New Zealand recognizes innovation and investment in agri-tech as an important part of their 10-year strategy for the primary sector. Singapore's provides $144 million for research and innovation efforts in the farming sector, and provides an Express Grant to quickly ramp up food-farm outputs within two years.

Irrespective of land and other natural resources size and availability, the food security leading countries, all as one, venture into the area of vertical, complete control environment farming.

Now, although it's true that countries with limited land or water resource availability are venturing quicker into farming or aquaculture techniques and technologies that maximize output from minimal space, nations also realize how a growing population can outpace food supply, exacerbated with reduced arable land, increased pollution of waterways and water resources, soil nutrient leaching, increased public awareness on health and climate change issues – all of which make technologies such as vertical farming, automated and controlled environment farming to be very relevant, irrespective of land and other natural resources size and availability. From the long-term perspective, it's crucial to embark on these technologies NOW.

d. Supporting small farm holders

Top food security performing countries unanimously focus on supporting their small farm holders as they are considered the majority and the backbone of not only national food security but overall national prosperity and wellbeing. Rather than amalgamating smallholders into big estates, the opposite is required— encourage, support and enable them to become independent agri-producers. The concept behind this is that if we absorb their pieces of land into bigger estates, we promote wealth concentration in the hands of few. While empowering a large enough number of individual farmers to unlock the gem they have in their hands, we create wealth distribution and economic independence on a national scale. The belief that smallholder farming cannot be efficient is rather an old conventional way of thinking. The elegant 4IR tech solutions allow efficiency to be achieved at every level, at any scale, in any industry.

This concept has been proven by the Malaysia Digital Economy Corporation (MDEC). MDEC pilot deployment of 4IR agri-tech was highly successful in various agricultural activities such as smart fertigation, smart misting, smart aquaculture, smart poultry, smart irrigation, and smart soil monitoring. MDEC observed how agtech increased the productivity, quality and income of small farmers by over 20%. A large number of farmers on the national scale enjoying higher incomes and collectively bringing their produce to the market would exert downward pressure on food prices, provided, of course, there is sufficient protection from foreign food suppliers.

The top-performers on food security among our regional peers, such as Singapore, Japan, South Korea, and others, already scrupulously focus on smallholder farmers— encouraging them to embrace agri-tech, easing their financing, and enabling these small players to bring their produce to the national markets collectively. In doing so, the countries are actually building entire vibrant and healthy ecosystems around their agricultural sector infused with tech, including producers, financiers, policymakers, educators, and even consumers. For example, China, in particular, has a strong focus

in reshaping its smallholder farming culture with extensive digitalization. With the help of agri-tech and new business models driven by digital innovation working through the entire agricultural value chain, small farmers can benefit from a huge and supportive ecosystem. A related example is where Japan's advance use of sensors generate super-smart Big Data connecting food from the breeding process to farming, distribution, sales, consumption and even recycling. This is a combination of agri-tech and circular economy. The system also helps small players to collectively bring their produce into extensive networks for e-commerce and the local market for a more price-competitive proposition.

e. Local agri-tech specialists at scale

Food security leaders also prepare local agri-tech specialists at scale**.** In this effort, as we could see they even go as far as changing school curriculum to excite the future generation about agriculture from the very young age. As food security in 4IR has pushed agri-tech as an indispensable tool, its sustainability is hinged on the healthy supply, or a consistent critical mass of talents and home grown agri-techpreneurs and innovators. For example, New Zealand is well known for its academy for horticultural robotics. Also, according to a global report, agri-tech and life sciences are highlighted as the leading areas for New Zealand start-ups. In South Korea, rural area site visits to learn about agriculture is common practice and part of curriculum school for children and students. In doing so government of South Korea also hopes that students would see how beautiful and fulfilling life can be outside of urban areas and therefore would be naturally attracted to live and work there including in the area of agri-tech. It also inevitable that such a strategy will require the development and upgrading of existing agricultural sites in rural areas, and opening of new ones. It is important to pair the increased output of relevant talents, with such talent and workforce dispersion strategy.

Conclusion

We have to learn from history, from other nations, and take stock of the current situation. Other countries are taking crucial steps in its national food security, while Malaysia, achieved a zero score in the food security and access policy indicator under GFSI 2020. This score indicates experts view of food security as not being the government's focus area and priority, and the absence or insufficient food security strategy. In fact, Malaysia has been receiving a zero score on this measure from the food security experts for years, from 2012 to 2020. This also reflects the experts' view of the Malaysian government's ability to be held responsible and accountable for whether it has invested in and taking a coordinated approach to achieving food security.

Growing global population, reduced arable land, pollution of waterways and water resources, soil nutrient loss, increased public awareness on health, climate change issues, and even future pandemics and global crises can and will test a nation's ability to feed its own people. Malaysia scored very weak in the ocean, rivers, and lakes sub indicator, which means that its waters and water resources are significantly at risk, jeopardising Malaysia's ability to improve its self-sufficiency in food security. Water resource security issues due to increasing pollution are exacerbated by growing demand due to population growth, economic activities, and climate-change related changes in water supply. In fact, GFSI views Malaysia as having absolutely no safety net against climate-change related adaptation measures for food safety. Thus, it is past time to realise the need for a whole-of-government approach and holistic strategy, towards food security as a high-priority of national security.

Results from MDEC's Digital Agtech pilot projects have showcased the viability of digital technologies and automation in agriculture. However, there is room for even more technological improvement. We can go beyond Industry 4.0's version of agri-tech, and into "agtech 5.0" which is also envisioned under Malaysia 5.0, inspired after Japan's Society 5.0. Under the "Unity Alliance" framework envisioned under Malaysia 5.0, such a national food security strategy will include the strong collaboration with all players and stakeholders in the ecosystem. In the near future, innovative fintech and trading platform such as blockchain-based peer-to-peer market platform may be considered to support small farmers by minimising the role of the middle-man and ensure best prices for the consumers, and better margins for the farmers. Similar technologies should be applied to other crops in Malaysia, particularly paddy. Despite a major rice consumer, Malaysia is only producing roughly 70 per cent of the total demand internally, while the remaining are imported. In fact, its self-sufficiency level dropped slightly from 70 per cent in 2018, to 69 per cent in 2019.

A global crisis such as Covid-19 pandemic has shown Malaysia's vulnerability in food security when trade activities are halted, depriving Malaysia from its staple food. If this is reflective of limitations in current capabilities, then technology appears to be the way breach the production ceiling. According to the department of statistics, the total food imports for 2019 is in excess of RM 51 billion, and jumped to RM 55 billion in 2020. To give an idea on the growth rate, the value was reported to be about RM 43 billion in 2013. Thus, in addition to transcending the current notion of food security (achieved via imports supplementation) to actual self-sufficiency (at least for staple foods, major livestocks and aquaculture; for obvious national security reasons), there is existing and sizeable captive market with an upward trend to be capitalised on, and technological advancement is the inevitable way forward. The time to act on this is now.

INTEGRATED FOOD SECURITY STRATEGY TO OVERCOME NUTRIENT DEFICIENCY

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Introduction

The Covid-19 pandemics has brought about renewed attention to food security concerns. Food security encompasses both quantity and quality elements, that is, to have access to sufficient supply as well as to have enough nutritious and safe food. One important element in food security that rarely get adequate public attention is food safety, especially in terms of the chemical residual and toxicity levels.

It is therefore important for the government to ensure that food safety is taken in a more serious manner. Some of the pertinent questions that need to be answered in ensuring food safety are:

- Is our food safe for consumption?
- Are toxic agro-chemicals putting consumers at risk?
- Are anti-biotics, used for animal breeding, placing animal and human health at risk of antimicrobial resistance?
- Are food processing practices compromising consumers' nutrition?

In 1972, the government introduced the Applied Food and Nutrition Program with the aim of improving nutrition and reducing hunger in Malaysia. Its intention is also targeted at increasing the production of nutritious foods and promoting supplementary nutrition to pregnant and lactating mothers as well as infants and school-going children. Since then, many nutrition programs have been incorporated into the rural development programs and have proven to be successful.

Improving and Strengthening Strategies to Enhance Food Security

There may be a need for the government to re-strategize and improve our national food security in terms of ensuring the public consume sufficient micronutrients and improve diets as diet-related Non-Communicable Diseases (NCDs) are in the rise. In addition, it is also pertinent that the government take more serious steps in reducing the amount of toxic agro-used in agriculture in Malaysia.

The government must realize that improving nutrition is crucial for both the economic and social progress of the nation. No country can achieve and sustain development with a malnourished population. Nutrient deficiencies especially when consuming diets lacking in essential micronutrients (vitamins, minerals), may pose risk and reduce health and wellbeing of the nation.

Statistics show that many people are suffering from anemia with serious consequences especially in women at their reproductive age. Insufficient vitamin A, iron, calcium and zinc seem to be the major micronutrient deficiencies of our national public health. More crucial is when a child becomes undernourished as it causes child stunting. This not only adversely effects their physical development, but also their cognitive development.

One initiative that can be implemented is to have at least one meal a day in school that fulfils at least the micronutrient requirements and provides some of the macronutrient needs. Khazanah Research Institute share this recommendation and add on that this initiative can be carried out at a relatively low cost and can be a way to promote the consumption of local vegetables and fruits. However, to make this a success, there needs to be a serious concerted effort by various ministries and stakeholders.

Addressing Poor Diet and Bad Eating Habits

The consequences of not eating properly need to be widely understood. Healthy eating requires well-proportioned dietary plans with diversity to ensure consumption of various different foods. Consuming a variety of nutritious foods can supply all the essential nutrients needed for healthy living. Healthy human needs macronutrients such as carbohydrates, protein and fats with limited consumption of rice or fatty, sugary and salty food, and micronutrients, especially vitamins and minerals. The public needs to be cautious as poor diets are very often promoted by large food corporations. In addition, due to the pandemic, people are also relying on unhealthy eating options such as consuming instant noodles more frequently.

Although Malaysian life expectancy exceeds 75 years, but the healthy life expectancy is almost 10 years less. The value of the healthy life expectancy is expected to reduce further with the Covid-19 pandemic. The government need to realise this and take immediate and serious steps to curb this issue.

Conclusion

The government should use the Covid-19 induced reassessment on food security to better address issues on malnutrition and food safety. A more holistic food systems should be established where more priority is placed on nutrition, food safety and dietary diversity.

EFFICIENCY AND EFFECTIVENESS OF LOGISTIC IN FOOD SECURITY: BEST MODEL IN AGRICULTURE

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Introduction

With the onset of Covid-19 pandemic, many businesses have been negatively and gravely impacted, the worst being the airline business. To persevere, Air Asia is now venturing into the agricultural sector where it is set to revolutionise the agribusiness supply chain through introducing an efficient and effective logistic system for ensuring food security.

Air Asia initiated its operation in 2001 with two planes and 200 staff and with a RM 40 million debt. By 2019, Air Asia has become one of the largest low cost carriers in Asean region with 280 aircrafts. However, with the horrific effects of the pandemic, in 2020, Air Asia is back to owning only two planes.

Going Forward

One of the strongest assets of Air Asia is that it owns huge sets of data and are utilising these databases to enable connectivity in the agrofood sector. Air Asia recently set up Air Asia Digital, a company similar to Grab. Air Asia Digital is a strong logistic company with huge relevance to the national food security, farming and financial services and offers the following:

i. A super App called the Airasia App.

ii. Financial services such as Bigpay and BigRewards. Bigpay is Air Asia's digital payment service, a part of the financial services offered. This venture has been successful with almost 1.2 million downloads with the involvement of 700,000 people. Another program offered is the BigReward, a rewards platform with over 35 million members, offering points redemption.

iii. Agrofood services: Air Asia Digital has also expanded into the agrofood industry where it is offering two programs; the Airasia Farm and the Airasia Kitchen.

iv. Logistics – one of the best logistics company in Asia

These four components represent a holistic ecosystem platform of ecommerce, digital technology and logistics where consumers can purchase food directly around Asia through the use of the Airasia app; with the excellent logistic services, food can be delivered fast and effectively; Bigpay on the other hand will support the financing in providing loans at a reasonable rate and the farms providing quality food at a cheaper rate.

Logistics as the Key to Food Security

Logistics is Air Asia Digital strength and is key element that has the potential to enhance our national food security. Inefficient logistics is hurting both small business and consumers. Farming is an important industry and with many opportunities. Air Asia Digital plans to reduce involvement of middlemen, thereby increasing farmers' profits while decreasing produce cost by directly connecting farmers to businesses. This is done through the establishment of an effective logistic chain or network and through the use of technology and data. Air Asia Digital is able to match the demand from food and beverage outlets to supply from agro producers. The logistic network can be expanded to other countries in Asia as observed in the export of durians to China. By creating more demand and better margins, Air Asia Digital believes that more people will venture into farming, thereby improving our national food security while enhancing our export business.

Air Asia Digital is also mobilising all logistic channels, let it be aeroplanes, cold store trucks, motorbikes, cars and vans to enable Malaysian farmers to export and move products around our country more efficiently and cheaply. When the pandemic is over, Air Asia will be able to access 160 cities around the world. Currently, Air Asia Digital is building cold stores in airports; to date one has been built in KLIA, they are looking to build two in Sabah, and in Sarawak and Penang so that farmers can ship their produce directly, faster and at a cheaper rate.

Airasia Farm

Airasia farm was launched with support from MAFI. Currently this program involves 50 staff and is linked with 1,200 farmers with 600 businesses throughout Malaysia. This venture is growing rapidly with record sales in April 2021, amounting to RM 2 million. Since Air Asia Digital is a digital company, it co-ventured with google to build a training academy, called Air Asia Academy to educate farmers on digital technology with the ultimate aim of improving farm productivity and yield.

Since Air Asia Digital is also involved in food delivery, it can offer restaurants cheaper food obtained directly from the farms. The types of food delivered are vegetables and fruits, meat and poultry, seafood, dairy products and daily staples.

To-date Airasia farm has enabled the following:

- For farmer:

i. increase farmer income by eliminating middlemen

ii. open up new markets to expand marketability and reach

iii. short payment terms to improve farmer cash flow

- For buyer:

i. High quality products through rigorous quality control

ii. New unique products

iii Reduced prices due to better pricing from farm and efficient logistic operations

THE CONTRIBUTION OF SEED TOWARD FOOD SECURITY

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Introduction

Food security is a common agenda globally. This is mainly due to the drastic and continuous increase in population throughout the world. Every minute, 120 babies are born and in one week, the world population is estimated to increase by 1.2 million. This value is projected to increase to 2 billion by the year 2050 which in turn will cause tremendous pressure to the world food systems. This growing population is leading to increase in hunger and famine. It is estimated that currently 854 million people are in the state of hunger and statistics show that 25,000 people die of hunger every day; of which 10,000 are children.

With the growing population, the demand for food is in the increase. By the year 2050, it is estimated that the world population will reach 9 million and the food demand will increase by 70%. This increase will be in the backdrop of limited or reducing levels of resources such as water and land. The way forward is to improve yield and carry out sustainable agriculture.

Food Security, Self-Sufficiency and Sustainability

To end hunger and achieve food security, it is important that we also look into self-sufficiency and self-sustainability. In food security, there are three basic components that should be made assessable and available to the nation; that is, to ensure there are sufficient sources of carbohydrate, protein and fiber. The main source of carbohydrate is rice, while the main source of protein comes from fish, chicken and meat. Although the self-sufficiency level of chicken is quite high, but to produce sufficient chicken, there is a need to have sufficient and quality feed for the animals. Currently the chicken feed consisting of 55% of maize is mostly imported; about three million metric tons of maize is imported yearly. Vegetables are the best fiber source in our local food. Although vegetable supply is quite sufficient but most of the vegetable seeds are imported; which again limits our level of self-sufficiency.

Malaysia's food security index is at quite a comfortable level; in 2018, Malaysia ranked 40 but in 2019, the ranking improved to 28. On the other hand, Singapore, although ranked number one in terms of food security index but stands at a very low self-sufficiency level (SSL). The importance of self-sufficiency is realised especially during the COVID- 19 pandemic and this has prompted Singapore to come up with the 30 by 30 strategy where by 2030, they hope to be self sufficient by 30%. The food security level, SSL and sustainability levels are exhibited below:

	Food Crops	Food Security	SSL	Sustainability	Action
1	Rice	<100%	70%	70%	Improve Productivity
2	Grain Corn	<100%	2%	2%	Increase Planting Acreage
3	Vegetable	<100%	80%	5%	Improve Productivity

The table above clearly shows that in terms of food security we are at a comfortable level but need improvements of our SSL and sustainability levels. Since most of the maize is imported, our SSL level and sustainability level only stands at 2%. Although we have 80% SSL for vegetables but because we depend on imported vegetable seeds, our sustainability level only stands at 5%. The way forward is to improve productivity and to develop high yielding variety

Investment

Another component that is important in food security is sufficient investments in agriculture. Agricultural investment is considered one of the best weapons against hunger and poverty, and according to Bill and Melinda Gates, investment have made life better for billions of people. Investing in the agriculture, although slow, it is stable and recession proof. In Malaysia, agricultural players mainly consist of small holders and there is a need for more corporate players to indulge in this industry.

Seed Industry and Use of High Quality Seed/Seedling/Planting Materials

Whole agricultural value chain begins with seeds. To enhance the agricultural value chain, quality seed or planting material is very crucial. It is estimated that quality of seed accounts for 20-25% of productivity and also for increased quality and nutritional value.

To build the seed industry, there is a need to have tangible and intangible resources. Tangible resources include land, funds and technology while intangible resources include human capital, knowledge, germplasm, conducive weather, innovation and reputation. Some of the challenges faced by the seed industry includes the following:

- Coping with climate change, soil erosion and biodiversity loss
- Keeping up with the changing trend and expectations of consumers
- Meet rising demand for more food of higher quality
- Sufficient investments in farm productivity
- Adoption and learning new technologies
- Staying resilient against global economic factors
- Inspiring young people to stay in rural areas and become future farmers

Benefits of investing in seed industry include contribution to food sovereignty, self-sufficiency, increase farmers' income and create more job opportunities. In terms of sustainability, it is important that industries strive to move beyond national borders. Another important element in successfully contributing to the national food security is to have a conducive and workable private public partnership.

GRAIN CORN INDUSTRY IN STRENGTHENING NATIONAL FOOD SECURITY

Ramana Naidu Kalaichelvan

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Beginnings of the Grain Corn Industry

Grain corn is considered to be an important element in food security. One of the most important source of protein comes from chicken and maize constitutes 60% of its feed. Malaysia imports almost 100% of grain corn and this volume increases with every passing year, thereby increasing its demand nationally. This became a pulling force and an opportunity for Famox Plantation Sdn. Bhd. to venture and tap into the maize market.

Famox Plantation Sdn. Bhd. is currently the pioneer and largest grain corn commercial plantation in Malaysia. This company began operations in 2011, cultivating cash crops. However, the company faced many challenges especially issues pertaining to middle man. In 2016, the company initiated its first cultivation of corn, starting from 6 acres and then expanding to the current 500 plus acres.

Experiences and Progress of the Grain Corn Industry

In Famox Plantation Sdn. Bhd. cultivation of grain corn has progressed to Kedah, Johor and Pahang. The focus is to involve as many youths as possible, especially those that have lost their jobs during the COVID-19 pandemic through initiating a mentor mentee project. Landbanks of about 1000 acres are provided to the young agro-preneurs to kick start their work. They were also being provided with cultivation SOPs, seeds and inputs. The maize cobs are then bought back by the company through a Famox buy back contract. These cobs are then subjected to mobile drying. The cultivation of maize by Famox also involves the use of machineries such as corn seeder, weeding cultivator, drones, boom sprayer, corn ridger, combine harvester and mobile grain dryer.

Opportunities and Benefits of Growing Maize in Malaysia

- Reduced levels on aflatoxins and mycotoxins. Feed millers when purchasing maize complain of incidence of. This issue, however is not observed in the maize grown in at Formax Plantation Sdn. Bhd.
- Reduce trade deficit. The demand of maize is in the increase and this in turn has caused an increase in maize price which eventually causes the price of poultry to increase. In 2019, the price of maize is RM 800 to 850 / metric ton but now price of maize is currently RM 1380/ metric to. To overcome the burden of price increase and to reduce dependency of imports, maize should be cultivated in Malaysia. With proper SOP and mechanisation, maize can be planted in Malaysia as witnessed by the success story of Fomex Plantation Sdn. Bhd.
- High demand of grain corn in Malaysia

Way Forward and Recommendations to MAFI

It is recommended that the acreage of grain corn cultivation be increased to meet the increasing demand of grain corn in the country. MAFI can play an important role in assisting the government to draft a grain corn policy where suitable platforms are provided for youngsters to get access to landbanks and to provide matching grants for new comers to initiate cultivation of grain corn.

JOURNEY OF SWEET CORN NELSON'S FRANCHISE (M) SDN. BHD. IN MALAYSIA

YBhg. Datuk Seri Nelson Kwok Teng Toong

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Introduction

The Nelson's Franchise (M) Sdn. Bhd. comprises of farming, including contract farming, processing, wholesale, export, retail and franchising. This company initiated their business in 1985. The Nelson franchise also has initiated a *balik kampung tanam jagung* program to encourage youth to go into farming of sweet corn.

High Quality Sweet Corn

One of the main focus areas of Nelson sweet corn franchise is to ascertain the production of high and good quality corn. To do this the following guidelines have to be taken into consideration:

i. Quality: ascertain quality in terms of sweetness, reduced fibre, thicker flesh, size and attractive colour

ii. Easy to cultivate: in terms of tolerant to disease and adverse climate; strong rooting system; high rate of germination

iii. Marketing: there should be good acceptance by retailers and consumers; large market for both process and raw corn

Remain Competitive

Some of the factors or initiative taken by Nelson sweet corn to remain competitive in the market are:

i. Ensure the seed supplier is good and provide consistent high quality seeds

ii. Stay relevant in the market – must have a distinct variety with valuable traits such as:

- thicker flesh: 2.2kg of Nelson's 28 corn variety produces 1kg seeds and can be easily removed from the cob
- good root system: Nelson's 28 corn variety has better and stronger root system
- angle of fruit from the stem: Nelson's 28 corn variety has a larger angle (35^{O} compared to 15^{O} in other varieties). This allows for easier and more efficient pollination and less attack by stem borer
- sweetness: Nelson's 28 corn variety has a 30 % higher brix (16-18 Brix)
- corn husk: Nelson's 28 corn variety has a thinner husk
- length of cob: Nelson's 28 corn variety has a longer cob

iii. Tolerant to adverse environmental conditions: more adaptable to Malaysian climate

iv. Better growth rate

Ensuring High Consistent Yield and Quality

To ensure high and consistent yield, stringent SOPs are followed in the pre-cultivation, cultivation and harvesting stages of growth. Important prerequisites before cultivation include the following:

- Suitable soil pH of about 6.0-6.5
- Devoid of weeds
- Irrigation in place: preferably sprinklers
- Seeds to be pre-soaked for 2 hours before sowing to improve germination rate

During cultivation, maintenance and harvesting the following SOP is

followed:

- Distance between plants: 18" X 18" 36" (48)
- One seed per hole
- 10^{th} day to fertilize at a rate of 10:10:10

- 15th day: spray pesticide, fungicide & foliar fertilizer
- 20th day to fertilize at a rate of 15:10:10
- 25th day: spray pesticide, fungicide & foliar fertilizer
- 35th day: flowering and pollination occurs
- 40th day: spray pesticide, fungicide & foliar potassium
- 51, 55 and 59th day: spray pesticide and fungicide
- Harvesting: occurs from 63 to 68 days

Criteria for Success

To ensure the cultivation, production and marketing of sweet corn is a successful venture, the following should be taken into consideration:

- Contract farming – important and easier to contract farm and this form of farming **c**an support food security in Malaysia
- Good quality products: good quality products that meet the market demand
- Price: should be affordable
- Location: land should be sufficient to grow and meet the demand
- People: good farmers are a very crucial element in successfully cultivating corn and obtaining a good yield. Workers / laborers supply is also important as farmers will lay off if insufficient labour force
- Promotion: need to promote products so that it can be marketed effectively

Government's Role or Intervention

The government has a huge and important role to play if the sweet corn industry is to expand in Malaysia especially as an additional contributor to the national food security. The government can play a vital role in the following aspects:

- Create more skilled agroprenuers
- Provide sufficient land to young agroprenuers
- Provide relevant agency support
- Provide immigration and authority support– for example to bring in sufficient foreign workers
- Establish a training agency and school of learning for young agroprenuers
- Provide incentives and subsidies for cultivating corn

THE HOLSTEIN MILK COMPANY

Loi Tuan Ee

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Introduction

The Holstein Milk Company was established about 10 years ago. It began as a Khazanah Strategic Investment in livestock business. Holstein started its business with 60 cows at Kota Tinggi Johor, which is also its home ground. Farm Fresh is its product brand. Holstein's business grew from this location to five other locations with two processing facilities across Malaysia. In addition, Holstein has a farm in Greater Shapparton, and a processing plant in Kyabram, Australia. Other farms in Malaysia are located in Muadzam Shah, Desaru, University Putra Malaysia, Mawai and Taiping. Today, Holstein has a heard capacity of 8,500 dairy cows and three processing facilities; with the main operation located at Muadzam Shah, housing 3, 600 cows and with a processing capacity of 67.4 mn L.

Holstein's Revenue and Growth

In terms of revenue, Holstein has grown significantly over the last 10 years. In financial year ending March 2021, her revenue stands at RM 490 million with 85 % of the revenue coming from Malaysia and the rest from Australia and Singapore. Holstein produce 9 million Litres (contributing 21% total fresh milk production in Malaysia 2020). According to Frost and Sullivan market research report for milk in Malaysia, in 2015, the value of liquid category milk stands at about RM 1.1 billion, and this value increased to RM 2.08 billion in 2020 with a compound growth rate (CAGR) of 13.4%. This market segment is projected to increase to RM 3.2 billion with CAGR value of 9 % by 2025. Holstein Farm Fresh milk started with 12 % market share in 2015 and today it has grown and acquired a 36% market share in chill categories. In the last 4 years, Holstein has grown at a yearly CAGR of 60.1%.

The key industry growth drivers for this significant growth are:

Government support from MAFI & DVS

- Khazanah actively playing strategic role
- Growing household income
- Growing consumer's preference for fresh milk
- Genetics pay an important role to ensure to carry out dairy farming in a sustainable manner in the tropics
- Good Model system - including distribution system and creating wealth for other micro entrepreneurs along the value chain

Importance of Breed in Dairy Cow Industry

In sustainable dairy farming, very crucial to have a good adaptable breed. It is a huge challenge to raise breed in hot and humid climate such as in Malaysia. Seven to eight years ago, Holstein acquired AFS (Australian Friesian Sahiwal) genetic breed dairy cows from Australia which was developed by the Queensland's government in the early seventies and now its own the genetic breed exclusively. This has become the platform of gene bank for the improvement of genetic breed in the Holstein industry. The pure AFS gene bank houses desirable genes that offer resilience and resistance to high humidity and temperatures, resistance to ticks and other blood parasites; also contains traits pertaining to high fertility and high productivity in terms of milk production. The AFS cow was cross bred with the temperate Pure Holstein to combine the desirable traits of both cows to produce an economically superior solution to the challenges of tropical dairy farming.

Over the last 10 years, massive data was accumulated and analysed; out of which the top 5- 10 % superior cows in terms of its genetic make-up were selected. They are then subjected to in vitro fertilization (IVF) technology. In the conventional AI reproductive technique, only one calf with superior genetics per year is obtained. However, with IVF, 20 embryos calves with superior genetics/ year can be achieved through surrogate mother. With the application of this advanced technique of reproduction, it is projected that in the next seven to eight years, a lot more super cows or top elite cows will be produced. This will be a game changer as it will enable Holstein to produce more milk and these cows are expected to have better longevity and with superior tropical dairy traits.

Sustainable Dairy Farming

Sustainable dairy farming is very important. It is important that the workforce understand that a happy, healthy cow produces more milk, and that has become one of the core values of Holstein milk company. To ensure sustainable dairy farming is being carried out, Holstein invested and ensured the following activities/ initiatives are being carried out:

a. Herd healthcare

Under healthcare, the health and the herd biosecurity are ensured to prevent contamination from external sources.

The initiatives taken:

i. Adhere to Good Animal Husbandry Practices (GAHP) for farm practices and obtain MyGAP certification

ii. Strict adherence to the scheduled vaccinations

iii. RFID technology for automated monitoring of herd health and progeny

b. Environment

The farm sustainability is maintained through **r**ecycling of waste, optimising water resources for consumption, irrigation etc.

The initiatives taken:

i. Automatic waste collection system in barns

ii. Solid separators

iii. Vermiculture

iv. Waste water irrigation system

c. Feed/Nutrition

Under this category, it is important that the feed costs are balanced to optimise herd economics and efficiency while ensuring nutritional sufficiency at various points in the lifecycle

The initiatives taken:

i. Continual land expansion strategy for growing fresh grass to optimize nutritional value and minimize feed cost

ii. Effective total mixed ration (TMR) to create balanced and nutritional feed

d. Milking

It is important to ensure that the milk extraction processes are efficient to optimise operational costs. In addition, technology and strategies have to be implemented to ensure scalability of farm operations

Initiatives taken:

i. Rotary milking system –up to 400 cows per hour

ii. Rapid exit milking stations –up to 200 cows per hour

iii. Two milking sessions a day (4-6 hours each)

Impact of Covid-19 on the Holstein's Dairy Industry

The model at Holstein showed resilience during the Covid-19 pandemic. Holstein's revenue increased by 61% when comparing the revenue values for financial year ending March 2020 and March 2021. This shows that if agriculture is carried out in an efficient and effective manner supported by a good business model, it will not only become successful but also resilient.

FOOD SECURITY THROUGH SYSTEMATIC POULTRY BREEDING PROGRAM AND CHALLENGES OF ESTABLISHING POULTRY FOOD

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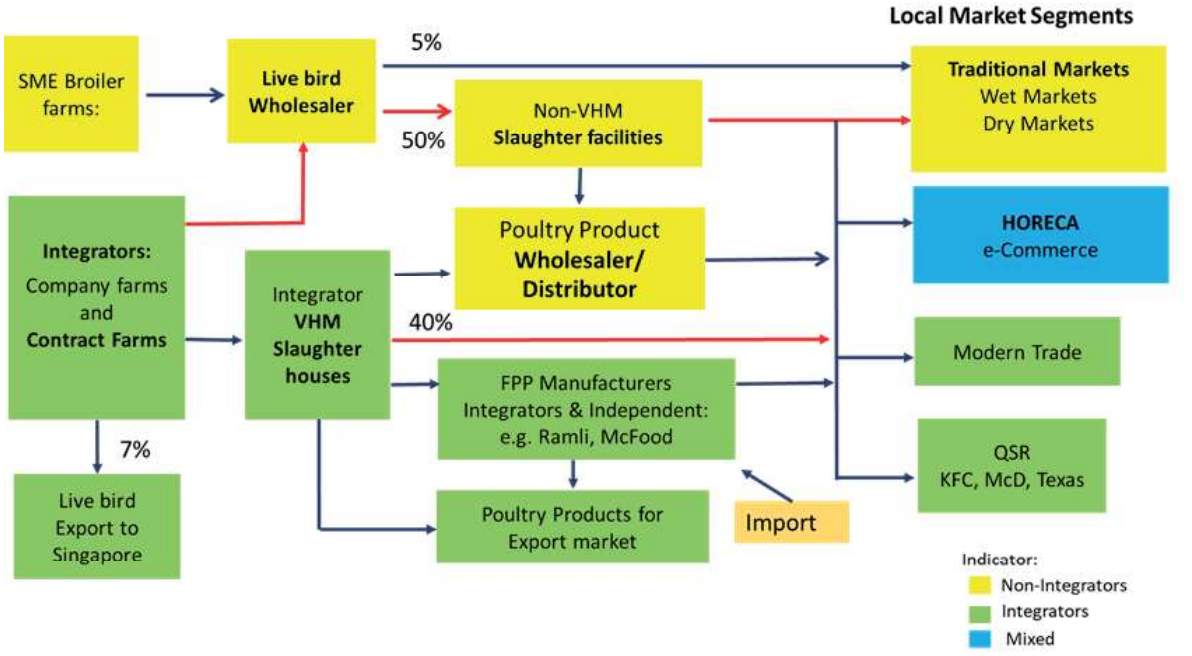
Introduction

Malaysian poultry industry is the largest sub-sector in the domestic livestock sector. It contributes 9% to agriculture GDP, worth RM8.9 billion. Poultry products are one of the most affordable protein sources. Its consumption is about 51 kg per capita/ year, being one of the highest in the world while egg consumption stands at 338 eggs per capita / year. Malaysian's self-sufficiency of poultry meat is 105% and that of eggs is 123%. The surplus poultry products are exported mainly to Singapore with an export value of approximately RM584 million (2018).

Poultry marketing pathways from "Farm to Folk" is portrayed in the diagram below:



Issues/Challenges Faced by the Malaysian Poultry Industry

Some of the pertinent issues and challenges faced by the Malaysian poultry industry are as follows:

- Dependence on imported breeding material renders our poultry industry vulnerable**.**
- Imported poultry breeds (usually Western) have good performance but not well adapted to local climate and disease condition
- Existing poultry breeding programme focuses on meat quality but with slow growth rate

Examples of Elite Poultry Breeds from Overseas

a. Russia's new domestic crossbreed "Smena-9"

Russia established her own national competitive crossbreed broiler chicken Smena-9 in 2020 and limits import-dependent breeding stocks. This breed has these desirable traits:

- Fast-growing broiler
- High-yield of pectoral muscles
- Lower fat content
- Low FCR and High uniformity
- Well-adapted to Russian climate

b. China's New White Feather Broiler "SZ901"

After 6 years of Research and development, China's Sunner Group announced their own domestic 'white feather broiler'. This breed possesses the following desirable traits:

- High-performing and fast-growing
- Highly adapt to local climates
- High fertilisation and hatching rate
- High-yield of meat content
- Low FCR and economic efficiency

Breeding Program at Malaysia

To ensure food security, a systematic breeding program to produce high-performing domestic chicken breed needs to be implemented. Recently Syarikat Sin Long Heng Breeding Farm Sdn. Bhd. signed a MOU with MARDI for a joint collaboration to develop a new local *kampung chicken* breed. The aim of this collaboration is to obtain breeds with better feed efficiency, improved growth and productivity performance. The project also involves the economic analysis on the production of new or improved *kampung chicken* breed and progenies to be conducted in addition to market verification to ensure that the newly developed domestic breed is adaptable to local climatic conditions. The target is to improve the current breed to have a faster growth rate and lower FCR. In the future, the intention is to use advance breeding technologies such as genomics breeding to generate fast-growing domestic chicken breed and to limit reliance of genetic stock from foreign countries.

In another effort, Syarikat Sin Long Heng Breeding Farm Sdn. Bhd will be using Genetic stock imported from foreign countries to ccrossbreed chicken that have similar or improved performance to target the development of new breeds that are better adaptation to local climate and diseases.

Challenges of Establishing Poultry Food Bank

Some of the challenges facing the establishment of a good poultry food bank is as follows:

- KM issue related to land code, buffer zone and etc.
- Anti-Profiteering Act
- Stockpiling for chicken and eggs in Malaysia
- Supports from government such as special loan, special tariffs for farming and etc.
- Exportation of poultry products
- Less than 50% of processing plants with Veterinary Health Mark accreditation.

COMPANY INTRODUCTION: OUR STORY

Mr. Kee Yau Leng

Manager, Leng Wah Fishery Sdn. Bhd.

Introduction

Leng Wah Fishery was established in 1995. The business began by selling fresh marine products in which the fishing activities were carried out using their own fishing vessels in Hutan Melintang, Perak. In 2001, Leng Wah Fishery was established with a vision of becoming one of the most revered fishing companies worldwide. To-date, Leng Wah Fishery Sdn Bhd owns more than ten (10) units of C1 and C2 fishing vessels. In 2007 the business was fully engaged in deep sea fishing and trading fresh marine products in local markets.

Business Expansion

By the end of 2007, Leng Wah Fishery Sdn Bhd modified their operation structure, from deep sea fishing to serving downstream marine products including frozen seafoods. This transformation has dramatically expanded the business in serving frozen marine and aquaculture products; mostly supplying local markets as well as exporting to Asian countries such as China, South Korea, Indonesia, Thailand, Singapore as well as a few African countries.

Years later, Leng Wah Fishery Sdn Bhd expanded the business to Gopeng, Perak. This branch focuses on trading frozen marine and aquaculture products. In addition, Leng Wah Fishery Sdn Bhd has also developed their own processing facility at their head company for manufacturing fresh and frozen marine and aquaculture products. Whilst the business keeps growing, the company enhanced their facilities in both the head and branch companies in order to have better and more efficient working environment.

Today, Leng Wah Fishery Sdn. Bhd. is recognised worldwide and well-known as one of the largest suppliers, local traders, importers and exporters of Malaysian marine products. Their main goal is to fulfill the market needs and provide the best products along with the best customer services. This is to ensure that the fishery industry is sustainable and successful.

Company Mission, Vision and Core Values

Leng Wah Fishery Sdn. Bhd. has two main missions; first is to provide the best and high quality frozen marine and aquaculture products, and second, to be respected especially in terms of having high values and integrity towards consumers, customers, employees, suppliers and business partners.

Leng Wah Fishery Sdn. Bhd. has set their vision and target to be the most renowned frozen marine and aquaculture products company in Asia that provides high quality and credible products.

Leng Wah Fishery Sdn. Bhd. strongly believes in having core values to sustain the business. The core values of the company are derived from the company's name itself; LENG WAH;

Initial	Core Value	Meaning
L	Loyalty	Building and maintaining loyal relationships with our external business partners and internal team toward achieving success collectively.
E	Excellence	Delivering what the promise and exceeding expectations.
N	Nerve	Courage to embrace every opportunity for greater challenge.
G	Growth	Continuously improve through learning to enhance the quality of performances and constantly improving.
W	Work in Team	Working collaboratively with team and emphasize team over oneself.
A	Accountability	Responsible for the community. Rake responsibility for every decision and actions.
H	Humility	Remain humble in recognizing own strength while also having self-awareness to improve upon weaknesses decision and actions.

Competitive Advantage

The founder's 20 years of experience in deep sea fishing is one of the biggest strengths and core of the company. Mr. Kee Yau Leng has certain skills and knowledge in fishing activities as he himself has been a fisherman since age 15.

In comparison to other fishing companies, this company has received many accreditations, proving Leng Wah Fishery Sdn. Bhd. credibility. The company has been authorized with ten (10) vessel permits; seven (7) permits for trawler and three (3) permits to purse seine fishing vessels. They are also qualified for marine fishing in Zone C2. Fisheries Development Authority of Malaysia (LKIM) has granted both import and export licenses to Leng Wah Fishery Sdn. Bhd. Besides, they also have European Union (EU) approval for landing site in addition to having tuna vessel license.

Leng Wah Fishery Sdn Bhd received its Halal certificate by Department of Islamic Development Malaysia (JAKIM) in 2014. They have also acquired the food safety certification, MeSTI by Ministry of Health (MOH).

Conclusion

To combat the pandemic and its negative impacts on both food supply chain and human well-being, Leng Wah Fishery Sdn Bhd is now focusing on more on natural aquaculture products. An application on refining and modernising fish vessels have been made to Department of Fisheries Malaysia (DOF) in order to ensure the best quality and safety of fish products; with the aim of supplying products both locally and internationally. Despite the COVID-19 pandemic, Leng Wah Fishery Sdn. Bhd. has been resilient and committed in providing fresh, safe and affordable food, create more job opportunities and sustain food supply during monsoon or pandemic seasons.

URBAN FARMERS, CONSUMERS AND THE ELEPHANT IN THE ROOM

Mr. Matt Van Leeuwen

CIO, Sunway Group

Introduction

Mr. Matt van Leeuwen, the Chief Innovation Officer (CIO) of Sunway Group, started his business venture due to his passion in the farming industry and to serve the community. Benchmarking for a competitive advantage maybe the way forward in agriculture. One good country to benchmark with would be the Netherlands.

Netherlands, although it is a relatively small nation, is the second-largest exporter of agricultural produce in world. The use of greenhouse complexes equipped with LED lights is a common sight as it is widely used by the farmers in Netherlands. This practice started about 20 years ago, when the Dutch government wanted to produce twice as much food using only half the resources. This notion was instilled and emphasised into all levels of population; the farmers, the communities, the universities and among the entrepreneurs.

As a result, after 20 years of innovative farming practices, the farmers are cultivating crops in greenhouses, using 90% less water, going towards zero pesticides, with exponential increase in yields. Netherlands now stands as the world's number two exporter of food, second only to the United States, which has 270 times its landmass. The value of Netherland's agricultural product export is close to 100 billion Euro, which is approximately RM500 billion.

With only a fraction of the land available compared to other countries, the question that has always been posed is that how did the Netherlands achieved this? The answer is mainly because of the utilisation of technology. It is important to note that these technologies were actually initiated and developed by the farmers themselves. They invested heavily into research and development to advance their farming practices to extraordinary levels. However, the R&D now is also being carried out by universities such as Wagenigen University & Research (WUR). WUR is located

50 miles southeast of Amsterdam is widely regarded as the world's top agricultural research institution. WUR is the nodal point of Food Valley, an expansive cluster of agricultural technology start-ups and experimental farms.

Urban Farming

Modern agriculture is also known as urban farming or vertical farming. The global vertical farming market is growing at a very rapid phase; it is valued at $3.12 billion in 2020 and is projected to reach $16.77 billion by 2027.

There are many notable advantages that come with urban farming. One of them is it maximises the use of land. Vertical farming for example, allows the farmers to make much better use of space by growing crops in vertically stacked layers, expanding how many crops can be placed in each square foot of space. This will also increase the productivity per unit area. Urban farming also enables the farmers to better match the market demand and tap into growing local food trend. This is possible as the agronomy structure of urban farming can be easily switched to meet the supply-demand needs. Besides, studies show that urban farms use up to 90% less water than traditional farms. In addition, since indoor vertical farms are completely sealed off from the outside environment, there is no need for pesticides or herbicide. This makes urban or vertical farming sustainable and environmentally friendly.

Complex Food Supply Chain

The perks of urban farming make it appealing to develop more urban farms in most local urban centers. However, prior to taking up this venture, there are a few gaps that need to be addressed. The traditional supply chain for fresh produce is complex and opaque. Currently, the fresh produce travels hundreds of miles to reach stores which takes a couple of days, passing through several middlemen along the way. This in turn reduces the freshness and quality of the produce and often increases risks for contamination.

One important element that needs to be addressed is the accessibility to space in urban areas. In Klang Valley and Selangor, there are over 30 million square feet of unoccupied commercial spaces. This is where intervention from the government is important. Government should provide space as a possible incentive for farmers and the relevant stakeholders who are interested in venturing into urban farming.

A lot of people do not know where their food comes from. More than 50% of vegetables are actually being imported from other countries and the consumers do not have the knowledge of how the vegetables are grown and produced. It is important for the consumers to be educated on this aspect. The government can play a more aggressive role here through carrying out structured awareness campaigns in educating the public on this matter.

In the supply-demand chain, the farmers also need to have access to data on the demand perspective, that is what type of food is preferable by the consumers. This in turn can spur further growth in food supply chain ecosystem.

Futurex – Making Farming Smarter

Technology and data can be used to make farming smarter. Sunway FutureX Farm is the first of its kind – urban farm innovation hub, in Malaysia that brings together urban farming professionals, tech companies, researchers and young talents to create transformative solutions focusing on food and latest agricultural technologies.

The idea of a smart urban farm is problem-solution fit. It is all started with a university's notion. Sunway Group have seen a lot of interest from university students who want to build sustainable solutions but there was no platform for them to do so. At the same time, there seems to be many underutilised spaces around the campus, rooftops and others. These places have the potential to be production sites for urban farming.

Year 2020 – pandemic saw the broken supply chain in the food sector right from the farmers to the consumers. In Malaysia, farmers turn to digital platforms to sell their produce. This is where FutureX Farm addresses issues related to food security. FutureX Farm focuses on the delivery of four (4) key objectives – nourish, educate, empower and innovate.

Key Objective	Focus
Nourish	Nourish consumers and businesses with sustainable, clean and fresh produce grown at our urban farms.
Educate	Provide urban farming education to students and communities, nurturing next generation of agri-preneurs and tech farmers.
Empower	Build decentralized farms to enable consumers to be food secure and self-sufficient in their communities.
Innovate	Discover new technology and innovations to impact regional adoption and scale of vertical farming.

To date, FutureX has transformed 350,000 square feet of space into three different farms; hydroponic greenhouses, indoor vertical farms and aquaponics farms. There is no one-size-fits-all when it comes to technology or innovation. Some prefers hydroponics while others swear by aquaponics. The options are actually very much dependent on the farm location, environment, consumers' demand and the amount of investments available.

Over the last nine months, utilising 350,000 square feet of space, FutureX has successfully growing over 60 varieties of vegetables, lettuces, microgreens and herbs. FutureX has produced more than 3,000 kilograms of vegetables involving 550 families who are now subscribers to their farms.

Moving Forward

Sunway Group aims to demonstrate how technology can play an important role across the food value chain to help enhance food security and sustainability. The future of agriculture will not only involve farmers but technology players as well. This will be essential especially in urban areas, where space is scarce but demand for fresh food is high. The COVID-19 pandemic has revealed that our food system especially food supply chain is not as resilient as we believe it to be and it needs to be improved.

This can be done through establishing decentralized farms and production centers that are closer to where people live. If FutureX's model is applied, urban farms will be built five kilometers within the vicinity of residential areas within a period of five years. FutureX believe that through this model, food supply chain can be more resilient and eventually contribute positively to both food safety and security. This, however requires new talents, as it is not just about cultivating and harvesting food but also involves the incorporating of advanced technologies such as the Internet of Things (IoT) and sensors, as well as the collection and analysis of data. To meet the requirement, FutureX has established its own urban farming talent academy involving data scientist, agronomist, farm managers, IoT or infrastructure engineers, software engineers and agri-preneurs. With the government contribution, FutureX envisages to supply 10,000 agri-talents to the industry in next five years.

FutureX has also established their own apprentice program – Agrifood Apprentice Program. This program aims to nurture the next generation of agrifood talents and agropreneurs by providing hands-on experience on sustainable urban farming methods and solving practical real-life urban farm problems.

Conclusion

The Covid-19 pandemic has been a wake-up call for Malaysia's especially in terms of sustaining its food security. Logistical complications have resulted in setbacks such as a temporary lack of food in certain areas while other locations experienced glut or waste. By 2050, there will be nine billion mouths to feed across the globe. Almost 70% of the world population is projected to live in urban areas by then. It is therefore timely to start executing plans for growing more food in urban areas.

RUMINANT INDUSTRY FROM THE INDUSTRY PERSPECTIVE

Dato' Ragu Raman T.P Loganathan

CEO, Ternakan Kamran Sdn. Bhd.

Introduction

Ternakan Kamran Sdn. Bhd. have been actively involved in local livestock industry for more than 40 years. Over the years, the company has evolved from being a small supplier of livestock to the largest importer of livestock such as cattle and sheep. Today, Ternakan Kamran Sdn Bhd business activities has evolved to also encompass feedlot, trading, farming other than having six retail outlets selling meat.

Cattle Business Segmentation

The cattle business comprises of three main activities; breeding/multiplying, feedloting and trading. These activities cover both upstream and downstream segments. The upstream segment starts off with breeding and multiplying. Currently, Ternakan Kamran Sdn Bhd still utilise conventional breeding methods to multiply their cattle.

Breedlot is a crucial program started in livestock farming. This is where the best and healthiest breeder cattle are selected to be further developed as multiplier herd. At the end of the reproductive cycle, breeding cattle will then be sent to slaughterhouses to later cater the fresh meat market. On the other hand, feeder cattle such as steers (castrated males) or heifers (female who have not dropped a calf) mature enough to be placed in a feedlot are selected and then fattened to a certain weight prior to slaughter.

Due to high market demand, livestock are imported from other countries such as Thailand and Australia. One of the modus operandi that Ternakan Kamran Sdn Bhd focuses on is livestock fattening in feedloting phase. Young livestock are brought in from abroad and value-added through the fattening proses domestically. This approach is more cost effective than importing cattle that are fully grown.

To ensure low production cost, high-quality feed livestock feed is produced domestically by Ternakan Kamran Sdn Bhd. Good quality feeds are important to achieve fast growth rate and desirable feed-to-bodyweight-gain ratio. These, in turn, will translate into higher productivity and profitability. Ternakan Kamran Sdn Bhd's livestock feed is organic as they grow the forage themselves and no additive mixture is incorporated into any of the feed given to their cattle. Their standard operational procedures are also closely monitored by the Department of Veterinary Services Malaysia (DVS).

Ternakan Kamran Sdn. Bhd. is also actively involved in the downstream segment of cattle business. This segment involves catering to the local market with live cattle, butchering, carcass distribution as well as selling frozen meats. Ternakan Kamran Sdn Bhd runs their business along the whole value chain of livestock industry, including livestock feeds, to ensure their products are fresh and of high quality. Ternakan Kamran Sdn Bhd has also initiated a new market strategy to ensure that there is sufficient food supply throughout its retail wings and plans to expand this sector to approximately 360 outlets throughout the country.

Current Scenario

In the context of the livestock industry in Malaysia, self-sufficiency level (SSL) refers to the ability of the local production to supply the demand by local consumers and it is measured by percentage. Cattle population in Malaysia is currently around 670,000 heads. Today, the local production of livestock, specifically beef cattle, is only able to supply about 22% of the local consumption. This is approximately 285,000 heads of beef cattle or 43,000 metric ton of meat. Nonetheless, the 22% of beef SSL is actually not 100% supplied from local breeding. 30% of the SSL is contributed by the live feeder cattle importation.

Today, the price of the live cattle stands around RM15 - RM17 per kilogram whereas the proce of the carcass is around RM30- RM33 per kilogram. Both of these categories caters the meat suppliers. The household consumers usually purschase the fresh meat at RM38 per kilogram for solid meat, RM42 per kilogram for sirloin and RM30 per kilogram for ribs. However, the price of meat varies depending on the supply and demand.

Issues and Challenges of Livestock Industry

Currently to meet the local demand, more than 50% of beef is imported. This reveals that there is still a huge potential growth of the nation's ruminant industry. In spite of this, there are four main challenges currently facing the ruminant industry in Malaysia and these are as follows:

- The initial capital to establish the livestock business is relatively high due to the infrastructure set up for breedlot, purchase of local or import breeder cattle, cost of feed materials and cost of veterinary supplies. To reduce some of this cost, government intervention is needed in controlling the prices of the raw materials needed to formulate feed. This intervention is able to reduce the manipulation of feed prices by importers and to thereby stabilise the prices. In addition, the government can also play a more active role in promoting and educating ruminant farmers on modern breeding technologies including farm mechanization and the use of Internet-of-Things (IoT).

- The second challenge in livestock industry is the land use competition. A lot of conventional farming lands have been converted into more productive commercial crop plots such as palm oil, fruits and vegetables cultivation. It is very competitive to get suitable, feasible and viable land area for livestock farming. The way forward maybe for plantation companies to embark on crop-livestock integrated farming in order to cater the needs of pasture area, as carried out successfully by Sawit Kinabalu Sdn Bhd and RISDA Livestock. They are the pioneers in cattle-oil palm integration in selected estates and feedlots all over Malaysia. The cattle provide complementary environmental-friendly biological lawn-mower service to reduce the use of chemical weedicide in estates. To tackle livestock farming land area issue, Ternakan Kamran Sdn Bhd has prepared a blueprint on cattle herd farming program and proposals as well as negotiations have been made to a few government-linked companies (GLCs) to spearhead this program. Ternakan Kamran Sdn Bhd will be the guarantor and offers the companies buy-back guarantee on behalf of the agropreneurs. This program is ready to be launched and executed.

- A friendly financial facility for livestock farmers is very much needed. It is widely acknowledged that financial institutions have been disproportionate in providing financial assistance to agriculture, including livestock industry due to natural hazards, adverse weather conditions or diseases which eventually results in high number of non-performing loans. Intervention by the government is needed to assist in the establishment of a friendly financial facility for livestock farming providing reasonable interest rate, and sufficient grace period with higher approval rates.

- The fourth challenge in livestock industry is manpower. Livestock farming unlike other industries, is dealing with live animals and this venture can be very demanding. Along with passion, effective and efficient skillsets are required at every level of the livestock supply value chain; from breeding and feedloting to carcass and meat distribution. Sufficient manpower is a major setback in livestock industry and this is mainly due to the lack of interest among the youth in this industry. Due to this, most livestock farming companies usually rely on foreign labours. More initiatives should be introduced by the government to attract young capable entrepreneurs to venture into livestock farming.

Conclusion

Livestock is an important sector due to its strategic nature in ensuring national food security, specifically in the supply of protein. In order to increase the productivity, many regulations, initiatives as well as incentives have been introduced by the government to support and safeguard the advancement of livestock industry. However, with the Covid-19 pandemic, new challenges in the livestock industry has emerged. Ternakan Kamran Sdn Bhd, on behalf of other companies in livestock industry, is hopeful that the government will support and place more emphasis towards the livestock industry in mobilising and strengthening the fresh meat market framework especially during the implementation of national Movement Control Order.

TAKE HOME MESSAGES OF THE NATIONAL FOOD SECURITY WEBINAR

The key take home messages from this webinar are as follows:

- Covid-19 pandemic laid bare the frailty of our food system especially in the sectors of the food supply chains. Malaysia also realised its heavy-reliance on imports and foreign labour and this poses a threat to the national food security
- There is an urgent need to place food security at the highest priority level and to come up with a clear and workable food security plan
- Malaysia should be prepared and be ready in overcoming food security crisis and this demands an integrated and holistic approach on crisis preparedness to combat future uncertainties.
- A "whole-of-government strategy" is needed where there should be concerted effort across all agencies and ministries to:
    i. Establish national policies geared towards self-sufficiencies
    ii. Increase the volume of domestically produced food
    iii. Diversify import resources to ensure a continuous supply of foods that cannot be produced locally.
    iv. Support local farmers in their technology adoption to maximise productivity and create a better and more efficient food system
    v. Enhance investment in the agri-tech research and development
    vi. Deploy various strategies to encourage youth to venture into agriculture by providing incentives in terms of providing suitable land, technology etc
    vii. Identify under- utilized urban spaces that can be converted into indoor farms
    viii. Develop and build school curricula in relevant areas of agriculture
    ix. Provide special emphasis and support to small farm holders

- Logistics as an important key to enhancing food security. Logistic supplemented with big data and digital technology can be used to establish an effective logistic chain that can connect farmers to businesses, open up new markets, thereby improving our national food security while enhancing export business
- Additional key elements in making agriculture successful and more resilience is to ensure that:
    i. High quality seeds or breed that are adaptable to the local climate are used for farming
    ii. To have a good and strong business model
    iii. Stay relevant in the market, improve continuously through technology adoption and to always have a competitive edge
    iv. Venture into the area of vertical, complete control environment farming
    v. Emphasise on sustainability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