



A Background Review of Agriculture and Food Systems in Malaysia, in preparation for the TEEBAgriFood Malaysia Study

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Report structure, purpose and limitations

The Economics of Ecosystems and Biodiversity (TEEB) initiative, coordinated by UN Environment, was developed in response to the need for a transformative change in food systems in order to meet the Sustainable Development Goals agreed globally. TEEB for Agriculture & Food (TEEBAgriFood) has developed an Evaluation Framework that provides a comprehensive and universal approach to capture positive and negative impacts and externalities across eco-agri-food value chains. It is a frame of reference that allows us to answer the question "what should we value and why?" The initiative is aimed at making the values of biodiversity and ecosystem services visible in decision-making, within the agriculture and food sector.

Malaysia is piloting the TEEBAgriFood approach to 'Measuring what Matters' in agriculture and food systems alongside six other countries (Brazil, China, India, Indonesia, Mexico, and Thailand), in a project that is funded by the EU. The project aims to identify intervention options and implement policy adjustments that result in a shift toward sustainable food production systems and improved biodiversity and livelihood outcomes. The objective is to move beyond standard agriculture indicators (i.e. yield per hectare) to include more holistic, long term elements of agricultural economics and development; to identify, develop and catalyze the application of a mix of policies and tools that capture the values of ecosystem services across the agri-food value chain; and to establish the enabling conditions for agri-business to build a sustainable economy and place biodiversity as a cornerstone of agriculture and food systems.

In order for the TEEBAgriFood Malaysia project to be carried out and focus on a particular agricultural sector or commodity, it is important to first have a background understanding of the Malaysian context, especially in terms of its agriculture and food sector, which therefore is the main aim of this report.

The background report begins by providing a brief general overview of Malaysia and continues by covering recent events connected to COVID and consequences that have impacted the Malaysian agriculture and food sector. It then discusses the nation's food consumption patterns, the agriculture and food sector, and biodiversity, before going into Malaysian development planning and agricultural policies.

This document was developed by UNEP-TEEB based entirely on background literature review. Some of the figures are dated, and the report would benefit from more up-to-date statistics. *The document has not been reviewed/cleared by the Malaysian government. UNEP-TEEB recognizes the limitations of the document, and we would welcome contributions from stakeholders to improve the document. We do however hope that it serves its intended function, i.e. to stimulate discussion at the Inception Workshop 2-3 December 2020.*

Executive Summary

1. Over the past few decades, Malaysia has transitioned from an agriculture-based economy to an industrial and service-based economy. **Though the agricultural sector's contribution to GDP has declined in relative importance, it remains a vital part of the economy.** Sustainable development of the agricultural industry is a key focus of the national agri-food policy.
2. **The National Agrofood policy and other agricultural policies and policy instruments have been employed to support the agriculture sector,** which have among other things, aimed to increase food security and the maximization of income particularly amongst rural farmers. The most important instruments of public policy affecting the incentive structure of agriculture have been subsidies on inputs and output, taxes on imports and other direct and indirect taxes, agricultural credits, guaranteed minimum prices (GMP) for agricultural products, and the provision of drainage and irrigation as well as other agricultural facilities and services, including extension, research and marketing, all of these affecting, primarily, the smallholder sector.
3. Despite improvements in food production, **Malaysia continues to be a net importer of food with annual imports of \$13 billion as of 2018,** and income inequalities between the urban and rural areas still exist.
4. In addition, to biodiversity conservation, sustainable agriculture production is also emphasized under the current **National Policy on Biological Diversity 2016-2025.** It serves as a national blueprint for the overall biodiversity management in the country as well as to fulfil its obligations under the Convention on Biological Diversity, to which Malaysia became a party in 1994.
5. Research into complex trade-offs between social, economic and environmental objectives in the Malaysia's agri-food systems is limited and still evolving. **More comprehensive analysis of potential social- economic and environmental trade-offs is generally constrained by the complexity of the agri-food value chains and data availability.** However, an understanding of these trade-offs is crucial for the effective implementation of the Malaysian Government sustainable agriculture initiatives.
6. **The UNEP TEEBAgriFood project** on promoting biodiversity and sustainability in the agriculture and food sector in Malaysia **complements the Government's green growth initiatives and the 12th MP objective of establishing new principles, including ecosystem services valuation,** in agricultural economy, by highlighting several trade-offs made in land-use decisions and mainstreaming the values of biodiversity and ecosystem services values in decision-making.
7. During the COVID-19 pandemic, the agriculture industry was classified as critical by the government during the application of the Movement Control Order, allowing businesses to operate as usual. Nevertheless, **food production and distribution have been disrupted** due to the limited supply of raw materials and inputs, shortages in labour and market access, hindrances in global supply chains and exports, as well as decreasing bulk demand from the hospitality and tourism sector.

8. **Transport restrictions** have slowed down agricultural services and hampered farmers from selling their produce or buying inputs, which has resulted in a **loss of produce and income and an increase in post-harvest loss and food waste**, while consumers have been facing difficulties in accessing enough food to meet their daily dietary needs.
9. The nations' agriculture sector depends on foreign workers to a large extent, and with movement restrictions in place, **labour shortages have been felt along entire value chains**, impacting food availability as well as market prices.
10. The UNEP-TEEBAgriFood project will be responsive to the changes in the sector and the economy overall brought about by the COVID-19 pandemic.

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1. Introduction

1. Malaysia has achieved impressive economic growth over the past four decades making it the third largest economy in South East Asia, after Indonesia and Thailand (as of 2018)¹. Currently, an upper middle-income country, Malaysia is attempting to achieve high-income status by 2024 (Aziz, 2019). Since 1960, Malaysia has pursued various economic reforms and **has transitioned through phases which can be grouped into three broad economic eras**, namely: agricultural (1960 - 1974); industrial (1975 - 1999) and urbanization (2000 - date) (Olaniyi et al., 2013).
2. Particularly during the urbanization era, the services sector (estimated at 55% of GDP) and manufacturing sector (estimated at 37% of GDP) have increasingly spearheaded the country's economic growth, while **the agriculture sector's contribution has declined from around 43.7% of GDP in 1960 to 18.7% in 1990 and further down to 8.4% in 2020** (Dardak, 2015).
3. However, agriculture remains a vital part of the economy, employing nearly 11% of the 14.94 million people from the labour force (Izad, 2012). **65% of the agriculture sector GDP comes from international trade**, especially in palm oil, rubber, and timber, but the country also relies on imports of key products including wheat, rice, dairy products and more. In 2017, agricultural products contributed 13.5% of the total export and 10.4% of imports (Dardak, 2019). Thailand, Indonesia and China are currently Malaysia's top trading partners for agricultural products (International Trade Administration 2020).
4. Challenges that this sector faces include: labour shortages that have led to an increase of idle agricultural land; a high dependency on foreign labour; increasing production and input costs; and low productivity and quality of agricultural produce – implying that the sector is in need of a sustainable transformation (Dardak, 2015).

2. Covid-19 Update

2.1. Situation summary for COVID-19 in Malaysia

5. As of **15 November 2020, there have been 47,417 confirmed cases of COVID-19 in Malaysia**. On 6 November, Malaysia recorded 1,755 new cases which is the highest single-day report of confirmed cases since the beginning of the outbreak (WHO 2020). Sabah and Selangor continue to be the states with the highest number of cases reported.
6. Malaysia has implemented several measures to contain the COVID outbreak since early 2020. A Movement Control Order (MCO) was put in place in March 2020 by the government as a preventive measure, forcing schools and non-essential businesses to close, banning interstate travel and introducing curfews. Following a drop in infections, restrictions were gradually eased as Malaysia entered a Conditional MCO (CMCO) phase in May. In June the government announced

¹ <http://statisticstimes.com/economy/countries-by-gdp.php>

a Recovery MCO (RMCO) allowing almost all activities to resume and businesses to reopen, after which cases again surged and new restrictions were set in place.

7. With cases currently rising again since early October, Kuala Lumpur, Putrajaya and Selangor, as well as Labuan and Sabah, have been placed under CMCOs, while MCOs have been implemented in other severely affected areas (WHO 2020, Martinus 2020).
8. Malaysian health authorities have established a national COVID-19 vaccination deployment plan that will be initiated when a safe vaccine has been identified. Priority will be given to front-line workers directly involved in combating the virus, elderly citizens and people with comorbidities (WHO 2020).

2.2. COVID-19 impacts on Malaysia's agriculture and food sector

9. The agriculture industry was classified as critical by the government during the application of the Movement Control Order, allowing businesses to operate as usual. Nevertheless, **food production and distribution have been disrupted** due to the limited supply of raw materials and inputs, shortages in labour and market access, hindrances in global supply chains and exports, as well as decreasing bulk demand from the hospitality and tourism sector (Shaharudin 2020, Vaghefi 2020). At the same time, food prices have risen due to the unpredictable market and change in consumer patterns (Abdullah et al. 2020).
10. **Transport restrictions** have slowed down agricultural services and hampered farmers from selling their produce or buying inputs, which has resulted in a **loss of produce and income and an increase in post-harvest loss and food waste**, while consumers have been facing difficulties in accessing enough food to meet their daily dietary needs (Abdullah et al. 2020, Vaghefi 2020). As such, volunteer groups were set up and the government's Welfare Department began delivering food to underprivileged groups (Abdullah et al. 2020).
11. The nations' agriculture sector depends on foreign workers to a large extent, and with movement restrictions in place, **labour shortages have been felt along entire value chains**, impacting food availability as well as market prices (Vaghefi 2020).
12. Because of the lockdowns, cooking at home has been increasing which has led to a change in consumer behaviour as demand for fresh food items at local markets and supermarkets increased (Abdullah et al. 2020).
13. The pandemic has led to changes in consumer behaviour and purchasing modalities, with the MCO resulting in increased purchases of staple and ready-to-eat food, increased online grocery shopping, increased home deliveries and increased cooking at home (Abdullah et al. 2020, Vaghefi 2020). As such, agribusinesses will have to adjust to these new consumer trends.
14. Despite Malaysia having achieved food security by international standards, the nation still depends heavily on food imports. Local food production is insufficient to meet the demand of the growing population. Over time, low prices of food imports have led Malaysian farmers to switch

to growing cash crops instead of food crops. **As overseas transportation has been disrupted and food import prices increased, much work is still needed to achieve a stable food supply, to ensure resilience against future threats** (Abdullah et al. 2020).

15. Because around 10% of Malaysia's labour force is involved in agriculture (Department of Statistics, Malaysia 2019), ensuring food security and protecting the well-being of workers in the sector is critical during the crisis, especially as the average wage of workers in the agriculture, fishing and forestry sector is lowest compared to other sectors, exposing workers to economic hardships (Abdullah et al. 2020, Shaharudin 2020).

2.3. Government measures taken within the agriculture sector in response to Covid-19 pandemic

16. Labour restrictions risk causing bottlenecks in horticulture, livestock, aquaculture and production systems, as well as for planting and harvesting of crops that are both labour-intensive and seasonally specific. It is of critical importance to designate safe working conditions for the agriculture workforce, to secure future growing seasons and avoid negative impacts on future food security and supply (Abdullah et al. 2020).
17. Around 90% of agricultural establishments in Malaysia are SMEs, and these SMEs employ almost half the workers in the agriculture sector, making them vulnerable to the impact of the economic crisis (Shaharudin 2020). The government has provided **special measures for SMEs and low-income earners** including for the agriculture sector, which include lending facilities, fund injections for infrastructure development and short-term agriculture projects, financial assistance to workers on unpaid leave, wage subsidy programmes etc. (Shaharudin 2020).
18. The government has allocated **RM 1 billion to the Food Security Fund** which aims to provide assistance to farmers and fishermen, and to boost domestic production. A further RM 100 million will be allocated for the development of agro-storage and distribution infrastructure, alongside crop integration programs. Furthermore, funds will also be allocated to the Area Farmers' Associations (PPKs) and the Area Fishermen's Associations (PNKs) that can undertake short-term agricultural projects – the aim being to ensure adequate food supply for Malaysia. The government has also allocated RM40 million to assist SMEs in the agriculture sector sell their products on e-commerce platforms so they can reach a wider pool of consumers (Abdullah et al. 2020).
19. Many additional measures have been proposed to help ensure food security and functional supply chains, such as offering increased support to farmers in producing and marketing food, and implementing big-data platforms to enhance circulation efficiency. Applying other digital solutions and AI to help adopt labour- and input-saving practices and allow farmers to be more efficient, productive, profitable, safe and environmentally friendly, will also be of critical importance even after the pandemic ends (Abdullah et al. 2020).

3. Food consumption patterns

19. **Demand for food products is understood to be a function of population, incomes, prices, and food preferences.** Population growth is the main driver of aggregate food demand, while changes in incomes and shifts in food preferences also influence the quantity and types of food products demanded (Gouel and Guimbard, 2017).
20. There is a decreasing trend in consumption of white rice and table sugar, which studies attribute to an **increase in bread, wheat- and rice-based noodles, as well as sweetened condensed milk. An increase in the uptake of meat, fish, seafood and eggs can also be seen,** as well as the share of meals away from home (Goh et al., 2020).
21. The prevalence of obesity and non-communicable diseases (NCD) diseases has continued to increase, **making Malaysia the most obese nation in Asia, with the second highest obesity rate among children aged 5-19 in ASEAN (UNICEF 2019).**
22. Obesity has been attributed to changing diets which have shifted from predominantly vegetable-based to high carbohydrate diets, and an increase in overall food consumption, following the country's economic progress (Roshidi, 2018). There is increasing food availability and food purchasing power. Western-style and franchise fast foods are increasingly consumed as snack or recreational foods. However, these are still consumed only occasionally and **most communities in Malaysia have retained many aspects of their traditional diets** (Lipoeto et al., 2013).
23. Malaysia has a relatively high amount of food waste in comparison with other Asian countries, and authorities are facing challenges in terms of food waste handling and treatment (Lim et al. 2016).
24. **The organic food sector is still at a preliminary stage in Malaysia,** but the number of producers of sustainable products has indeed been steadily increasing since its establishment in the 1990s. Despite the growing demand for organic food, local producers are unable to meet the needs, meaning that **60% of organic products are imported into the nation** (Kashif et al. 2020).
25. Despite the existence of various local eco-labelling programs, the level of consumer awareness and understanding of eco-labels is still very low (Rashid, 2009, Azizan and Suki, 2014). On the other hand, Malaysian's environmental knowledge is strong in general, with a high ability to identify national environmental problems, but this does not necessarily provide assurance that consumers will have green purchasing intention and behaviour (Azizan and Suki, 2014).
26. Figures from 2016 show that Malaysia is ranked the third largest CO₂ emitter per capita in the region, after Brunei Darussalam and Singapore (World Bank, 2016). Public awareness about climate change in the country is estimated at 32% to 40% of the population (Varkkey, 2019).
27. In Malaysia's Intended Nationally Determined Contribution (INDC) to the UNFCCC in 2015, the nation **committed to reduce its emission intensity of 35% by 2030** from its 2005 baseline, with

another 10% reduction upon receipt of climate finance, technology transfer and capacity building from developed countries (Varkkey, 2019).

4. Agriculture sector and crops

28. Agriculture is an essential sector in Malaysia's economy, contributing **12% to the national GDP and providing employment for 16% of the entire population** (Adnan and Nordin 2020), while industry provides 37.6% of GDP (occupying 36% of the labour force in 2017), and services provide 53.6% (occupying 53% of the labour force in 2017) (CIA 2020).
29. **The country has a total land area of 33.03 million ha, of which as of 2015, 23.1% is agricultural land, 63.6% is forest area and 13.3% is for other land uses.** Peninsular Malaysia has the largest land area suitable for agriculture accounting for nearly 48% of the total agricultural land area (Olaniyi et al., 2013).
30. The key industrial crops include **oil palm, rubber, cocoa and tobacco**, which mainly serve the export market. Crops that are referred to as "food crops" primarily serve, though not exclusively, the domestic market, mainly **comprise paddy, fisheries, fruits and vegetables**. Other miscellaneous crops include sugarcane, cassava, maize and sweet potato, which cater for both export and domestic markets. For a long time, Malaysia's agricultural policy has mainly revolved around the industrial crops and, to some extent, the food crops (Fatah, 2017)
31. Malaysia's livestock sector is primarily made up of poultry and egg production, which is relatively well developed, followed by the production of pork, beef, mutton and milk (International Trade Administration 2020).

4.1. Oil Palm

32. Oil palm is the main cash crop grown in the nation. **Malaysia and Indonesia are the leading global producers of palm oil supplying over 80% of the global production** and consequently dominate the international trade (Parveez et al., 2020).
33. The key growers of oil palms in Malaysia are the private estates, accounting for 61.2% of all growers in 2016. Independent smallholders accounted for 16.3% of the total oil palm cultivated in 2016. Other key stakeholders composed of mainly state agencies such as Federal Land Development Authority (FELDA) account for the remaining 22.5 % of oil palm plantations (Kushairi, 2017, p.14).

4.2. Rubber

34. The rubber tree was introduced in Malaysia from South America in the 19th century. Rubber was a key focus crop to boost the agriculture-based economy. The industry developed and is now the

second major agricultural commodity product currently in Malaysia after palm oil (Abdulla and Arshad, 2017).

35. Malaysia produced 673,513 tonnes of rubber latex in 2016, which is processed into natural rubber, supplying 5.4 % of global production (Malaysian Rubber Board (MRB), 2016). **The country was ranked sixth in the world in natural rubber production in 2017².**
36. In recent decades, as the country's economic policy shifted from primary production to export-oriented manufacturing, one of the structural modifications in the Malaysian rubber industry was the expansion into local processing of value-added products, which led to **the Malaysian rubber sector developing from a supplier of raw materials, to a rubber-based manufacturing industry** producing export products such as medical gloves and tyres.
37. **There has been a declining trend in both plantation area and production capacity.** Since the 1980s, the area under cultivation consisted of more than 2 million ha. By 2010, this had decreased to 1 million ha with an average annual decrease rate of 2% (see fig1) (Abdulla and Arshad, 2017, p.29). Additionally, Malaysia produced 673,513 tonnes of natural rubber compared to 722,122 tonnes in 2015, indicating an annual decline rate of 6.7% (MRB, 2016, p.7).
38. Estate plantations used to account for 25% of the total area and smallholder plantations the remainder (75%). As of 2017, 94% of the total rubber area was owned by smallholders, while estate plantations only represent 6% (Abdulla and Arshad, 2017, p.29).

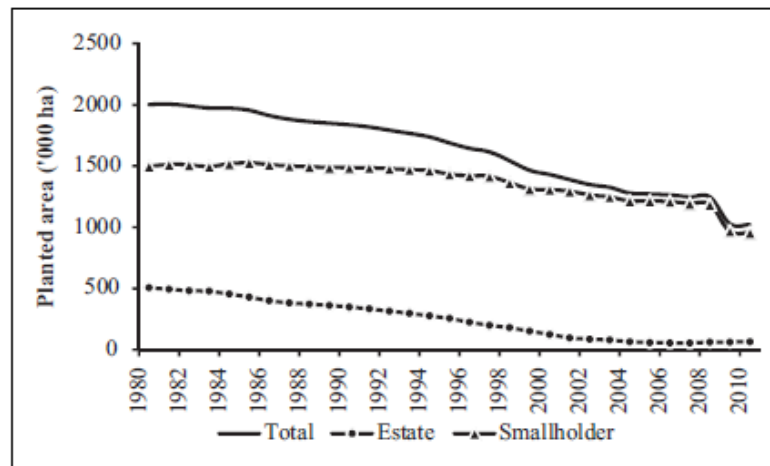


Fig1. Planted area of natural rubber under estates and smallholdings in Malaysia (1980–2010) ('000 ha). Source: MRB (2011) cited in Abdulla and Arshad, 2017, p.29.

39. This decline in area arose from conversion of some rubber areas to alternative crops, including oil palm, following the diversification programme driven by unfavourable natural rubber prices brought about by the discovery of synthetic rubber (Olaniyi et al., 2013). Furthermore, there has

² <http://www.factfish.com/statistic/natural+rubber,+production+quantity>

been a rising cost of labour in Malaysia, which constitutes the largest fraction of production cost (Abdulla and Arshad, 2017).

4.3. Rice

40. Rice is the most important staple food for Malaysia and a defining feature of the country's culture (Omar et al., 2019). The **per capita consumption in 2016 was of 82.3 kg (Gain report, 2018)**. In the same year, Malaysia produced rice equivalent to 1.77 million metric tons³.
41. However, given that around 2.7 million tons of rice were consumed in the country in 2016, **it is estimated that Malaysia still imports around 33% of its consumed rice, primarily from Thailand, Vietnam and Pakistan** (Omar et al., 2019). Given the trends of rice production and consumption in Malaysia, **the country will continue to depend on imported rice to satisfy local consumption** (Rajamoorthy and Munusam, 2015). The country relies on cereal imports to satisfy its domestic needs as local production covers only about one fourth of the total national cereal consumption⁴.
42. Rice production has been hampered by bad weather or pest and diseases. The government of Malaysia (GOM) through the Malaysian Agricultural Research and Development Institute (MARDI), conducts research and promotes the use of hybrid paddy varieties. **GOM also provides various incentives to produce, such as subsidized seeds, fertilizers, pesticides, and irrigation**. The GOM sets the support price for rice production at Malaysian Ringgit (RM) 1,200 per ton (US\$270/ton) (USDA GAIN Report, 2018).

4.4. Other Crops

43. In addition to oil palm, rubber and rice, Malaysia grows a variety of other major crops such as cocoa, tobacco, coconut, pepper, tropical fruits and vegetables.

5. Biodiversity

44. Malaysia is endowed with extremely rich and very diverse biological resources (summarized in table 1). It is recognized by Conservation International as **one of the top twelve megadiverse countries in the world**. Some of the iconic species in Malaysia include the Malayan tiger, Malayan tapir, Asian elephant, Orangutan, Sunda pangolin, and Sunda clouded leopard. Sabah and Sarawak combined host the richest rainforests in the world with a high diversity of Dipterocarps, comprising 291 species or 75% of the family (MNRE, 2019).

³ <https://www.statista.com/statistics/794700/rice-production-volume-malaysia/>

⁴ <http://www.fao.org/giews/countrybrief/country.jsp?code=MYS>

Table1. Estimated total number of distinct species in Malaysia

Organisms	Total number of species
Mammals	306
Birds	742
Reptiles	567
Amphibians	242
Marine fishes	Over 1,619
Freshwater fishes	Over 449
Invertebrates	Over 150,000
Vascular plants	15,000

Source: Sixth National Report of Malaysia to the Convention on Biological Diversity (MNRE, 2019)

45. **Malaysia forms part of the Sundaland biodiversity hotspot, the second most important hotspot in the world**, consisting of a wide array of coastal, marine and terrestrial ecosystems (Myers et al., 2000).
46. Many of these biological resources are increasingly under threat. **According to the 2012 IUCN Red List⁵ of threatened species, 686 plants and 225 animals in Malaysia are at risk of extinction and 256 are at least critically endangered, placing Malaysia third in the list of countries with the largest number of threatened species**, behind only Ecuador and the United States. The IUCN Red List⁶ estimates threatened species in Malaysia at over 1,000.
47. **Malaysia is one of the 14 tiger range countries, harbouring the Malayan Tiger (*Panthera tigris*)** subspecies. The DWNP (Department of Wildlife and National Parks) is working in collaboration with NGOs to carry out the First National Tiger Survey to assess the wild tiger population in Malaysia. Interim figures from the survey, reported in the latest National Report to the CBD, indicate that fewer than 200 tigers remain in the wild (MNRE, 2019).
48. In 1946, forests covered 77% of Peninsular Malaysia's total land area⁷. **According to official government figures, as of 2018, peninsular forest cover is currently 43.6%⁸**. Land use change has contributed to the **local extinction of several species in Peninsular Malaysia including the Javan rhinoceros (*Rhinoceros sondaicus*), and the green peafowl (*Pavo muticus*)** (UNDP, 2014: 16).

⁵ IUCN, 2012. IUCN Red List of Threatened Species. Version 2012.2. [online] Available at: <http://www.iucnredlist.org>

⁶ IUCN Red List version 2017-1: Table 5 Last Updated: Nov 2017. Available at: <http://www.iucnredlist.org/about/summary-statistics>

⁷ Peninsular Malaysia covers about 40% of Malaysia's land area. The remaining approximate 60% of Malaysia's land area is on the island of Borneo.

⁸ <https://www.forestry.gov.my/en/2016-06-07-02-53-46/2016-06-07-03-12-29>

49. Sustainable development in the agricultural industry is a key focus of the national agri-food policy (as discussed below).
50. **Malaysia is making strides towards protecting its biodiversity and ecosystem services.** Within the oil palm sector, green agriculture practices are being promoted through national level and internationally accepted certification schemes, including Malaysian Good Agricultural Practice (MyGAP), **the Malaysian Sustainable Palm Oil (MSPO) standards** and Roundtable on Sustainable Palm Oil (RSPO).

6. Malaysian development planning and agricultural policy

51. Malaysia's economic planning follows the 2020 Vision Plan launched in 1991. The 2020 Vision Plan considers Malaysia a fully developed country across six different aspects: economic, political, social, spiritual, psychological, and cultural - by the year 2020. The Vision 2020 has been realized through a series of **National Policies (spanning ten years) and five-year Malaysia Plans (MP)**, as shown in figure 3.

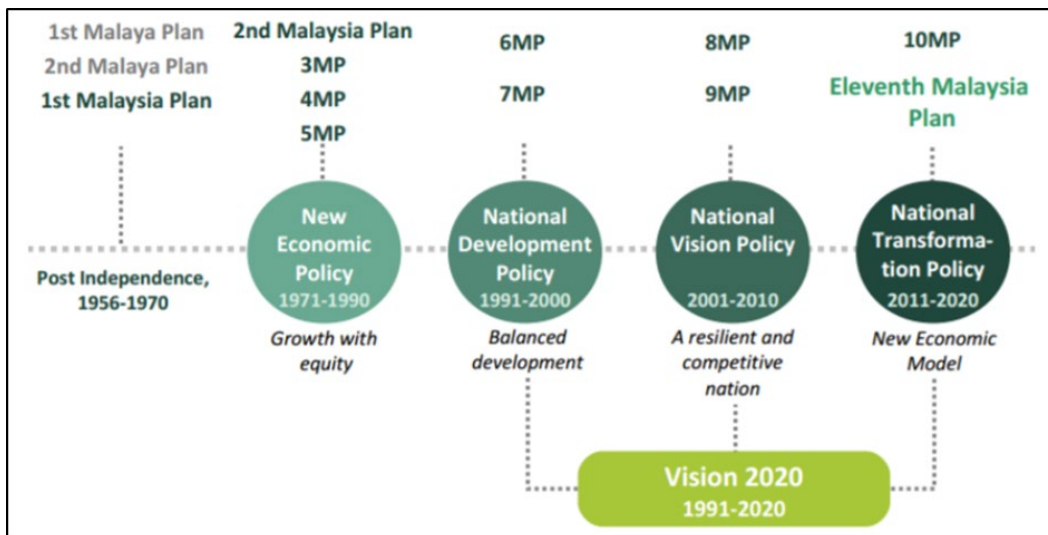
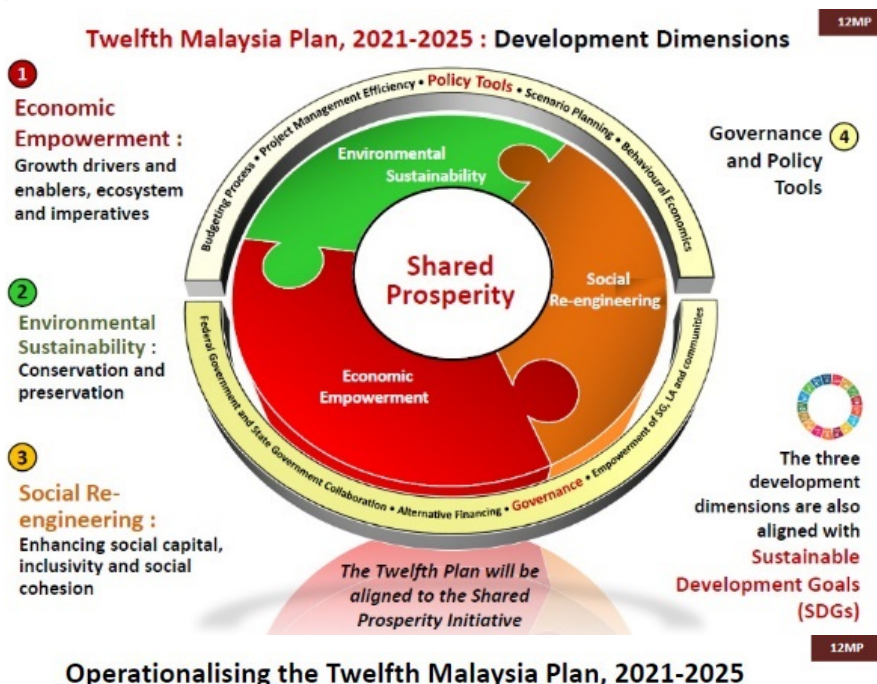


Fig3. Malaysia system of Development Planning, Source: Van der Beek and Achmadi (2018, p.75)

52. **Recently, the government through its Prime Minister announced its Vision 2030, to guide National Policies over the next ten years.** The vision 2030's advocates shared prosperity, by overcoming wage and wealth gap, based on a more structured economy that is progressive and hinges on knowledge and values with participation from Malaysians across the board (Prime minister office, 2019). This new vision promises to provide a "decent standard of living for all Malaysians" by 2030)
53. The current, **eleventh Malaysia Plan (2016-2020), called "Anchoring growth on people" and the twelfth (2021-2025) "shared prosperity" Malaysia Plan,** both emphasize green growth that is

resource-efficient, clean, and resilient. The green growth strategy aims to significantly **reduce greenhouse gas emissions; improve conservation of terrestrial and inland water, as well as coastal and marine areas including its ecosystems; intensified the conservation of natural resources, including biodiversity and promote sustainable consumption and production practices** (Government of Malaysia, 2015).

54. The twelfth (2021-2025) Malaysia Plan proposes a new plan for management of blue and green economy and **commits to establish the valuation of ecosystem services in Malaysia (as shown in figure 4).**



Operationalising the Twelfth Malaysia Plan, 2021-2025

Environmental Sustainability

Conservation and preservation

- Climate change mitigation and adaptation
- Disaster risk management
- Disaster risk insurance scheme



- Green technology
- Management of green and blue economy
- Biodiversity conservation
- Sustainable forest management
- Sustainable Consumption & Production
- Energy efficiency
- Renewable energy
- Integrated water resource management
- Marine litter
- Waste as commodity
- Circular economy – reducing waste and creating value from waste
- Valuing ecosystem services
- Carbon Tax

Fig4. The Twelfth Malaysia Plan (2021-2025), Source: Tay (2019)⁹

⁹ <https://www.theedgemarkets.com/article/mea-12th-malaysia-plan-will-focus-shared-prosperity>

55. Within the agriculture sector, the Eleventh Malaysian Plan serves to fulfil the policy objectives and strategies of the National Agro-food Policy (2011-2020), building upon previous plans and policies. **The National Agro-food Policy (2011-2020) has as key policy objective to “tackle the issue of sustainable agriculture and the competitiveness of the agro food industry with food safety and nutrition aspects along its value chain”.** Table 2 shows the evolution of agricultural policy in Malaysia.

Table 2. Agriculture policy evolution in Malaysia (1957-2020), Source: Bakar et al. (2005), Dardak (2015), Izad (2012), Ministry of Agriculture (2009)

Agricultural policy	Policy Objectives	Strategies
First National Agricultural Policy (NAP1) (1984-1991)	<ul style="list-style-type: none"> • Modernize and revitalized the agriculture sector • Maximize income through optimal utilization of resources in the sector • Increase food production for local market such as rice, vegetables, fruits & poultry 	<ul style="list-style-type: none"> • Investment in institutional building • New land developments for oil palm and cocoa • In-situ development to resolve uneconomic farm size and low productivity among small holders
Second National Agricultural Policy (NAP2) (1992-1997)	<ul style="list-style-type: none"> • Further strengthen and enable agriculture sector to contribute substantially to the economic growth of Malaysia • Enhance productivity, efficiency and competitiveness • Increase land areas for oil palm • Develop agro-based industry • Accelerate the transformation of the sector into a dynamic and commercialized sector 	<ul style="list-style-type: none"> • Promotion of resource use optimization to diversify out of export crop cultivation into other activities • Development of agro-based industries to generate more off-farm opportunities for smallholders • Enhancement of R&D to overcome the production process, labor and other constraint in the sector • Greater participation of the private sector in the agriculture sector • Human resource development
Third National Agricultural Policy (NAP3) (1998-2010)	<ul style="list-style-type: none"> • Enhance food security • Increase productivity and competitiveness of the sector • Deepen linkages with other sectors • Create new sources of growth (after the 1997 Asian Financial Crisis) • Adopt sustainable development, utilization and management of natural resources 	<ul style="list-style-type: none"> • Adoption of cluster-based agro-industrial development • Tackling the problem of resource constraints and promotion of sustainable agriculture • Creation of a large production base for agriculture and forestry
New National Agro-food Policy (NAFP) (2011-2020)	<ul style="list-style-type: none"> • provide food security and safety • make agro-food a competitive and sustainable industry, • increase the level of income of agro-based entrepreneurs 	<ul style="list-style-type: none"> • Development and upgrading of agriculture infrastructure • Improvement in the quality and safety of food by expanding the compliance of standards

•“Development of human capital to ensure sufficient skill labour force in the agricultural sector” (Dardak, 2015, p.6)¹⁰

56. It is worth noting that enhancing food security has been an underlying objective cutting across all the previous four agricultural policies and many Malaysia Plans, by improving productivity, increasing skills of farmers, fishermen, and smallholders, enhancing support and delivery services, strengthening the supply chain and ensuring compliance to international market requirements. **Consequently, since the year 2000, Malaysia has witnessed tremendous improvements in production of a number of key food commodities as shown in Figure 5.**

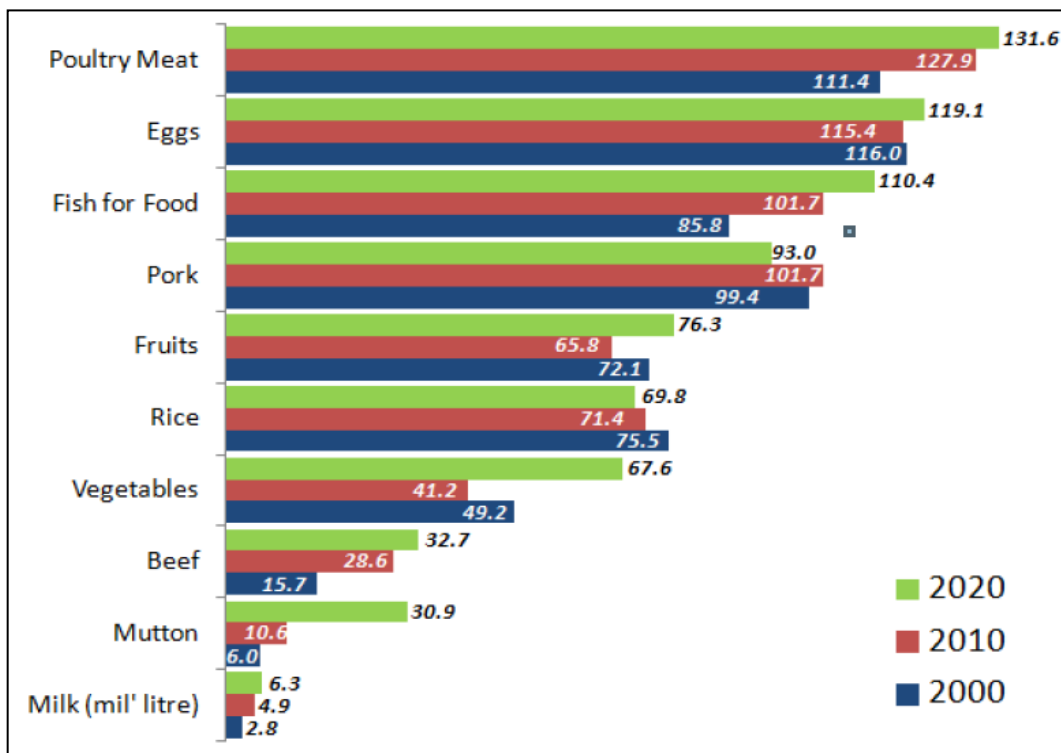


Figure 5: self-sufficiency level of key food commodities in Malaysia (in %), 2000-2020. Source: Dardak (2015, p.6)

57. Despite improvements in food production, **Malaysia continues to be a net importer of food with annual imports of \$13 billion.** For instance, in 2016, Malaysia’s total imports of consumer-oriented and edible fishery products were \$7.1 billion. Imports of this category from the United States were \$492 million, about 7% of market share. China is the major supplier with imports at \$1.4 billion, representing 19% of the market share. India took the second spot with imports worth

¹⁰ http://ap.fttc.agnet.org/files/ap_policy/386/386_1.pdf

of \$727 million (10%), followed by Thailand (9%), New Zealand (8%) and Australia (7%) (GAIN Report, 2017).

6.1. The Agricultural Support Policy and the Malaysian Government's active role

58. The development of the agriculture sector in Malaysia occurred with **an active role and intervention of the government**, that still considers agriculture as a vital industry to the rural economy and food security (Dardak, 2015). The government has therefore focused attention on agriculture as embedded in relevant policy documents under the broad Economic Transformation Plan (ETP) for the whole economy (Arshad et al. 2014).
59. Since the second National Agriculture Policy (1992-1998), the government of Malaysia focused on issues of productivity and efficiency to enhance competitiveness in the global trade (market) of agri-food based products (MOA, 2009, p18). During this period, **the government provided incentives through the development of new infrastructures and subsidy programs that benefits smallholder farmers in all sub-sectors of agriculture**. The government also opened new land areas for industrial crops (rubber and palm oil) as well as for agro-food (paddy, pineapple and vegetables) (Dardak, 2015).
60. In recent years, the government still subsidises considerably its agriculture sectors. **In 2014, the government allocated RM2.4 billion for continuation of subsidies and incentives** to enhance national economy growth and ensure food security (Borneo post, 2013)¹¹. In 2017, the government provided RM1.3 billion to boost paddy production and help the farmers. For rubber tappers, the government provided RM510 million in subsidies and incentives, including aid to tide over the monsoon season. For the fishermen, the government provided RM260 million as cost-of-living allowance (Free Malaysia today, 2017)¹².
61. In fact, **government subsidies and efforts are mainly directed to increasing crops yield and farms productivity**. The government financed large scale irrigation, complementary inputs, and provide other forms of subsidies such as credits, and marketing on behalf of farmers (Izad, 2012, p.8).
62. Finally, **the government contributes considerably in research through agricultural research agencies**, such as the Malaysian Agricultural Research and Development Institute (MARDI), Malaysian Palm Oil Board (MPOB), Malaysian Rubber Board (LGM), Universities, and private research centres. Those researches focus particularly in the development of quality seeds, breeds, fry and animal feeds, integrated pest and disease management, as well as product improvement (Dardak, 2016).

¹¹ <https://www.theborneopost.com/2013/11/14/rm2-4-bln-for-agriculture-subsidies-and-incentives/>

¹² <https://www.freemalaysiatoday.com/category/nation/2017/02/17/rm10-billion-in-subsidies-given-this-year/>

63. Other initiatives being undertaken within the agri-food sector include **the National Strategies and Action Plans on Agricultural Biodiversity Conservation and Sustainable Utilization, which is seen as an important step in mainstreaming the Convention on Biological Diversity (CBD) objectives** into the development of the agriculture sector in Malaysia. The Government of Malaysia recognizes the huge potential biodiversity holds as a reservoir of future food, natural gene bank harbouring the key ingredients for developing new varieties for better yield and also to meet the potential impacts of climate change (see figure 5, as example) (MOA, 2012, p.IX).

The Bug That Helped Malaysia Save \$10 Billion

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African palm oil weevil or its scientific name *Elaeidobius kamerunicus* was introduced in 1981 for local palm oil pollination

AT a glance, this is just any ordinary bug.

This African palm oil weevil or its scientific name *Elaeidobius kamerunicus* played a part in helping Malaysia to save a staggering \$10 billion!

Speaking at the UN biodiversity meeting at the Kuala Lumpur Convention Centre Monday, Prime Minister Datuk Seri Najib Tun Razak said when the oil palm industry was still at its infancy, the government opted to import the four-legged bug from Cameroon to be part of the plantation labour in 1981.

The weevil played the role in pollinating trees, a chore previously done manually -- which was undoubtedly time-consuming and ineffective.

Introduction of the weevil to the process, led to a significant increase in palm oil production and ultimately saved costs. Between 1982 and 2015, the 'kerching' saved totalled at a whopping US\$10 billion!

Figure 5. Source: Bakeri and Awani (2016)¹³

6.2. The Tenth and Eleventh Malaysian Plans and Green Growth for sustainability and resilience

64. In the Tenth Malaysia Plan (2011-2015), and the Eleventh Plan (2016-2020) **environmental sustainability was recognised as an integral part of a comprehensive socio-economic development plan**. It included measures to address issues of climate change, environmental degradation, and sustainable utilisation of Malaysia's natural endowment. Table 4 shows the key highlights of some of the milestones achieved during the Tenth Plan and target of the Eleventh Plan.

¹³ <http://english.astroawani.com/malaysia-news/bug-helped-malaysia-save-10-billion-95646>

Table 1: Highlights Tenth Malaysia Plan, 2011-2015: Achievements

1. In 2009, Malaysia set a voluntary target of reducing the greenhouse gases (GHGs) emission intensity of its Gross Domestic Product (GDP) by up to 40% compared to 2005 levels by 2020. BY the end of 2013, Malaysia had already achieved a 33% reduction.
2. Forest cover has increased from 56.4% in 2010 to 61% in 2014.
3. Various conservation initiatives were also undertaken including;
 - gazetting 23,264 Hectares of forest gazetted as Permanent Reserved Forest under the Central Forest Spine;
 - nearly 2,509 hectares of mangroves and other suitable species were planted to protect coastlines against wave actions and coastal winds;
 - Crocker Range Park in Sabah listed as Man and Biosphere Reserves by UNESCO.
4. To conserve at least 17% of terrestrial and inland water areas, as well as 10% of coastal and marine areas as protected areas in line with the Aichi Biodiversity Targets. (The Eleventh Malaysia Plan, 2016-2020)

Source: Government of Malaysia (2015, p.104)¹⁴

6.3. The National Policy on Biological Diversity (NPBD) 2016-2025

65. Malaysia is a party to the United Nations Convention of Biological Diversity (CBD). In 1998, Malaysia developed its first National Biodiversity Strategies and Action Plan (NBSAP) which is known as the National Policy on Biological Diversity (NPBD). It serves as a national blueprint for the overall biodiversity management in the country as well as to fulfil its obligations under the Convention (UNDP, 2014^b). The current policy (2016-2025) seeks to conserve Malaysia's biological diversity and to ensure that its components are utilised in a sustainable manner for the continued progress of the nation. It specifies 5 national goals and 17 national biodiversity targets to be implemented by stakeholders, as outlined in Table 5. Target 3 of the NPBD 2016-2025 emphasizes mainstreaming of biodiversity conservation into national development planning and sectoral policies and plans by 2025. **Under its Target 4, the NPBD aims to ensure that agriculture production and fisheries are managed and harvested sustainably.**

¹⁴ https://www.talentcorp.com.my/clients/TalentCorp_2016_7A6571AE-D9D0-4175-B35D-99EC514F2D24/contentms/img/publication/RMKe-11%20Book.pdf

Table 2: The National Policy on Biological Diversity (NPBD) 2016-2025: Goals and Targets

Goals	Targets
<p>Goal 1: We have empowered and harnessed the commitment of all stakeholders to conserve biodiversity.</p>	<p>Target 1: By 2025 more Malaysians are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably.</p> <p>Target 2: By 2025, the contributions of indigenous peoples and local communities, civil society and the private sector to the conservation and sustainable utilisation of biodiversity have increased significantly.</p>
<p>Goal 2: We have significantly reduced direct and indirect pressures on biodiversity.</p>	<p>Target 3: By 2025, biodiversity conservation has been mainstreamed into national development planning and sectoral policies and plans.</p> <p>Target 4: By 2025, our production forests, agriculture production and fisheries are managed and harvested sustainably.</p> <p>Target 5: By 2025, tourism is sustainably managed and promotes biodiversity conservation.</p>
<p>Goal 3: We have safeguarded all our key ecosystems, species and genetic diversity.</p>	<p>Target 6: By 2025, at least 20% of terrestrial areas and inland waters, and 10% of coastal and marine areas, are conserved through a representative system of protected areas and other effective area-based conservation measures</p> <p>Target 7: By 2025, vulnerable ecosystems and habitats, particularly limestone hills, wetlands, coral reefs and seagrass beds, are adequately protected and restored.</p> <p>Target 8: By 2025, important terrestrial and marine ecological corridors have been identified, restored and protected.</p> <p>Target 9: By 2025, the extinction of known threatened species has been prevented and their conservation status has been improved and sustained.</p> <p>Target 10: By 2025, poaching, illegal harvesting and illegal trade of wildlife, fish and plants are under control and significantly reduced.</p> <p>Target 11: By 2025, invasive alien species and pathways are identified, priority species controlled and measures are in place to prevent their introduction and establishment.</p> <p>Target 12: By 2025, a comprehensive biosafety system inclusive of a liability and redress regime is operational to manage potential adverse impacts of modern biotechnology</p>

	<p>on the conservation and sustainable use of biodiversity and human health.</p> <p>Target 13: By 2025, the genetic diversity of cultivated plants and farmed and domesticated animals and of wild relatives is adequately conserved.</p>
<p>Goal 4: We have ensured that the benefits from the utilisation of biodiversity are accrued equitably to all.</p>	<p>Target 14: By 2025, Malaysia has an operational Access and Benefit-sharing (ABS) framework that is consistent with the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their utilisation.</p>
<p>Goal 5: We have improved the capacity, knowledge and skills of all stakeholders to conserve biodiversity.</p>	<p>Target 15: By 2025, capacity for the implementation of the national and subnational biodiversity strategies, the CBD and other related Multilateral Environmental Agreements (MEAs) has significantly increased.</p> <p>Target 16: By 2025, knowledge and the science base relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are significantly improved and applied.</p> <p>Target 17: By 2025, there is a significant increase in funds and resources mobilised for the conservation of biodiversity from both government and non-government sources.</p>

Source: Ministry of Natural Resources and Environment (2016, p.13)¹⁵

66. Other related policies include the **National Forestry Policy**, endorsed by the National Forestry Council in 1978 and amended in 1992¹⁶. **Key objectives include managing forest areas in order to maximize the benefits of social, economic and environmental benefits in line with principles of sustainable management.** The policy aims to manage the nation's forests through splitting areas into protection-, work-, amenity-, and research and education forests, that are strategically located throughout the country. In specific reference to work forests, the policy promotes the efficient harvesting and use for the maximum economic benefits for all types of forest products and encourages forest industrial development in line with the trend of forest resources and employment opportunities.
67. According to the Federal Constitution of Malaysia, states have jurisdiction over their lands, forests, fishery, agriculture, and water resources, including the power to decide on the administration, management, use and allocation of their forest resources.
68. Beyond these specific national policies, **there are complementarities between local plans and multilateral initiatives providing guidance and opportunities in the eco-agri-food sector** including FAO-OECD Guidelines on Responsible Supply Chains; the BioTrade initiative managed

¹⁵ <https://www.mybis.gov.my/pb/590>

¹⁶ <https://www.forestry.gov.my/en/about-us/national-forestry-policy>

by UNCTAD¹⁷; the Intergovernmental Science- Policy Platform on Biodiversity and Ecosystem Services (IPBES)¹⁸; ESERALDA¹⁹ (Enhancing ecoSystem sERvices mApping for poLicy and Decision mAking); FAO assessment/Platform on mainstreaming biodiversity in agricultural sectors²⁰ and DG Research and Innovation initiatives such as FOOD 2030²¹.

69. Businesses and civil society in Malaysia have ongoing initiatives that aim to strive for sustainability in the eco-agri-food system. **As example, GIZ in partnership with UNEP, in the framework of “Advancing and measuring sustainable consumption and production for a low-carbon economy in middle-income and newly industrialized countries” project**, are developing consumer information programme, that help consumers to assess the sustainability dimension of food they consume, and serve as basis for their decisions that lead to sustainable food systems (GIZ, 2019).

7. Concluding remarks

70. **Malaysia is making significant strides towards protecting and conserving its natural habitats, species and genetic diversity and promoting sustainable practices across the sectors of the economy.** This is evidenced by a suite of national policies and strategic plans, coupled with market and regulatory instruments discussed above.
71. **Mainstreaming biodiversity and ecosystem values into the agri-food value chain is still work in progress.** Research into complex trade-offs between social, economic and environmental objectives in Malaysia’s agri-food systems is limited and still evolving (see for example Foo and Hashim, 2014; Brander and Eppink, 2012; Hassan et al., 2011). **More comprehensive analysis of potential social, economic and environmental trade-offs is generally constrained by the complexity of the agri-food value chains and data availability.** However, an understanding of these trade-offs is crucial for the effective implementation of sustainable agriculture initiatives.
72. **The UNEP TEEBAgriFood project** on promoting biodiversity and sustainability in the agriculture and food sector in Malaysia **complements the Government’s green growth initiatives and the 12th MP objective of establishing new principles, including ecosystem services valuation**, in agricultural economy, by highlighting several trade-offs made in land-use decisions and mainstreaming the values of biodiversity and ecosystem services values in decision-making.

¹⁷ www.biotrade.org

¹⁸ <http://www.ipbes.net/>

¹⁹ <http://www.esmeralda-project.eu/>

²⁰ <http://www.fao.org/biodiversity/en/>

²¹ <http://ec.europa.eu/research/conferences/2016/food2030/index.cfm>

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