MINISTRY OF AGRICULTURE AND FOOD INDUSTRIES

NATIONAL AGROFOOD POLICY 2021-2030 (NAP 2.0)

Agrofood Modernisation: Safeguarding the Future of National Food Security

ISBN 978-983-9863-57-4

For further information refer to:
Policy and Strategic Planning Division
Ministry of Agriculture and Food Industries
Level 14, Block 4G1, Wisma Tani
No.28, Persiaran Perdana, Precinct 4
Federal Government Administrative Center
62624 Putrajaya
MALAYSIA

www.mafi.gov.my
Telephone: 603-8870 1155
Fax: 603-8888 8548
Email: sekretariatdan@mafi.gov.my

Released on 24th October 2021
Printed on 30th December 2021

Printed by

My Gogoprint Sdn. Bhd.
Suite 2.03, Level 2
Wisma E&C
No. 2 Lorong Dungun Kiri
Damansara Height
50490 Kuala Lumpur

www.gogoprint.com.my
Telephone: 603-7890 1347

Digital copy can be accessed through

www.mafi.gov.my/penerbitan

NATIONAL AGROFOOD POLICY 2021-2030 (NAP 2.0)

Agrofood Modernisation: Safeguarding the Future of National Food Security

FOREWORD BY

THE PRIME MINISTER OF MALAYSIA

“This policy supports the aspirations and future direction of the national agrofood sector to be more sustainable, resilient and highly technology driven. It aspires to drive economic growth and improves the well-being of the people while prioritising the national food security and nutrition.”

DATO’ SRI ISMAIL SABRI BIN YAAKOB

Bismillahirrahmanirrahim,

Assalamualaikum Warahmatullahi Wabarakatuh,

Salam Keluarga Malaysia,

Alhamdulillah, thanks to the Almighty Allah SWT for His mercy and guidance for the successful publication of the National Agrofood Policy 2021-2030 (NAP 2.0) document. The national agrofood sector has been recording impressive growth for the previous decade.

Despite facing various challenges, the contribution of this sector to the Gross Domestic Product (GDP) has increased by an annual average of 6.8% during the implementation of the National Agrofood Policy 2011-2020.

However, the COVID-19 pandemic affecting the whole world has prompted governments to re-evaluate current policies adjusting to the global scenario and domestic needs.Therefore, to further develop the agrofood sector, NAP 2.0 is formulated as the government's effort to safeguard food security through the transformation of the national food system.

This policy supports the aspirations and future direction of the national agrofood sector to be more sustainable, resilient and highly technology driven. It aspires to drive economic growth and improves the well-being of the people while prioritising the national food security and nutrition.

NAP 2.0 also supports the national development agenda and current policies including Shared Prosperity Vision 2030 (SPV 2030), Malaysia Five-Year Development Plan, National Fourth Industrial Revolution (4IR) Policy and Malaysia Digital Economy Blueprint as well as other sectoral policies.

I am confident that through collaboration between federal government agencies, state governments as well as the support of industry players, the NAP 2.0 objectives can be achieved by 2030.NAP 2.0 will also enable the agrofood sector to remain competitive henceforth contributing to the national economic development, improving the well-being of the people as well as ensuring environmental sustainability. These goals are in line with the principles of the Sustainable Development Agenda 2030 (SDG 2030).

Finally, I call upon all stakeholders to work together in strengthening food security and advancing the modernisation agenda of the national agrofood sector.

#KeluargaMalaysia

#BekerjaBersamaRakyat

PREFACE BY

THE MINISTER OF AGRICULTURE AND FOOD INDUSTRIES

“An efficient and resilient future food system has the potential to increase income of food producers along the food chain as well as be able to provide nutritious and affordable food in line with the core thrust of the national framework for food security.”

DATUK SERI DR. RONALD KIANDEE

The National Agrofood Policy 2021-2030 (NAP 2.0) is holistically formulated to continue the first National Agrofood Policy (NAP) with a focus on the modernisation and development of the agrofood sector as well as enhancing national food security.

NAP 2.0 is formulated from various engagement sessions with multiple stakeholders such as Government agencies, academicians, industry representatives, non-governmental organisations (NGOs) and the general public.

Current issues and challenges have been considered in the process of formulation including the need for food system transformation to ensure the agrofood sector remains significant and relevant in the national socio-economic development. An efficient and resilient future food system has the potential to increase income of food producers along the food chain as well as be able to provide nutritious and affordable food in line with the core thrust of the national framework for food security.

To support the aspirations of NAP 2.0, a policy framework has been established by incorporating economic, social and environmental elements as key principles. In summary, five (5) policy thrusts have been formulated with emphasis on modernisation and smart agriculture; strengthening market and product access; human capital development; food system sustainability; as well as creating condusive business ecosystems and governance.

Food security will continue to be given emphasis through strengthening of four (4) key sub-industries of the agrofood sector. The main goals of the strategies under the key sub-industries which include paddy and rice; fruits and vegetables; livestock; as well as fisheries and aquaculture are to increase the self-sufficiency level (SSL) of each commodity and income of the target group.

To achieve the goals, the application of modern technology is required to drive the development of agrofood sector to increase productivity in line with the Industrial Revolution 4.0 (IR4.0). In addition, the agrofood sector needs participation from competent youths and the Government’s commitment to increase private investment in high-impact projects.

In support of the implementation of NAP 2.0, dedicated action plan has been formulated for each strategy outlined, setting specific outcomes and targets to bring greater impact on the livelihoods of the rakyat. All the initiatives will be implemented within the stipulated timeframe by optimising the efficient use of resources. Therefore, I urge all stakeholders to support the Government's efforts in the implementation of NAP 2.0.

Finally, I would like to express my utmost appreciation to all stakeholders involved in the formulation of NAP 2.0 and hope that the cooperation and networking established can be pursued further in the implementation of this policy to drive the modernisation of the national agrofood sector.

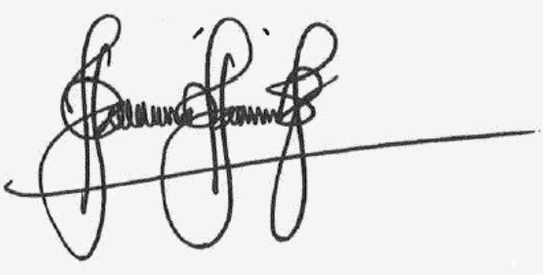
#KeluargaMalaysia

#BekerjaBersamaRakyat

INTRODUCTION BY

THE SECRETARY GENERAL OF THE MINISTRY OF AGRICULTURE AND FOOD INDUSTRIES

“This policy will be an inspiration and motivating factor to the private sectors and industry players to collaborate with the Government in spearheading the development of the agrofood sector towards a competitive and modern sector and subsequently ensuring the success of NAP 2.0.”



DATO’ HASLINA BINTI ABDUL HAMID

National Agrofood Policy, 2021-2030 (NAP 2.0) is formulated with a vision to develop a sustainable, resilient and technology-based agrofood sector in driving economic growth, improving the well-being of the people as well as prioritising food security and nutrition.

This vision has been translated into the policy statement based on three main principles of sustainable development, namely economic, social and environment. This resolution is in line with the national development agenda and global goals as aspired in the Shared Prosperity Vision 2030 (SPV 2030) and Sustainable Development Goals 2030 (SDG 2030) respectively.

The implementation of NAP 2.0 is driven by 6 policy objectives, supported by 5 policy thrusts, 21 strategies and 77 action plans that will be realised through various departments and agencies over a period of 10 years up to 2030. The policy thrusts include embracing modernisation through smart agriculture and intensification of research, development, commercialisation and innovation (R&D&C&I) activities, strengthening the agrofood product value chain for domestic and international markets, developing talent and skilled manpower, advancing towards sustainable agricultural practices and creating conducive business ecosystem including land use, finance, infrastructure, investment and governance.

At the same time, NAP 2.0 also focuses specifically on 4 sub-industries including paddy and rice, fruits and vegetables, livestock as well as fisheries and aquaculture through the implementation of 18 strategies and 58 action plans. The strategies will focus on high value activities along the food value chain that would be able to generate higher income to the target groups and improve the socioeconomic status of farmers, breeders, fishermen and agropreneurs.

Hence, the aspiration of NAP 2.0 will be achieved with the support of all stakeholders involved. I hope that this policy will be an inspiration and motivating factor to the private sectors and industry players to collaborate with the Government in spearheading the development of the agrofood sector towards a competitive and modern sector and subsequently ensuring the success of NAP 2.0.

#KeluargaMalaysia

#BekerjaBersamaRakyat

Preface: Introduction to Policy Document

The following details out the structure of the Policy Document. The Policy Document is presented in 4 parts:

Part A – National Aspiration for Malaysia Agrofood Sector **This section of the policy document introduces the 2030 goals of NAP 2.0**	
Chapter 1	2030 Aspiration for Malaysia Agrofood Sector
This chapter seeks to describe Agrofood Sector goals set to be achieved by 2030	
Part B – Industry Landscape **This section of the policy document introduces the past performance of both global agriculture industry and Malaysia Agrofood Sector, main bottlenecks that hinders industry development, key themes by each editions of Malaysia's agrofood policies, and highlights other relevant national policies related to agrofood sector**	
Chapter 2	Review of Agrofood Sector 2011-2020
In this chapter, the performance of agrofood sector from 2011 until 2020 is assessed in order to lay out the landscape of the industry prior to the inception of NAP 2.0	
Chapter 3	Issues and Challenges
This chapter presents the issues and challenges faced by the agrofood sector on a global context and Malaysia's context	
Chapter 4	Evolution of NAP, and its Relation to Other National Policies
This chapter looks into the focuses of each editions of Malaysia's agrofood policies up until NAP 2.0, and identifies relevant national policies that are associated with the development of agrofood sector	
Part C –NAP 2.0 Strategies and Action Plans **This section of the policy document presents details the strategies and action plans contained within NAP 2.0**	
Chapter 5	National Agrofood Policy 2.0
This chapter seeks to provide the policy framework, implementation structure, along with strategies and action plans for the 5 policy thrusts as well as 4 subsectors	
Chapter 6	Governance Structure
This chapter will describe the governance structure and implementation framework for the execution and monitoring of NAP 2.0	
Part D - Way Forward **This section of the policy document describes the future landscape of Malaysia agrofood Sector, as derived from industry 2030 goals, past performance, issues and challenges, and strategies and action plans of which will serve to drive the industry forward**	
Chapter 7	Conclusion
This chapter presents the concluding segment of NAP 2.0	

Table of Contents

Table of Contents

List of Figures

List of Figures

List of Figures

List of Figures

List of Tables

List of Tables

Acronyms & Abbreviations

3D	Dirty, Dangerous and Difficult
AB	Bahagian Antarabangsa
AgF	Agriculture Flagship
AGP	Antimicrobials Growth Promoter
B40	Bottom 40%
BDI	Bahagian Pembangunan Perniagaan dan Pelaburan
BIMAT	Bahagian Industri Makanan dan Asas Tani
Bioeconomy	Malaysian Bioeconomy Development Corporation Sdn Bhd
BLKP	Bahagian Latihan Kemahiran Pertanian
BPEM	Bahagian Pembagunan
BPKLP	Bahagian Pembangunan Kapasiti dan Latihan Pertanian
BPM	Bahagian Pengurusan Maklumat
BPP	Bahagian Pemodenan Pertanian
BPSM	Bahagian Pengurusan Sumber Manusia
BPSP	Bahagian Pengairan dan Saliran Pertanian
CAGR	Compound Annual Growth Rate
COVID-19	Coronavirus Disease 2019
CRISPR-Cas9	Clustered Regularly Interspaced Short Palindromic Repeats and Associated Protein 9
DID	Department of Irrigation and Drainage
DNA	Deoxyribonucleic acid

DOA	Department of Agriculture Malaysia
DOF	Department of Fisheries Malaysia
DOSM	Department of Statistics Malaysia
DPS	Bahagian Dasar dan Perancangan Strategik
DSD	Department of Skills Development
DVS	Department of Veterinary Services Malaysia
e.g.	exempli gratia
EEZ	Exclusive Economic Zone
EPP	Entry Point Projects
etc	et cetera
FAMA	Federal Agricultural Marketing Authority
FAO	Food and Agriculture Organisation of the United Nations
FLI	Food Loss Index
FMD	Foot and Mouth Disease
FWI	Food Waste Index
GDP	Gross Domestic Product
GFSI	Global Food Security Index
GHG	Greenhouse Gases
GOF	General Operations Force
Ha	Hectare

Acronyms & Abbreviations

HVC	High Value Commodities
IADA	Integrated Agricultural Development Area
IAS	Invasive Alien Species
IoT	Internet of Things
IPB	Bahagian Industri Padi dan Beras
IR 4.0	Industrial Revolution 4.0
IT	Information Technology
ITTP	Bahagian Industri Tanaman, Ternakan dan Perikanan
JAS	Department of Environment
JMG	Department of Mineral and Geoscience Malaysia
JPBD	Federal Department of Town and Country Planning
KADA	Kemubu Agricultural Development Authority
KASA	Minister of Environment and Water
KBS	Ministry of Youth and Sports
KeTSA	Ministry of Energy and Natural Resources
Kg	Kilogram
KPDNHEP	Ministry of Domestic Trade and Consumer Affairs
KPKT	Ministry of Housing and Local Government
KPLB	Ministry of Rural Development
KPWKM	Ministry of Women, Family and Community Development

LKIM	Fisheries Development Authority of Malaysia
LPNM	Malaysian Pineapple Industry Board
LPP	Farmers' Organisation Authority
MABIC	Malaysian Biotechnology Information Centre
MADA	Muda Agricultural Development Authority
MAF SABAH	Kementerian Pertanian & Perikanan Sabah
MAFI	Ministry of Agriculture and Food Industries
MANRED	Ministry of Modernisation of Agriculture, Native Land and Regional Development
MAQIS	Malaysian Quarantine & Inspection Services
MARDI	Malaysian Agricultural Research and Development Institute
MATRADE	Malaysia External Trade Development Corporation
MCS	Monitoring, Control and Surveillance
MEDAC	Ministry of Entrepreneur Development and Cooperatives
MIDA	Malaysian Investment Development Authority
Mil	Million
MITI	Ministry of International Trade and Industry
MOE	Ministry of Education
MOF	Ministry of Finance
MOFA	Ministry of Foreign Affairs
MOH	Ministry of Health

Acronyms & Abbreviations

MOHA	Ministry of Home Affairs
MOHE	Ministry of Higher Education
MOHR	Ministry of Human Resources
MOSTI	Ministry of Science, Technology and Innovation
MOT	Ministry of Transport
MOTAC	Ministry of Tourism, Arts and Culture Malaysia
MPA	Marine Protected Areas
MPIC	Ministry of Plantation Industries and Commodities
MPOB	Malaysian Palm Oil Board
MT	Metric Tonnes
MyCC	Malaysia Competition Commission
myGAP	Malaysia Good Agricultural Practices
MyIPO	Intellectual Property Corporation of Malaysia
myOrganic	Malaysian Organic Certification Scheme
NAP	National Agrofood Policy
NGO	Non-Governmental Organisation
No.	Number
NSWMD	National Solid Waste Management Department
NTM	Non-tariff measure
O&M	Operation and Maintenance

PBN	Pihak Berkuasa Negeri
PBT	Local Authorities (Pihak Berkuasa Tempatan)
PKC	Palm Kernel Cake
PP	Pertubuhan Peladang
PPN	Pertubuhan Peladang Negeri
PPP	Public-Private Partnership
Proj.	Projected
PSD	Public Service Department Malaysia
PUU	Pejabat Penasihat Undang-undang
PWD	Persons with Disabilities
R&D	Research and Development
R&D&C&I	Research and Development and Commercialisation and Innovation
RM	Ringgit Malaysia
RMK	Rancangan Malaysia
ROI	Return of Investment
SCP	Sustainable Consumption and Production
SDG	Sustainable Development Goals
SME	Small and Medium-Sized Enterprise
SSL	Self-Sufficiency Level
TFP	Total Factor Productivity

Acronyms & Abbreviations

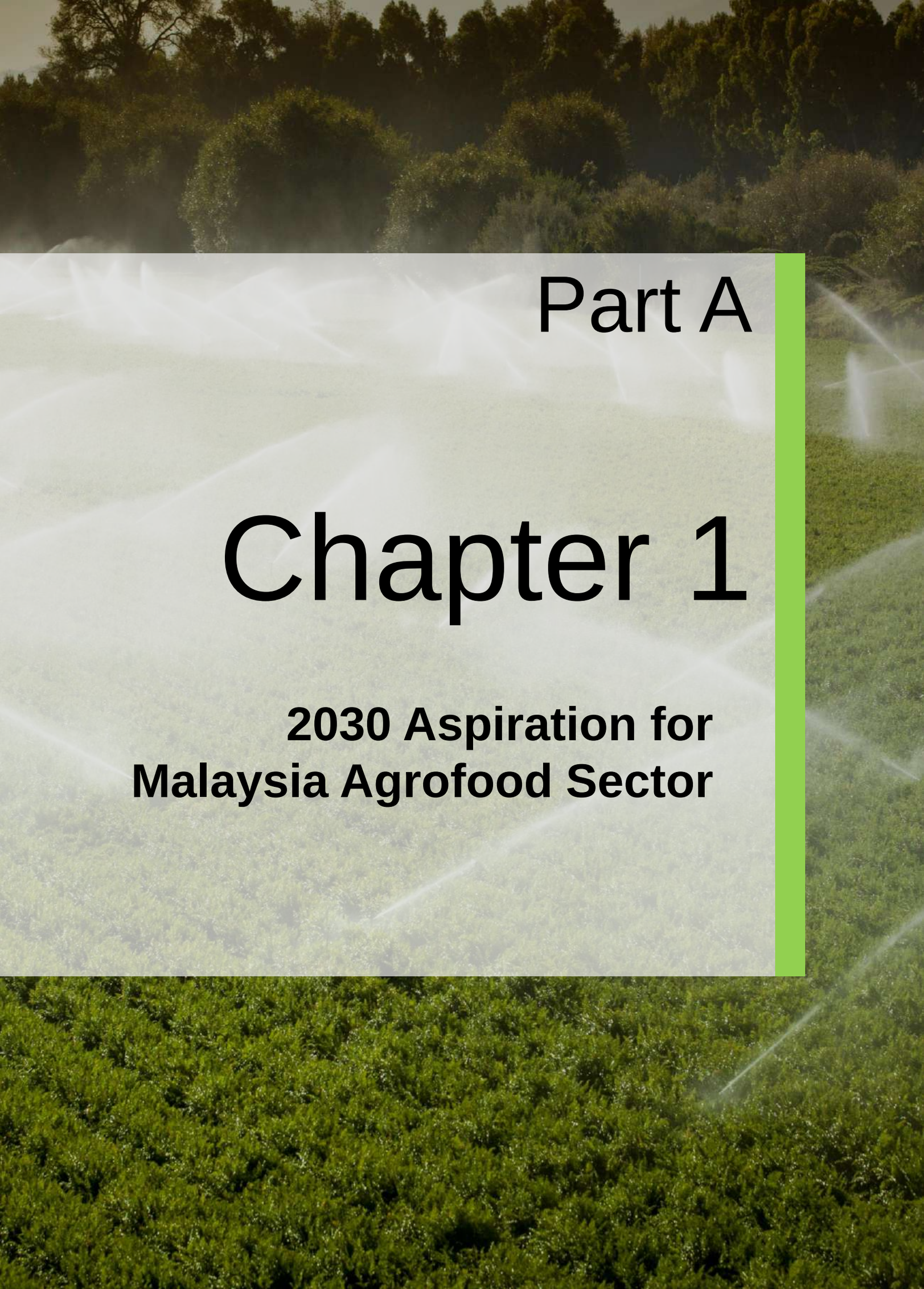
TKPM	Taman Kekal Pengeluaran Makanan
TOL	Temporary Occupation License
TVET	Technical and Vocational Education and Training
UKK	Unit Komunikasi Korporat
UN	United Nation
USDA	United States Department of Agriculture
TKPM	Taman Kekal Pengeluaran Makanan
TOL	Temporary Occupation License
TVET	Technical and Vocational Education and Training
UKK	Unit Komunikasi Korporat
UN	United Nation
USDA	United States Department of Agriculture

Definition of Terms

Agricultural land	Agricultural land is designated land for the purpose of agricultural, livestock, plantation and fisheries activities.
Agriculture Drainage	Refers to drainage that serves to remove/channel/discharge excess water from lots/sites/agricultural areas to lower/downstream areas.
Agriculture Irrigation	Irrigation: purposely providing land with water, other than rain, for agricultural purposes.
Agriculture Water Resource	A renewable water resource that can be obtained naturally for agricultural activities. These include rivers, lakes, freshwater wetlands, rain, glaciers and groundwater that are either directly channel or treated for agriculture use.
Agrofood Sector	The agricultural sector that involves food production activities comprising industries such as paddy and rice, vegetables and fruits, fisheries and aquaculture, livestock, food industry, agro-based industry and herbal industry.
Agropreneur	Those who involve in business related to the agricultural sector or the food and agro -based industry including micro, small and medium enterprises.
Cash Crop	Refers to short term crop that can be harvested within three to six months after planting for the purpose of generating income. Examples: sweet corn, cassava, sweet potato, yam, sugarcane, peanuts and other short term crops.
Farmer	A person who cultivates land for activities such as crop, livestock or fisheries.
Farmer (Big scale/Registered Area Farmer's Organisations member)	Registered member under Area Farmer's Organisations and involved in agricultural activities.
Farmer (s) (small to medium scale)	A person or group of people who cultivate activities other than paddy in the farm.
Fisherman	Those who engage in fishing activities whether sea or inland fishermen (lakes, rivers, or other places related to fishing activities) for commercial or subsistence purposes.
Food Industries	Refers to the range of activities involved in the food manufacturing and preparation industry including processing, preserving, packaging and marketing activities. In general, the raw materials used are source from agricultural activities such as crops, livestock, fisheries and aquaculture.
Agrofood Producers	A person who is involved in food production in the upstream of the value chain. This includes farmers, fisherman and livestock breeders.
Food security	Food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life.
Food Supply Chain	A food supply chain or food system refers to the processes that describe how food from a farm ends up on our tables. The processes include production, processing, packaging, storage, distribution, consumption and disposal to ensure safety and quality of food products through efficient and effective means.
Food System	The food system is a complex web of activities involving the production, processing, transport, and consumption.

Definition of Terms

Food Value Chain	A ‘value chain’ in agriculture identifies the set of actors and activities that bring a basic agricultural product from production in the field to final consumption, where at each stage value is added to the product. A value chain can be a vertical linking or a network between various independent business organisations and can involve processing, packaging, storage, transport and distribution.
High Value Agriculture	High value agriculture refers to the production of agriculture products which have specific market demands (niche market) and have the potential to be developed such as stingless bee honey, bee honey, mushrooms, coffee, floriculture, herbs, spices, swiftlet/edible birds nests, aquaculture, ornamental fish, seaweed and other commodities including from local biodiversity that has the potentials as well as those yet to be identified.
Intercropping	Intercropping is the practice of planting more than one type of crop in one area to obtain maximum yield and increase farmers' income. The main crop is a permanent crop while the second crop is a short term crop (cash crop).
Livestock breeder	A person or group of people who breed animals, birds or fish and engaged in production activities for commercial or subsistence purposes.
Malaysian Fisheries Waters	Means maritime waters under the jurisdiction of Malaysia over which exclusive fishing rights or fisheries management rights are claimed by law and includes the internal waters of Malaysia, the territorial sea of Malaysia and the maritime waters comprised in the exclusive economic zone of Malaysia.
Paddy Farmer(s)	A person or group of people who cultivate paddy in a paddy field.
Precision Farming	Refers to the application of modern information technologies to provide, process and analyse multisource data of high spatial and temporal resolution for decision making and operations in the management of crop production.
Smart Farming	Smart Farming refer to the wide use and integration of high technology that is environmentally friendly in farming activities, in order to increase quantity and quality of domestic harvests.



Part A

Chapter 1

2030 Aspiration for Malaysia Agrofood Sector

1.0 2030 Aspiration for Malaysia Agrofood Sector

1.1 Malaysia Agrofood Sector

Food system plays a crucial role in any functioning human society, as it caters to the demand of daily nutritional intakes which is one of the basic physiological needs for human survival. Similar to any other nations, Malaysia's food system operates upon the foundation of agrofood sector, of which is characteristically intricate with a complex web of interaction between multiple actors, each with varying profiles, responsibility, interest, and expertise. Its function as an industry of food production, has its impacts cascade down onto the economic, social, and environmental aspect of a nation. The economic and social impact of the sector is evident where in 2019 the industry employs approximately 500,000 people (~4.00% of total workforce), contributes ~3.50% to the total national GDP, and has a total land use of 5.63 million Ha accounting for approximately 17% of total land area of Malaysia.

With the world economy transitioning into an ever dynamic and competitive landscape, whilst experiencing the stresses of a global pandemic which had and will further disrupt economic activities as well as individual livelihood, the state of food security is now one of the centerpiece that will strongly influence a nation's long term development. Thereby, the Malaysian government has determined to enhance its food security level by further developing the agrofood sector, from a multifaceted point of view; economic, social, and environment.

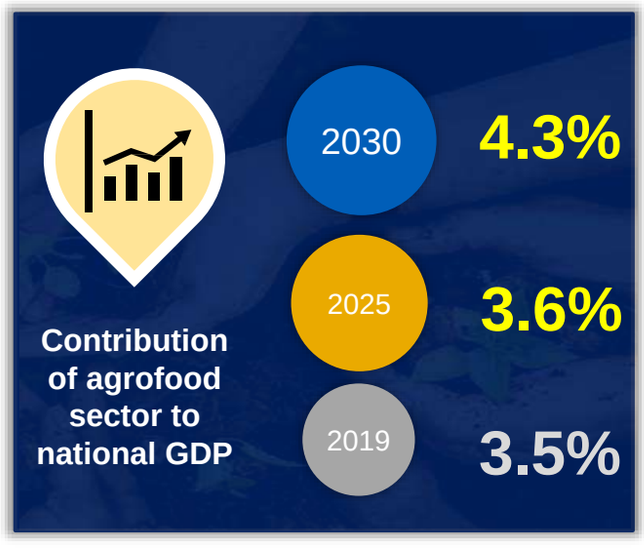
As the term of the National Agrofood Policy 1.0 (NAP 1.0) has ended in year 2020, thereby the Ministry of Agriculture and Food Industry (MAFI) has developed the National Agrofood Policy 2.0 (NAP 2.0) as a succeeding national policy document which lays down the development pathway of the agrofood sector for the period 2021 – 2030. This policy is targeted to explore new focused areas and mitigation measures to enhance the agrofood sector's economic contribution, competitiveness, inclusiveness, sustainability, as well as its resilience to shocks of detrimental global events.

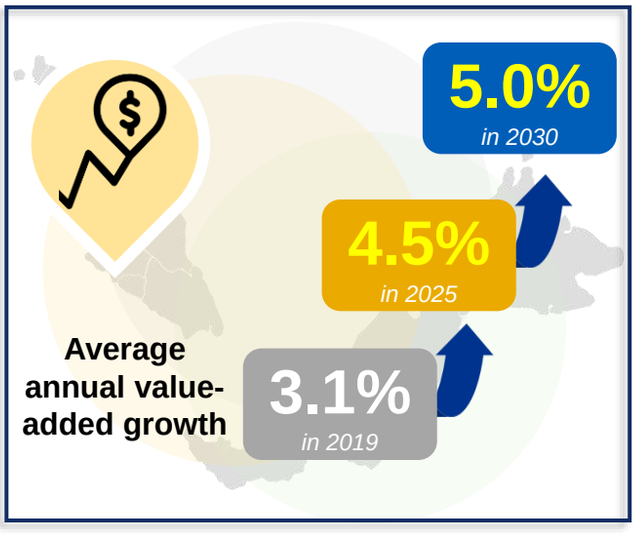
1.0 2030 Aspiration for Malaysia Agrofood Sector

1.2 Malaysia Agrofood in 2030

Economic Contribution

Growth of economic performance is emphasised upon as it is strongly linked to a better functioning of an industry to produce the intended output. In the context of agrofood sector, such improvement would lead to greater food security, greater resource use efficiency, increased business vitality, growth of employment opportunity, diversification of national revenue base, contribution towards national food trade, to name a few key reasons. In NAP 2.0, the adopted indicators/elements for measurement of economic performance are; contribution of agrofood sector to national GDP, average annual value-added growth, food trade balance CAGR, and food loss.





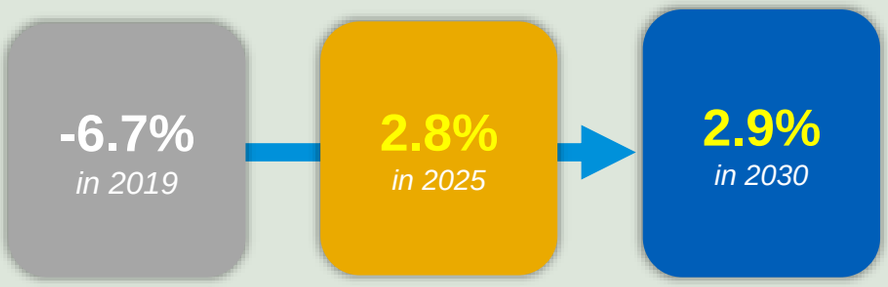
The contribution of agrofood sector to national GDP (%) is an indicator which measures the agrofood economic sector's share over the total national GDP, as the total value of Agrofood production increases its economic contribution would generally be increased. At 2019 the agrofood sector has contributed a share of 3.5% to national GDP, with the figure targeted to increase to 3.6% (+0.1%) and 4.3% (+ 0.8%) by 2025 and 2030 respectively. As for average annual value-added growth, the goal set forth for agrofood Industry is to achieve 4.5% (+1.4%) in 2025 and 5.0% (+1.9%) in 2030, from the baseline percentage of 3.1% in 2019. Value added growth in this context, is the measurement of contribution by agrofood sector towards the national economy after adjusting the impact of subsidies and taxes on related products.

These two indicators are typically utilised to measure the extent of an industry's contribution towards a greater economy of a country, on a national level. Thereby by increasing agrofood sector's achievement based on these two metrics it would improve its foothold as one of the important economic sector in driving the future development of Malaysia.

1.0 2030 Aspiration for Malaysia Agrofood Sector

Economic Contribution *(continuation)*

Food Trade Balance CAGR



Food trade balance CAGR is an indicator which measures the difference, surplus or deficit, between the export and import of agrofood products in Malaysia.
In 2019, the food trade balance has a CAGR of -6.7%. It is then targeted that in 2025 and 2030, the food trade balance in Malaysia will achieve a CAGR of 2.8% and 2.9% respectively, primarily through the means of increased export volume and export value. By reversing food trade balance from negative to a positive figure, it would have a beneficial impact on the national balance sheet and a greater standing in global food trade.

Food loss

Food loss is the decrease in the quantity or quality of food resulting from decisions and actions by food suppliers in the chain, excluding retailers, food service providers and consumers. Food loss would occur during the post harvest, production, post production and distribution phases of the value chain. To put a numerical value to these loss for analysis, the Food Loss Index (FLI), is an index which provides loss estimates along the entire value chain excluding retail stage. It is important to address food loss as it would lead to an increase of resource use efficiency in the value chain.

Currently, the agrofood sector is experiencing incidents of food loss, particularly in post harvest and food processing stages, that hampers the value chain efficiency. This means that the ratio between input volume (e.g. farming inputs, cultivation cost, labour cost) is more than the output volume (e.g. the amount harvested and amount of food produced) are unfavourably skewed, which indicates a room for higher efficiency. While such improvement has proved to be a challenge due to the multi-faceted nature of agrofood sector, nevertheless the lower the food loss the closer the value chain is to perform at maximum efficiency.

1.0 2030 Aspiration for Malaysia Agrofood Sector

Social Wellbeing

The Malaysia agrofood sector aspires to improve the social wellbeing of the people, from the standpoint of socio-economic, inclusivity, and food availability. Such focus is reflected in the adopted key indicators/elements which consist of; income level of agrofood sector, local participation in agrofood, food waste, and self sufficiency level (SSL) of major food commodities. With these key indicators/elements in place, it would assist in measuring the industry's ability to provide employment prospects for a better livelihood, participation opportunities for all facets of society, and supply of food to the people.

Income Level of Agrofood Sector

Income level of agrofood Industry can be defined as the monthly revenue of players across the agrofood value chain, which includes food producers, food processors, wholesalers, retailers, etc. In this document, heightened emphasis will be placed upon increasing the income level of food producers as the majority of the individuals remains within B40 category. The cascading of increased economic contribution into actual improvement of income level is key to support the long term development of the industry. With greater income, it could potentially elevates the general livelihood of Agrofood players and further attract the interest of more diverse demographics, younger generations in particular, to participate in the industry.

Local Participation in Agrofood

Local participation in the agrofood sector will look to be increased, through providing higher employment, recreation, education, and communal farming opportunities. These opportunities will contribute towards strengthening of the linkage between agrofood sector and the general population, be it as value chain players or end consumers, via multiple channels. A stronger relationship would contribute greatly towards the sharing of responsibility of national food security, with the wider public members, where the entire nation is able to act and respond as one cohesive unit against the challenges of agrofood sector.

1.0 2030 Aspiration for Malaysia Agrofood Sector

Social Wellbeing *(continuation)*

Food Waste and Food Nutritional Quality

Food waste refers to the decrease in the quantity or quality of food resulting from decisions and actions by retailers, food service providers and consumers. The Food Waste Index (FWI) is used to provide estimates on the food wasted at the retail and consumption levels, to monitor the progress of food waste reduction. Malaysia's agrofood sector will emphasis on increasing efforts to reduce food waste through initiatives that look to establish a more sustainable patterns of food consumption and management. Whereas improvement of food nutritional quality will look to provide higher tangible value and intangible value towards the national food system, raising the welfare of both food producers and food consumers. Reducing food waste and improve food nutritional quality are part of the crucial aspects to be focused upon as the agrofood sector develops, because of its potential social benefits where more food products that meets greater dietary needs could be remained and produced within the food system for actual human consumption.

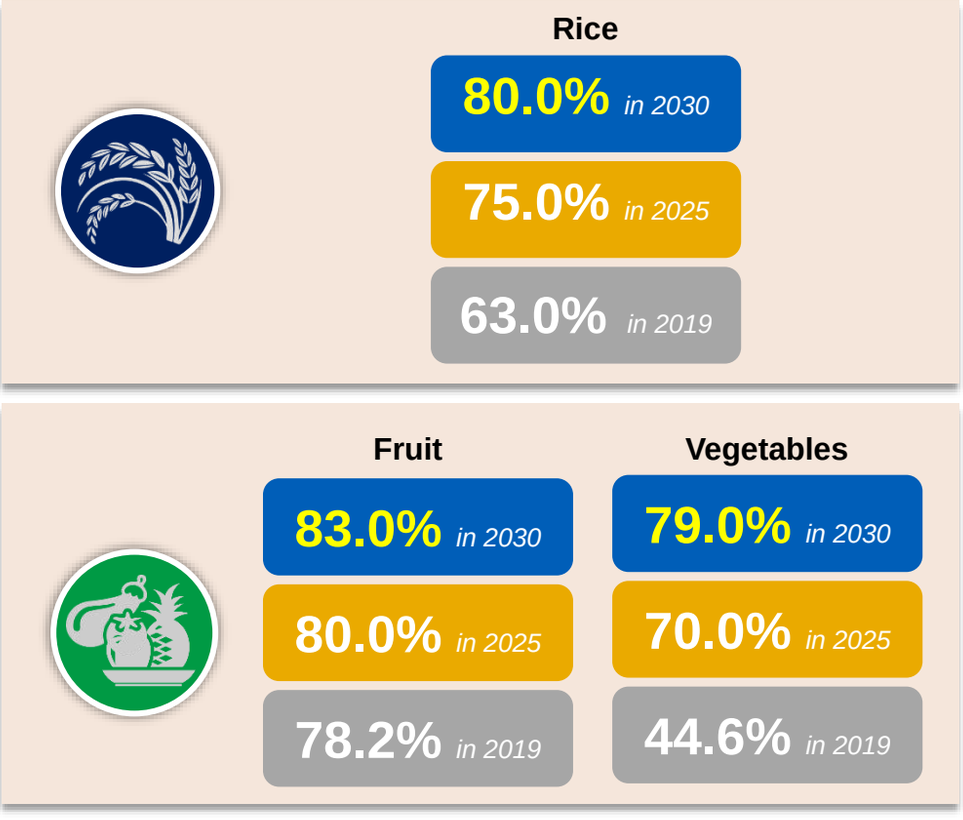
1.0 2030 Aspiration for Malaysia Agrofood Sector

Self Sufficiency Level (SSL)

Self sufficiency level is a major component of food security and functions as an indicator to measure a country's ability to satisfy its food needs from its own domestic production. The government of Malaysia has set SSL targets for major food commodities to achieve by 2030. The SSL targets are moving targets that need to be actively monitored and managed.

SSL acts as a shield in times of adversity. In the event of a global crisis or a global shortage of food due to drought or climate change resulting in supply chain disruptions, the focus would normally be shifted to SSL, as the greater the SSL for a given food commodity, the lesser the reliant on international import thereby mitigates the impact of adverse events as mentioned. SSL targets could be repositioned as situation develops so that resources can be varied or diverted accordingly to achieve the nation's food security.

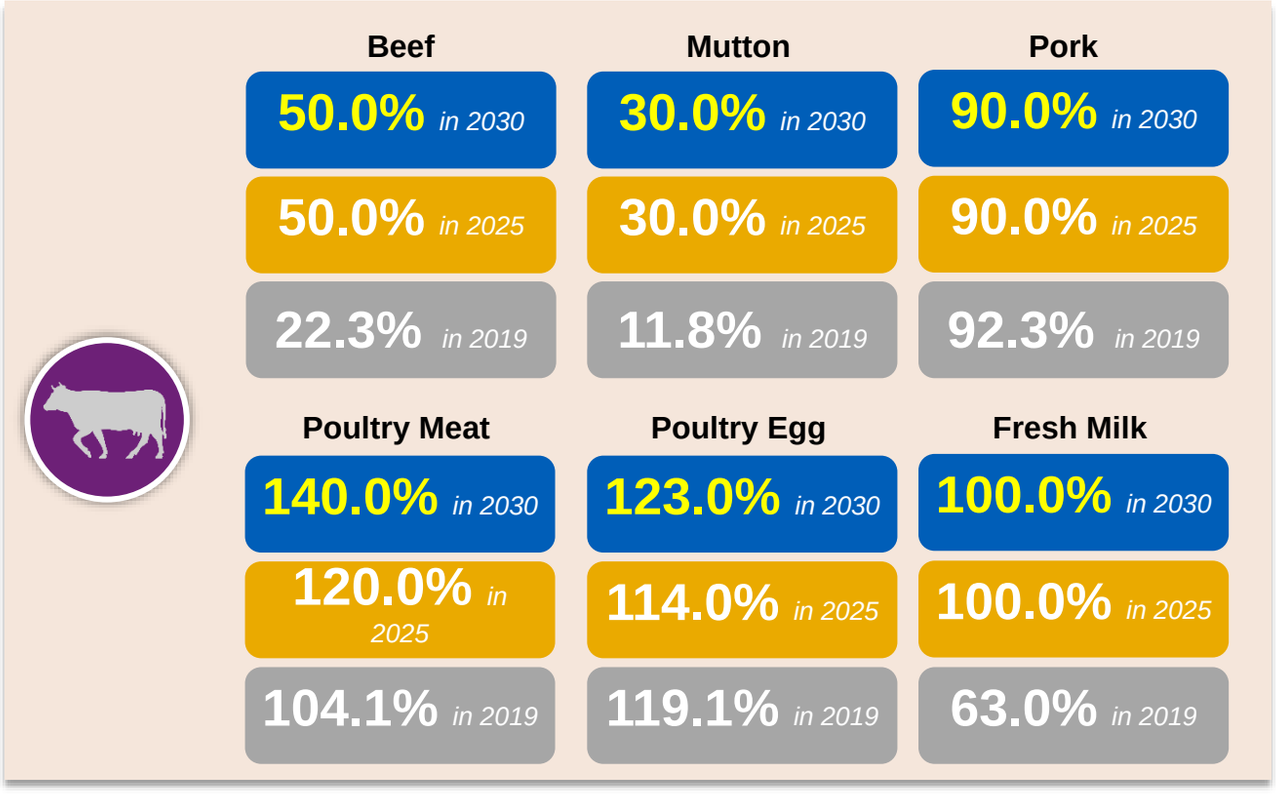
As of now, the SSL target of Malaysia's rice production has been set to 75% in 2025 and 80% in 2030, which is a target of 17% increase from 2019 to 2030. An increase of 4.8% SSL from 78.2% in 2019 to 83.0% 2030 has been set for fruit production. The SSL target of vegetables production by 2030 is 79.0%, 34.4% increase from 2019.

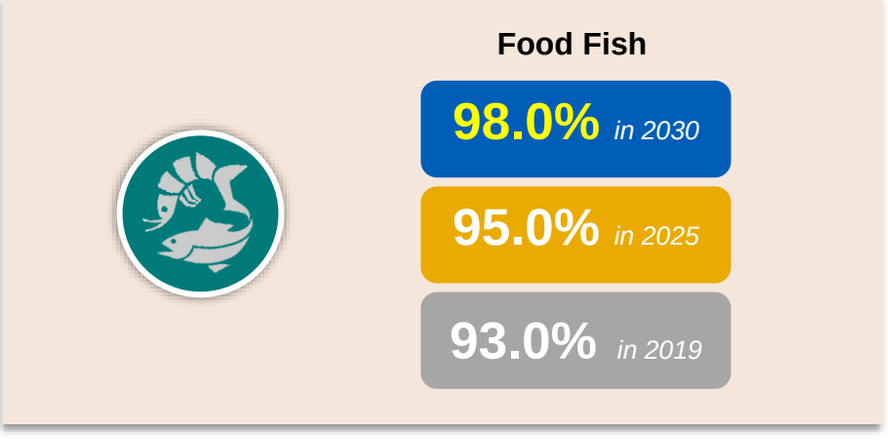


1.0 2030 Aspiration for Malaysia Agrofood Sector

Self Sufficiency Level (SSL) *(continuation)*

The SSL target has also been set for livestock and food fish commodities. Within the livestock commodities, the SSL target by 2030 is 50% for beef, 30% for mutton, 90% for pork, 140.0% for poultry meat, 123.0% for poultry egg, and 100% for fresh milk. The SSL target for food fish is 98.0% by 2030, an increase of 5.0% from 2019.





1.0 2030 Aspiration for Malaysia Agrofood Sector

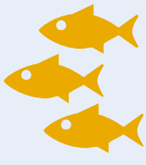
Environment

An agrofood sector that is primed for a long term development does not focuses merely on with economic contribution and social wellbeing, but also its environmental aspect. If such element is left unmanaged over the course of industry development, it would risk occurrences of environmental degradation such as air pollutions, habitat destruction, and biodiversity concerns, which stems from non-environmental friendly farming activities. Therefore, it is highly important to regulate farming operations that in a manner that would minimise its negative impact to the surrounding environment, up to a level that is deemed to be of sustainable. To enhance the environmental elements of agrofood sector, the following indicators will also be used to access the sector in the following 10 years;

Agrofood GHG

Similar to most industries, agrofood sector produces greenhouse gases (GHG) as one of the waste emission from processes such as management of agricultural soils, production, livestock breeding, biomass burning, etc. Due to the adverse effects of GHG on the environmental and living quality, the measurement of GHG emission from agrofood activities is important to gauge the degree of its harmonious co-existence with its surroundings. The emission of GHG in Malaysia will look to be curbed by facilitating improvements on production efficiency and adoption of sustainable practices. The end goal would be to reduce the emissions of gases per unit of food produced, thereby lessens the carbon footprint of the agrofood sector. Specific GHG reduction targets shall refer to National Determined Contributions (NDC) and National Adaptation Plan (NAP), or any other relevant documents prepared by the country.

Fish Stock Management



Management of fish stock over a sustainable level is an essential practice to protect the longevity of the fisheries subsector and eco-system, as well as to secure the long term supply of fish products for human consumption. This is one way to conserve the natural resources for further development and the future of the agrofood sector. By adopting this indicator would assist in future monitoring, surveillance, and controlling efforts of marine ecosystem and mitigate the risk of further depletion of coastal resources.

Biodiversity

Biodiversity includes the variability among living organisms and the ecological system, diversity within species, between species and of ecosystems. It is an important elements that contributes to the well-functioning of agrofood sector, as it helps in the continual supply of natural resources (water, soil), as well as regulating natural processes needed for agrofood activities. Therefore, biodiversity in Malaysia will look to be protected externally and internally by enhancing adoption of farming practices that acts against external threats such as invasive alien species, and better protection of environmentally sensitive areas through strengthening agrofood planning and practices.

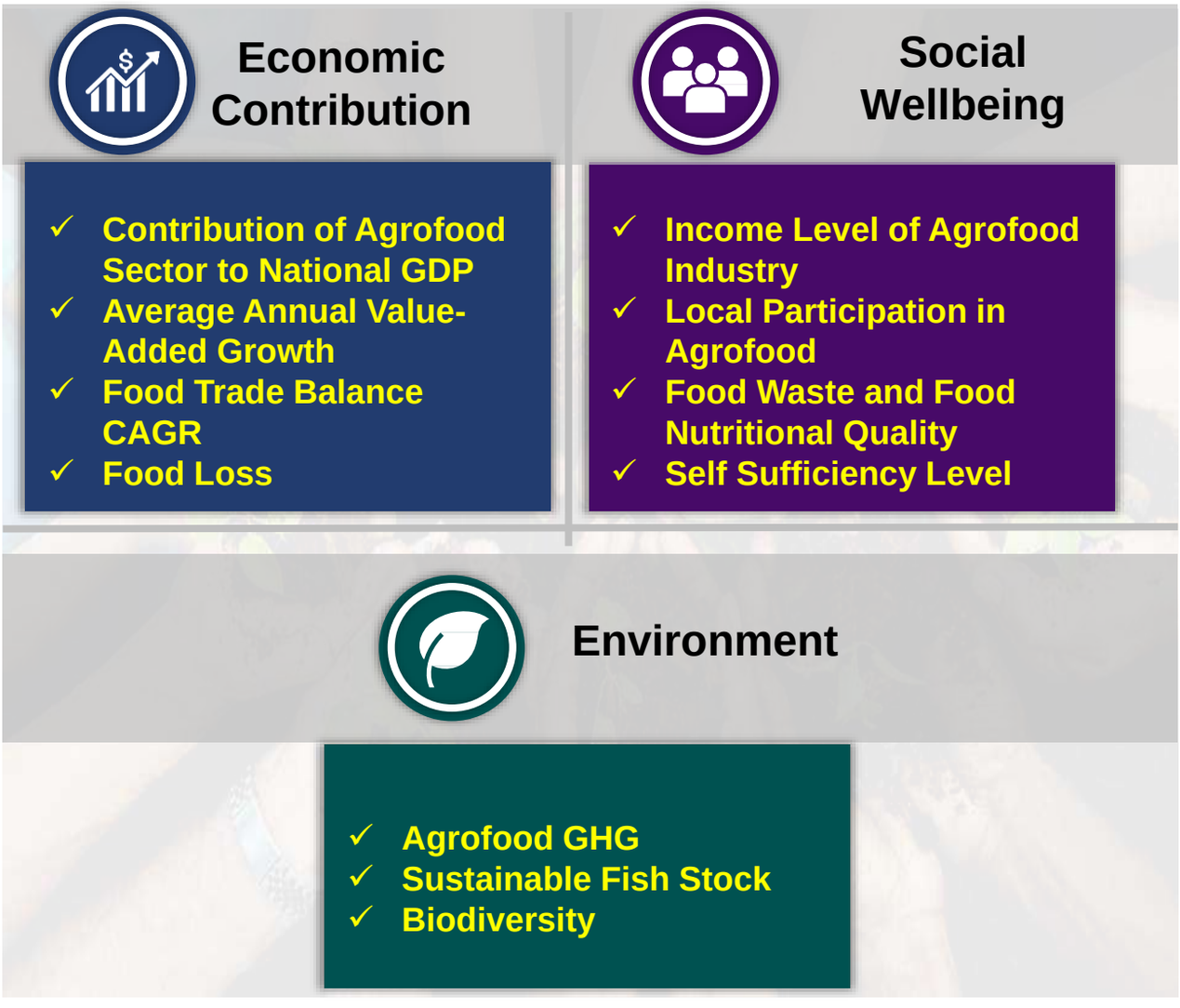
1.0 2030 Aspiration for Malaysia Agrofood Sector

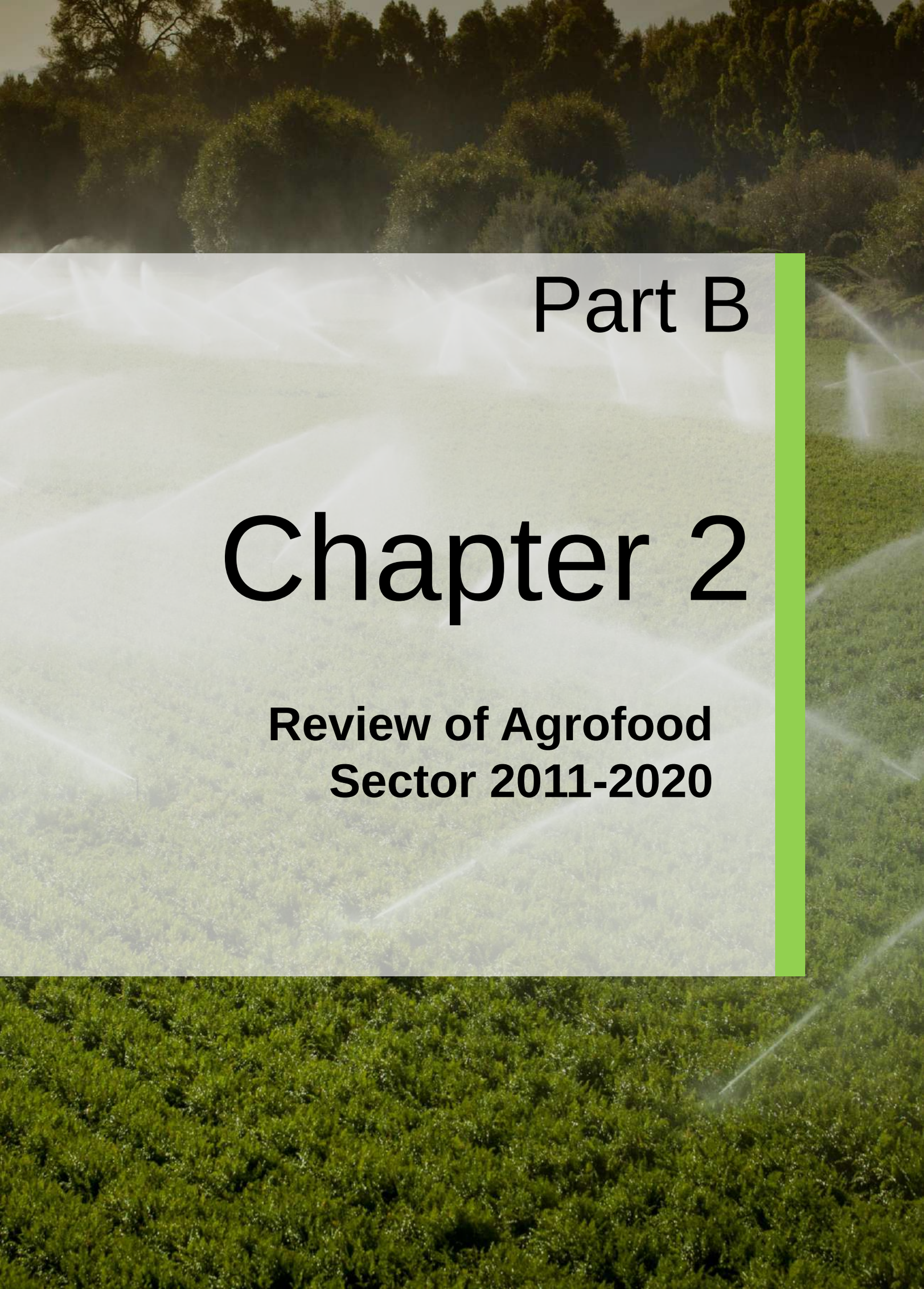
1.3 Conclusion

Summary

In conclusion, the Malaysia agrofood Industry will look to utilise all of the above described indicators as a basis to drive Malaysia's agrofood sector forward in the next 10 years in a clearly defined manner. The indicators are grouped into 3 segments, namely; economic contribution, social wellbeing, and environment. It is imperative for the agrofood Industry to advance towards the achievement of all the set targets, to cement its position as one of the vital economic sectors that serves the greater interest and continual development of the nation and its people. As such, the NAP 2.0 articulates the aspiration of the nation to have "A sustainable, resilient and technology driven agrofood sector that prioritises food security and nutrition while driving economic growth and enhancing the wellbeing of the rakyat".

Figure 1-1: All Indicators for Malaysia Agrofood Sector





Part B

Chapter 2

Review of Agrofood Sector 2011-2020

2.0 Review of Agrofood Sector 2011 - 2020

2.1 Review of Agrofood Sector Past Performances

In 2010, the agriculture sector accounted for RM83.75 billion or 9.26% of Malaysia's total GDP of RM904.49 billion. Of the 9.26%, approximately 41.78% are contributed by the agrofood sector, accounting for RM34.99 billion or 3.87% of the total Malaysia GDP.

As shown in table 2-1 below, the overall value added growth rate of the agrofood sector of 3.95% is higher than the growth rate of industrial crops of 1.35%. Additionally, the contribution of agrofood sector to the value added Agriculture sector increased from 41.78% in 2010 to 48.02% in 2020, which potentially suggest that the agrofood sector may overtake the industrial crops industry in terms of GDP contribution.

However, the GDP contribution of the agriculture sector, industrial crops and agrofood sector has declined in 2020 as compared to 2010 indicating the possibility that other economic sectors' contribution are growing at a higher rate than the contribution by the agriculture sector, or there is a diminishing reliance on the agriculture sector in the Malaysian economy.

Table 2-1: Malaysia GDP Contribution Breakdown by Sector (2010 – 2020), (RM Million in 2015 prices)

Sector/Item	2010		2015		2020[f]		Compound Annual Growth Rate (CAGR) - (%)		
	RM Million	%	RM Million	%	RM Million	%	2010 - 2015	2015 – 2020[f]	2010 – 2020[f]
Agriculture	83,756	9.26	97,538	8.29	107,313	7.18	3.09	1.93	2.51
Industrial Crops	*48,764*	*5.39*	*51,043*	*4.34*	*55,782*	*3.73*	*0.92*	*1.79*	*1.35*
Agrofood	*34,991*	*3.87*	*46,495*	*3.95*	*51,531*	*3.45*	*5.85*	*2.08*	*3.95*
Mining and Quarrying	96,892	10.71	103,059	8.76	104,062	6.97	1.24	0.19	0.72
Manufacturing	207,245	22.91	262,379	22.29	329,995	22.09	4.83	4.69	4.76
Construction	33,444	3.70	55,382	4.71	69,862	4.68	10.61	4.75	7.64
Services	474,984	52.51	643,883	54.71	869,984	58.24	6.27	6.20	6.24
Import Duties	8167	0.90	14,699	1.25	12,598	0.84	12.47	(3.04)	4.43
Total Value Add (RM Million)	**904,489**	**100.00**	**1,176,940**	**100.00**	**1,493,814**	**100.00**	**5.41**	**4.88**	**5.15**

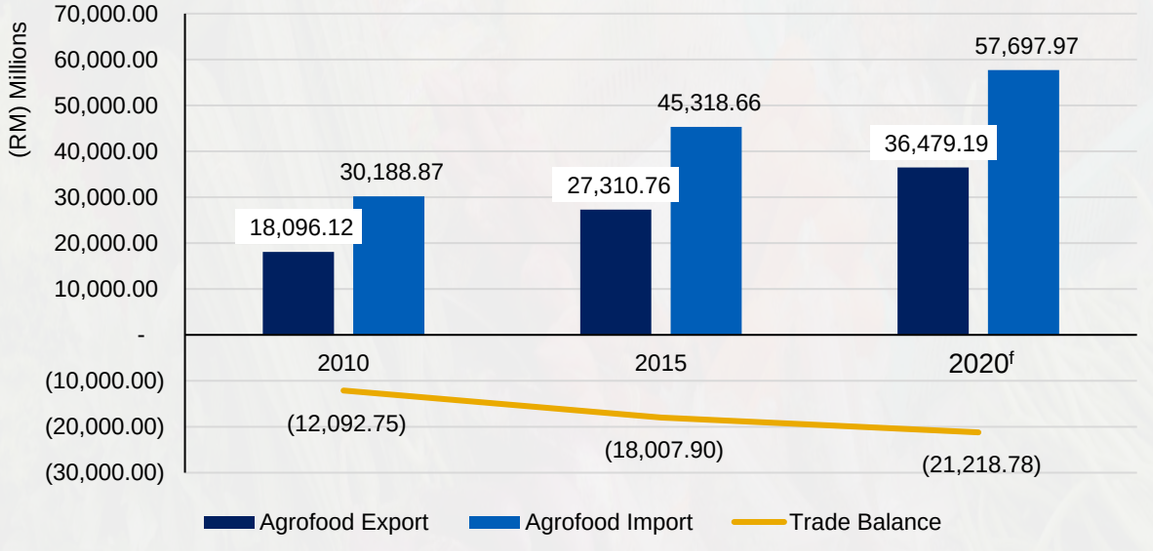
Sources: MAFI (2019), MoF (2020)
[f] – Forecast

2.0 Review of Agrofood Sector 2011 - 2020

The overall contribution of the agrofood sector to the total exports increased from 2.83% in 2010 to 3.87% in 2020 with an overall CAGR of 3.18% as shown in Table 2-2. Some of the key contributor to agrofood export includes coffee, cocoa, tea, spices and manufactures (26.03% of total agrofood export in 2020), miscellaneous edible products and preparations (25.67%), cereal and cereal preparations (12.22%), and fish, crustaceans, molluscs and preparations (8.42%).

Similarly, the imports on agrofood also increased from 2010 to 2020, which had a higher CAGR growth rate of 6.69% as compared to the agrofood exports. The increase in import over export has led to the increase in trade deficit for agrofood and agrofood products from RM12,092.75 million in 2010 to RM21,218.78 million in 2020. This potentially indicates that Malaysia's increasing reliance on the global value chain to support its agrofood sector.

Figure 2-1: Trade Balance of Agrofood (2010 - 2020)



Sources: MAFI (2020)

[f] – Forecast

2.0 Review of Agrofood Sector 2011 - 2020

Table 2-2: Malaysia Export of Agrofood and Agro-based Industries (2010 – 2020)

Sector/Item	2010	2015	2020[f]	Compound Annual Growth Rate (CAGR) - (%)		
	RM Million	RM Million	RM Million	2010 - 2015	2015 – 2020[f]	2010 – 2020[f]
Agriculture Sector (Total)	106,099	109,959	66,441	0.72	(9.58)	(4.57)
Agrofood Sector (Total)	18,096	27,310	36,479	8.58	5.96	7.26
Live Animal (Food)[A]	*551*	*705*	*863*	*5.05*	*4.13*	*4.59*
Meat and Meat Preparations	*263*	*569*	*813*	*16.69*	*7.40*	*11.95*
Dairy Products	*550*	*1,419*	*1,631*	*20.87*	*2.82*	*11.48*
Poultry Eggs	*334*	*493*	*605*	*8.10*	*4.28*	*6.12*
Fish, Crustaceans, Molluscs and Preparations[B]	*2,586*	*2,614*	*3,070*	*0.22*	*3.27*	*1.73*
Cereal and Cereal Preparations	*1,405*	*2,982*	*4,459*	*16.24*	*8.38*	*12.24*
Vegetables	*682*	*1,097*	*1,676*	*9.97*	*8.85*	*9.41*
Fruits	*589*	*964*	*1,439*	*10.36*	*8.34*	*9.34*
Sugars, Sugar Preparations and Honey	*873*	*934*	*970*	*1.36*	*0.76*	*1.06*
Coffee, Cocoa, Tea, Spices and Manufactures	*5,323*	*7,403*	*9,497*	*6.82*	*5.11*	*5.96*
Animal Feed	*974*	*1,448*	*2,086*	*8.25*	*7.57*	*7.91*
Miscellaneous Edible Products and Preparations	*3,960*	*6,678*	*9,365*	*11.02*	*7.00*	*8.99*
% of Agrofood/Total Exports	2.83	3.51	3.87	4.40	1.97	3.18
Total National Exports	**638,822**	**777,335**	**943,761**	**4.00**	**3.96**	**3.98**

Sources: MAFI (2020), DOSM (2020), MoF (2020)
[A] – Excluding race horses, pets and zoo animals
[B] – Excluding ornamental fish
[f] – Forecast

2.0 Review of Agrofood Sector 2011 - 2020

From 2011 to 2020, the total employment rate in the agrofood sector which contributed 3.21% to total employment in Malaysia and 29.5% to total agricultural employment, declined at a CAGR of 1% (Table 2-3). The reduction of agrofood employment is largely contributed by the decrease of participation among paddy farmers, aquaculturist and fishermen, except for the livestock subsector which recorded positive growth.

Despite the decrease in employment, the overall agrofood employee productivity has seen an increase at a CAGR of 5.00%, surpassing the agriculture and national average employee productivity. This increase is potentially a result of the increased use of labour saving technologies and techniques through mechanisation and automation for food production activities.

Table 2-3: Employment and Productivity in Agrofood Sector (2010 – 2020)

Year	Employment in '000			Compound Annual Growth Rate (CAGR) - (%)		
	2010	2015	2020[f]	2010 - 2015	2015 – 2020[f]	2010 – 2020[f]
Employment in Agrofood	535.70	498.90	484.52	(1.41)	(0.58)	(1.00)
% of Total Employment	*4.50*	*3.55*	*3.21*	*(4.63)*	*(1.99)*	*(3.32)*
% of Agriculture Employment	*33.17*	*28.44*	*29.50*	*(3.03)*	*0.73*	*(1.17)*
Productivity per Employee (RMin 2015 prices)	*65,318.28*	*93,195.03*	*106,354.74*	*7.37*	*2.68*	*5.00*
Employment in Agriculture	1,614.90	1,753.90	1,644.15	1.67	(1.28)	0.18
% of Agriculture Employment	*13.57*	*12.47*	*10.90*	*(1.68)*	*(2.66)*	*(2.17)*
Productivity per Employee (RMin 2015 prices)	*51,864.51*	*55,612.06*	*65,269.59*	*1.41*	*3.25*	*2.33*
Total Employment	11,899.50	14,067.50	15,083.90	3.40	1.40	2.40
Productivity per Employee (RMin 2015 prices)	*76,010.67*	*83,663.76*	*99,033.67*	*1.94*	*3.43*	*2.68*

Sources: MAFI (2020), DOSM (2020), MoF (2020), The World Bank (2020)
[f] – Forecast

2.0 Review of Agrofood Sector 2011 - 2020

The agrofood production increased by a total of 1.30% from 2010 to 2020 at a CAGR of 0.13% with a slight increase in from 2010 to 2015 and slight decrease from 2015 to 2020. Meanwhile, the agrofood consumption in Malaysia saw a steady increase from 2010 to 2020 as shown in Figure 2-3 with an overall growth of 20.05% with a CAGR of 1.84%. This performance was influenced by the increase in food production costs mainly involving inputs influenced by various factors such as world crude oil prices, foreign exchange rates as well as the global crisis, and production output due to climate change challenges.

Among the major crops, the production of poultry meat and vegetables increased the most with 27.70% and 15.48% from 2010 to 2020 respectively, while the production of milk and aquaculture produce decreased most significantly with 38.81% and 29.09% respectively. With the exception of rice, the growth rate of CAGR for the consumption for most major agrofood crop (fruits, vegetables, fish, meat and poultry) is at a higher rate than the CAGR of the production. This potentially indicate that the consumption of the major agrofood crops will over cede the domestic production if the trend persist. The dietary trend for the past decade has played a crucial role in the food consumption trend. The increasing global trend in reducing carbohydrate intake and reducing energy supply(6) from rice has affected the total rice consumption in Malaysia.

Figure 2-2: Agrofood Production and Consumption Growth (CAGR), (2010 – 2020)

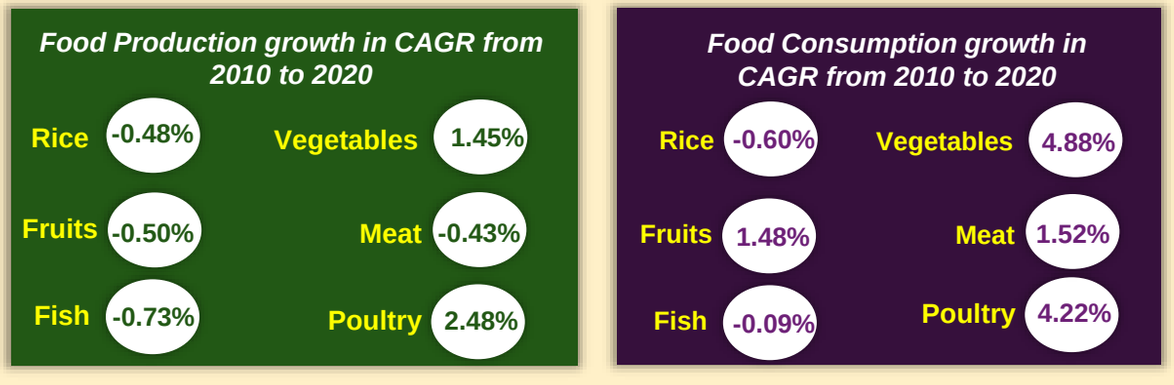
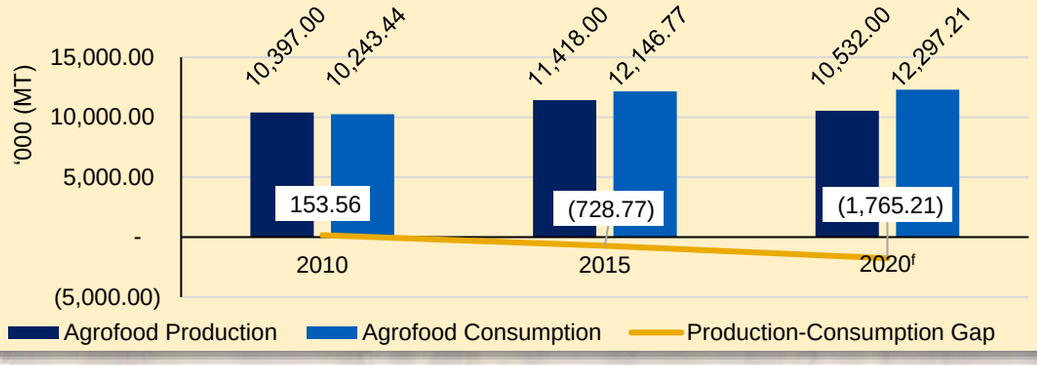


Figure 2-3: Agrofood Production and Consumption (2010 – 2020)



Sources: Agrofood Statistics Malaysia
[f] - forecast

2.0 Review of Agrofood Sector 2011 - 2020

Table 2-4: Production of Major Agrofood Commodities (2010 – 2020), ('000 MT)

Sector/Item	2010	2015	2019[A]	Compound Annual Growth Rate (CAGR) - (%)		
	'000 MT	'000 MT	'000 MT	2010 - 2015	2015 – 2019[A]	2010 – 2019[A]
Crops	6,147	6,713	6,056	1.78	(2.04)	(0.15)
Paddy	*2,465*	*2,741*	*2,349*	*2.15*	*(3.04)*	*(0.48)*
Fruits	*1,642*	*1,589*	*1,561*	*(0.65)*	*(0.35)*	*(0.50)*
Vegetables	*872*	*1,373*	*1,007*	*9.50*	*(6.01)*	*1.45*
Cash Crops	*156*	*227*	*221*	*7.79*	*(0.53)*	*3.54*
Herbs and Spices	*34*	*70*	*60*	*15.54*	*(3.04)*	*5.84*
Industrial Crops	*979*	*712*	*857*	*(6.17)*	*3.78*	*(1.32)*
Livestock	2,235	2,707	2,603	*3.91*	*(0.78)*	*1.54*
Beef	*47*	*50*	*44*	*1.25*	*(2.52)*	*(0.66)*
Mutton	*2*	*4*	*4*	*14.87*	*0.00*	*7.18*
Pork	*234*	*223*	*223*	*(0.96)*	*0.00*	*(0.48)*
Poultry Meat	*1,296*	*1,633*	*1,655*	*4.73*	*0.27*	*2.48*
Poultry Egg	*590*	*796*	*677*	*6.17*	*(3.19)*	*1.38*
*Milk (Million Litre)**	*67*	*36*	*41*	*(11.68)*	*2.64*	*(4.79)*
Fisheries	2,015	1,998	1,873	*(0.17)*	*(1.28)*	*(0.73)*
Aquaculture[1]	*581*	*506*	*412*	*(2.73)*	*(4.03)*	*(3.38)*
Marine Captured Fisheries	*1,429*	*1,486*	*1,455*	*0.79*	*(0.42)*	*0.18*
Inland Fisheries	*5*	*6*	*6*	*3.71*	*0.00*	*1.84*

Sources: MAFI (2020)
2019[A] – Figure based on 2019 figures due to limited data
[1] – Including Seaweed (Seaweed production – 207,892 mt in 2010, 260,760 mt in 2015, 188,111 mt in 2019 and 182,061 mt in 2020)
*1 Litre = 1 kg

2.0 Review of Agrofood Sector 2011 - 2020

From 2010 to 2020, the CAGR for the SSL of all major agrofood crop declined, except rice, vegetables and poultry eggs. The SSL for these 3 commodities increased with a CAGR of 0.01%, 0.37% and 0.17% respectively as shown in Table 2-5. Among all the agrofood crop, only poultry meat and poultry egg achieved SSL of above 100.00%.

Table 2-5: Self-Sufficiency Level of Major Crops (2010 – 2020)

Sector/Item	2010	2015	2020[f]	Compound Annual Growth Rate (CAGR) - (%)		
	%	%	%	2010 - 2015	2015 – 2020[f]	2010 – 2020[f]
Rice	62.95	64.78	63.00	0.57	(0.56)	0.01
Fruits	83.73	80.57	79.50	(0.77)	(0.27)	(0.52)
Vegetables	49.61	52.42	51.50	1.11	(0.35)	0.37
Beef	30.12	23.05	21.72	(5.21)	(1.18)	(3.22)
Mutton	11.89	11.45	10.72	(0.75)	(1.31)	(1.03)
Pork	95.25	93.57	91.62	(0.36)	(0.42)	(0.39)
Poultry Meat	105.55	104.16	104.51	(0.26)	0.07	(0.10)
Poultry Egg	114.63	113.99	116.60	(0.11)	0.45	0.17
Milk	99.60	64.40	62.40	(8.35)	(0.63)	(4.57)
Fisheries	94.89	93.14	93.51	(0.37)	0.08	(0.15)

Sources: MAFI (2020)
[f] - forecast

2.0 Review of Agrofood Sector 2011 - 2020

Per capita consumption of most agrofood commodities has shown positive growth, except rice, fruits and pork. Among the commodities that have the highest consumption growth rate are fresh milk, followed by mutton and poultry meat with CAGR of 11.61%, 4.14% and 2.95% respectively. However, the consumer consumption pattern may change as it can be affected by various reasons, and needs to be studied in order to understand its impact over the diversity in food production.

Table 2-6: Per capita Consumption of Major Food Crops (2010 – 2020)

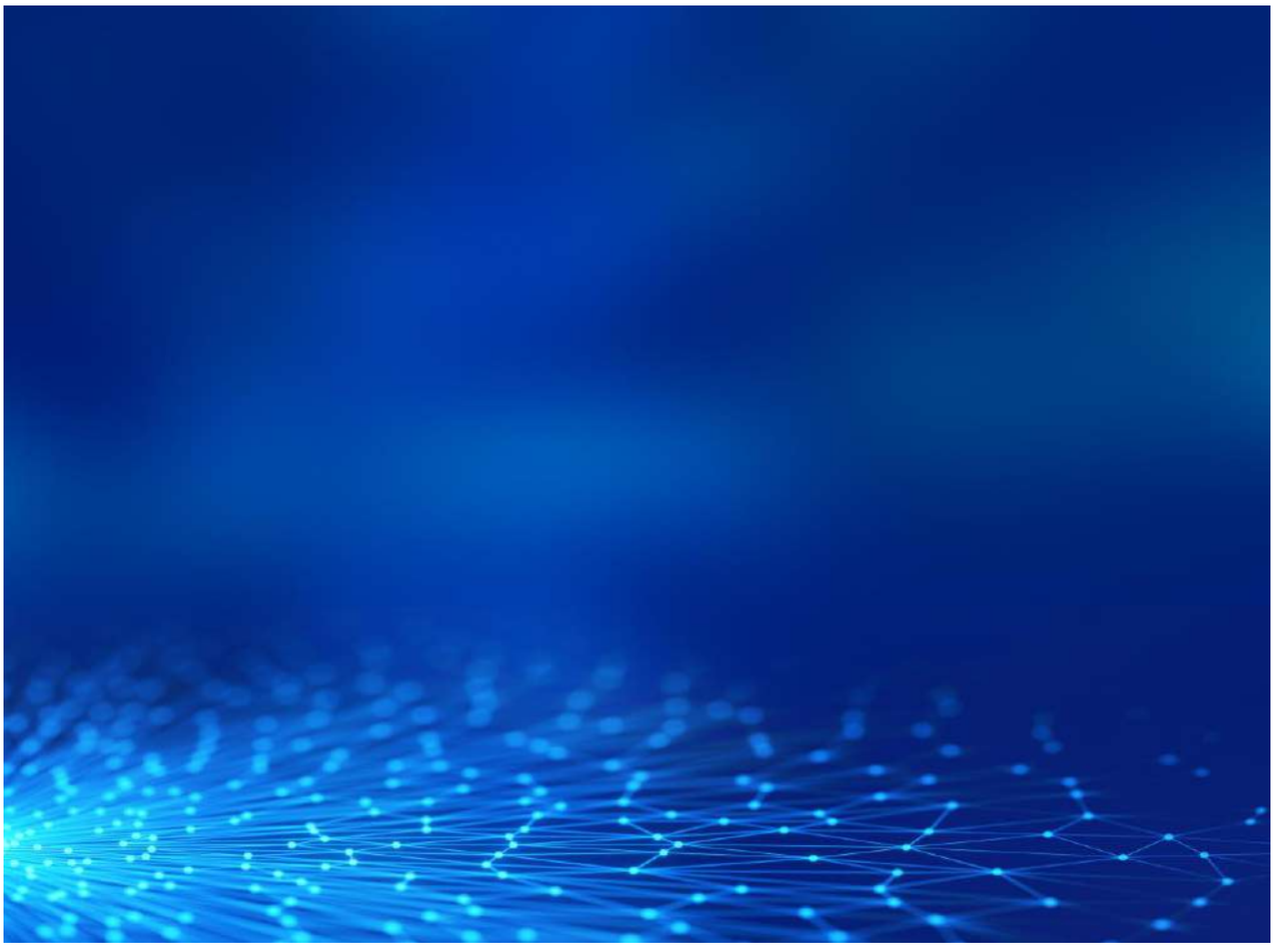
Sector/Item	2010	2015	2020[f]	Compound Annual Growth Rate (CAGR) - (%)		
	KG/ year	KG/ year	KG/ year	2010 - 2015	2015 – 2020[f]	2010 – 2020[f]
Rice	79.6	87.5	76.5	1.91	(2.65)	(0.40)
Fruits	93.0	96.7	78.0	0.78	(4.21)	(1.74)
Vegetables	54.7	70.4	65.1	5.18	(1.55)	1.76
Beef	5.6	7.0	6.1	4.56	(2.71)	0.86
Mutton	0.8	1.2	1.2	8.45	0.00	4.14
Pork	19.9	19.1	18.5	(0.82)	(0.64)	(0.73)
Poultry Meat	35.0	50.3	46.8	7.52	(1.43)	2.95
Poultry Egg*	295.0	371.9	361.5	4.74	(0.57)	2.05
Milk**	0.7	1.8	2.1	10.79	3.13	11.61
Fisheries	45.5	51.4	51.5	0.45	0.07	0.26

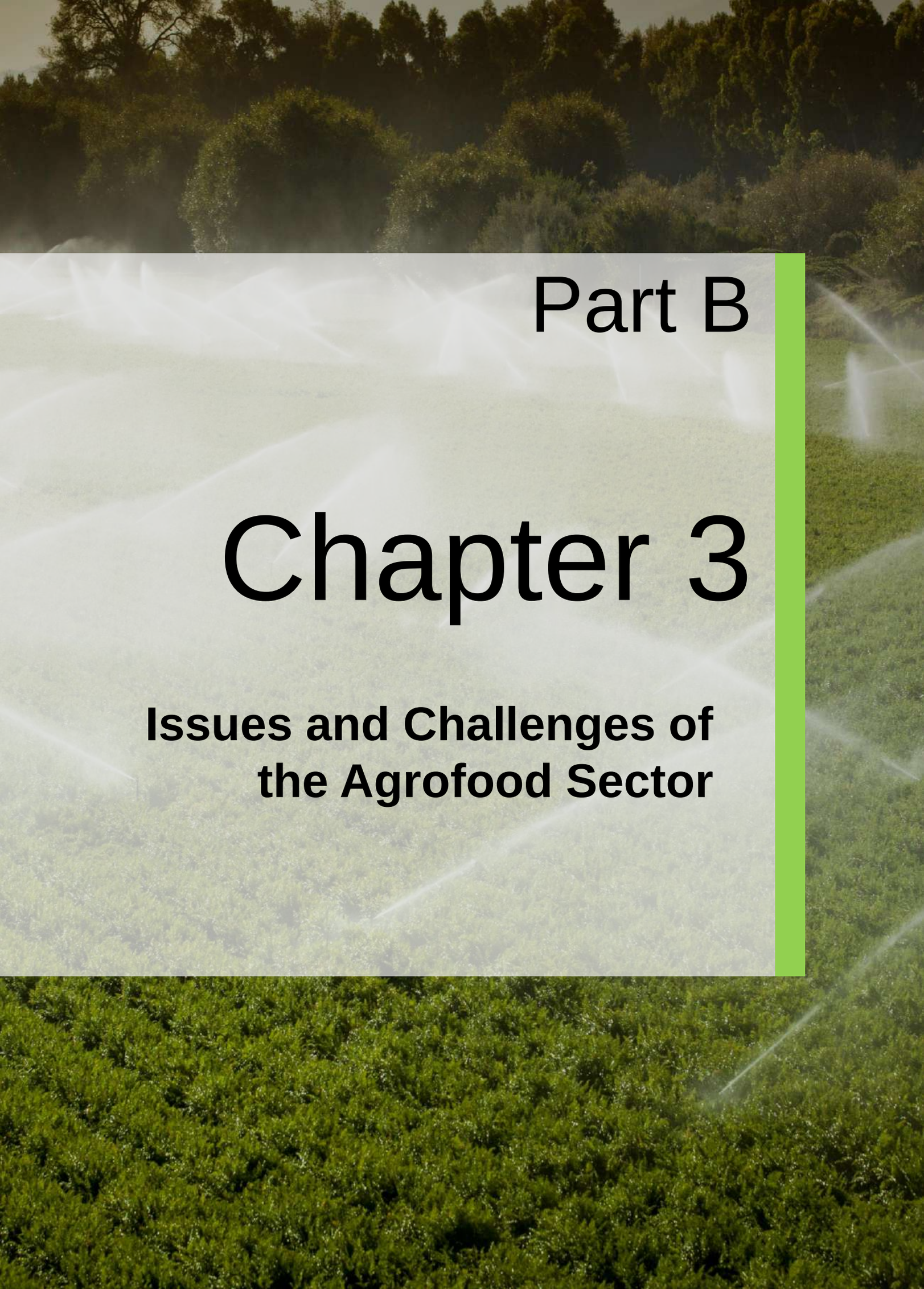
Sources: MAFI (2020)
[f] – forecast
*Number of eggs
**Litres

2.0 Review of Agrofood Sector 2011 - 2020

References:

(1) Agrofood Statistics, Ministry of Agriculture and Food Industries (MAFI), (2019)
(2) Economic Outlook 2020, Ministry of Finance (MoF), (2020): https://www.treasury.gov.my/pdf/economy/2020/chart_Malaysia.pdf
(3) Malaysia External Trade Statistics, Department of Statistics Malaysia (DOSM), (2020): https://www.dosm.gov.my/v1/index.php?r=column/cthemeByCat&cat=139&bul_id=citRNWJWOXpGT0NCOSs2SEppQ1BEUT09&menu_id=azJjRWpYL0VBYU90TVhpclByWjdMQT09
(4) Malaysia Trade Statistics, Malaysia External Trade Development Corporation (MATRADE), (2020): https://www.matrade.gov.my/en/malaysian-exporters/services-for-exporters/trade-market-information/trade-statistics
(5) Employment in Agriculture, The World Bank, (2020): https://data.worldbank.org/indicator/SL.AGR.EMPL.ZS?locations=MY
(6) The nutrition transition in Malaysia; key drivers and recommendations for improved health outcomes (Research Article), BMC Nutrition, (2020): https://bmcnutr.biomedcentral.com/articles/10.1186/s40795-020-00348-5





Part B

Chapter 3

Issues and Challenges of the Agrofood Sector

3.0 Issues and Challenges of the Agrofood Sector

3.1 Global Issues and Challenges

Agriculture and the agrofood sector play a vital role in social and economic development globally. It is 2 to 4 times more effective in raising incomes of the poorest population compared to other sectors, and can help reduce poverty for 80% of the world's poor living in rural areas[1]. It is also a crucial sector in order to feed the projected global population of approximately 10 billion by 2050[2].

However, there is a global concern that the sector is at risk due to a number of factors which will be described in details;

1. Scarcity of Natural Resources
2. Agricultural Productivity and Innovation
3. Demographic Changes and Shifting Dietary Trends
4. Food Loss and Waste
5. Climate Change

3.0 Issues and Challenges of the Agrofood Sector

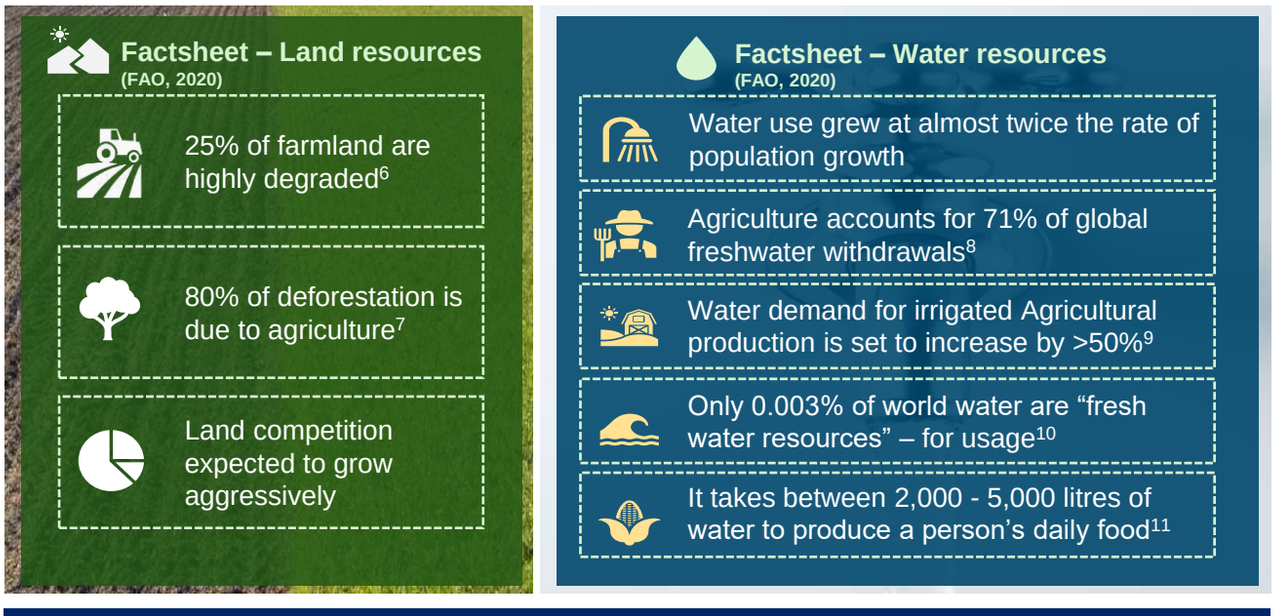
3.1.1 Scarcity of Natural Resources

Land Scarcity

Land as a finite resource in the agrofood sector, is degraded primarily by agricultural activities, and results in a diminished capacity of the ecosystem to provide goods and services. Historically, degraded farmlands are simply replaced by bringing new, unused land into cultivation. However, cultivation through deforestation is no longer sustainable as clearing forest land can cause severe damage to the environment, causing soil erosion and ultimately reducing the quality of drinking water. In addition, agriculture land use also faces greater competition due to industrialisation. FAO estimates that global arable land per person to continue decreasing until 2050[3], and agriculture productivity will need to be increased each year by approximately 1% to meet the growing food demand.

Water Scarcity

Similarly, water is an essential but limited resource sought for agricultural and other activities. Globally, agriculture accounts for about 71% of freshwater usage, and can go up to 95% in some developing countries[4]. Furthermore, agricultural activities are also a major contributor to water pollution from the use of pesticides and other contaminants. It was estimated that the water pollution from agricultural activities have reduced biodiversity in rivers, lakes and wetlands by about one-third globally since the mid-1970s[5]. Experts forecasted that by 2050, the usage of water by agriculture is expected to increase by more than 50% for irrigated food production purposes.



Key Takeaway – To adopt farming techniques with higher efficiencies that make better use of natural resources, such as land and water. This is essential for industries to continuously increase global food supplies on a sustainable basis.

3.0 Issues and Challenges of the Agrofood Sector

3.1.2 Agricultural Productivity and Innovation

Need for Sustainable Increase in Productivity in Agriculture

To feed a population of approximately 10 billion by 2050, there is a need to explore ways to increase food production to meet the rising demand. While this can be achieved by increasing factors of production such as land expansion, irrigation extension and input intensification, these strategies need to be applied appropriately to avoid negative outcomes such as soil degradation, erosion and higher emission of GHG, and reduction of water quality over time. Due to the constraints and pressure on sustainability, innovative ways to improve productivity should be explored.

Total Factor Productivity (TFP)

Total Factor Productivity (TFP) is used globally to measure how efficiently agricultural inputs (such as land, labour, fertiliser, machinery, feed) are transformed into outputs[13]. Data between 2006 and 2015 reveals that TFP's contribution to global agricultural output growth has declined, while contribution of land expansion to output growth is rising as producers of all scales continues converting forests and grasslands for the purpose of food production in response to the increasing demand of food and feed.

Low Productivity

The source of agriculture supply is highly dependent on productivity in many developing countries. However, productivity (or yield) remains low among smallholders. Based on a study by an independent consultant in Philippines, smallholders on average have a yield gap of about 20% as compared to industrial farmers[12]. Smallholders are also at a disadvantage due to the small sizes of land, lack accessibility.

The Role of Technology in the Future of Agriculture

Agricultural technologies that enable food producers to increase their output using the same amount, or less, land, labour, capital, and other inputs, are the primary drivers of productivity growth. Modern farms and agricultural operations driven by advancements in technology, including sensors, devices, machineries and information technology could lead businesses to be more profitable, efficient, safer, and environmental friendly while still providing for global food and agricultural needs.

Key Takeaway – To develop new and evaluate existing production techniques and technologies aimed to boost productivity and increase efficiency in the food chain; especially among smallholders.

3.0 Issues and Challenges of the Agrofood Sector

3.1.3 Demographic Changes and Shifting Dietary Trends

Growth in Population will See Increase in Demand for Food

By 2050, the global population is expected to rise to approximately 10 billion population, with the highest increment from Asia and Africa[14]. As a result of growing population, food demand is expected to increase between 59% to 98% by 2050. Food producers worldwide would have to increase production, such as by increasing planted land size to grow crops or increase overall productivity on existing land through fertiliser and irrigation and adopting new methods like precision farming. FAO projected that in order to meet the demand in 2050, average annual net investment required in developing countries' agriculture would amount to an addition of USD 83 billion per year.

Urbanisation Leads to Changes in Consumer Trends

Globally, nations are urbanising rapidly with about 70% of the world population projected to reside in urban areas in 2050[15]. The urbanisation impact has led to changes in these various consumer's trends.

Shift in Dietary Preference among Consumers – Upstream

In rising incomes in many parts of the world, the general transition from staple cereal consumption to protein based diets is expected to occur. In Australia, consumers are turning away from traditional proteins to plant-based proteins, resulting in higher demand for niche products such as kale, quinoa and almond milk. Malaysian consumers are similarly shifting their diet to healthier options such as oats, cereal bars and fruits[16]. Malaysian consumers are also reducing carbohydrates while increasing consumption of dairy products.

Rising Demand for Processed and Convenience Food – Midstream

As nations become wealthier, it is expected that per capita food demand will increase, and the mix of demand will include more meat, sugar, and processed products. Higher urban incomes tend to lead to the increased consumption of fast food, store-bought convenience foods and foods prepared and marketed by street vendors over home-prepared food.

Greater Demand and Expectations on Food Information and Sourcing – Downstream

Consumers nowadays are not only conscious towards price, taste and convenience of food, but also have greater demands and expectations on where their food and fibres come from, and how its produced[17]. The emphasis towards transparency, ethical and socially-driven values are equally important as the price and taste of a particular food.

Key Takeaway – To be increasingly sensitive to the shift in consumer preferences, as well as taking into account ethical methods of production.

3.0 Issues and Challenges of the Agrofood Sector

3.1.4 Food Loss and Waste

Food Loss

Food loss is the decrease in the quantity or quality of food resulting that is discarded, incinerated or otherwise disposed along the supply chain, excluding the retail and consumption level. Less developed regions have higher food loss, where inefficient management at the production, post-harvest handling/storage, and processing causes food quantity or quality to decrease. Globally, 14% of the world's food is lost from production stage before reaching the retail level[18]. Food loss in certain situations are inevitable; as countries concerned with food security maintain a buffer of food stock within their handling/storage levels.

Food Waste

Food waste, on the other hand, refers to the decrease in quantity or quality of food resulting from decisions and actions by retailers, food service providers and consumers. In more developed regions, the majority percentage of food loss/wasted are associated with the retail and consumption part of the value chain. Food waste in certain situations are inevitable; as consumers move towards healthier and premium food, food waste tend to be higher as quality food are usually consumed fresh and is highly perishable at retail and consumption level.

Sustainable Development Goals

The United Nations has placed one of the key targets of SDG (Target 12.3 Ensure sustainable consumption and production patterns) to halve per capita global food waste at retail consumer levels by 2030, as well as reducing food losses along the production and supply chain.

Key Takeaway – To investigate the source of food losses and wastages along the value chain and identify why it occurs, whilst exploring possible mitigation methods.

3.0 Issues and Challenges of the Agrofood Sector

3.1.5 Climate Change

Weather destabilisation is a threat to the agriculture industry. Unsustainable farming practices such as deforestation and extensive usage of fertilisers could further exacerbate climate change.

The Impact of Climate Change on Agriculture Practices

- Increase in sea level: By the year 2100, sea level is expected to rise by 70cm, leading to the reduction in land size and salinity intrusion[19].
- Water stress: competition for water resources, especially for agriculture with heavy usage of water, will be further stressed as river water levels fall.
- Increase in peak temperature: as agriculture is conditioned by temperature and rainfall, thus the peak in temperature can lead to heat stress and crop sterility, while increased night time temperatures may reduce yield.
- Inconsistent and changes in rainfall concentration: Changes in rainfall concentration might lead to water deficit stress, flooding losses, and changes to seasonal duration that often affect production of crops.
- Increased frequency and severity of natural disaster: Natural disasters such as drought and floods could potentially cause severe damage to crops and livestock farms.

The radical change in global climate could cause difficulty in growing crops, raising animals, and catching fish in the same ways and places as it was done in the past.

Key Takeaway – To promote usage of sustainable farming practices that is resilient towards climate change.

3.0 Issues and Challenges of the Agrofood Sector

3.2 Issues and Challenges of Malaysia Agrofood Sector

Challenges faced by the global agriculture industry are a concern to the Malaysia's agrofood sector. This section will delve into more specific issues pertaining to the agrofood sector in Malaysia. The issues and challenges identified will then provide a basis and facilitate the development of the National Agrofood Policy 2.0.

1	Low Production Efficiency and High Production Cost Affecting Farmer's Income
2	Limited High Value-Added Produce and Products
3	Unconducive Business Environment
4	Threat from Natural Disasters, Diseases, as well as Unsustainable Farming Practices
5	Low Involvement of Youth in the Agrofood Sector
6	Limited Financial Assistance for Farmers
7	Issues Related to Coordination and Collaboration
8	Issues in High Value Commodities (HVC)
9	Impact of Unexpected Crisis on the Agrofood Sector

3.0 Issues and Challenges of the Agrofood Sector

3.2.1 Production Efficiency and High Production Cost Affecting Farmer's Income

The average monthly income of a worker in the agriculture sector in 2018 is RM1,865, which is 60.4% of the average monthly income in Malaysia at RM3,087. The low income is mainly due to the low productivity of the agriculture sector, with an average output per employee of RM63,345 in 2018 when compared to the national average of RM92,145.

Automation in the Industry

Adoption of automation in the industry remains low due to the lack of confidence among farmers to invest as a result of land ownership issues and short lease terms. In cases where the farmer is the owner of the land, automation is sometimes not financially feasible due to the uneconomical size of land.

Adoption of Modern Farming Methods

Due to the lack of financial support and knowledge transfer, smallholders and individual farmers are skewed towards using traditional farming methods that are often time consuming and unsustainable.

High Cost of Input

Farmers are highly reliant on imported input materials such as fertilisers and seeds due to a lack of supply of local input, leading to high input cost.

Disconnect between Upstream, Midstream and Downstream of the Value Chain

Produces from smallholder are often being sold at low gate prices to middlemen, collectors and transporters. The lack of accessibility to markets cause smallholders to be at a disadvantage to negotiate prices.

Key Takeaway – To boost productivity and empower food producers by facilitating the adoption of technology and modern farming methods.

3.0 Issues and Challenges of the Agrofood Sector

3.2.2 Limited High Value-Added Produce and Products

Mismatch between the Upstream and Downstream Activities

There is a mismatch in demand and supply within the food production value chain. Upstream and post-harvest activities are mostly dominated by individual and smallholders while large corporations and food processing companies are usually involved only in the midstream to downstream segment. Additionally, food processing companies are placed under the purview of the Ministry of International Trade and Industry (MITI) while the Ministry of Agriculture and Food Industries (MAFI) oversees the upstream segment of the value chain with limited involvement in the midstream and downstream. Hence, the demand from the midstream and downstream players are not entirely and accurately translated to the upstream players, resulting in possible raw material shortage or surplus of perishable supplies being wasted.

Risky Nature of Food Production Sector

The upstream segment is considered a risky field as it is susceptible to multiple factors including supply and cost of input material which are currently inconsistent and highly dependent on imports and unpredictable weather and climate affecting the yield and produce quality.

Existing Private Investments are too Narrow

In 2019, private investments in agriculture were all domestic, with 54.29% (RM73.33 million) of the investment in durian plantations in Pahang and 20.95% (RM28.30 million) in king oyster mushroom production in Negeri Sembilan, indicating that only less than 25% of the remaining RM135.08 million of total private investment were invested for other agriculture related projects[20]. Low interest to invest in other products could be due to perception of low profitability by investors.

Lack of Private Investment in the Upstream and Post-harvest Segment

There is currently a lack of options to make use of produce that are less optimal or partially spoilt that can potentially be processed or used for other purposes. However, smallholders and individual food producers may not be able to conduct post-harvest handling activities due to the lack of foresight and financial support.

Key Takeaway – To explore ways to incentivise participation of large players and increase investment throughout the value chain.

3.0 Issues and Challenges of the Agrofood Sector

3.2.3 Unconducive Business Environment

A favourable business environment refers to the overall regulatory and business support system that sets the foundation to ease doing business and improve the overall attractiveness of the agrofood sector in Malaysia.

Land Related Issues

Land issue remains as a longstanding issue for the agrofood sector in Malaysia. Farmers without land ownership are given the option to farm on state-government owned land through Temporary Occupation License (TOL), which has a lease period of 3 years with additional 2 years that can only be renewed annually upon approval. The short land lease period is one of the main reasons for low investment in upgrading of farms and automation as food producers face uncertainty in terms of their return on investment. Short land tenure also hinders certain certification to be obtained, subsequently limiting export potential.

Increasing Logistics Cost

In a recent report released by Malaysia Competition Commission (MyCC), inland logistics charges by shipping lines and ports at Port Klang has observed an increase on its average charges per import by almost 227% from RM650 in 2013 to RM2,130 in 2019 [21]. Long cargo clearance time is also a main issue particularly for perishable produces.

Limited Extension Services

Extension services for upstream food producers are limited due to insufficient on-the-ground extension officers. There is an experience gap where extension officers may have knowledge on agriculture but lack farming experience and technical know-how on the farming operations and technology application.

3.0 Issues and Challenges of the Agrofood Sector

3.2.3 Unconducive Business Environment *(continuation)*

Inadequate Infrastructure and Facilities

There are insufficient cold storage room for perishable produces. In addition, the irrigation and water supply within the paddy fields are in need of better maintenance and upgrade. In terms of machinery facilities, an estimated 70% of the agricultural machinery under Bahagian Jentera of Pertubuhan Peladang Negeri (PPN) are dated 10 years and above with high frequency of breakdown. This may potentially affect the productivity of farmers under PPN who lack the financial capabilities to invest in their own machineries.

Acts and Regulations Unsuitable for Current Industry

Existing acts and regulations passed some decades ago have fallen behind time and may no longer be suitable for the industry at present. Since enaction of such acts and regulations, there were minimal revision made to match the existing agriculture ecosystem. Some examples of acts that were developed for at least 20 years ago and have not been amended includes Plant Quarantine Act (1976), Kemubu Agricultural Development Authority Act (1972), Malaysia Agricultural Research and Development Institute Act (1969), Abattoir (privatision) act (1993) and Lembaga Padi Dan Beras Negara (Successor Company) Act (1994).

Key Takeaway – To create a more conducive business environment for the agriculture industry by increasing support through improvement of facilities and equipment whilst relooking at existing acts and regulations.

3.0 Issues and Challenges of the Agrofood Sector

3.2.4 Threat from Natural Disasters, Diseases, as well as Unsustainable Farming Practices

Climate Change

Climate change plays a pivotal role in agriculture activities. A change in temperature or moisture levels can improve or reduce productivity of crops and livestock drastically.

Natural Disasters

Natural disasters, particularly flooding and landslide, can destroy farm areas, crash drainage and irrigation facilities that disrupts the food supply chain. Floods happen regularly in Malaysia during the monsoon season.

Outbreak of Pests and Diseases

Pests and diseases are common issues faced by food producers. Additionally, there is also cause for concern against invasive alien species (IAS) such as non-native plants, animals, pathogens and other organisms that threatens biodiversity and cause economic damage through loss of crop and livestock. Some examples of diseases include blast disease for rice, moko disease for banana and fusarium disease for tomato[22]. FAO estimates that pests and diseases are responsible for approximately 25% of crop loss globally. Local livestock also face threats of diseases such as bird flu from wild birds and Foot and Mouth diseases from illegally imported cattle, which could lead to culling of livestock and economical losses to food producers in order to prevent further spread of the disease to neighboring farms.

Unsustainable Farming Practices

The lack of proper waste management in the livestock sector and unsustainable farming methods such as unrestricted use of pesticides can harm pollinators such as bees, midges and bats. This leads to pollution to the environment which affects existing natural resources such as the availability of potable water, causing it to deplete at an alarming rate.

Depleting Coastal Resources

Fishery supplies are depleting due to overfishing both by local fisherman and foreign illegals. Use of trawling further destroys the corals which are the natural habitat for many aquatic species, as well as the landing of juveniles of commercially important species before its allowed to mature.

Key Takeaway – To and be mindful of unforeseen circumstances, apply preventative measures, develop contingency plan and also to internalise the environment costs in agriculture so that farming and fishing practices can be conducted in a more sustainable manner.

3.0 Issues and Challenges of the Agrofood Sector

3.2.5 Low Involvement of Youth in the Agrofood Sector

Out of the approximately 14.8 million workforce in Malaysia in 2019, about 10.6% or 1.6 million are part of the agricultural workforce[23]. While the overall workforce in Malaysia grew at a CAGR of 2.7%, agricultural workforce declined with a CAGR of 0.5% between 2010 to 2019. As ageing farmers gradually exit the workforce, the sector is unable to capture the interest of younger generations resulting in the declining workforce in the agriculture sector.

Poor Perception of the Agrofood Sector

Around 44% of Malaysia's population are youths, but only 15% are involved in the agriculture sector. At the tertiary level, only 4% of students consider a career in agriculture. The younger generation have a relatively poor perception of the agrofood sector, considering it as a labour intensive job with low returns while having a greater preference for white collar jobs.

Barrier of Entry for Young Agroprenuers

Stringent regulations coupled with unconducive environment has impeded young agroprenuers from entering into the agrofood sector. Young agroprenuers also faced challenges to apply for sufficient loans without collateral. Other challenges include high start-up costs, regulatory hurdles, or other obstacles that prevent new competitors from easily entering the market.

Dependency on Foreign Labour

Agriculture in Malaysia is still largely labour intensive due to the low adoption of technology and automation. Low-skilled foreign workers make up 31% of the agricultural workforce. The involvement of foreign labour in the industry made it unfeasible for locals to be involved in the industry, as labour cost competition further drives down farmer's income.

Low and Volatile Income

In terms of wages, agriculture workers are on average earning lesser than the national average. In 2018, the average wages for agricultural worker was RM1,865, against the national average at RM3,087. Furthermore, the average monthly salary for the crop subsector increased between 2010 to 2015 but declined between 2015 and 2017, suggesting that the subsector is also volatile and is susceptible to economic shocks that might impact the income of farmers.

Key Takeaway – To provide an enabling environment to further engage, attract and retain youths in the Agriculture industry to build a workforce that can produce sufficient food moving forward.

3.0 Issues and Challenges of the Agrofood Sector

3.2.6 Limited Financial Assistance for Farmers

There is currently limited financial assistance for food producers. Most financial assistance are given by the government as subsidies or financial grants for food producers in need. Hence, it is difficult for these food producers to expand their farms or acquire new technologies for farming purposes due to limited financing options.

High Risk

The reluctance of financial institutions providing financing to players in the industry as the nature of the agrofood sector poses a higher risk to the institution. The agrofood sector face multiple threats and uncertainties which makes credit assessment for food producers challenging. New strategies to mitigate credit risk needs to be identified to support individual borrowers to kickstart more entrepreneurships in the Agrofood sector.

Lack of Insurance Plans

The agrofood sector in Malaysia currently has insufficient risk management solutions such as insurance plans to protect food producers against financial ruin through losses caused by an adverse event. This also hinders the willingness of food producers to invest and innovate due to fear of irrecoverable loss.

Key Takeaway – To explore options in providing more accessible loan process for food producers and develop risk mitigation plans such as a comprehensive agriculture insurance scheme.

3.0 Issues and Challenges of the Agrofood Sector

3.2.7 Issues Related to Coordination and Collaboration

Accuracy of Industry Data

Published ministry data was collected and verified in advance by various agencies relevant to the subsector and it's functions. However, it was observed that there is a lack of single standard data collection method or an integrated database that can be used as a single reference point for the agrofood sector and to reduce duplication of data collection work. In addition, existing industry data might not be inclusive and exhaustive as it only represents data from food producers registered under MAFI.

Coordination between Agencies within MAFI

There are in total 11 MAFI divisions and 13 MAFI agencies that are directly involved in the agrofood sector. In the past, the roles of the different agencies are more often than not only intertwined and in some cases overlap with each other, particularly in training and developement, subsidies and grants, regulation and licensing, and R&D. This can create confusion among the food producers that have to engage with different bodies for approval or assistance.

Coordination between Stakeholders Beyond MAFI

Agrofood sector is among one of the main economic activities for the B40 income group and population living in rural areas. Some of these agencies including state authorities, state planning unit, regional economic development authorities and rural development authorities are also involved in overseeing, planning and monitoring the agrofood sector within the respective areas. These authorities and agencies often work in silo, which may lead to inefficient use of resources and overlap in provision of benefits to beneficiaries.

3.0 Issues and Challenges of the Agrofood Sector

3.2.7 Issues Related to Coordination and Collaboration *(continuation)*

Coordination between Federal and State

From previous observations, there is a disconnect between federal plans and implementation at state level, especially with regards to the agrofood sector. The main point of dispute is on land-use matters, where despite the agrofood plans and policies were made at federal level, the implementation requires close engagement and consultation with state bodies. For example, the Federal government has initiated the Taman Kekal Pengeluaran Makanan (TKPM), however, the execution demands arrangement with the State Governments to identify and gazette suitable land.

Centralisation of Information

There is a lack of a one-stop information center to provide information and services for investors. The investment process is complex which requires investors or new food producers to obtain information from various agencies. For example, information on land matters can only be obtained from state authorities, trade matters can only be obtained via trade related authorities while other information on the functions along the value chain can only be obtained via specific agencies.

Key Takeaway – To revisit certain key functions and enhance overall efficiency of services provided by various stakeholders through better communication and collaboration

3.0 Issues and Challenges of the Agrofood Sector

3.2.8 Issues in High Value Commodities (HVC)

Growing demand for high value agrofood commodities in the global market represents a potentially lucrative opportunity for local food producers. A number of HVC have been identified for further growth, including edible birds nest, ornamental fish, seaweed, herb and spices, floriculture, mushroom, guarana, kelulut honey, durian, coconut and pineapple.

Lack of investment

HVC have low visibility among both local and foreign investors, with the exception of durian which has seen exponential demand in recent years. Due to the low visibility among food producers, there is low financial investment especially into R&D to optimise farming methods which are capable of maximising yield or create new resilient breeds against pest and diseases. R&D is also important to further develop the use of ingredients such as kelulut honey and seaweed in other lucrative high return products.

Volatility in demand

Many of the HVC are considered high risk industries due to the volatility of local and global demand compared to staple produce which sees stable demand. This may result in difficulties for entrepreneurs to secure capital as financial institutions may not keen to offer financial assistance.

Small production volumes

A number of HVC are produced in relatively small volumes, which leads to difficulty in adopting automation and results in relatively high labour cost. As an example, smallholders cultivating mushrooms are unable to adopt advanced technology in order to increase productivity and quality of production. Small production volumes may also lead to inconsistency in providing sufficient supply of raw material input in the downstream sections of food processing.

Branding and Competition from neighbouring countries

There is a need for stronger business support, marketing and market access in order to grow the respective HVC. As a number of HVC face strong competition with neighbouring countries, a strong branding is among the key factors to stand out in the international markets and develop strong demand for locally produced HVC. In addition, the development of standards for specific HVC such as kelulut honey could elevate the status of locally produced HVC and ease exports for HVC.

3.0 Issues and Challenges of the Agrofood Sector

3.2.8 Issues in High Value Commodities (HVC) *(continuation)*

Lack of regulation

Despite being cultivated for decades, some HVC are still produced at a relatively small scale, and not regulated through legislation or regulation. One example is the edible birds nest, which may cause pollution and health hazards due to absence of regulation to govern swiftlet farming houses. Proper legislation can be important to drive the industry growth while balancing the impact on the environment and community.

Key Takeaway – To identify and capitalise on the demand for High Value Commodities while addressing various issues faced by local food producers.

3.0 Issues and Challenges of the Agrofood Sector

3.2.9 Impact of Unexpected Crisis on the Agrofood Sector

On 18th March 2020, the Malaysian Government implemented the Movement Control Order (MCO) in response to an outbreak of an unexpected disastrous event, Covid-19 pandemic. Food supply have remained stable, though the various restrictions that have been imposed has exposed existing weak links in the agrofood supply chain and mitigation of several other vulnerable areas.

Disruption of the Supply Chain

During the initial stages of the MCO, travel restrictions were enforced strictly to control the spread of the COVID-19. While transport services falls under the essential services, various measures were taken by the government to improve the safety and health of the workers such as roadblocks and requiring a work travel pass discourage logistic suppliers from providing transportation services. As a result, farmers faced difficulties in securing transport services to deliver their products or buying inputs, which has led to loss in produce, income, and decline in productivity. The farmers in Cameron Highlands for example was forced to dispose of their perishable fruits and vegetables due to their usual transportation arrangements being disrupted.

Gap between Producers and Consumers

To protect themselves from catching the virus, consumers started using online platforms to purchase food. Many also opt to cook at home instead of ordering from restaurants. The sudden shift in consumer habits has caused a decline in demand in the usual distribution channels among food producers as they scramble to adjust to the new reality of new technology and new markets, which might be a challenge especially to older food producers that are not tech savvy.

Reduced Agriculture Labour

Agriculture in Malaysia is labour intensive and heavily dependant on foreign workers. With many foreign workers repatriated during the lockdown and international travel restrictions further restricting entry of new foreign workers, the agriculture is experiencing shortage of workers across the various agriculture sub-industries. The shortage of workers could lead to a significant drop in productivity or even loss of crops or livestock that are not properly cared for.

3.0 Issues and Challenges of the Agrofood Sector

3.2.9 Impact of Unexpected Disastrous Events on the Agrofood Sector *(continuation)*

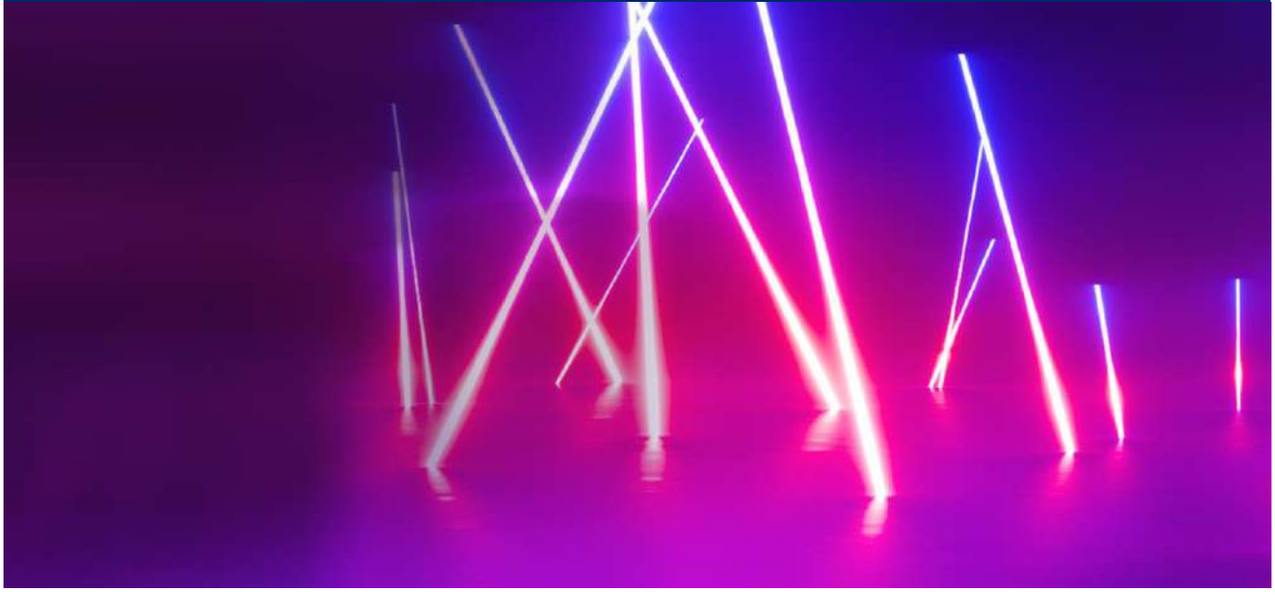
Limited Operation Activities

The implementation of MCO impose strict regulations on businesses including reduced operational hours, social distancing measures, temperature screening, constant disinfection and mandatory COVID-19 screening. This potentially limits the productivity and increase the cost of food production, which can threaten the livelihood of food producers.

Long Term Impact on the Agrofood Sector

As the MCO continues to extend, lower income among food producers can affect cashflow levels and lead to lower purchasing capacity for farming inputs in the following crop cycle. In addition, effective consumer demand may decline due to closure of schools and restricted operations of restaurants, which may further lead to a decline in food production. Lower down the value chain, SMEs which provide supporting services to farming activities or are dependent on agriculture produce as raw materials may also be affected.

Key Takeaway – To identify areas of vulnerability and establish a more resilient agrofood ecosystem against future shocks.



3.0 Issues and Challenges of the Agrofood Sector

3.3 Conclusion

The global food system is facing a set of unique issues in its path to produce sufficient food for a fast growing population.

01 Scarcity of Natural Resources

Essential resources of water and land, which are finite in nature, are both under heavy demand pressure as well as the threat of quality degradation. Conservation of essential natural resources need to be exercised to create a sustainable growth for the agrofood sector.

02 Agricultural productivity and innovation

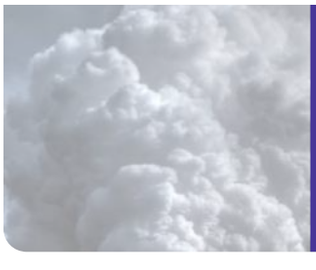
Productivity growth rate and agriculture TFP is below the estimated requirement rate to satisfy projected food demand. Technological implementation and innovation is crucial in the agricultural sector in order to meet sustainable agricultural productivity growth with increasing food demand.

03 Demographic Changes and Shifting Dietary Trends

Population growth and changes to consumer behaviour will test the ability of countries to meet increasing quantity and more complex food demand. Food producers needs to be increasingly attentive towards variations in food demand in terms of quantity, quality as well as ethical considerations.

04 Food Loss And Waste

Food wastage and losses is prevalent along the supply chain including the downstream segment. Investigative efforts are required to understand and resolve the true source of food loss and waste.



05 Climate Change

Climate change remains a major challenge in the agrofood sector, and initiatives need to be in place to create sustainable farming methods that is resilient towards climate change.

3.0 Issues and Challenges of the Agrofood Sector

The Malaysian Agrofood sector also comes with its own challenges as it aspires towards food security, food safety and other relevant goals.

01
Low Production Efficiency and High Production Cost, Affecting Farmer's Income

Food producers have low profits due to low adoption of automation, obsolete farming methods, as well as high cost of inputs. There is a need to boost productivity through greater use of modern technology to improve food producers' livelihood.

02
Limited High Value-Added Produce and Products

There is a lack of investments in Malaysia's agrofood sector to develop high value-added produce and products. Other uses for produce should be explored to further boost the attractiveness for investments.

03
Unconducive Business Environment

There is currently inadequate support given to food producers to sufficiently entice them to upgrade their farms and tools. There is a need to relook at existing acts, regulations and incentives to better accommodate to the current industry.

04
Threat from natural disasters, diseases, as well as unsustainable farming practices

The agrofood sector is vulnerable to natural disasters. Initiatives need to be developed to prepare food producers for challenges.

05
Low Involvement of Youth in the Agrofood Sector

Involvement among the youth generation is an issue which affects the future workforce and the longevity of the agrofood sector.

06
Limited Financial Assistance for Food Producers

Due to the precarious nature of the agrofood sector, it often remains a task for farmers to acquire financial assistance. Hence, there is a need to develop more comprehensive risk management plans.

07
Issues Related to Coordination and Collaboration

There is a need to centralise information on the agrofood sector to increase synergy among stakeholders and prevent miscommunication and overlap of provided services.

08
Issues in High Value Commodities (HVC)

Identify and capitalise on the demand for HVC while addressing various issues faced by local food producers.

09
Impact of Unexpected Disastrous Events

Identifying areas of vulnerability and establishing a more resilient ecosystem to mitigate risks within the agrofood sector.

3.0 Issues and Challenges of the Agrofood Sector

References:

(1) Ending Poverty and Hunger by 2030: An Agenda for the Global Food System, The World Bank (2015)
(2) Agriculture and Food, The World Bank (2020)
(3) FAO – How to Feed the World in 2050
(4) FAO – Water for Sustainable Food and Agriculture – A report produced for the G20 Presidency of Germany
(5) Challenges and Opportunities for the Global Food System, OECD: https://www.oecd.org/agriculture/understanding-the-global-food-system/opportunities-and-threats-for-agriculture/
(6) Status of the World's Soil Resources, FAO (2015)
(7) Global Forest Atlas – Industrial Agriculture *https://globalforestatlas.yale.edu/land-use/industrial-agriculture*
(8) UNESCO – The United Nations World Water Development Report 2015; Water for a Sustainable World Facts and Figures
(9) Water Resources: An Integrated Approach
(10) FAO – Water – the most basic resource but also the most essential
(11) Water at a glance, FAO (2009)
(12) Philippines Business For the Environment, The Business Case for Supporting Smallholder Farmers
(13) Global Agricultural Productivity 2019 Report (GAP 2019)
(14) United Nations – 2019 Revision of World Population Prospects, Handelsblatt Research Institute; The Future of Agriculture and Food
(15) KPMG Thought Leadership – Talking 2030; Growing Agriculture into a $100 billion Industry
(16) Kantar Worldpanel – International Company dealing in consumer knowledge and insights
(17) KPMG Thought Leadership – Talking 2030; Growing Agriculture into a $100 billion Industry
(18) FAO – A major step forward in reducing food loss and waste is critical to achieve the SDGs, FAO – the State of Food and Agriculture 2019
(19) FAO World Agriculture Towards 2030/2050
(20) Malaysia Investment Performance Report, Malaysia Investment Development Authority (MIDA), 2019
(21) Market Review on Food Sector in Malaysia under the Competition Act, MyCC, 2018 https://www.mycc.gov.my/sites/default/files/pdf/newsroom/MyCC%20Report-market%20Review%20on%20Food%20Sector.pdf
(22) Agriculture Faculty, UPM – Addressing food security in Malaysia, *https://agri.upm.edu.my/article/agriculture_addressing_food_security_in_malaysia-46781*
(23) Laporan Survei Tenaga Buruh Malaysia, DOSM (2018)

Part B

Chapter 4

Evolution of NAP, and its Relation to Other National Policies

4.0 Evolution of NAP, and its relation to other national policies

4.1 Key Themes of NAPs

From its first inception in 1948, the policy themes and focus areas has evolved across each passing editions.

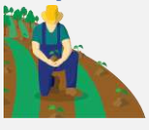
Pre-independence Policy (1948-1957) and The Malaya/Malaysia Economic Plan (1957-1983)

Commodity focused

The pre-independence policy was focused on primary commodity for instance, rubber and spices. Such direction were followed after independence, and the agricultural policies were published in national plans such as: The First Malaya Plan (1956-1960), The Second Malaya Plan (1961-1965) and The First Malaysia Plan (1966-1970)

1950s

First National Agricultural Policy (1984-1991)



Income bridging

Established as a long-term policy to drive the industry in a comprehensive and coordinated manner. This policy focused upon rural poverty, and the income gap between commercial and traditional farmers.

1980s

Second National Agricultural Policy (1992-1997)

Industry Growth

An extension of the previous policy, this edition emphasised on increasing the contribution of agricultural sector to the national economic growth. Among the focus areas are productivity, competitiveness, R&D, human capital development, and private sector participation.

1990s

Third National Agricultural Policy (1998-2010)

Agriculture Revisit

This edition was a revised version of the Second National Agricultural Policy, following the events of 1997-1998 Asian Financial Crises. The revision was done partly to address the newly realised importance of agriculture as food providers to the nation, as such the policy focuses on enhancing food supply, productivity, intersectoral linkages, and sustainable development.

2000s

National Agrofood Policy (2011-2020)

Industry Transformation

The National Agrofood Policy was designed to provide keen attention to the development of food commodities that contributes strongly towards food security. Other focuses include improving value-adding processes, and higher value of agricultural export earnings. Eight (8) main ideas in the policy have been identified to support the transformation process of the agrofood sector.

2010s

2020s

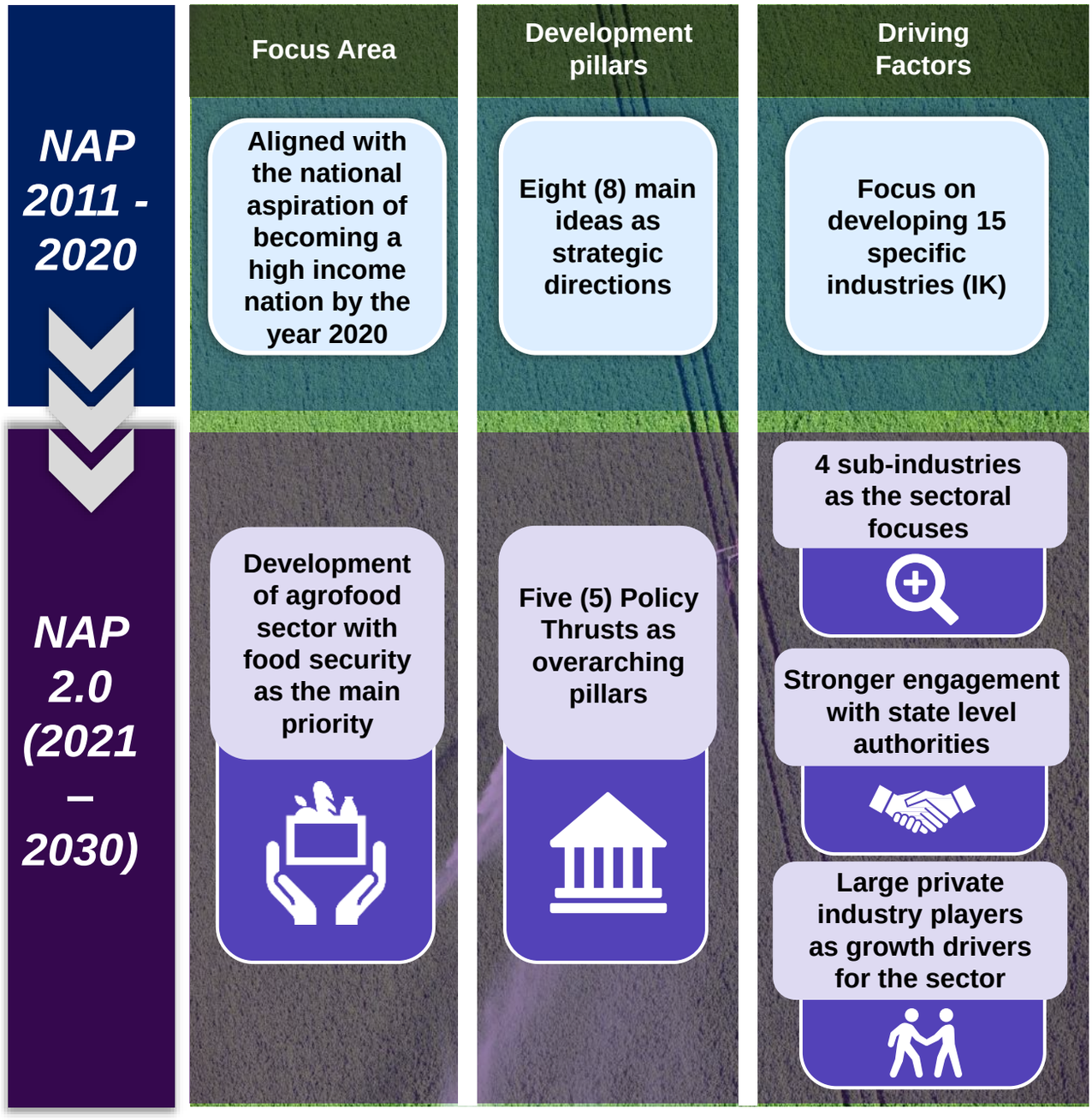
Timeline

4.0 Evolution of NAP, and its relation to other national policies

4.1.1 NAP 1.0 vs NAP 2.0

NAP 2.0 focuses on the continuing challenges of the agrofood sector, with heightened priority on the multifaceted dimensions of food security

In the face of continuing challenges, the NAP 2.0 looks to drive the agrofood sector towards greater contribution of national food security, by enhancing conduciveness and sustainability of agrofood ecosystem for all players.

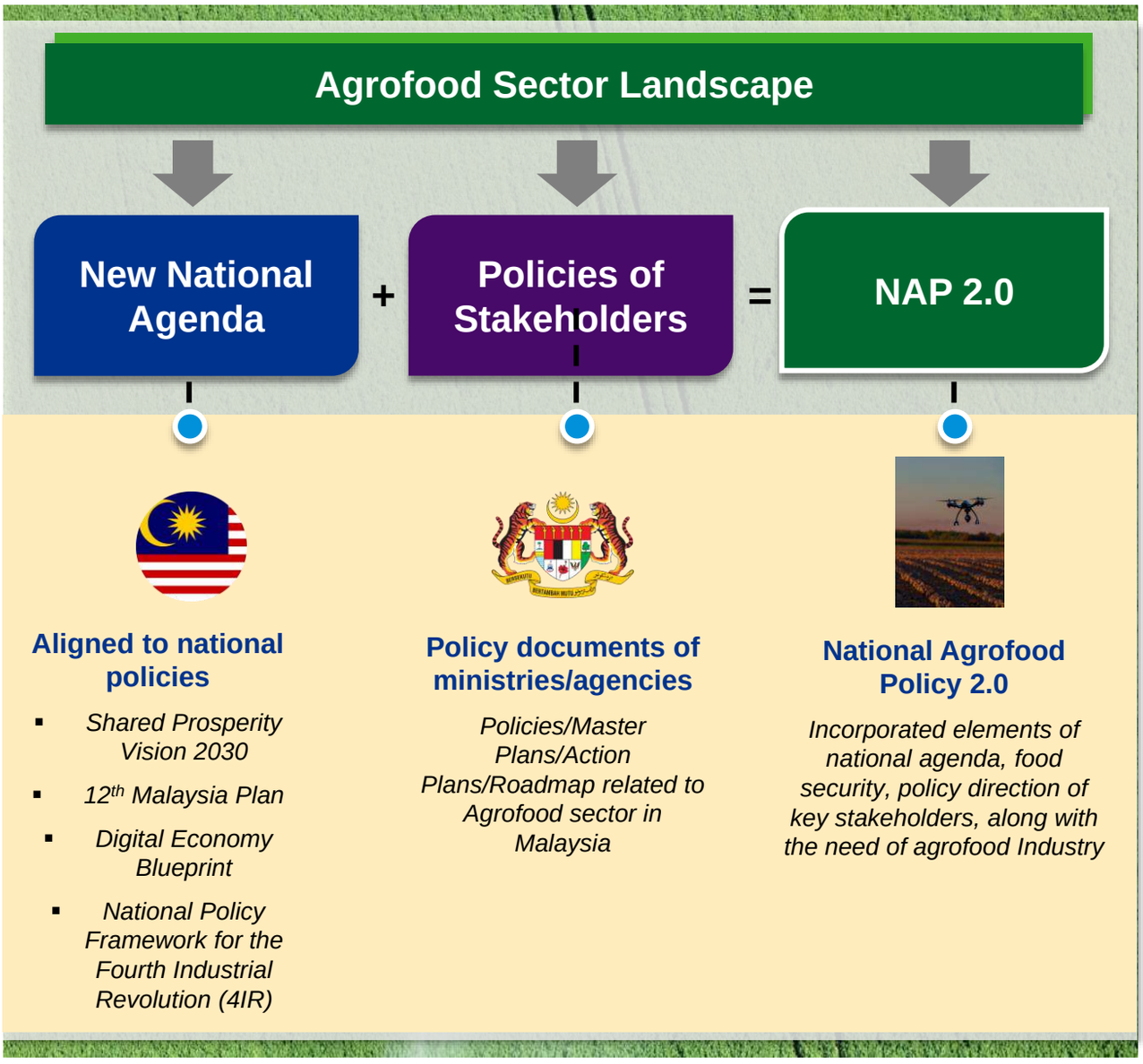


4.0 Evolution of NAP, and its relation to other national policies

4.2 Relationship between NAP 2.0 and other national policies

4.2.1 Nationals Policies related to NAP 2.0

The NAP 2.0 was formulated with consideration of relevant policies which can be segregated into two segments; national policies, and ministerial policies. Policies contained within all the identified policy documents were studied under the context of agrofood sector to be effectively translated and incorporated within NAP 2.0. Shared Prosperity Vision 2030 and the 12th Malaysia Plan are the two national policies to be in alignment with, whereas relevant ministerial policies are identified by examining the roles of each participating ministry within the agrofood value chain, which will be further described in the later section.



4.0 Evolution of NAP, and its relation to other national policies

4.2.1 Alignment of NAP 2.0 to National Policies

The contribution of NAP 2.0 towards the achievement in line with the national vision and development pathway, as stipulated in the national policies are described in this section of the report. Key features of the national policies were extracted to be map linkages of national policies against the contents of NAP 2.0, to display the strongly interconnected nature of these policies.

Shared Prosperity Vision 2030

Summary

Shared Prosperity Vision 2030 (SPV 2030), or Wawasan Kemakmuran Bersama 2030 (WKB 2030), is a blueprint released by the Government of Malaysia for the period of 2021 to 2030 which outlines the 10-year goals and course of development, to restructure Malaysia's economic, socio-economic, governance, and societal landscape, for the benefit of its people. The official definition of SPV2030 reads: *"Shared Prosperity Vision 2030 is a commitment to make Malaysia a nation that achieves sustainable growth along with fair and equitable distribution, across income groups, ethnicities, regions and supply chains. The commitment is aimed at strengthening political stability, enhancing the nation's prosperity and ensuring that the rakyat is united whilst celebrating ethnic and cultural diversity as the foundation of the nation-state. The primary aim of Shared Prosperity Vision is to provide a decent standard of living to all Malaysians by 2030"*

The Shared Prosperity Vision covers three primary objectives:

1) Development for All

2) Addressing Wealth and Income Disparities

3) United, Prosperous and Dignified Nation

15 Guiding Principles have been set as a guide for the preparation of the strategic thrusts, enablers and target achievements of this document:

Continuous Prosperity	Distributed Economy	Future Economy	Integrated Social Model	Integrity and Good Governance
Equitable Outcome	Inclusivity	Needs-Based Approach Economy	Economic Centre of Asia	Unity in Diversity
Equitable Growth	Learning Society	Institutional Political-Economy	Democracy and Stability	Sovereignty and Sustainability

4.0 Evolution of NAP, and its relation to other national policies

The linkages between 7 strategies thrusts formulated to support the achievement of objectives within SPV 2030, with NAP 2.0 are as described below;

SPV 2030 Strategic Thrusts	NAP 2.0
Strategic Thrust 1: Restructuring Business and Industry Ecosystem	The focus of this strategic thrust is reflected through NAP 2.0's focus on the development of conducive landscape, which includes the elements of: value chain advancement and digitalisation, linkage between large companies and SMEs, entrepreneurship development, and the betterment of R&D&C&I investment, governance, and technology transfer
Strategic Thrust 2: Key Economic Growth Activities (KEGA)	The emphasis on greater technology adoption, value-adding, and productivity of the agrofood sector covered in NAP 2.0, will lead to major contributions towards two Key Economic Growth Activities within SPV 2030 namely; KEGA 6 (Halal and Food Hubs), and KEGA 13 (Smart and High-Value Farming)
Strategic Thrust 3: Transforming Human Capital	NAP 2.0 highlights the pathway to develop future talents that will be of greater relevance with the need of the agrofood sector, primarily by strengthening existing educational offerings, promoting collaborative effort with private actors, and stimulating innovation
Strategic Thrust 4: Labour Market & Compensation of Employees	Emphasis on developing a working condition that would entice further interest of local talents and domestic investments to participate in the agrofood sector, whilst reducing the dependence on foreign labour is one of the key highlights of NAP 2.0
Strategic Thrust 5: Social Wellbeing	The elements of social wellbeing is covered within NAP 2.0's pursuit to improve the income of food producers where a large majority falls under the B40 income group, as well as initiatives to provide social protection scheme against the occurrence of natural disasters
Strategic Thrust 6: Regional Inclusion	In line with the strategic trust for an equitable development distribution across the states of Malaysia, NAP 2.0 contains initiatives that looks into greater development of infrastructure and promotion of farming models that would improve the viability of undertaking agrofood economic activities particularly in rural areas
Strategic Thrust 7: Social Capital	NAP 2.0 contributes towards the advancement of social capital by supporting the undertaking of community-based farming activities as well as enhancement of inclusivity by offering greater opportunity to non-traditional workforce in agrofood related activities

4.0 Evolution of NAP, and its relation to other national policies

12th Malaysia Plan

Summary

The Twelfth Malaysia Plan (12MP), or Rancangan Malaysia ke-12 (RMKe-12), is Malaysia's five-year development plan, which lays out the direction of the nation from 2021 to 2025 in line with the Shared Prosperity Vision 2030 (SPV 2030). The 12MP will contribute towards the achievement of SPV 2030 by aiming to drive economic growth, while ensuring the country's prosperity is distributed in a fairer and equitable manner without neglecting the preservation of the environment.
Several national priorities have been listed in the 12MP as following:

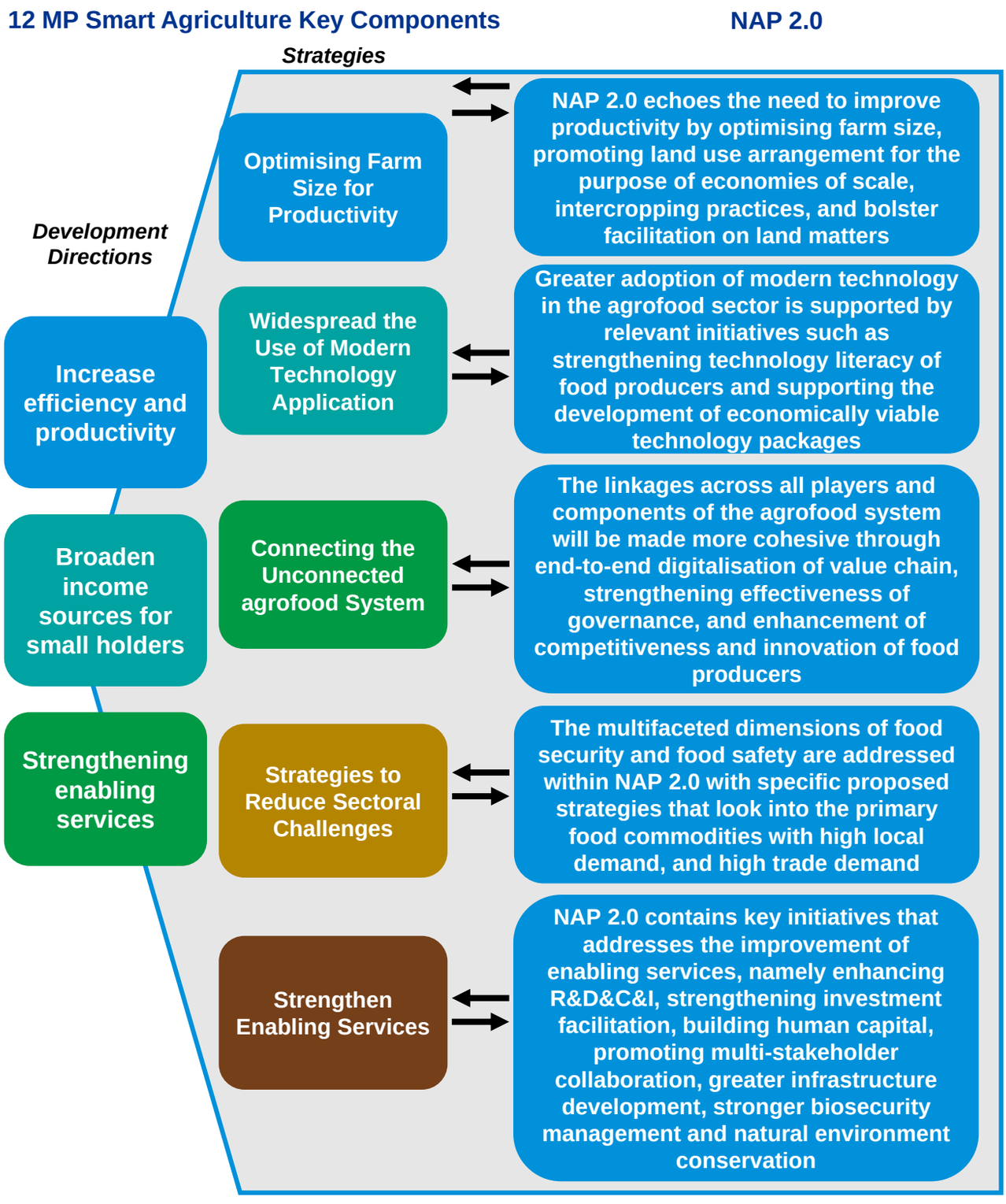
1	**Tackling of poverty, especially the eradication of hardcore poverty**
2	**Reducing socio-economic inequality**
3	**Emphasising on the Bumiputera Empowerment Agenda to reduce the disparity between the Bumiputera and other ethnicities**
4	**Speeding up development in Sabah and Sarawak and other states that are less developed**
5	**Preparing a conducive environment to develop micro, small and medium enterprises**
6	**Accelerate the acceptance and use of the latest technology and digitalisation**
7	**Encouraging quality investment by focusing on high-technology activities**
8	**Speeding up a shift towards "green economy" to support the agenda of sustainable development and turning Malaysia into a low-carbon nation**

In line with the national priorities, several industries with high potential had been identified as drivers and sources of new growth for the nation, which includes Smart Agriculture, the economic sector that NAP 2.0 directly addresses:

Aerospace | **Electrical and Electronics** | **Biomass** | **Smart Agriculture**

4.0 Evolution of NAP, and its relation to other national policies

To realise the potential of Smart Agriculture as drivers and sources of new growth for the nation, 3 development directions followed by 5 strategies have been crafted for the sector. This section describes the linkages between NAP 2.0 and the relevant strategies within 12 MP.



4.0 Evolution of NAP, and its relation to other national policies

Malaysia Digital Economy Blueprint

Summary

Malaysia Digital Economy Blueprint is a national initiatives by the Malaysian Government to effectively transform Malaysia into a digital-enabled and technology-driven, high income nation and a regional leader in digital economy. Digital economy has been recognised as a key economic growth area (KEGA) in SPV 2030, to ensure that the development of Malaysia's digital economy is in a sustainable, fair and inclusive environment. MyDIGITAL outlines the strategies, action plan and targets to strengthen the foundation and accelerate growth of digital economy. The blueprint will ensure that the country is prepared to embrace rapid digitalisation and bridge the digital divide.

MyDIGITAL consists of 6 strategic thrusts, supported by 22 strategies, 48 national initiatives and 28 sectoral initiatives. The blueprint will be implemented in 3 phases from 2021 to 2030. Phase 1 aims to build the foundation of digital adoption while phase 2 will focus on expediting an inclusive digitalisation of the country's economy, and followed by the final phase which will emphasise on building Malaysia's digital content and strengthening its cyber security.

The 6 strategic thrusts under MyDIGITAL are:

Drive digital transformation in the public sector	**Boost economic competitiveness through digitalisation**	**Build enabling digital infrastructure**
Build agile and competent digital talent	**Create an inclusive digital society**	**Build trusted, secure and ethical digital environment**

4.0 Evolution of NAP, and its relation to other national policies

The 6 strategic thrusts of Malaysia Digital Economy Blueprint consists of important aspects on digitalisation that are relevant to NAP 2.0, the relationship between MyDIGITAL and NAP 2.0 are as described below;

MyDIGITAL Strategic Thrusts	NAP 2.0
Drive digital transformation in the public sector	NAP 2.0 emphasises on the importance of the public sector's role to drive modernisation in the agrofood sector through initiatives that look to improve online service offerings and digital platforms performance of public sector, as well as development of human capital within the civil service to enhance readiness of digital technology adoption
Boost economic competitiveness through digitalisation	This aligns with the aspirations of NAP 2.0 to empower local industry players in the agrofood sector to embrace technologies, by collaborating with the private sector to bring in new technology offerings and accelerate the process of technology adoption by food producers. Digitalisation will also assist the agrofood sector to build a resilient and agile value chain
Build enabling digital infrastructure	In order to expedite technology adoption and automation in the agrofood sector, access to extensive and high quality digital infrastructure is among the highlights in NAP 2.0. The focus on building basic infrastructure in the rural and remote areas will path the way and prepare for more advance technology to be utlised progressing forward
Build agile and competent digital talent	NAP 2.0 also seek to ensure that the workforce in the agrofood sector will continue to be well-equipped with relevant technology and digital skills as it is crucial to drive the industry forward. Initiatives are laid out to ensure key players will have the opportunities to upskill and thrive in the evolving digital economy
Create an inclusive digital society	In line with MyDIGITAL, digital inclusiveness is a key aspect highlighted in NAP 2.0. Several initiatives has been made to address the digital divide and ensure food producers are provided with equal opportunities in the digital sphere. This includes IT and digital related training for targeted groups to improve adoption and integration of digital skills in daily work
Build trusted, secure and ethical digital environment	One of the key features in NAP 2.0 is the emphasis towards transparency, ethical and secure digital environment in the agrofood sector. This is supported by several strategies which include higher accessibility to available data, and guiding relevant key players of the value chain throughout the digital transformation process

4.0 Evolution of NAP, and its relation to other national policies

National Fourth Industrial Revolution (4IR) Policy

Summary

Following the launch of the National Fourth Industrial Revolution (4IR) Policy on the 1st July 2021, which focuses on the adoption of Industry 4.0 technological elements for the manufacturing sector and manufacturing-related services, it has became apparent for rest of the country's economy to be interphase with the 4IR framework. The 4IR Policy serves to provide a broader policy framework for existing and future policies to be finetuned, for better resource optimisation and implementation coordination towards the goal of a nationwide 4IR adoption.

The 4IR Policy has incorporated both the international and national agenda stemming from Sustainable Development Goals (SDGs), Shared Prosperity Vision 2030 (SPV 2030), and 12th Malaysia Plan (12MP), into the following vision, mission, and objectives:

Vision	*Mission*	*Objectives*
To achieve a balanced, responsible and sustainable growth	**1. Improve quality of life by leveraging technological advancement** **2. Enhance local capabilities to embrace 4IR across sectors** **3. Harness technologies to preserve ecological integrity**	**1. Seizing economic growth opportunities arising from 4IR** **2. Creating a conducive ecosystem to cope with 4IR** **3. Building trust and an inclusive digital society**

To support the achievement of the said goals, 4 policy responses have been formulated:

01	02	03	04
Equip the people with 4IR knowledge and skillsets	**Forge a connected nation through digital infrastructure development**	**Future-proof regulations to be agile with technological changes**	**Accelerate 4IR technology innovation and adoption**

4.0 Evolution of NAP, and its relation to other national policies

The 4 policy responses which target at businesses, society and the public sector to prepare for 4IR, are the key components for NAP 2.0 to be mapped against, in order to gauge the degree of cohesiveness between the two policies:

National Fourth Industrial Revolution (4IR) Policy Key Components		NAP 2.0
01 **Equip the people with 4IR knowledge and skillsets**	⇄	The notion to upskill the people with 4IR related knowledge and skillsets is reflected in NAP 2.0's emphasis on increasing the viability of modern technology adoption among food producers, via improving their technological literacy, among other focuses such as supporting the development of agrofood education programmes that are in line with industry needs, and the development of human capital amongst extension officers.
02 **Forge a connected nation through digital infrastructure development**	⇄	Infrastructure development that maximises economical viability for agrofood activities, while reducing regional disparity is one of the key focus in NAP 2.0. These enablers of public goods will contribute to building a stronger foundation for the development of digital infrastructure. The drive for end-to-end digitalisation of the agrofood value chain also effectively serves to provide a greater urgency to expedite digital infrastructure development.
03 **Future-proof regulations to be agile with technological changes**	⇄	NAP 2.0 contributes towards the preparation of regulatory arm for 4IR future landscape, by strengthening existing governance of the agrofood sector, both in terms of efficiency and effectiveness. Governance mechanism is aimed to be streamlined for better resource allocation with priorities placed on strengthening multi-stakeholder governance between the public and private sector as well as updating regulations as industry landscape evolves.
04 **Accelerate 4IR technology innovation and adoption**	⇄	Expediting the innovation and adoption of 4IR technology within local landscape is one of the key features of NAP 2.0. This is highlighted through the emphasis on providing technical, financial, and informational supports to all agrofood players to transition their business process to reach the level of 4IR. In addition, R&D&C&I ecosystem within the agrofood sector will be made more conducive and strengthened, to facilitate greater technological outputs.

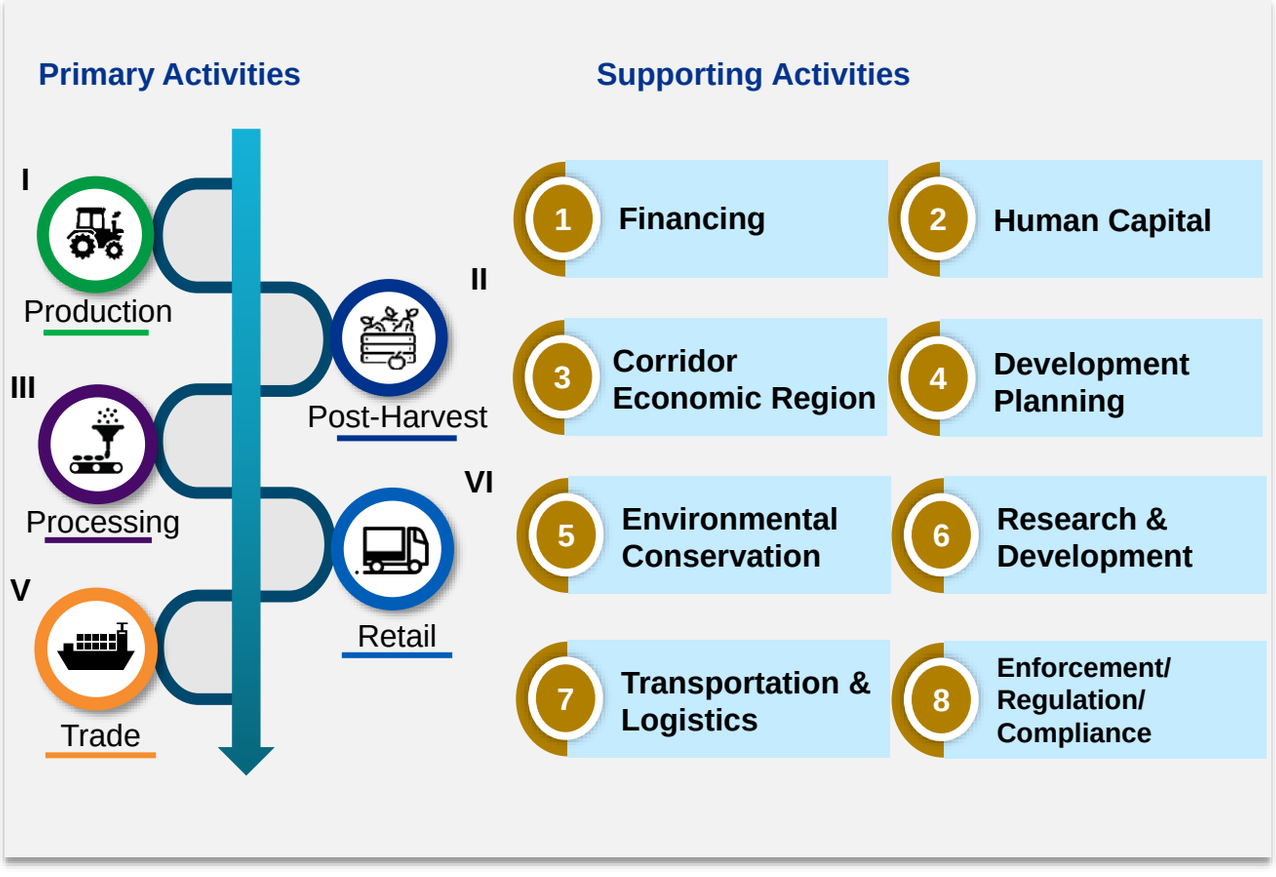
4.0 Evolution of NAP, and its relation to other national policies

4.2.2 Policies/Master Plans/Action Plans/Roadmap related to Agrofood sector in Malaysia

The agrofood sector of Malaysia is an expansive economic segment that involves the participation of multiple governmental institutions, across its processes. Hence, it is crucial to identify the linkages between NAP 2.0 and the policy documents of the relevant stakeholders, for a better streamlining of policy directions.

The role of stakeholders can be segregated into two main categories; Primary activities, and Supporting Activities. The primary activities involves various activities which stretches across the value chain. This includes the stages of production, postharvest, processing, retail, trade, and logistics while supporting activities are the value chain enablers, that provide the support which makes the development and functioning of value chain possible. As various ministries are involved in both categories that makes up all activities of the agrofood sector (excluding private sector), of which the involvement is highlighted in the subsequent figure, it is crucial to maintain good synergistic working relationship amongst all participating stakeholders to facilitate a smooth running of industrial operations.

Figure 4-1: Types of primary and supporting activities in Malaysia Agrofood Sector



4.0 Evolution of NAP, and its relation to other national policies

The relevant Policies/Master Plans/Action Plans/Roadmap have been segmented into Primary Activities and Supporting Activities, as shown in the figures below:

Figure 4-2: Policies/Master Plans/Action Plans/Roadmap relevant to primary activities in Malaysia Agrofood Sector

4.0 Evolution of NAP, and its relation to other national policies

This section describes the relationship between the highlighted planning documents, and the development pathway as per charted within NAP 2.0:

	Policies/Master Plans/Action Plans/Roadmap		NAP 2.0
Ministry of Energy and Natural Resources	**National Policy on Biological Diversity 2016-2025**	The National Policy on Biological Diversity 2016-2025 serves as the direction and framework to sustainably manage the nation's biological resources.	Key elements in relation to biodiversity conservation, which includes applicable national biodiversity targets, have been incorporated within NAP 2.0. The subject matter is one of the emphasis in charting the way forward for the agrofood sector, as evident in the environmental goals alongside strategies and action plans for sustainable agrofood practices.
	National Forestry Policy 2020	National Forestry Policy 2020 provides direction on the management and conservation, of primarily forest resources and wildlife reserves.	The need for the conservation of ecological landscape including forest resources and wildlife, which plays a pivotal role in sustaining agrofood activities is highlighted in NAP 2.0. Initiatives have been designed with a multi-stakeholder implementation approach, to contribute towards the conservation of natural environment.
	Green Technology Masterplan 2017-2030 (GTMP)	The GTMP provides a framework that facilitates the mainstreaming of green technology within the fabric of Malaysia.	NAP 2.0 supports the green technology notion, by intensifying management of agrofood waste, in areas of waste reduction, waste reuse, and waste data capture along the value chain. In addition, strategic actions are also in place to facilitate greater adoption of green technology within the agrofood sector.
Ministry of Environment and Water	**National Policy on the Environment 2002 (DASN)**	DASN aims to integrate environmental considerations into development activities and decision-making processes.	Environmental considerations are incorporated along the formulation of NAP 2.0, as seen in initiatives such as increasing adoption of sustainable agrofood practices, enhancing efficiency in use of natural resources, and boosting agrofood regulatory proficiency on environmental matters.
	National Policy on Climate Change 2009	This policy provides a framework to ensure climate-resilient development to fulfil national aspirations for sustainability.	NAP 2.0 recognises the potential adverse impact of climate change on the well-functioning of agrofood sector, thereby incorporates the need for adaptation over changing climate condition within its industry goals, strategies, and action plans.
	National Water Resources Policy	This policy provides a framework for the management of water resources across the nation.	Water resources, being one of the crucial farming inputs of the agrofood sector, will look to be managed more effectively in NAP 2.0. This is reflected through initiatives such as enhancement of water delivery performance, and promoting sustainable water use.

4.0 Evolution of NAP, and its relation to other national policies

	Policies/Master Plans/Action Plans/Roadmap		NAP 2.0
Ministry of International Trade and Industry	**National Policy on Industry 4.0 2018-2025 (Industry4 WRD)**	Industry4WED was launched to provide a developmental pathway on the adoption of Industry 4.0 technological elements, for the manufacturing sector and manufacturing-related services, in order for the industry to be smart, systematic and resilient.	NAP 2.0 plays a supporting role towards the objective of Industry4WED, by promoting the uptake of Industry 4.0 across the agrofood value chain with heightened emphasis on the upstream segment. Examples of initiatives include enhancement of R&D&C&I ecosystem, supporting the advancement of aggrotech, boosting investment facilitation and promotion, developing human capital that meets future skill demand, and increasing strategic collaborations with the private sector. Such focus would assist in strengthening the linkages between players of different value chain segment as the technological advancement will be on a similar level throughout, thereby reducing the occurrence of a disjointed value chain.
Ministry of Domestic Trade and Consumer Affairs	**National Intellectual Property Policy 2007**	This policy aims to enhance social and economic prosperity through the development of intellectual property.	In line with the National Intellectual Property Policy 2007, NAP 2.0 contributes towards similar aspiration to strengthen the country's intellectual property landscape, through accelerating the process of intellectual property of value-added products to achieve a rapid and successful commercialisation.
	Fair Trade Practices Policy 2005	The main pursuit of this policy is to promote and protect the competitiveness process of the national's economy.	NAP 2.0 supports the objectives of the Fair Trade Practices Policy 2005 through several initiatives. This includes boosting competitiveness in the agrofood sector by encouraging the participation of SMEs in the country's economy as well as providing a conductive environment for commercial activities, and thereby protecting consumers' interest.
	National Consumer Policy	The policy's goal is to establish a sustainable market, by instilling self-protection in consumers and self-regulation in key players.	Aligning to the National Consumer Policy, NAP 2.0 recognises the importance of developing a sustainable agrofood sector, by increasing consumers' nutritional knowledge, promoting good agricultural practices, and strengthening the linkages between food production and food consumers.
	Consumer Master Plan	The master plan was established to outline the strategic plan to enhance consumer welfare and protection in Malaysia.	NAP 2.0 supports the objectives of the National Consumer Master Plan to realise holistic consumer protection in the agrofood sector. Initiatives that support the objectives of the master plan include promoting and supporting sustainable consumption as well as educating consumer on the food source.

4.0 Evolution of NAP, and its relation to other national policies

On top of primary activities, planning documents from stakeholders who participates in supporting activities are also highlighted on a high level basis, to highlight the its relevancy for the future development of agrofood sector.

Figure 4-3: Policies/Master Plans/Action Plans/Roadmap relevant to secondary activities in Malaysia Agrofood Sector

Supporting Activities in the Agrofood Sector

Ministry of Plantation Industries and Commodities

- National Biofuel Policy 2006-2020
- National Timber Industry Policy 2009-2020
- National Agri-Commodity Policy 2021-2030

Ministry of Higher Education

- Malaysian Education Development Plan (Higher Education) 2015-2025
- Entrepreneurship Action Plan of Higher Education Institutions 2016-2020

Ministry of Health of Malaysia

- National Nutrition Policy of Malaysia 2005
- National Food Safety Policy
- National Plan of Action for Nutrition of Malaysia III 2016-2025

Ministry of Education Malaysia

- Malaysia Education Blueprint 2013-2025

Ministry of Women, Family and Community Development

- Women's Development Action Plan 2009
- Disability Action Plan 2016-2022

Ministry of Human Resources

- The Malaysian Workforce Expertise Development and Training Master Plan 2008-2020
- National Workforce Human Capital Development Blueprint 2018 - 2025

Ministry of Tourism, Arts, & Culture

- National Tourism Policy 2020-2030
- National Ecotourism Plan 2016-2025

Ministry of Youth and Sports

- National Youth Policy 2015-2035

Ministry of Science, Technology and Innovation

- National Biotechnology Policy 2005-2020
- The Commercialisation of Intellectual Property Policy 2009
- National Science, Technology and Innovation Policy 2021-2030
- National Internet of Things (IoT) Strategic Roadmap 2014

Ministry of Rural Development

- Rural Development Policy 2019-2030

Ministry of Transport Malaysia

- Malaysia Transport Policy 2019-2030
- The Trade and Logistics Facilitation Master Plan 2015
- The Malaysian Shipping Master Plan 2017-2022

Ministry of Housing and Local Government

- National Solid Waste Management Policy
- National Physical Plan
- National Community Policy 2019

Ministry of Entrepreneur Development and Cooperatives

- National Entrepreneurship Policy 2030
- National Cooperatives Policy 2011-2020
- SME Masterplan 2012-2020
- The Malaysian Social Enterprise Action Plan 2015-2020

4.0 Evolution of NAP, and its relation to other national policies

4.3 Sustainable Development Goals

4.3.1 Sustainable Development Goals (SDGs) related to Malaysia Agrofood Sector

In 2015, the United Nation introduced the 2030 Agenda for Sustainable Development and was since then adopted by all United Nations Member State. The agenda provides all members a shared blueprint for peace and prosperity for people and the planet, now and into the future establishing 17 main Sustainable Development Goals (SDGs) which call for all members to take action and collaborate in this global partnership.

As a United Nation member country, Malaysia is committed to support and contribute towards the 2030 Agenda for Sustainable Development and its 17 SDGs. 10 SDGs has been highlighted to be of direct relation with Malaysia's agrofood Industry, and hence serve as one of the guiding principles in formulation of this policy document.

Out of 17 GOALS, 10 were identified for incorporation into NAP 2.0

SUSTAINABLE DEVELOPMENT GOALS

Figure 4-4: 10 SDGs related to Malaysia Agrofood Sector

Source: United Nations, 2020

4.0 Evolution of NAP, and its relation to other national policies

Recognising the potential of agrofood sector as one of the means to realise international agenda for a better and more sustainable future for all, NAP 2.0 thereby has been formulated with direct contribution towards the 10 highlighted SDGs as described below:

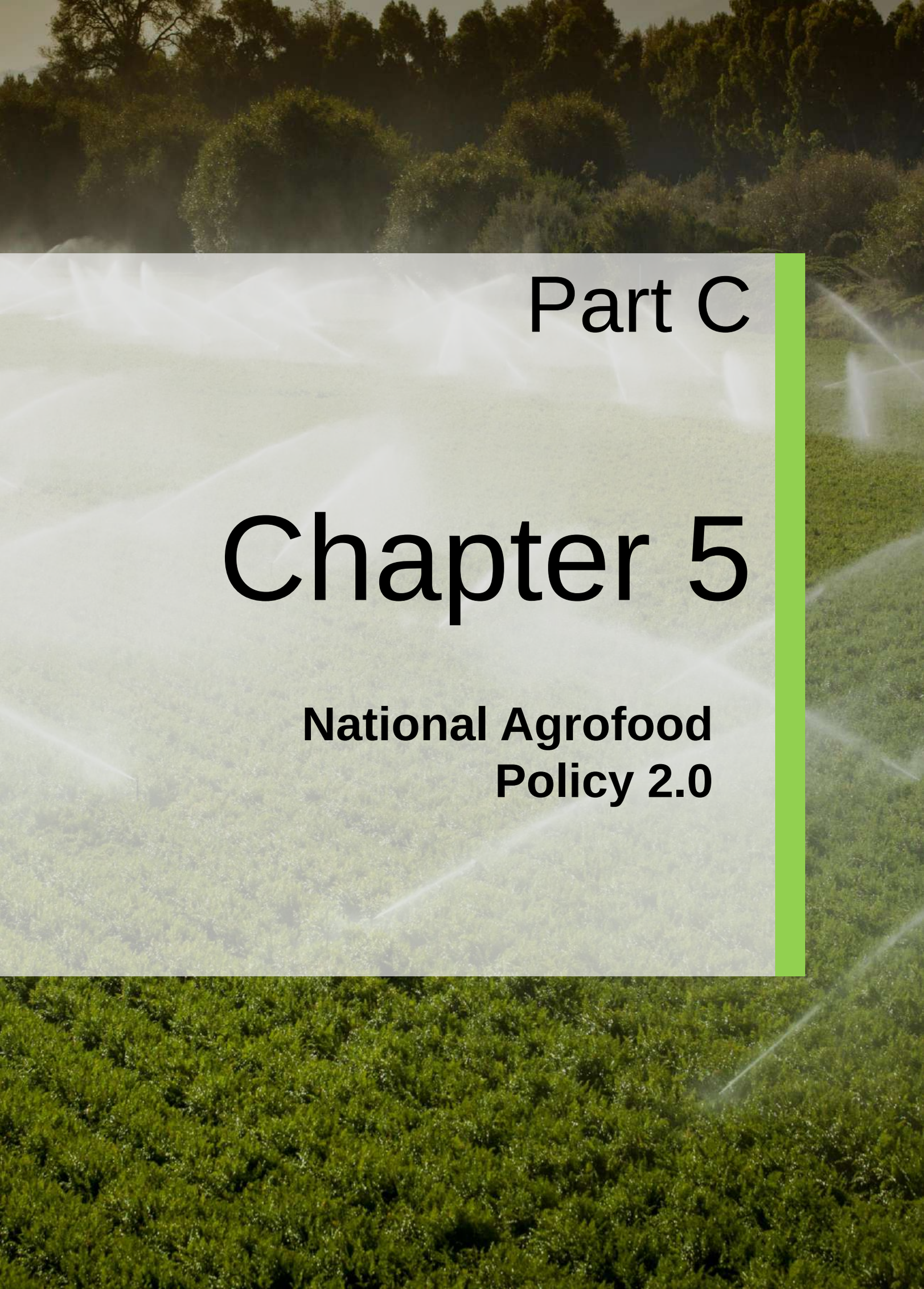
4.0 Evolution of NAP, and its relation to other national policies

4.4 Conclusion

Malaysia's national agriculture policies have come a long way since 1948, when the first agricultural policy paper was formulated. From the colonial era to the earlier years of post-independence period and up until the modern era, the shifting role of agriculture industry towards the national economy can be seen by the policy emphasis as it evolves from one edition to another. What started as a policy paper focused on the primary commodities utilised as a tool to tackle issues of income gap and rural poverty, followed by the agenda to increase production and competitiveness of the agricultural sector, enhancing food supply with sustainable development, and finally The National Agrofood Policy (NAP 1.0) was formulated for 2011 – 2020 period with a set of vision that has geared towards reforming and transforming the agrofood sector into a more advance and dynamic industry.

As NAP 1.0 comes to its tailend, NAP 2.0 will provide a new direction and address the challenges faced within the agrofood sector as the nation transitions into a new era and battle with disruptive events such as the global COVID-19 pandemic. The focus of NAP 2.0 will be placed on the multifaceted dimensions of food security, which will go beyond the aspect of food supply to include elements such as food safety, affordability, and resilience of the value chain. On top of that, further emphasis will be placed on effective implementation of NAP 2.0 through strengthening engagement with state level authorities as well as buy-ins and collaboration with large scale private players.

To design a policy direction that is streamlined with the future pathway of governmental stakeholders, NAP 2.0 was formulated with reference to identified policy documents that has an important footprint in the development of agrofood sector. The identified policy documents are the likes of national vision and policies, as well as ministerial level policies. Finally, to reflect Malaysia's commitment to support and contribute towards the achievement of Sustainable Development Goals (SDGs), the principles of the 10 identified SDGs relevant to the agrofood sector have been incorporated into the formulation process of NAP 2.0.



Part C

Chapter 5

National Agrofood Policy 2.0

5.0 National Agrofood Policy 2.0

5.1 Policy Framework

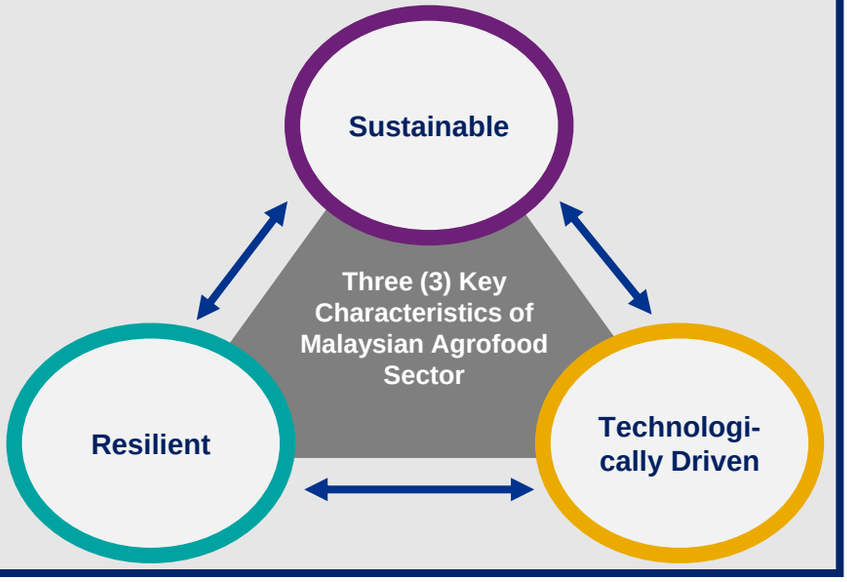
This chapter outlines the proposed policy framework for the National Agrofood Policy 2.0 (NAP 2.0) for the Agrofood sector for 2021 to 2030. The policy framework for NAP 2.0 includes the policy statement, policy objectives, policy thrust, and strategies, and action plans for each policy thrust and key sub-industries.

Key Characteristics of NAP 2.0

NAP 2.0 is the policy that will guide and shape the next 10 years of the agrofood sector in Malaysia, driving it to be a more resilient and more agile industry. The diagram below portrays 3 key characteristics of NAP 2.0, representing the focus of national agrofood sector in the next 10 years.

Figure 5-1: Key Characteristics of NAP 2.0

The 3 key characteristics of NAP 2.0 are crucial elements of the policy in order to further develop and sustain the agrofood sector in Malaysia.



Sustainable - Ecosystem that delivers food and nutrition security for all in a way that the economic, social, and environmental aspects to generate food security and nutrition for future generations is not compromised

Resilient – Strength and flexibility to withstand and recover from effects of internal and external economic, social and environmental disruptions

Technologically Driven - Agrofood sector that is spearheaded by the potentials of available technology offerings and consists of elements of scientific development for new technological advancement and adoption

With these 3 key characteristics, the Malaysia agrofood sector aspires to be one that is robust and agile to meet the rapid growth of the global economy and effects of globalisation, while contributing to the local society and environment through sustainable development initiatives.

5.0 National Agrofood Policy 2.0

Main Aspects of NAP 2.0

NAP 2.0 considers 2 main aspects in addition to the 3 key characteristics in order to shape an agrofood sector that is robust, agile and holistic, while placing the wellbeing of all Malaysians as the key priority of the industry. The 2 main aspects include:

Figure 5-2: Main Aspects of NAP 2.0

Food security is defined as when "all people, at all times, [have] physical, social and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life"(2). Importantly, this definition highlights that food should be available in sufficient quantity and quality, should be culturally acceptable, and should be available at all times throughout the year.

The term food security includes food safety aspects such as handling, storing and preparation of food to prevent contamination and to ensure that food available to the population preserves sufficient nutrients for a healthy diet. Meanwhile, nutrition security refers to having access to a healthy and balanced diet, whilst also having access to adequate caregiving practices, safe and clean environment, as well as access to health, water and sanitation services to stay healthy and utilise the food consumed effectively.

The aspect on economic growth encompasses a higher contribution from the agrofood sector to the national GDP, higher value-added agrofood produce, improved income for food producers, and an increase in trading and business activities in the agrofood sector. The well-being of "rakyat" generally refers to improving the quality of life through measures to increase the purchasing power of Malaysians and the access to quality and affordable food.

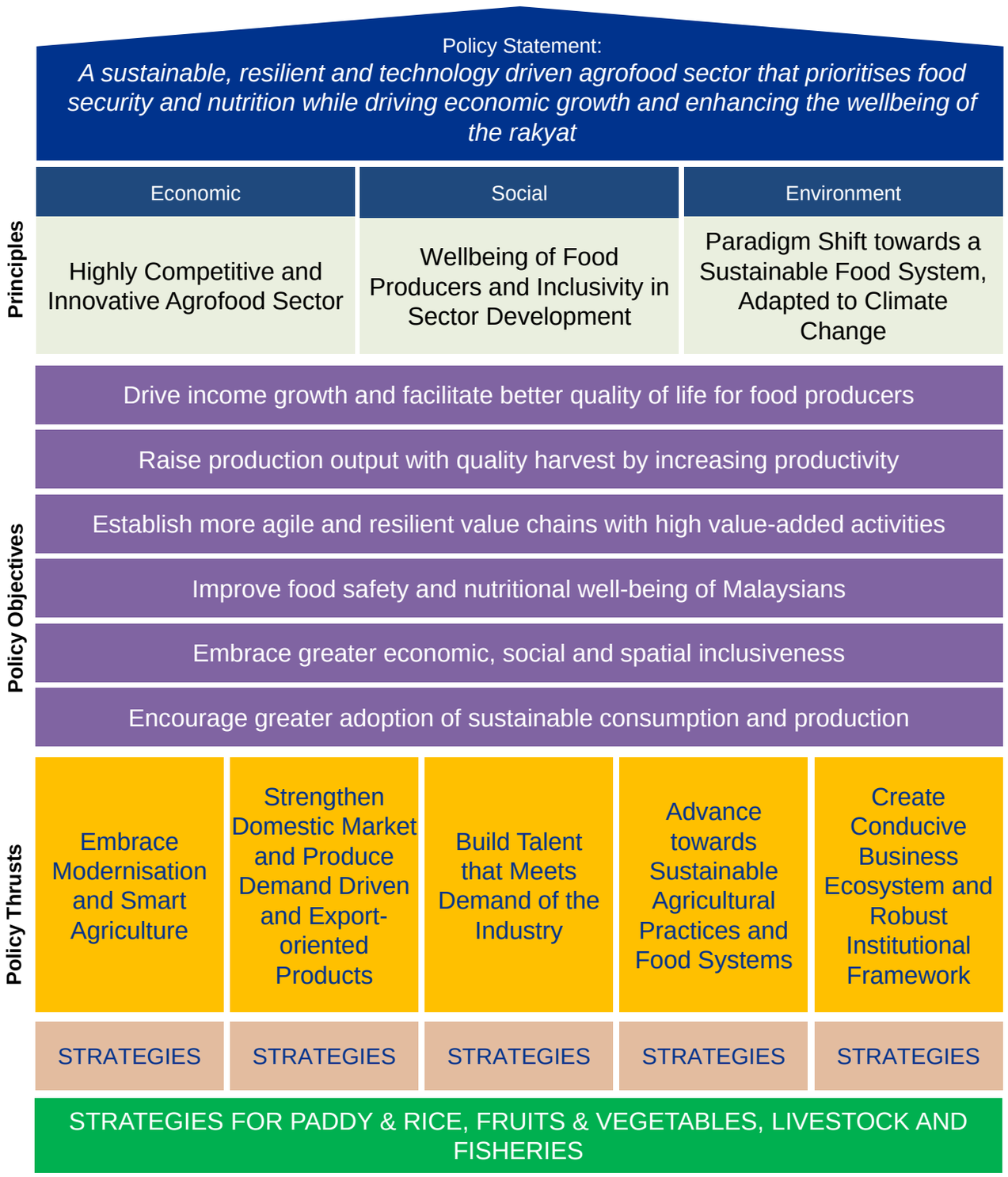
HOWEVER,

The global agrofood sector is faced by a rising global concern on its sustainability and depletion of resources as a result of the increasing pressure on the environment caused by human activities as well as other natural causes. Hence, the 3 key characteristics of NAP 2.0 are crucial elements of the policy in order to develop and sustain the agrofood sector, and to fulfil the 2 main aspects which are food and nutrition security and improvement to "rakyat's" wellbeing for Malaysia. The characteristics and main aspects of the NAP 2.0 lead to the overall policy statement of

"A sustainable, resilient and technology driven agrofood sector that prioritises food security and nutrition while driving economic growth and enhancing the wellbeing of the rakyat".

5.0 National Agrofood Policy 2.0

The policy framework for NAP 2.0 is as depicted below, and is developed taking into consideration of the key characteristics, main aspects and identified policy statement:



5.0 National Agrofood Policy 2.0

5.1.1 Policy Principles

NAP 2.0 is developed looking into 3 key policy principles which are the economic, social and environment aspects of the agrofood sector.

ECONOMIC  ***KEY INDICATORS*** ▪ **Agrofood contribution to National GDP** ▪ **Export Value of Agrofood**	***Highly Competitive and Innovative Agrofood Sector*** The agrofood sector is envisioned to be a competitive and innovative industry. To achieve this, it is important for the industry to increase value added output through greater value-added activities by driving producers up the value chain and focusing on export potentials. Conducive business environment is a crucial element for the producers to be able to operate smoothly and attract participation of large corporations into the industry, while greater adoption of technology is essential for achieving a competitive and an innovative industry as technology plays a key role to improving agricultural productivity which translate to an increase in smallholders' income and more affordable food prices.
SOCIAL  ***KEY INDICATORS*** ▪ **Income levels of Agrofood Sector** ▪ **Local participation in Agrofood**	***Wellbeing of Food Producers and Inclusivity in Sector Development*** The wellbeing of the food producers is amongst the key priority in the development of the agrofood sector, particularly the smallholders, due to the large number of smallholders in the industry that are often caught in a low income trap. The need to uplift the quality of life of food producers is pivotal in order to drive continuous growth in the industry as well as increasing the attractiveness of the industry to attract new talents, particularly the youth. Inclusivity is among the key agenda in NAP 2.0, as greater participation from women, youth, indigenous community and those living in the rural and remote areas can potentially contribute to the development of the agrofood sector. While it is an economic activity and additional income for those groups of community, it reduces income gaps, and creates a balanced regional development that will contribute to the national agenda of distributing wealth across the country.
ENVIRONMENT  ***KEY INDICATORS*** ▪ **Food loss and waste index** ▪ **Agrofood GHG** ▪ **Sustainable Fish Stock** ▪ **Global Food Security Index**	***Paradigm Shift towards a Sustainable Food System, Adapted to Climate Change*** The impacts on the environment should be given due consideration during the development of the food industry as it should not be done at the expense of the environment. By embracing sustainable food systems, the need of the current and future generations will be better safeguarded. Quality and efficiency of handling and processing products/produce must be embedded in the entire value chain in order to produce food that are safe for consumption and provide nutritional balance for consumer, at minimal wastage. The adverse effects of climate change could potentially affect the production of food if the agrofood sector is further exacerbated by unsustainable farming and fishing practices. As such, it is crucial to further intensify the implementation of sustainable farming practices that is environmentally friendly and climate resilient to minimise the impact of climate change on the agrofood sector.

5.0 National Agrofood Policy 2.0

5.1.2 Policy Objectives

NAP 2.0 has identified a total of 6 policy objectives to steers the direction of the strategies and action plans for the development of Malaysia Agrofood sector for the next 10 years.

Policy Objective 1:

Drive Income Growth and Facilitate Better Quality of Life for Food Producers

Key Indicator(s) of Policy Objective:

- Income levels of Agrofood Producers
- Agrofood Insurance

Smallholders are among the key stakeholders in the agrofood sector in Malaysia, comprising over 76 percent of industry players. However, the average household income for the head of household involved in agriculture has been recorded to be about 40% lower than the national average

Hence, one of the key objectives of NAP 2.0 is to improve the well-being of food producers, by increasing the income level of food producers which contributes to the improvement of quality of life. Although the adoption of technology can help increase productivity and contribute to higher income, the level of readiness in the area of knowledge, expertise and capital to implement this transformation is still low among food producers, particularly smallholders. Therefore, among the measures that can be implemented are through the provision of support mechanisms to increase production, for efficient management of post-harvest, and for greater access to the market. Additionally, collaboration between smallholders and large scale industry players is essential to create confidence and provide assurance to encourage the adoption of technology to innovate and move up the value chain.

5.0 National Agrofood Policy 2.0

Policy Objective 2:

Raise Production Output with Quality Harvest by Increasing Productivity

Key Indicator(s) of Policy Objective:

- Total factor productivity

Productivity remains a critical factor for the agrofood sector. Key drivers to achieve higher productivity includes:

Adoption of technology and innovative practices – this could enable food producers improve the management of agriculture activities more effectively, reduce reliance on manual labour, increase conservation of natural resources and to adapt to the effects of climate change.

Sustainable agriculture practices - improved plant and animal stock, and prudent soil and water management practices could act as catalysts in increasing productivity and improving food security in Malaysia, which would also aid in maintaining the appropriate balance between the conservation and use of resources in growing crops and raising livestock[3].

Research and development (R&D) expenditure - According to the Economic Research Service (ERS) of the United States Department of Agriculture, the reduction in public funds for R&D activities have a pronounced effect on sector productivity. Although the impact of declining public R&D funds is witnessed in the long term, its recovery through investment will still take time for future productivity growth. This is due to the lag between investment in research and its application[4].

5.0 National Agrofood Policy 2.0

Policy Objective 3:

Establish More Agile and Resilient Value Chains with High Value-Added Activities

Key Indicator(s) of Policy Objective:

- Tracking systems
- Digitalisation/e-Commerce

Agile and resilient value chains are critical for the agrofood sector to maintain smooth operations in the industry and remain competitive under distressed conditions such as climate change, a global pandemic, and other crisis, where disruptions could impact value and supply chains. In addition, an agile and resilient value chain is capable of accelerating the speed in increasing product customisation levels based on needs of consumers. Such agile and resilient value chains could contribute in driving businesses to penetrate new market space and capture customers whose special or personal needs could not be met by standard products or existing offerings.

In building a resilient and agile value chain, the adoption of technology and automation play a crucial role as it could potentially help to minimise disruptions and support the development higher value-added activities which may be a key factor in developing food products that consumers' demand and may potentially have higher export potential.

5.0 National Agrofood Policy 2.0

Policy Objective 4:

Improve Food Safety and Nutritional Well-Being of Malaysians

Key Indicator(s) of Policy Objective:

- myGap and myOrganic Certification
- Global/International Certifications

Food and nutrition security cover a wide array of elements across the food value chain, i.e. from the production level to the handling, processing, preparation, transaction and consumption of food. The 4 main dimensions of food and nutrition security include:

STABILITY

- *Food safety & quality*
- *Clean water*
- *Health and sanitation*
- *Care, feeding and health seeking practices*

AVAILABILITY

- *Domestic production*
- *Import capacity*
- *Trading with other countries*
- *Food stocks and food aids*

ACCESS

- *Income & purchasing power*
- *Own production*
- *Transport/logistics and market structure*
- *Food distribution*

UTILISATION

- *Weather variability and seasonality*
- *Price fluctuations*
- *Political factors*
- *Economic factors*

5.0 National Agrofood Policy 2.0

Policy Objective 5:

Embrace Greater Economic, Social and Spatial Inclusiveness

Key Indicator(s) of Policy Objective:

- Young Agropreneurs
- Urban/Community Farming

The economic growth and development of the nation take into consideration the inclusivity agenda with the goal to encourage all social groups and levels to participate in the Malaysian economy and benefit from the economic prosperity, regardless of gender, ethnicity, socioeconomic status and geographical location with an emphasis on the provision of equitable opportunity for households to improve the income levels and wellbeing of the *rakyat*. In line with this, the development of the agrofood sector considers the aspects of inclusivity that all segments of the society, particularly B40 households, women and rural communities would benefit from the nation's growth and development.

Meanwhile, spatial inclusiveness is linked to the nation's vision to achieve balanced regional development. Although it does not result in equal development in all states, spatial inclusiveness represents the full realisation of each region's potential in order for the benefits of national economic growth to be shared by the people in respective areas with a priority to develop the rural and remote areas particularly in East Malaysia. Agrofood development shall take into consideration the suitability of the geographical landscape and the potential to create economic spillover for the local population. Another key aspect in spatial inclusiveness is in digital inclusion, which refers to digital infrastructure in the rural and remote areas as well as access to IT and digital related training for the targeted groups.

5.0 National Agrofood Policy 2.0

Policy Objective 6:

Encourage Greater Adoption of Sustainable Consumption and Production

Key Indicator(s) of Policy Objective:

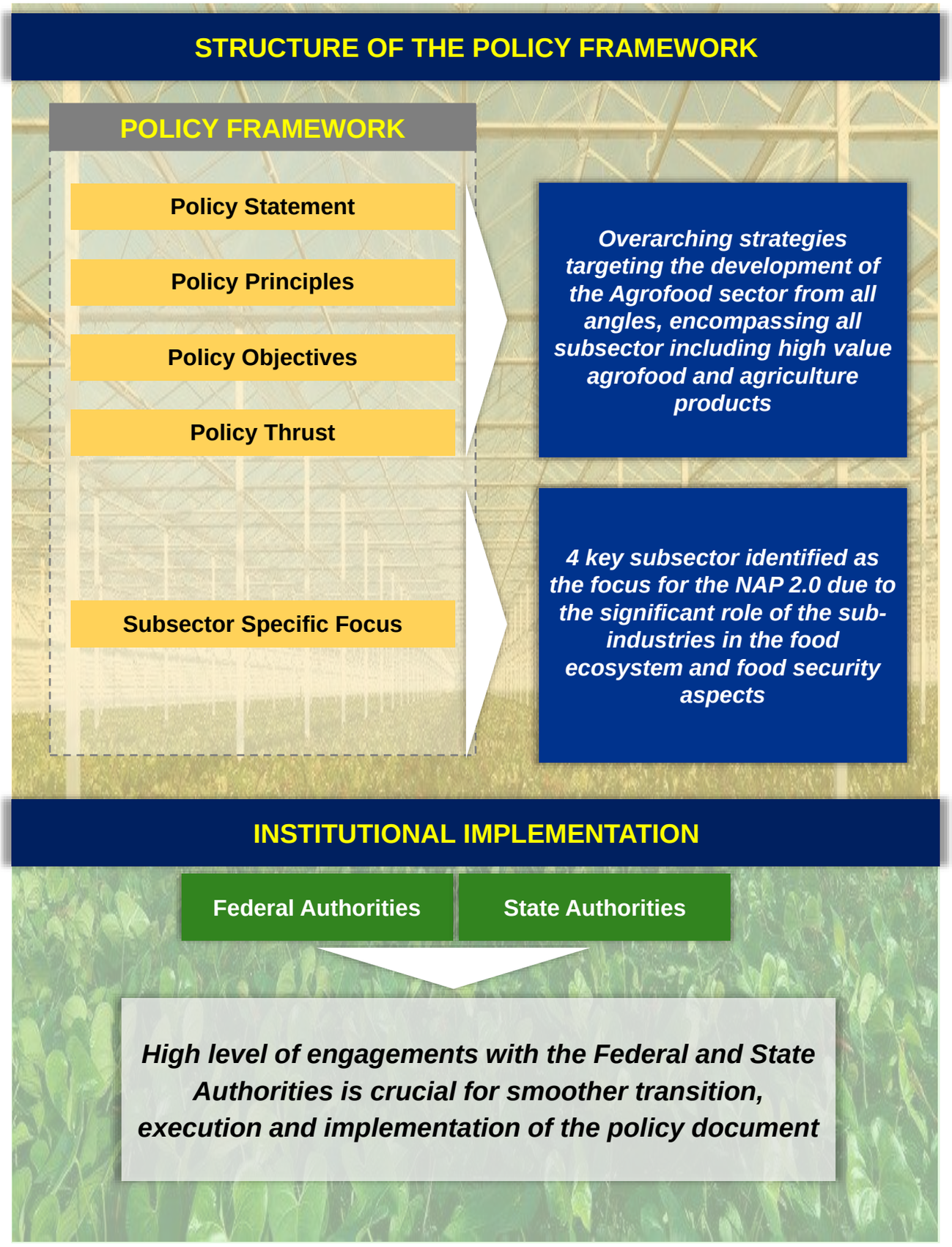
- Postharvest loss
  - Food Waste
- Water use/water footprint per HA

The United Nations has emphasised that the global agriculture system must become more productive and less wasteful and need to be implemented in a holistic and integrated manner. This means that the supply of food in Malaysia must be efficiently produced, processed, distributed and consumed within the recommended dietary intake and with minimal wastage. Quality and efficiency of handling and processing food products/produce must be embedded in the entire value chain.

Moving forward, rising global issues such as land competition, water scarcity and climate change, which affect production levels in the food system needs to be monitored. In addition, consumer preferences are also moving towards healthier and premium food options. This situation in turn will cause food waste as consumers seek to purchase only the freshest produce available leading to older but consumable produce getting less attention. Hence, in order to increase the efficiency of the food system, food loss and waste must be minimised.

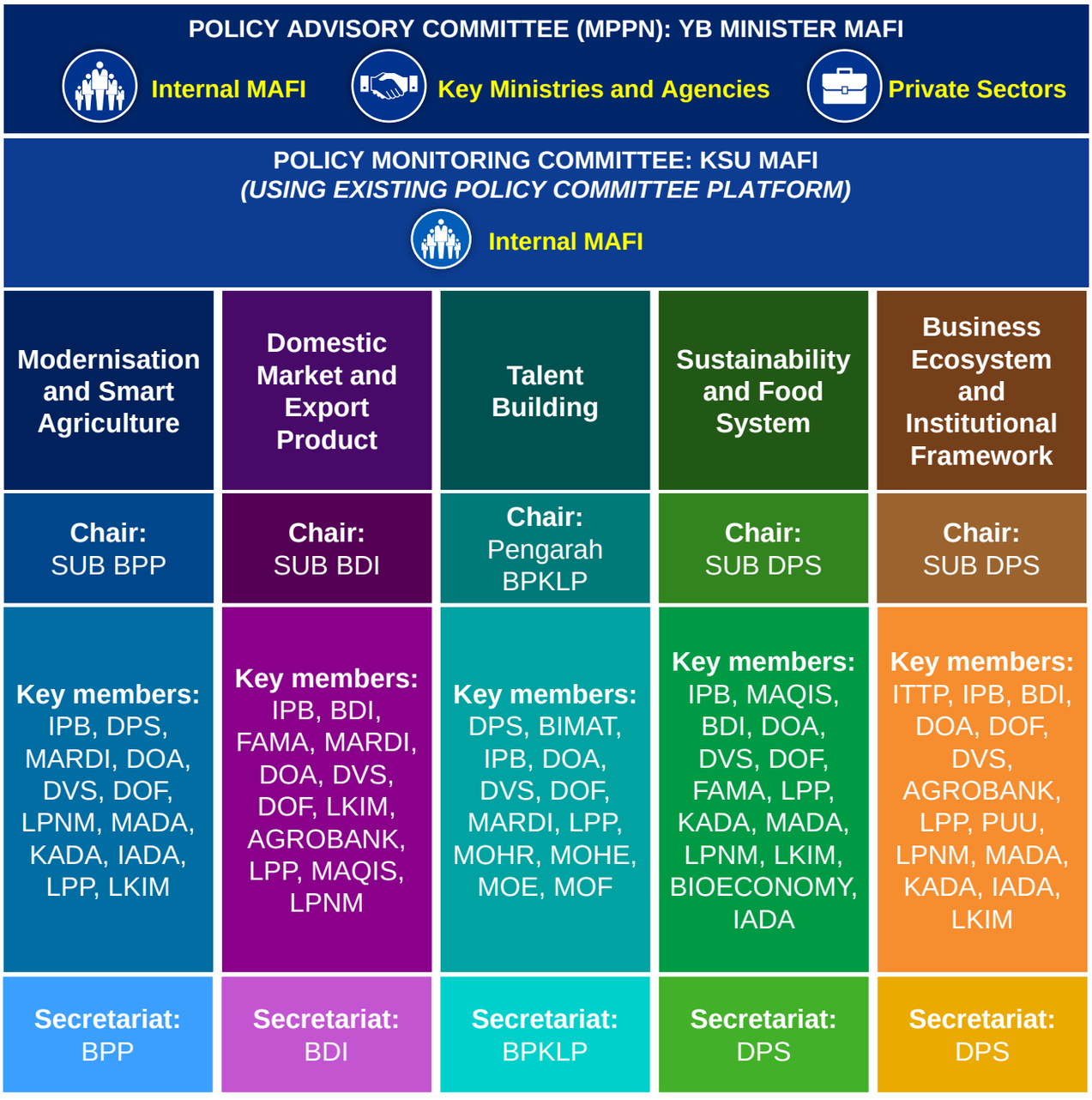
In line with moving towards an efficient food system, the adoption of Sustainable Consumption and Production (SCP) practices is necessary to achieving the SDG goals specifically Goal 12: Responsible Consumption and Production. SCP practices advocates an efficient use of natural resources, minimising the use of hazardous substances and reducing pollution and waste over the life cycle of products and services, as well as sustainable diet approach.

5.0 National Agrofood Policy 2.0



5.0 National Agrofood Policy 2.0

The implementation of NAP 2.0 will require an extensive collaboration between the relevant agencies. Therefore, a governance structure which monitors the progress of different key areas is important for the effective rolling out of action plans under each Policy Thrust leading to achieving the objectives of NAP 2.0 and propelling the agrofood sector forward.



Part C

Chapter 5

National Agrofood Policy 2.0

Policy Thrusts, Strategies & Action Plans

5.0 National Agrofood Policy 2.0

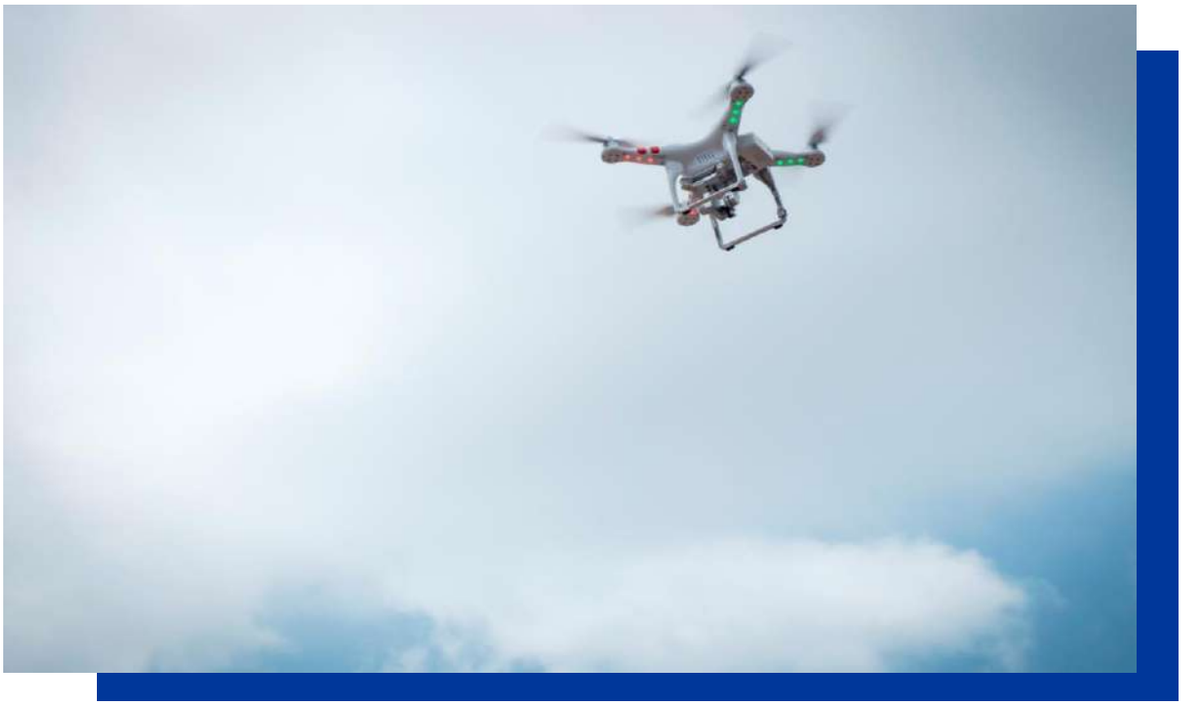
5.2 Policy Thrust 1

Policy Thrust 1: Embrace Modernisation and Smart Agriculture

The use of technology can contribute to an increase in quality and quantity of crop yield, thus, increasing productivity. Through various smart agriculture technology and offerings available at present, food producers are able to gain better control over pests and disease issues, making the process of production such as raising livestock and growing crops more predictable and efficient. In addition, with the assistance of technology, human error and wastages in the agrofood sector can be minimised.

Higher productivity which can be potentially achieved through mechanisation can translate into lower cost and higher profits for food producers leading to more funds available for reinvestments. As the income of food producers increase, food producers are able to enjoy a better quality of life. However, in order to achieve the above, food producers must be effectively trained and equipped with necessary technological skills to better prepare themselves to adopt technology and embrace modernisation, in the next 10 years and beyond.

The drive for modernisation is in tandem with national aspiration to embark the nation's value-producing industries towards Industry 4.0 with the agrofood sector being among those highlighted. As such, the focus on modernisation is also reflected in the strategies and initiatives contained in RMKe-12.

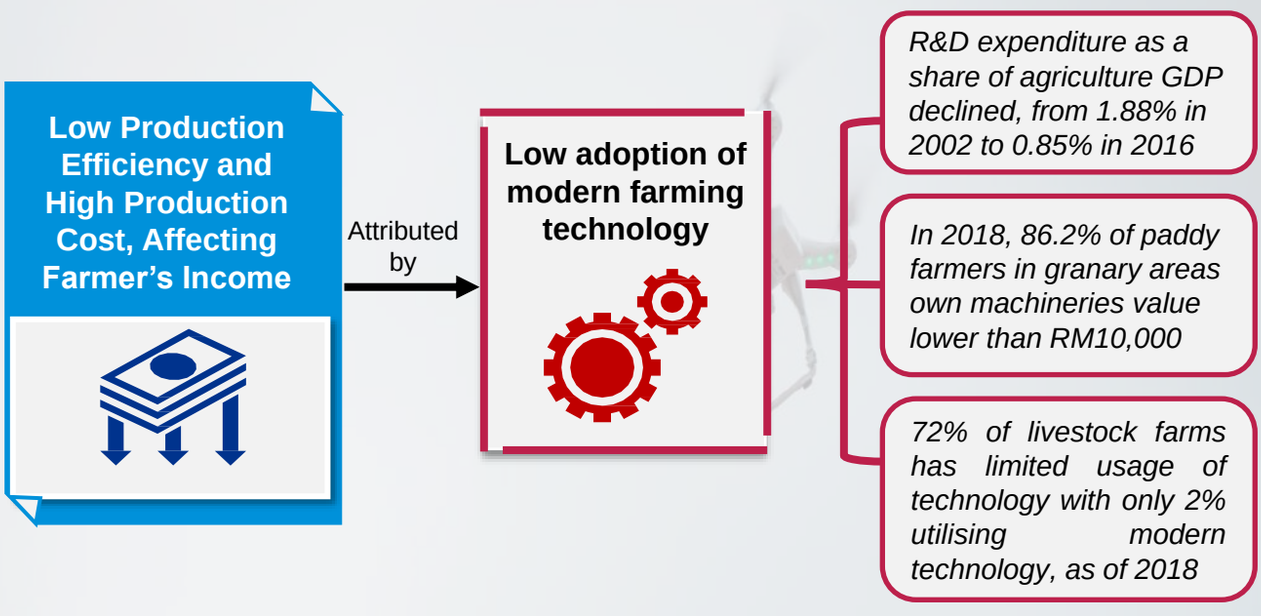


5.0 National Agrofood Policy 2.0

Issues and Challenges relevant to Policy Thrust 1

As explained in Chapter 3 and Figure 5-3 below, the existing landscape of the agrofood sector is associated with low production efficiency and high production costs which could potentially be attributed to low technology adoption.

Figure 5-3: Issues and Challenges relevant to Policy Thrust 1



Contribution to policy objectives

There are 2 main policy objectives and 2 key indicators under Policy Thrust 1:

1

Policy Objective 1:
Drive income growth and facilitate better quality of life for food producers

Key Indicator(s):

- Income levels of Agrofood Producers

2

Policy Objective 2:
Raise production output with quality harvest by increasing productivity

Key Indicator(s):

- Total Factor Productivity

5.0 National Agrofood Policy 2.0

Strategies and Action Plans of Policy Thrust 1

There are 4 strategies and 14 action plans formulated to facilitate modernisation and adoption of smart agriculture as follows:

01

Embrace modernisation and smart agriculture

Strategy 1: Intensifying R&D&C&I in Catalysing Modernisation of Agrofood Sector

1. Coordinate, Streamline and Drive R&D Initiatives to Ensure Development of Adequate and Impactful Modern and Smart Technologies to Advance the Agrofood Industries
2. Increase Resources for R&D&C&I such as Funding, Technical Expertise and Availability of Infrastructure
3. Expedite Ownership of Local Technologies through Accelerating Process of Intellectual Property for Rapid and Successful Commercialisation
4. Enhance International Partnership/Collaboration on R&D&C&I Related Initiatives and Knowledges

Strategy 2: Increase Adoption of Technology and Automation in Agrofood Sector

1. Develop Viable Technology Adoption Models to Improve the Uptake Rate of Modern and Smart Technology Packages
2. Connect Food Producers with Appropriate Agrotech Service Providers to Offer Affordable Technology Packages
3. Enhance Readiness of Food Producers to Adopt Technology (especially Biotechnology) through Structured and Effective Promotion, Training, Technical, as well as Financial Support

5.0 National Agrofood Policy 2.0

01

Embrace modernisation and smart agriculture

Strategy 3: Create Conducive Ecosystem for R&D&C&I

1. Streamline and Strengthen Functions of Agencies including Effective Governance in R&D&C&I for the Agrofood Sector
2. Accelerate Development of New and Improved Resilient Varieties and Breeds with High Market Demand to Cater the Expansion of the Seed and Brood Stock Industries
3. Increase Join-Collaboration between Foreign and Domestic Partners/Investors to Boost Investments and Technology Transfer in Agrofood R&D&C&I

Strategy 4: Intensify Innovation Programmes and Activities to Support Advancement of Agrotech

1. Increase End-to-End Engagement with Private Sector in R&D&C&I Efforts to Drive Continuity in Development of New Technology, Breed and/or Product
2. Accelerate the Development and Utilisation of Strategic Model Farms to Promote the Use of Modern and Smart Farming Methods in a Holistic Manner
3. Increase Awareness and Participation of General Public in Developing Innovative Agriculture Solutions through Test Beds, Exhibition and Learning Centres
4. Strengthening of Food Entrepreneurship and Food Technology Innovation

5.0 National Agrofood Policy 2.0

Strategy 1: Intensifying R&D&C&I in Catalysing Modernisation of Agrofood Sector

It is of general understanding that the modernisation pathway of any economic sector involves the continual scientific breakthrough, as well as adoption of technological equipment, that provides opportunity for greater productivity compared to previous generations. This strategy looks into facilitating implementation towards scientific breakthrough by solidifying the foundation in the implementation of R&D&C&I activities. This includes strengthening the coordination of initiatives, increase fiscal and non-fiscal resources available for R&D&C&I in the agrofood sector, reducing the time taken for intellectual property certification processes, and intensify international knowledge exchanges.

A total of 4 action plans has been formulated to support the implementation of strategy 1 as below:

Table 5-1: Summary of the Action Plans under Strategy 1

Strategies	Action Plans
1.0 Intensifying R&D&C&I in Catalysing Modernisation of Agrofood Sector	**1.1** Coordinate, Streamline and Drive R&D Initiatives to Ensure Development of Adequate and Impactful Modern and Smart Technologies to Advance the Agrofood Industries
	1.2 Increase Resources for R&D&C&I such as Funding, Technical Expertise and Availability of Infrastructure
	1.3 Expedite Ownership of Local Technologies through Accelerating Process of Intellectual Property for Rapid and Successful Commercialisation
	1.4 Enhance International Partnership/Collaboration on R&D&C&I Related Initiatives and Knowledges

In reference to the respective targets of each policy objectives, strategy 1 and the 4 action plans will look to contribute directly towards 2 key indicators as shown below:

Figure 5-4: Strategy 1 Key Indicators Contribution

5.0 National Agrofood Policy 2.0

Strategy 2: Increase Adoption of Technology and Automation in Agrofood Sector

The adoption of more advanced technological equipment is another crucial elements of industrial modernisation. This is due to the benefits from automisation of operation processes, which includes greater operating capacity and increasing productivity with the same amount of time and inputs. This could in turn translate into potentially lower production cost and higher profits for food producers over the long run, and subsequently more funds available for reinvestments and expansion of agrofood businesses. Thereby, this strategy focuses on increasing technology adoption rate through provision of assistance on two ends; improving the feasibility and ease of technology adoption, and enhancing the capacity of technology takers (food producers).

A total of 3 action plans has been formulated to support the implementation of strategy 2 as below:

Table 5-2: Summary of the Action Plans under Strategy 2

Strategies	Action Plans
2.0 Increase Adoption of Technology and Automation in Agrofood Sector	**2.1** Develop Viable Technology Adoption Models to Improve the Uptake Rate of Modern and Smart Technology Packages
	2.2 Connect Food Producers with Appropriate Agrotech Service Providers to Offer Affordable Technology Packages
	2.3 Enhance Readiness of Food Producers to Adopt Technology (especially Biotechnology) through Structured and Effective Promotion, Training, Technical, as well as Financial Support

In reference to the respective targets of each policy objectives, strategy 2 and the 3 action plans will look to contribute directly towards 2 key indicators as shown below:

Figure 5-5: Strategy 2 Key Indicators Contribution

5.0 National Agrofood Policy 2.0

Strategy 3: Create Conducive Ecosystem for R&D&C&I

A R&D&C&I ecosystem is the network of organisations including research institutions, private sectors, government agencies, technology takers and others being involved in the delivery of scientific discoveries which would then be implemented in business processes, through both competition or cooperation. The idea is that each entity in the ecosystem is intertwined, creating a constantly evolving relationship. Initiatives which include a supportive institutional or regulatory framework, effective allocation of resources, clear policy guidelines, clear current and future research needs, as well as various monetary and non-monetary incentives, are able to enhance the conduciveness of the R&D&C&I ecosystem. These efforts could strengthen the working relationship among all entities which could be translated into greater R&D&C&I output.

A total of 3 action plans has been formulated to support the implementation of strategy 3 as below:

Table 5-3: Summary of the Action Plans under Strategy 3

Strategies	Action Plans
3.0 Create Conducive Ecosystem for R&D&C&I	**3.1** Streamline and Strengthen Functions of Agencies including Effective Governance in R&D&C&I for the Agrofood Sector
	3.2 Accelerate Development of New and Improved Resilient Varieties and Breeds with High Market Demand to Cater the Expansion of the Seed and Brood Stock Industries
	3.3 Increase Join-Collaboration between Foreign and Domestic Partners/Investors to Boost Investments and Technology Transfer in Agrofood R&D&C&I

In reference to the respective targets of each policy objectives, strategy 3 and the 3 action plans will look to contribute directly towards 2 key indicators as shown below:

Figure 5-6: Strategy 3 Key Indicators Contribution

5.0 National Agrofood Policy 2.0

Strategy 4: Intensify Innovation Programmes and Activities to Support Advancement of Agrotech

This strategy emphasises on strengthening the link between basic research output with industrial application, to increase the rate of contribution by R&D&C&I towards modernisation of the agrofood sector. As such, the initiatives of the strategy include to facilitate greater exchange of information and insight, between research institutions and private sectors, to enhance the relevancy of research output and industry needs. Next, the testing of new technology products/concepts should be conducted in test beds which contains varying profiles to better access the viability of such new products/concepts across different location. In addition, opportunities available to the wider public to participate in agrofood R&D&C&I could be increased to boost the scale of local innovation towards a possible nation wide adoption.

A total of 4 action plans has been formulated to support the implementation of strategy 4 as below:

Table 5-4: Summary of the Action Plans under Strategy 4

Strategies	Action Plans
4.0 Intensify Innovation Programmes and Activities to Support Advancement of Agrotech	**4.1** Increase End-to-End Engagement with Private Sector in R&D&C&I Efforts to Drive Continuity in Development of New Technology, Breed and/or Product
	4.2 Accelerate the Development and Utilisation of Strategic Model Farms to Promote the Use of Modern and Smart Farming Methods in a Holistic Manner
	4.3 Increase Awareness and Participation of General Public in Developing Innovative Agriculture Solutions through Test Beds, Exhibition, and Learning Centres
	4.0 Strengthening of Food Entrepreneurship and Food Technology Innovation

In reference to the respective targets of each policy objectives, strategy 4 and the 4 action plans will look to contribute directly towards 2 targets as shown below:

Figure 5-7: Strategy 4 Key Indicators Contribution

5.0 National Agrofood Policy 2.0

5.3 Policy Thrust 2

Policy Thrust 2: Strengthen Domestic Market and Producing Demand Driven and Export-oriented Products

The importance of strengthening and diversifying exports is pivotal as this is beneficial not only to the agrofood sector but also other various sectors of the economy through the generation of spillover effects. Among the ways to achieve this is by increasing productivity and competitiveness of agrofood products in the global market as this can translate into higher exports and greater trade value, thereby creating a positive trade balance for Malaysia.

Moving forward, the focus on intensifying high value-added activities and investment in targeted areas with high growth potential could be amongst the key drivers of growth in the agrofood sector. This will boost competitiveness and the growth of income for the workforce in the agrofood sector.

In addition, the agrofood sector needs to be ready to meet the rapidly changing consumer demand. For example, failures to meet the changing consumer demand due to shift in dietary preferences and lifestyle may lead to an increase in import of premium agrofood products and widen the trade balance gap.

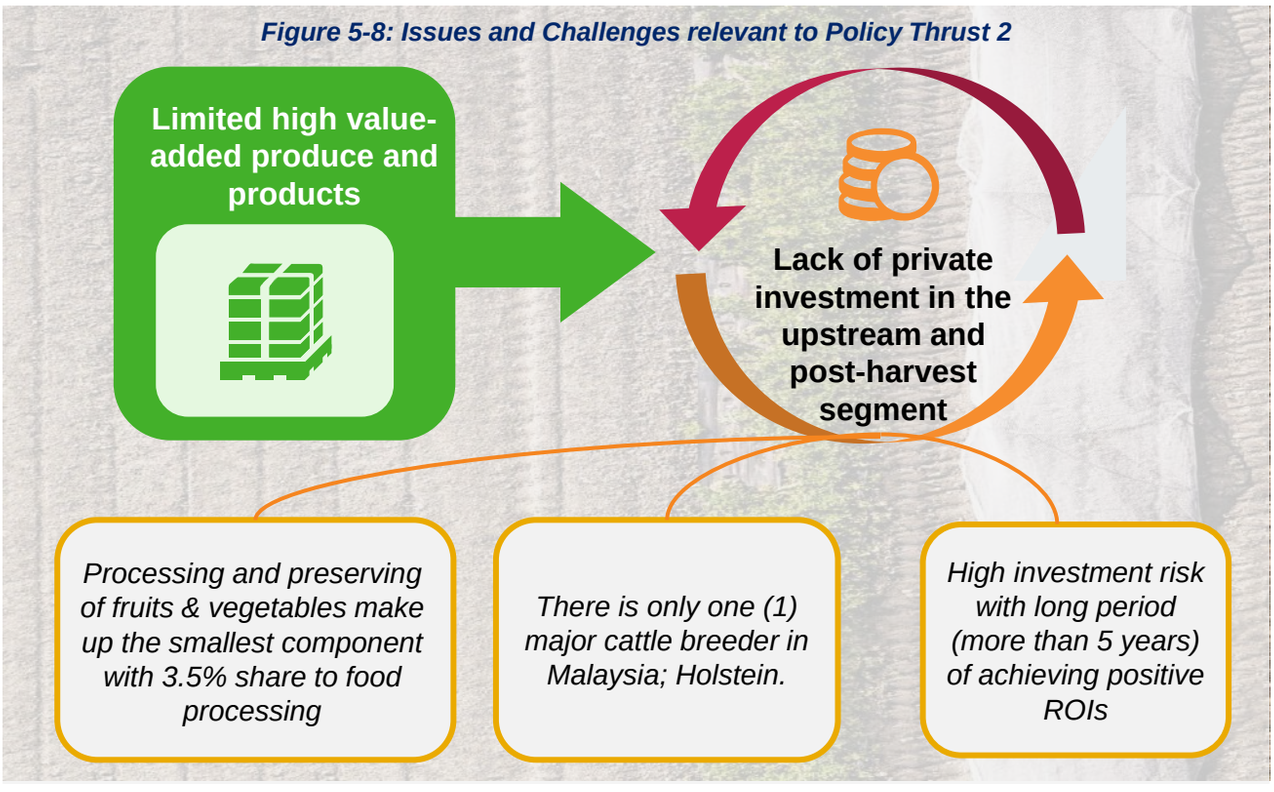
As the agrofood sector is moving towards strengthening of domestic market and increasing of export-oriented products, the strategies to achieve this policy objective will be reflected in this section.

5.0 National Agrofood Policy 2.0

Issues and Challenges relevant to Policy Thrust 2

As explained in Chapter 3 and Figure 5-8 below, the lack of private investment in the upstream and post-harvest segment could attribute to the limited high value-added produce and products. Hence, this is related to the need to Strengthen Domestic Market and Produce Demand Driven and Export-oriented Products.

Figure 5-8: Issues and Challenges relevant to Policy Thrust 2



Contribution to policy objectives

There are 3 main policy objectives and 4 key indicators under Policy Thrust 2:

1

Policy Objective 1: Drive income growth and facilitate better quality of life for food producers

Key Indicator(s):

- Income Levels of Agrofood Producers

2

Policy Objective 2: Raise production output with quality harvest by increasing productivity

Key Indicator(s):

- Income Levels of Agrofood Producers

3

Policy Objective 3: Establish more agile and resilient value chains with high value-added activities

Key Indicator(s):

- Tracking System
- Digitalisation/ e-commerce

5.0 National Agrofood Policy 2.0

Strategies and Action Plans of Policy Thrust 2

There are 4 strategies and 13 action plans formulated to Strengthen Domestic Market and Produce Demand Driven and Export-oriented Products as follows:

02

Strengthen Domestic Market and Produce Demand Driven and Export-oriented Products

Strategy 1: Enhance Development and Commercialisation of High Value Products through Greater Collaboration and Partnership with Private Sector

1. Increase Provision of Business Facilitation for Product Development in Niche Areas
2. Strengthen Partnership between Food Producers and Food Manufacturers to Produce Higher Value Products
3. Intensify Collaboration between Agencies and Local NGOs to Expand and Develop New Local Specialty Products

Strategy 2: Increase Export of Targeted Products and Produce

1. Develop Robust Branding and Campaigns for Targeted Products in Domestic and International Market
2. Consolidate Similar Agrofood Products from Smallholders and Identify Focus Product to Meet International Market Demand and Enhance Promotion Effort
3. Strengthen Export Value Chain and Improve Ease of Exporting (Trade Facilitation Mechanisms)
4. Enhance Market Growth and Development on High Value Product
5. Improve Foreign Market Access for Food Producers with Assistance to Meet Export Standards

5.0 National Agrofood Policy 2.0

02

Strengthen Domestic Market and Produce Demand Driven and Export-oriented Products

Strategy 3: Provide Support to Local Food Industries by Strengthening Domestically Produced Products

1. Encourage Private Sector to Increase Usage of Raw Material/Input Sourced Locally Through Incentive Packages
2. Strengthen the Resilience of Local Produce Supply Chain for Domestic Market
3. Enhance Domestic Market for Specialised Premium Products such as Organic Produce and Superfood

Strategy 4: Strengthen the Role of MAFI in Championing Agriculture Related Investment

1. Intensify Investment Promotion in Targeted Areas in Both Upstream and Downstream of the Industry, including Supporting Services
2. Strengthen Investment Facilitation with End to End Capabilities and Support to Attract New Investors and Retain Existing Ones

5.0 National Agrofood Policy 2.0

Strategy 1: Enhance Development and Commercialisation of High Value Products through Greater Collaboration and Partnership with Private Sector

As the agrofood sector is moving towards participating in more high value activities, one of the key aspect is to increase engagement with private sectors. The action plans focused on encouraging industry players to consider the potential of developing and venturing into targeted products with high demand such as superfood, essential oils and gelatine. The action plans also emphasis on supporting close collaboration with local NGOs as they are directly exposed to the business environment and will have the knowledge to identify gaps for improvement in local specialty products. At the same time, the government will provide them the support that are needed.

A total of 3 action plans has been formulated to support the implementation of strategy 1 as below:

Table 5-5: Summary of the Action Plans under Strategy 1

Strategies	Action Plans
1.0 Enhance Development and Commercialisation of High Value Products through Greater Collaboration and Partnership with Private Sector	**1.1** Increase Provision of Business Facilitation for Product Development in Niche Areas
	1.2 Strengthen Partnership between Food Producers and Food Manufacturers to Produce Higher Value Products
	1.3 Intensify Collaboration between Agencies and Local NGOs to Expand and Develop New Local Specialty Products

In reference to the respective targets of each policy objectives, strategy 1 and the 3 action plans will look to contribute directly towards 3 key indicators as shown below:

Figure 5-9: Strategy 1 Key Indicators Contribution

5.0 National Agrofood Policy 2.0

Strategy 2: Increase Export of Targeted Products and Produce

The agrofood sector could benefit from the strengthening and diversification of exports which in turn could drive the growth of national economy in terms of income creation and positive spillover effect to other various sectors. To drive exports, there is a need to enhance the branding of the agrofood products and produce through establishing a strong global branding, as well as facilitating small industry players to develop their branding and marketing at an international level. Additionally, issues such as processing, logistics and transporting that occur within the export value chain will need to be addressed. The export agenda also includes improving the prospects of premium agrofood products to ensure there is sufficient competitiveness in the domestic and international market.

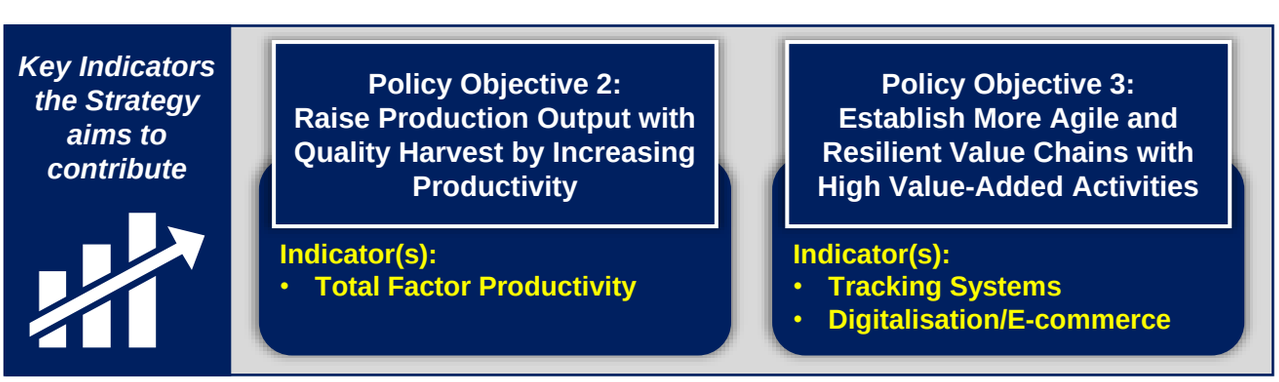
A total of 5 action plans has been formulated to support the implementation of strategy 2 as below:

Table 5-6: Summary of the Action Plans under Strategy 2

Strategies	Action Plans
2.0 Increase Export of Targeted Products and Produce	**2.1** Develop Robust Branding and Campaigns for Targeted Products in Domestic and International Market
	2.2 Consolidate Similar Agrofood Products from Smallholders and Identify Focus Product to Meet International Market Demand and Enhance Promotion Effort
	2.3 Strengthen Export Value Chain and Improve Ease of Exporting (Trade Facilitation Mechanisms)
	2.4 Enhance Market Growth and Development on High Value Product
	2.5 Improve Foreign Market Access for Food Producers with Assistance to Meet Export Standards

In reference to the respective targets of each policy objectives, strategy 2 and the 5 action plans will look to contribute directly towards 3 key indicators as shown below:

Figure 5-10: Strategy 2 Key Indicators Contribution



5.0 National Agrofood Policy 2.0

Strategy 3: Provide Support to Local Food Industries by Strengthening Domestically Produced Products

As the agrofood sector relies heavily on the imports of raw materials, there are risks that needs to be considered as the supply of raw materials on agricultural produce might be volatile and susceptible to a lot of other factors such as weather, climate changes and diseases. As such, there is a need to increase facilitation of using locally produced raw materials especially to support downstream activities. This can ultimately strengthen domestic market and increase production of premium products. In this strategy, the first two action plans will emphasis on improving the consistency supply of agricultural inputs and locally produced products. The remaining action plan will look to expand the high value products within the domestic market.

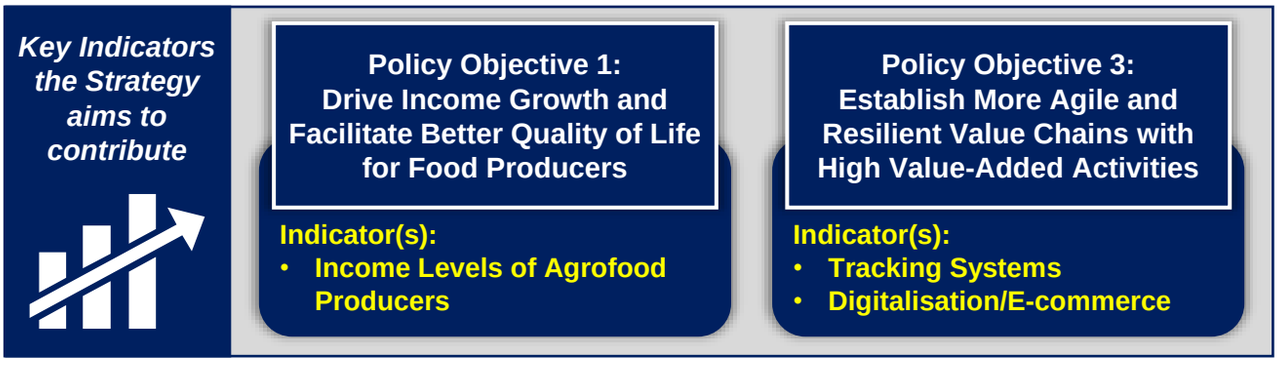
A total of 3 action plans has been formulated to support the implementation of strategy 3 as below:

Table 5-7: Summary of the Action Plans under Strategy 3

Strategies	Action Plans
3.0 Provide Support to Local Food Industries by Strengthening Domestically Produced Products	**3.1** Encourage Private Sector to Increase Usage of Raw Material/Input Sourced Locally Through Incentive Packages
	3.2 Strengthen the Resilience of Local Produce Supply Chain for Domestic Market
	3.3 Enhance Domestic Market for Specialised Premium Products such as Organic Produce and Superfood

In reference to the respective targets of each policy objectives, strategy 3 and the 3 action plans will look to contribute directly towards 3 key indicators as shown below:

Figure 5-11: Strategy 3 Key Indicators Contribution



5.0 National Agrofood Policy 2.0

Strategy 4: Strengthen the Role of MAFI in Championing Agriculture Related Investment

An increase in foreign and domestic direct investment in the agrofood sector could bring about the increase in production and productivity which could contribute towards food security. In general, the current investment in agriculture sector is extremely low. In 2018, it only contributed 0.11% of total investment, affecting the growth of the industry towards higher value-added activities. In order to drive investment within the agrofood sector, there is a need to emphasis investment in both upstream and downstream of the value chain. MAFI will also need to focus on ensuring a more seamless investment experience for both existing and potential investors.

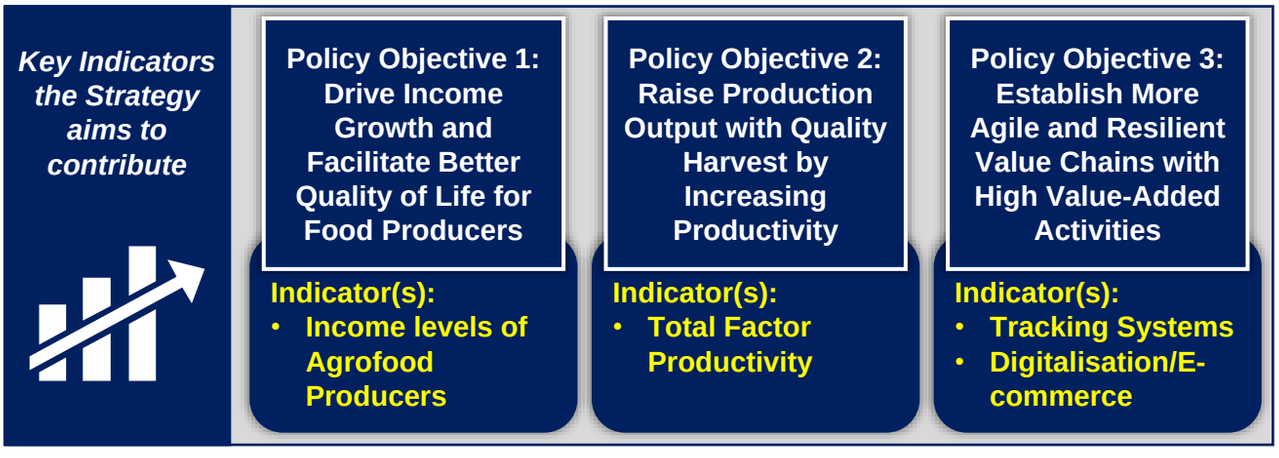
A total of 2 action plans has been formulated to support the implementation of strategy 4 as below:

Table 5-8: Summary of the Action Plans under Strategy 4

Strategies	Action Plans
4.0 Strengthen the Role of MAFI in Championing Agriculture Related Investment	**4.1** Intensify Investment Promotion in Targeted Areas in Both Upstream and Downstream of the Industry, including Supporting Services
	4.2 Strengthen Investment Facilitation with End to End Capabilities and Support to Attract New Investors and Retain Existing Ones

In reference to the respective targets of each policy objectives, strategy 4 and the 2 action plans will look to contribute directly towards 4 targets as shown below:

Figure 5-12: Strategy 4 Key Indicators Contribution



5.0 National Agrofood Policy 2.0

5.4 Policy Thrust 3

Policy Thrust 3: Build Talent that Meets Demand of the Industry

The betterment of human capital plays a critical role in the long term development of the agrofood sector to improve productivity and efficiency, drive higher revenue and income as well as steer innovation and ability of players to move up the value chain. Therefore, improvement and upgrading of the skills of all the players across the value chain in the agrofood sector remains an important agenda to drive the industry forward. Training programmes and an education system that caters to current and future skills needs in the agrofood sector could assist to build a robust workforce for the industry.

The potential and opportunities generated by technological advances have proven to be endless, thus, the ability to unlock the potential of technology and harness the opportunities in the adoption of technology could contribute greatly to the agrofood sector. To capitalise on the advancement of technology, relevant education and training programmes must be designed and provided according to targeted groups to enhance their technology and digital skills.

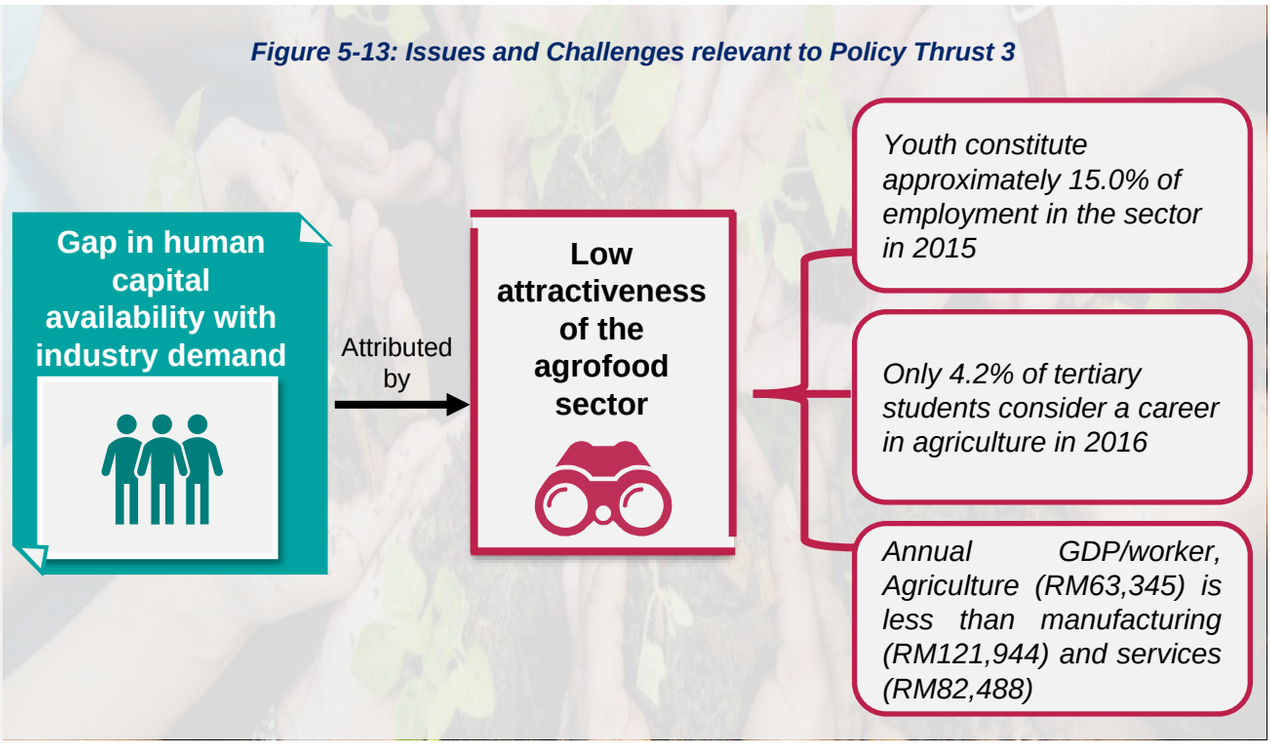
Building suitable talents in the agriculture industry can set a strong foundation that is able to adapt faster to modern technology and produce food in greater quantity and quality to meet food security and safety goals in Malaysia.

5.0 National Agrofood Policy 2.0

Issues and Challenges relevant to Policy Thrust 3

As explained in Chapter 3 and Figure 5-3 below, existing landscape associated with the gap in human capital availability with industry demand, which could be attributed to the low attractiveness of the agriculture industry.

Figure 5-13: Issues and Challenges relevant to Policy Thrust 3



Contribution to policy objectives

There are 4 main policy objectives and 4 key indicators under Policy Thrust 3:

1	2	3	4
Policy Objective 1: Drive income growth and facilitate better quality of life for food producers	**Policy Objective 2: Raise production output with quality harvest by increasing productivity**	**Policy Objective 3: Establish more agile and resilient value chains with high value-added activities**	**Policy Objective 5: Embrace greater economic, social and spatial inclusiveness**
Key Indicator(s): • Income Levels of Agrofood Producers	*Key Indicator(s):* • Total Factor Productivity	*Key Indicator(s):* • Digitalisation/e-commerce	*Key Indicator(s):* • Young Agropreneurs

5.0 National Agrofood Policy 2.0

Strategies and Action Plans of Policy Thrust 3

There are 4 strategies and 15 action plans formulated to facilitate building talent that meets the demand of the industry as follows:

03

Build Talent that Meets Demand of The Industry

Strategy 1: Attract and Retain Young Talent

1. Rebranding with Incorporation of Modern and Smart Agriculture to Elevate the Young Talent in the Agrofood Sector
2. Producing Greater Supply of Industry Ready Workforce through Integration of Graduates into the Actual Working Environment via More Internships and Apprenticeships
3. Increase Exposure of Younger Generation to Agricultural Activities through Targeted Education and Other Means such as Innovation Competitions
4. Develop Management Model to Improve Labour Productivity

Strategy 2: Forecast Demand and Develop Better Skilled Workforce for Agrofood Sector

1. Enhance/Develop a Workforce Database for Data Analytics to Make Strategic and Management Decisions on Workforce Planning Processes
2. Encourage and Facilitate Universities and Local Experts to Adopt Holistic Training Programmes Relating to the Agrofood Sector
3. Develop Human Capital and Expertise to Support Future Job Requirements and Implementation of New Technology
4. Making Available Relevant Scholarship Platforms to Encourage the Pursuit of Higher Learning Degrees in Agrofood Related Fields
5. Upgrade Universities and Agrofood Training Centres with Modern Facilities and Equipment including ICT and Networking

5.0 National Agrofood Policy 2.0

03

Build Talent that Meets Demand of The Industry

Strategy 3: Enhance Inclusivity of Agrofood Sector

1. Identify and Promote Suitable Career Opportunities and Implementation of Technology for Women and the Persons With Disabilities (PWD) Community in the Agrofood Sector
2. Increase Scholarship for Women, Indigenous People and PWD Communities for Agrofood Programmes
3. Develop Transition Programmes for Non-Agriculture Graduates with Interest in Pursuing a Career in the Agrofood Sector

Strategy 4: Increase Efficiency and Technical Services of Extension Officers

1. Enhancing Technical Expertise of Extension Service Providers through Efficient Knowledge Transfer by Providing Structured Programmes including Cross Fertilisation with Knowledgeable Workforce/Industry
2. Introduce Mobile Labs Comprising Extension and Research Officers, as well as Experts to Provide In-Situ Solutions to Food Producers
3. Attachment of Extension Officers with Industry Associations to Build Expertise and Champion Niche Areas/Market
4. Train and Hire TVET Graduates and/or Experienced Food Producers as Technology Transfer Agents to Food Producers

5.0 National Agrofood Policy 2.0

Strategy 1: Attract and Retain Young Talent

The current participation of youth in the agrofood sector constitute only approximately 15.0% of the total members registered with the Farmers' Organisation Authority. To transform the industry, a greater youth participation is required as young talent who are technologically savvy could potentially innovate and modernise the industry. The agrofood sector which is commonly perceived as dirty, dangerous and difficult (3D) needs to improve its image to one which is high-tech with high returns. A clear mapping of career path from primary and secondary school to tertiary education and onto industry linkages to show the available professional opportunities in the industry could assist in attracting and retaining young talent.

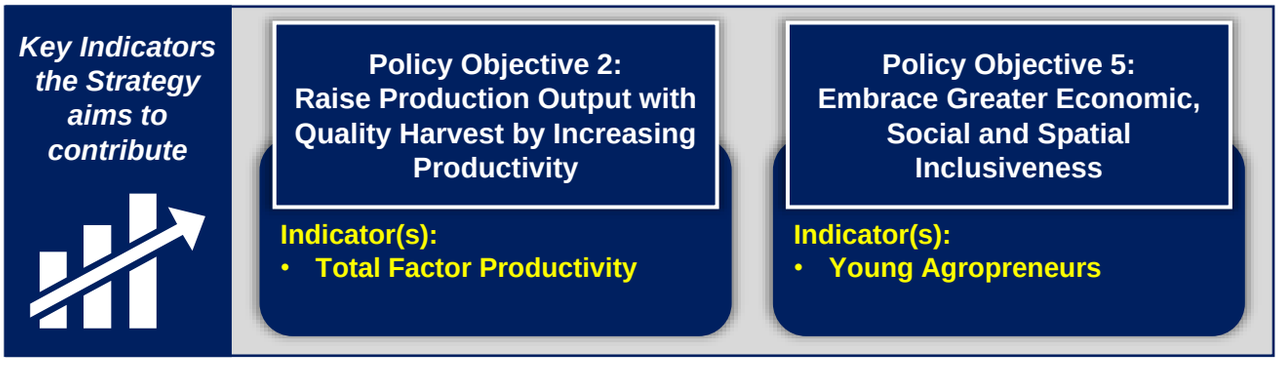
A total of 4 action plans has been formulated to support the implementation of strategy 1 as below:

Table 5-9: Summary of the Action Plans under Strategy 1

Strategies	Action Plans
1.0 Attract and Retain Young Talent	**1.1** Rebranding with Incorporation of Modern and Smart Agriculture to Elevate the Young Talent in the Agrofood Sector
	1.2 Producing Greater Supply of Industry Ready Workforce through Integration of Graduates into the Actual Working Environment via More Internships and Apprenticeships
	1.3 Increase Exposure of Younger Generation to Agricultural Activities through Targeted Education and Other Means such as Innovation Competitions
	1.4 Develop Management Model to Improve Labour Productivity

In reference to the respective targets of each policy objectives, strategy 1 and the 4 action plans will look to contribute directly towards 2 key indicators as shown below:

Figure 5-14: Strategy 1 Key Indicators Contribution



5.0 National Agrofood Policy 2.0

Strategy 2: Forecast Demand and Develop Better Skilled Workforce for Agrofood Sector

The lack of a comprehensive database on the workforce in this sector needs to be addressed to improve understanding of the future workforce needs. Through the availability of a comprehensive database, the planning and execution of long term initiatives related to human capital can be done including projecting future demand as well as reducing the mismatch between job demand and supply. With an accurate insight and forecast, this initiative is targeted to better produce required skills.

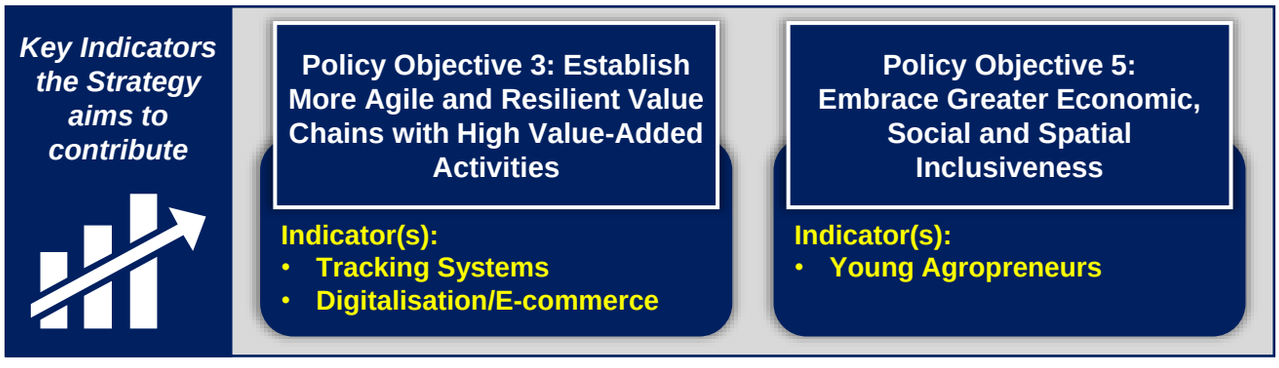
A total of 5 action plans has been formulated to support the implementation of strategy 2 as below:

Table 5-10: Summary of the Action Plans under Strategy 2

Strategies	Action Plans
2.0 Forecast Demand and Develop Better Skilled Workforce for Agrofood Sector	**2.1** Enhance/Develop a Workforce Database for Data Analytics to Make Strategic and Management Decisions on Workforce Planning Processes
	2.2 Encourage and Facilitate Universities and Local Experts to Adopt Holistic Training Programmes Relating to the Agrofood Sector
	2.3 Develop Human Capital and Expertise to Support Future Job Requirements and Implementation of New Technology
	2.4 Making Available Relevant Scholarship Platforms to Encourage the Pursuit of Higher Learning Degrees in Agrofood Related Fields
	2.5 Upgrade Universities and Agrofood Training Centres with Modern Facilities and Equipment including ICT and Networking

In reference to the respective targets of each policy objectives, strategy 2 and the 5 action plans will look to contribute directly towards 2 key indicators as shown below

Figure 5-15: Strategy 2 Key Indicators Contribution



5.0 National Agrofood Policy 2.0

Strategy 3: Enhance Inclusivity of Agrofood Sector

In terms of women participation, in 2018, only 22.3% of the agriculture labour force comprised of women. Issues such as lack of access to land, financing, markets, agricultural training and education as well gender-specific issues including suitable working conditions deters the participation of women in the agrofood sector. Aspects of inclusivity could be embedded in developing the agrofood sector in order for the benefits reaped from the growth of the industry to be shared with the larger population. This covers participation from women, PWD and indigenous people as well as a balanced regional development.

A total of 3 action plans has been formulated to support the implementation of strategy 3 as below:

Table 5-11: Summary of the Action Plans under Strategy 3

Strategies	Action Plans
3.0 Enhance Inclusivity of Agrofood Sector	**3.1** Identify and Promote Suitable Career Opportunities and Implementation of Technology for Women and the Persons With Disabilities (PWD) Community in the Agrofood Sector
	3.2 Increase Scholarship for Women, Indigenous People and PWD Communities for Agrofood Programmes
	3.3 Develop Transition Programmes for Non-Agriculture Graduates with Interest in Pursuing a Career in the Agrofood Sector

In reference to the respective targets of each policy objectives, strategy 3 and the 3 action plans will look to contribute directly towards 1 key indicators as shown below:

Figure 5-16: Strategy 3 Key Indicators Contribution

5.0 National Agrofood Policy 2.0

Strategy 4: Increase Efficiency and Technical Services of Extension Officers

A majority of smallholder food producers are reliant on extension officers to provide technical advice and resolve any ground issues among food producers. Hence, extension officers are expected to have adequate technical knowledge and expertise. However, some extension officers have limited hands-on experience in food production and occasionally unable to resolve issues posed by experienced farmers. The efficiency and competency of extension officers need to be strengthened particularly in the application of agrofood related technology to improve the ability of technology transfer to food producers to increase technology adoption and automation.

A total of 4 action plans has been formulated to support the implementation of strategy 4 as below:

Table 5-12: Summary of the Action Plans under Strategy 4

Strategies	Action Plans
4.0 Increase Efficiency and Technical Services of Extension Officers	**4.1** Enhancing Technical Expertise of Extension Service Providers through Efficient Knowledge Transfer by Providing Structured Programmes including Cross Fertilisation with Knowledgeable Workforce/Industry
	4.2 Introduce Mobile Labs Comprising Extension and Research Officers, as well as Experts to Provide In-Situ Solutions to Food Producers
	4.3 Attachment of Extension Officers with Industry Associations to Build Expertise and Champion Niche Areas/Market
	4.4 Train and Hire TVET Graduates and/or Experienced Food Producers as Technology Transfer Agents to Food Producers

In reference to the respective targets of each policy objectives, strategy 4 and the 4 action plans will look to contribute directly towards 2 key indicators as shown below:

Figure 5-17: Strategy 4 Key Indicators Contribution

5.0 National Agrofood Policy 2.0

5.5 Policy Thrust 4

Policy Thrust 4: Advance Towards Sustainable Agricultural Practices and Food Systems

In the process of achieving the food security goal, the agrofood sector need to adopt sustainable practices to preserve the delicate balance of the environment and ecosystem by taking due care that growth of the industry is not at the expense of polluting and degrading the environment. Sustainable farming practices should focus on:

1) methods and processes that improve soil productivity while minimising harmful effects on the climate, soil, water, air, biodiversity and human health
2) reducing the use of inputs from nonrenewable sources and petroleum-based products and replace them with those from renewable resources
3) ensuring that the basic nutritional requirements of current and future generations are met
4) reducing the agricultural sector's vulnerability to adverse natural conditions (e.g. flooding), socioeconomic factors (e.g. economic downturn) and other risks. An additional concern for food security is food loss and waste. Globally, 14% of the world's food loss is during the production phase before reaching the retail level. Reducing loss and waste may potentially cushion the pressure from increasing food demand

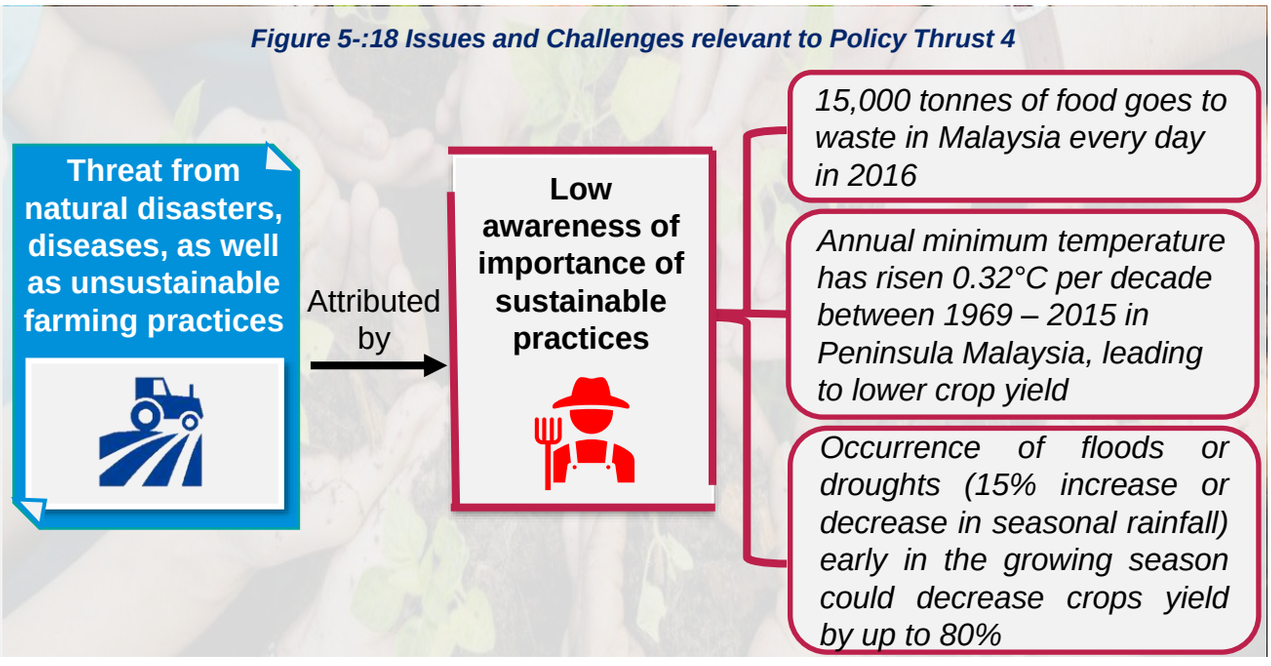
To meet increasing food demand in the next decade and beyond, the agriculture sector would need to move towards more sustainable food production methods incorporating agroecology approach, which promotes diversity, co-creation and innovation, synergy, efficiency, recycling, resilience, human and social values, culture and food tradition, responsible governance and circular economy to create a more sustainable food system.

5.0 National Agrofood Policy 2.0

Issues and Challenges relevant to Policy Thrust 4

As explained in Chapter 3 and Figure 5-18 below, threats from natural disasters, diseases as well as unsustainable farming practices are among the challenges faced by the agrofood sector in advancing towards sustainable agricultural practices and food systems. The current landscape could be attributed to the low level of awareness of the importance of sustainable practices.

Figure 5-:18 Issues and Challenges relevant to Policy Thrust 4



Contribution to policy objectives

There are 5 main policy objectives and 9 key indicators under Policy Thrust 4:

1 Policy Objective 2: Raise production output with quality harvest by increasing productivity

Key Indicator(s):
- Tracking Systems

2 Policy Objective 3: Establish More Agile and Resilient Value Chains with High Value-Added Activities

Key Indicator(s):
- myGap and myOrganic Certification
- Global/International Certifications

3 Policy Objective 4: Improve food safety and nutritional well-being of Malaysians

Key Indicator(s):
- Young Agropreneurs
- Urban/Community Farming

4 Policy Objective 5: Embrace greater economic, social and spatial inclusiveness

Key Indicator(s):
- Young Agropreneurs

5 Policy Objective 6: Encourage greater adoption of sustainable consumption and production

Key Indicator(s):
- Postharvest Loss
- Food Waste
- Water use/Water Footprint per HA

5.0 National Agrofood Policy 2.0

Strategies and Action Plans of Policy Thrust 4

There are 4 strategies and 13 action plans formulated to facilitate the advance towards sustainable agricultural practices and food systems as follows:

04

Advance towards Sustainable Agricultural Practices and Food Systems

Strategy 1: Reduce Food Loss and Food Wastage along the Value Chain

1. Increase Awareness on Extent of Food Loss and Food Wastage along the Value Chain through Carrying Out Structured Programmes
2. Reduce Food Loss along the Value Chain through Smart Traceability System and Strengthening Existing Regulations
3. Encourage the Use of Agrofood Waste as Inputs to Promote "Waste to Wealth" Concept
4. Intensify Collaborations between Downstream Players with Food Banks and Charity Bodies to Minimise Food Wastage and Promote Zero Waste

Strategy 2: Drive Greater Adoption of Sustainable Farming Practices with Utilisation of Bioresources

1. Accelerate the Growth of Bioresource Start-up Companies through Collaborative Programmes and Increase in Investments
2. Increase Adoption of Sustainable Practices through Intensification of Extension Services
3. Increase Adoption of Standard Food Certifications by Food Producers
4. Promote Urban Farming to Encourage Community Participation in Food Production

5.0 National Agrofood Policy 2.0

04

Advance towards Sustainable Agricultural Practices and Food Systems

Strategy 3: Promote Conservation and Preservation of Biodiversity and Natural Resources for Sustainable Agriculture

1. Develop and Establish Core Collections of Microbes, Insects, Varieties and Breeds with Traits that are More Resistant to Pest, Disease and Climate Change Accompanied by Promotion of Integrated Pest Management
2. Enhance Protection of Local Ecosystem against the Threats of Invasive Alien Species (IAS)
3. Strengthen Agrofood Planning and Good Practices to Protect the Environmentally Sensitive Areas and Important Ecosystem

Strategy 4: Develop Healthy and Sustainable Food Systems

1. Facilitate the Production of Food Products that are of Higher Nutritional Quality
2. Provide Greater Knowledge on Nutrition to Consumers to Facilitate Healthier Food Choice

5.0 National Agrofood Policy 2.0

Strategy 1: Reduce Food Loss and Food Wastage along the Value Chain

Food loss is one of the indicators under 'Availability' category of Global Food Security Index (GFSI), therefore, it is imperative to strengthen the existing operation and monitoring of the value chain in the Malaysian agrofood sector to minimise food loss. To identify the state of food loss, the agrofood sector would need to be supported by reliable statistics, along with identification of pain points throughout the industry value chain, followed with subsequent remedy action steps. Meanwhile, food waste can be reduced by reintegrating discarded unwanted food products back into the value chain in the downstream segment allowing such products to be recirculated with as little value loss as possible. By reducing food loss and waste, the efficiency of resource utilisation could be potentially improved while reducing use of resources.

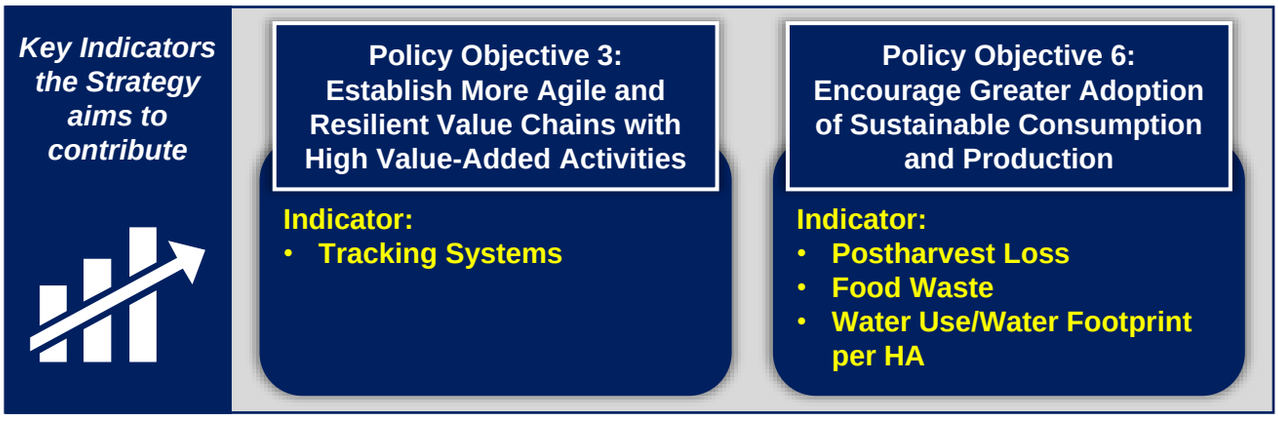
A total of 4 action plans has been formulated to support the implementation of strategy 1 as below:

Table 5-13: Summary of the Action Plans under Strategy 1

Strategies	Action Plans
1.0 Reduce Food Loss and Food Wastage along the Value Chain	**1.1** Increase Awareness on Extent of Food Loss and Food Wastage along the Value Chain through Carrying Out Structured Programmes
	1.2 Reduce Food Loss along the Value Chain through Smart Traceability System and Strengthening Existing Regulations
	1.3 Encourage the Use of Agrofood Waste as Inputs to Promote "Waste to Wealth" Concept
	1.4 Intensify Collaborations between Downstream Players with Food Banks and Charity Bodies to Minimise Food Wastage and Promote Zero Waste

In reference to the respective targets of each policy objectives, strategy 1 and the 4 action plans will look to contribute directly towards 4 key indicators as shown below:

Figure 5-19: Strategy 1 Key Indicators Contribution



5.0 National Agrofood Policy 2.0

Strategy 2: Drive Greater Adoption of Sustainable Farming Practices with Utilisation of Bioresources

Sustainable farming practices with the goal of improving quality of product output in the agrofood sector is essential to secure a long-term return in both economic and social aspect. This objective could be aided by integrating the use of bioresources within the agrofood value chain. Bioresources are natural renewable sources such as organic waste and naturally formed or formable raw materials from human and animal activities which are primarily used as an input in food production, manufacturing of substantial products, as well as energy production. To develop a more sustainable farming practice, the focus of this strategy will be on increasing the utilisation of bio resources across the food production value chain, particularly on farmlands, for the purpose of improving food safety and reducing environmental pollution.

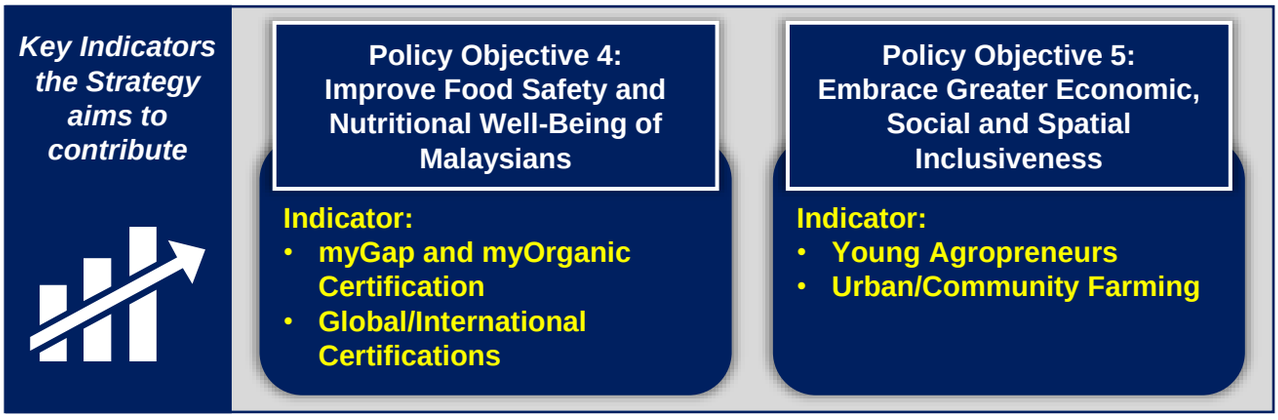
A total of 4 action plans has been formulated to support the implementation of strategy 2 as below:

Table 5-14: Summary of the Action Plans under Strategy 2

Strategies	Action Plans
2.0 Drive Greater Adoption of Sustainable Farming Practices with Utilisation of Bioresources	**2.1** Accelerate the Growth of Bioresource Start-up Companies through Collaborative Programmes and Increase in Investments
	2.2 Increase Adoption of Sustainable Practices through Intensification of Extension Services
	2.3 Increase Adoption of Standard Food Certifications by Food Producers
	2.4 Promote Urban Farming to Encourage Community Participation in Food Production

In reference to the respective targets of each policy objectives, strategy 2 and the 4 action plans will look to contribute directly towards 4 key indicators as shown below:

Figure 5-20: Strategy 2 Key Indicators Contribution



5.0 National Agrofood Policy 2.0

Strategy 3: Promote Conservation and Preservation of Biodiversity and Natural Resources for Sustainable Agriculture

Biodiversity and the agriculture sector are strongly interrelated because agriculture activities could also contribute to the conservation of biodiversity if sustainable practices are adopted. However, agricultural practices such as unsustainable demand for water, overgrazing, as well as excessive use of nutrients and chemical inputs to control weeds, pests and diseases leads to pollution and eutrophication which in turn negatively impact biodiversity. Further, land and habitat conversion to large-scale agricultural production also cause significant loss of biodiversity. Therefore, it is critical to ensure that food producers adopt sustainable farming practices to protect and conserve biodiversity. Maintenance of biodiversity is key in sustainable production of food and other agricultural products as well as maintain the benefits of biodiversity provided to humanity, including food security, nutrition and livelihood.

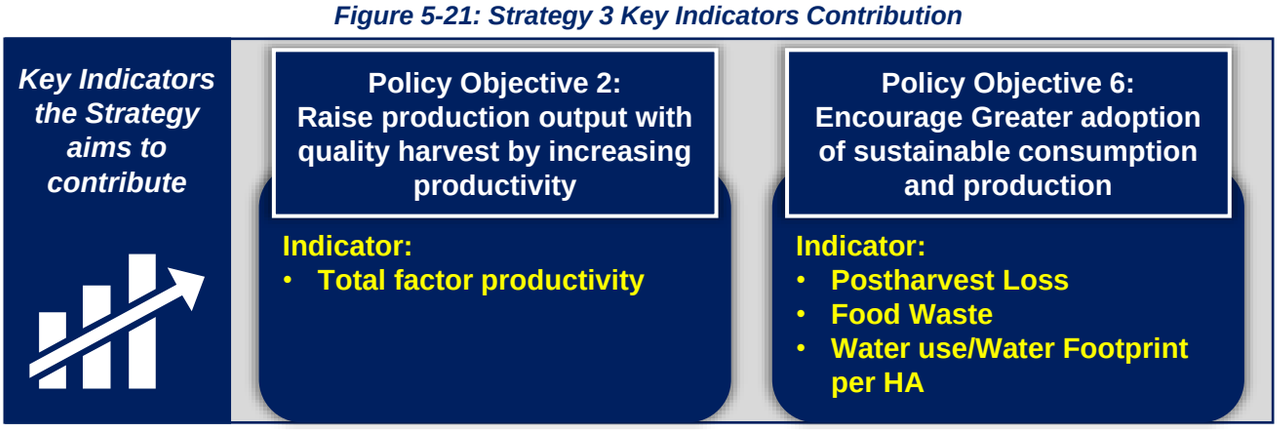
A total of 3 action plans has been formulated to support the implementation of strategy 3 as below:

Table 5-15: Summary of the Action Plans under Strategy 3

Strategies	Action Plans
3.0 Promote Conservation and Preservation of Biodiversity and Natural Resources for Sustainable Agriculture	**3.1** Develop and Establish Core Collections of Microbes, Insects, Varieties and Breeds with Traits that are More Resistant to Pest, Disease and Climate Change Accompanied by Promotion of Integrated Pest Management
	3.2 Enhance Protection of Local Ecosystem against the Threats of Invasive Alien Species (IAS)
	3.3 Strengthen Agrofood Planning and Good Practices to Protect the Environmentally Sensitive Areas and Important Ecosystem

In reference to the respective targets of each policy objectives, strategy 3 and the 3 action plans will look to contribute directly towards 4 key indicators as shown below:

Figure 5-21: Strategy 3 Key Indicators Contribution



5.0 National Agrofood Policy 2.0

Strategy 4: Develop Healthy and Sustainable Food Systems

A sustainable food system, according to the definition provided by the Food and Agriculture Organisation of the United Nations (FAO), is a food system that delivers food security and nutrition for all in such a way that the economic, social and environmental bases to generate food security and nutrition for future generations are not compromised. It thereby emphasises the element of sustainability across three facets of development namely; economic, social, and environment, in the course of achieving greater food security and nutrition. The term food security includes food safety aspects such as handling, storing and preparation of food to prevent contamination and ensure that food available to the population preserves sufficient nutrients for a healthy diet. Food is an important element in daily lives as it provides sustenance and energy for daily activities. However, food consumption is beyond meeting the caloric requirements. The human body also requires a complex mix of nutrients from various food sources in order to be healthy and avoid diseases caused by deficiencies. Therefore, it is important that food production priorities not only the quantity of food produced, but take into account nutrition security where the population of Malaysia have access to a healthy and balanced diet.

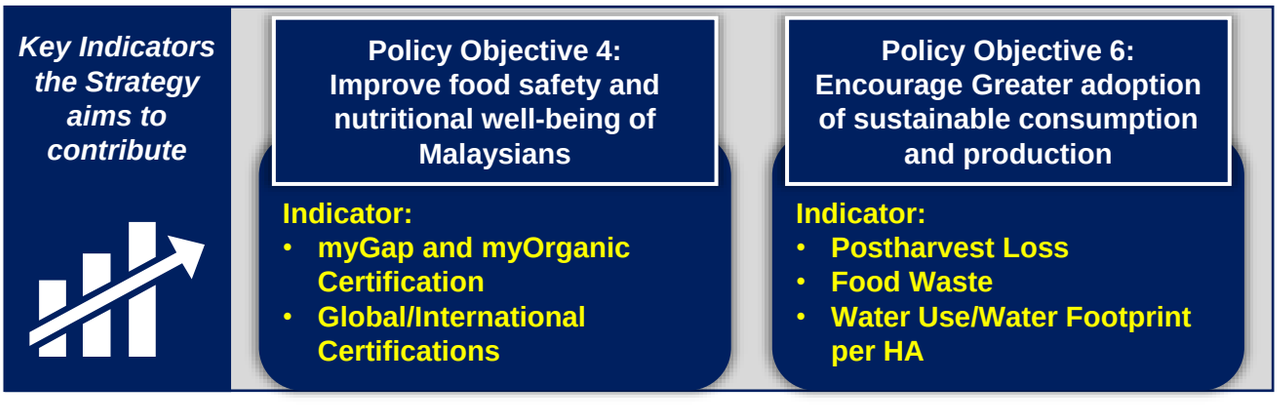
A total of 2 action plans has been formulated to support the implementation of strategy 4 as below:

Table 5-16: Summary of the Action Plans under Strategy 4

Strategies	Action Plans
4.0 Develop Healthy and Sustainable Food Systems	**4.1** Facilitate the Production of Food Products that are of Higher Nutritional Quality
	4.2 Provide Greater Knowledge on Nutrition to Consumers to Facilitate Healthier Food Choice

In reference to the respective targets of each policy objectives, strategy 4 and the 2 action plans will look to contribute directly towards 5 key indicators as shown below:

Figure 5-22: Strategy 4 Key Indicators Contribution



5.0 National Agrofood Policy 2.0

5.6 Policy Thrust 5

Policy Thrust 5: Create Conducive Business Ecosystem and Robust Institutional Framework

To attract and maintain the interest of food producers, investors and private sector to continuously participate in the agrofood sector, the business ecosystem needs to be conducive for these different players to operate and conduct businesses in the industry. In the context of the agrofood sector, the key areas of the ecosystem are land tenure and property rights; regulatory matters such as norms, rules and regulations; financial services; physical infrastructure and digital connectivity, as well as end-to-end value chain linkages, especially between the upstream and downstream segments.

The governance of the agrofood sector must be strengthened with progressive policies and plans; efficient coordination and collaboration among key players within the industry; and effective implementation and delivery mechanisms to create a conducive business ecosystem which benefits all the players in the industry.

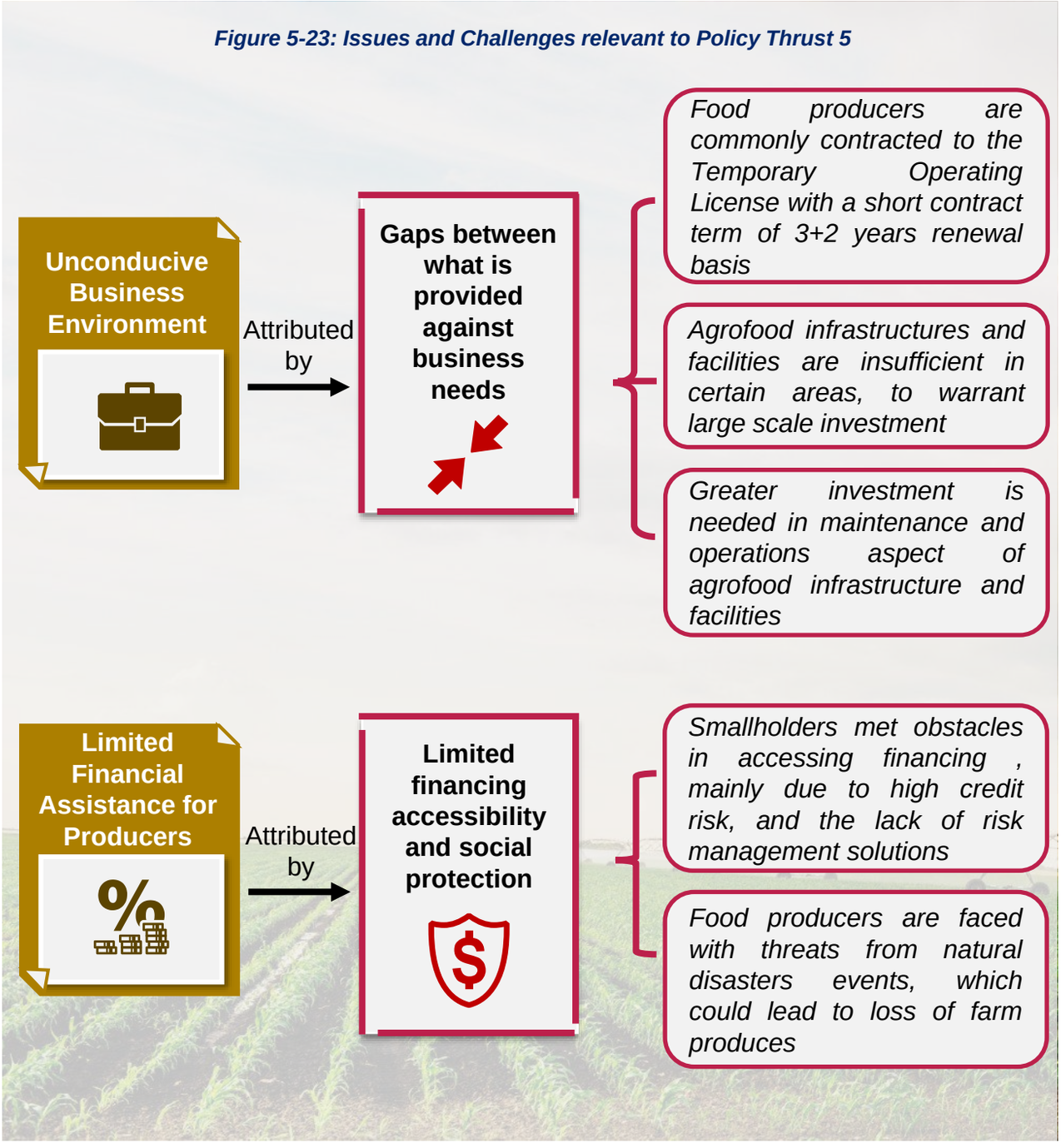
On top of that, elements that make up the foundation of business activities; land security, financing accessibility, infrastructure availability, need to be solidified to entice greater confidence and willingness from private players and investors to enter or further invest in the agrofood sector. In the meantime, digitalisation across the value chain segments would be beneficial towards increasing the value chain efficiency, to take the agrofood sector to the next level of development stages.

5.0 National Agrofood Policy 2.0

Issues and Challenges relevant to Policy Thrust 5

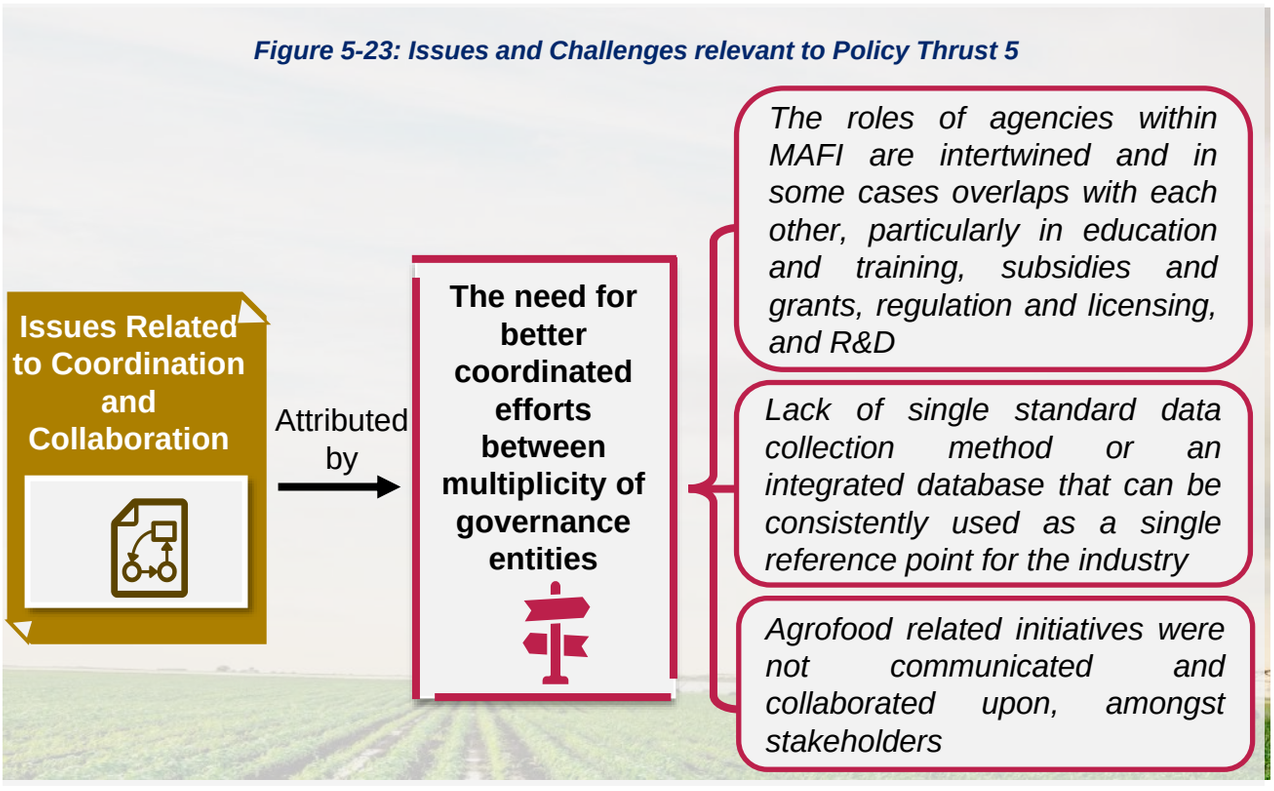
As explained in Chapter 3 and Figure 5-23 below, unconducive business environment, limited financial assistance for producers, and issues related to coordination and collaboration are amongst the existing conditions which prompted the need to create conducive a business ecosystem alongside robust institutional framework.

Figure 5-23: Issues and Challenges relevant to Policy Thrust 5



5.0 National Agrofood Policy 2.0

Figure 5-23: Issues and Challenges relevant to Policy Thrust 5



Contribution to policy objectives

There are 5 main policy objectives and 10 key indicators under Policy Thrust 5:

1

Policy Objective 1:
Drive income growth and facilitate better quality of life for food producers

Key Indicator(s):
- Income Levels of Agrofood Producers
- Agrofood Insurance

2

Policy Objective 2:
Raise production output with quality harvest by increasing productivity

Key Indicator(s):
- Tracking Systems

3

Policy Objective 3:
Establish More Agile and Resilient Value Chains with High Value-Added Activities

Key Indicator(s)s:
- myGap and myOrganic Certification
- Global/International Certifications

4

Policy Objective 4:
Improve food safety and nutritional well-being of Malaysians

Key Indicator(s):
- Young Agropreneurs
- Urban/Community Farming

5

Policy Objective 6:
Encourage greater adoption of sustainable consumption and production

Key Indicator(s)s:
- Postharvest Loss
- Food Waste
- Water use/Water Footprint per HA

5.0 National Agrofood Policy 2.0

Strategies and Action Plans of Policy Thrust 5

There are 5 strategies and 20 action plans formulated to create conducive business ecosystem and robust institutional framework as follows:

05

Create Conducive Business Ecosystem and Robust Institutional Framework

Strategy 1: Bolster Facilitation and Support on Land Matters for Agrofood Sector

1. Intensify Participation and Contribution Within Existing High Level Committees/Councils to Address Issues Related to Land Matters at State Level
2. Facilitate the Development of Land Rental Market for Agrofood Production Purposes
3. Develop Suitable Models to Consolidate and Manage Land Resources, e.g. Wakaf and Vacant Land
4. Enhance Anchor Management Companies for Small Landholders via PPP Model to Drive Economies of Scale

Strategy 2: Redesign Funding Support and Enhance Financial Services for Food Producers

1. Design and Establish Insurance Scheme for Food Producers Against Natural Disasters
2. Shift of Emphasis on Incentives, to Increasing Funding That Supports Sustainable or Technology Driven Farming
3. Facilitate Financial Credibility and Improve Access to Private Funding Through Digitalisation of Credit Rating of Food Producers

Strategy 3: Drive End-to-End Digitalisation of Value Chain

1. Increase Transparency and Reliability for Data Gathering and Information Dissemination
2. Leverage AgF to Develop an Integrated National Agriculture Database Using Big Data Platform
3. Implement Track-and-trace Technologies to Enhance Traceability Along the Value Chain
4. Facilitate Participation and Connectivity of Key Players with the Agrofood Value Chain, Throughout the Process of Digitalisation

5.0 National Agrofood Policy 2.0

05

Create Conducive Business Ecosystem and Robust Institutional Framework

Strategy 4: Streamline and Strengthen Governance of Agrofood Sector

1. Reduce Overlapping Roles of Agencies and Enhance Role of MAFI In the Development of the Industry
2. More Frequent and Coordinated Reviews of Relevant Legislation/Regulations to Keep Up to Date Prevailing Industry Trends
3. Regulate and Enhance Enforcement on Improper Use of Chemicals and Antibiotics within Farms
4. Bolster the Conduct of Agriculture Census to Keep Better Records of Agrofood Sector Data
5. Reinforce Legal Framework and Implementation Structure Pertaining to Public-Private Partnership (PPP) Schemes
6. Establish Database and Frequent Review of NTMs

Strategy 5: Enhance Investment in Agrofood Targeted Infrastructure

1. Expedite Development of Agrofood Related Infrastructure, Especially in Locations Where it is Deficient and Justifiably in Need
2. Strengthen the Functionality of Agrofood Infrastructures, by Incorporating Supporting Facilities and/or Promoting Alternative Use of the Said Infrastructure (Usage Diversification)
3. Increase Accountability for the Management of Infrastructure, Infrastructure Users Groups on Operation and Maintenance Matters
4. Continuous Development of the Agrotourism Industry

5.0 National Agrofood Policy 2.0

Strategy 1: Bolster Facilitation and Support on Land Matters for Agrofood Sector

This strategy aims to enhance the use efficiency of land resources as well as to provide greater land security to food producers, with emphasis placed on the production stage. The higher efficiency of land resources will be driven by facilitating land use arrangement that adheres to the concept of economics of scale, whereby farm operations are to be scaled up to reduce total cost per production unit. Land security will look to be enhanced, via more effective coordination and communication with stakeholders whom has prerogative over land matters, to improve upon conditions of land tenure for agrofood players.

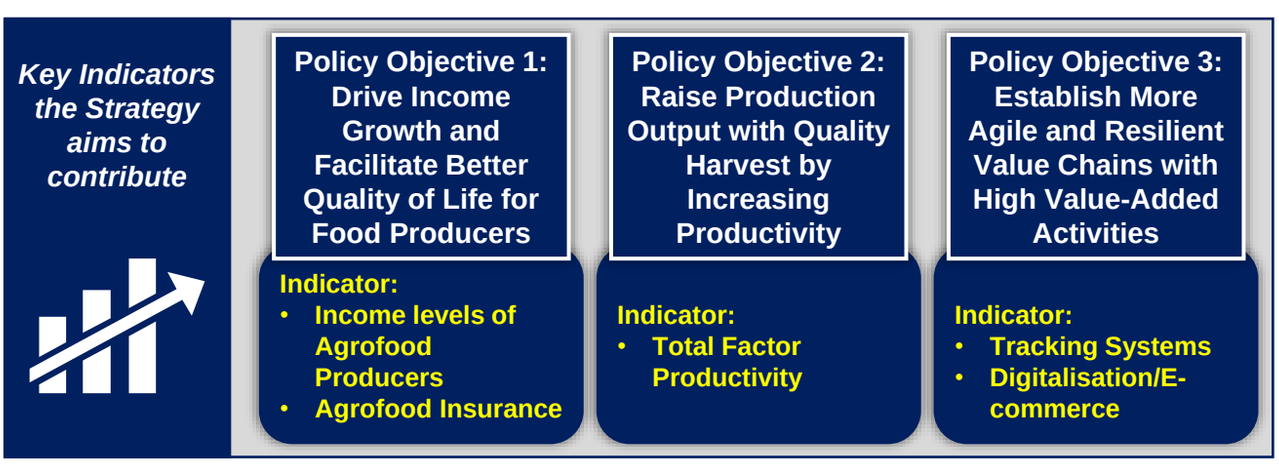
A total of 4 action plans has been formulated to support the implementation of strategy 1 as below:

Table 5-17: Summary of the Action Plans under Strategy 1

Strategies	Action Plans
1.0 Bolster Facilitation and Support on Land Matters for Agrofood Sector	**1.1** Intensify Participation and Contribution Within Existing High Level Committees/Councils to Address Issues Related to Land Matters at State Level
	1.2 Facilitate the Development of Land Rental Market for Agrofood Production Purposes
	1.3 Develop Suitable Models to Consolidate and Manage Land Resources, e.g. Wakaf and Vacant Land
	1.4 Enhance Anchor Management Companies for Small Landholders via PPP Model to Drive Economies of Scale

In reference to the respective targets of each policy objectives, strategy 1 and the 4 action plans will look to contribute directly towards 2 key indicators as shown below:

Figure 5-24: Strategy 1 Key Indicators Contribution



5.0 National Agrofood Policy 2.0

Strategy 2: Redesign Funding Support and Enhance Financial Services for Food Producers

The availability of financial resources to the proper functioning of business operations is pivotal and thus, the redirection of funding supports, and the enhancement of social protection and financing accessibility, will be the focuses for this strategy. Social protection in the agrofood sector context can be improved by introducing insurance schemes to agrofood players, as to provide a form of safety net, when farm produces are destroyed from events of natural disasters. To address financing accessibility, initiatives are targeted to improve elements that will assist in financial assessment of agrofood players, to generate credit rating of higher reliability. Finally, provision of funding support will be partly shifted to place more focus on facilitating existing agrofood businesses to upscale its operations.

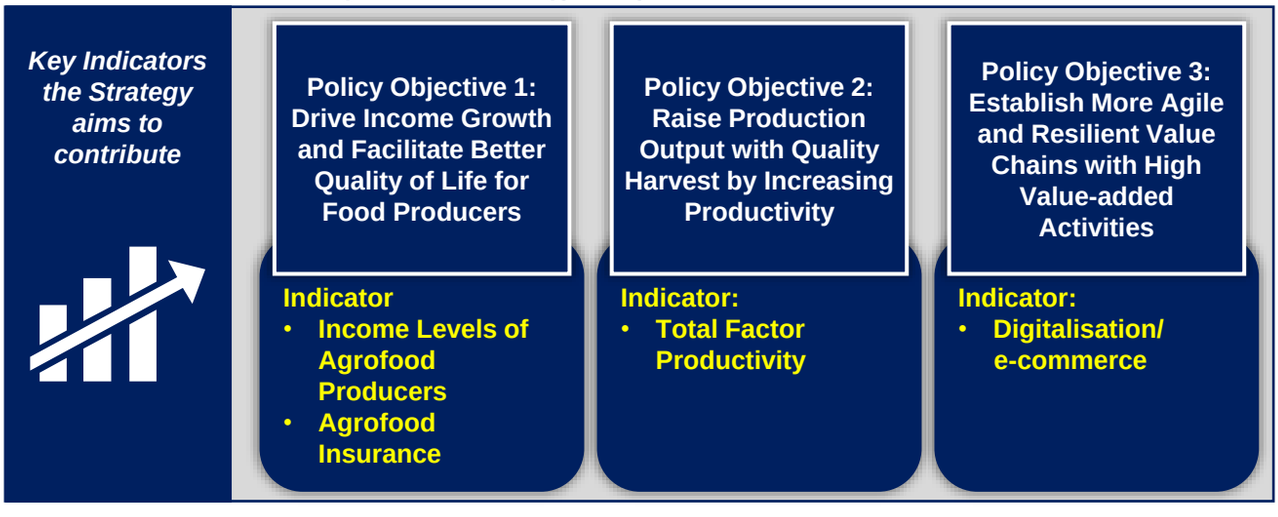
A total of 3 action plans has been formulated to support the implementation of strategy 2 as below:

Table 5-18: Summary of the Action Plans under Strategy 2

Strategies	Action Plans
2.0 Redesign Funding Support and Enhance Financial Services for Food Producers	**2.1** Design and Establish Insurance Scheme for Food Producers Against Natural Disasters
	2.2 Shift of Emphasis on Incentives, to Increasing Funding That Supports Sustainable or Technology Driven Farming
	2.3 Facilitate Financial Credibility and Improve Access to Private Funding Through Digitalisation of Credit Rating of Food Producers

In reference to the respective targets of each policy objectives, strategy 2 and the 3 action plans will look to contribute directly towards 4 key indicators as shown below:

Figure 5-25: Strategy 2 Key Indicators Contribution



5.0 National Agrofood Policy 2.0

Strategy 3: Drive End-to-End Digitalisation of Value Chain

Digitalisation converts information and products into a digital format, and once converted, these resources can be used to streamline processes, eliminating the need for paperwork and face-to-face interaction. Some of the apparent benefits from a digitalised value chain are faster speed, lower cost and improved operational efficiency. The advantage of digitalisation is greatly highlighted particularly in times of turmoil, for instance in an event of pandemic. During the COVID-19 pandemic, a number of supply chains have been crippled due to their traditional value chain systems. Traceability lapses occurred when certain aspects of the network were shut due to unforeseen reasons, and many processes that revolve around deliveries that require a face-to-face, paper-based signature, were disrupted. Using a digital approach to these typical systems can greatly reduce the need for physical interactions, improving business both during and after the COVID-19 pandemic.

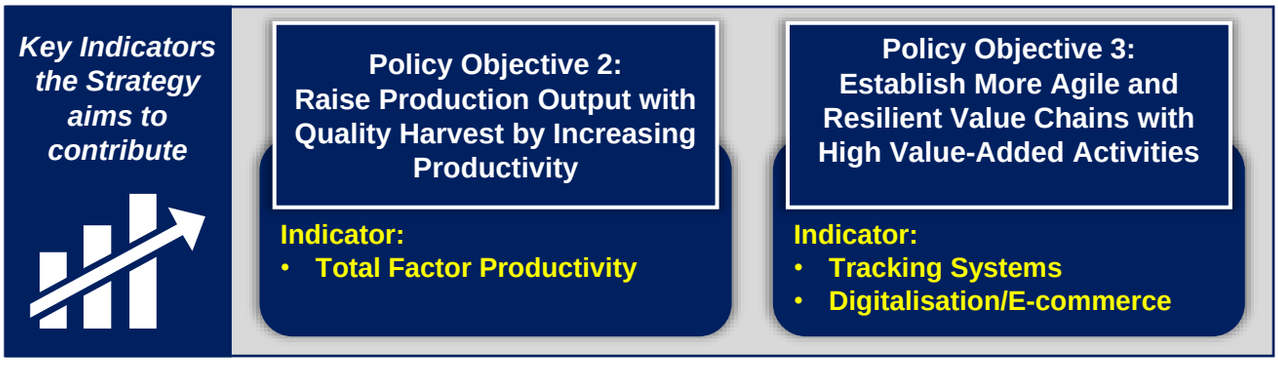
A total of 4 action plans has been formulated to support the implementation of strategy 3 as below:

Table 5-19: Summary of the Action Plans under Strategy 3

Strategies	Action Plans
3.0 Drive End-to-End Digitalisation of Value Chain	**3.1** Increase Transparency and Reliability for Data Gathering and Information Dissemination
	3.2 Leverage AgF to Develop an Integrated National Agriculture Database Using Big Data Platform
	3.3 Implement Track-and-trace Technologies to Enhance Traceability Along the Value Chain
	3.4 Facilitate Participation and Connectivity of Key Players with the Agrofood Value Chain, Throughout the Process of Digitalisation

In reference to the respective targets of each policy objectives, strategy 3 and the 4 action plans will look to contribute directly towards 3 key indicators as shown below:

Figure 5-26: Strategy 3 Key Indicators Contribution



5.0 National Agrofood Policy 2.0

Strategy 4: Streamline and Strengthen Governance of Agrofood Sector

Given the important contribution of the agrofood sector towards national food security, it is important to ensure that the country's food value chain operates efficiently and effectively in a safe and secure environment. For this to materialise, governance efforts need to be improved. The roles of agencies under the purview of MAFI will be realigned, as to heighten operational efficiency and reduce instances of duplication in responsibilities. Improvement of governance also extends to include the activities of private players, specifically on the regulation and enforcement of farming input related matters. This is to facilitate the long term development of agrofood sector, whereby the industry produces safer food product for human consumption whilst limiting negative impacts on the quality of natural environment.

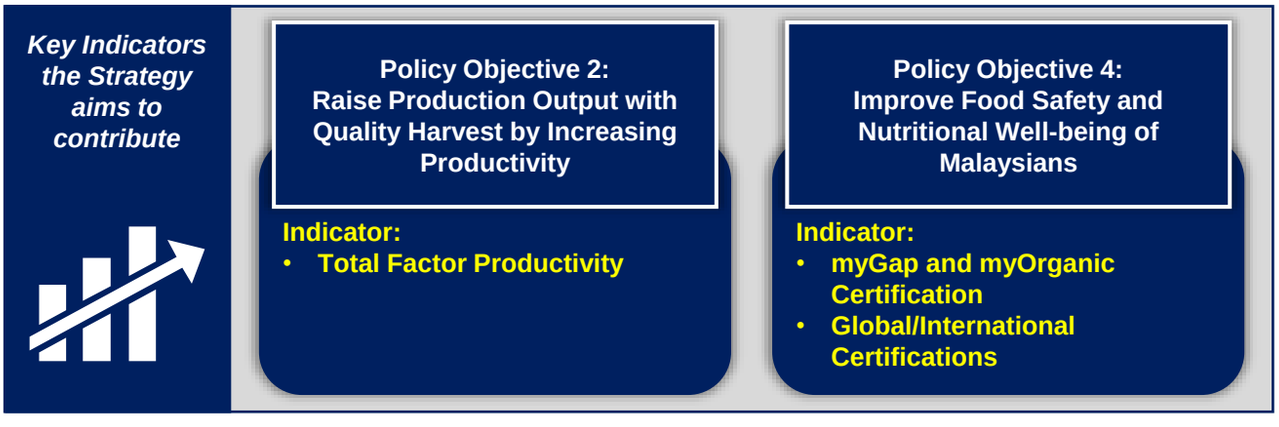
A total of 4 action plans has been formulated to support the implementation of strategy 4 as below:

Table 5-20: Summary of the Action Plans under Strategy 4

Strategies	Action Plans
4.0 Streamline and Strengthen Governance of Agrofood Sector	**4.1** Reduce Overlapping Roles of Agencies and Enhance Role of MAFI In the Development of the Industry
	4.2 More Frequent and Coordinated Reviews of Relevant Legislation/Regulations to Keep Up to Date Prevailing Industry Trends
	4.3 Regulate and Enhance Enforcement on Improper Use of Chemicals and Antibiotics within Farms
	4.4 Bolster the Conduct of Agriculture Census to Keep Better Records of Agrofood Sector Data
	4.5 Reinforce Legal Framework and Implementation Structure Pertaining to Public-Private Partnership (PPP) Schemes
	4.6 Establish Database and Frequent Review of NTMs

In reference to the respective targets of each policy objectives, strategy 4 and the 6 action plans will look to contribute directly towards 3 key indicators as shown below:

Figure 5-27: Strategy 4 Key Indicators Contribution



5.0 National Agrofood Policy 2.0

Strategy 5: Enhance Investment in Agrofood Targeted Infrastructure

Physical infrastructure is an important factor in any business operations as it provides the facilities and utilities essential to conduct business activities. Therefore, this strategy focuses on the aspect of agrofood related physical infrastructure, in terms of infrastructure availability, utility, and maintenance. More agrofood related infrastructure will look to be developed in areas where food production is one of the primary source of wealth and employment. For existing agrofood infrastructures, usage diversification will be encouraged to improve its utility rate, as well as return of investment. Greater responsibility will be shared between the management and the users groups on the maintenance of such infrastructure to prolong the lifespan of infrastructure.

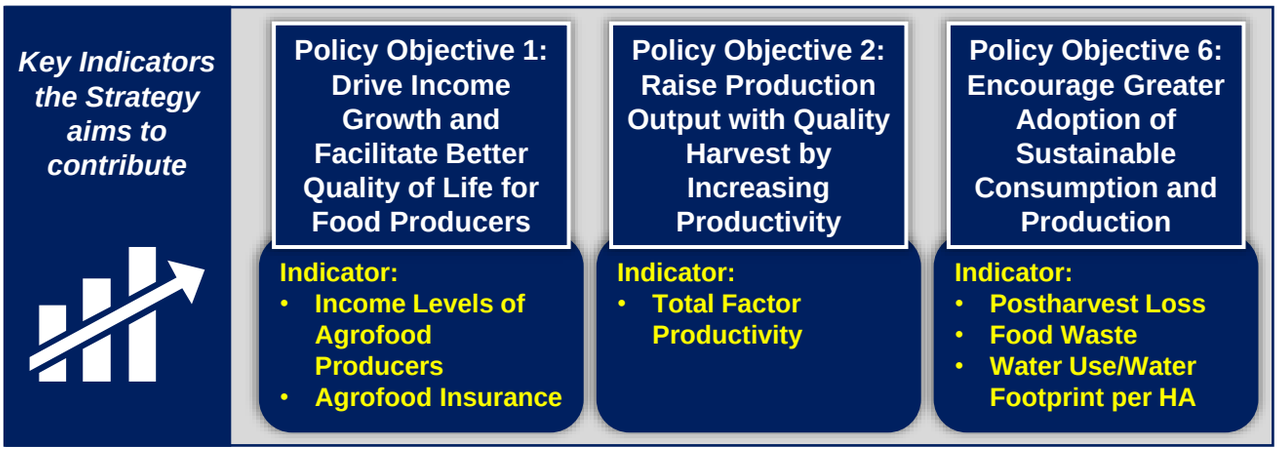
A total of 4 action plans has been formulated to support the implementation of strategy 5 as below:

Table 5-21: Summary of the Action Plans under Strategy 5

Strategies	Action Plans
5.0 Enhance Investment in Agrofood Targeted Infrastructure	**5.1** Expedite Development of Agrofood Related Infrastructure, Especially in Locations Where it is Deficient and Justifiably in Need
	5.2 Strengthen the Functionality of Agrofood Infrastructures, by Incorporating Supporting Facilities and/or Promoting Alternative Use of the Said Infrastructure (Usage Diversification)
	5.3 Increase Accountability for the Management of Infrastructure, Infrastructure Users Groups on Operation and Maintenance Matters
	5.4 Continuous Development of the Agrotourism Industry

In reference to the respective targets of each policy objectives, strategy 5 and the 4 action plans will look to contribute directly towards 3 key indicators as shown below:

Figure 5-28: Strategy 5 Key Indicators Contribution



Strategies & Action Plans

Subsector:
Paddy & Rice
Fruits and Vegetable
Livestock
Fisheries & Aquaculture

5.0 National Agrofood Policy 2.0

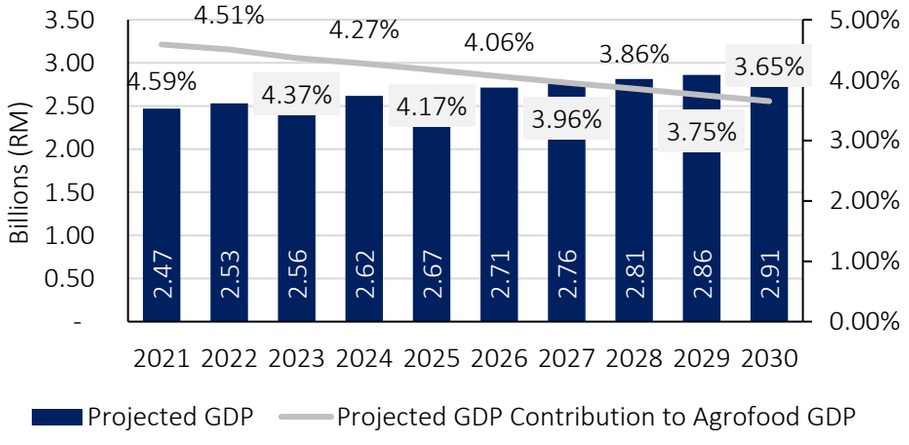
5.7 Paddy and Rice

5.7.1 Key Outlook of the Paddy and Rice Subsector

GDP Contribution

The paddy and rice subsector is forecasted for continual growth of GDP, at a CAGR of 1.84% from RM2.47 billion in 2021 to RM2.91 billion in 2030. The figure below depicts the GDP and GDP contribution forecast of the paddy and rice subsector:

Figure 5-29: Projected GDP and GDP Contribution of Paddy and Rice Subsector

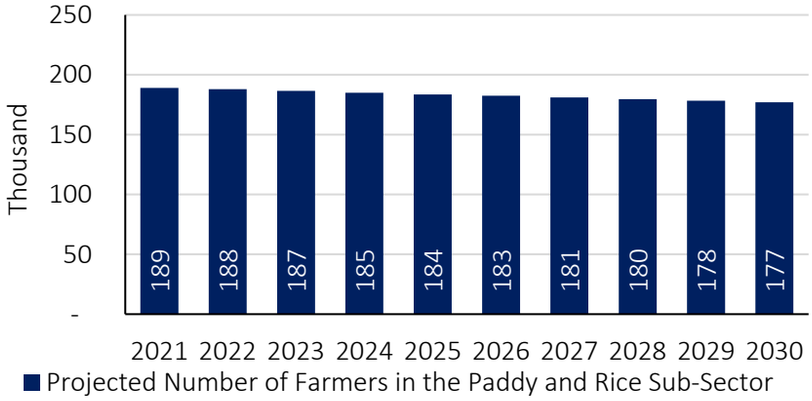


Source: MAFI

Employment

Employment wise, the number of farmers in the paddy and rice subsector is looking to undergo a reduction in the number of workers, from approximately 189 thousand people in 2021 to 177 thousand people in 2030. The employment figure is expected to decrease at a CAGR of -0.72% as shown in the figure below:

Figure 5-30: Projected Number of Farmers in the Paddy and Rice Subsector



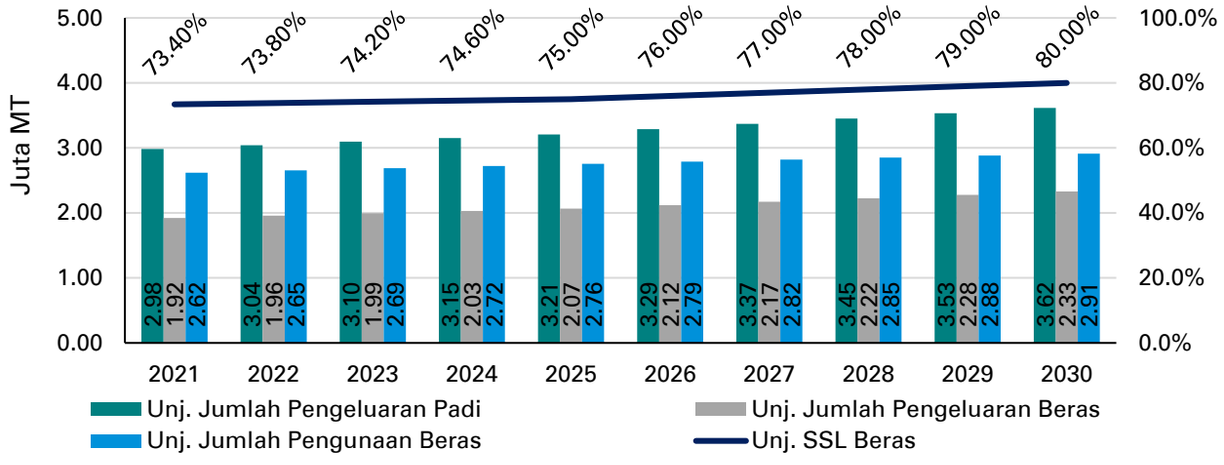
Source: MAFI

5.0 National Agrofood Policy 2.0

Production, Consumption and SSL

Paddy production is projected to grow from 2.98 Million MT in 2021 to 3.62 million MT in 2030 with a CAGR of 2.16%, causing the production of rice to also increase from 1.92 million MT to 2.33 million MT during the same period. The consumption of rice is forecasted to grow at a CAGR of 1.16%, and is expected to be lower than the growth rate of rice production, causing the SSL of rice to increase from 73.4% in 2021 to 80.0% in 2030. The gap between total production and total rice consumption is also projected to narrow from 0.70 million MT to 0.58 million MT.

Figure 5-31: Projected Production, Consumption and SSL of Rice

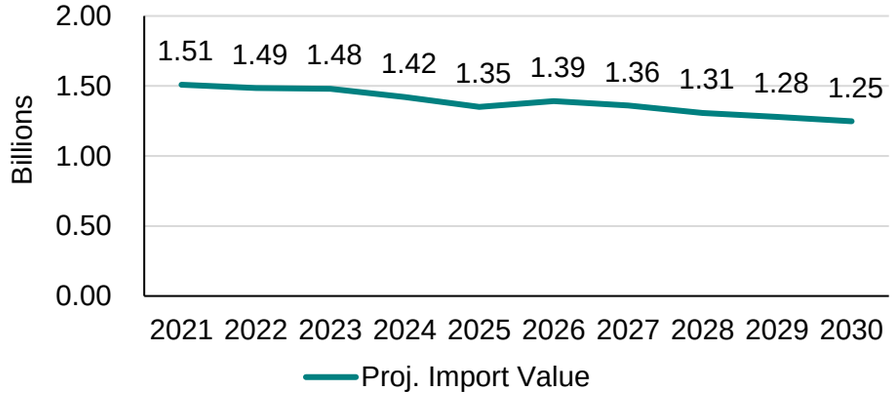


Source: MAFI

Import Value

The import value of rice products into Malaysia is projected to be on a downward trend, from RM1.51 billion in 2021 to RM1.25 billion in 2030, with a CAGR of -2.09% as shown in the figure below. This projected decrease in import value is likely to be attributed by the reducing gap between local production and consumption as per described in Figure 5-31.

Figure 5-32: Projected Import Value of Rice



Source: MAFI

5.0 National Agrofood Policy 2.0

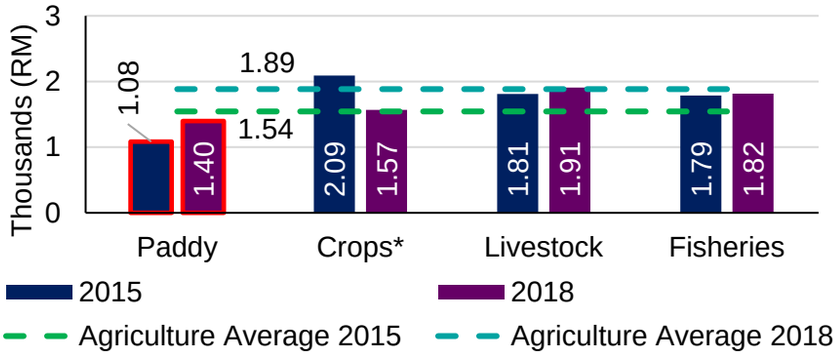
5.7.2 Summary of Issues and Challenges Hindering the Growth of the Paddy and Rice Subsector

Paddy and Rice subsector receives heavy scrutiny within the agrofood sector as it is a staple food in every Malaysian's daily diet. Henceforth, public expenditure on agrofood has been greatly emphasised on supporting the growth this particular subsector. This section highlights several key bottlenecks that if mitigated, would serve to expedite the development pace of Paddy and Rice subsector.

Income of Paddy Producers

The income of food producers in the Paddy and Rice subsector is comparatively lower than other sub-industries as depicted in the figure below. Additionally, the income of paddy farmers is still below the income of producers in the other crops subsector despite the 24.88% increase in 2018 from 2015.

Figure 5-33: Producers' Income by Subsector



*Crops exclude Palm Oil and Rubber

Source: Laporan Survei Tenaga Buruh Malaysia, DOSM, 2018

While each paddy farmer encounters unique issues and challenges within specific regions, areas and location, some of the common factors affecting paddy farmer's income include:

High Production Cost	High cost of inputs and land rentals contributes to unfavourable production cost with the key contributing factor being uneconomic farm size. 3.48 hectare was the estimated cultivated paddy land per farmer in 2019, as compared to 10 hectare optimum farm size to achieve economics of scale. (Agrofood Statistics, MAFI)
Yield Gap	Average yield of 3,496 kg/hectare in 2019, as compared to 2020 target of 5,000 kg/hectare. (Agrofood Statistics, MAFI)
Lack of mechanisation and automation	86.2% farmers in granary areas owns machineries value lower than RM10,000. (*MARDI 2018)*

5.0 National Agrofood Policy 2.0

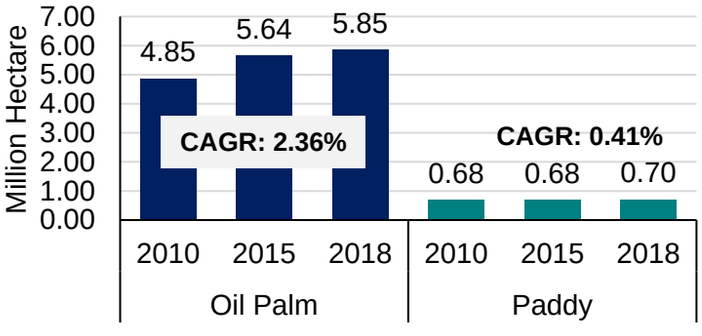
Unconducive Business Environment

There are several factors the represents as bottleneck towards a business environment of a greater conduciveness. The first being land use competition; the Paddy and Rice subsector is constantly faced with competition for land from other economic uses. The priorities are often afforded to other types of development, such as commercial and housing development, has indirectly reduced the amount of land allocated for paddy farming purpose. Competition for land use is also a common challenge within the agrofood sector especially against industrial commodities. A comparison is depicted in Figure 5-34 below where paddy have a significantly lower planted area than oil palm. The cumulative growth rate for paddy planting is only 0.41% while it is 2.36% for oil palm planting.

The second factor is the depiction of paddy planting, specifically on the topic of income level of paddy farmers. The results of extensive stakeholder engagements have highlighted that methodology employed in data gathering and interpretation had led to a general misrepresentation of the actual earnings; income level of farmers only considered revenue generated from rice harvest rather than the total household income. Hence the actual household income of paddy farmers could be different than common understanding that could hinder the entrance of potential paddy farmers.

Thirdly, existing input and output mechanism provided to Paddy and Rice producers, has resulted in several unintended shortcomings. The attached condition and distribution channel does not promote paddy farmers to make their own business decision, such as the likes of farming inputs selection and farming operation upscaling. On top of that, this subsidy policy also “crowd out” private sectors from paddy input market as well as the midstream segment (rice milling).

Figure 5-34: Comparison of Planted Area of Oil Palm against Paddy



Source: MAFI

Post-Harvest Loss

In 2015, Malaysia produced about 2.6 million MT of paddy with post-harvest loss of a total of 9.97% or 259,000 MT. Based on the current price of paddy at RM1,200, the total losses amount to approximately RM311 million. However, based on a study conducted by MARDI, post-harvest losses have experienced a significant reduction since 1985 with a total post-harvest loss of 28.5%. This situation indicates that post-harvest management needs to be improved to reduce the percentage of post-harvest losses. In addition, more end uses for paddy by-products such as broken rice, rice straw and rice husks could look to be developed in line with the goal of developing a cyclical economy of the paddy and rice subsector.

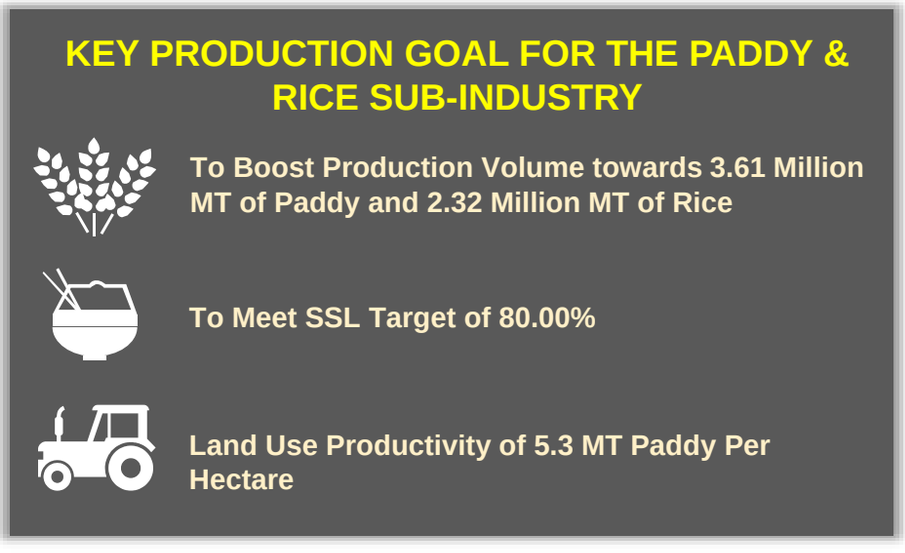
5.0 National Agrofood Policy 2.0

5.7.3 Key Goals of the Paddy and Rice Subsector by 2030

Production Goals

By 2030, the total production of rice is targeted to reach 2.32 million MT, an approximately 53.6% increase as compared to the latest available figure of production (1.51 million MT in 2019), with targeted CAGR of 3.98%. The increased production volume will be the key contributor towards the set goal, which is an SSL of 80.00%.

To achieve this goal, the average yield of paddy per unit area of paddy field will be increased to 5.3 MT per hectare compared to the current average yield of 3.5 MT per hectare (2019) with a CAGR of 3.84%. Higher productivity will reduce the need to expand planted areas, and is of high relevance as this subsector faces intense land use competition from other economic activities.



5.0 National Agrofood Policy 2.0

Sustainability Goals

Increasing competition on the use of natural resources against other development activities, along with threats from climate change impacts mean that sustainability element is imperative to be looked into, when charting the long term development pathway of this subsector.

Paddy cultivation is an important economic activity that uses a lot of water compared to other crops. This is evident in the huge financial resource invested in the development of irrigation infrastructure in granary areas. Compared to other economic activities, the number of paddy harvesting cycles is limited (2-3 times a year) in addition to lower financial returns per unit area. Therefore, the efficient use of natural resources is essential to ensure continued growth for this sub -sector.

KEY SUSTAINABILITY GOALS FOR THE PADDY & RICE SUB-INDUSTRY

To Enhance Efficiency of Natural Resource Use (Land and Water) during Rice Production

Rice Producer's Wellbeing

As described in the earlier section, the average income level of paddy farmers (income sourced from paddy farming activity) has been well below both national as well as agriculture average. The average monthly income of paddy farmers in 2018, was recorded to be approximately RM1,400, 54.64% lower than the national average 24.9% lower than agricultural average. However it is important to note that there has been discussion surrounding the method of deriving income figure for paddy farmers, which does not factor in secondary income source (including the income of farmers who cultivate crops other than rice). Even so, the income level of paddy farmers needs to be improved to uplift the quality of life of full time paddy farmers. As for increasing the income of part-time paddy farmers, investment incentives to increase paddy production must be implemented.

PRODUCER WELLBEING GOALS FOR THE PADDY & RICE SUB-INDUSTRY

To Improve the Level of Income, a Strong Contributor towards Better Quality of Life for the Paddy Farmers

5.0 National Agrofood Policy 2.0

Below are the key goals for the Paddy and Rice subsector by 2030:

Table 5-22: Summary of the Key Goals of the Paddy and Rice Subsector by 2030

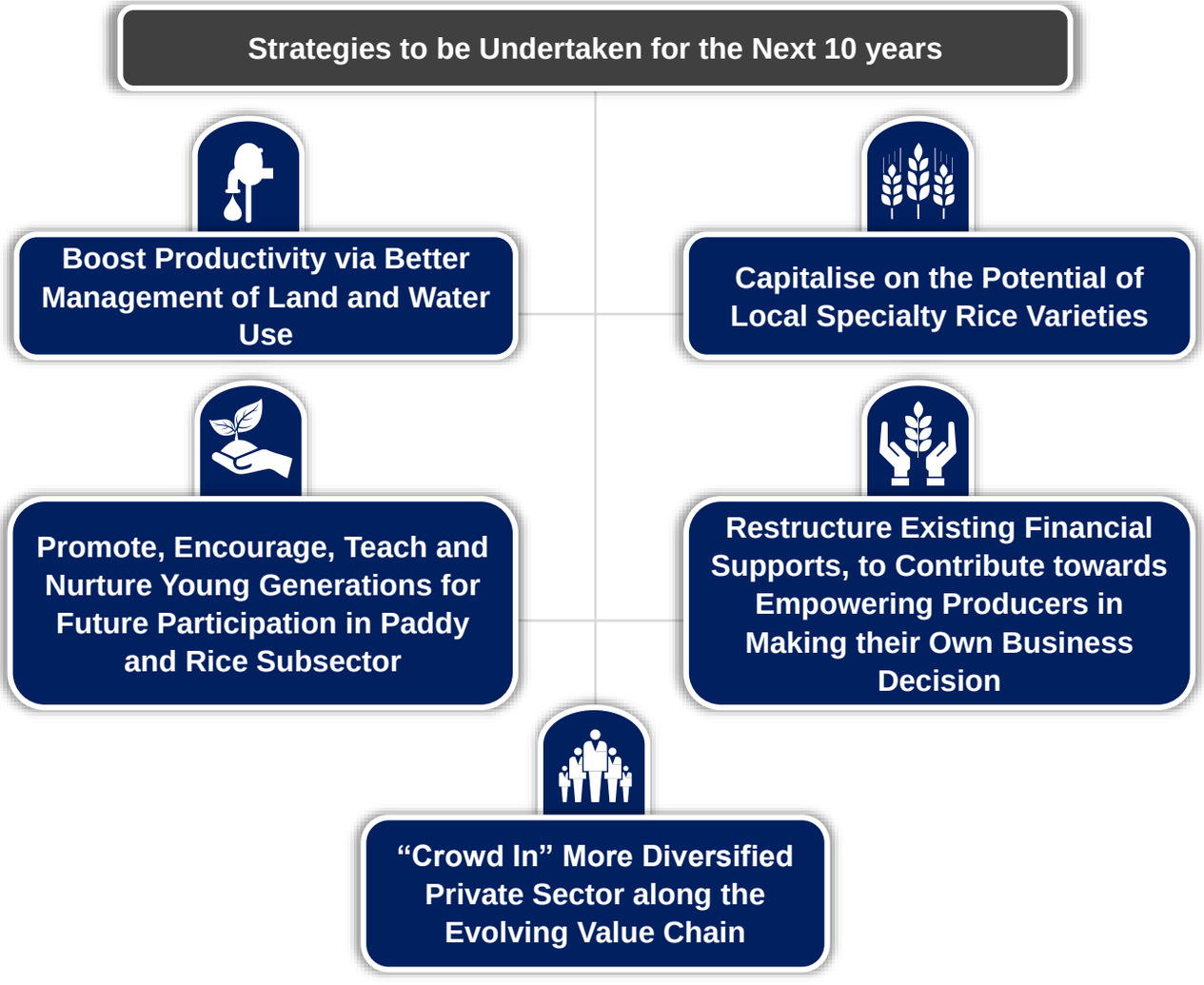
Summary of Subsector Goals by 2030	
Total Production: • 3.61 Million MT of Paddy • 2.32 Million MT of Rice	1
Productivity: • 5.3 MT Per Hectare	2
SSL: • 80.00% for Rice	3
Average Income • RM3,500 for Granary farmers • RM2,500 for Non-granary farmers	4

5.0 National Agrofood Policy 2.0

5.7.4 Way Forward of the Paddy and Rice Subsector

Moving forward in the next 10 years, the Paddy and Rice subsector should look into enhancing productivity, through better efficiency of natural resource use, along with improving the income level of industry players across the value chain in this subsector, particularly for paddy farmers. Also, by improving the subsector's competitiveness and ability to innovate, across the policy timeframe, business environment could be made more conducive. Five (5) main strategies as in Figure 5-35 will be undertaken within the next 10 years. These strategies consider the issues and challenges faced by the Paddy and Rice subsector whilst serve as a driving force in meeting the subsector goals as outlined in Table 5-22.

Figure 5-35: 5 Strategies Identified to be Undertaken by the Paddy and Rice Subsector for the Next 10 Years



5.0 National Agrofood Policy 2.0

The summary of strategies in Table 5-23 outlines each of the strategies that have been identified to address the various challenges in achieving the goals of the Paddy and Rice Subsector by 2030.

Table 5-23: Summary of the Identified Strategies for the Paddy and Rice Subsector

Strategies	Summary/Purpose of the Strategy
Boost Productivity via Better Management of Land and Water Use	Emphasis is placed on the two main resources in paddy cultivation; land and water, to increase the efficiency of the use of these resources in achieving higher productivity.
Capitalise on the Potential of Local Specialty Rice Varieties	This strategy looks to develop the specialty rice segment of the local varieties to provide option for variety diversification by paddy farmers.
Restructure Existing Financial Supports, to Contribute towards Empowering Producers in Making their Own Business Decision	Refining current input and output supports for paddy farmers, in a way that would encourage paddy farmers to optimise farming operations based on their own knowledge and experience.
“Crowd In” More Diversified Private Sector along the Evolving Value Chain	To promote the participation of private players of all scales, across the value chain of paddy and rice subsector as it evolves with time.
Promote, Encourage, Teach and Nurture Young Generations for Future Participation in Paddy and Rice Subsector	To provide exposure and increase knowledge on the paddy and rice subsector towards the younger generation who will be the industry players in the future.

5.0 National Agrofood Policy 2.0

A total of 14 action plans have been formulated across the 5 strategies to further strengthen implementation of each identified strategy. Additionally, the action plans were formulated to facilitate in the achievement of the key goals for the Paddy and Rice subsector. The Table 5-24 below is the mapping of the the strategies and action plans to key goals.

Table 5-24: Paddy and Rice Subsector Strategies and Action Plans against Key Goals

Strategies	Action Plans	Key Goals
1.0 Boost Productivity via Better Management of Land and Water Use	**1.1** Promote Land Use Arrangements that would Enlarge Farming Operation	1 2 3 4
	1.2 Support Large Scale Paddy Farming Initiatives	1 2 3 4
	1.3 Improve Availability, Efficiency, and Management of Water Use, as well as Operation and Maintenance (O&M) of Irrigation Infrastructures	1 2 3 4
2.0 Capitalise on the Potential of Local Specialty Rice Varieties	**2.1** To Recognise and/or Develop Specialty Rice Varieties as Part of Malaysia's Premium Agrofood Products	1 4
	2.2 Promote and Facilitate Contract Farming Arrangement with New/Existing Food Producers that Cultivates Specialty Rice Varieties	1 4
	2.3 Update the Acts and Regulations to Create an Enabling Environment for the Entry of Small and Medium Enterprises (SMEs) to Enter the Specialty Variety Market	1 4
3.0 Restructure Existing Financial Supports, to Contribute towards Empowering Producers in Making their Own Business Decision	**3.1** Move Toward a Voucher System for Input Subsidies, for Paddy and Rice Subsector	1 2 3 4
	3.2 Periodically Reduce the Level of Support Provided through Input Vouchers and Relocate Excess Financial Resource to Other Areas for Long-term Growth	1 2 3 4
	3.3 Phase Out Both Input and Output Based Support with a "Decoupled Cash Payment", which does not Depend either on Current Input Use or on Quantity of Production	1 2 3 4

5.0 National Agrofood Policy 2.0

Strategies	Action Plans	Key Goals
4.0 "Crowd In" More Diversified Private Sector along the Evolving Value Chain	**4.1** Leverage Upon Restructured Financial Support to Encourage the Involvement of Private Sector and Farmer Cooperatives into Farming Input Supplier	1 2 3 4
	4.2 Strengthening Backward Linkages between Input Suppliers and Paddy Farmers	1 2 3 4
	4.3 Restructure Output Based Support, to Facilitate the Entry of New Private Players into the Midstream Segment	1 2 3 4
5.0 Promote, Encourage, Teach and Nurture Young Generations for Future Participation in Paddy and Rice Subsector	**5.1** Promote Field Trips, Educational and Recreational Visits to Model Paddy Farms	3
	5.2 Incorporate Micro Scale Paddy Planting in Community Gardens/Farms	3

Further detail on the strategies and action plans is depicted in the following section.

5.0 National Agrofood Policy 2.0

Strategy 1: Boost Productivity via Better Management of Land and Water Use

Following the highlight of issues and challenges faced by Paddy and Rice subsector, especially in regards to land use competition, one of the key aspect to be looked into in order to achieve greater productivity, is by increasing the use efficiency of existing natural resources. In this strategy there are 2 action plans that focus on upscaling paddy farming operation to reap the benefits of economics of scale, which reduces the cost per production unit of rice while also increasing-average rice yield per farm hectarage. The remaining action plan looks to enhance the use efficiency of water resource alongside improving water delivery performance of irrigation infrastructures in paddy production areas.

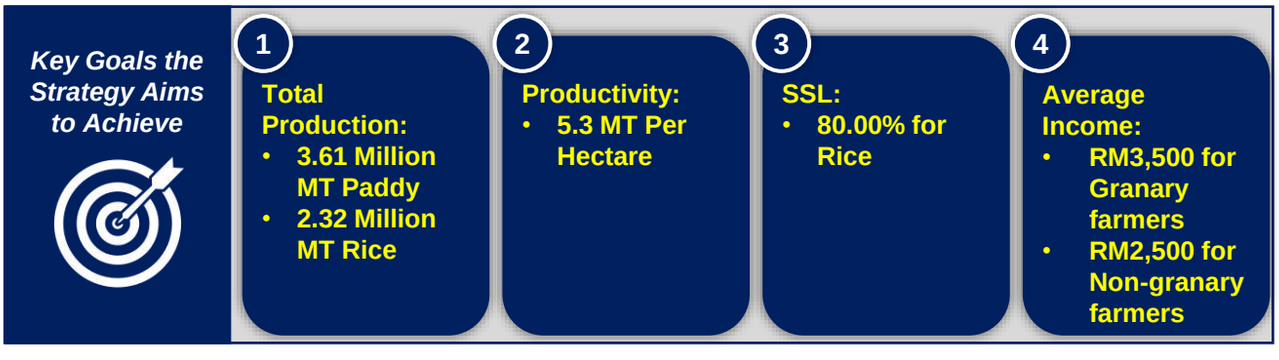
A total of 3 action plans have been formulated to support the implementation of strategy 1 as below:

Table 5-25: Summary of the Action Plans under Strategy 1

Strategies	Action Plans
Boost Productivity via Better Management of Land and Water Use	**1.1** Promote Land Use Arrangements that would Enlarge Farming Operation
	1.2 Support Large Scale Paddy Farming Initiatives
	1.3 Improve Availability, Efficiency, and Management of Water Use, as well as Operation and Maintenance (O&M) of Irrigation Infrastructuresructures

In addition, this strategy and 3 action plans have been formulated to align with 4 of the main goals as follows:

Figure 5-36: Key Goals of Strategy 1



5.0 National Agrofood Policy 2.0

Strategy 2: Capitalise on the Potential of Local Specialty Rice Varieties

Specialty rice varieties such as the likes of aromatic rice has long been recognised to have the potential as an alternative cultivation for paddy farmers should they diversify from the common options (white rice). This notion is evident when looking at past government initiatives, in the case of EPP 9 (a project focusing on the production of two local varieties of fragrant rice), as well as the granted permission in 2019 to devote up to 30 percent of sites or plantings in MADA and KADA, to fragrant rice varieties. On top of that, heirloom speciality varieties in Sabah and Sarawak is also on the rise for greater market development. Specialty rice varieties typically commands a greater market selling price due to consumer's reception on its superior qualities in terms of taste, texture, and fragrance, over common rice varieties. Therefore, this market segment should be leveraged to further open up additional source of value to which the Paddy and Rice subsector can be benefited by.

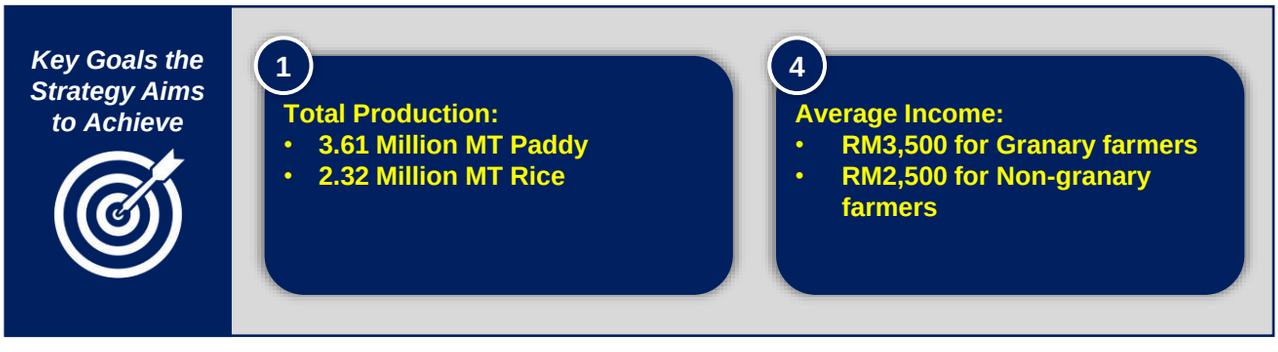
A total of 3 action plans has been formulated to support the implementation of strategy 2 as below:

Table 5-26: Summary of the Action Plans under Strategy 2

Strategies	Action Plans
Capitalise on the Potential of Local Specialty Rice Varieties	**2.1** To Recognise and/or Develop Specialty Rice Varieties as Part of Malaysia's Premium Agrofood Products
	2.2 Promote and Facilitate Contract Farming Arrangement with New/Existing Food Producers that Cultivates Specialty Rice Varieties
	2.3 Update the Acts and Regulations to Create an Enabling Environment for the Entry of Small and Medium Enterprises (SMEs) to Enter the Specialty Variety Market

In addition, this strategy and 3 action plans have been formulated to align with 2 of the main goals as follows:

Figure 5-37: Key Goals of Strategy 2



5.0 National Agrofood Policy 2.0

Strategy 3: Restructure Existing Financial Supports, to Contribute towards Empowering Producers in Making their Own Business Decision

The current subsidy support for Paddy and Rice subsector has been structured in a manner that indirectly restricts the farm management options available for paddy farmers, particularly in the selection of farming inputs. Under the existing structure, farming inputs of fertiliser and pesticide were distributed directly to eligible paddy farmers via the channel of area farmer's organisation (PPK). As the allocation of those inputs to each regions were decided by government institutions prior to its distribution, this discourages paddy farmers to explore a better optimised formula of fertiliser and pesticide volume and composition, based on the specific farm profile. On top of that, the planting of certified paddy seeds being one of the mandatory requirement to be eligible for subsidy, has discouraged producers from looking into the potential of diversification into other rice varieties. Therefore, this strategy looks to refine subsidy support towards placing greater responsibility onto producers to make their own business decision.

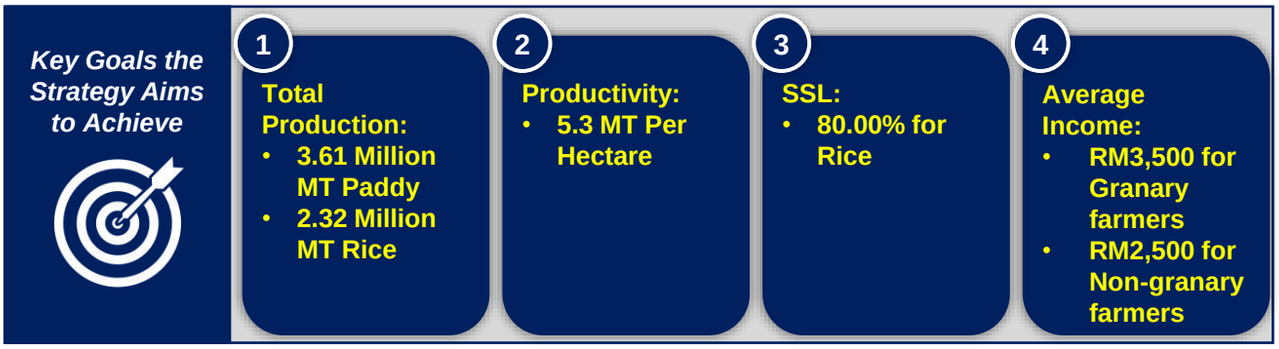
A total of 3 action plans has been formulated to support the implementation of strategy 3 as below:

Table 5-27: Summary of the Action Plans under Strategy 3

Strategies	Action Plans
Restructure Existing Financial Supports, to Contribute towards Empowering Producers in Making their Own Business Decision	**3.1** Move Toward a Voucher System for Input Subsidies, for Paddy and Rice Subsector
	3.2 Periodically Reduce the Level of Support Provided through Input Vouchers and Relocate Excess Financial Resource to Other Areas for Long-term Growth
	3.3 Phase Out Both Input and Output Based Support with a "Decoupled Cash Payment", which does not Depend either on Current Input Use or on Quantity of Production

In addition, this strategy and 3 action plans have been formulated to align with 4 of the main goals as follows:

Figure 5-38: Key Goals of Strategy 3



5.0 National Agrofood Policy 2.0

Strategy 4: "Crowd In" More Diversified Private Sector along the Evolving Value Chain

Involvement of more diversified private sector, across all business sizes, is imperative in enhancing the Paddy and Rice subsector's competitiveness and its innovativeness to respond to changing business environment. This strategy looks to facilitate greater entry of private players by increasing available business opportunities along the value chain, particularly in the segment of farm inputs and rice milling. In relation to the previous strategy, where financial support is to be restructured, this indirectly creates a new market gap to be filled in by private business entities, to play the role of input suppliers and other related activities. This opportunity can also be capitalised by promoting business arrangements that strengthen the working relationship between input suppliers and paddy farmers. As for mid-stream segment, existing output-based support in the form of price floor and price ceiling will be relooked and restructured, to ease the "profit squeezing" pressure placed on rice millers, and create better profit margin to entice entry of new midstream players. All these factors contributes towards strengthening the linkages between all players and in turn, a more resilient value chain.

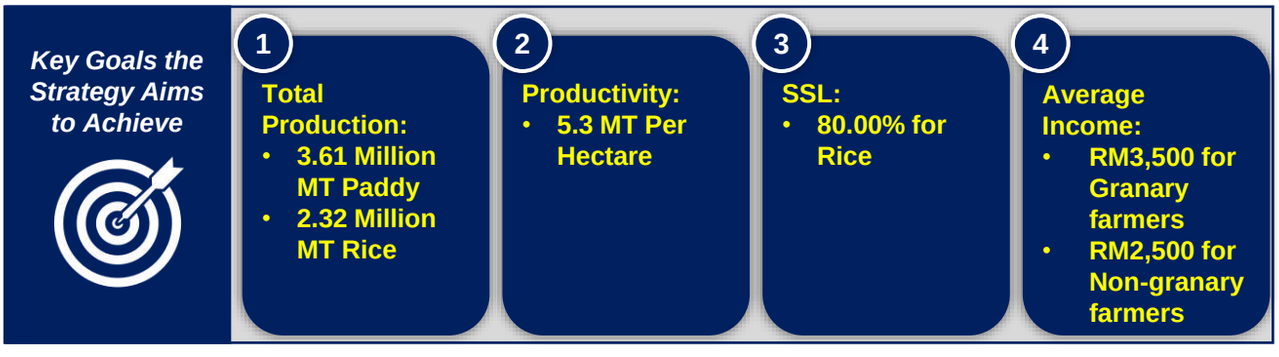
A total of 3 action plans has been formulated to support the implementation of strategy 4 as below:

Table 5-28: Summary of the Action Plans under Strategy 4

Strategies	Action Plans
"Crowd In" More Diversified Private Sector along the Evolving Value Chain	**4.1** Leverage Upon Restructured Financial Support to Encourage the Involvement of Private Sector and Farmer Cooperatives into Farming Input Supplier
	4.2 Strengthening Backward Linkages between Input Suppliers and Paddy Farmers
	4.3 Restructure Output Based Support, to Facilitate the Entry of New Private Players into the Midstream Segment

In addition, this strategy and 3 action plans have been formulated to align with 4 of the main goals as follows:

Figure 5-39: Key Goals of Strategy 4



5.0 National Agrofood Policy 2.0

Strategy 5: Promote, Encourage, Teach and Nurture Young Generations for Future Participation in Paddy and Rice Subsector

To facilitate the continual development of Paddy and Rice subsector, initiatives involving the development of future talent are imperative to be looked into. Increase of exposure, understanding, and hands-on experience are some of the key aspects this strategy focus upon, in order to spur greater interest and abilities of young generations for their future participation into the Paddy and Rice subsector. Attracting and nurturing future talents are given greater emphasis in this particular subsector, due to existing common perception of which Paddy and Rice subsector is viewed as an industry with little profitability and aging producers that require hefty financial support to maintain its functionality. This strategy would contribute onto the revisiting of enduring narratives about this subsector, towards a greater reflection of its true potential.

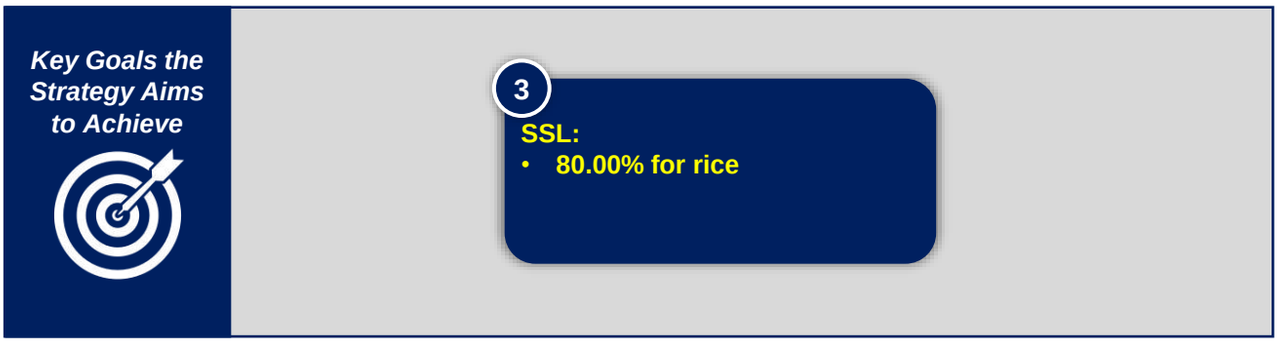
A total of 2 action plans has been formulated to support the implementation of strategy 5 as below:

Table 5-29: Summary of the Action Plans under Strategy 5

Strategies	Action Plans
Promote, Encourage, Teach and Nurture Young Generations for Future Participation in Paddy and Rice Subsector	**5.1** Promote Field Trips, Educational and Recreational Visits to Model Paddy Farms
	5.2 Incorporate Micro Scale Paddy Planting in Community Gardens/Farms

In addition, this strategy and 2 action plans have been formulated to align with the main goals as follows:

Figure 5-40: Key Goals of Strategy 5



5.0 National Agrofood Policy 2.0

5.7.5 Aspiration of the Paddy and Rice Subsector in 2030

By 2030, the Paddy and Rice subsector is forecasted to achieve 80.00% SSL of rice products, which is a major contributor towards strengthening of national food security. There will be improved productivity through enhancing the use efficiency of natural resources via encouraging large scale farming and enhancement of water delivery performance.

Higher contribution of local specialty varieties towards Paddy and Rice subsector is looking to be realised, in terms of achieving greater level of production value. The higher market selling price of local specialty varieties will also provide paddy farmers with additional viable options of variety diversification, in the quest to increase their own income.

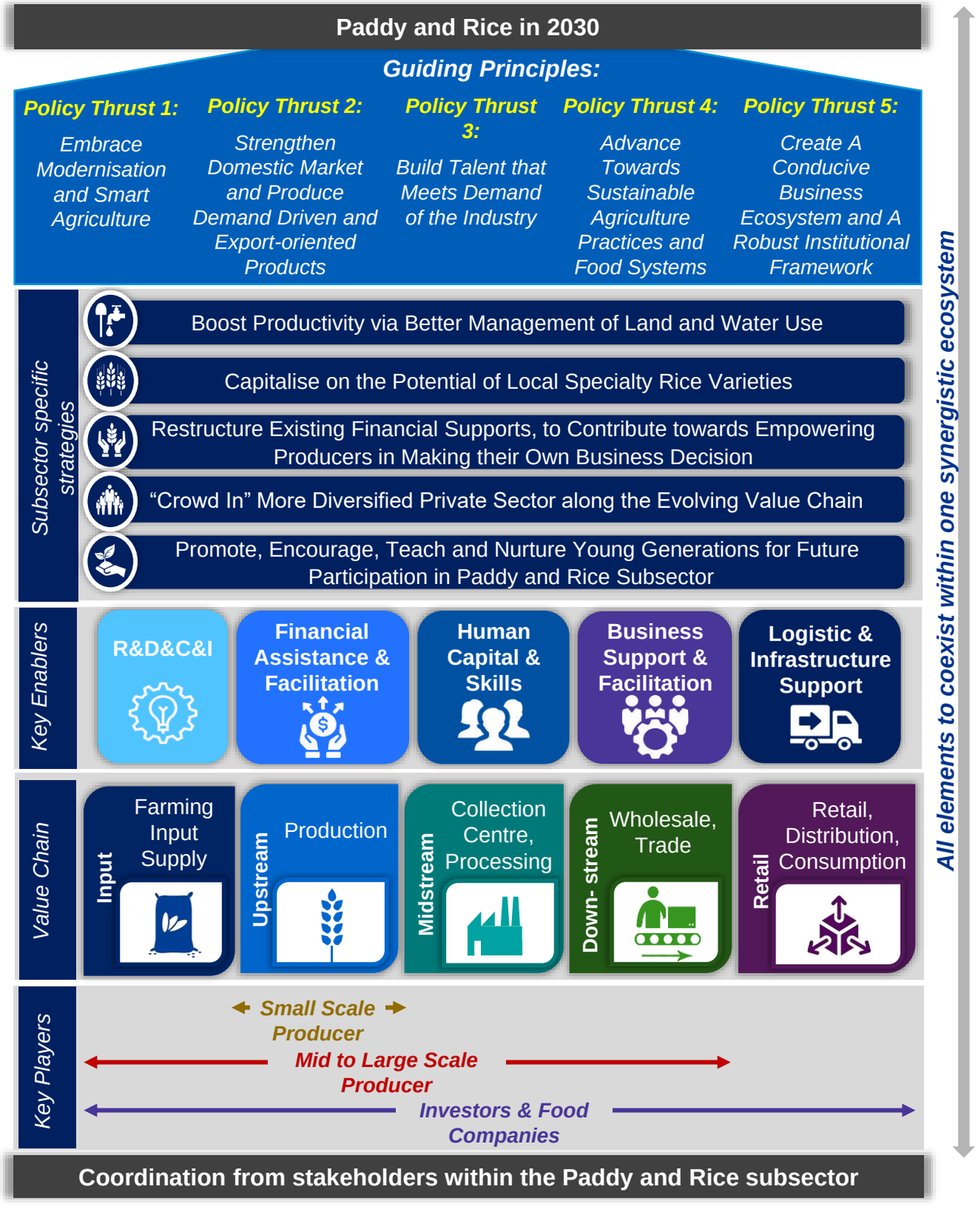
The greater entry of diversified private players will drive to towards a more efficient value chain and facilitate Malaysia's Paddy and Rice subsector to evolve and adapt in across the shifting business landscape as time passes by. Private players will be enticed to enter and participate along the activities of Paddy and Rice value chain, especially in the segment of agricultural inputs and rice milling.

Producers will be given further opportunity to improve their business acumen and build their capacity to make business decisions in farm operations, through a restructured financial support. With this, farming operations that is favourable to the public interest, such as environmentally friendly practices, could be encouraged with and not to mention reducing public expenditure on subsidy assistance.

Finally, younger generations and community members will have greater opportunity be exposed of the processes and operations of Paddy and Rice subsector and potentially sparking a higher interest to participate in this subsector.

5.0 National Agrofood Policy 2.0

Figure 5-41: Paddy and Rice Subsector Conceptual Ecosystem



5.0 National Agrofood Policy 2.0

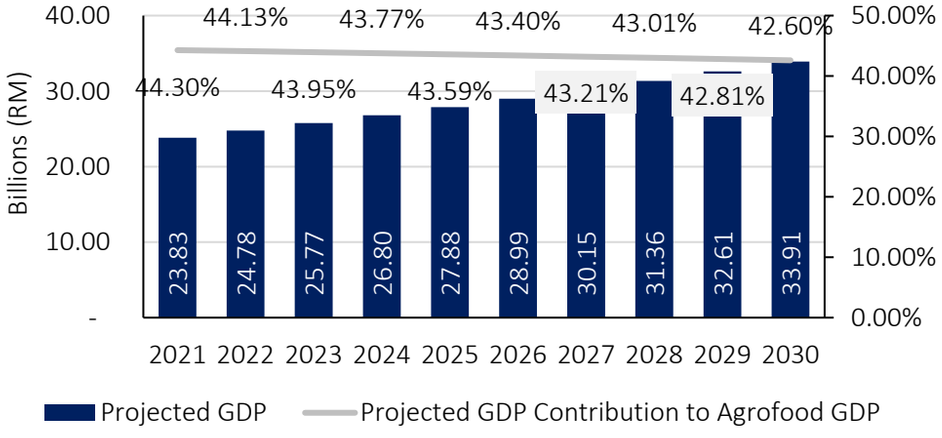
5.8 Fruits and Vegetable

5.8.1 Key Outlook of the Fruits and Vegetables Subsector

GDP Contribution

The Fruits and Vegetables subsector is forecasted to contribute to the GDP at a CAGR of 4.00% from RM23.83 billion in 2021 to RM33.91 billion in 2030. The subsector is also expected to contribute approximately 42.60% to 44.30% to the total agrofood sector GDP from 2021 to 2030, the largest share among other sub-industries. The figure below depicts the GDP and GDP contribution of the Fruits and Vegetables subsector:

Figure 5-42: Projected GDP and GDP Contribution of Fruits and Vegetables Subsector

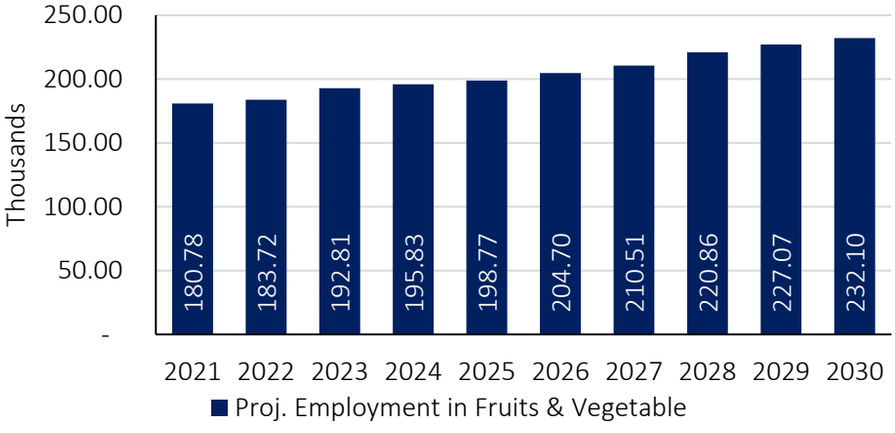


Source: MAFI

Employment

In terms of employment, the Fruits and Vegetables subsector is projected to increase its number of workers, from approximately 180 thousand people in 2021 to 232 thousand people in 2030. The employment figure is expected to increase at a CAGR of 2.82% as shown in the figure below:

Figure 5-43: Projected Employment in Fruits and Vegetables Subsector



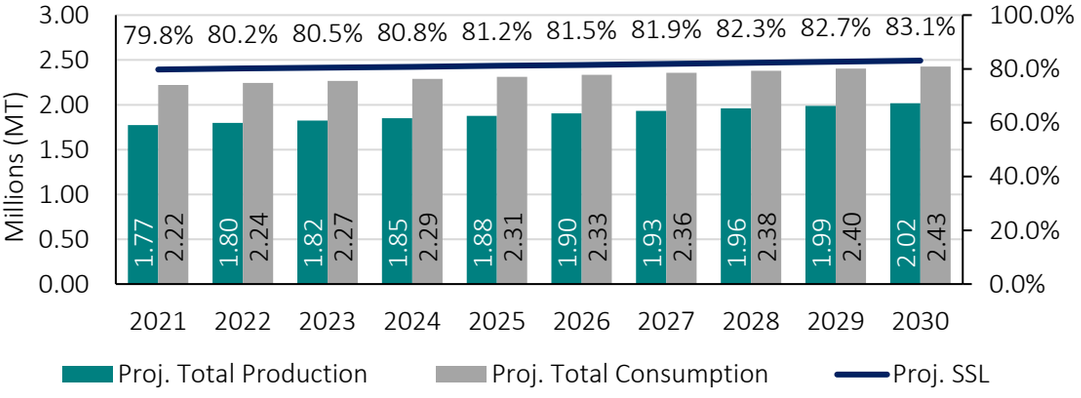
Source: MAFI

5.0 National Agrofood Policy 2.0

Production, Consumption and SSL

The production and consumption figure for fruits are expected to increase over the next 10 years, with the gap difference between the two figures to be reduced. From 2021 to 2030, the consumption of fruits is expected to rise from 2.22 million to 2.43 million MT, coupled with continual increase of production from 1.77 million to 2.02 MT as shown in the figure below. The closing gap difference is reflected in the SSL %, from 79.8% in 2021 to 83.1% in 2030, with a CAGR of 0.45%.

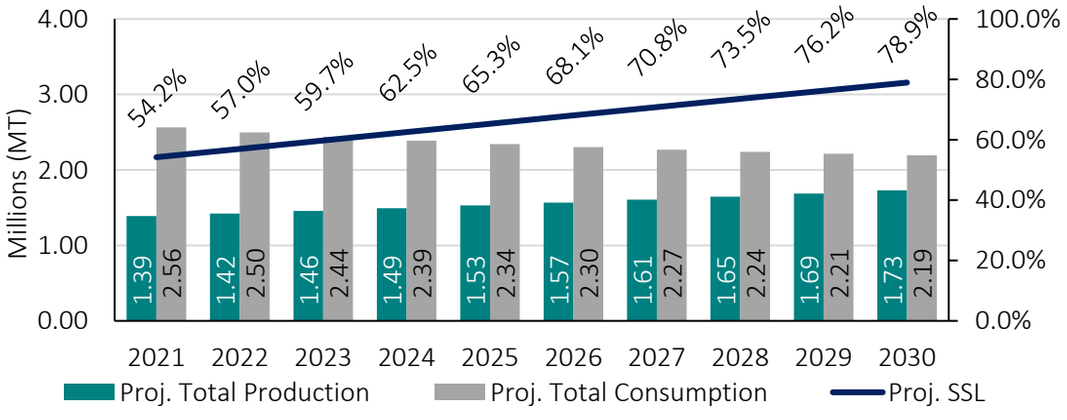
Figure 5-44: Projected Production, Consumption and SSL of Fruits



Source: MAFI

As for vegetables, the a higher degree of increase in SSL % can be observed, from 54.2% in 2021 to 78.9% in 2030, growing at a CAGR of 4.26%. This can be attributed to the expected decrease in vegetables consumption from 2.56 million MT to 2.19 million MT, alongside expected rise of production from 1.39 million MT to 1.73 million MT, across the next 10 years.

Figure 5-45: Projected Production, Consumption and SSL of Vegetable



Source: MAFI

It is projected that the production and consumption gap, when comparing 2021 to 2030, for Fruits and Vegetables are expected to reduce from 52,000 MT to 41,000 MT, and from 1.17 MT million to 46,000 MT respectively.

5.0 National Agrofood Policy 2.0

Trade

As shown in figure 5-46 and 5-47, the trade balance for both Fruits and Vegetables, in terms of trading value, are expected to remain negative across the next 10 years.

The export value for fruits is expected to grow at a CAGR of 5.36% from RM1.56 billion in 2021 to RM2.50 billion in 2030. In the meantime, the import value for fruits is expected to grow at a marginally higher rate than export value, at a CAGR of 5.55%, from RM5.24 billion to RM8.52 billion across the same period. This translates into further widening of the trade balance gap from RM3.68 billion in 2021 to RM6.03 billion in 2030.

In the case of vegetable, the total export value is projected to grow from RM1.80 billion in 2021 to RM2.78 billion in 2030, growing at a CAGR of 4.95%, marginally higher than the growth rate of import values which is projected to grow at 4.51%, from RM6.22 billion in 2021 to RM9.25 billion in 2030. Despite that, the overall trade balance gap in for vegetables is also projected to widen from a negative trade balance of RM4.41 billion in 2021 to RM6.47 billion in 2030.

Figure 5-46: Projected Trade of Fruits by Value

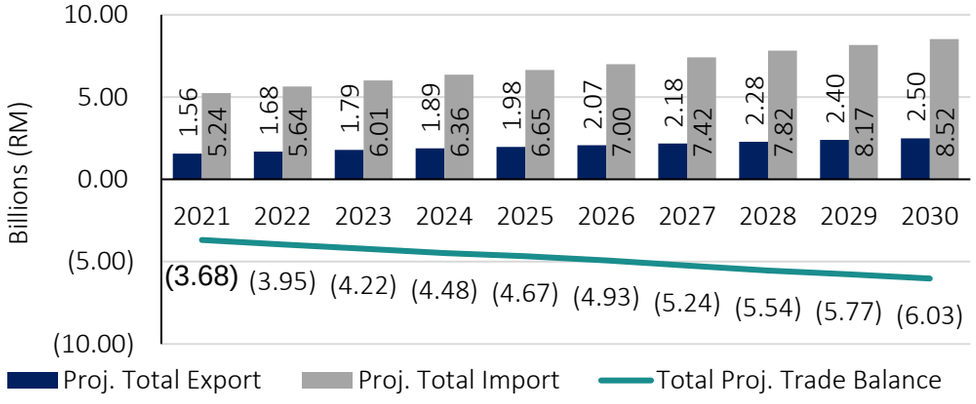
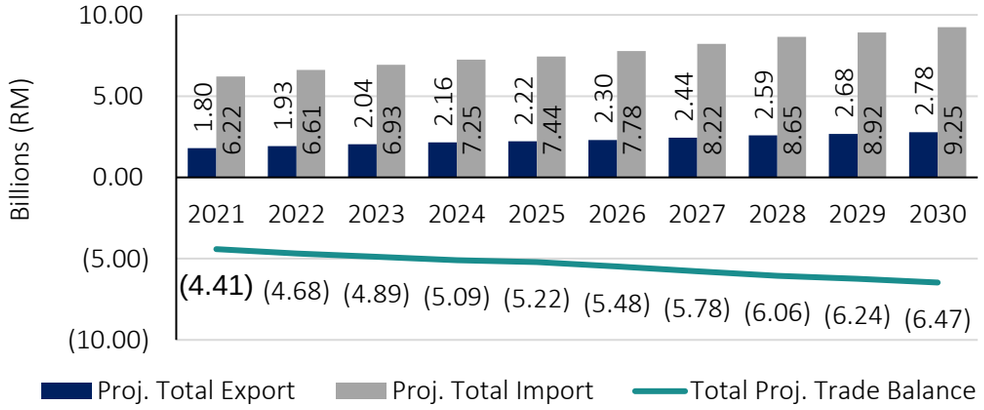


Figure 5-47: Projected Trade of Vegetables by Value



Source: MAFI

5.0 National Agrofood Policy 2.0

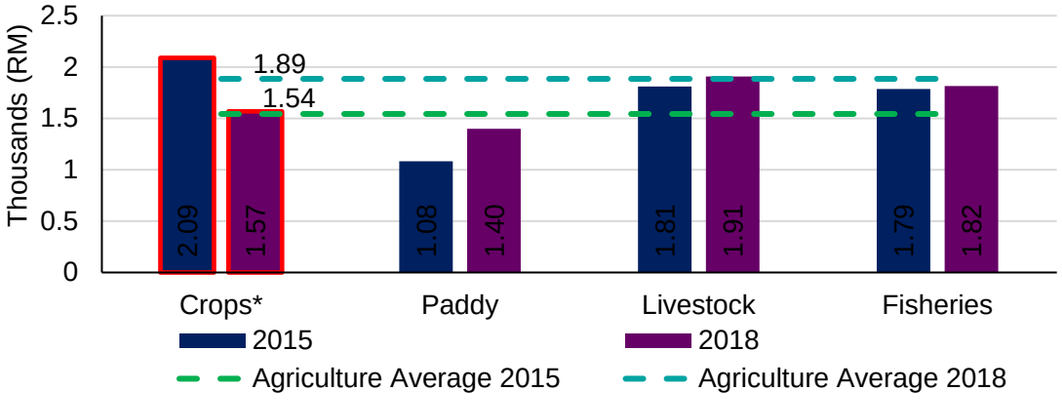
5.8.2 Summary of Issues and Challenges Hindering the Growth of the Subsector

Fruits and Vegetable, being the subsector that contributes close to half of the total agrofood GDP, has its own fair share of issues and challenges. By mitigating the bottlenecks which will be highlighted in this section, would facilitate its long-term development and consolidating its role to remain as the main contributor in spearheading Malaysia's agrofood sector towards a greater height.

Income of Fruits and Vegetables Producers

The income of food producers in the Fruits and Vegetables subsector has seen a 24.8% decline when comparing 2015 figure to that of 2018. This is alarming as the level of monthly income has regressed from the highest among other agrofood sub-industries to second lowest, only above the Paddy & Rice subsector. Despite both figures remain higher than the recorded agriculture average, this downward trend should look to be reversed.

Figure 5-48: Producers' Income by Subsector



*Crops exclude Palm Oil and Rubber

Source: Laporan Survei Tenaga Buruh Malaysia, DOSM, 2018

From the analysis conducted based on available secondary and anecdotal data, here are some of the main factors affecting Fruits and Vegetables producer's income:

High Production Cost

Majority of the producers are highly dependent on imported farming inputs. For instance, approximately 90% of vegetables producers relies on imported seed. (*Industry player engagement)*

Lack of Market Foresight

Smallholder producers lack the knowledge and scale to effectively plan out crops plantation that responds to changing market demands across time. (*Industry player, MAFI engagement)*

Limited Technology Adoption

Estimated farm size of 1.41 ha, coupled with low producer's income translates to restricted financial capacity for technology adoption. (*Agrofood Statistics)*

5.0 National Agrofood Policy 2.0

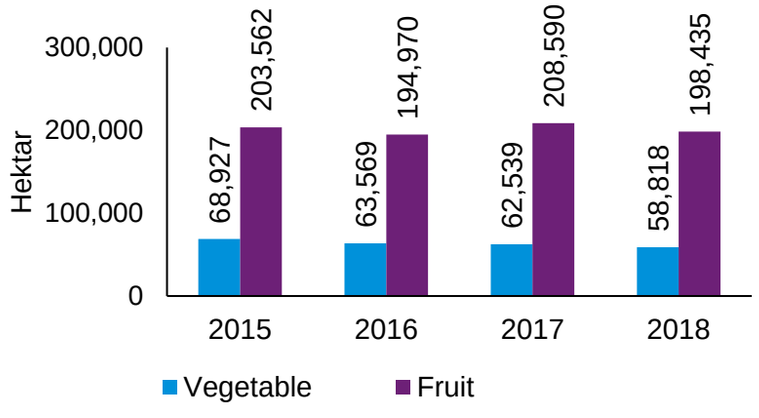
Limited High-Value Added Produce

Lack of a strong linkage between the upstream with the midstream and downstream result in producers often cultivating Fruits and Vegetables varieties in the volume and qualities, with direct consumption in the form of fresh produce in mind. This translates into a limited production of higher value added produce, which would need the participation from midstream players, for processing purpose. However, from the engagement with industry players, the actual needs of the midstream are not effectively being met by producers which result in high importation of Fruits and Vegetables as the raw materials for midstream segment. Food processing and manufacturing companies have little to no interest to be directly involved in the upstream segment of the value chain as it is labour intensive, volatile with yields that are unpredictable, and other related risks. To reduce risk exposure, these players would often opt to purchase raw produce from wholesaler, and collection centre or directly import from sources where the specific critical volume and required produce characteristics can be met. The effect of this condition can be seen where food processing is a small industry within manufacturing sector with value added share to manufacturing amounts to approximately 4.2% in 2018. Within the food processing and preserving of Fruits and Vegetables make up the smallest component with 3.5% share to food processing. In addition, there are limited R&D and innovation to produce new products that meets the consumer demand and this can be observed with low R&D expenditure in Fruits and Vegetables, only RM1.2 mil in 2015 compared to RM214 mil in food processing.

Stiff Land Competition

The total planted areas for Fruits and Vegetables has been on a decline from 2015 to 2018, by 2.50% and 14.74% respectively.

Figure 5-49: Planted Areas (Hectare) for Fruits and Vegetables Subsector



Source: MAFI

5.0 National Agrofood Policy 2.0

Stiff Land Competition (continuation)

This could be attributed to land competition with other forms of developmental use, as well as the condition of land tenure. For instance, , farmers in Cameron Highlands are contracted to the Temporary Occupation License with a contract term of 3+2 years renewal basis with some contracted with an annual fee of RM4,500 per acre annually. Although farmers are given the option farm on state-government owned land through Temporary Occupation License (TOL), the lease term is relatively short as compared to the gestation period of certain crops. Engagement with industry players has shown that the issues on land security resonates across all states. The short land rental period is quoted from the stakeholders as one of the main reasons for low investment in upgrading of farms and automation as farmers face uncertainty in terms of the return on investment. Short land tenure also hinders related farmland certification to be obtained, subsequently limiting the export potentials.

5.8.3 Key Goals of the Fruits and Vegetables Subsector, 2021 - 2030

Production Goals

The production volume of Fruits and Vegetables is targeted to be increased by a total of 28.8% and 40.0% respectively, over the next 10 years. The increase in production volume however, is paired alongside production value, as to facilitate the creation of value that is greater in number and weight. This would improve upon the performance of Fruits and Vegetables subsector, and its contribution to the greater national economy.

By 2030, the total consumption of fruits is forecasted to increase by a total of 9.4%, whilst vegetables is looking at a decrease of 14.4% in consumption. With the projected SSL of 83.1% (from 1.77 Million MT to 2.03 Million MT) and 78.9% (1.39 Million MT to 1.73 Million MT) respectively, it is imperative to meet the production target as described to realise the goal towards achieving greater food security on the aspect of food availability.

5.0 National Agrofood Policy 2.0

Sustainability Goals

Similar to Paddy and Rice, the Fruits and Vegetables subsector also faces heightened pressure from land use competition and environmental threats. The subsector shall look to improve upon the use efficiency of land resource whilst minimising its impact on environmental quality.

Current land development and management practice of Fruits and Vegetables subsector will need to be refined in a way that would maximise the value generation per unit of Agrofood farmland. This is to reduce the need to open up new farming lands on a massive scale in order to keep up with the growth rate of the subsector, as well as offering a greater land security for its producers to re-invest in the betterment of farming operation. The reduction of environmental degradation from farming activities is also one of the key aspects to be achieved in this goal.

KEY SUSTAINABILITY GOALS FOR THE FRUITS & VEGETABLES SUB-INDUSTRY

To Enhance Efficiency of Land Use for the Sustainable Production of Fruits and Vegetable

Fruits and Vegetables Producer's Wellbeing

As the Fruits and Vegetables subsector continues to develop in higher value creation for the next 10 years, it is imperative that the trend for producer's income mirrors as such. As previously described, the average monthly household income of Fruits and Vegetables producers has seen a 24.8% decline from RM 1,890 in 2015 to RM 1,540 in 2018. Initiatives should look to reverse this trend and improve upon this figure, as the level of income is commonly understood to be one of the significant contributor towards better quality of life. On top of that, higher income is also related to an increased financial capability to re-invest in improving and expanding farm operation, in line with the national aspiration to transition into an agrofood sector that is modern, high productivity and competitive.

PRODUCER WELLBEING GOALS FOR THE FRUITS & VEGETABLES SUB-INDUSTRY

To Improve the Level of Income for Fruits and Vegetables Producers

5.0 National Agrofood Policy 2.0

Below is the summary of the key goals of the Fruits and Vegetables subsector by 2030:

Table 5-30: Summary of the Key Goals of the Fruits and Vegetables Subsector by 2030

Subsector Goals	
Total Production: • 2.03 Million MT for Fruits • 2.04 Million MT for Vegetables	1
Land Use Productivity: • 15.0 MT per hectare for Fruits • 20.6 MT per hectare for Vegetables	2
SSL: • 83.0 % for Fruits • 79.0 % for Vegetables	3
Export Value: • RM2.49 Billion for Fruits • RM2.78 Billion for Vegetables	4
Average Income: • RM4,000 for workers in Fruits segment • RM6,000 for workers in Vegetables segment	5

5.0 National Agrofood Policy 2.0

5.8.4 Way Forward of the Fruits and Vegetables Subsector

To solidify the foundational elements for which the Fruits and Vegetables subsector develop upon in the long run, it is imperative to facilitate the subsector's adoption into the latest cutting edge technology which would improve its productivity and value creation. Next, a strengthened management of the subsector along its development alongside special emphasis on its most priced products could facilitate the continual improvement of value chain processes and the rate of profit, for a resilient and efficient subsector. Aside from that, the ability for Fruits and Vegetables subsector to produce food products that have higher nutritional value, better consumption safety, while also lowering its negative impact on the environment is important for a sustainable growth.

4 main strategies in Figure 5-50 will be undertaken within the next 10 years to further develop and improve the Fruits and Vegetables subsector. These strategies considers the issues and challenges faced by the Fruits and Vegetables subsector whilst setting the path in meeting the subsector goals as identified in Table 5-30:

Figure 5-50: Strategies for Fruits and Vegetables Subsector, 2021-2030

5.0 National Agrofood Policy 2.0

As shown in the summary below, each strategy were identified to address various challenges and to meet several 2030 goals identified for the subsector.

Table 5-31: Summary of the Identified Strategies for the Fruits and Vegetables Subsector

Strategies	Summary
Intensify Gene Editing Research	Develop one of the tools of genetic engineering - Genome Editing, to further leverage upon the potential benefits of biotechnology, on the development of Fruits and Vegetables subsector
Efficient Long-term Land Management Involving All Industry Players across the Value Chain	Challenges that revolves around land resources would aimed to be mitigated by this strategy, while also integrate and accommodate players within, and across, different segment of value chain
Promote Sustainable Development of Food Production	Increase integration of sustainability elements, for the benefit of this subsector, primarily via adoption of good agricultural practices and strengthening linkages between food production and food consumers
Support the Growth of High Value Fruits and Vegetables	The growth high value Fruits and Vegetables segment is focused upon by this strategy, to facilitate its long-term development along the value chain

5.0 National Agrofood Policy 2.0

A total of 12 action plans have been formulated across the 4 strategies to further strengthen each of the strategy identified. Additionally, the action plans were formulated to facilitate in the achievement of the key goals identified for the Fruits and Vegetables subsector. Below is the mapping of the action plans to the strategies and key goals.

Table 5-32: Fruits and Vegetables Subsector Strategies and Action Plans against Key Goals

Strategies	Action Plans	Key Goals
1.0 Intensify Gene Editing Research	**1.1** Building Expertise and Providing Suitable Facilities for Facilitating the R&D&C&I on Gene Editing Technologies	1 2 3 4
	1.2 Accelerating the Incorporation of Multiple Desirable Traits in Food Crops through Gene Editing Technologies	1 2 3 4
	1.3 Incorporate Gene Editing Technologies within Existing Science and Risk Based Regulatory System for Facilitating Commercialisation and Reducing Trade Barriers of Gene Edited Products	1 2 3 4
2.0 Efficient Long-term Land Management Involving All Industry Players across the Value Chain	**2.1** Further Adoption/Development of Agro-based Hub, that Brings All Players across the Value Chain within One Agro-based Economic Zone	1 2 3 4 5
	2.2 Strengthen Existing TKPM and Development of New TKPM with Easy Accessibility and Sufficient Natural Resources	1 2 3 4 5
	2.3 Promote Greater Participation of Anchor Companies in Linkages Projects within Fruits and Vegetables Economic Zones	1 2 3 4 5
3.0 Promote Sustainable Development of Food Production	**3.1** Expedite the Development of Controlled Environment Farming such as Plant Factory as Enabling Tool for Urban Farming and Cultivation of High Value Plant-based Products	1 2 3 4
	3.2 Enhance the Development of Intercropping System	1 2
	3.3 Support Community Farming Programmes and Initiatives	3
4.0 Support the Growth of High Value Fruits and Vegetables	**4.1** Promote and Facilitate Market Driven Arrangements with New/Existing Food Producers that Cultivate High Demand/High Value Fruits and Vegetables	1 2 3 4
	4.2 Integration of High Value Fruits and Vegetables within Existing/Future Agro-based Hub/TKPM	1 2 3 4
	4.3 Explore and Develop More End Uses for High Value Fruits and Vegetables	1 2 3 4

5.0 National Agrofood Policy 2.0

Strategy 1: Intensify Gene Editing Research

Gene editing refers to modifications (insertions, deletions, substitutions) in the genome of a living organism. The most widely used approach to genome editing nowadays is based on Clustered Regularly Interspaced Short Palindromic Repeats and associated protein 9 (CRISPR-Cas9). This technology is just one of the tools in the toolbox of plant breeders. The biotechnology tools that are important for agricultural biotechnology. The key differentiation of gene editing vs gene modification is that the former involves a small, controlled tweak to a living organism's existing DNA versus the latter, which is introduction of a new, foreign gene into living organism's DNA.[1]

This biotechnology tool facilitates greater opportunity to develop crop varieties that are of higher pest and disease resistance, alongside potential climate change impact. On top of that, favourable traits such as those which could generate varieties that produce higher yields with lower inputs requirement, prolonged shelves life as well as better nutritional value for consumption, can be enhanced. It is important to highlight that the pursuit for further advancement of gene editing research will be done with strict regard for national biosafety laws, protocols, and also taking considerations of feedbacks all stakeholders, along the journey.

A total of 3 action plans has been formulated to support the implementation of strategy 1 as below:

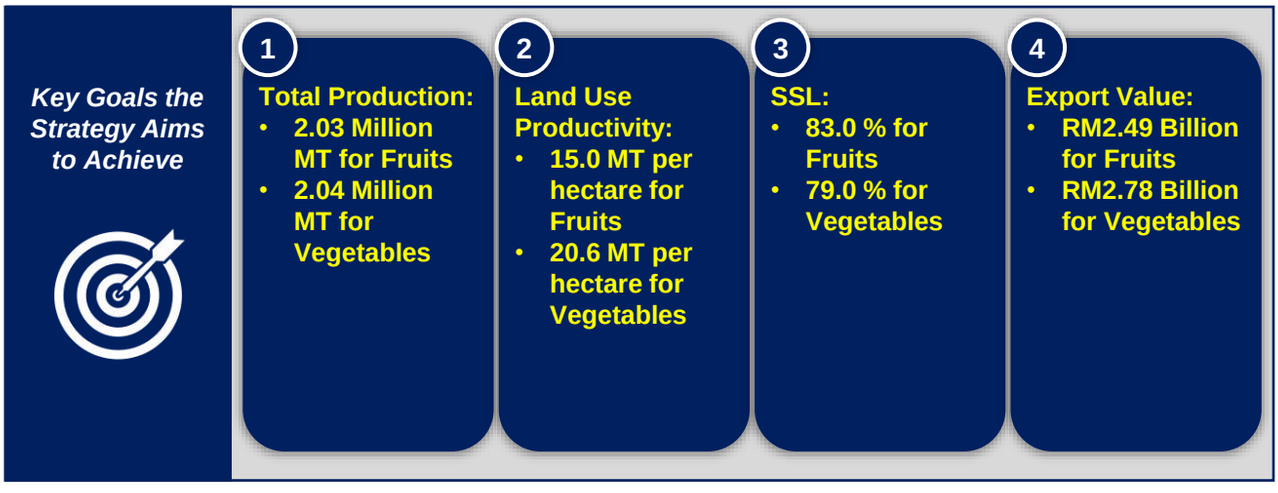
Table 5-33: Summary of the Action Plans under Strategy 1

Strategies	Action Plans
Intensify Gene Editing Research	**1.1** Building Expertise and Providing Suitable Facilities for Facilitating the R&D&C&I on Gene Editing Technologies
	1.2 Accelerating the Incorporation of Multiple Desirable Traits in Food Crops through Gene Editing Technologies
	1.3 Incorporate Gene Editing Technologies within Existing Science and Risk Based Regulatory System for Facilitating Commercialisation and Reducing Trade Barriers of Gene Edited Products

5.0 National Agrofood Policy 2.0

In addition, this strategy and 3 action plans have been formulated to align with 4 of the main goals as follows:

Figure 5-51: Key Goals of Strategy 1



5.0 National Agrofood Policy 2.0

Strategy 2: Efficient Long-term Land Management Involving All Industry Players across the Value Chain

Land management and development in this context refers to the land resource allocated for the purpose of Fruits and Vegetables subsector, be it focusing solely on production stage or across the whole value chain. This strategy looks to mitigate the bottleneck of weak linkages between upstream and midstream activities, alongside land security issue faced typically by Fruits and Vegetables producers. Further adoption of development model which connects players of value chain from end-to-end within a physically defined location could prove to be instrumental in reducing the proximity gap between value chain actors, and increases the rate of investment return via a area focused infrastructure development. As for land security issue, better utilisation of existing tools which already provides extended land tenures, would be useful in expanding the range of its beneficiaries, to include as much Fruits and Vegetables producers as possible.

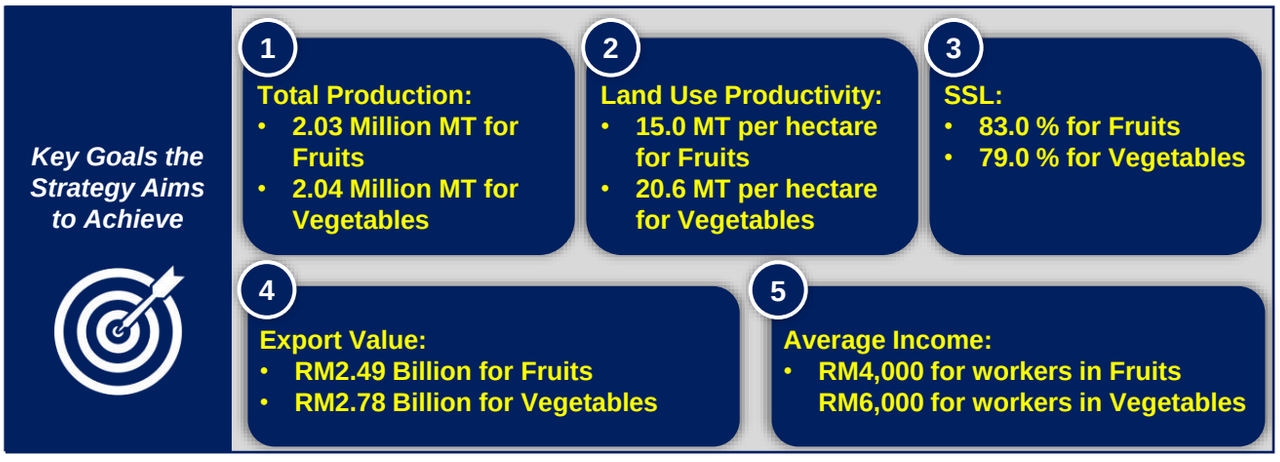
A total of 3 action plans has been formulated to support the implementation of strategy 2 as below:

Table 5-34: Summary of the Action Plans under Strategy 2

Strategy	Action Plans
Efficient Long-term Land Management Involving All Industry Players across the Value Chain	**2.1** Further Adoption/Development of Agro-based Hub, that Brings All Players across the Value Chain within One Agro-based Economic Zone
	2.2 Strengthen Existing TKPM and Development of New TKPM with Easy Accessibility and Sufficient Natural Resources
	2.3 Promote Greater Participation of Anchor Companies in Linkages Projects within Fruits and Vegetables Economic Zones

In addition, this strategy and 3 action plans have been formulated to align with 5 of the main goals as follows:

Figure 5-52: Key Goals of Strategy 2



5.0 National Agrofood Policy 2.0

Strategy 3: Promote Sustainable Development of Food Production

When laying out the developmental direction of agrofood sector, the element of sustainability would always come into mind due to its crucial role in supplying a nation's population with daily dietary intake, a key aspect of human physiological needs. This strategy looks to strengthen the linkage between urban dwellers and food production, by promoting urban farming initiatives. Some benefits offered by urban farming includes increasing of land area utilised for agrofood, which in turn boosts food availability as the population number goes on a upward trend and arable land constantly facing depletion. Also it reduces the physical distance between production site and end consumer, thereby lowers the cost of food logistic and the need for preservative additives, as well as greater opportunity for urban population to be directly involved in food production activities. Another focus of this strategy is to facilitate the adoption of good agricultural practices within food production, for the purpose of reducing its negative environmental impact and enhance food safety.

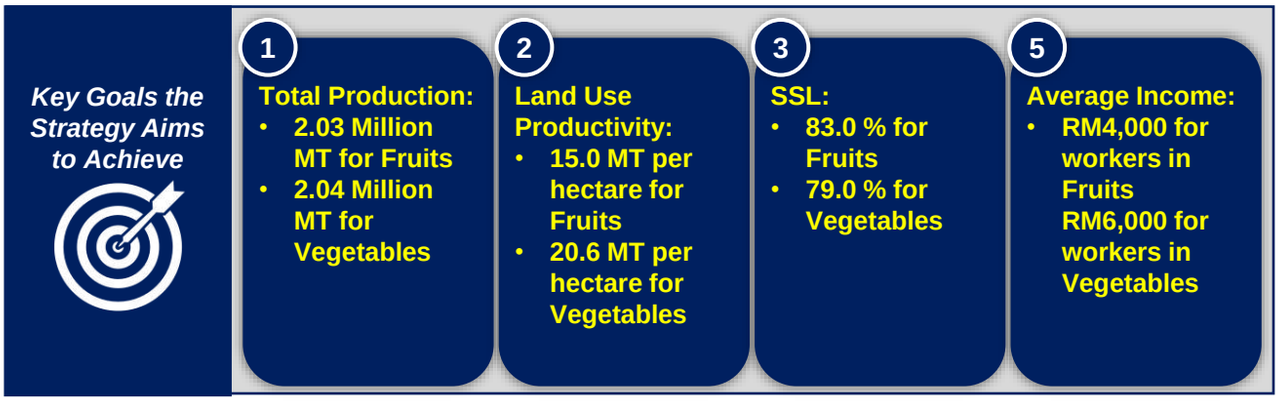
A total of 3 action plans has been formulated to support the implementation of strategy 3 as below:

Table 5-35: Summary of the Action Plans under Strategy 3

Strategy	Action Plans
Promote Sustainable Development of Food Production	**3.1** Expedite the Development of Controlled Environment Farming such as Plant Factory as Enabling Tool for Urban Farming and Cultivation of High Value Plant Based Products
	3.2 Enhance the Development of Intercropping System
	3.3 Support Community Farming Programmes and Initiatives

In addition, this strategy and 3 action plans have been formulated to align with 4 of the main goals as follows:

Figure 5-53: Key Goals of Strategy 3



5.0 National Agrofood Policy 2.0

Strategy 4: Support the Growth of High Value Fruits and Vegetables

It is imperative to facilitate a better safeguarding of the continual contribution of high value products to the greater Fruits and Vegetables subsector across a long timeframe. This could be achieved primarily via strengthening the end-to-end value chain and usage diversification of high value Fruits and Vegetables products. As the long term growth high value Fruits and Vegetables is heavily dependent on the value chain's ability to consistently satisfy market demand in terms of supply volume and specification, thereby the focus is to increase the share of production base to be located within regions that could be better managed and offer prolonged land tenure. Also, the producers of such products should be encouraged to have a better connection with midstream and downstream players, to improve their ability to meet the specific requirements of the end consumer market. Finally, usage diversification is important to reduce price fluctuation of high value produces as a shift in one end of the demand is counter balanced by the demand of other end uses, thereby lessens the risk exposure, similar to the case of industrial commodities. It is important to note that this strategy will be applied across other planted commodities such as coffee beans.

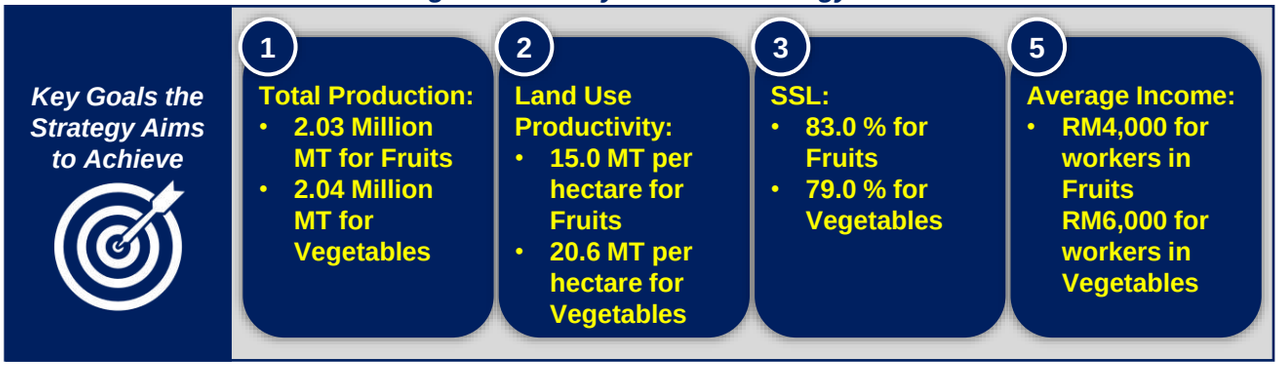
A total of 3 action plans has been formulated to support the implementation of strategy 4 as below:

Table 5-36: Summary of the Action Plans under Strategy 4

Strategy	Action Plans
Support the Growth of High Value Fruits and Vegetables	**4.1** Promote and Facilitate Market Driven Arrangements with New/Existing Food Producers that Cultivate High Demand/High Value Fruits and Vegetables
	4.2 Integration of High Value Fruits and Vegetables within Existing/Future Agro-based Hub/TKPM
	4.3 Explore and Develop More End Uses for High Value Fruits and Vegetables

In addition, this strategy and 3 action plans have been formulated to align with 4 of the main goals as follows:

Figure 5-54: Key Goals of Strategy 4



5.0 National Agrofood Policy 2.0

5.8.5 Fruits and Vegetables Subsector in 2030

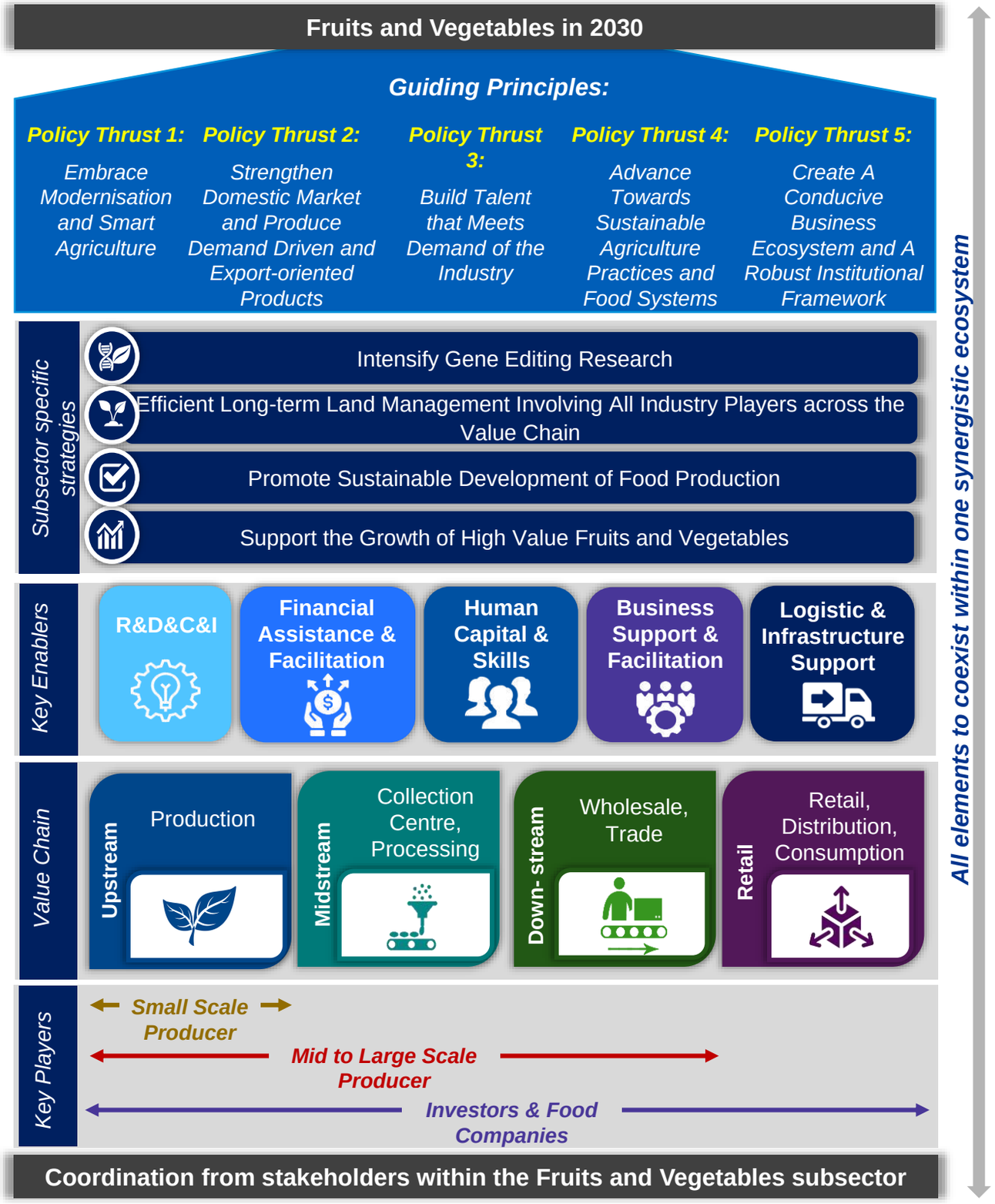
By 2030, the Fruits and Vegetables subsector is projected to achieve 83.0% and 79.0% self sufficient level, of which contributed by the increase in production volume. A greater export value is coupled alongside, to boost the subsector's profitability and attract higher number of investment into the betterment of its processes as well as its contribution to the greater national economy.

The income of all players in the Fruits and Vegetables subsector, especially the producers, will be improved in tandem with the development of the subsector in the next 10 years. This will lead to stronger interest from both existing and future talents to participate in this subsector, enhance its competitiveness, and the ability to evolve throughout the shifting market landscape. Higher income will also contribute towards an increased financial capability to re-invest in improving and expanding farm operation, in line with the national aspiration to transition into an agrofood sector that is modern, high productivity, competitive and incorporates elements of IR 4.0.

With increasing pressure from all angles on food safety and reduction of negative environmental impact, The subsector shall look to improve upon the its natural resource use efficiency, while at the same time increase the rate of good agricultural practice adoption. Moving forward, the development of Fruits and Vegetables subsector will enhance its harmonious relationship with its surrounding natural environment and continuously producing food products that is of higher nutritional quality for the health benefits of its consumers.

5.0 National Agrofood Policy 2.0

Figure 5-55: Fruits and Vegetables Subsector Conceptual Ecosystem



5.0 National Agrofood Policy 2.0

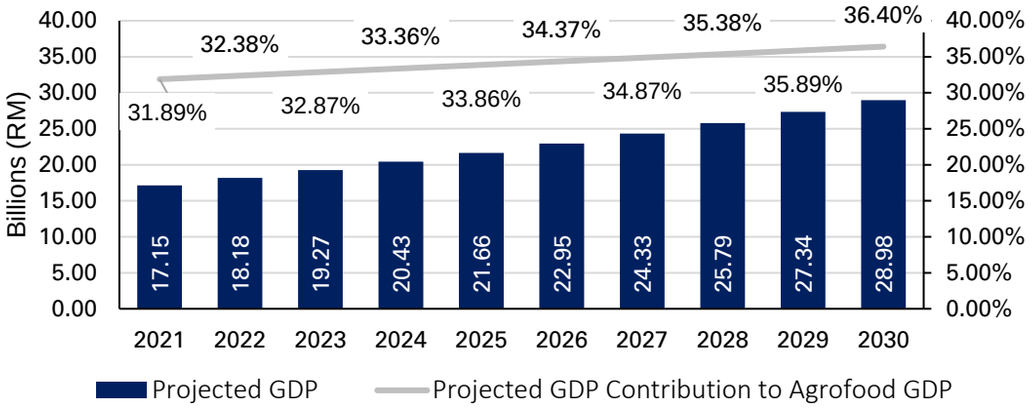
5.9 Livestock

5.9.1 Key Outlook of the Livestock Subsector

GDP Contribution

The Livestock subsector is forecasted to contribute to the GDP at a CAGR of 6.00% from RM17.15 billion in 2021 to RM28.98 billion in 2030. The subsector is also expected to contribute approximately 32.38% to 36.40% to the total agrofood sector GDP from 2021 to 2030. The figure below depicts the GDP and GDP contribution of the Livestock subsector:

Figure 5-56: Projected GDP and GDP Contribution of Livestock Subsector

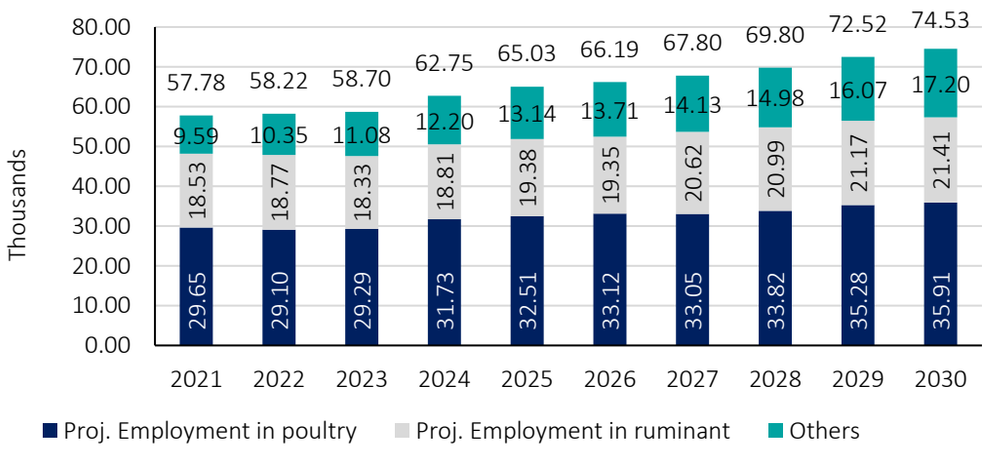


Source: MAFI

Employment

The subsector is also projected to employ approximately 58,000 people in 2021 to 75,000 people in 2030. The employment figure is expected to grow at a CAGR of 2.87% as shown in the figure below:

Figure 5-57: Projected Employment of Livestock Subsector



Source: MAFI

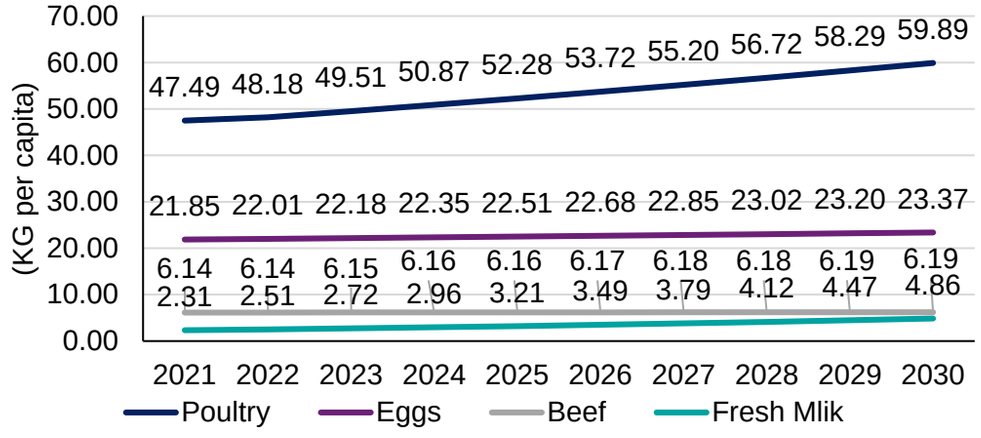
Poultry makes up 50% of employment within the Livestock subsector, with a CAGR of 2.15%; while ruminant makes up 30% of employment with a CAGR of 1.62%.

5.0 National Agrofood Policy 2.0

Production, Consumption and SSL

The consumption pattern of meat, eggs and fresh milk may potentially be affected by price, consumer preference and rising income levels. From 2021 to 2030, the consumption per capita of poultry, eggs, beef and fresh milk is expected to increase at a CAGR of 2.61%, 0.75%, 0.09% and 8.62% respectively. In addition to the increasing Malaysian population, the total consumption for livestock products is forecasted to grow from 2.66 million MT in 2021 to 3.59 million MT in 2030, growing with an overall CAGR of 2.69%.

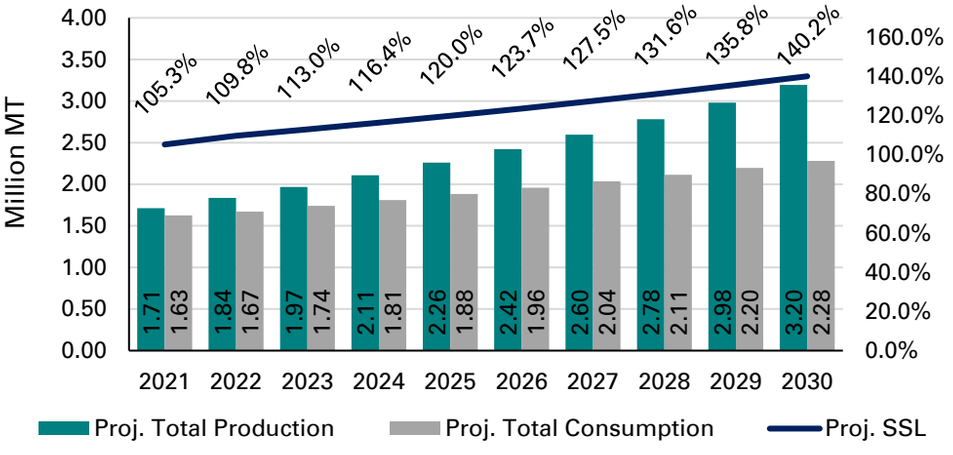
Figure 5-58: Projected per Capita Consumption of Meat, Eggs And Fresh Milk



Source: MAFI

Referring to Figure 5-59, the SSL for poultry is forecasted to increase from 105.3% in 2021 to 140.2% in 2030 with at a CAGR of 3.23%. Meanwhile, the total production of poultry in Malaysia is forecasted to grow at a CAGR of 7.18% from 1.71 million MT in 2021 to 3.20 million MT in 2030, while consumption is expected to grow at a CAGR of 3.83% and expected to reach 2.28 million MT by year 2030. As a result, the production surplus for poultry is expected to increase from 0.09 million MT to 0.92 million MT from 2021 to 2030.

Figure 5-59: Projected Production, Consumption and SSL of Poultry



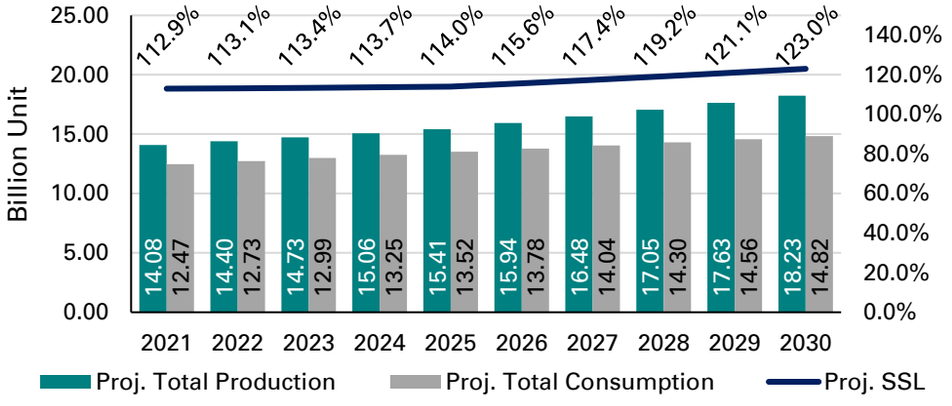
Source: MAFI

5.0 National Agrofood Policy 2.0

Production, Consumption and SSL (continuation)

As shown in Figure 5-60, SSL for eggs is forecasted to increase from 112.9% in 2021 to 123.0% in 2030 with at a CAGR of 0.96%. Meanwhile, the total production of eggs in Malaysia is forecasted to grow at a CAGR of 2.92% from 14.08 billion units in 2021 to 18.23 billion units in 2030, while consumption is expected to grow at a CAGR of 1.94% and expected to reach 14.82 billion units in 2030. As a result, the production surplus for eggs is expected to increase from 1.61 billion units to 3.41 billion units from 2021 to 2030.

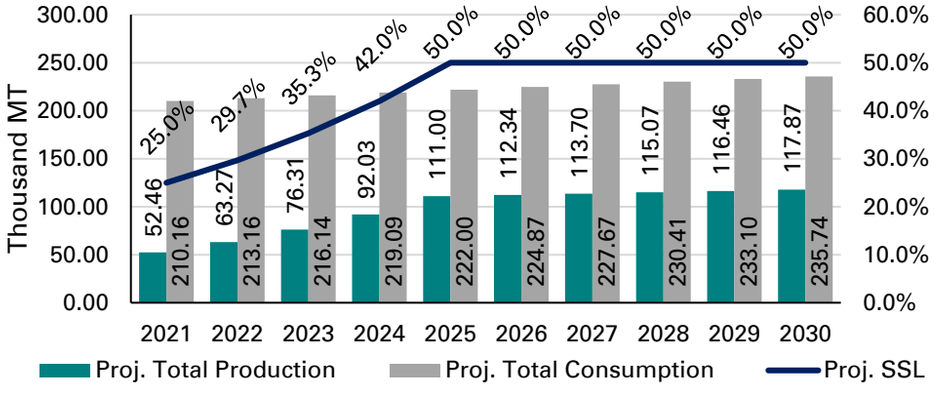
Figure 5-60: Projected Production, Consumption and SSL of Eggs



Source: MAFI

The SSL for beef is forecasted to be stagnant at 22.7% in 2021 to 22.8% in 2030 with at a CAGR of 0.03%. Meanwhile, the total production of beef in Malaysia is forecasted to grow at a CAGR of 1.72% from 46.23 thousand MT in 2021 to 53.92 thousand MT in 2030, while consumption is expected to grow at a CAGR of 1.70% and reach 236.79 thousand MT in 2030. Although the SSL projection reaches 50% and is flat until 2030, beef production continued to increase during the period without significant increase in the rate of beef imports.

Figure 5-61: Projected Production, Consumption and SSL of Beef



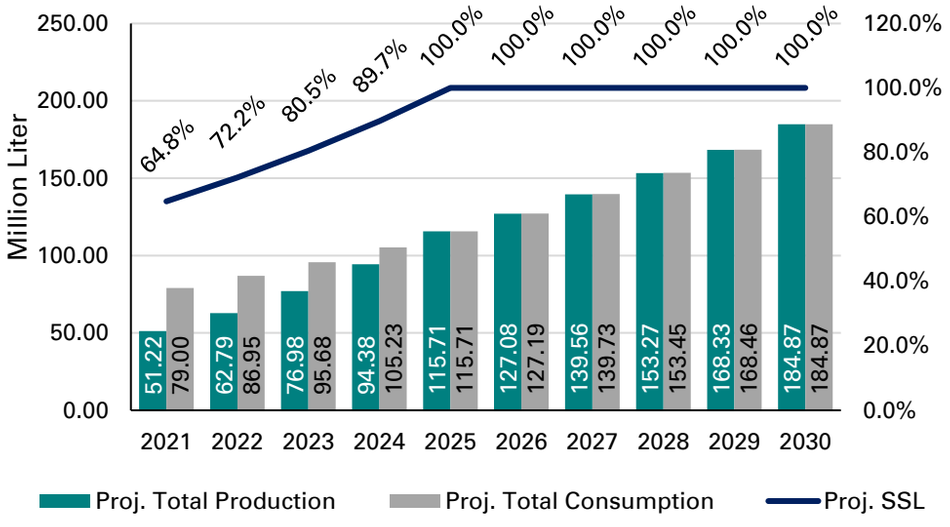
Source: MAFI

5.0 National Agrofood Policy 2.0

Production, Consumption and SSL (continuation)

Referring to Figure 5-62, SSL for fresh milk is projected to increase from 64.8% in 2021 to 100.0% in 2030 with a CAGR of 4.94%. Meanwhile, total fresh milk production in Malaysia is projected to increase at a CAGR of 15.33% from 51.22 million liters in 2021 to 184.47 million liters in 2030, while consumption is expected to increase to 184.47 million liters with a CAGR of 9.91% in 2030. As a result, expected deficit in fresh milk production as experienced in 2021 is expected to reach a balance in terms of production and consumption in 2025 and beyond.

Figure 5-62: Projected Production, Consumption and SSL of Fresh Milk



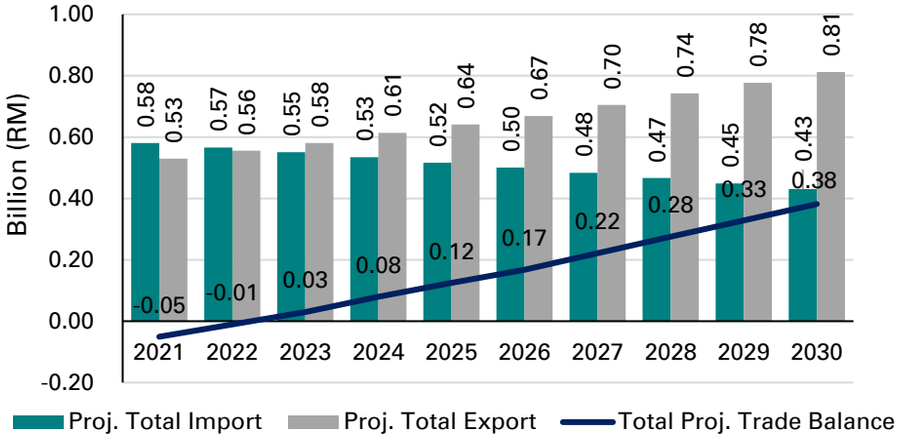
Source: MAFI

5.0 National Agrofood Policy 2.0

Trade

The total export value for poultry meat is projected to grow from RM0.53 billion in 2021 to RM0.81 billion in 2030, growing at a CAGR of 4.86%. Meanwhile, total import value is projected to drop from RM0.58 billion to RM0.43 billion between 2021 to 2030 at a CAGR of -3.27%. The overall trade balance deficit for poultry is projected to increase from a deficit of RM0.05 billion in 2021 to a surplus of RM0.38 billion in 2030. This is due to the excess in production of poultry meat which continues to surpass 100% SSL.

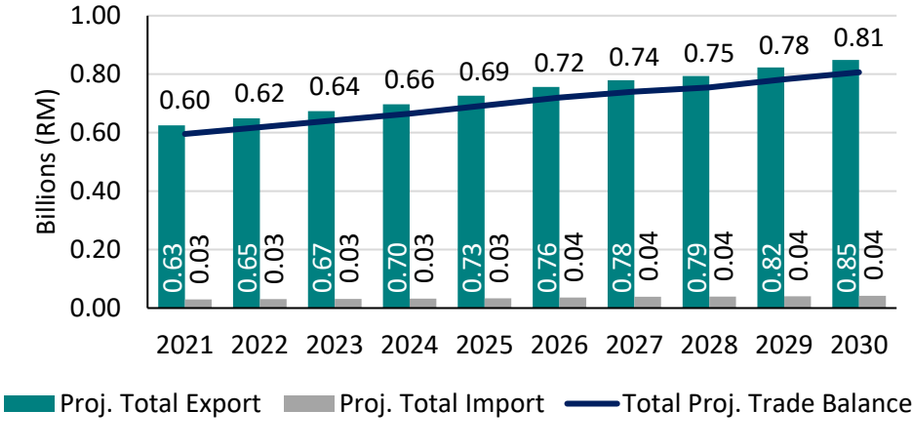
Figure 5-63: Projected Trade of Poultry Meat by Value



Source: MAFI

The total export value for eggs is projected to grow from RM0.63 billion in 2021 to RM0.85 billion in 2030, growing at a CAGR of 3.45%. Meanwhile, total import value is projected to grow from RM0.03 billion to RM0.04 billion between 2021 to 2030, growing at a CAGR of 3.98%. The overall trade balance is projected to increase from RM0.60 billion in 2021 to RM0.81 billion in 2030. Malaysia is self sufficient with egg production and therefore doesn't import much eggs, leading to a high positive trade balance.

Figure 5-64: Projected Trade of Eggs by Value



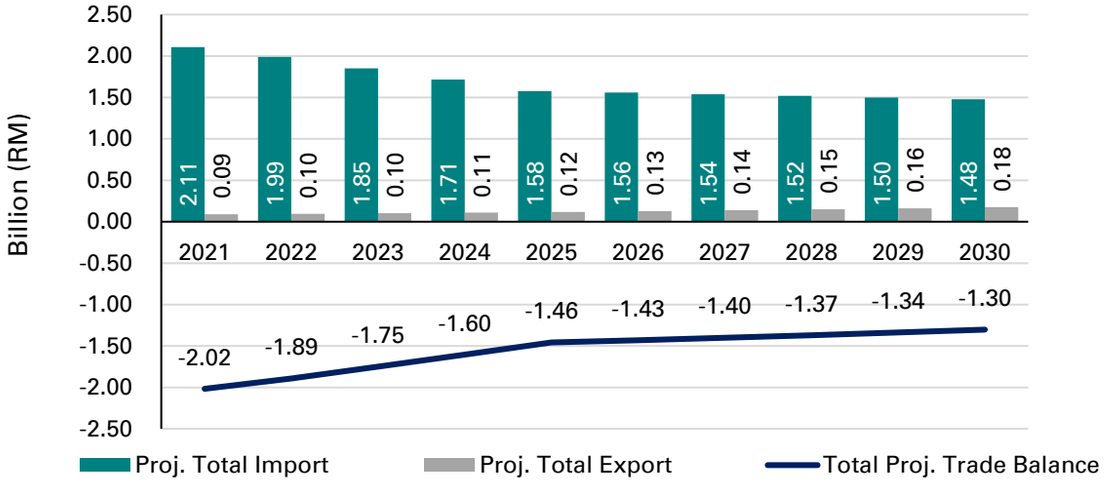
Source: MAFI

5.0 National Agrofood Policy 2.0

Trade (continuation)

The total export value for ruminant meat is projected to grow from RM0.09 billion in 2021 to RM0.18 billion in 2030, growing at a CAGR of 7.78%. Meanwhile, total import value is projected to drop from RM2.11 billion to RM1.48 billion between 2021 to 2030 at a CAGR of -3.86%. The overall trade balance gap in value is projected to shrink from a deficit of RM2.02 billion in 2021 to RM1.30 billion in 2030. Due to low SSL, Malaysia still imports beef to meet domestic demand.

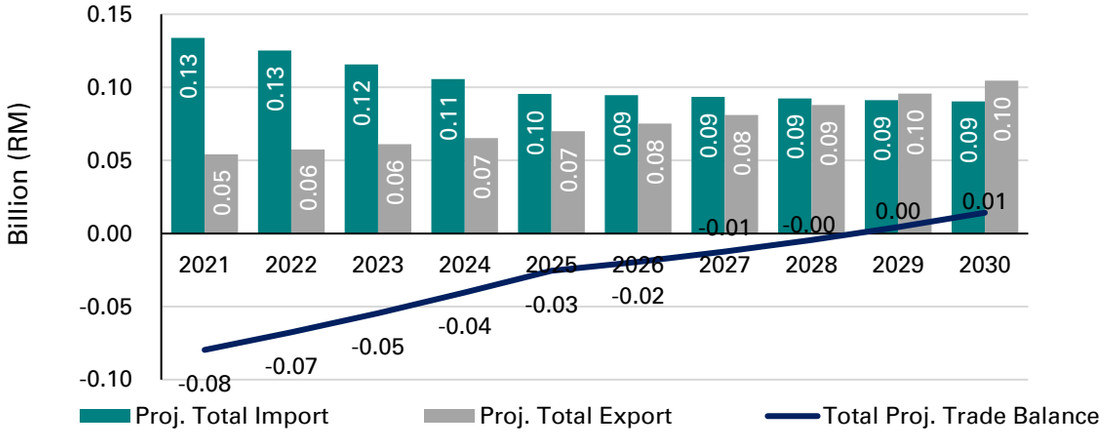
Figure 5-65: Projected Trade of Ruminant Meat by Value



Source: MAFI

The total export value for fresh milk is projected to grow from RM0.05 billion in 2021 to RM0.10 billion in 2030, growing at a CAGR of 7.57%. Meanwhile, total import value is projected to drop from RM0.13 billion to RM0.09 billion between 2021 to 2030 at a CAGR of -4.28%. The overall trade balance gap for fresh milk is projected to reverse from a deficit of RM0.08 billion in 2021 to a positive trade balance of RM0.01 billion in 2030.

Figure 5-66: Projected Trade of Fresh Milk by Value



Source: MAFI

5.0 National Agrofood Policy 2.0

5.9.2 Summary of Issues and Challenges of the Livestock Subsector

General issues

Infectious Virus and Diseases

Infectious virus and diseases such as bird flu and Food and Mouth disease which threatens the health and safety of livestock.

Dependency on Imported Feed

Poultry farming in Malaysia is heavily reliant on imported feed, and is vulnerable to price fluctuations of feed prices. For the ruminant sector, one of the challenges to adapt more integrated and intensive farming system is due to the lack of economical and consistent supply of livestock feed.

Unlicensed Slaughtering of Livestock

Most of the slaughtering of livestock is still done outside of approved and licensed slaughterhouses such as in farms or slaugher sites. This situation can raise concerns in the aspect of food safety in addition to unsustainable practices in the disposal of livestock waste.

Shortage of Manpower

The lack of manpower to perform veterinary services especially for animal health screening has also led to an increase in livestock mortality rates.

Poultry Specific Issue and Challenges

High Conversion Cost for Closed Coop System

The use of closed coop systems can increase farm efficiency and productivity, reduce pollution and reduce the risk of disease transmission. However, most contract farmers still use the open coop system due to the high cost of upgrading and the difficulty of obtaining planning approval.

High Import of Chicken Parts

Despite SSL exceeding 100%, Malaysia continues to import chicken parts/cuttings in large quantities due to high cost which in turn contributes to the deficit in the poultry trade balance

Use of Antimicrobials Growth Promoter (AGP)

Poultry farming in Malaysia is still heavily dependent on antibiotics as a growth promoter, a practice which have already been phased out in many parts of the world as a strategy to tackle the emergence of bacteria and other microbes resistant to antibiotics.

5.0 National Agrofood Policy 2.0

Ruminant Specific Issue and Challenges

High Barrier of Entry for New Entrepreneurs

New entrepreneurs may find it hard to join the ruminant industry due to the lack of suitable farming land and high capital requirements. The ruminant industry is also considered high risk, and new entrepreneurs may find it difficult to obtain loans without sufficient collateral.

Lack Of Quantity and Quality Cattle Breeds for Breeding

In order to be competitive in the ruminant sector, quality cattle breeds with high productivity is required. However, there is a lack of quantity and quality of cattle breeds and ruminant farmers might have to import breed stock at a high price.

Low Awareness of Animal Husbandry Best Practices

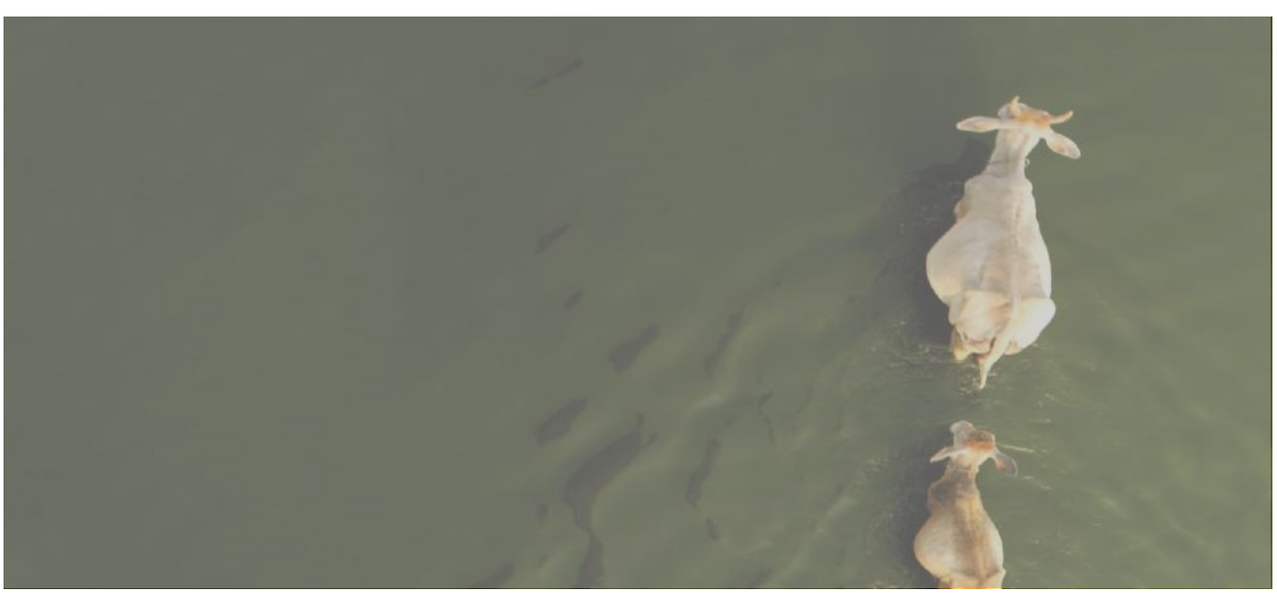
Animal husbandry may not be well understood in Malaysia, especially among smallholders. Due to the hot and humid climate, animals can become stressed when not properly sheltered and have difficulty breeding. This leads to relatively stagnant number of cattle in Malaysia for many years.

Improper Feeding Management System

There is a need for proper feeding management, which includes balanced diet as well as pasture for intensive farming system.

Challenges in the Implementation of Ruminant-Oil Palm Integration

Ruminant-oil palm integration have been identified as an symbiotic and effective system to raise ruminant, but face challenges in the establishment of the integration with the oil palm plantation companies.



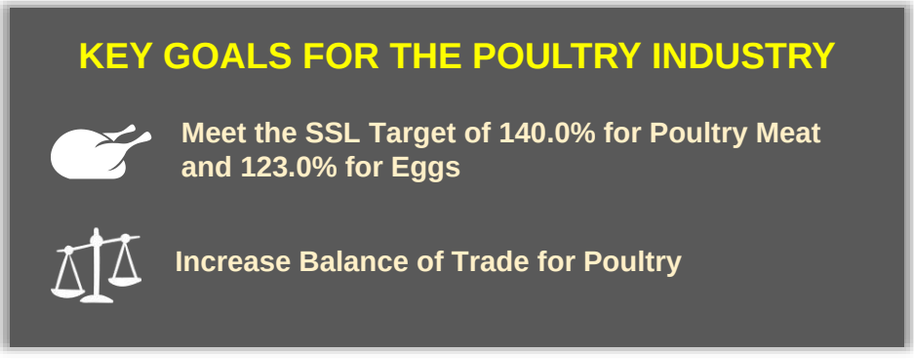
5.0 National Agrofood Policy 2.0

Poultry Industry Goals

Between 2021 to 2030, consumption of poultry and eggs are expected to increase at a CAGR of 3.02% and 1.02% respectively.

While the poultry industry have a good SSL track record, the subsector may need to move towards closed house farm systems to increase productivity and further capitalise on its advantage against an increasingly competitive international market.

The poultry industry could also look into developing more added value downstream products to close the gap in trade balance through higher exports.



Ruminant Industry Goals

Between 2021 to 2030, consumption of beef and fresh milk are expected to increase at a CAGR of 1.70% and 9.89% respectively. In order to meet SSL goals, a number of strategies such as ruminant-oil palm integration may need to be introduced to increase the total number of ruminants in the country.

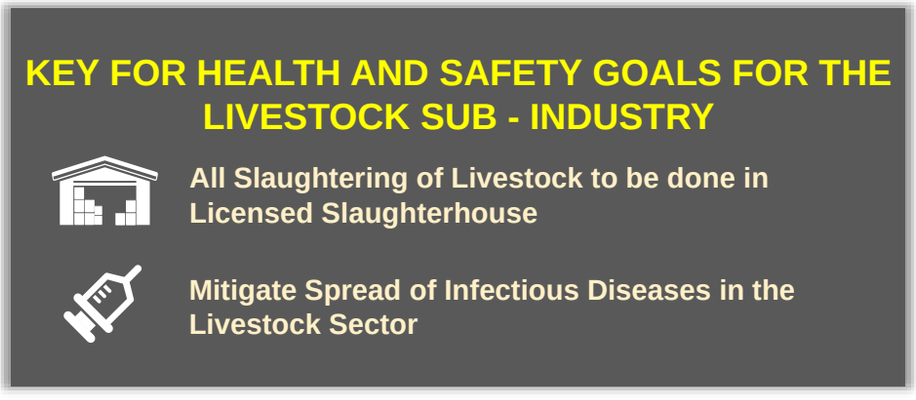
In addition, barriers of entry to the industry could be lowered to attract more young entrepreneurs into the ruminant industry.

5.0 National Agrofood Policy 2.0

Health and Safety Goals

It is important to protect local livestock against various virus, infections and diseases(due to bacteria, parasites and others) to protect farmer's livelihoods and ensure food produced from the livestock is safe for consumption.

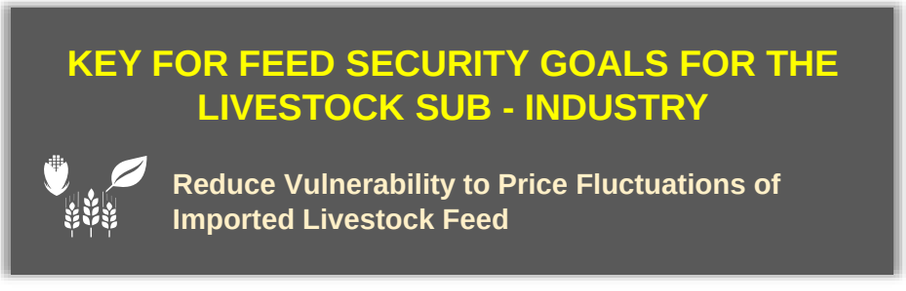
In addition, food hygiene standards could also be increased. The slaughtering of livestock is traditionally done in wet markets, which is unsanitary and leads to improper disposal of waste. Regulations to make it compulsory for all slaughtering of livestock to be done at a licensed slaughterhouse could increase levels of food safety, and increase traceability of diseases in livestock.



Feed Security Goals

The poultry industry is currently heavily dependent on imported feed which is vulnerable to global market price fluctuations. The cost of imported feed also contributes significantly to Malaysia's food import bill. More research can be done to identify efficient and proper use of local feed substitute such as Palm Kernel Cake (PKC) to reduce dependency on imported feed.

The livestock subsector could also conduct more research to identify the precise feed formulation required for a better feed conversion efficiency for the different varieties of cattle in Malaysia.



5.0 National Agrofood Policy 2.0

Below is the summary of the key goals of the Livestock subsector by 2030:

Table 5-37: Summary of the Key Goals of the Livestock Subsector by 2030

Summary of Subsector Goals by 2030	
SSL for Poultry Meat: • 140.0%	1
SSL for Eggs: • 123.0%	2
Achieve positive Balance of Trade for Poultry	3
SSL for Beef: • 50.0%	4
SSL for Fresh Milk: • 100%	5
Inrease the Total Number of Cattle and Buffalo	6
Increase Level of Ruminant-Oil Palm Integration	7
Slaughtering of Livestock to be made Compulsory in Licensed Slaughterhouse	8
Reduce Loss of Livestock to Diseases	9
Reduce Vulnerability to Price Fluctuations of Imported Livestock Feed	10

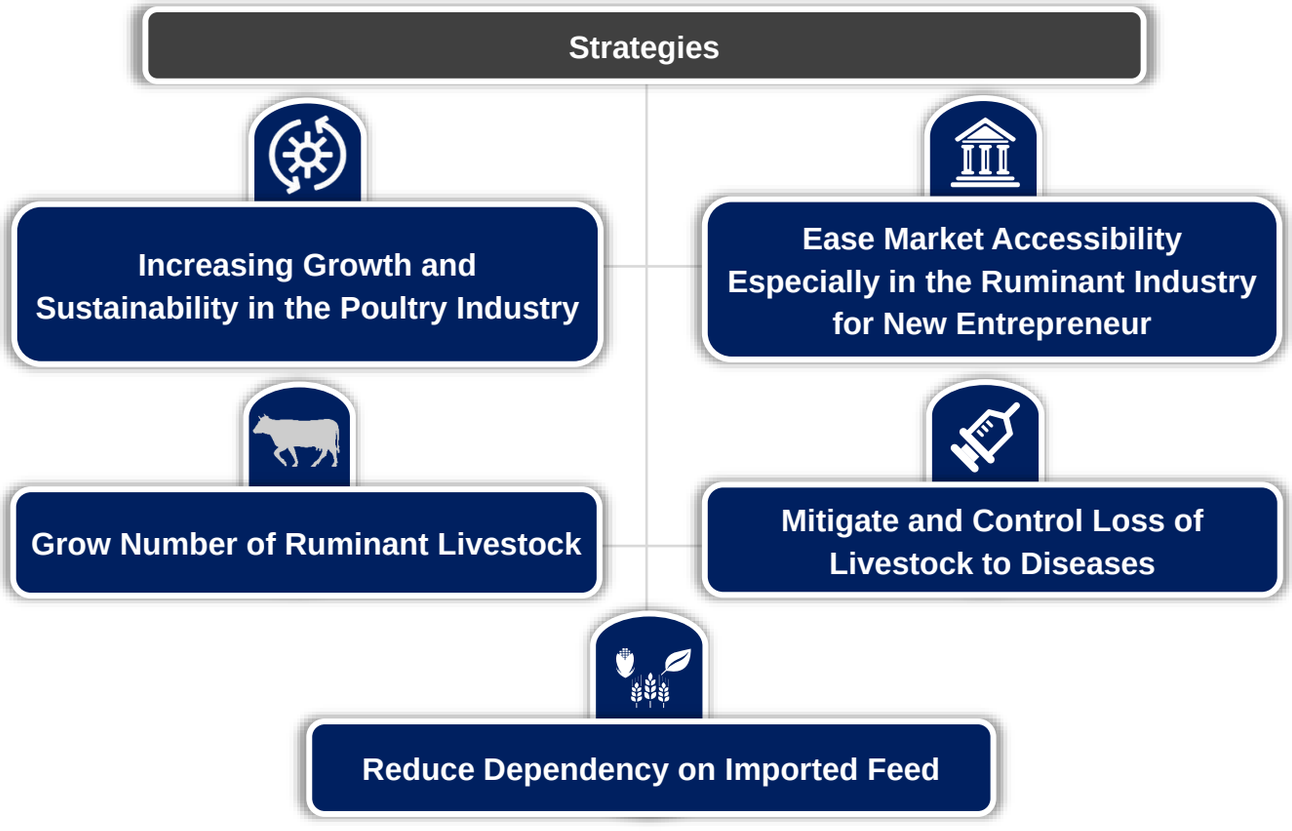
5.0 National Agrofood Policy 2.0

5.9.4 Way Forward of the Livestock Subsector

Within the next 10 years, it is important to identify different set of strategies to manage the demand for various commodities in the Livestock subsector. In the poultry industry, it is crucial to continuously optimise production and increase productivity in order to remain competitive and aspire towards further growth in the international market. In the Ruminant subsector, more entrepreneurs need to be attracted to enter and grow the industry to increase low self sufficiency levels and accommodate increasing demand. Various strategies such as intensive breeding programmes and ruminant oil-palm integration are needed to boost the quantity and quality of cattle in the country. Additionally, diseases are a serious threat to livestock, and proper measures must be taken to prevent and protect against such threats. Finally, more researches are needed on the use of local feed substitutes to develop precise feed formulation in order to reduce dependency on imported feed.

Five (5) main strategies as in Figure 5-83 will be undertaken within the next 10 years to further develop and improve the Livestock subsector. These strategies consider the issues and challenges faced by the Livestock subsector whilst setting the path in meeting the subsector goals as outlined in Table 5-37:

Figure 5-67: Strategies for Livestock Subsector, 2021-2030



5.0 National Agrofood Policy 2.0

As shown in the summary below, each strategy were identified to address various challenges and to meet several 2030 goals identified for the subsector.

Table 5-38: Summary of the Identified Strategies for the Livestock Subsector

Strategies	Summary/Purpose of the Strategy
Increasing Growth and Sustainability in the Poultry Industry	This strategy aims to address the environmental sustainability and future opportunities for growth in the international market for the poultry industry.
Ease Market Accessibility Especially in the Ruminant Industry for New Entrepreneur	This strategy aims to ease the challenges faced by new entrepreneurs coming in to the ruminant industry.
Grow Number of Ruminant Livestock	This strategy aims to ramp up the number of ruminant Livestock in the country which have been relatively stagnant in order to meet local demand and reduce heavy dependency on imported beef and dairy products.
Mitigate and Control Loss of Livestock to Diseases	This strategy is vital for ensuring food safety of meat, eggs and dairy products for local consumption and to be viable for export.
Reduce Dependency on Imported Feed	This strategy addresses the high dependency of imported Livestock feed for intensive farming, which is vulnerable to global price fluctuations.

5.0 National Agrofood Policy 2.0

A total of 16 action plans have been formulated across the 5 strategies to further strengthen each of the strategy identified. Additionally, the action plans were formulated to facilitate in the achievement of the key goals identified for the Livestock subsector. Below is the mapping of the action plans to the strategies and key goals.

Table 5-39 Livestock Subsector Strategies and Action Plans against Key Goals

Strategies	Action Plans		Key Goals
1.0 Increasing Growth and Sustainability in the Poultry Industry	**[Poultry] 1.1**	Lower Barrier for Conversion from Open House to Closed House System	1 2 3
	[Poultry] 1.2	Develop and Promote Ready-to-Eat Poultry Products in the International Market and Fairs to Increase Export Access	1 2 3
	[Ruminant and Poultry] 1.3	Phase Out Use of Antimicrobials Growth Promoter (AGP) for Livestock	3
2.0 Ease Market Accessibility Especially in the Ruminant Industry for New Entrepreneur	**[Ruminant] 2.1**	Designate Livestock Zones and Set Up Infrastructure for Intensive Cattle Farms to Rent Out to New Entrepreneurs	4 5 6
	[Ruminant] 2.2	Ruminant Integrator to Drive Contract Farming Model	4 5 6
	[Ruminant] 2.3	Ease Conditions on Loan Application for Ruminant Entrepreneurs	4 5 6
3.0 Grow Number of Ruminant Livestock	**[Ruminant] 3.1**	Increase Implementation of Ruminant-Oil Palm Integration System	4 5 6 7
	[Ruminant] 3.2	Financial Incentive to Increase Scale of Intensive Ruminant Stock Breeding Programme	4 5 6
	[Ruminant] 3.3	Increased Capacity and Quality of Veterinary Development Services for the Application of Animal Husbandry Best Practices	4 5 6

5.0 National Agrofood Policy 2.0

Strategies	Action Plans		Key Goals
4.0 Mitigate and Control Loss of Livestock to Diseases	[Ruminant] 4.1	Strict Border Enforcement to Prevent Diseases being Brought In through Livestock Smuggling	6 9
	[Ruminant and Poultry] 4.2	Regulation to Make Licensing of Slaughterhouse Compulsory Nationwide	8 9
	[Ruminant and Poultry] 4.3	Insurance System against Infectious Diseases	9
	[Ruminant and Poultry] 4.4	Increasing Laboratory Capacity and Veterinary Services	6 9
5.0 Reduce Dependency on Imported Feed	[Ruminant] 5.1	R&D to Identify Economical and Precise Feed Formulation	10
	[Ruminant and Poultry] 5.2	Regulation of Quality and Quantity of PKC to be Used as Feed Source Substitution	10
	[Ruminant and Poultry] 5.3	To Provide Incentive of Locally Produced Feed for Local Use	10

Further detail on the strategies and action plans is depicted in the following section.

5.0 National Agrofood Policy 2.0

Strategy 1: Increasing Growth and Sustainability in the Poultry Industry

The livestock industry faces a major challenge in sustaining the development and future opportunities for growth in the international market. The poultry industry is experiencing key challenges such as negative trade balance despite having SSL of over 100%. The use of open house systems in farm also has lower productivity. In addition, the use of Antimicrobials Growth Promoter (AGP) especially for poultry is unsustainable as it leads to the emergence of bacteria and other microbes resistant to antibiotics. Hence, the aim of this strategy is to increase trade balance and sustainability issues.

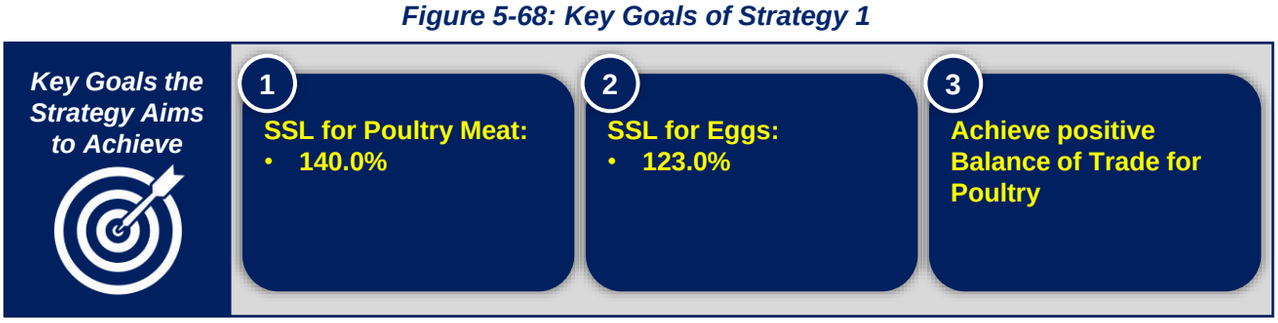
A total of 3 action plans has been formulated to support the implementation of strategy 1 as below:

Table 5-40: Summary of the Action Plans under Strategy 1

Strategies	Action Plans	
Increasing Growth and Sustainability in the Poultry Industry	**[Poultry]1.1**	Lower Barrier for Conversion from Open House to Closed House System
	[Poultry]1.2	Develop and Promote Ready-to-Eat Poultry Products in the International Market and Fairs to Increase Export Access
	[Ruminant and Poultry] 1.3	Phase Out Use of Antimicrobials Growth Promoter (AGP) for Livestock

In addition, this strategy and 3 action plans have been formulated to align with 3 of the main goals as follows:

Figure 5-68: Key Goals of Strategy 1



5.0 National Agrofood Policy 2.0

Strategy 2: Ease Market Accessibility Especially in the Ruminant Industry for New Entrepreneur

The key purpose of strategy 2 is to increase the number of new entrepreneurs entering the ruminant industry. New entrepreneurs face difficulties in pursuing a career in the ruminant sector due to the lack of suitable land to raise cattle and difficulty in obtaining loans without sufficient collateral. Furthermore, new entrepreneurs also face challenges might be unfamiliar with the best practices with raising ruminant such as how to obtain suitable feed. Hence, the aim of this strategy is to provide guidance and ease the difficulty to enter the ruminant industry.

A total of 3 action plans has been formulated to support the implementation of strategy 2 as below:

Table 5-41: Summary of the Action Plans under Strategy 2

Strategies	Action Plans	
Ease Market Accessibility Especially in the Ruminant Industry for New Entrepreneur	**[Ruminant] 2.1**	Designate Livestock Zones and Set Up Infrastructure for Intensive Cattle Farms to Rent Out to New Entrepreneurs
	[Ruminant] 2.2	Ruminant Integrator to Drive Contract Farming Model
	[Ruminant] 2.3	Ease Conditions on Loan Application for Ruminant Entrepreneurs

In addition, this strategy and 3 action plans have been formulated to align with 3 of the main goals as follows:

Figure 5-69: Key Goals of Strategy 2

5.0 National Agrofood Policy 2.0

Strategy 3: Grow Number of Ruminant Livestock

The key purpose of this strategy is to increase the number of ruminant livestock in the country that is largely stagnant in order to meet the growing demand in beef. One of the effective strategies highlighted is ruminant-oil palm integration, though the scale of implementation remains small. Smallholders also lack the knowledge on good animal husbandry practices. These issues need to be addressed to increase self sufficiency levels of beef and milk moving forward.

A total of 3 action plans has been formulated to support the implementation of strategy 3 as below:

Table 5-42: Summary of the Action Plans under Strategy 3

Strategies	Action Plans	
Grow Number of Ruminant Livestock	**[Ruminant] 3.1**	Increase Implementation of Ruminant-Oil Palm Integration System
	[Ruminant] 3.2	Financial Incentive to Increase Scale of Intensive Ruminant Stock Breeding Programme
	[Ruminant] 3.3	Increased Capacity and Quality of Veterinary Development Services for the Application of Animal Husbandry Best Practices

In addition, this strategy and 3 action plans have been formulated to align with 4 of the main goals as follows:

Figure 5-70: Key Goals of Strategy 3

5.0 National Agrofood Policy 2.0

Strategy 4: Mitigate and Control Loss of Livestock to Diseases

There is a need for farm-to-table tractability when it comes to food to detect and prevent diseases at the source to ensure that livestock food products are safe to eat. One such example is to prevent the smuggling of cattle that has caused virus such as Foot and Mouth Disease (FMD) to be brought into the country. In addition, farmers are unlikely to report cases of virus outbreak to minimise potential economical loss, which delays efforts to prevent the outbreak from spreading which may lead to potential economical loss.

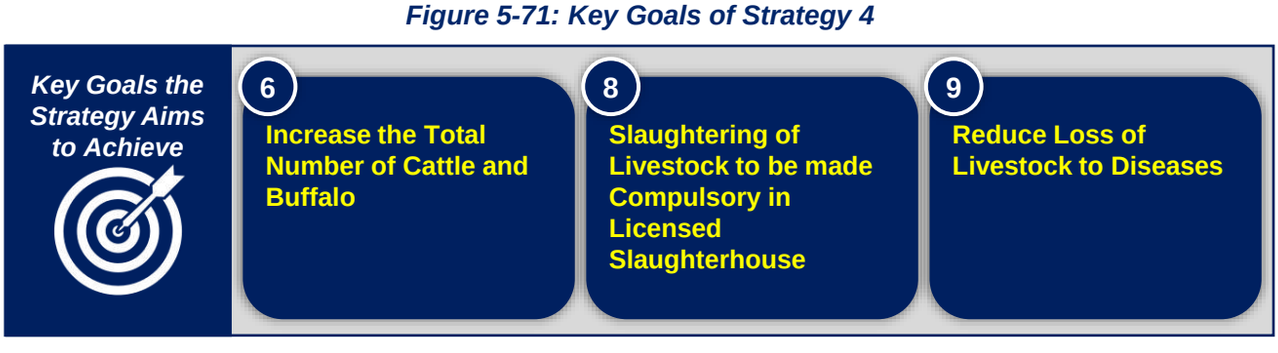
A total of 4 action plans has been formulated to support the implementation of strategy 4 as below:

Table 5-43: Summary of the Action Plans under Strategy 4

Strategies	Action Plans	
Mitigate and Control Loss of Livestock to Diseases	**[Ruminant] 4.1**	Strict Border Enforcement to Prevent Diseases being Brought In through Livestock Smuggling
	[Ruminant and Poultry] 4.2	Regulation to Make Licensing of Slaughterhouse Compulsory Nationwide
	[Ruminant and Poultry] 4.3	Insurance System against Infectious Diseases
	[Ruminant and Poultry] 4.4	Increasing Laboratory Capacity and Veterinary Services

In addition, this strategy and 4 action plans have been formulated to align with 3 of the main goals as follows:

Figure 5-71: Key Goals of Strategy 4



5.0 National Agrofood Policy 2.0

Strategy 5: Reduce Dependency on Imported Feed

In order to reduce dependency of the livestock subsector on imported feed, the aim of this strategy is to ensure that the livestock subsector is able to have alternatives and not be vulnerable to price fluctuations of imported feed. For example, a majority of the cost of poultry farming and intensive ruminant farming comes from the feed.Due to the difficulty in planting animal feed such as corn due to the humidity and unpredictable rainy seasons, Malaysia needs to import to meet its fodder requirements. Palm Kernel Cake (PKC) have been identified as an effective feed substitution for livestock, and is produced in large quantity in Malaysia due to an extensive oil palm industry. In addition, proper feed formulation is important in achieving the optimal ratio of feed ingredients used to increase the weight of livestock. Finally, incentives for the production of local feed will be encouraged to attract local investors and entrepreneurs.

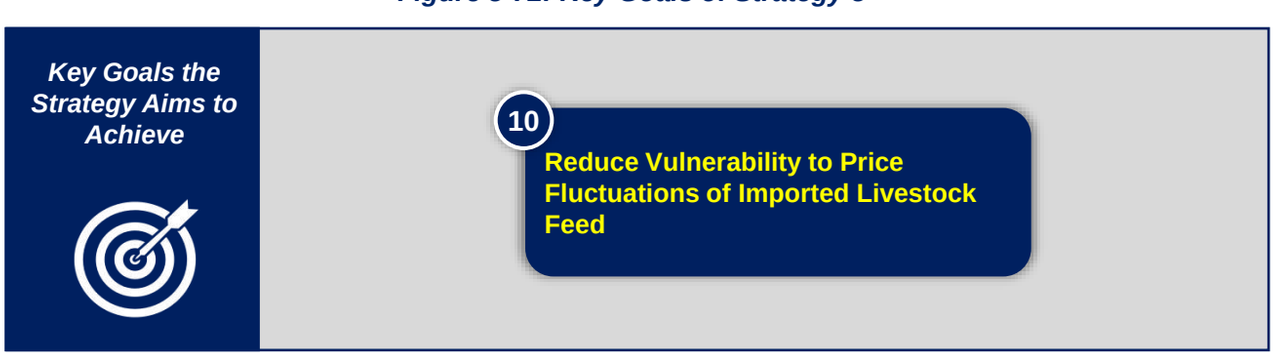
A total of 3 action plans has been formulated to support the implementation of strategy 5 as below:

Table 5-44: Summary of the Action Plans under Strategy 5

Strategies	Action Plans	
Reduce Dependency on Imported Feed	**[Ruminant] 5.1**	R&D to Identify Economical and Precise Feed Formulation
	[Ruminant and Poultry] 5.2	Regulation of Quality and Quantity of PKC to be Used as Feed Source Substitution
	[Ruminant and Poultry] 5.3	To Provide Incentive of Locally Produced Feed for Local Use

In addition, this strategy and 3 action plans have been formulated to align with the main goals as follows:

Figure 5-72: Key Goals of Strategy 5



5.0 National Agrofood Policy 2.0

5.9.5 Livestock Subsector in 2030

During 2021-2030, the production of poultry, eggs, beef and fresh milk is targeted to be 140.0%, 123.0%, 50.0% and 100.0% self sufficient respectively.

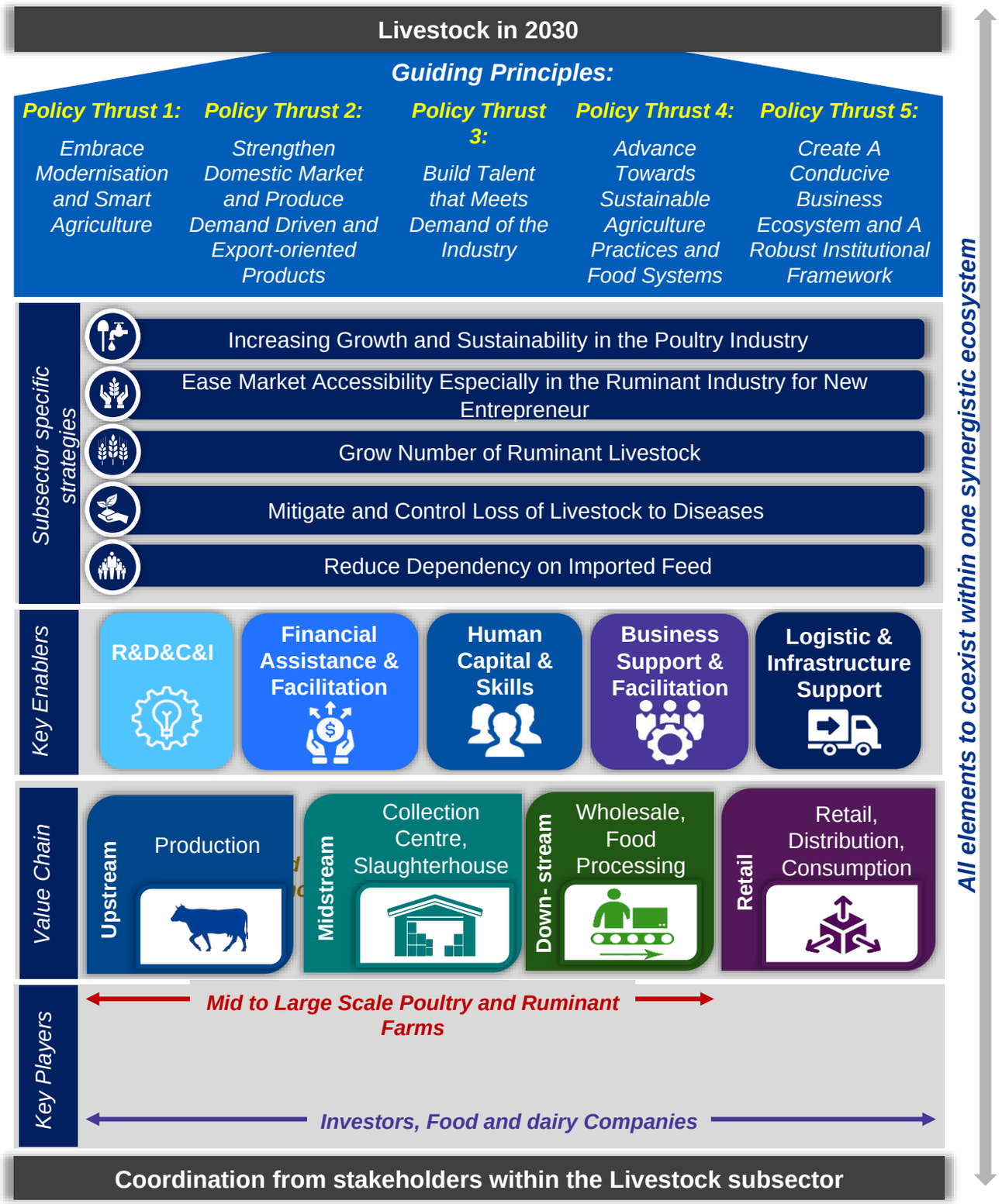
Within the poultry industry, livestock activities through the open house system will be gradually reduced to focus on the closed house system. to increase productivity and competitiveness in the international market. In addition, the development of ready-to-eat poultry products have also increased access to export markets and eliminate trade defisit in these commodities.

Within the ruminant industry, efforts will be stepped up to encourage ruminant-oil palm integration to continue to grow towards a larger scale. In addition, intensive ruminant stock breeding programme is targeted to produce sufficient quality and quantity of cattle to meet the demand of new entrepreneurs. Precise feed formulation using local substitute feed ingredients will be identified and widely used livestock subsectors and in turn result in improved productivity of the ruminant subsector and greater number of entrepreneurs involved. As a result of various effective strategies, the number of cattle is expected to continue to increase by 2030 and be able to develop sustainably towards meeting the demand for beef and dairy in Malaysia.

All livestock produced from mid to large scale producers are slaughtered in licensed slaughterhouse to increase the traceability of meat from farm-to-table. The meat is processed by certified slaughterhouse with high sanitary standards, and are inspected for diseases so that it is safe for consumption. This leads to increased confidence among consumers on the traceability and safety of livestock products in Malaysia.

5.0 National Agrofood Policy 2.0

Figure 5-73: Livestock Subsector Conceptual Ecosystem



5.0 National Agrofood Policy 2.0

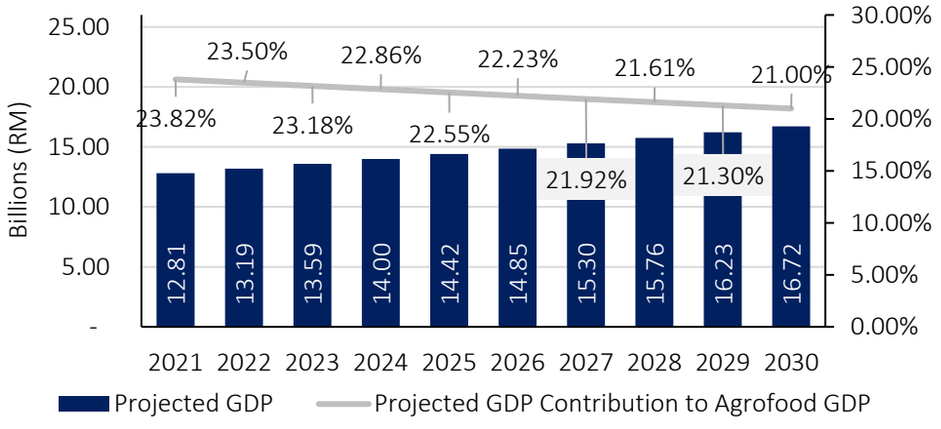
5.10 Fisheries and Aquaculture

5.10.1 Key Outlook of the Fisheries and Aquaculture Subsector

GDP Contribution

The fisheries and aquaculture subsector is forecasted to contribute to the GDP at a CAGR of 3.00% from RM12.81 billion in 2021 to RM16.72 billion in 2030. The subsector is also expected to contribute approximately 21.00% to 24.00% to the total agrofood sector GDP from 2021 to 2030. The figure below depicts the GDP and GDP contribution of the fisheries and aquaculture subsector:

Figure 5-74: Projected GDP and GDP Contribution of Fisheries & Aquaculture Subsector

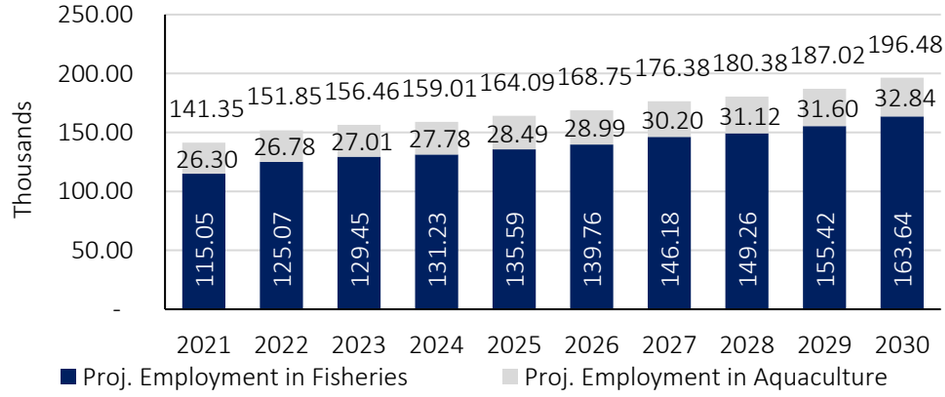


Source: MAFI

Employment

The subsector is also projected to employ approximately 141, 349 people in 2021 to 196,478 people in 2030. The employment figure is expected to grow at a CAGR of 3.73% as shown in the figure below. Additionally, the proportion of employment in fisheries and aquaculture is an average of 82.00% and 18.00%, with a CAGR of 3.99% and 2.50% respectively.

Figure 5-57: Projected Employment of Fisheries & Aquaculture Subsector



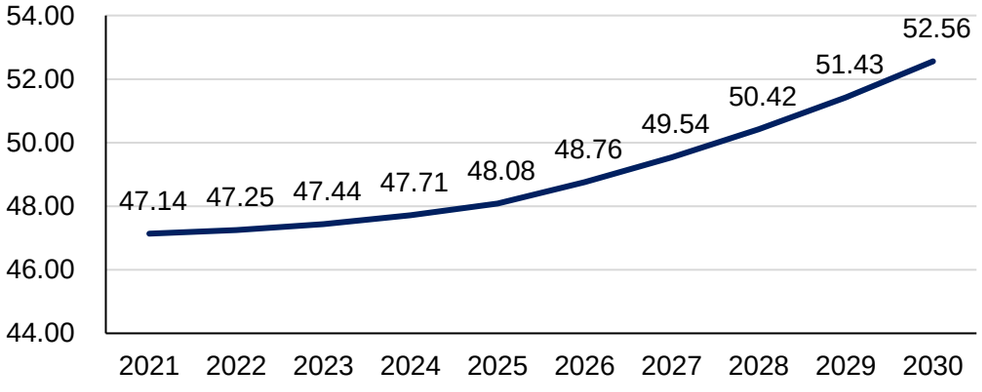
Source: MAFI

5.0 National Agrofood Policy 2.0

Production, Consumption and SSL

The consumption pattern of fishery products may be affected by various factors including pricing and availability of fish as well as consumer preferences. From 2021 to 2030, the consumption of fishery products is expected to fluctuate between 47.14 kg to 52.56 kg per person as shown in the figure below. In addition to the increasing Malaysian population, the total consumption for fishery products is forecasted to grow from 1.61 mil MT in 2021 to 2.00 mil MT in 2030, growing with an overall CAGR of 2.41%.

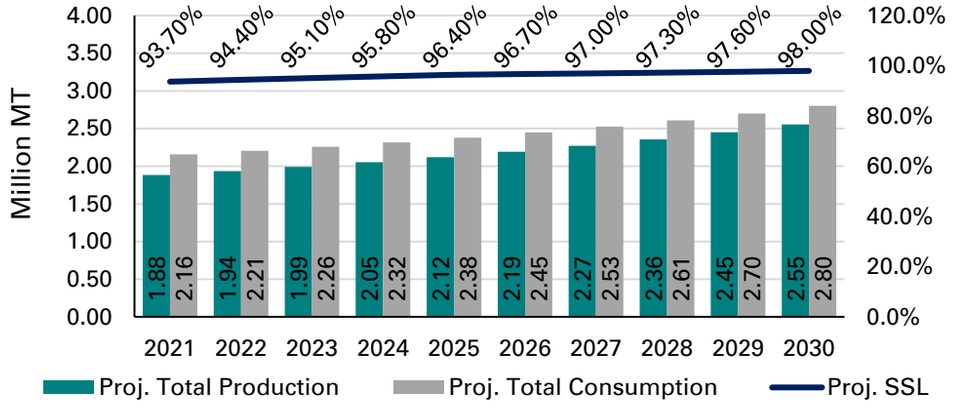
Figure 5-76: Projected per Capita Consumption of Fisheries



Source: MAFI

Referring to Figure 5-77, SSL for the fisheries and aquaculture subsector is forecasted to increase from 93.7% in 2021 to 98.0% in 2030 with a CAGR of 0.50%. Meanwhile, the total production of fisheries in Malaysia is forecasted to grow at a CAGR of 3.44% from 1.88 mil MT in 2021 to 2.55 mil MT in 2030. As a result, it is expected that the fishery production deficit from 2021 to 2030 will decrease from 0.28 million MT to 0.25 million MT from 2021 to 2030.

Figure 5-77: Projected Production, Consumption and SSL of Fisheries



Source: MAFI

5.0 National Agrofood Policy 2.0

Trade

The trade for fisheries includes trade of fish and shellfish which includes crustacean and molluscs. As shown in figure 5-78 and 5-79, the trade balance for fisheries is expected to remain negative from 2021 to 2030.

The export volume for fisheries is expected to grow at a CAGR of 2.19% from 3.15 mil MT in 2021 to 3.83 mil MT in 2030. Meanwhile, the import volume for fisheries is expected to grow at a higher rate than the export, at a CAGR of 3.02%, from 4.79 mil MT to 6.49 mil MT during the same period. The higher growth rate of import volume further widens the trade balance gap from 1.63 mil MT to 2.67 MT.

Similarly, the total export value is projected to grow from RM1.89 billion in 2021 to RM1.95 billion in 2030, growing at a CAGR of 0.33%, lower than the growth rate of import values which is projected to grow at 3.02%, from RM3.70 billion in 2021 to RM4.83 billion in 2030. The overall trade balance gap in value is projected to widen from a negative trade balance of RM1.80 billion in 2021 to RM2.88 billion in 2030.

The increasing imports on fisheries is inevitable as the importation and trade of fisheries is an important element in the food value chain. Studies from the FAO[5] suggested that importation of fisheries can potentially create job opportunities particularly on the fish and food processing of the value chain. Importation of fisheries can also stabilise fish prices by increasing supply in the food market. Additionally, importation of fish is also to provide diversification of fisheries species for consumer particularly for fisheries that are not available within Malaysian waters.

Figure 5-78: Projected Trade of Fisheries by Volume

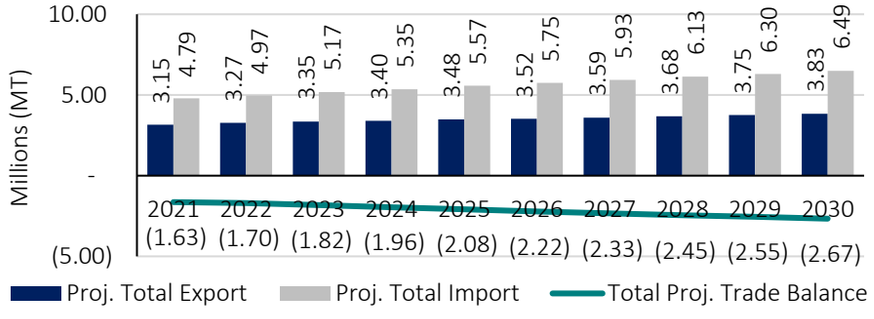
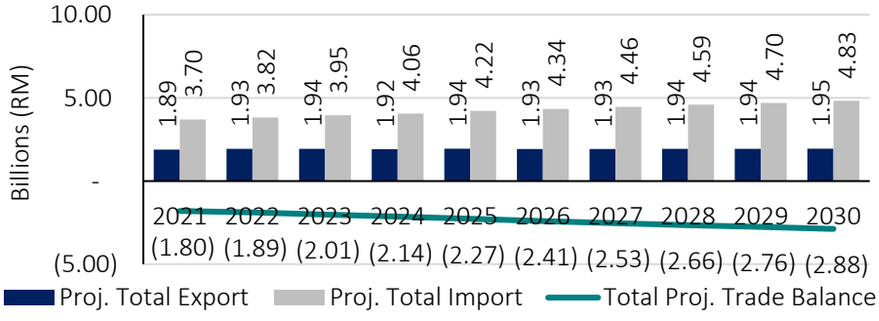


Figure 5-79: Projected Trade of Fisheries by Value



Source: MAFI

5.0 National Agrofood Policy 2.0

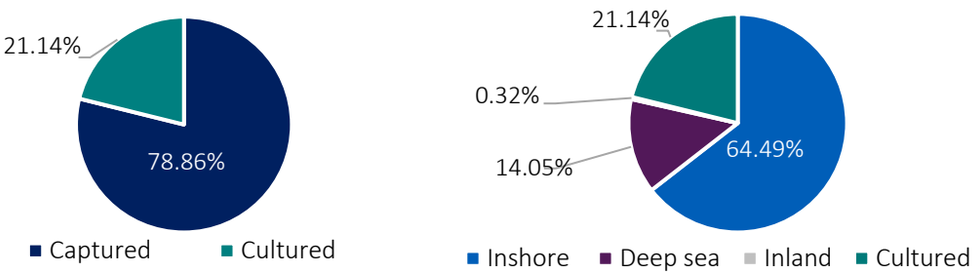
5.10.2 Summary of Issues and Challenges Hindering the Growth of the Fisheries and Aquaculture Subsector

Fisheries is one of the subsector with a consistent SSL of above 90.00% for the past 10 years. However, there are several factors particularly on climate change and depletion of natural resources that can affect the overall arhievement of the subsector in the future if no further mitigation measure is to be taken.

Depletion of Coastal Resources

The fisheries stock assessment conducted by DOF in 2014 to 2016 showed that the demersal fish biomass in the whole of Malaysia (including exclusive economic zone (EEZ)) was only 16.00% respectively from the original stock in 1960's which was before the introduction of commercial fishing methods such as trawling. In 2018, the fish landing ratio of captured fisheries to aquaculture was approximately 78.90% to 21.10%. Among the 78.90% of captured fisheries landing, the proportion of fish landing from deep sea, inshore and inland in 2018 was 17.82%, 81.77% and 0.41% respectively, indicating the relatively higher dependency on inshore fisheries in Malaysia. The breakdown of fish landing is as shown in Figure 5-80 below[6]:

Figure 5-80: Proportion of Fish Landing in 2018



Source: MAFI

High Production Cost for Fisheries and Aquaculture

The operating cost for captured fisheries is equally high with other farming activities such as crops, livestock and aquaculture, from the cost of fuel, vessel and equipment maintenance. Although the cost of fuel is subsidised, the cost to maintain a safe and fully functioning vessel can pose financial stress on traditional fishermen.

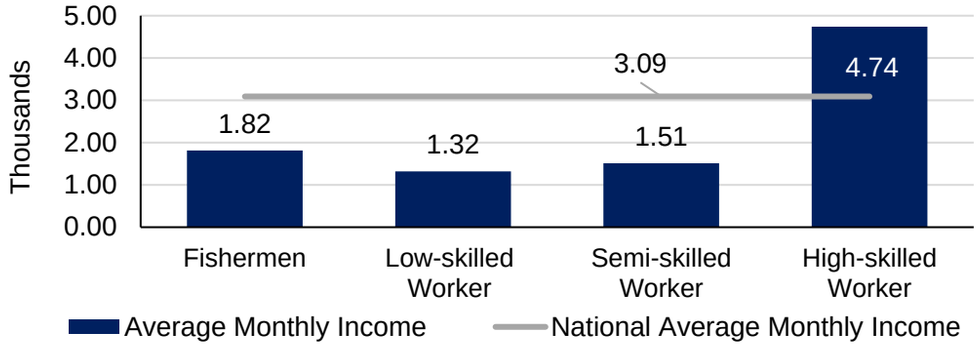
In terms of aquaculture, the cost of production is affected by various factors including cost of infrastructure and maintenance, input and feed, brood stock, and utilities. Despite the existing research and development efforts, there is still insufficient brood stocks that are high in quality or are resilient to diseases. Hence, aquaculture farmers often source imported brood stock for local aquaculture activities. Additionally, the cost of common ingredients used for feed in aquaculture such as soybean, corn, fishmeal, fish oil, rice and wheat are also highly competitive in the world market as these are also common ingredient for other food items consumed by livestock and human being.

5.0 National Agrofood Policy 2.0

Low Income Among Fisheries Food Producers

In 2018, the total workforce in the fisheries and aquaculture subsector is 15,913 people. However, there is a significant income gap between high-skilled worker and the semi and low-skilled workers such as fishermen, small scale aqua culturist or fish farmers and part-time farm workers. As shown in Figure 5-81, the wages of the semi-skilled and low-skilled workers are at least 3 times lower than that of high-skilled workers. As for the income of fishermen, they are on average higher than low-skilled and semi-skilled workers, but is 40% below the national average income.

Figure 5-81: Comparison of Average Monthly Income for the Fisheries and Aquaculture Subsector in 2018



Source: MAFI

Challenges within Aquaculture and Aquaculture Farm

Aquaculture produce only makes up approximately 21.14% of total fish production in 2018, indicating the lower reliance on aquaculture produce in Malaysia. Additionally, consumers has higher preference for captured fisheries produce, which lowers the overall demand for aquaculture products.

At present, there are limited freshwater areas provided for aquaculture land that are generally owned by the state governments. The existing available land are limited and subject to terms of land tenure, while facing competition from other economic developments. Hence, the conditional and subjective land tenure period does not justify the high initial cost incurred in the preparation and construction of aquaculture farms.

Availability of suitable waters are crucial factors affecting the quality and quantity of fish which makes aquaculture farms being vulnerable to changes in adjacent environment, potentially affecting affecting the economic returns of aquaculture and the subsector as a whole. Additionally, disease outbreak is also a major challenge faced in aquaculture farming as water is an easy medium for disease transmission, and this is further aggravated by the tropical climate in Malaysia. Due to the sparsely distribution of aquaculture farms across Malaysia, it is also relatively difficult for extension officers to monitor, and perform disease management in every farm.

5.0 National Agrofood Policy 2.0

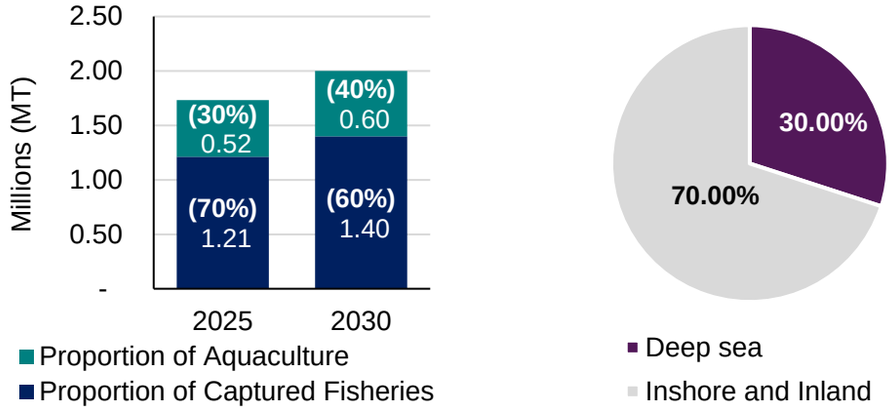
5.10.3 Key Goals of the Fisheries and Aquaculture Subsector by 2030

Production Goals

Between 2021-2030, the total consumption of fisheries is forecasted to increase by 22.86%, from 2.16 mil MT in 2021 to 2.80 mil MT in 2030. With the projected SSL of 98.00%, the total production of fisheries in Malaysia is estimated to reach a minimum of 2.55 mil MT by 2030.

As explained in the previous sub-section, approximately 63.64% of the total fish landing in 2019 are sourced from inshore fisheries indicating the current high dependency on it.

Figure 5-82: Projected Proportion of Fish Landing



Source: MAFI

Without further measures to balance the fish landing ratio, it may potentially cause permanent damage to the marine ecosystem affecting availability of future fish stock.

However, the total contribution of deep sea fisheries, inland fisheries and aquaculture to the total fish landing in 2019 is only 14.04%, 0.32% and 22.00% respectively. Hence, these sources should be further explored moving forward to reduce the dependency on inshore marine sources.

KEY PRODUCTION GOALS FOR THE FISHERIES AND AQUACULTURE SUB-INDUSTRY

To meet the SSL of 98.00%, with total fisheries production of at least 2.55 mil MT by 2030

To balance the fish landing ratio, increasing the proportion of fish landing from deep sea, inland and aquaculture

5.0 National Agrofood Policy 2.0

Sustainability Goals

The increasing pressure on the environment caused by climate changes, unsustainable fishing activities and other competing economic developments is further deteriorating the existing issues on depletion of natural and marine resources. Hence, marine protection is a crucial step to protect the ecosystem and to maintain the local marine biodiversity and fisheries resources.

In addition to marine protection, sustainable fishing methods are also crucial to protect and maintain the marine ecosystem and provide safe and consistent supply of fish. Sustainable fishing include using sustainable methods applied during fishing and fish handling during post-harvest and processing stage. Similarly sustainable aquaculture include the use of safe and sustainable input during culturing stage and the use of sustainable techniques during post-harvest handling and processing stages.

KEY SUSTAINABILITY GOALS FOR THE FISHERIES AND AQUACULTURE SUB-INDUSTRY

Enhance monitoring, control and surveillance (MCS)

To encourage use of safe and sustainable fish sources along the value chain

Wellbeing of Fisheries Food Producers

In 2018, the monthly average income of food producers is RM1,815.00, approximately 41.26% lower than the national average. Additionally, the CAGR of the monthly average income of food producers from 2015 to 2018 is only 0.54% while the average inflation rate in Malaysia within the same period is 2.24%. Hence, it is crucial to increase the income levels of food producers in order for the food producers to cope with the market inflation. While there are insufficient baselines to determine the ideal growth rate for the food producers' income, the average income of food producers should meet the national average levels in order to cope with the increasing cost and standards of living.

KEY FOR WELLBEING OF FOOD PRODUCERS FOR THE FISHERIES AND AQUACULTURE SUB - INDUSTRY

Improve the livelihood and income levels for the fishermen and fish farmers in Malaysia

Part C: NAP 2.0 Strategies and Action Plans

5.0 National Agrofood Policy 2.0

Below is the summary of the key goals of the fisheries and aquaculture subsector by 2030:

Table 5-45: Summary of the Key Goals of the Fisheries and Aquaculture Subsector by 2030

Matlamat Subsektor	
Total Fisheries Production: • 2.55 million MT	1
SSL for Fisheries Production: • 98.00%	2
Ratio of Captured Fisheries to Aquaculture Production to Achieve • 60:40	3
Ratio of Deep Sea Fish Landing to Inshore Fish Landing to Achieve • 30:70	4
Protecting 10.00% of National Marine and Coastal Area	5
Zone B towards Trawl Free Zone	6
Targeted Fisheries Income: • RM 5,500 (median) along the Value Chain of the Subsector • RM 2,724 (median) for Traditional Fishermen	7
Increase in Fish Consumption that are Safe, Traceable, and Obtained from Sustainable Sources	8

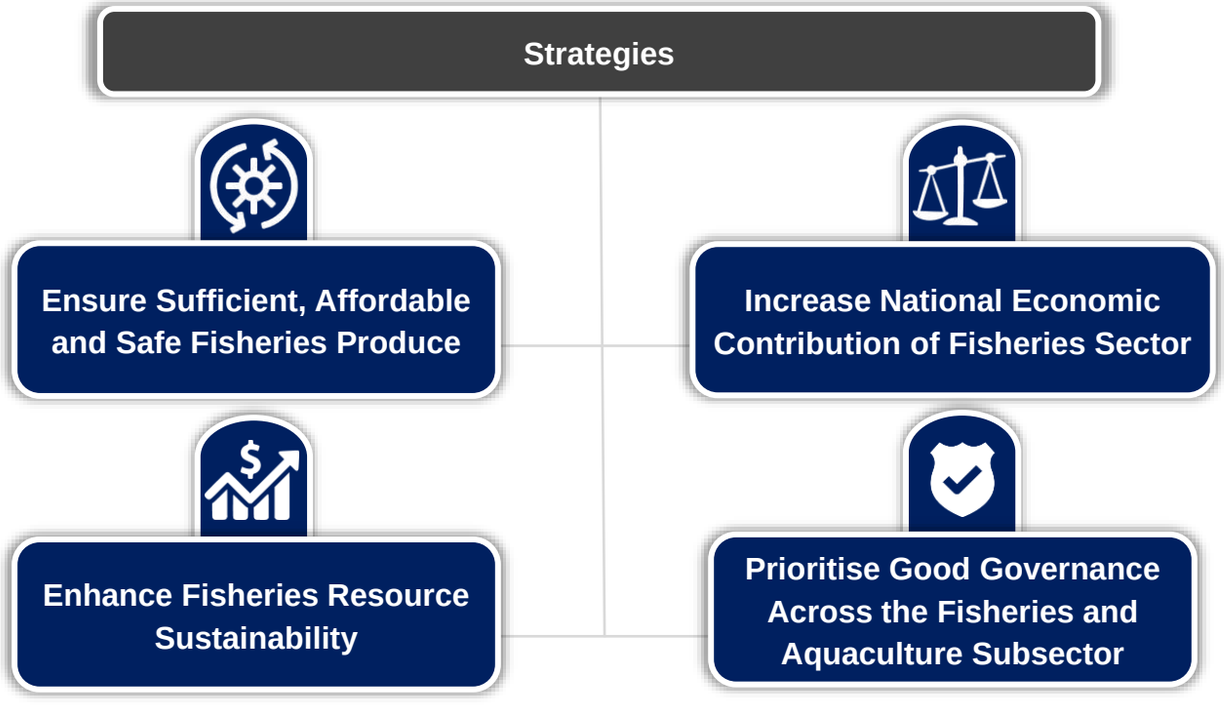
5.0 National Agrofood Policy 2.0

5.10.4 Way Forward of the Fisheries and Aquaculture Subsector

Within the next 10 years, it is crucial to look into sustainable measures in managing the fisheries and aquaculture subsector in order to have maintain and increase existing fish stock while at the same time have continuous supple of fish to the market. In order to maintain the continuous livelihood of the fisheries and aquaculture subsector, the enforcement on the control and management of fishing activities needs to be strengthened. Additionally, consumers play a vital role in the food ecosystem whereby the choices made by consumers directly affects the way the upstream of the fisheries value chain is managed and shifts towards food that are produced sustainably. Meanwhile, it is equally essential to protect and provide assistance to food producers such as fishermen and fish farmers as these people are the key stakeholders in the food ecosystem. At the same time, development of deep sea and inland fisheries should be further enhance while innovation and use of high technology and diversification of species cultured, should be further encouraged.

Four (4) main strategies as shown in Figure 5-83 will be undertaken within the next 10 years to further develop and improve the fisheries and aquaculture subsector. These strategies consider the issues and challenges faced by the fisheries and aquaculture subsector whilst setting the path in meeting the subsector goals as outlined in Table 5-45.

Figure 5-83: Strategies for the Fisheries and Aquaculture Subsector, 2021-2030



5.0 National Agrofood Policy 2.0

As shown in the summary below, each strategy were identified to address various challenges and to meet several 2030 goals identified for the subsector.

Table 5-46: Summary of the Identified Strategies for the Fisheries and Aquaculture Subsector

Strategies	Summary/Purpose of the Strategy
Ensure Sufficient, Affordable and Safe Fisheries Produce	This strategy looks into balancing fish sources in the market, with the aim to shift the fish consumption pattern from a majority of marine fisheries to a more balanced proportion of marine fisheries, inland fisheries and aquaculture.
Enhance Fisheries Resource Sustainability	To maintain and increase existing fish stock, and promote consumption of fish products that are safe and sustainable.
Increase National Economic Contribution of Fisheries Sector	To improve the income of the food producer and overall economic contribution of the fisheries and aquaculture subsector by assisting the food producers in diversifying income sources and increasing the market accessibility of national fishery produce to the global market.
Prioritise Good Governance Across the Fisheries and Aquaculture Subsector	To improve cooperation and communication with stakeholders such as state governments, enforcement agencies, fishermen and fish farmer communities and civil societies.

5.0 National Agrofood Policy 2.0

A total of 16 action plans have been formulated across the 4 strategies to further strengthen each of the strategy identified. Additionally, the action plans were formulated to facilitate in the achievement of the key goals identified for the fisheries and aquaculture subsector. Below is the mapping of the action plans to the strategies and key goals.

Table 5-47: Fisheries and Aquaculture Subsector Strategies and Action Plans against Key Goals

Strategies	Action Plans		Key Goals
1.0 Ensure Sufficient, Affordable and Safe Fisheries Produce	**[FISH] 1.1**	Modernisation and Mechanisation of Fishing Vessels to Enhance Fishing Capacities	1 2 3 4 6 7 8
	[AQUA] 1.2	Develop Feasible and Suitable Aquaculture Inputs to Provide a Sustainable Aquaculture Value Chain	1 2 3
	[AQUA] 1.3	Increase Aquaculture Productivity through Adoption of Technology and Integrated Aquaculture	1 2 3
	[AQUA] 1.4	Strengthen and Expand Industrial Aquaculture Zones to Increase Output of Aquaculture Produce	1 2 3
	[AQUA] 1.5	Improve Existing Aquaculture Species Performance and Productivity, and Identify Additional Potential Species to be Further Developed in Malaysia	1 2 3
	[FISH & AQUA] 1.6	Encourage Adoption of Certification and Biosecurity Compliance among Fishermen and Aquaculture Farmers	8 6
2.0 Enhance Fisheries Resource Sustainability	**[FISH & AQUA] 2.1**	Create Awareness on Importance and Role of Consumers in the Sustainability of the Fisheries Value Chain	8
	[FISH & AQUA] 2.2	Develop Circular Economy in Fisheries and Aquaculture	7 8
	[FISH] 2.3	Implement Fisheries Management Plans	3 4 5

5.0 National Agrofood Policy 2.0

Strategies	Action Plans		Key Goals
3.0 Increase National Economic Contribution of Fisheries Sector	**[FISH & AQUA] 3.1**	Increase Facilitation of International Market Access of Fish and Fisheries Products	7 8
	[FISH] 3.2	Encourage Additional Economic Activities as Secondary Income for Small Scale Fishermen	7 8
	[FISH & AQUA] 3.3	Encourage the Development of Food Industries and Food Processing Activities	7 8
4.0 Prioritise Good Governance Across the Fisheries and Aquaculture Subsector	**[FISH] 4.1**	Increase Coverage of Marine Protected Areas (MPAs) and Inland Water Sanctuaries	5 6 8
	[FISH] 4.2	Fisheries Resource Enhancement And Habitat Restoration	5 6 8
	[FISH & AQUA] 4.3	Strengthen Network and Collaboration with State Governments, Relevant Enforcement Agencies, Local Communities and Civil Societies	5
	[FISH] 4.4	Enhance Monitoring, Control and Surveillance (MCS) Capacities and Assets	5 6 8

5.0 National Agrofood Policy 2.0

Strategy 1: Ensure Sufficient, Affordable and Safe Fisheries Produce 1873

This strategy aims to strike a balance between the capture fisheries and aquaculture within the domestic supply of fisheries produce and products. Currently, the proportion of fish landing is segregated into 3 types which are marine fisheries, inland fisheries and aquaculture. In 2019, the distribution of fish landing is 77.68%, 0.32% and 22.00%, indicating high capture of capture fisheries. While majority of fish landing is dependent on capture marine fisheries, approximately 81.92% are fish captured within the inshore and only 18.08% are from deep sea fisheries. However, the over dependent and exploitation on marine fisheries particularly inshore fisheries without proper rehabilitation measure may cause permanent damage to the ecosystem affecting the availability and supply of fish stock in the future. Hence, the aim of this strategy is to reduce reliance on capture fisheries by providing diversification to the local supply with aquaculture. There are 3 key targeted areas under this strategy; (1) to enhance the development of deep sea fisheries such as tuna, (2) to increase production from aquaculture and (3) to promote the use of aquaculture produce for fish and fish products.

A total of 6 action plans has been formulated to support the implementation of strategy 1 as below:

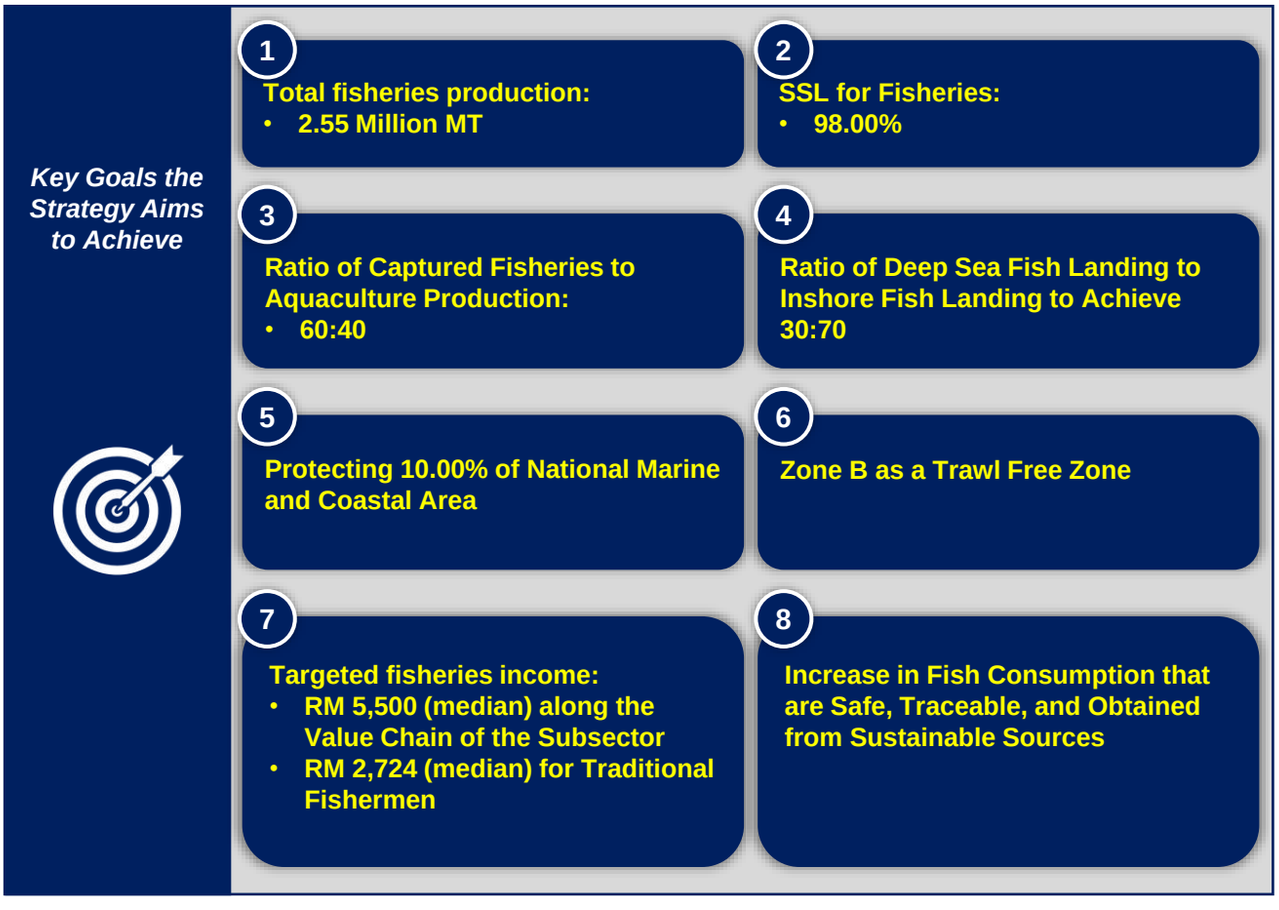
Table 5-48: Summary of the Action Plans under Strategy 1

Strategies	Action Plans	
Ensure Sufficient, Affordable and Safe Fisheries Produce	**[FISH] 1.1**	Modernisation and Mechanisation of Fishing Vessels to Enhance Fishing Capacities
	[AQUA] 1.2	Develop Feasible and Suitable Aquaculture Inputs to Provide a Sustainable Aquaculture Value Chain
	[AQUA] 1.3	Increase Aquaculture Productivity through Adoption of Technology and Integrated Aquaculture
	[AQUA] 1.4	Strengthen and Expand Industrial Aquaculture Zones to Increase Output of Aquaculture Produce
	[AQUA] 1.5	Improve Existing Aquaculture Species Performance and Productivity, and Identify Additional Potential Species to be Further Developed in Malaysia
	[FISH & AQUA] 1.6	Encourage Adoption of Certification and Biosecurity Compliance among Fishermen and Aquaculture Farmers

5.0 National Agrofood Policy 2.0

In addition, this strategy and 6 action plans have been formulated to align with 8 of the main goals as follows:

Figure 5-84: Key Goals of Strategy 1



5.0 National Agrofood Policy 2.0

Strategy 2: Enhance Fisheries Resource Sustainability

The purpose of this strategy is to encourage the production and consumption of fish and fishery products in a sustainable and safe environment. There are 2 key targeted areas under this strategy:

- Build and enhance awareness among consumers to be vigilant about the food choices by promoting the importance of consuming fish and fish products that is sustainable and traceable
- Encourage the use of good, safe and sustainable practices for fishing and farming activities among food producers

It is crucial for consumers to be aware of the nutritional value and sources of the ingredient used for daily consumption in order for them to make food choices that are safe and beneficial to their health. Additionally, with the shift of preference for safe and sustainable food and food ingredients among consumers, food producers are compelled to supply food products and ingredients that are in compliance with the market demand in order to stay in business. Hence, consumer preference is crucial in bringing the change to safe and sustainable food ecosystem. Meanwhile, on the supply side, it is vital that the production of fish and fishery products are conducted in a safe and environmental friendly manner. Good management plan on fisheries resources can positively contribute to better result in food production.

A total of 3 action plans has been formulated to support the implementation of strategy 2 as below:

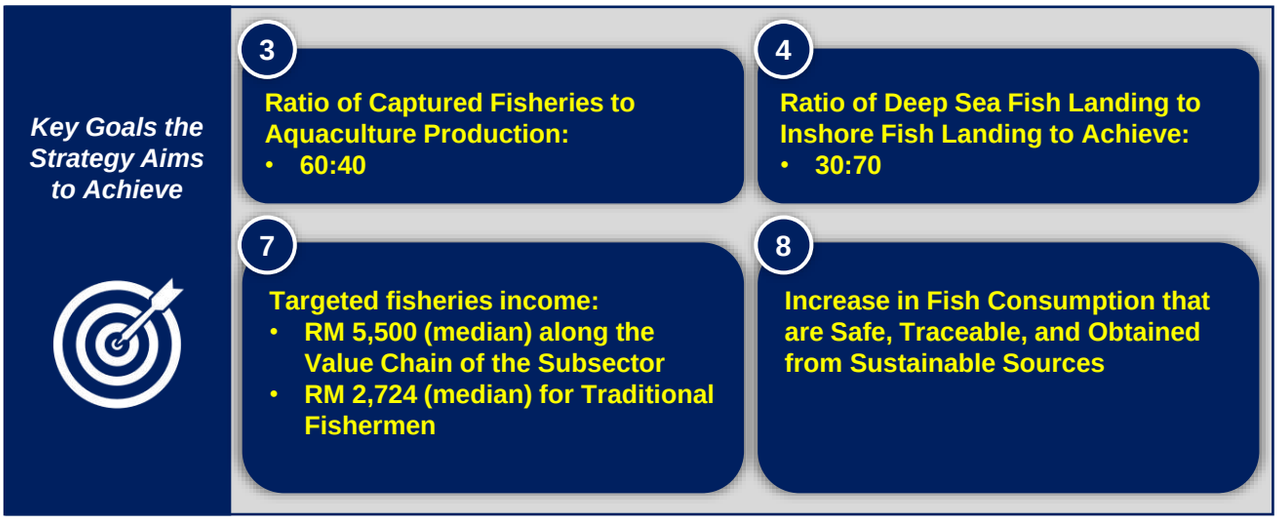
Table 5-49: Summary of the Action Plans under Strategy 2

Strategies	Action Plans	
Enhance Fisheries Resource Sustainability	**[FISH & AQUA] 2.1**	Create Awareness on Importance and Role of Consumers in the Sustainability of the Fisheries Value Chain
	[FISH & AQUA] 2.2	Develop Circular Economy in Fisheries and Aquaculture
	[FISH] 2.3	Implement Fisheries Management Plans

5.0 National Agrofood Policy 2.0

In addition, this strategy and 3 action plans have been formulated to align with 4 of the main goals as follows:

Figure 5-85: Key Goals of Strategy 2



5.0 National Agrofood Policy 2.0

Strategy 3: Increase National Economic Contribution of Fisheries Sector

This strategy is crucial to improve the livelihood and standard of living of fishermen and aquaculture farmers by promoting diversification of income sources and reducing barriers to market access particularly to the international markets. Based on 2018 statistics, the average monthly income of fishermen is approximately 40.00% lower that the national average monthly income level. Hence, this strategy is developed to promote additional sources of income for food producers in the fisheries subsector especially fishermen and aquaculture farmers who play an crucial role in the food ecosystem and value chain. The wellbeing of fishermen and aquaculture farmers is just as important as other players within the value chain. Hence, by improving the income and livelihood of fishermen and aquaculture farmers, it can indirectly improve the overall perception towards the fisheries and aquaculture, and agrofood sector.

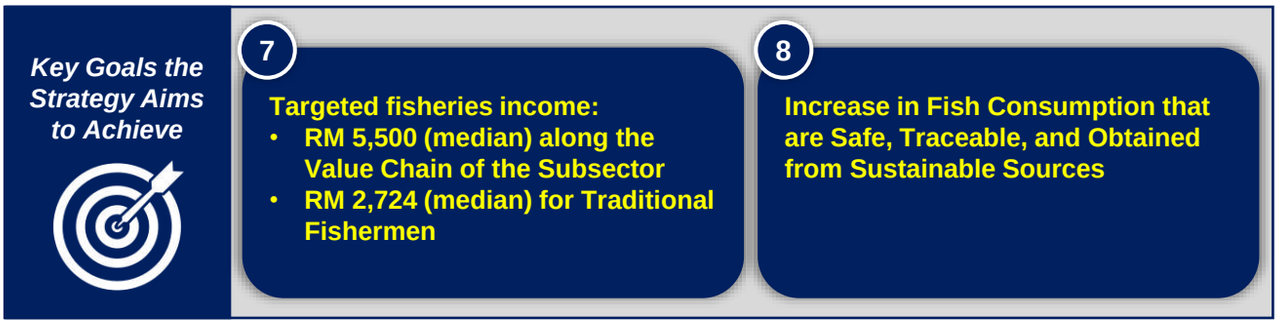
A total of 3 action plans has been formulated to support the implementation of strategy 3 as below:

Table 5-50: Summary of the Action Plans under Strategy 3

Strategies	Action Plans	
Increase National Economic Contribution of Fisheries Sector	**[FISH & AQUA] 3.1**	Increase Facilitation of International Market Access of Fish and Fisheries Products
	[FISH] 3.2	Encourage Additional Economic Activities as Secondary Income for Small Scale Fishermen
	[FISH & AQUA] 3.3	Encourage the Development of Food Industries and Food Processing Activities

In addition, this strategy and 3 action plans have been formulated to align with 2 of the main goals as follows:

Figure 5-86: Key Goals of Strategy 3



5.0 National Agrofood Policy 2.0

Strategy 4: Prioritise Good Governance Across the Fisheries and Aquaculture Subsector

Strengthening the monitoring, controlling and surveillance(MCS) effort in managing the Malaysian fishing practices is an essential strategy to protect the sustainability of the fisheries subsector and eco-system. One of the key challenge faced by the fisheries and aquaculture subsector is the depletion of resources that will affect yield and production in the future. Hence, sustainable food production system is a key factor for the sustainability of the subsector. Therefore the practice of good governance is vital for the moving forward of the fisheries and aquaculture subsector as it will mitigate risk of further depletion of coastal resources due to the over exploitation and pressure on the marine ecosystem. There are 3 key targeted areas under this strategy:

- To have stronger surveillance and enforcement effort on fishing activities and marine protection
- To provide support for deep sea fishing, inland fishing and aquaculture activities
- Stronger cooperation among stakeholders within the subsector

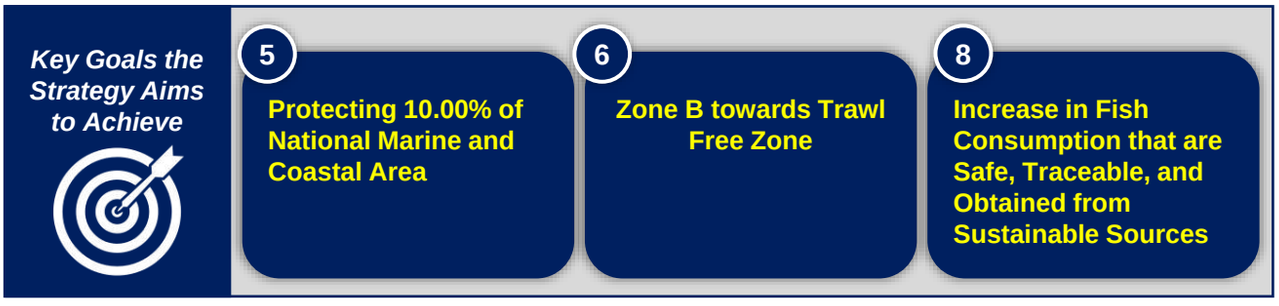
A total of 4 action plans has been formulated to support the implementation of strategy 4 as below:

Table 5-51: Summary of the Action Plans under Strategy 4

Strategies	Action Plans	
Prioritise Good Governance Across the Fisheries and Aquaculture Subsector	**[FISH] 4.1**	Increase Coverage of Marine Protected Areas (MPAs) and Inland Water Sanctuaries
	[FISH] 4.2	Fisheries Resource Enhancement And Habitat Restoration
	[FISH & AQUA] 4.2	Strengthen Network and Collaboration with State Governments, Relevant Enforcement Agencies, Local Communities and Civil Societies
	[FISH] 4.3	Enhance Monitoring, Control and Surveillance (MCS) Capacities and Assets

In addition, this strategy and 4 action plans have been formulated to align with 3 of the main goals as follows:

Figure 5-87: Key Goals of Strategy 4



5.0 National Agrofood Policy 2.0

5.10.5 Fisheries and Aquaculture Subsector in 2030

In the period 2021-2030, the fisheries and aquaculture subsector is projected to achieve 98.00% SSL with at least 40.00% of fisheries and fishery products being from aquaculture sources. This could improve the perception of aquaculture-based fishery products as well as the potential to increase their use within food ecosystems, including frozen and processed foods.

The income of fishermen and aquaculture farmers will be increased in line with the increasing cost of living. The increase in income will be able to attract new workforce participation in this subsector. In addition, technologically advanced equipment will also be widely used particularly among fishermen involved in deep sea fishing and aquaculture activities.

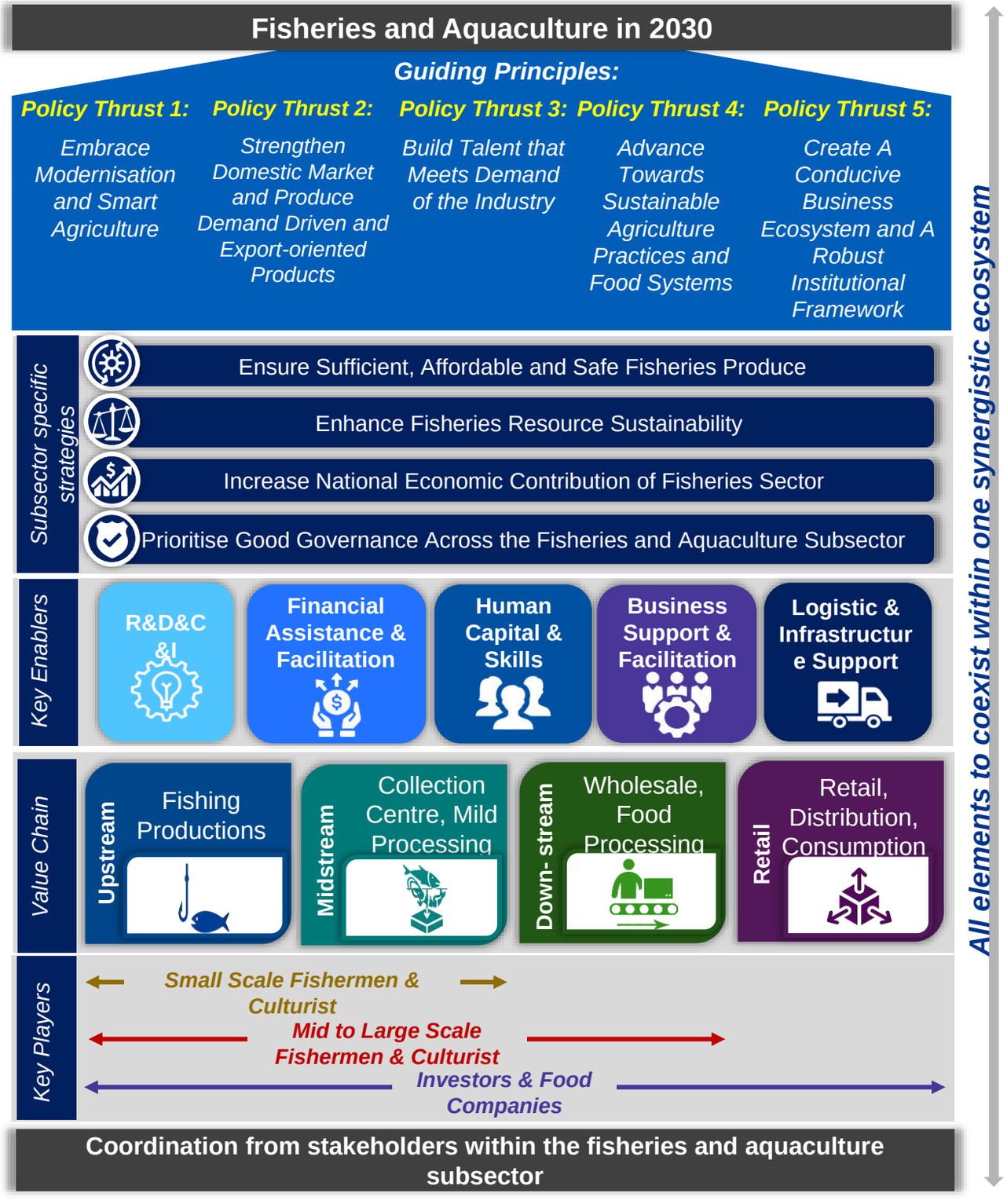
Additionally, there will be increased awareness among consumers to consume fishery and fishery products that are safe, traceable and sustainable. Consumers will be aware of and understand the importance of being able to trace food products from its origin, and to know the quality and type of food products being consumed to be sourced via sustainable and good fishing and aquaculture practices.

With increasing consumer demand for safe, traceable and sustainable fisheries and fishery products, it will be a push factor to create an influence on food producers, fishermen and fish farmers to produce fisheries and fishery products that are safe and sustainable.

There will also be an increase in effort in maintaining and sustaining the marine biodiversity and ecosystem in attempt to rehabilitate, replenish and improve the quality of marine fish stock and other natural resources. By the next decade, it is projected that there will be 10.00% of marine protected areas in Malaysia, with additional effort to implement closed season and closed areas in the Malaysian waters.

5.0 National Agrofood Policy 2.0

Figure 5-88: Fisheries and Aquaculture Subsector Conceptual Ecosystem



5.0 National Agrofood Policy 2.0

References:

1) High Level Task Force on food and nutrition security, United Nations (UN), (2015) : https://www.un.org/es/issues/food/taskforce/pdf/

2) An Introduction to the Basic Concepts of Food Security, Food and Agriculture Organisation of the United Nations (FAO), (1996): http://www.fao.org/3/a-al936e.pdf

3) Improving Productivity in Agriculture, International Atomic Energy Agency (IAEA): https://www.iaea.org/sites/default/files/agriculture.pdf

4) Agriculture research and productivity, United States Department of Agriculture (USDA), (2020): https://www.ers.usda.gov/topics/farm-economy/agricultural-research-and-productivity/

5) Study On The Impact Of International Trade In Fishery Products On Food Security, Food and Agriculture Organisation (FAO): http://www.fao.org/3/Y4961E/y4961e07.htm

6) Malaysia Annual Economic Survey Statistics for the Agriculture Sector, Department of Statistics Malaysia (DOSM)

7) Partnership for Growth: Linking Large Firms and Agro-Processing SMEs, The World Bank Group, (2018): https://openknowledge.worldbank.org/handle/10986/29822

8) World Programme for the Census of Agriculture 2020, Food and Agriculture Organisation (FAO), (2015): http://www.fao.org/world-census agriculture/wcarounds/wca2020/en/

9) Development of Agricultural Biotechnology in Malaysia in Comparison to Global Status, Malaysian Biotechnology Information Centre (MBIC), (2016): http://bic.org.my/wp-content/uploads/2019/07/Development-of-Agricultural-Biotechnology-in-Malaysia-in-Comparison-to-Global-Status-2016.pdf

10) Analysis of a pineapple-oil palm intercropping system in Malaysia, Wageningen University & Research, (2019): https://edepot.wur.nl/498793

11) The Status of the Paddy and Rice Industry in Malaysia, Khazanah Research Institute (KRI), (2019): http://www.krinstitute.org/assets/contentMS/img/template/editor/20190409_RiceReport_Full%20Report_Final.pdf

Part C

Chapter 6

Governance Structure

6.0 Governance Structure

NAP 2.0 is a 10-year policy document and the implementation of the policy would require strategic and extensive collaboration between stakeholders along the value chain of the agrofood sector. The document encompasses areas relevant to the agrofood sector and developmental agenda including food security, economic contribution, improvement on food producers livelihood, technology and modernisation driven, environmental sustainability, human capital and talent, market accessibility, and business ecosystem along the entire value chain from upstream to downstream.

Therefore, a governance structure and implementation framework that is integrated and efficient is crucial in monitoring the progress of action plans under each Policy Thrust and sub-industries leading to achieving the objectives of NAP 2.0.

This chapter encompasses 3 key elements in supporting the execution and implementation of NAP 2.0:

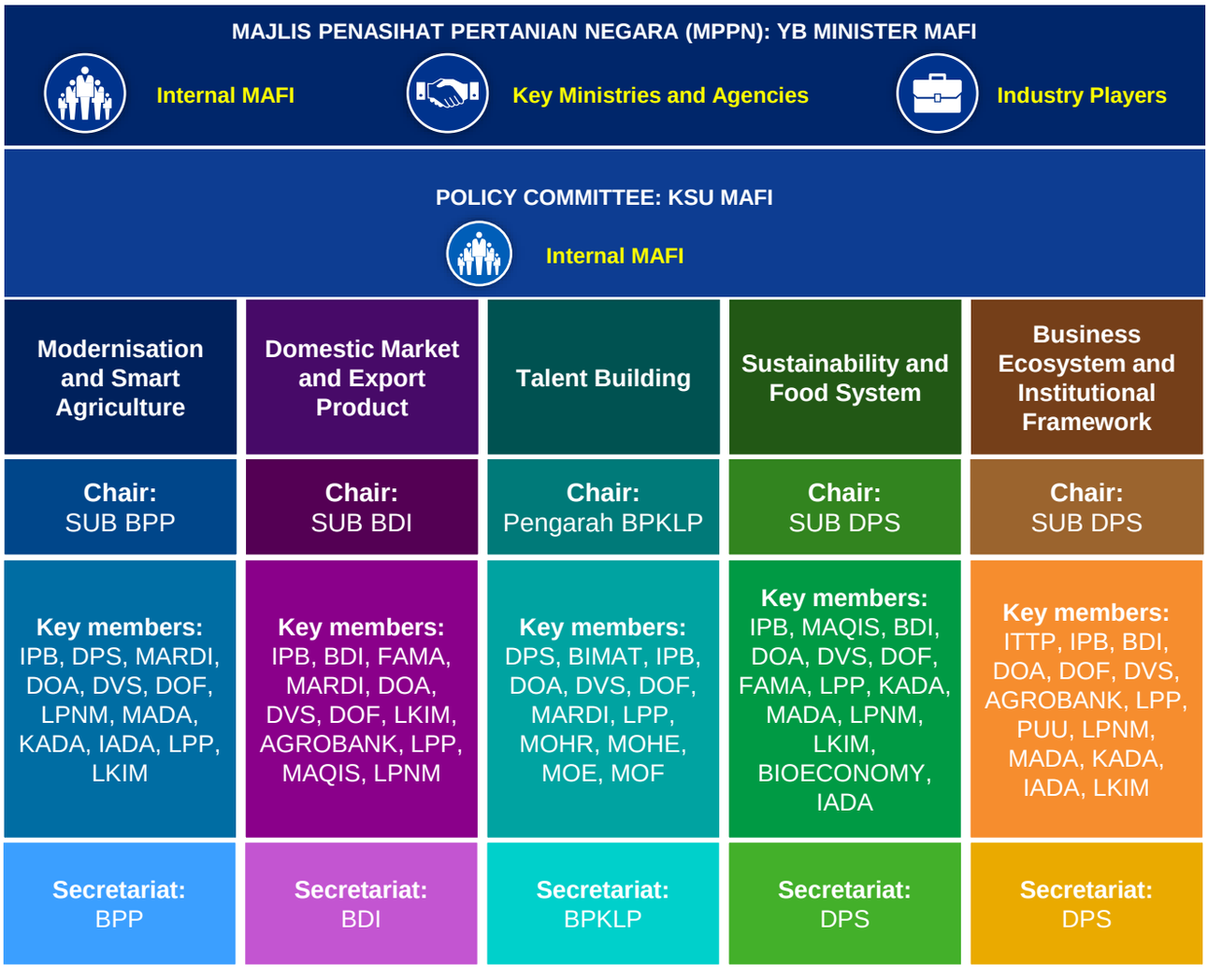
Governance Structure	*To lay out a clear reporting and monitoring structure to guide the execution of NAP 2.0 by identifying the key committees, lead and supporting stakeholders involved in the execution of the policy*
Implementation Framework	*To provide a high-level guideline comprising of operational details including timeline, lead and supporting agencies on the implementation of the proposed action plans*
Key Observation and Improvement	*To identify key observation and areas of improvement and concern on the implementation method that will impact the execution of NAP 2.0*

6.0 Governance Structure

6.1 Governance Structure of NAP 2.0

The governance structure of NAP 2.0 as shown in the Figure 6-1 below will be spearheaded by Majlis Penasihat Pertanian Negara (MPPN) as the policy advisory committee, which is chaired by the Minister of MAFI. MPPN will serve as the highest level of governance body for NAP 2.0, featuring committee members from MAFI internal departments and agencies, other key ministries/agencies and industry players/associations of agrofood sector. Following that would be the Policy Committee, chaired by the Secretary General of MAFI and consists of MAFI officers as its members. Existing policy committee platform will be leveraged to govern the 5 policy thrusts and respective action plans within NAP 2.0. The governing of 5 policy thrusts will be led and coordinated by the respective Undersecretary/Director in accordance to their key roles and expertise.

Figure 6-1: Governance Structure of NAP 2.0



6.0 Governance Structure

6.2 Implementation Framework

Policy Thrust 1: Embrace Modernisation and Smart Agriculture

Short Term (1-2 years)	Medium Term (3-5 years)	Long Term (6-10 years)	Lead Agencies	Supporting Agencies
Strategy 1: Intensifying R&D&C&I in Catalysing Modernisation of Agrofood Sector				
AP1: Coordinate, Streamline and Drive R&D Initiatives to Ensure Development of Adequate and Impactful Modern and Smart Technologies to Advance the Agrofood Industries			BPP, MARDI	DVS, DOF, MOSTI , EPU, KPLB, KASA, KeTSA, MDEC, SIRIM
AP 2: Increase Resources for R&D&C&I such as Funding, Technical Expertise and Availability of Infrastructure			BPP, MARDI	DVS, DOF, MOSTI
AP 3: Expedite Ownership of Local Technologies through Accelerating Process of Intellectual Property for Rapid and Successful Commercialisation			BPP, MARDI	DOA, DVS, DOF, MOSTI, MPC, MyIPO
AP 4: Enhance International Partnership/Collaboration on R&D&C&I Related Initiatives and Knowledges			BPP, MARDI	DVS, DOF, MOSTI, MDEC, MOHE/IPT
Strategy 2: Increase Adoption of Technology and Automation in Agrofood Sector				
AP 1: Develop Viable Technology Adoption Models to Improve the Uptake Rate of Modern and Smart Technology Packages			BPP	MARDI, IADA, MADA, KADA, DOA, DVS, DOF, LPNM, LPP, MOSTI
AP 2: Connect Food Producers with Appropriate Agrotech Service Providers to Offer Affordable Technology Packages			BPP	MARDI, IADA, MADA, KADA, DOA, DVS, DOF, LPNM, LPP, LKIM
AP 3: Enhance Readiness of Food Producers to Adopt Technology (especially Biotechnology) through Structured and Effective Promotion, Training, Technical, as well as Financial Support			BPP	BPKLP, Bioeconomy, MARDI, LPP, LPNM, MADA, KADA, IADA, DOA, DVS, DOF, LKIM, Agrobank, BDI, KeTSA, KASA

6.0 Governance Structure

Short Term (1-2 years)	Medium Term (3-5 years)	Long Term (6-10 years)	Lead Agencies	Supporting Agencies
Strategy 3: Create Conducive Ecosystem for R&D&C&I				
AP 1: Streamline and Strengthen Functions of Agencies including Effective Governance in R&D&C&I for the Agrofood Sector			BPP	MARDI, DVS, DOF, DOA, LPP, LKIM, MOHE, MOSTI
AP 2: Accelerate Development of New and Improved Resilient Varieties and Breeds with High Market Demand to Cater the Expansion of the Seed and Brood Stock Industries			ITTP	MARDI, DOA, DVS, DOF, MOSTI
AP 3: Increase Join-Collaboration between Foreign and Domestic Partners/Investors to Boost Investments and Technology Transfer in Agrofood R&D&C&I			BDI	BPP, MARDI, DOA, DVS, DOF
Strategy 4: Intensify Innovation Programmes and Activities to Support Advancement of Agrotech				
AP 1: Increase End-to-End Engagement with Private Sector in R&D&C&I Efforts to Drive Continuity in Development of New Technology, Breed and/or Product			BPP, ITTP	MARDI, DVS, DOF, DOA
AP 2: Accelerate the Development and Utilisation of Strategic Model Farms to Promote the Use of Modern and Smart Farming Methods in a Holistic Manner			BPP, ITTP	MARDI, DOA, DVS, DOF
AP 3: Increase Awareness and Participation of General Public in Developing Innovative Agriculture Solutions through Test Beds, Exhibition and Learning Centres			UKK, BPKLP	MARDI, LPP, LKIM, DOA, DVS, DOF

6.0 Governance Structure

Short Term (1-2 years)	Medium Term (3-5 years)	Long Term (6-10 years)	Lead Agencies	Supporting Agencies
Strategy 4: Intensify Innovation Programmes and Activities to Support Advancement of Agrotech *(continuation)*				
AP 4: Strengthening of Food Entrepreneurship and Food Technology Innovation			BIMAT	MARDI, FAMA, LKIM, DOA

6.0 Governance Structure

Policy Thrust 2: Strengthen Domestic Market and Produce Demand Driven and Export-oriented Products

Short Term (1-2 years)	Medium Term (3-5 years)	Long Term (6-10 years)	Lead Agencies	Supporting Agencies
Strategy 1: Enhance Development and Commercialisation of High Value Products through Greater Collaboration and Partnership with Private Sector				
AP1: Increase Provision of Business Facilitation for Product Development in Niche Areas			BDI	MARDI, LPP, Agrobank, DOA, DVS, DOF, LPNM, LKIM, BIMAT, Bioeconomy, KPDNHEP, FAMA
AP 2: Strengthen Partnership between Food Producers and Food Manufacturers to Produce Higher Value Products			BDI	LPP, FAMA, DOA, DVS, DOF, LPNM, LKIM, IPB, BIMAT, MOSTI
AP 3: Intensify Collaboration between Agencies and Local NGOs to Expand and Develop New Local Specialty Products			BIMAT	MARDI, LPP, DOA, DVS, DOF, LPNM, LKIM, IPB, KeTSA, FAMA, Sabah and Sarawak's Biodiversity Centre
Strategy 2: Increase Export of Targeted Products and Produce				
AP 1: Develop Robust Branding and Campaigns for Targeted Products in Domestic and International Market			BDI	DOA, DVS, DOF, LPNM, LKIM, IPB, BIMAT, FAMA, MATRADE
AP 2: Consolidate Similar Agrofood Products from Smallholders and Identify Focus Product to Meet International Market Demand and Enhance Promotion Effort			BDI, BIMAT	FAMA, LKIM, DOA, DVS, DOF, LPNM, IPB, AB
AP 3: Strengthen Export Value Chain and Improve Ease of Exporting (Trade Facilitation Mechanisms)			BDI	MAQIS, DOA, DVS, DOF, LPNM, LKIM, FAMA, AB

6.0 Governance Structure

Short Term (1-2 years)	Medium Term (3-5 years)	Long Term (6-10 years)	Lead Agencies	Supporting Agencies
Strategy 2: Increase Export of Targeted Products and Produce *(continuation)*				
AP 4: Enhance Market Growth and Development on High Value Product			BDI	MAQIS, DOA, DVS, DOF, LPNM, LKIM, IPB, FAMA, LPP, AB
AP 5: Improve Foreign Market Access for Food Producers with Assistance to Meet Export Standards			BDI	MAQIS, DOA, DVS, DOF, LPNM, LKIM, FAMA, AB, MATRADE
Strategy 3: Provide Support to Local Food Industries by Strengthening Domestically Produced Products				
AP 1: Encourage Private Sector to Increase Usage of Raw Material/Input Sourced Locally Through Incentive Packages			BDI	ITTP, Agrobank, DOA, DVS, DOF, LPNM, LKIM, BIMAT
AP 2: Strengthen the Resilience of Local Produce Supply Chain for Domestic Market			BDI	MARDI, ITTP, DOA, DVS, DOF, LPNM, LKIM, FAMA
AP 3: Enhance Domestic Market for Specialised Premium Products such as Organic Produce and Superfood			BDI	FAMA, Bioeconomy, DOA, DVS, DOF, LPNM, LKIM, IPB
Strategy 4: Strengthen the Role of MAFI in Championing Agriculture Related Investment				
AP 1: Intensify Investment Promotion in Targeted Areas in Both Upstream and Downstream of the Industry, including Supporting Services			BDI	Agrobank, DOA, DVS, DOF, LPNM, LKIM, BIMAT, Bioeconomy, LPP
AP 2: Strengthen Investment Facilitation with End to End Capabilities and Support to Attract New Investors and Retain Existing Ones			BDI	Agrobank, DOA, DVS, DOF, LPNM, LKIM, Bioeconomy

6.0 Governance Structure and Implementation Framework

Policy Thrust 3: Build Talent that meets the Demand of the Industry

Short Term (1-2 years)	Medium Term (3-5 years)	Long Term (6-10 years)	Lead Agencies	Supporting Agencies
Strategy 1: Attract and Retain Young Talent				
AP1: Rebranding with Incorporation of Modern and Smart Agriculture to Elevate the Young Talent in the Agrofood Sector			BPKLP	BIMAT, DOA, DVS, DOF, FAMA, MOHE, IPT
AP 2: Producing Greater Supply of Industry Ready Workforce through Integration of Graduates into the Actual Working Environment via More Internships and Apprenticeships			BPKLP	MOHE, DOA, DVS, DOF, DSD, KBS, FAMA
AP 3: Increase Exposure of Younger Generation to Agricultural Activities through Targeted Education and Other Means such as Innovation Competitions			BPKLP	MOE, DOA, DVS, DOF, FAMA, LPP
AP 4: Develop Management Model to Improve Labour Productivity			IPB, ITTP	DOA, DVS, DOF, KPLB, DOSM
Strategy 2: Forecast Demand and Develop Better Skilled Workforce for Agrofood Sector				
AP 1: Enhance/Develop a Workforce Database for Data Analytics to Make Strategic and Management Decisions on Workforce Planning Processes			DPS	DOA, DVS, DOF, IPB, MADA, KADA, IADA, LKIM, LPNM, FAMA
AP 2: Encourage and Facilitate Universities and Local Experts to Adopt Holistic Training Programmes Relating to the Agrofood Sector			BPKLP	DOA, DVS, DOF, MOHE
AP 3: Develop Human Capital and Expertise to Support Future Job Requirements and Implementation of New Technology			BPKLP	BPP, MARDI, MOHE
AP 4: Making Available Relevant Scholarship Platforms to Encourage the Pursuit of Higher Learning Degrees in Agrofood Related Fields			BPKLP	DOA, DVS, DOF, MOHE, PSD, MOF
AP 5: Upgrade Universities and Agrofood Training Centres with Modern Facilities and Equipment including ICT and Networking			BPKLP	DOA, DVS, DOF, MOHE, IPT (e.g.: UPM, UMK, Unisza, UM)

6.0 Governance Structure

Short Term (1-2 years)	Medium Term (3-5 years)	Long Term (6-10 years)	Lead Agencies	Supporting Agencies
Strategy 3: Enhance Inclusivity of Agrofood Sector				
AP 1 : Identify and Promote Suitable Career Opportunities and Implementation of Technology for Women and the Persons With Disabilities (PWD) Community in the Agrofood Sector			BPKLP	KPWKM, DOA, DVS, DOF, LPP, LKIM
AP 2: Increase Scholarship for Women, Indigenous People and PWD Communities for Agrofood Programmes			BPKLP	KPLB/JAKOA, KPWKM
AP 3: Develop Transition Programmes for Non-Agriculture Graduates with Interest in Pursuing a Career in the Agrofood Sector			BPKLP	MARDI, BIMAT
Strategy 4: Increase Efficiency and Technical Services of Extension Officers				
AP 1: Enhancing Technical Expertise of Extension Service Providers through Efficient Knowledge Transfer by Providing Structured Programmes including Cross Fertilisation with Knowledgeable Workforce/Industry			BPKLP	DSD, DOA, DVS, DOF, KADA, MADA
AP 2: Introduce Mobile Labs Comprising Extension and Research Officers, as well as Experts to Provide In-Situ Solutions to Food Producers			BPKLP	MARDI, DOA, DVS, DOF, ITTP
AP 3: Attachment of Extension Officers with Industry Associations to Build Expertise and Champion Niche Areas/Market			BPKLP	DOA, DVS, DOF, FAMA
AP 4: Train and Hire TVET Graduates and/or Experienced Food Producers as Technology Transfer Agents to Food Producers			BPKLP	DOA, DVS, DOF

6.0 Governance Structure

Policy Thrust 4: Advance towards Sustainable Agricultural Practices and Food Systems

Short Term (1-2 years)	Medium Term (3-5 years)	Long Term (6-10 years)	Lead Agencies	Supporting Agencies
Strategy 1: Reduce Food Loss and Food Wastage along the Value Chain				
AP1: Increase Awareness on Extent of Food Loss and Food Wastage along the Value Chain through Carrying Out Structured Programmes			UKK	IPB, ITTP, KADA, MADA, IADA, DOA, DVS, DOF, LPP, LPNM, FAMA, BIMAT, MARDI, KPDNHEP
	AP 2: Reduce Food Loss along the Value Chain through Smart Traceability System and Strengthening Existing Regulations		ITTP, DPS	MARDI, FAMA, MADA, KADA, IADA, DOA, DVS, DOF, LPP, LPNM, LKIM, MOSTI
	AP 3: Encourage the Use of Agrofood Waste as Inputs to Promote "Waste to Wealth" Concept		ITTP	MARDI, MADA, KADA, IADA, DOA, DVS, DOF, LPP, LPNM, KPKT
AP 4: Intensify Collaborations between Downstream Players with Food Banks and Charity Bodies to Minimise Food Wastage and Promote Zero Waste			MARDI, DPS	BIMAT, LKIM, FAMA, KPDNHEP
Strategy 2: Drive Greater Adoption of Sustainable Farming Practices with Utilisation of Bioresources				
		AP 1: Accelerate the Growth of Bioresource Start-up Companies through Collaborative Programmes and Increase in Investments	BDI, Bio-economy	DOA, BPKLP
		AP 2: Increase Adoption of Sustainable Practices through Intensification of Extension Services	IPB, ITTP, DOA	MADA, KADA, IADA, LPP, LPNM, DVS, DOF, BPKLP
		AP 3: Increase Adoption of Standard Food Certifications by Food Producers	ITTP	BIMAT, DOA, DVS, DOF, MARDI, FAMA

6.0 Governance Structure

Short Term (1-2 years)	Medium Term (3-5 years)	Long Term (6-10 years)	Lead Agencies	Supporting Agencies
Strategy 2: Drive Greater Adoption of Sustainable Farming Practices with Utilisation of Bioresources *(continuation)*				
AP 4: Promote Urban Farming to Encourage Community Participation in Food Production			ITTP	DOA, Local Authorities (PBT), KPKT, KWP
Strategy 3: Promote Conservation and Preservation of Biodiversity and Natural Resources for Sustainable Agriculture				
AP 1: Develop and Establish Core Collections of Microbes, Insects, Varieties and Breeds with Traits that are More Resistant to Pest, Disease and Climate Change Accompanied by Promotion of Integrated Pest Management			ITTP, MARDI	BPP, DOA, DVS, DOF, LPNM, MOSTI
AP 2: Enhance Protection of Local Ecosystem against the Threats of Invasive Alien Species (IAS)			ITTP	DPS, MAQIS, DOA, DVS, DOF, LPNM, MARDI, LKIM, KeTSA
AP 3: Strengthen Agrofood Planning and Good Practices to Protect the Environmentally Sensitive Areas and Important Ecosystem			DPS	ITTP, DOA, LPNM, KADA, MADA, IADA, LPP, DVS, DOF, MARDI
Strategy 4: Develop Healthy and Sustainable Food Systems				
AP 1: Facilitate the Production of Food Products that are of Higher Nutritional Quality			BIMAT	MADA, KADA, IADA, ITTP, DOA, LPP, DVS, DOF, LKIM, LPNM, MARDI, MITI, FSQ, MOH
AP 2: Provide Greater Knowledge on Nutrition to Consumers to Facilitate Healthier Food Choice			BIMAT	DOA, IPB, ITTP, LPP, DVS, DOF, LKIM, FAMA, MARDI, MITI, FSQ, MOH

6.0 Governance Structure

Policy Thrust 5: Create Conducive Business Ecosystem and Robust Institutional Framework

Short Term (1-2 years)	Medium Term (3-5 years)	Long Term (6-10 years)	Lead Agencies	Supporting Agencies
Strategy 1: Bolster Facilitation and Support on Land Matters for Agrofood Sector				
AP1: Intensify Participation and Contribution Within Existing High Level Committees/Councils to Address Issues Related to Land Matters at State Level			DPS	IPB, ITTP, IADA, KADA, MADA, DOA, DVS, DOF
AP 2: Facilitate the Development of Land Rental Market for Agrofood Production Purposes			ITTP	DOA, LPP, DVS
AP 3: Develop Suitable Models to Consolidate and Manage Land Resources, e.g. Wakaf and Vacant Land			ITTP	DOA, DVS, DOF, Majlis Agama Islam (by each state), Director Office of Land and Mines (by each state)
AP 4: Enhance Anchor Management Companies for Small Landholders via PPP Model to Drive Economies of Scale			ITTP, IPB	LPP, DOA, DVS, DOF, LPNM, MADA, KADA, IADA, FAMA
Strategy 2: Redesign Funding Support and Enhance Financial Services for Food Producers				
AP1: Design and Establish Insurance Scheme for Food Producers Against Natural Disasters			BDI, Agro-bank	ITTP, IPB, MADA, KADA, IADA, DOA, DVS, DOF, LKIM, LPNM
AP 2: Shift of Emphasis on Incentives, to Increasing Funding That Supports Sustainable or Technology Driven Farming			BDI, Agro-bank	DPS, IPB, DOA, DVS, DOF, ITTP, MADA, KADA, IADA, LKIM, LPNM, LPP
AP 3: Facilitate Financial Credibility and Improve Access to Private Funding Through Digitalisation of Credit Rating of Food Producers			BDI, Agro-bank	ITTP, MADA, KADA, IADA, DOA, DVS, DOF, LKIM, LPNM, LPP, FAMA

6.0 Governance Structure

Short Term (1-2 years)	Medium Term (3-5 years)	Long Term (6-10 years)	Lead Agencies	Supporting Agencies
Strategy 3: Drive End-to-End Digitalisation of Value Chain				
AP1: Increase Transparency and Reliability for Data Gathering and Information Dissemination			DPS	DOA, DVS, DOF, LPNM, IPB, LPP, FAMA
AP 2: Leverage AgF to Develop an Integrated National Agriculture Database Using Big Data Platform			DPS, BPM	DOA, DVS, DOF, LPNM, IPB, LPP, MARDI, FAMA
AP 3: Implement Track-and-trace Technologies to Enhance Traceability Along the Value Chain			BDI	ITTP, DPS, DOA, DVS, DOF, LKIM, LPNM, IPB, LPP, MARDI, FAMA, MOSTI
AP 4: Facilitate Participation and Connectivity of Key Players with the Agrofood Value Chain, Throughout the Process of Digitalisation			BDI	ITTP, BPP, DOA, DVS, DOF, LKIM, LPNM, IPB, LPP, MARDI, FAMA
Strategy 4: Streamline and Strengthen Governance of Agrofood Sector				
AP1: Reduce Overlapping Roles of Agencies and Enhance Role of MAFI In the Development of the Industry			BPSM	All MAFI divisions, departments and agencies
AP 2: More Frequent and Coordinated Reviews of Relevant Legislation/Regulations to Keep Up to Date Prevailing Industry Trends			DPS, PUU	All MAFI divisions, departments and agencies
AP 3: Regulate and Enhance Enforcement on Improper Use of Chemicals and Antibiotics within Farms			ITTP	DPS, MADA, KADA, IADA, DOA, DVS, DOF, LPP, LKIM, LPNM, MOH, KASA
AP 4: Bolster the Conduct of Agriculture Census to Keep Better Records of Agrofood Sector Data			DPS, DOSM	All MAFI divisions, departments and agencies

6.0 Governance Structure

Short Term (1-2 years)	Medium Term (3-5 years)	Long Term (6-10 years)	Lead Agencies	Supporting Agencies
Strategy 4: Streamline and Strengthen Governance of Agrofood Sector *(continuation)*				
AP 5: Reinforce Legal Framework and Implementation Structure Pertaining to Public-Private Partnership (PPP) Schemes			BDI	MADA, KADA, IADA, DOA, LPNM, DVS, DOF, BIMAT, FAMA
AP 6: Establish Database and Frequent Review of NTMs			BDI	AB, DPS, PUU, DOA, DVS, DOF, MAQIS, MITI, MOH, MPC
Strategy 5: Enhance Investment in Agrofood Targeted Infrastructure				
AP 1: Expedite Development of Agrofood Related Infrastructure, Especially in Locations Where it is Deficient and Justifiably in Need			BPEM, BPSP	ITTP, IPB, All MAFI divisions, departments and agencies
AP 2: Strengthen the Functionality of Agrofood Infrastructures, by Incorporating Supporting Facilities and/or Promoting Alternative Use of the Said Infrastructure (Usage Diversification)			BPEM, BPSP	ITTP, IPB, All MAFI divisions, departments and agencies
AP 3: Increase Accountability for the Management of Infrastructure, Infrastructure Users Groups on Operation and Maintenance Matters			BPSP	All MAFI divisions, departments and agencies
AP 4: Continuous Development of the Agrotourism Industry			BIMAT	DOA, DVS, DOF, MARDI, LKIM, LPP, LPNM, FAMA, DOA Sabah, DOA Sarawak, IADA, MOTAC

6.0 Governance Structure

Paddy and Rice Subsector

Short Term (1-2 years)	Medium Term (3-5 years)	Long Term (6-10 years)	Lead Agencies	Supporting Agencies
Strategy 1: Boost Productivity via Better Management of Land and Water Use				
AP1: Promote Land Use Arrangements that would Enlarge Farming Operation			IPB	BPSP, MADA, KADA, IADA, LPP, DOA, MANRED, MAF Sabah
AP 2: Support Large Scale Paddy Farming Initiatives			IPB	BPSP, MADA, KADA, IADA, LPP, DOA MANRED, MAF Sabah
AP 3: Improve Availability, Efficiency, and Management of Water Use, as well as Operation and Maintenance (O&M) of Irrigation Infrastructures			BPSP	MADA, KADA, IADA, LPP, DOA, DID, JMG, MANRED, MAF Sabah, KASA
Strategy 2: Capitalise on the Potential of Local Specialty Rice Varieties				
AP 1: To Recognise and/or Develop Specialty Rice Varieties as Part of Malaysia's Premium Agrofood Products			IPB	BPSP, MADA, KADA, IADA, LPP, DOA, MARDI, MANRED, MAF Sabah
AP 2: Promote and Facilitate Contract Farming Arrangement with New/Existing Food Producers that Cultivates Specialty Rice Varieties			IPB	BPSP, MADA, KADA, IADA, LPP, DOA, MANRED, MAF Sabah
AP 3: Update the Acts and Regulations to Create an Enabling Environment for the Entry of Small and Medium Enterprises (SMEs) to Enter the Specialty Variety Market			IPB	MADA, KADA, IADA, LPP, DOA, MANRED, MAF SABAH
Strategy 3: Restructure Existing Financial Supports, to Contribute towards Empowering Producers in Making their Own Business Decision				
AP 1: Move Toward a Voucher System for Input Subsidies, for Paddy and Rice Subsector			IPB	MADA, KADA, IADA, LPP, DOA, Agrobank, MANRED, MAF Sabah

6.0 Governance Structure

Short Term (1-2 years)	Medium Term (3-5 years)	Long Term (6-10 years)	Lead Agencies	Supporting Agencies
Strategy 3: Restructure Existing Financial Supports, to Contribute towards Empowering Producers in Making their Own Business Decision *(continuation)*				
AP 2: Periodically Reduce the Level of Support Provided through Input Vouchers and Relocate Excess Financial Resource to Other Areas for Long-term Growth			IPB	MADA, KADA, IADA, LPP, DOA, MANRED, MAF Sabah
	AP 3: Phase Out Both Input and Output Based Support with a “Decoupled Cash Payment", which does not Depend either on Current Input Use or on Quantity of Production		IPB	MADA, KADA, IADA, LPP, DOA, MANRED, MAF Sabah
Strategy 4: “Crowd In” More Diversified Private Sector along the Evolving Value Chain				
AP 1: Leverage Upon Restructured Financial Support to Encourage the Involvement of Private Sector and Farmer Cooperatives into Farming Input Supplier			IPB	MADA, KADA, IADA, LPP, DOA, MANRED, MAF Sabah, Agrobank, MEDAC
AP 2: Strengthening Backward Linkages between Input Suppliers and Paddy Farmers			IPB	MADA, KADA, IADA, LPP, DOA, MANRED, MAF Sabah
	AP 3: Restructure Output Based Support, to Facilitate the Entry of New Private Players into the Midstream Segment		IPB	MADA, KADA, IADA, LPP, DOA, MANRED, MAF Sabah
Strategy 5: Promote, Encourage, Teach and Nurture Young Generations for Future Participation in Paddy and Rice Subsector				
AP1: Promote Field Trips, Educational and Recreational Visits to Model Paddy Farms			IPB	LPP, MADA, KADA, IADA, DOA, MARDI, BIMAT, BPKLP
AP 2: Incorporate Micro Scale Paddy Planting in Community Gardens/Farms			IPB	KADA, MADA, IADA, DOA, MARDI

6.0 Governance Structure

Fruits and Vegetables Subsector

Short Term (1-2 years)	Medium Term (3-5 years)	Long Term (6-10 years)	Lead Agencies	Supporting Agencies
Strategy 1: Intensify Gene Editing Research				
AP 1: Building Expertise and Providing Suitable Facilities for Facilitating the R&D&C&I on Gene Editing Technologies			ITTP, MARDI	BPP, MADA, KADA, IADA, DOA, LPNM, MOSTI
AP 2: Accelerating the Incorporation of Multiple Desirable Traits in Food Crops through Gene Editing Technologies			ITTP, MARDI	BPP, MADA, KADA, IADA, DOA, LPNM, MOSTI
AP 3: Incorporate Gene Editing Technologies within Existing Science and Risk Based Regulatory System for Facilitating Commercialisation and Reducing Trade Barriers of Gene Edited Products			ITTP, MARDI	BPP, BDI, MADA, KADA, IADA, DOA, LPNM, MOSTI
Strategy 2: Efficient Long-term Land Management Involving All Industry Players across the Value Chain				
AP 1: Further Adoption/Development of Agro-based Hub, that Brings All Players across the Value Chain within One Agro-based Economic Zone			ITTP	DOA, State Governments, Regional Economic Corridors, FAMA
AP 2: Strengthen Existing TKPM and Development of New TKPM with Easy Accessibility and Sufficient Natural Resources			ITTP	DOA, State Governments, Regional Economic Corridors
AP 3: Promote Greater Participation of Anchor Companies in Linkages Projects within Fruits and Vegetables Economic Zones			ITTP	BDI, DOA, State Governments, Regional Economic Corridors

6.0 Governance Structure

Short Term (1-2 years)	Medium Term (3-5 years)	Long Term (6-10 years)	Lead Agencies	Supporting Agencies
Strategy 3: Promote Sustainable Development of Food Production				
AP 1: Expedite the Development of Controlled Environment Farming such as Plant Factory as Enabling Tool for Urban Farming and Cultivation of High Value Plant Based Products			BPP, ITTP	DOA, MARDI, Local Authorities (PBT), MANRED, MAF SABAH, Regional Economic Corridors
AP 2: Enhance the Development of Intercropping System			ITTP	DOA, MARDI, MPIC
AP 3: Support Community Farming Programmes and Initiatives			ITTP	DOA, KPKT, Local Authorities (PBT), MOE, MOHE
Strategy 4: Support the Growth of High Value Fruits and Vegetables				
AP 1: Promote and Facilitate Market Driven Arrangements with New/Existing Food Producers that Cultivate High Demand/High Value Fruits and Vegetables			BDI	FAMA, ITTP, DOA, LPP, LPNM
AP 2: Integration of High Value Fruits and Vegetables within Existing/Future Agro-based Hub/TKPM			ITTP, BDI	DOA, FAMA, State Governments, Regional Economic Corridors
AP 3: Explore and Develop More End Uses for High Value Fruits and Vegetables			BDI, BIMAT	MARDI, Bioeconomy, DOA, FAMA, LPNM

6.0 Governance Structure

Livestock Subsector

Short Term (1-2 years)	Medium Term (3-5 years)	Long Term (6-10 years)	Lead Agencies	Supporting Agencies
Strategy 1: Increasing Growth and Sustainability in the Poultry Industry				
AP 1.1 : Lower Barrier for Conversion from Open House to Closed House System			ITTP	DVS, Agrobank, Local Authorities (PBT), PBN, JPBD, JAS, MOH
AP 1.2: Develop and Promote Ready-to-Eat Poultry Products in the International Market and Fairs to Increase Export Access			ITTP	DVS, BDI, FAMA, MATRADE, MARDI
AP 1.3: Phase Out Use of Antimicrobials Growth Promoter (AGP) for Livestock			ITTP	DVS, MARDI
Strategy 2: Ease Market Accessibility Especially in the Ruminant Industry for New Entrepreneur				
AP 2.1: Designate Livestock Zones and Set Up Infrastructure for Intensive Cattle Farms to Rent Out to New Entrepreneurs			ITTP	DVS, BIMAT, State Governments
AP **2.2:** Ruminant Integrator to Drive Contract Farming Model			ITTP	DVS
AP 2.3: Ease Conditions on Loan Application for Ruminant Entrepreneurs			BDI, Agro-bank	DVS
Strategy 3: Grow Number of Ruminant Livestock				
AP 3.1: Increase Implementation of Ruminant-Oil Palm Integration System			ITTP	DVS, MPIC, MPOB, MARDI
AP 3.2: Financial Incentive to Increase Scale of Intensive Ruminant Stock Breeding Programme			BDI, ITTP	DVS
AP 3.3: Increased Capacity and Quality of Veterinary Development Services for the Application of Animal Husbandry Best Practices			ITTP	DVS, MARDI, MOHE/IPT

6.0 Governance Structure

Short Term (1-2 years)	Medium Term (3-5 years)	Long Term (6-10 years)	Lead Agencies	Supporting Agencies
Strategy 4: Mitigate and Control Loss of Livestock to Diseases				
AP **4.1:** Strict Border Enforcement to Prevent Diseases being Brought In through Livestock Smuggling			MAQIS	DVS, Border enforcement agents
		AP 4.2: Regulation to Make Licensing of Slaughterhouse Compulsory Nationwide	ITTP	DVS
	AP 4.3: Insurance System against Infectious Diseases		BDI, ITTP, Agro-bank	DVS
		AP 4.4: DVS to Increasing Laboratory Capacity and Veterinary Services	ITTP	DVS, MARDI
Strategy 5 : Reduce Dependency on Imported Feed				
		AP 5.1: R&D to Identify Economical and Precise Feed Formulation	ITTP	MARDI, DVS, DOA, MPIC, MPOB, MOSTI
AP 5.2: Regulation of Quality and Quantity of PKC to be Used as Feed Source Substitution			ITTP	DVS, MARDI, MPIC, MPOB
AP 5.3: To Provide Incentive of Locally Produced Feed for Local Use			BDI, ITTP	DVS in collaboration with MOF, KPDNHEP/ MyCC, MPIC, MPOB)

6.0 Governance Structure

Fisheries and Aquaculture Subsector

Short Term (1-2 years)	Medium Term (3-5 years)	Long Term (6-10 years)	Lead Agencies	Supporting Agencies
Strategy 1: Ensure Sufficient, Affordable and Safe Fisheries Produce				
AP 1: Modernisation and Mechanisation of Fishing Vessels to Enhance Fishing Capacities			BPP, ITTP	DOF, Agrobank, LKIM, MOT, MOSTI
AP 2: Develop Feasible and Suitable Aquaculture Inputs to Provide a Sustainable Aquaculture Value Chain			ITTP	DOF, LKIM, MARDI, MIDA, MOSTI
AP 3: Increase Aquaculture Productivity through Adoption of Technology and Integrated Aquaculture			ITTP	DOF, Agrobank, Regional Economic Corridors
AP 4: Strengthen and Expand Industrial Aquaculture Zones to Increase Output of Aquaculture Produce			ITTP	DOF, State Governments, Regional Economic Corridors
AP 5: Improve Existing Aquaculture Species Performance and Productivity, and Identify Additional Potential Species to be Further Developed in Malaysia			ITTP	DOF, MARDI, MOSTI, MOHE/IPT
AP 6: Encourage Adoption of Certification and Biosecurity Compliance among Fishermen and Aquaculture Farmers			ITTP	DOF, LKIM, MAQIS, MOH
Strategy 2: Enhance Fisheries Resource Sustainability				
AP 1: Create Awareness on Importance and Role of Consumers in the Sustainability of the Fisheries Value Chain			UKK, ITTP	DOF, LKIM, DPS KPDNHEP
AP 2: Develop Circular Economy in Fisheries and Aquaculture			ITTP	DOF, LKIM, KASA, KPKT/NSWMD
AP 3: Implement Fisheries Management Plans			ITTP	DOF, LKIM, KeTSA

6.0 Governance Structure

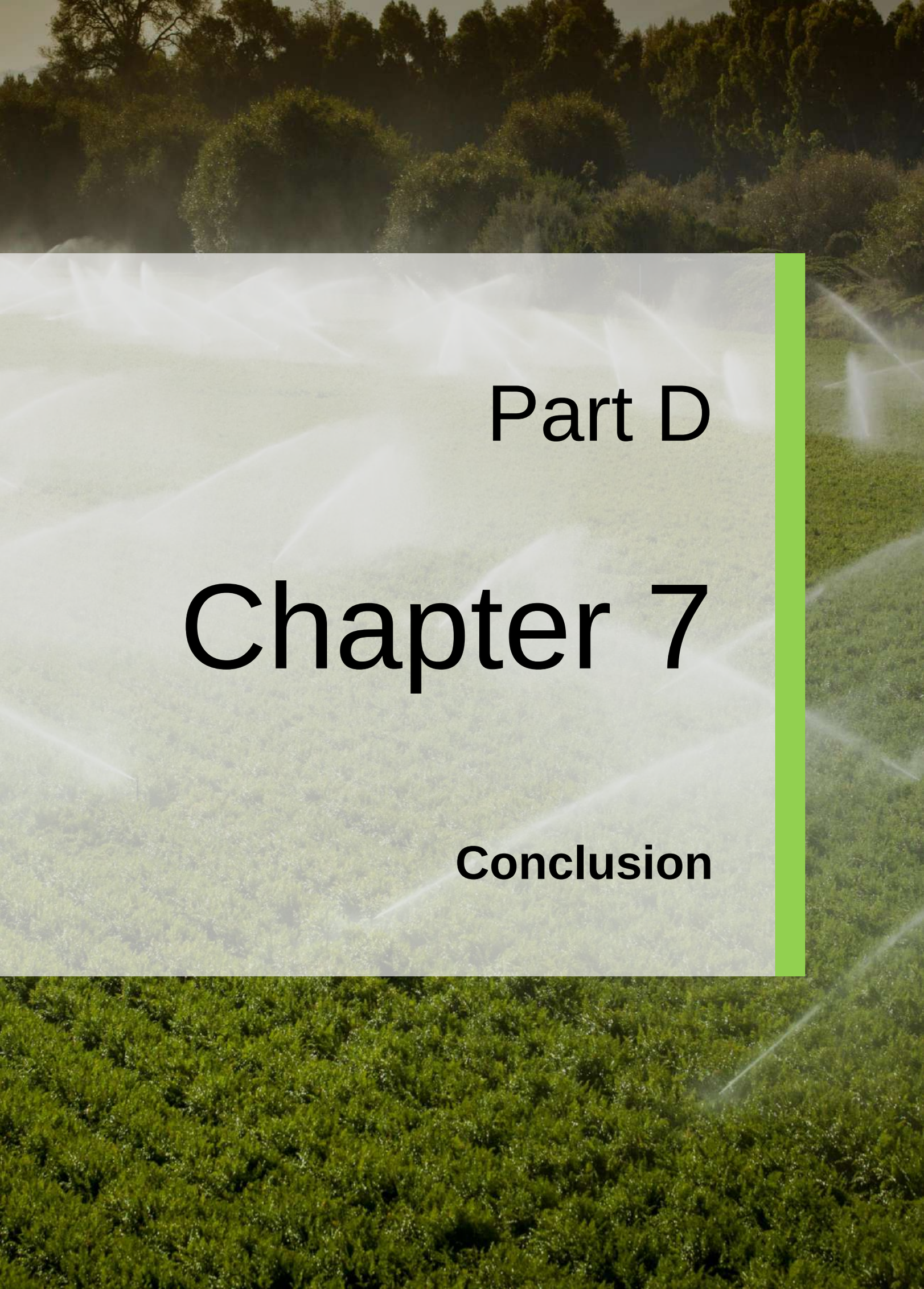
Short Term (1-2 years)	Medium Term (3-5 years)	Long Term (6-10 years)	Lead Agencies	Supporting Agencies
Strategy 3: Increase National Economic Contribution of Fisheries Sector				
AP1: Increase Facilitation of International Market Access of Fish and Fisheries Products			BDI, ITTP	DOF, LKIM, MAQIS, MITI, MOH
AP 2: Encourage Additional Economic Activities as Secondary Income for Small Scale Fishermen			ITTP	DOF, LKIM, BIMAT
AP 3: Encourage the Development of Food Industries and Food Processing Activities			BIMAT	ITTP, DOF, LKIM, MARDI, Agrobank, MEDAC, MITI, MOH
Strategy 4: Prioritise Good Governance Across the Fisheries and Aquaculture Subsector				
AP 1: Increase Coverage of Marine Protected Areas (MPAs) and Inland Water Sanctuaries			ITTP, DPS	DOF, LKIM, State Governments, KeTSA
AP 2: Fisheries Resource Enhancement And Habitat Restoration			ITTP, DPS	DOF, LKIM
AP 3: Strengthen Network and Collaboration with State Governments, Relevant Enforcement Agencies, Local Communities and Civil Societies			ITTP	DOF, LKIM, Federal Government Agencies, State Governments, MOSTI
AP 4: Enhance Monitoring, Control and Surveillance (MCS) Capacities and Assets			ITTP	DOF, BPEM, LKIM, MOHA, MOT, MINDEF, MOFA

6.0 Governance Structure

6.3 Key Observation

Observations gathered from stakeholder engagement sessions and further analysis have identified several key areas of concern that needs to be prioritised on the implementation of the NAP 2.0.

Project Management and Monitoring	Comprehensive project management and monitoring is the foundation for well execution of projects. Hence, it is important to look into project monitoring and management methods that will provides a clear reporting mechanism and guidelines for stakeholders involved in the execution and implementation of the policy. This would also include providing briefing on the policy, clear communication on objectives and KPIs, scheduled discussion and continuous updates on project progress, outcome and troubleshooting.
Database Management	Database management is one of the essential key supporting function for project execution and monitoring. It provides stakeholders with data and information on the progress and stage of implementation of specific projects. Good database management will have to also depend on an integrated platform which is a crucial element to ease project monitoring and reporting. However, database management is complex and would require collaborative effort from all stakeholders involved in the execution and implementation of the policy.
Understanding Roles of Stakeholders	Roles and responsibility of each stakeholder involved in the execution and implementation of objectives and key milestones of the policy should be well cascaded from the policy advisory council and committee, as well as management level to the relevant stakeholders. This is to provide a clear understanding of the goals and key aspiration of the policy roles as well as the roles and responsibilities of stakeholders at all levels to reduce overlapping of work.
Communication between Stakeholders	Clear communication between stakeholders involved in the implementation of the policy is crucial as it facilitate the overall implementation and monitoring of projects. Effective communication between agencies can also reduce potential silos and overlapping of work which can lead to cost optimisation as a result of lean project implementation.



Part D

Chapter 7

Conclusion

7.0 Conclusion

7.1 The Future of Malaysia Agrofood Sector

The National Agrofood Policy (NAP) 2.0 is a policy document that lays down the foundational pathway for the reference of all stakeholders to coordinate and collaborate as one cohesive unit, to contribute towards Malaysia's target of enhancing its state of food security, while at the same time having an agrofood sector that is economically, socially, and environmentally outstanding at both national and global level.

NAP 2.0 was formulated with reference to all relevant policies of both national and international level, particularly Shared Prosperity Vision 2030, the 12th Malaysia Plan, and Sustainable Development Goals 2030. The result is a policy document that not only serves as the developmental framework for Malaysia's agrofood sector, but will also contribute strongly towards the global agenda and the greater aspiration of the nation that is represented in the policy statement. NAP 2.0 provides measurable milestones and specific industry goals to be achieved by 2025 and 2030 supported by 3 policy principles; Economy, Social, and Environment.

Table 7-1: Key Goals of NAP 2.0 in Summary

Economy
▪ Contribution of Agrofood Sector to National GDP
▪ Average Annual Value-added Growth
▪ Food Trade Balance CAGR
▪ Food Loss
Social
▪ Income Level of Food Producers
▪ Local Participation in Agrofood
▪ Self Sufficiency Level
▪ Food Waste and Food Nutritional Quality
Environment
▪ Agrofood GHG
▪ Sustainable Fish Stock
▪ Biodiversity

Figure 7-1: NAP 2.0 Policy Framework and its relationship to relevant policy documents

7.0 Conclusion

Figure 7-2: NAP 2.0 in a Glance

Referring to Figure 7-2, NAP 2.0 is supported by five Policy Thrusts which have been formulated according to the needs of the sector itself:

1) Embrace Modernisation and Smart Agriculture - modernisation of agrofood sector to be in parallel with the standard of IR 4.0
2) Strengthen Domestic Market and Produce Demand Driven and Export-oriented Products - enhance agrofood sector market resilience by building strength on our domestic abilities and stronger position on global food trade
3) Build Talent that Meets Demand of the Industry - shifting towards a highly skilled local labour force, increases worker's productivity and employment opportunity
4) Advance towards Sustainable Agriculture Practices and Food Systems - strive for better balanced development and growth that looks to safeguard the interest of food consumers and the natural environment
5) Create Conducive Business Ecosystem & Robust Institutional Framework - an enabling business environment that facilitates greater entry and investment from business entities onto agrofood sector, as well as governance structure that is effective in promoting collaborative efforts, coordination, industry regulation, and support amongst all stakeholders

The five Policy Thrusts contains a total of 21 strategies and 77 action plans that are to be implemented industry-wide, coupled with 18 strategies and 58 action plans to be realised in the four key sub-industries which are paddy and rice, fruits and vegetable, livestock, and fishery and aquaculture.

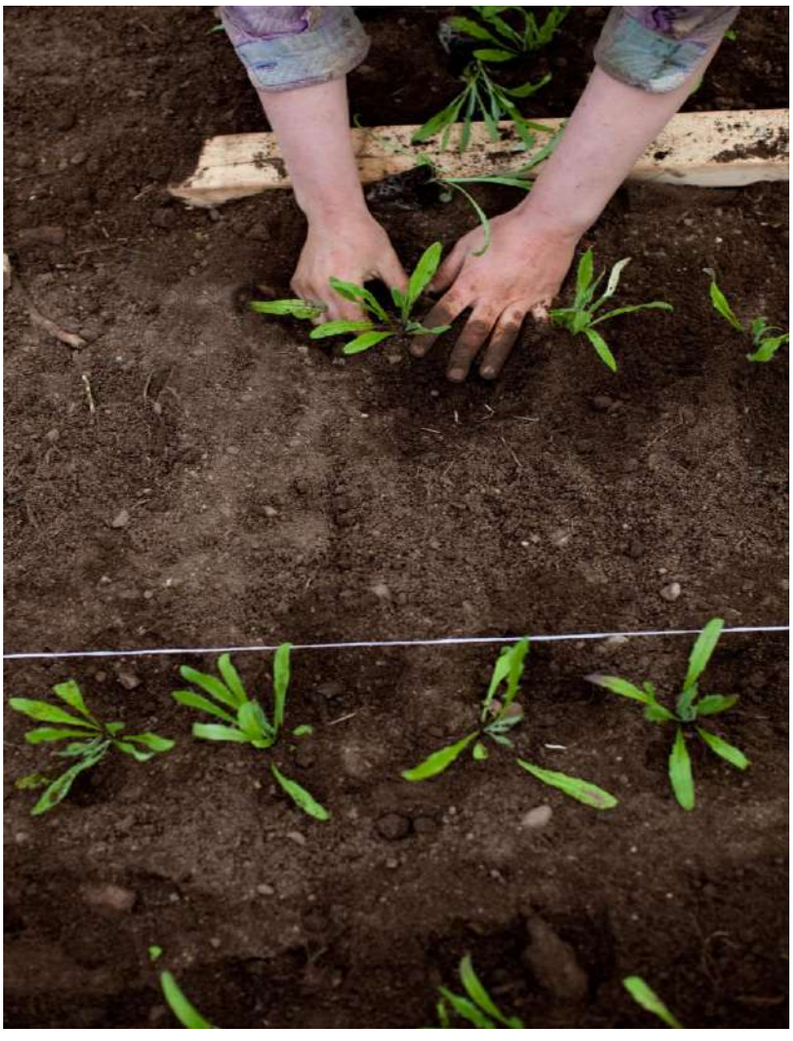
7.0 Conclusion

Amidst the ever-shifting global and regional landscapes that have a significant impact on the state of food security as well as the changing perception on what agrofood sector entails as a economic sector within the process of nation development, NAP 2.0 serves as the framework to unite all stakeholders to enable cohesive collaboration and contribution towards the betterment of the agrofood sector in navigating current challenges.

The resilience and readiness of the country have been tested with various shocks to the level of food security in the wake of the COVID-19 pandemic. This event, coupled with the growing urgency for IR 4.0 transition to enhance the competitiveness of the agrofood sector has led to the need to formulate a strategic direction and action plan to the next developmental phase. The agrofood sector in the period 2021-2030 must be advanced to a stage which it is well-prepared against the various challenges facing the country while uplifting the economic status and well-being of its players along the value chain and achieving environmental sustainability.

To realise the goals of NAP 2.0, continuous efforts need to be focused on facilitating effective collaboration and greater participation from all relevant stakeholders which includes government/state authorities and industry players.

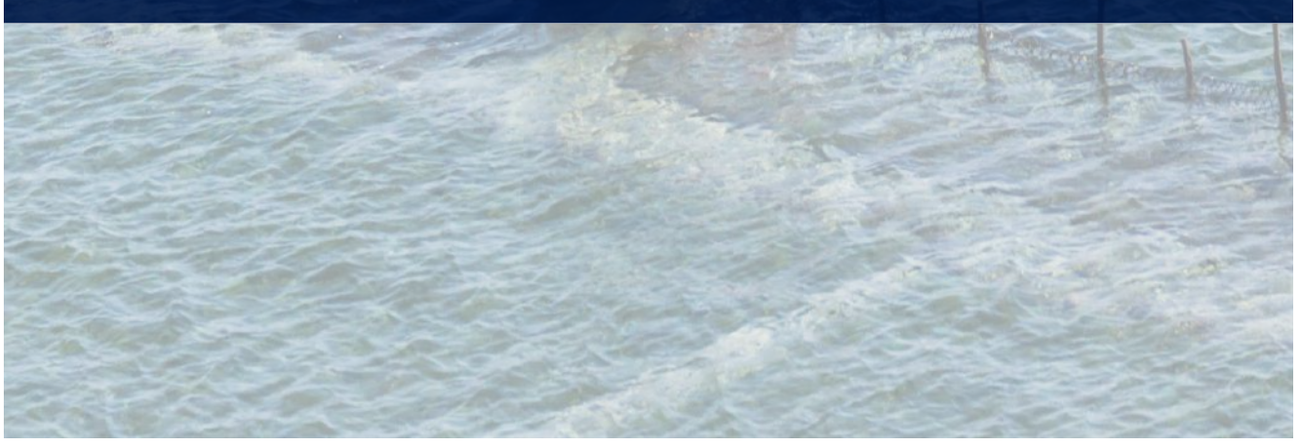
NAP 2.0 reflects the commitment of the Malaysian Government to continue continue in its pursuit for the betterment of the nation by focusing development efforts for a sustainable, resilient and technology driven agrofood sector. The effective implementation of DAN 2.0 will be able to drive the agrofood sector as well as strengthen Malaysia’s food security agenda in line with the nation’s Shared Prosperity Vision 2030.



7.0 Conclusion

The Ministry of Agriculture and Food Industries (MAFI) acts as the main agency to coordinate the achievements and efficiency of agrofood initiatives that are carried out or assisted by various government ministries and agencies. Such coordination is important to ensure that the outcome of these initiatives contributes to the objectives of NAP 2.0 towards realising the national aspiration of Shared Prosperity Vision:

"A sustainable, resilient and technology driven agrofood sector that prioritises food security and nutrition while driving economic growth and enhancing the wellbeing of the rakyat"



MINISTRY OF AGRICULTURE AND FOOD INDUSTRIES
Block 4G1, Wisma Tani,
No. 28, Persiaran Perdana, Precint 4,
Federal Government Administrative Center,
62624 Putrajaya, Malaysia.

Tel : 03-8000 8000
Fax : 03-8888 6020
E-mail : pro@mafi.gov.my

www.mafi.gov.my

@mafimalaysia