# THE FUTURE OF MALAYSIAN INDUSTRIES 2030:

## GLOBAL CHALLENGES AND FUTURE DIRECTIONS


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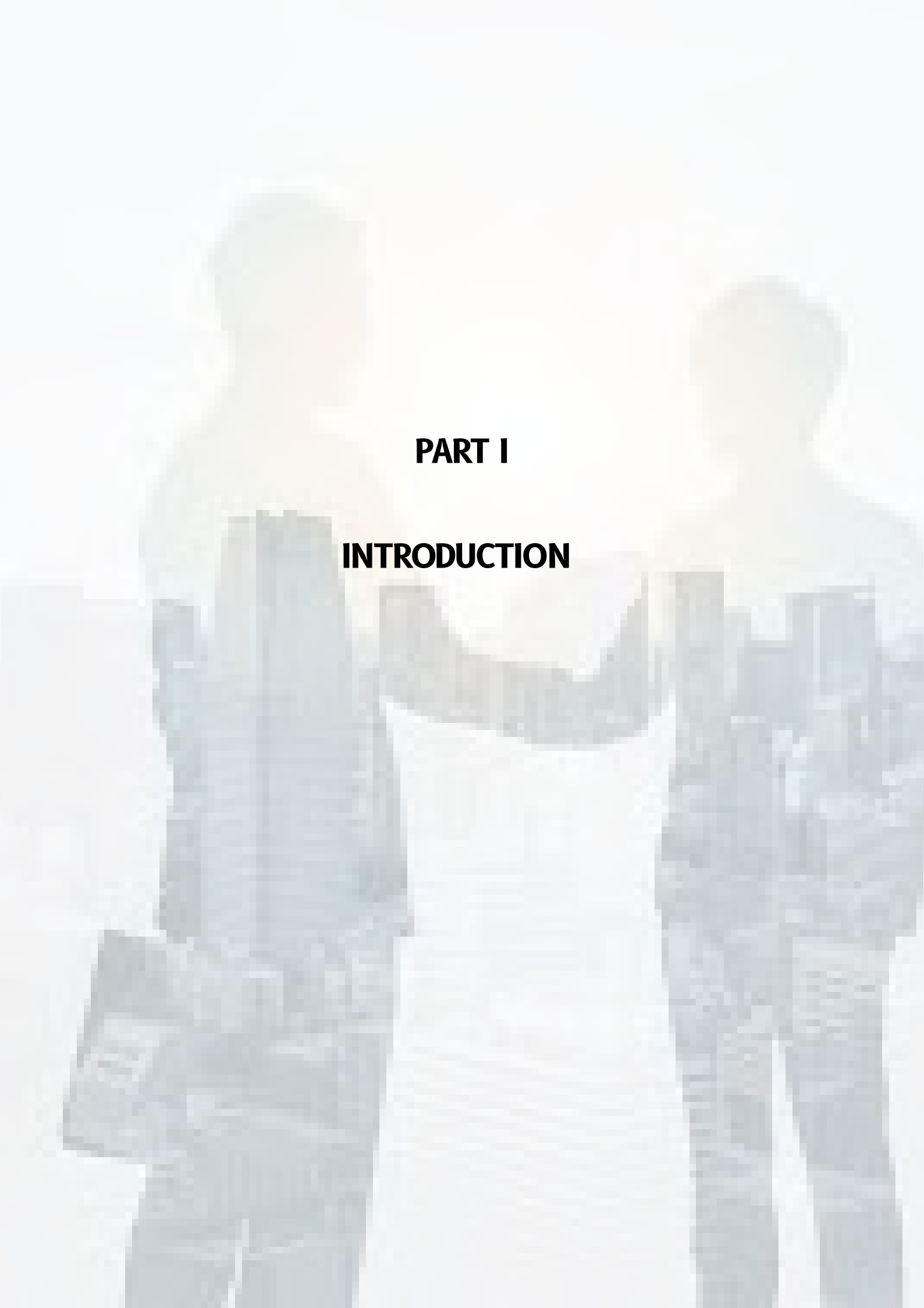
# Preface

The book consists of seven chapters arranged by major industry and a comprehensive analysis of the future of Malaysian industrial development. Chapter 1, Introduction, provides an overview of the importance of industrial development in Malaysia and the main objectives of this book. Chapter 2, The Future of the Malaysian Automotive Industry 2030, discusses the direction of the country's automotive industry, with a focus on green technology and electrification. Chapter 3, Towards Sustainable Paddy Production in Malaysia 2030, analyses the challenges and opportunities in the paddy industry, including innovative approaches that can ensure the sustainability and food security of the country.

Next, Chapter 4, Malaysian Rubber Industry 2030, explores resilience strategies in the rubber industry to ensure the competitiveness and sustainability of the sector in the face of global challenges. Chapter 5, The Future of Malaysia's Wholesale and Retail Sector, describes the transformation in the wholesale and retail sectors, especially in the rapidly growing digital and e-commerce era.

Chapter 6, Synergies and Policy Framework for Malaysian Industrial Development, links all the sectors discussed previously by examining the interrelationships between sectors in economic development. This chapter also discusses the policy framework that supports industrial growth and the roles of government, industry, and academic institutions in accelerating the country's economic development. Finally, Chapter 7, Conclusion and Future Directions, summarizes the main findings of each chapter, discusses policy implications for Malaysia by 2030, and presents research proposals and future directions to ensure sustainable and competitive industrial development.

# Table of Contents



# PART I

# INTRODUCTION

# CHAPTER 1

# INTRODUCTION

Nurnaddia Nordin

## Background

Malaysia is heading towards 2030 with aspirations to become a competitive country in various industrial sectors. The country's economic growth depends heavily on the effectiveness of government policies, the use of the latest technology, and the competitiveness of local industries in facing the challenges of globalization and changing world economic climate. In this context, the automotive sectors, paddy production, rubber industry, wholesale and retail are among the main pillars for the economic development of Malaysia.

The automotive segment in Malaysia is changing rapidly with the switch to EVs and green technology. Similarly, the agricultural sector, particularly paddy production, must take on a new approach toward ensuring the sustainability and food security of the country. The global challenges in the rubber industry ranging from price fluctuations to competition with other producing countries will call for sound resilience strategies. The wholesale and retail sector are also being introduced to digitalisation and e-commerce, which challenge conventional ways of carrying out business.

The book intends to delve into the challenges, opportunities, and strategies pertinent to each of the sectors with regards to the developments toward 2030. Each chapter containing a specific industry will critically assess the challenges and opportunities and develop strategies that may serve toward enhancing Malaysia's competitiveness on the global front.

## Importance of Industrial Development in the Malaysian Economy

With respect to the industrial sector, Malaysia's economy draws its strengths from the creation of jobs, the contribution to gross domestic product (GDP), and competitiveness in the global economy. With the onset of rapid technological advancements and the recent global calls for greater economic sustainability, it must develop towards these considerations of sustainability, innovation, and global marketability, as follows:

Such as a greener automotive industry that reduces carbon emissions but pulls in much foreign investment, a more modern agricultural sector that improves productivity and reduces dependence on food imports, a sustainable rubber industry to keep Malaysia's main position in the global market, and a more digital wholesale and retail sector to help local businesses adapt to e-commerce era.

The government is active with its initiatives and policies such as the National Automotive Policy (NAP), the 12th Malaysia Plan (12MP), and numerous investment incentives for agriculture and industrial production. Thus, understanding these challenges and opportunities within key industries is necessary in realizing success and effectiveness in such policies.

**Objectives and Scope of the Book**

The book's objectives are:

1. To assess the challenges and opportunities in Malaysia's key industrial sectors by 2030, including the automotive, paddy production, rubber, and wholesale and retail sectors.

2. To explain the strategies and policies that can be used to boost the competitiveness of these sectors, with an emphasis on technology, digitalization, and sustainability in the industry.

The book's coverage includes four critical industries identified as propelling forces for Malaysia's growth up to the year 2030. Each chapter will concentrate on a particular sector and will discuss, in detail, current trends, challenges, strategies that can be undertaken, and consequential policy implications for the future.

**About the Book**

The book contains seven chapters, classified by significant industries and an analysis of the future of industrial development in Malaysia.


Chapter 1: Introduction
Describes the importance of industrial development in Malaysia, along with the purposes of this book.


Chapter 2: Future of Malaysian Automobile Industry 2030
Discusses the direction of Malaysian automotive industry, focusing on aspects of green technology and electrification.


Chapter 3: Towards Sustainable Rice Production in Malaysia 2030
Discusses challenges and opportunities in the rice industry's innovations toward sustainability.


Chapter 4: Malaysia's Rubber Industry 2030
Delineates the resilience strategies that will underpin the rubber industry's competitiveness and sustainability.


Chapter 5: The Future of Malaysia's Wholesale and Retail Trade Sector
Provides insights into challenges and opportunities in wholesale and retail industries, specifically in the digital age.


Chapter 6: Synergies and Policy Framework for Malaysian Industrial Development
Constrains all the industries discussed in this study and evaluates the effect of policies on economic development.


Chapter 7: Conclusion and Future Directions
Provides a summary of the main findings of the book and recommendations for the policy to develop Malaysia's industry by 2030.

# PART 2

# MALAYSIA'S STRATEGIC INDUSTRIES TOWARDS 2030

# CHAPTER 2

## FUTURE OF MALAYSIAN AUTOMOBILE INDUSTRY 2030

Naeem Hayat, Dzulkifli Mukhtar, and Syahril Azmi Md Isa

Malaysian automobile industry Malaysia was the first carmaker in Southeast Asia. The car industry's contribution to the Malaysian GDP stands at 4% with USD 8.4 Billion and employing around 70,000 people in 2023. The Malaysian automotive sector is the third largest in Southeast Asia and is in the 23rd position globally. Nevertheless, with a combined production capacity of 1.0 million cars annually, Malaysia has a good prospect for the future.

Over the years, Malaysia's auto industry has made two national car brands, Proton and Perodua. Government policy remains the driving force for the development and growth of the Malaysian auto industry. Tax incentives and exemptions to the manufacturers and consumers help produce and sell local brands.

The Malaysian market is in hard-hitting competition from imported car brands. Competition affects local manufacturers based on price, brand perception, Investment in clean technologies and developing environmental standards in production systems are becoming a big ask.

The local manufacturers are forming alliances with international automakers to leverage their technical skills and expertise and to develop indigenous technologies to build unique value propositions for local and export markets.

Now, cars are highly reliant on semiconductor chips, and the world is facing a shortage of semiconductors that reduces production capacity or delays the supply of finished products. Developing the local semiconductor market is the only viable option in the long run, as a considerable investment is required to build the semiconductor manufacturing capabilities. Another option is to collaborate with industry leaders to navigate the current and future trends in the semiconductor market and have a resilient supply chain to meet current and future demands.

Another area that requires attention is meeting the international environment and safety standards. Malaysian automakers must develop cars that meet the reduced carbon emissions and minimize environmental impact standards.

The safety standards also pressure the local automakers to remain competitive and work with technology leaders who can offer the necessary support to build vehicles with electronic stability control, driver assistance systems and autonomous emergency brakes.

Consumer awareness and expectation are also becoming the driving force to meet the crucial environment and safety standards to build and maintain the brand reputation and consumer trust. Meeting the stringent international environment and safety standards is a complex and resource-driven challenge. Malaysian automotive playersare building the necessary international collaboration to proactively meet the regulatory requirements to evolve in the global automotive landscape. Currently, the auto industry employs73% of the workforce, and they need skills upgrades to deal with automation and the next generation of cars.

**Local car manufactures**

Malaysian 1st national car company, Proton, has three manufacturing plants with a combined production capacity of 360,000 units annually. Proton was established in 1985 and remains a major player in the Malaysian car market. Initially, Proton assembled the complete knock-down (CKD) units, the main parts of which were imported from Japan. Proton has the most advanced car production facility outside Japan, where 60% of automation is achieved.
a combined production capacity of 150,000 units annually.

Perodua was the 2nd Malaysian car manufacturing plant to start workingin 1994. Perodua has two car manufacturing plants with an annual capacity of 350,000 cars. Perodua workedwith Daihatsu to develop an engine manufacturing plant in 2014. Perodua also assembled different Toyota models under contract with the Daihatsu brand.

**Other car assembler in Malaysia**

Tan Chong Motor Holdings (TCMH) has two production facilities in Malaysia with a combined production capacity of 100,000 units per year. TCMH assembles a variety of international brands under contract from different international players like Subaru, Mitsubishi, Renault, and Nissan.

Honda Malaysia (HM) operates with one production plant with an annual capacity of 100,000 units. HM assembled the Honda brand cars from importedCKDs from Honda, Japan. Honda became Malaysia's best- selling international brand,pushing Toyota to second place. Assembly ServicesSdn. Bhd. (ASSB) It assembles the cars for Toyota Motor Corporation and Toyota Tsusho Corporation in their two assembly plantswith Inokom Corporation production plant at Kulim, Kedah, has an overall production capacity of 30,000 units per year. The plant initially assembled the cars for Hyundai, BMW, and Mazda under license from these respective brands.

**Used car industry**

The used car market is very active in Malaysia, with a market size of USD 25.14 Billion in 2024. The used car market also significantly meets the demands of local car customers. The used car market is rapidly evolving as the Malaysian generaleconomic condition and consumer preferences essentially excel the used car market. The vast used car market attractsmanufacturers and big players to launch the certified pre-owned car initiative. Honda Malaysia and Mitsubishi Malaysia have been offering the certified pre-owned car inspection program since 2022. The Malaysian used car market is expected to touch the USD 35 Billion mark by 2030.

Table 1: No. of cars sold in Malaysia in the Last Ten Years

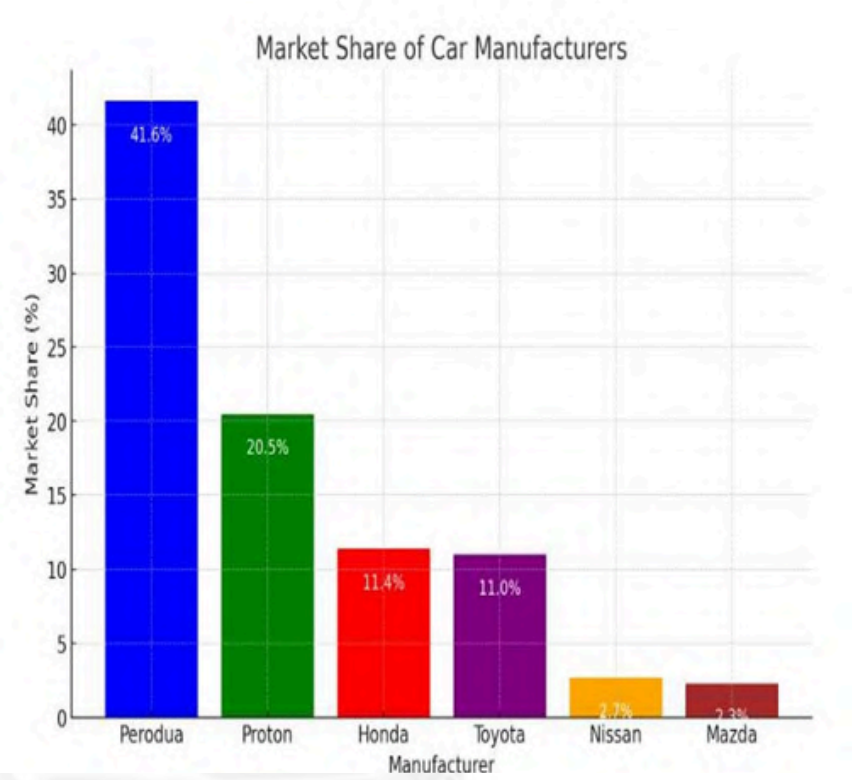
| Year | No. of Cars Sold |
|---|---|
| 2023 | 799000 |
| 2022 | 720658 |
| 2021 | 508911 |
| 2020 | 529514 |
| 2019 | 604287 |
| 2018 | 598714 |
| 2017 | 56625 |
| 2016 | 580085 |
| 2015 | 666677 |
| 2014 | 666487 |
| 2013 | 655744 |

Source: https://www.goodcarbadcar.net/malaysia- car-sales-data/

Table 2: Market Share Top Car Manufacturers with Market Share for 2023
Position Manufacturer Market

| Position | Manufacturer | Market Share |
|---|---|---|
| 1st | Perodua | 41.6 |
| 2nd | Proton | 20.5 |
| 3rd | Honda | 11.4 |
| 4th | Toyota | 11.0 |
| 5th | Nissan | 2.7 |
| 6th | Mazda | 2.3 |

Source: https://www.goodcarbadcar.net/malaysia- car-sales-data



Global Future Trends in the Car Industry The global automotive industry has changed drastically in the last decade, and the next decade will be marked by the five megatrends shaping the car industry's future. Industry experts proposed these five megatrends shaping the future of the automobile industry:

1. Electric revolution
2. Shared mobility
3. Autonomous driving
4. Digitalization and Personalization
5. Sustainability

A brief discussion of these trends is as follows.

**Electric revolution**

The world is witnessing a profound shift toward electric vehicles. That marks car technology's shift and is perceived as the fundamental shift towards sustainable mobility, transforming transportation and its impact on climate. The future of individual mobilities is highly associated with the electric car revolution and a cleaner environment.

The electric mobility revolution builds on the idea of reducing the greenhouse gas emissions associated with using internal combustion engines and fossil fuel-based vehicles. Electric cars offer a promising solution, such as zero-emission and reduced reliance on fossil fuels. The electric car revolution is not just reducing greenhouse gas emissions but is promising to innovate, making mobility safe through technological innovations and stimulating economic development.

The widespread use of electric vehicles requires a shift in manufacturing design, battery production, charging stations, and grid capacity. The use of hydrogen cell- based cars is the future of alternative mobility options. The automakers are raging their electric vehicle offering and building state-of- the-art mobility options in the future. The electric car revolution represents the transformative shift towards a sustainable and equitable future. The global EC market can reach $ 1.00 trillion by 2030, with a 36% market share.

**Shared mobility**

Shared mobility is the new reality of the current transportation landscape. The Internet of Things (IoT) and electric propulsion are the backbone of shared mobility. The conventional car ownership model givingway to shared mobility services as a new transportation model. Shared mobility promotes convenience and flexibility, reducing congestion and emissions. Shared mobility also paves the wayfor urban planningand regulation to ensure the smooth execution of individual mobility with equitable access, safety, and efficiency. With emerging environmental concerns, shared mobility can help to achieve sustainability and reduce the transportation impact on climate. Shared mobility promotes social inclusivity, curtail social divides, and bridges the gaps between urban and rural areas. Shared mobility also creates new economic opportunities from entrepreneurship, infrastructure job creation, and software development.

**Autonomous driving**

The momentous developmental revolution in artificial intelligence, sensor technology, and IoT offers a progressive road to autonomous driving in the future. The leading cause of road accidents is human error, and autonomous driving can bring about the realm of safety in transportation. Autonomous driving can curtail traffic accidents and associated injuries and fatalities. The appropriate functioning of sensors and AI algorithms monitor the vehicles' movement according to their surroundings, reducing road accidents caused by driver distraction, fatigue and impaired driving skills. With the help of AI interacting with the road infrastructure, the traffic flow and road congression are significantly reduced. Optimized road utilization is possible with AI, where vehicles communicate with other vehicles and infrastructure in real-time. Security and reliability issues are of paramount concern for the future of Autonomous driving; these vulnerabilities can bring catastrophic consequences. Regulatory frameworks must be developed to accommodate autonomous vehicles on roads. Clear standards and guidelines can bring convenience, safety, and accountability to autonomous driving technologies. The future of transportation linked with autonomous driving promises equitable, safe and efficient transportation to future generations.

**Digitalization and personalization**

The automotive industry is going through a profound digital transformation powered by artificial intelligence, connectivity, and data analytics. Now, vehicles are not only a mode of transportation but evolved into an intelligent, interconnected platform offering various digital services and experiences. Real-time data connectivity facilitates smooth and safe vehicle movement, offering ease, facilitation, and entertainment features. AI powers vehicles to make the necessary driving decisions, level passenger safety, and pave the way for efficient transportation. The data generated and captured through interconnectivity can bring enormous insights into user behaviors, preferences, vehicle performance, and transportation efficiency. The automotive industry can tailor the design, engineering, and technology to meet the user's expectations and driving experience.

Personalization is also an emerging tapping point shaping the automobile future. The customization options from car color to interior design are on the rise. Automakers are offering personalized services to meet the needs of drivers and passengers. Concierge and predictive maintenance services alerts, personalized navigation, and car entertainment are a few personalised services consumers seek. Integrating digital technologies, user-centric design, and ergonomic layout can elevate the overall user experience. The intersection of digitalization and personalization will drive the automotive industry's innovation and define future transportation.

**Sustainability**

The future design, engineering, production, and operation of cars must reduce the environmental impact. Designing future cars with the life-cycle assessment in mind can make the way for the reuse and recycling of automobile components, waste reduction, and efficient manufacturing processes. The automobile industry's sustainability may be achieved using recycled and renewable materials that can reduce car weight, fuel efficiency, and greenhouse gases. Building hybrid vehicles with fuel consumption and regenerative braking systemscan reduce fuel consumption and bring sustainability to car production and use.

Sustainable car manufacturing increases the environmental benefits in terms of raw material extraction, production, usage, and disposal of car parts and units. Sustainable cars, one way, reduce greenhouse gas emissions and help to mitigate climate change. Reduced operational costs were achieved using hybrid cars with fuel and energy efficiency. Reduction in air pollution promotes general public health while meeting the regulatory environment requirements. The future of transportation sits in technological innovations, responsible manufacturing, comprehensive life-cycle assessment, and car production and use management.

**Malaysian Consumer Market**

Public investment has shown a downward trend in the last decade, where public investment declined by 4% and private investment rose by 2% of GDP. The world reports a decline in human capital growth and population growth. The decrease in population growth is typical for developing and high-income economies. The human capital growth has decreased from 2% to 0.6% and is associated with a decline in population growth. Though female participation in Malaysia rose from 55% to 46%, it is still less than that of high-income economies and regional peers like Thailand, China, and Singapore.

Malaysia's GDP growth was around 5% on average in the last 20 years. However, it is common for growth to reach slower with the decline in public or private investment. Malaysia belongs to the upper-middle income group with a GNI of USD 12,090 per capita, whereas the high-income countries have a USD 13,206 GNI per capita [World Population Review, 2023]. That also presents the capacity to buy the car among the Malaysian population.

**Future of Malaysian economic growth**

The Malaysian GDP growth may fall from 4.5%to 2.0% in 2050. The primary reasons for the projected decline in GDP growth are demographics, falling private investment, and significant economic reforms required to offset the decline in the Malaysian GDP. The Malaysian Government is projected to invest USD 1.1 Billion in 13 new projects to enhance the performance and efficiency of the auto part sectors. Electric car manufacturing is also on cars, and the auto sector is regarded as having a high potential to bring high growth to the country. The Government also foresee that the auto sector's contribution to GDP must reach 10% by 2030.

Domestic demand is also rising with the growth of the middle-income group, which accounts for 40% of the Malaysian population. Urbanisation also adds to the demand for personal and public vehicles. The cheap auto loans from the finance sector also upraise the demand for cars in the country.

**Future of the Malaysian Auto Industry**

The future of the Malaysian auto industry looks promising as with an overall installed capacity of more than 1.0 millionannually, Malaysia can meet the rising demand for cars and export cars to neighbouring countries. People love local brands,and they are alreadymeeting 60% of the car demand. However, global trendsmust be incorporated to remain relevantand produce future-ready cars for the local and international markets. The future belongs to EVs and technology, which can offer production and car usage efficiency.

The increase in urbanization and rising middle-income groups drive the demand for local cars. Government policies and incentives also accelerate the development of the automotive ecosystem, encouraging innovation, research, and development for the production and adoption of green vehicles. Future policy must be based on the changing local and global market dynamics, pushing the Malaysian auto industry to compete at the global level.

Public policy needs to take the direction of strong reformsto achieve the future goals of sustainable growth. Local auto manufacturers must work with international brands to bring green technology home and improve local auto manufacturing operations to achieve efficiency and efficacy. Human capital growthis a priority area for improving car production and operations. Investment in the quantity and quality of education can help Malaysian economic growthand facilitate the Malaysian auto industry to meet the 4% target contribution to GDP.

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Hayat, N., Mukhtar, D. & Isa, S.A.M. (2024). Future of Malaysian Automobile Industry 2030: An Industry Note, GERIC Industry Notes. 1-8.

# CHAPTER 3

# TOWARDS SUSTAINABLE RICE PRODUCTION IN MALAYSIA 2030: POLICY ENHANCEMENTS AND TECHNOLOGICAL INTERVENTIONS

Nurnaddia Nordin, Nurhaiza Nordin, Nur Ilyana Amiiraa Nordin

Rice is one of the most major crops produced in Malaysia, directly associated with national food security. The practice of rice cultivation in Malaysia has been transformed from traditional methods to modern ones, utilizing mechanization and advanced technology. In spite of all the efforts made to increase production, the Self-Sufficiency Level (SSL) has not reached the desired level yet. According to the MAFS, Malaysia's rice SSL stood at 65% in 2023 and thus imports 35% of its domestic demand. In 2022, Malaysia imported 1.1 million metric tonnes of rice most from Thailand, Vietnam, and India, costing roughly RM2.5 billion (Department of Statistics Malaysia, 2023).

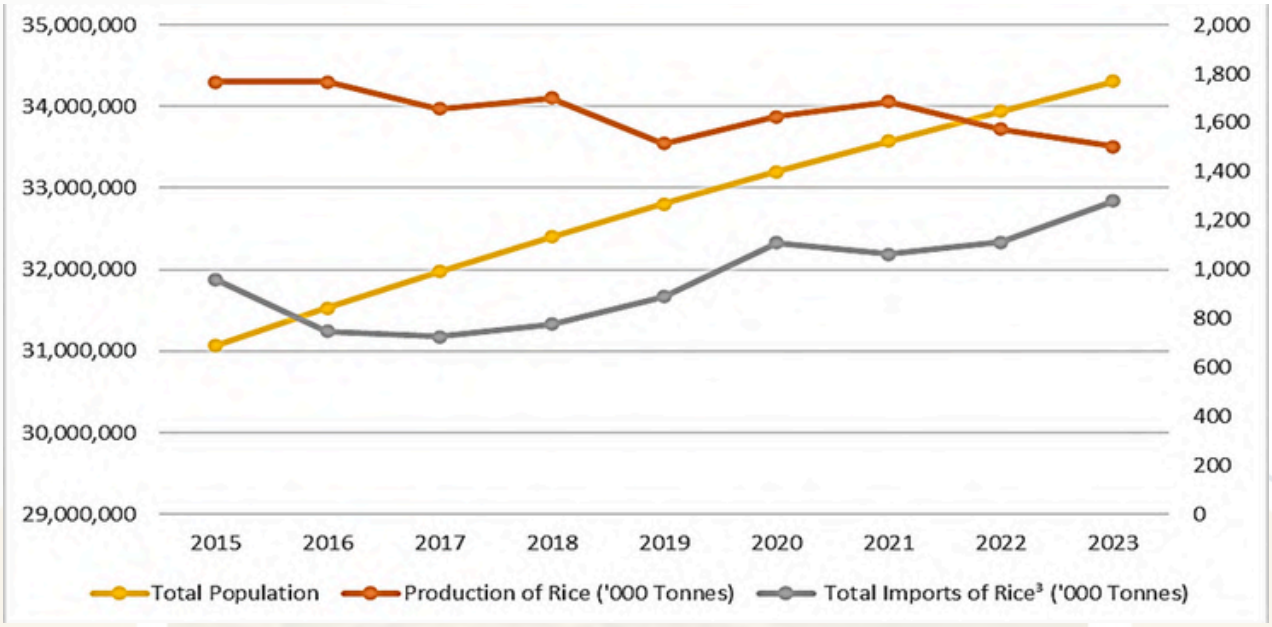
Recent statistics further highlight key challenges faced by the rice industry in Malaysia at present. First, the planted paddy area has been reduced from 681,559 hectares in 2015 to 614,082 hectares in 2023, illustrating the continuing loss of agricultural land (Bahagian Pembangunan Industri Padi, KPKM, 2023). Similarly, paddy production has also been downsized from 2.741 million metric tonnes in 2015 to 2.175 million metric tonnes in 2023, exposing further constraints on local supply. The average yield per hectare has also not improved over the years as it has fluctuated between 3,500 kg/ha and 4,022 kg/ha, confirming the need for improved farming techniques and the adoption of better technology. Finally, imports have increased further as overall importation has increased from 961,000 metric tonnes in 2015 to 1.281 million metric tonnes in 2023, which raises concerns over the long-term security of the food supply (Bahagian Pembangunan Industri Padi, KPKM, 2023).

An increasing population in Malaysia is compounded by the food security problems in the nation. The population of Malaysia has grown from 31.2 million in 2015 to 34.3 million as of 2023, and it is projected to continue to rise in the decades to come (Department of Statistics Malaysia, 2024). These translate into higher requirements, including staples such as rice. But considering that domestic rice production is stagnating and agricultural land is dwindling, gaps between demand and supply continue to increase. Unless production improves significantly, the reliance on rice imports will keep on growing, exposing Malaysia to global price fluctuations, supply chain disruptions, and imposed restrictions by major rice-exporting countries.

A larger population, however, increases pressure on existing food production systems, natural resources,

A larger population, however, increases pressure on existing food production systems, natural resources, and infrastructure. Heightened demand for land as a result of urbanization, housing, and industrial development frequently leads to the conversion of former agricultural land to other uses, hence reducing local food production capacity. More threatening to stability of rice yields are climate change-related problems cheered by erratic patterns of rainfall and extreme weather conditions.

Figure 1: Production of rice, total population and Total import rice in 2015-2023




**Sustainability and Food Security**

Climate change poses one of the greatest challenges to rice production, leading to reduced crop yields. Increases in global temperatures, with extreme weather events such as floods and droughts, and higher pest infestations due to changes in ecosystem dynamics cause uncertainties in rice production. Flooding in 2022 in the prime rice-growing states of Kedah and Perlis saw an estimated total loss of 12 percent in total rice output representing a loss of 150 metric tonnes of rice [Department of Agriculture, 2023]. Thus, Malaysia should take proactive mitigation measures, such as the development of more efficient irrigation systems, the promotion of sustainable farming practices, and the encouragement of resilient rice varieties.

Sustainable agriculture is being recognized as an alternative technology to conventional farming. Organic fertilization, crop rotation systems, and biological pest control have been known to increase long-term yield of rice yet limit adverse effects on the environment. Thailand and Vietnam are already imbibing this sustainable agricultural model into their rice industries; so too can Malaysia ensure that its future generation will have sufficient rice supply. Studies have shown that organic rice farming could boost the profitability of farmers by 20-25% due to higher market prices and reduced input costs [MARDI, 2023].

Unless good policies and proper investments are made to address the above issues, Malaysia's security in food may be under great danger in the future. In fact, to overcome these challenges, policymakers should give importance to modernization in agriculture, technological innovation, and sustainable agricultural practices in promoting domestic production of rice.

**Technology and Innovation in the Rice Industry**

Technology's contribution remains ongoing, driving productivity through innovation in rice farming in Malaysia. When modern technology such as drones for farm monitoring systems, smart irrigation systems for effective water use, and soil sensors measure the fertility of the soil are used, rice would be harvested better without necessarily adhering to traditional means. According to studies, there was an increase of around 15 to 20 percent in yield, as compared to the traditional farming method by using techniques of precision agriculture (Malaysian Agricultural Research and Development Institute, 2023).

This further digitalizes agricultural development by tying it in with the Internet of Things (IoT) and artificial intelligence (AI) in managing crops. AI-powered monitoring systems, for instance, can predict pest infestation or disease much earlier so that farmers can be advised on remediation in a timely fashion. According to latest findings, AI-driven pest control can be responsible for reducing losses owing to pest damages between 25 and 30 percent, thus helping the grower save RM500 per year per hectare (MARDI, 2023). Such technologies are found in use by developed countries like Japan and South Korea, and developing countries like Malaysia can adopt the same strategies to improve competitiveness in the rice sector among local farmers.

Malaysia's broad steps are developments in the aforementioned innovations through initiatives such as the Large-Scale Smart Paddy Field (SBB) program that advocates the use of precision farming tools and digital technologies by farmers. The government, in partnership with research institutions and private tech firms, has also made strides in advancing automation in rice farming productivity-enhancing initiatives. One example is the provision of grants and aggrandizement to farmers embracing smart technologies in their fields through the Smart Farming Technology Adoption Programme.

Government Policies and Incentives for Farmers

The government of Malaysia has played an important role in ensuring that the paddy industry is sustainable and capable of meeting the food security needs of the nation. Several key policies have been introduced to support farmers and improve productivity within the sector. These include the National Agro-Food Policy 2.0 (NAP 2.0) and the Paddy Price Subsidy Scheme, as well as other financial and technical incentives for small-scale farmers. There are, however, challenges regarding policy implementation and efficiency, along with sustained support for farmers.

**1. National Agro-Food Policy 2.0 (NAP 2.0)**

The National Agro-Food Policy 2.0 (NAP 2.0) offers fundamental importance in improving agricultural production-that of paddy farming. The other areas that are facilitated through this instrument include production efficiency improvement, competitiveness feature, and build-up of national food security. Mechanization of the paddy industry, encouraging R&D for introducing new rice varieties into the country, and providing incentives for farmers to increase yield per hectare are some of the key strategies.

However, a few weaknesses indicated in the implementation of NAP 2.0 wherein there were promising applications of new technologies toward improved access to modern technology, especially for small-scale and rural farmers. There were also some inefficiencies in resource distribution efficiency, particularly in fertilizer and seed subsidies, which have disrupted expected productivity enhancing efforts. Thus, reassessing the effectiveness of NAP 2.0 through more efficient distribution of subsidies and providing technical assistance in the adoption of new technologies to farmers has to be done.

**2. Paddy Price Subsidy Scheme**

One of the biggest government aids for farmers comes under the Paddy Price Subsidy Scheme relatively by which the minimum price for paddy to be sold to mills is fixed by the government. The objective of this scheme is to protect the income of farmers without fluctuations in the price but keeps a steady supply to them. Besides, the government has come up with production incentive scheme, where farmers will be awarded with extra compensation on their production of paddy.

Though this subsidy scheme provides farmers some security regarding their income, there are a number of flaws in its implementation. The first that can be noticed here is dissimilarity of the subsidy distribution where farmers tending to have large landholdings benefit from more subsidy while small-scale farmers are left with little benefits. In addition, inefficiency in the subsidy distribution system has resulted in some farmers getting delayed bureaucratic processes without the benefit through channelizing such disability. Digitizing the farmers' registry as well as providing technical assistance to help them adopt new technology is an approach to enhance transparency and efficiency in addressing these issues.

**3. Financial Aids and Infrastructure Grant.**

The government, among other things, offers some financial grants to farmers for the purposes of increasing crop production. With regard to this, an example of such financial assistance is the Commercial Agriculture Financing Scheme (SPPK). This scheme is tailored to offer low-interest loans to farmers for purchasing modern equipment such as harvesting machines, smart irrigation systems, and crop monitoring technology. In addition, there are some special assistance programs such as the Certified Paddy Seed Assistance Scheme for obtaining high-quality seeds that could potentially increase yield per hectare.

Nevertheless, one major concern in executing these financial schemes is that the farmers do not have sufficient information regarding the support available to them. For most, small-scale farmers, their ignorance of qualification limits the majority of them from participating in these programs or hinders them from access due to the mazy processing of applications. In this regard, expansion of governments' awareness programs through training courses and digitalization initiatives to ensure that farmers can better realize their standing to receive and employ these incentives would be advisable.

In terms of infrastructure, the government has launched high-output irrigation schemes such as those under the Muda Agricultural Development Authority (MADA) and the Kemubu Agricultural Development Authority (KADA) in order to ensure that major areas suitable for paddy are able to get sufficient water supply. However, this is an old irrigation system mostly in need of repair and upgrading. Using obsolete and inefficient irrigation systems tend to waste water while yields of paddy harvested go down. Therefore, the government should modernize the irrigation systems with intelligent technologies for more efficient water flow control.

**4. Challenges in Private Sector Participation and Public-Private Partnerships (PPP).**

The participation of the private sector is essential to improving the competitiveness of the paddy industry. Although the government has advocated public-private partnerships (PPP) for agricultural development, there is still a number of constraints that prevent private sector entry into the paddy industry. For instance, non-provision of investment incentives for agricultural research and development (R&D) clearly stagnates private investments in the paddy industry. Bureaucratic processes associated with agricultural land use also discourage private investments in this industry.
For instance, private sector participation in the development of new rice varieties and more efficient farming technologies is well pronounced in countries like Thailand and Vietnam. Malaysia has to emulate the same by providing tax incentives to those corporates investing in agricultural R&D and by simplifying the approval processes for such interested parties.

**Improving Policies and Incentives to Strengthen Malaysia's Rice Industry**

A solid mix of policy, technology, and investment in modern infrastructure will be necessary to ensure sustainable rice production by 2030 in Malaysia. Efficiency is the major area that would work on subsidy modification. There should be a robust use of digital platform in the managing subsidy products: ensure transparency and make sure that all beneficiaries targeted receive help. The e-agro system tracking real-time data will prevent false claims and ensure targeting benefits towards small farmers. Countries with digitised agricultural subsidy distributions have evidenced the benefits of reduced leakages and expanded access [Joseph et al., 2023]. The other thing is developing microfinance programs and low-interest agricultural credit schemes through development banks that can assist farmers in modernization without cash limits [Rahman, 2023].

Infrastructure investment for the agriculture side is yet another vital pillar in transformation. This should therefore include public grants that enable smart irrigation systems, resource management with automated nutrient dispensers, and remote water management as part of a system that minimizes waste and maximizes resource use. Studies have proved that countries such as China and India have adopted precision farming technologies like sensor-based irrigation and AI-driven crop monitoring, thus improving efficiency and reducing negative environmental impacts [Ngigi et al., 2023]. Malaysia should implement climate-resilient farming techniques, such as flood-resistant rice varieties and weather-adaptive farming practices, given that it is susceptible to the effects of climate change. Climate-smart agriculture alone can significantly boost productivity and reduce risks created by the impacts of extreme climatic events [Saroj et al., 2023]. Public-private partnerships [PPP] should play a much bigger role in financing and developing such infrastructures while ensuring that private sector innovations complement government efforts [Suresh et al., 2023].

Farmers' education will also have to grow into areas of digital literacy and precision agriculture. Many farmers lack the knowledge of AI-driven pest control, IoT farming tools, and blockchain for supply chain transparency. According to Wang and Zhang [2017], farmer education in digital agriculture improves yield and sustainability considerably by allowing the adoption of advanced farm management techniques. Farmers would, into the bargain, have access to continued training in entrepreneurial agriculture complemented with smart farming practices and sustainable land use management by establishing farmer advisory centers in rural areas. Farmers would now increase productivity while maintaining ecological balance with the technical expertise to grow crops and manage pastures better. Further, studies suggest that farmer-led knowledge-sharing platforms enhance learning outcomes and technology adoption rates [Afonso & Furceri, 2008].

Public-private participation and private sector participation policies can significantly enhance Malaysia's rice sector. The government must introduce tax incentives to agritech companies that invest in research and development (R&D) on high-yield varieties of rice, rice cultivation automation, and aerial monitoring by drones. According to empirical studies, investing agricultural technology through the private sector increases efficiency and innovation in crop production (Jones & Temouri, 2016). It should also include digital farming grants such as those of the Malaysia Digital Economy Corporation (MDEC) to further stimulate innovation in rice production. Through partnerships with private enterprises, government research centers could fast-track developing climate-resilient high-yield varieties of rice for long-term sustainability within the industry (Li & Liu, 2019).

Central to achieving food security into the long run is the reduction of Malaysia's dependence on rice imports. The government should thus work towards increases in national rice self-sufficiency through efficiency improvements in production, strengthening of local rice supply chains, and investment-incentivizing policy formulation vis-a-vis local seed innovation for improvements in yield and nutrition quality. Countries that have invested in house seed research and development have seen increased productivity in agriculture and lower dependence on imports (Nasiti & Saepudin, 2023). Stockpiling strategies and branding initiatives could also be adopted to create local rice as premium in order to enhance competitiveness in the domestic market(Sujidno & Febriani, 2023).

The National Agro-Food Policy 2.0 (NAP 2.0) would also require a periodic review for bringing interventions into line with emerging challenges in the rice sector. Future revisions of the policy would primarily center on adaptation to climate change, with respective strategies laid out to mitigate weather-related disruptions and improvements in disaster resilience in rice farming. Empirical findings have shown that adaptive agriculture policies, including measures for sustainability, lead to greater resilience and growth over time for different sectors (Durlauf & Johnson, 1995). Besides, incentive schemes based on performance for farmers who adopt sustainable agricultural practices would hasten the transition to an environment-friendly rice production model (Barro, 1990). A dedicated task force could be set up to monitor the implementation and effectiveness of these policies, hence ensuring that the rice sector remains both strong and adaptable to potential future challenges (Easterly & Rebelo, 1993).

**The Future of Malaysia's Rice Industry**

One of the strategic measures to ensure the continuous growth and resilience of the rice industry in Malaysia is to empower farming communities through training and technical support to use technology efficiently. Agricultural cooperatives could help small farmers integrate into larger markets and thereby enhance bargaining relevant to them in the industry.

More incentives to the private sector for agricultural research and development investment are needed. At present, only 1.2% of Malaysian R&D expense on rice technology comes from agriculture GDP, which is a smaller percentage than that of the top rice-producing countries (World Bank, 2023). R&D collaboration among the government, universities, and tech firms could speed the conditions of innovation and make them stress-field convenient. By putting into operation such measures, Malaysia could bolster itself toward self-sufficiency in rice to potentially lead in agricultural innovations in the ASEAN region.

On the other hand, in terms of sustainability, Malaysia should look upgrade its rice supply chains. This means precision-agriculture tools, smart-irrigation systems, and AI-based monitoring systems to achieve yield optimization and limit resource wastage. To further sustain transparency in the supply chain, blockchain adoption can answer our traceability concerns-favouring the guarantee that rice produced on its territory meets high-quality standards while reducing dependency on imports. China and India are two examples of successful blockchain application in agriculture, which increases efficiency of operations and profit margins among farmers (FAO, 2023).

Beside that, government policies must align themselves with global sustainability efforts, for instance, the UN Sustainable Development Goals (SDGs). The government will have to, at one point, curb agricultural activities that negatively impact environmental sustainability by enhancing soil fertility for future generations while using green farming techniques such as organic fertilizers, crop rotations, and integrated pest management. Infrastructure development such as irrigation network extension and flood prevention mechanism elaboration could also help counter climate change threats to rice production sustenance in Malaysia.

With policies like National Agro-Food Policy 2021-2030 (NAP 2.0), the government of Malaysia is already responding to these needs by laying emphasis on sustainable food security and technological development under agriculture. A further boosting opportunity to be realized through the introduction of the Padi Price Subsidy Scheme (SSHP) and Large-Scale Smart Paddy Field (SBB) initiatives, which are aimed principally to boost farmers' income and productivity by reports on mechanization and digitalization. Ultimately, promoting trade outside the country will be crucial as well. Malaysia must seek regional cooperation in ASEAN to bolster food security and stabilize rice prices. Agreements with countries such as Thailand and Vietnam would foster inter-country exchange of knowledge while guaranteeing consistent supplies of rice during periods of low production. Exploring the production of value-added rice products such as fortified rice or specialty organic varieties may further generate new markets for export and enhance the economic outlook for the industry.

The rice industry in Malaysia will need a holistic and sustainable approach to sustain food security in the country today. These challenges include climate change, labor shortages, and dependence on imports and should be counteracted with good strategies, which include modern technology interventions, strengthening government policies, and empowering the farming community. With the right R&D investment and enabling public-private collaboration, Malaysia can make its rice industry more competitive and secure food for future generations.

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# CHAPTER 4

# MALAYSIA'S RUBBER INDUSTRY 2030: STRATEGIES FOR RESILIENCE AND SUSTAINABLE GROWTH

Nurnaddia Nordin , Nurhaiza Nordin, Nur Ilyana Amiiraa Nordin

Having been introduced by the British in the early 1870s, the rubber industry has been inextricably linked to Malaysia's economic development since. Favorable tropical climatic conditions and centuries-old fertile soil allowed for the rapid establishment of rubber plantations, which made its way with the turn of the mid-century into one of the world's foremost producers of natural rubber. Starting out then mainly for global consumption, particularly in the auto industry for tires, Malaysia's rubber industry now encompasses high-value downstream products like gloves, tires, and medical devices. An important diversification is succeeding in asserting the strength of the industry throughout changing world economic conditions.

The rubber industry remains one of the major components of Malaysia's economy, significantly contributing to its GDP, employment, and exports. As one of the top producers of natural rubber and rubber-based products in the world, Malaysia has made a considerable impact in the global arena. This sector has now blossomed beyond mere traditional rubber cultivation into high-value downstream products including gloves, tires, and medical devices, making it even more economically relevant.

In terms of contribution to GDP, approximately RM 12.4 billion were earned in export revenue by Malaysia's rubber industry in 2024, of which rubber gloves contributed a considerable share. This depicts the resilience of the rubber industry vis-à-vis its capacity to meet global market demands in the wake of health awareness and industrial needs. The strong performance of the rubber sector continues to contribute towards economic growth of the country and remains relevant in both local and international markets [The Malaysian Reserve, 2024].

In terms of employment, the rubber industry provides livelihoods for over 450,000 smallholder rubber farmers across the country. In addition, hundreds of thousands of workers are also engaged in the manufacturing of rubber gloves and other rubber-based products. Companies like Top Glove and Hartalega spearhead employment generation, which in turn helps stabilize Malaysia's labor market and sustain industrial growth development. These firms have also played an important role in meaningful technological advancement and production efficiency to the industry.

Malaysia is still a major rubber-based products exporter, retaining its international reputation. Exports of natural rubber (NR) hit 48,199 tonnes in July 2024, marking a 21.1% increase simply from June 2024. Major first export destination was China (30% of total exports), followed by the United Arab Emirates (12.3%), India (11.6%), Germany (10.6%), and the United States (6.7%). Increasing demands for the country's high-quality rubber products denoted its competitive advantage and the sustained global dependence on its rubber industry.

The shipment of natural rubber from Malaysia amounted to 39,800 tonnes in June 2024, down 21.6 per cent as against May 2024 (50,798 tonnes) and down 18.5 per cent from last year's same month exports of 48,848 tonnes. The main rubber-importing country remained China, having accounted for 35.7 per cent of total exports in June 2024, followed by Germany (11.8%), India (11.0%), United Arab Emirates (6.6%), and USA (6.2%). Glove exports of rubber-based products were the major contributor at 47,412 tonnes followed by rubber glove imports into the USA (16,318 tonnes), Germany (3,219 tonnes), and Japan (2,355 tonnes) as shown in Table

Table 1: Top 10 Exports Countries of Rubber Gloves, May and June 2024

| **Countries** | **Quantity (Tonnes) May 2024** | **Quantity (Tonnes) June 2024** | **Value (RM million) May 2024** | **Value (RM million) June 2024** |
|---|---|---|---|---|
| United States | 15,774 | 16,318 | 438.9 | 474.2 |
| Germany | 3,336 | 3,219 | 87.9 | 87.2 |
| Japan | 2,543 | 2,355 | 81.5 | 76.7 |
| China | 2,685 | 2,227 | 51.8 | 44.3 |
| Hong Kong | 428 | 1,659 | 11.1 | 10.3 |
| United Kingdom | 1,561 | 1,539 | 40.8 | 38.9 |
| India | 1,681 | 1,453 | 25.7 | 21.1 |
| Canada | 1,581 | 1,464 | 35.5 | 28.7 |
| Italy | 1,236 | 1,342 | 28.4 | 31.0 |
| Spain | 1,246 | 1,136 | 30.1 | 28.0 |

Source: Department of Statistics Malaysia

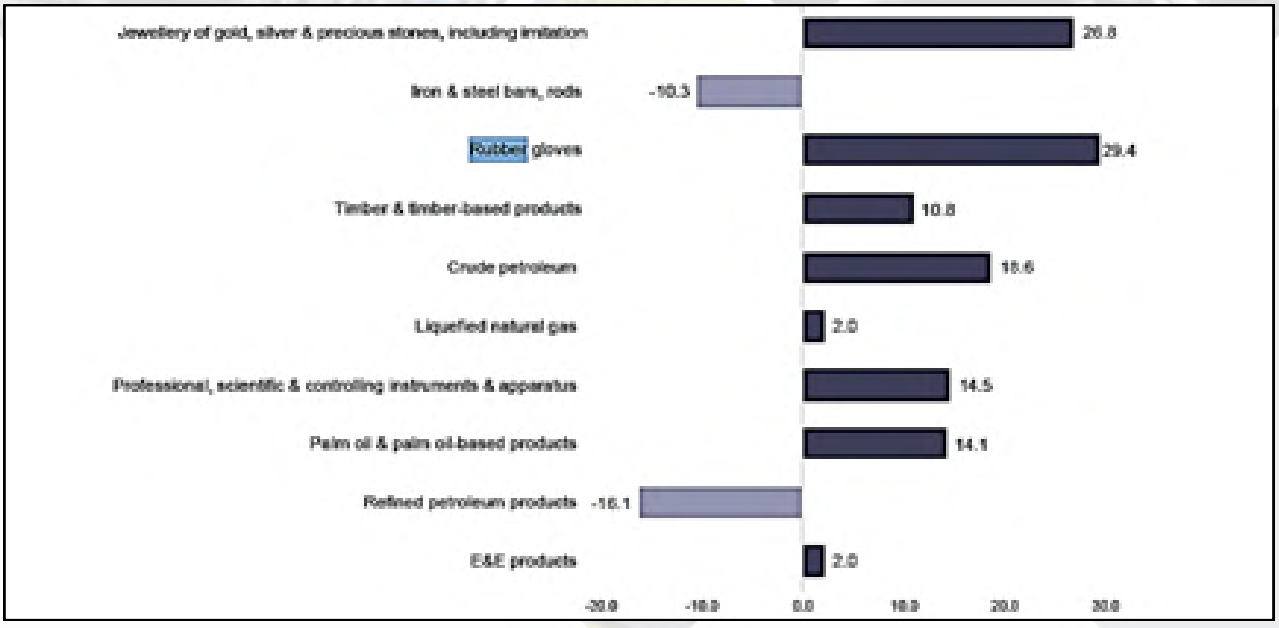
**Comparative Analysis with Other Key Producers**

In the world, South-East Asia produces most of the rubber, with Thailand, Indonesia, and Vietnam accounting for over 70% of rubber plantation area globally. The global largest producer of natural rubber is Thailand, where vast plantation areas exist and enormous export volumes of raw rubber are traded. Indonesia is also a notable supplier of raw rubber, focusing most of its effort on developing synthetic rubber production that takes advantage of the availability of resources based on petroleum. Vietnam has made significant increase in the rubber cultivation in the past two decades and is now a very strong competitor for raw rubber exports and processed rubber goods.

Malaysia, despite having less plantation area in comparison to Thailand and Indonesia, is quite competitive through its technological emphasized production. This country is known globally in the production of rubber gloves, medical rubber products, as well as engineered rubber components, proving itself competent in maintaining resilience in the industry as a whole. It was proven by the current pandemic COVID-19 when the demand for rubber gloves flooded the market and Malaysia remained a salient exporter of manufactured rubber goods.

Malaysia will have to upgrade its synthetic rubber capabilities by looking forward to 2030; as an example, Indonesia has made huge investments in synthetic rubber production, whereas most of Malaysia's demand for synthetic rubber is met through imports.

Figure 1: Annual Percentage Change (%) of Malaysia Exports by Top 10 Major Selected product.




Source: Department of Statistics Malaysia

Therefore, increasing local production of synthetic rubber would save Malaysia from import dependence and foster growth in other wider industrial sectors of the economy, with emphasis on automotive, aerospace, and medical applications. To be competitive in the future, Malaysia must continue investments in sustainability initiatives and automation and digital transformations that will lead to increased productivity levels and make the market attractive to global buyers interested in sourcing in an ESG-compliant manner.

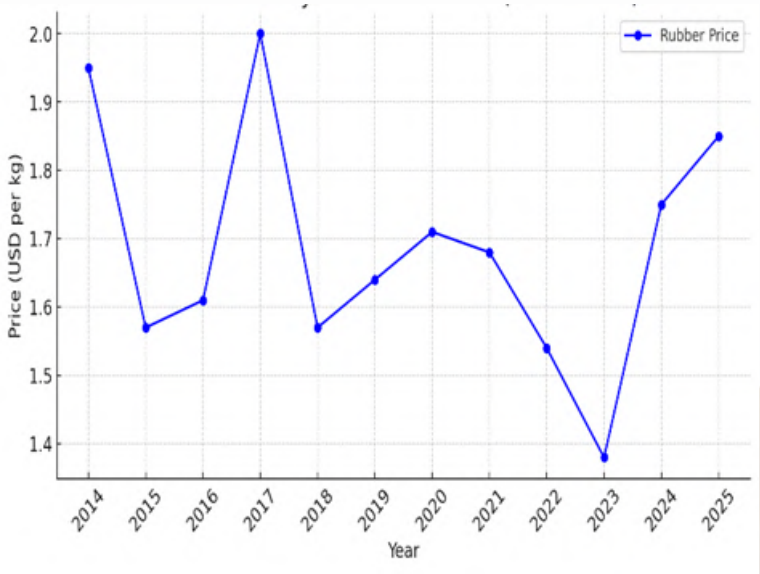
**Major Challenges Faced**

Through the decades, the rubber industry in Malaysia has faced several challenges that overtly transformed its viability and sustainability. Price volatility and competition from synthetic alternatives are very much economic-related, while environmental sustainability and labor shortages are considerations that might altogether be a pinch to the industry. Serious attention must be given to bridging such outstanding questions to ensure the resilience and competitiveness of the sector in all dimensions that assure long-term survival in the global market.

**i. Price Fluctuation**

Rubber is the kind of industry that ebbs and flows with the world's commodity stages, and incomes of smallholders rest directly upon these ebbs and flows. Multiple factors cause this rubber price fluctuation: crude oil prices that determine the synthetic rubber development costs, currency exchange rates, supply-demand disparities, etc. Up until the price recovery expectations in 2026, market movements, sustainability programs, and technological advancements are increasing prices, shifting the demand back in favor of rubber. Malaysian rubber prices started to break down under global competition from synthetic rubber. Demand, economic shocks, and highly competitive synthetic rubber prices bear the brunt of this shock followed by highly volatile prices. High price drops, well pronounced with the rubber price drop in 2020 during COVID-19, were extremely detrimental to the income of smallholders, pushing them into financial despair. Price stabilization mechanisms have thus been increasingly warranted, including governments setting up some minimum price guarantee, as well as improved financial risk management by way of futures contracts, and insurance schemes.

Figure 2: Trend of Malaysia Rubber Price (2014-2025)




**ii. Competition from Synthetic Rubber**

The growing need for synthetic rubber constitutes a major constraint to Malaysia's exportation of natural rubber. At present, synthetic rubber, with an estimated current share of over 60% of global rubber consumption, is preferred in many different industries, from automotive to aerospace and medical equipment applications, owing to its uniformity, durability, and cost-effectiveness. Any increase in the supply of synthetic rubber will be from petroleum-based sources; therefore, fluctuations in crude oil prices will determine the production cost of synthetic rubber and eventually affect the demand dynamics between synthetic and natural rubber.

Increasingly, this preference for synthetic alternatives is steadily reducing the share of natural rubber in historically traditional applications like the manufacture of tires. Henceforth, in order to stay competitive, Malaysia must focus on value-added specialty rubber products, ie, eco-rubber compounds, biodegradable rubber, and medical-grade latex that cater to niche long-term markets with tightly defined sustainability requirements.

**ii. Environmental and Sustainability Concerns**

The rubber industry stirs up controversies about deforestation, carbon emissions, and farming practices that cannot be sustained. Large rubber plantations on the one hand cause deforestation and loss of biodiversity and soil-degrading farming practices give the environmentalists and regulators just cause to be concerned. Then there is the carbon footprint attributed to rubber processing and transport, all which beg for environmentally friendly and sustainable production practices.

In order to respond, there have been calls and pressures for Malaysia to promulgate and enforce sustainability certification programs like the Malaysian Sustainable Palm Oil (MSPO) certification model and the Sustainable Natural Rubber Initiative (SNRI) by the Malaysian Rubber Board. Land use would be encouraged in a responsible manner throughout the sector, with a minimal environmental footprint, and improved social welfare. Advancement in carbon-neutral rubber production stands at the precipice of realization with accompanying traceability technologies, such as blockchain-based monitoring of the supply chain to satisfy global sustainability benchmarks.

**iv. Labour Shortages**

The rubber industry sector in Malaysia remains heavily dependent on foreign labor, particularly in relation to tapping of rubber and processing of rubber. However, a dearth of interest from local laborers in plantation work led to chronic labor shortages exacerbated by COVID-19 lockdowns and due closures which impeded the inflow of foreign laborers.

Thus, mechanization, automation, and upskilling have become a matter of great urgency with the aim of reducing dependence on manual labor. Investment in mechanized tapping systems, plantation management through AI, and robotics for rubber processing must greatly enhance productivity and guarantee future sustainability of the industry. Running parallel to this would be government programs aimed at training and upskilling local employees to attract a skilled workforce into the sector and to mitigate undue reliance on foreign labor.

**Resilience and Growth Strategies for the Future**

The Malaysian rubber industry has been able to withstand challenges like an inconsistent global demand, volatile price fluctuations, and environmental concerns-daring challenges to some of the conditions aimed at sustaining growth and competitiveness in government support, new technologies, and sustainability initiatives. These would eventually translate into increased productivity over the longer term and ensure Malaysia's position as a competitor for the global leader in sustainable rubber production.

Some important pillars of resilience within the industry include government incentives and funding. The Malaysian government has worked on many policies through government agencies like the Malaysian Rubber Board (MRB), the Ministry of Investment, Trade, and Industry (MITI), and the Rubber Industry Smallholders Development Authority (RISDA) to help smallholders and rubber manufacturers. This includes incentives for the subsidized replanting of high-yielding rubber clones and R&D grants along the lines of programs to widen markets for their exports.

Furthermore, these governments have put in place programs to enhance skills to refresh industry players with advances in modern agricultural techniques, as well as transformation within the digital world. Such initiatives are indeed critical to enabling smallholders and manufacturers to navigate economic uncertainties while building their global competitiveness.

Technological advancements have, therefore, been proved with changes in the arena of the Malaysia rubber industry. AI performance is being innovated through plantation monitoring and precision farming, which are quite automated. Improvements to the supply chain have increased in multiple responsibilities in other organizations involved. Currently, AI and IoT sensors are used for monitoring the conditions of the soil detection of diseases at their early stages as well as optimizing tapping cycles to manage yields. Further production process automation using robotics guarantees a significant reduction in the manual input needed, thus ensuring the product quality. With blockchain technology, supply-chain processes have become more transparent, allowing buyers to authenticate the sustainability and ethical sourcing of Malaysian rubber products. It is by such technological development that Malaysia seeks to incorporate itself in becoming a hub of smart and innovative production of rubber.

Sustainability and compliance with ESG (Environmental, Social, and Governance) meet the other twain through which resilience and growth strategies are being sought for the industry. From carbon neutrality schemes to eco-certifications to green manufacturing, the initiatives are being embraced across the board. The international certifications are being met for credibility enhancement purposes in the international market, such as Forest Stewardship Council (FSC) certification and ISO 14001 Environmental Management System. The industry is investing money in renewable energy and waste management along with development initiatives aimed at the circular economy toward the objective of minimizing its environmental footprint. Others wish to ensure that ethical labor practices and social responsibility translate into fair wages, safe working conditions, and community development. These sustainability efforts will improve Malaysia's image in the global market and attract investments from foreign companies wanting alignment with responsible and green supply chains.

The rubber sector in Malaysia stands on this crossroad, needing the two main prescriptions-resilience and innovation-for its sustainable growth. Government support, application of technology, and sustainability, are increasingly becoming the pillars for lending in the sector to meet contemporary challenges and create opportunity avenues. Continued investments in research and digital transformation while upholding ESG standards will keep Malaysia in the rubber industry globally and bring in long-term economic benefits.

## Conclusion

Indeed, market forces, technology, and environmental changes have tried and tested Malaysia's rubber industry on many occasions yet it has remained resilient. It has evolved within all situations prevailing, internally, or externally, where huge global price fluctuations, shortage of labor, and increasing regulations are made available through government intervention or technology or sustainability schemes. Hence, Malaysia has created a niche for itself in the global rubber market.

Active growth will continue until 2030, with smart agricultural practices, sustainability, digital transformation, and high-value product innovations leading the way. Adoption of AI-based monitoring systems, mechanized tapping, and precision irrigation will enhance the productivity, yield, and long-term viability of smallholders and commercial plantations. New economic diversification and competitiveness opportunities shall also rise through the upstream development of high-value products, including biodegradable rubber, innovations in medical applications, and components for electric vehicles.

In the long run, carbon neutrality will remain the core target for the industry, along with implementing deforestation-free sourcing of rubber-a measure reinforced by options of bio-based synthetic rubber alternatives. Further, with respect to compliance with international environmental standards and engagement in eco-certification schemes, Malaysia would be further elevated as a responsible and sustainable rubber-producing nation.

Export growth opportunities will also be created by diversifying market access through bilateral trade agreements towards increasingly emerging markets, thus reducing its dependence on conventional buyers. Engaging strategically in both regional and international forms of collaboration will maintain Malaysia's competitive edge in the emerging globalized economy.

In a nutshell, the Malaysian rubber industry is prepared for a future of sustainable growth, technological advancement, and penetration into larger markets. This has placed the industry in evolution undergoing technological transformation, investments in sustainability, and entrenchment into global trends, thereby further entrenching its resilience and ensuring its leadership position within the global rubber supply chain.

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# CHAPTER 5

# THE FUTURE OF MALAYSIA'S WHOLESALE AND RETAIL TRADE SECTOR: GROWTH, POLICY, CHALLENGES, AND ECONOMIC INSIGHTS TOWARDS 2030

Nurhaiza Nordin, Nurnaddia Nordin, Nur Ilyana Amiiraa Nordin

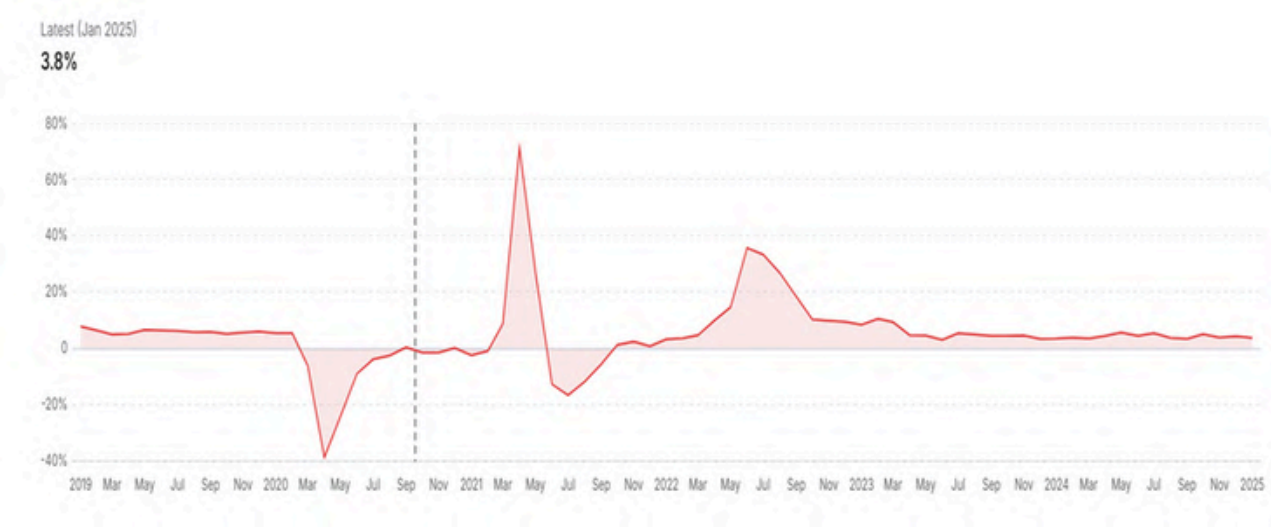
Trade, whether wholesale or retail, forms the backbone of the Malaysian economy in its magnitude and effectiveness in contributing significantly to GDP and employment. The aforementioned sector continued to play its pivotal role as it has historically done in enhancing national economy performance in 2023 and 2024; it offered evidenced support to enterprises and employment openings and ensured seamless flow of goods throughout the nation. The contribution of this sector to the GDP in the year 2023 will be about 17.2%, underscoring its importance in daily commerce as well as in the economic stability of Malaysia.

Consumer spending remained strong, with more Malaysians embracing digital shopping and businesses adapting to new retail trends. Resilience came from government funding, inflation, and disruption of global supply chains, but the industry had also been witnessing a shift toward e-commerce and the rise of omni-channel retailing. The momentum of 2023 carried through the sector into 2024, with the GDP contribution climbing to an estimated 17.6%. Retail and wholesale undertakings reported good sales on a monthly basis, with more spending from consumers and higher confidence. The good showing by the sector carried well into the end of 2024, with sales up 4.7% year-on-year in November to RM149.3 billion, largely underpinned by retail and wholesale spending. By December, sales had accelerated to RM152.2 billion, reflecting a 5.7% increase from the previous year. Growth was supported by higher sales from non-specialized retail stores and specialized wholesalers, indicating that Malaysians were spending confidently in the face of economic turbulences. This is not only a sector that contributes quantitatively but also plays a major role in shaping up consumer trends, transforming the digital landscape, and molding government policies regarding various affairs.

In fact, within the last decade, rapid development in Malaysia's retail industry has resulted from the application of technology, urbanization, and changing patterns in consumers' behavior. E-commerce, mobile payments, and AI-powered analytics have shaken the traditional models creating fierce competition between brick-and-mortar and online platforms

The wholesale and retail trade sector has made steady growth, strengthening its position as a significant economy in Malaysia. A key pillar of the domestic economy, this sector ensures the efficient distribution and availability of goods for the support and use of several industries. He acts between producers and consumers, facilitating market access and economic transactions.

Figure1: The performance of Wholesale and Retail Trade)




Source: Department of Statistics Malaysia

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**A Comparative Analysis of Key Economic Sectors**

The wholesale and retail trade sector in Malaysia has its own distinctiveness when compared with both manufacturing and services. While manufacturing is based on production, and industrial output, and value creation through the physical goods, and the services sector enhances productivity through specialized knowledge, financial services, and other professional expertise, wholesale and retail trade primarily facilitate market access, distribution, and consumption. This is the most important link that ensures that goods produced by manufacturers reach consumers in an efficient manner, whereby the whole mechanism is thus driven into economic activity.

The wholesale and retail trade sector is more consumer-driven, unlike manufacturing, which relies on capital-intensive processes and industrial advancements. It relies on demand patterns, purchasing power, and consumption habits to thrive. Whereas manufacturing works on an export-led industrialization strategy for economic growth, wholesale and retail trade fortifies domestic consumption, a key driver of GDP in Malaysia. This essentially plays a stabilizing factor in uncertain economic times when consumer spending wanes.

Further, while industries like financial services, tourism, education, and professional services are part of the services sector, wholesale and retail trades engage more immediately in economic circulation. While the services sector heightens productivity through specialized skills and knowledge-based solutions, wholesale and retail trade sustain economic momentum through a continuous incoming and outgoing of goods. Also, digitalization has made it harder to differentiate between services and wholesale and retail sectors since sectors like retail increasingly adopt service-oriented attributes, including but not limited to online shopping platforms, personalized customer experience, and fintech-enabled payment options.

One key strength of the sector is its wide-spread reach to both urban and rural consumers, ensuring the equitable access of goods and services across Malaysia. Underscoring this distinctiveness is the fact that, unlike manufacturing, which remains much more often concentrated in industrial hubs, or certain high-value services that are primarily available in urban centers, wholesale and retail trade do have a wider geographic spread. This broad access helps promote micro, small, and medium enterprises (MSMEs), which play key roles in job creation and local economic development.

The expeditious march of Malaysia towards a digital economy will make increasing degrees of intertwining between these sectors. The wholesale and retail trade sector is taking on innovations in e-commerce, automation, and logistics for greater efficiency, while manufacturers and service providers are applying retail onto their solutions for market reach.

The intricate interplay highlights the significance of each sector in fostering economic resilience and long-term growth.

**Key Industry Players and Market Structure**

Wholesaling and retailing are highly influenced in Malaysia by a typical mix of players, domestic and international, thus creating a dynamic market structure. Though still important, traditional brick-and-mortar retailing has undergone great agility with the onset of digital retail and has strongly influenced consumer shopping behavior and competitive spirit.

**i. Competition Between Domestic and International Players**

A mixture of well-established local retailers and big international brands determines the current retail landscape in Malaysia. Long-established home-grown companies such as Mydin, AEON Big, and Lotus's (formerly Tesco Malaysia) are players in the hypermarket and supermarket segments focusing on a bargain-orientated customer base and the affordability of local products. Competition between local industry giants and international players such as Walmart and IKEA is intense, especially considering the burgeoning middle-income class with an inclination towards international products within Malaysia.

Additionally, other players in the sector apart from hypermarkets and large chains include small independent retailers and specialty shops, which remain significant, especially in suburban and rural areas. While traditional convenience stores and mom-and-pop shops are being challenged by modern retail formats, they are also trying to accept digital payment systems and improve their product offerings.

**ii. The Surge in E-commerce and Digital Retailing**

Perhaps one of the most groundbreaking trends that have transformed the retail landscape in Malaysia is rapidly increasing e-commerce. The sector continues to experience double-digit growth annually for online retail sales, with Shopee, Lazada, and TikTok Shop emerging as leading players in this market. These three platforms accounted for more than 60 percent of the total online retail sales in 2023, indicating a significant shift in consumer purchasing behavior. The platforms owe their gains, especially, to a smooth user experience, price competitiveness, and customer engagement personalization through AI recommendation systems.

Omnichannel retailing is now the survival strategy by all means for traditional retailers to remain in the industry. Retailers are now blending both online and offline experiences and allowing customers to browse products online and complete purchases at physical stores or vice versa. AEON and Parkson have also constructed strong digital platforms as a basis for allowing online shopping to complement their in-store presence for conventional shoppers towards that end.

### iii. The Rise of Mobile Commerce and Digital Payments

Increasing smartphone penetration and internet connectivity pushed the rise of mobile commerce (m-commerce). In Malaysia, 80% of consumers prefer e-wallet transactions over cash, boosted by government initiatives in promoting a cashless economy. Many digital payment platforms, such as Touch 'n Go eWallet, GrabPay, and Boost, achieved near-ubiquity, especially for youth and urban consumers. Comfort using mobile methods is further extended by incentives such as cashback rewards and loyalty points, which made it more challenging to convert to cash transactions.
The digital revolution has stretched beyond the big retail chains; it has also reached the small and independent sellers, who now explore social commerce. This has enabled the micro-entrepreneurs to reach more customers without the need for a physical shop, thanks to platforms like Instagram, Facebook Marketplace, and Blockchain Live Shopping. All of this generalization about retail has strengthened SMEs and individual sellers, bringing diversity to the easily changing world of retailing.

## Government Policies and Support: Driving Growth and Digital Transformation in Retail

The government's role in the wholesale and retail trade sector has been enabled through a range of policies, financial incentives, and programs to encourage modernization. Since these sectors contribute to economic growth and employment and foster digital transformation in their own right, a number of measures have been instituted to strengthen retail, hasten digitalization, and encourage sustainability.

### i. Increase Digital Trade and SME Involvement

The foremost major policy initiative supporting the retail sector is the National eCommerce Strategic Roadmap (NESR), which aims to fast-track the digitalization of the retail business and increase SME participation in online trade. The various roadmaps would provide financial assistance, digital training programs, and infrastructure development to enhance e-commerce capability. In consequence, it has witnessed online retail sales steadily increasing in Malaysia, with greater involvement from the SME sector in the digital economy.

Further digital adoption has been encouraged through government grants and funding programs targeting over 25,000 SMEs. These grants assist companies in adopting digital payment systems, e-commerce platforms, and cloud-based inventory management solutions. Initiatives such as Shop Malaysia Online and Go-eCommerce also provide small retailers with marketing support, subsidies, and exposure to larger digital marketplaces.

### ii. Financial Incentives and Tax Policies

The Malaysian government also has a tax incentive plan and targeted exemption measures under the Sales and Services Tax (SST) framework to support retail businesses, especially in their post-pandemic economic recovery. These incentives provide some relief from operating costs to give businesses an incentive to reinvest into digital transformation, workforce training, and supply chain improvements. Micro and small businesses have also benefited from corporate tax reductions and special financing schemes, which have enabled much more effective scaling of their operations.

### iii. Encouragement in Sustainability within Retail

Sustainability is an increasingly important issue for retail, and policies have grown to support greener practices. The Sustainable Malaysia Program promotes sustainable packaging, energy-efficient retail operations, and waste minimization initiatives. Retailers are encouraged to lower their carbon footprint by employing eco-friendly logistics, minimizing single-use plastics, and adopting ethical sourcing practices into their supply chains.

Furthermore, there are government-sponsored green financing mechanisms, allowing retailers to make green investments. These funds are allocated to companies transitioning towards renewable energy solutions, introducing sustainable products, and cutting down waste. Big retailers like AEON and Lotus's have pledged plastic waste reduction and the adoption of solar energy for their stores to complement national sustainability objectives.

## Challenges and Risks Pertaining to Malaysia's Retail Sector

As the wholesale and retail trade sector in Malaysia continues to grow, there are several issues that threaten its sustainability and competitiveness in the long term. Among the most prominent risks are disruptions in the supply chain, the growing competition that international retailers bring, and an increasing cost of compliance to regulations dealing with sustainability. Retailers must steer their way through these challenges smartly, remaining resilient in a socially diverse and economically dynamic environment.

### i. Supply Chain Disruption: Expensive and Short on Stock

The global supply chain breakdowns are operational complications that have been faced by Malaysian retailers, which led to an increase in operational costs and inadequate stock. The shipping costs multiplier, which was seen to increase by 35% in 2023, will see its reflection through changes in price due to increasing cost of importing goods and price fluctuation within the different segments of retail.

Once again, logistics delays, such as delivery for important products including electronics and household items, create stocks shortages that in turn force retailers to adopt more agile supply chain strategies. In order to mitigate these issues, companies have localized their supply chains by sourcing from domestic manufacturers and suppliers, adopting a very important strategy of diversification of supply networks, whereby they will have reduced dependence on a single region or country for their imports. In this manner, most retailers are now using AI-driven inventory management systems that will optimize stock levels, forecast demand more accurately, and minimize losses caused by supply chain uncertainties to evade these effects.

**ii. Competition from International Retail Chains**

Global retail giants such as IKEA, Decathlon, and Uniqlo have heightened competition in the retail industry in Malaysia. In 2023, about 35% of the market share was occupied by foreign retailers, who took advantage of economies of scale, brand power, and advanced techniques in digital marketing to entice Malaysian consumers. This was in addition to having very competitive prices and a wide range of products; therefore, one channel stock them in stores and online. That made it hard for local players to compete in Malaysia.

In response to this, domestic retailers will work on differentiation strategies, such as:

a. Curation of product offerings emphasizing local culture, traditions, and consumer preferences.

b. Better consumer experience by personalizing service, loyalty programs, and interactive experience in stores.

c. Localization of marketing strategies, publicizing marketplace with social media influences, consumer-driven campaigns, and partnerships with local crafts and SMEs.

In addition, those backed by government initiatives for SME digitalization through e-commerce, AI-driven consumer behavior insight systems, and automation tools for enhancing productivity improved competition among poorer retailers.

### iii. Regulatory Compliance and Pressure for Sustainability

Growing emphasis on sustainability from both global and local perspectives has propelled retailers into increased regulatory pressures to conform with environmental laws that are becoming more stringent for compliance. Such compliance costs (20% increase in costs) can be attributed to the enforcement of the following:

a. Mandatory laws on eco-friendly packaging, that compel businesses to reduce plastic usage and offer biodegradable alternatives.

b. Compulsorily record and report a company's carbon emissions-reporting obligations that force an organization to track its environmental impact and disclose it to the world.

c. Ethical sourcing mandates specify that products must be obtained from environment and socially friendly suppliers.

Although these regulations come hand in hand with rising consumer demand for popular sustainable products, they are not free of financial and operational costs to retailers. Most of the current corporate investments in green technologies comprise among others, energy-efficient operations of stores, online receipts, and waste-reduction initiatives undertaken to comply with sustainability targets. Leading retailers like AEON and Lotus's have set up eco-friendly practices into their sustainable business models, making them examples for sustainability in the industry. Despite these challenges, Malaysia's retail sector remains resilient by embracing technological innovation, strategic market positioning, and sustainability-driven business models. As competition intensifies and regulatory requirements evolve, businesses that adapt quickly, invest in digitalization, and prioritize sustainability will be best positioned to thrive in Malaysia's dynamic retail landscape.

### Future Outlook of Malaysia's Wholesale and Retail Trade Sector

The future outlook for the wholesale and retail trade sector of Malaysia is an upward one even with the many challenges confronting it. The sector is still one of the backbones of the economy, with rising consumer spending, digital transformation, and government backing for retail modernization as driving forces. As the market undergoes transformation, firms are navigating competition through technology adoption, automation, and sustainability. Taken together, these trends point toward a strong and continually evolving retail landscape set to expand in the years to come.

The increased purchasing power of consumers, through the interplay of an emerging middle class and urbanization, is a short-term driver for the sector. The sector is likely to grow at a CAGR of 5.5% between 2024 and 2028, a result of increasing numbers of Malaysians shopping more and more by both online and offline means. E-commerce has disrupted the game as big digital retailers, offering platforms like Shopee, Lazada, and TikTok Shop, are defining consumer patterns. More retailers are now embracing omnichannel strategies, combining physical stores with digital marketplaces to ensure a seamless shopping experience. Alongside the expansion of cashless payments in the form of the e-wallet and BNPL (buy now pay later) options) for added convenience, the spending behavior of consumers is being changed.

Investment opportunities in these areas are also increasing, especially in AI retail solutions and automation. AI is changing the way inventory management is done basically by allowing retailers to forecast demand pattern behaviors and level stocks accordingly that ensure low waste with productive efficiency. Storage, warehousing, and logistics automation solutions powered by robots and IoT to facilitate sound supply chain-based operations form the other part of the investment mix. This tech-savvy way of doing business cannot only bring down self-costs but also help serve customers faster while ensuring timely deliveries; and that becomes of utmost importance and essence in the highly competitive retail market today.

Sustainability is becoming another focal point for the retail players in Malaysia. With mounting regulatory pressure and awareness of environmental issues on the part of consumers, the businesses have begun to embrace green retailing practices actively. Many retailers have begun to invest in energy-efficient store designs, biodegradable packaging, and carbon offsetting to comply with ESG (Environmental, Social, and Governance). Sustainability, therefore, is no longer merely a matter of corporate responsibility: it is now a major differentiator in consumer choice and brand loyalty.

However, vis-a-vis the silver linings, grey clouds do exist. The industry has to grapple with growing competition from international retail giants, supply chain disruptions, and changes in regulations. Nevertheless, businesses ready to embrace the digital innovation landscape, improve operational efficiency, and integrate sustainability into their strategy will be in a prime position to benefit from sustained growth opportunities across the sector. What remains evident is that with demand from consumers being so solid, plus government backing and technology evolution as perennial players, the future of wholesale and retail trade in Malaysia can only be predicted to remain an anchor for the national economy.

**Future of Malaysia's Wholesale and Retail Trade Sector in 2030**

By the year 2030, the wholesale and retail trade sector in Malaysia is likely to continue undergoing transformation due to digitalization, change in consumer behavior, and sustainable initiatives. The sector will remain a crucial pillar of the economy, combining technological advancement with improved efficiency and competitiveness.

**i. Growth and Market Expansion**

The continuous growth of the sector is likely to maintain an equilibrium as urbanization rises, household income increases, and the digital and omnichannel retail path expands. With online sales expected to dominate the retail environment, e-commerce will contribute a larger amount-more than 50% to the total retail transactions. The traditional and brick-and-mortar stores will be transformed into experience retail spaces that integrate augmented reality (AR) and virtual reality (VR) platforms to enable enhanced customer engagement. Initiatives such as the Malaysia Digital Economy Blueprint (MyDIGITAL) will be instrumental in anchoring the retail changes through improved digital infrastructure and accessibility to e-commerce.

**ii. Technology Integrated and Automated**

Automation and artificial intelligence (AI) will thus remain central to ensuring streamlined operations-from supply-chain management down to personalized marketing. AI would enhance operational efficiency and cost effectiveness with procedures such as inventory systems driven by AI, smart check-out systems, and warehouse management via robotics. It is likely that blockchain technology would also enhance transparency and security throughout the supply chain, that is in terms of tracking the goods better, and thus reducing risks associated with fraud. The National Industry 4.0 Policy Framework is set up to assist enterprises that wish to embrace these technology advancements to emerge more competitive.

**iii. Sustainability and Green Retailing**

Sustainability is slated to become a primary consideration for retailers, and stringent environmental regulations are compelling businesses to adopt greener practices. Beginning in 2030, most retailers will likely engage in eco-packaging, emissions neutral approaches toward logistics, and energy-efficient store design. Consumer trends will also favor the investments in sustainable supply chains as increasing demand arises for ethically sourced and environmentally friendly products. The Rangka Tindakan Keusahawanan Sosial Malaysia 2030 (SEMy2030) provides the framework for promoting sustainable business models and incentives for environmentally friendly initiatives that encourage alignment with green practices by businesses.

### iv. Shift in Consumer Preferences

Malaysian consumers will be ever maturing into the savvy digital age with the eroding preference for the seamless and personalized shopping experience. Engagement in voice-assisted shopping, AI-pictures recommendations, and drone delivery will usher in a new frontier in convenience. The aforementioned activities, coupled with the rising evolution of the metaverse, may consider openings for a new avenue of virtual retail space, wherein consumers browse and shop for their desired products in immersive digital environments. NeSR, supported by the Government, enshrines powers for enhancement in Malaysia's digital retail ecosystem, attends to changing consumer expectations, and assists businesses.

### v. Government Policies and Economic Impact

The government of Malaysia expects to introduce more incentives toward building the wholesale and retail sector through initiatives such as tax breaks on the digital transformation for SMEs and initiatives to enhance financial inclusivity when e-commerce is concerned. Policies that encourage local business entities to grow and embrace sustainable retail practices will also create a resilient and competitive sector. SEMy2030 does play an important role in creating an inclusive pathway towards economic growth by supporting enterprises with a social and environmental impact focus as part of the more mainstream shift toward sustainable and responsible retailing.

By 2030, the wholesale and retail trade sector in Malaysia will be molded around digital advancement, sustainability initiatives, and shifting consumer demand. Those that carry their technology, invest in green solutions, and reshape to market dynamics will not only be sustainable but also continue spearheading economic growth with custom-made supportive policies such as MyDIGITAL, NeSR, and SEMy2030.

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# PART 3

# SYNERGY AND THE FUTURE OF MALAYSIAN INDUSTRY

# CHAPTER 6

# SYNERGY AND POLICY FRAMEWORK FOR MALAYSIAN INDUSTRIAL DEVELOPMENT

Nurhaiza Nordin

## Inter-Sectoral Relationships in Economic Development

Economic growth in a country cannot be studied without considering the relationships and synergies between sectors. The industrial, agricultural, and service sectors in Malaysia are interconnected and act as synergies for sustainable economic growth. A case is made by the green automotive shift in technology, which in turn creates high demand for renewable energy and battery manufacturing, benefiting the clean energy and electronics industries. Similarly, the agricultural sector is now applying digital technologies, with agricultural automation and IoT-based monitoring systems, thereby strengthening the linkage between the food production sector and smart technology. The rubber sector also plays a significant role in the manufacturing industry, especially in the production of tires, medical gloves, and related products. E-commerce-driven development of the retail sector is also accelerating the digital transformation of Malaysia, with a strong contribution to information and communication technology (ICT).

The synergy between these sectors supports not only the efficient operation of the domestic supply chain, but also enables Malaysia to successfully compete in international markets. Hence, the interdependence between these sectors highlights the need for integrated industrial development strategies in order to ensure that Malaysia's competitiveness is sustained in the long run.

**Policy Framework for Industrial Development Growth**

The Malaysian government has rolled out a number of policies intended for enhancing sustainability in the areas of industrial development-competitiveness and innovation-in the economic sector. Among the most strategic policies is that which has a great impact on the industrialization development of Malaysia:

01

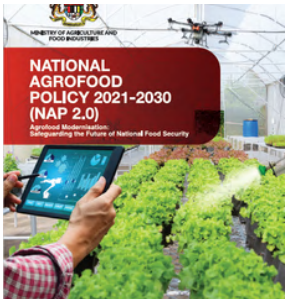
National Automotive Policy 2020 (NAP 2020). Focuses on the development of electric vehicles (EVs), electrification of automotive and the use of green energy in the automotive industry.


02

Malaysia Digital Transformation Plan (MyDIGITAL). Accelerating the digitalisation of industries and promoting smart technology in the industry.


03

National Agro-Food Policy 2021-2030 (DAN): Strengthening food security and resilience of the agricultural sector through modern technology.




04

New Industrial Master Plan 2030 (NIMP2030). Directing measures to enhance production efficiency in the manufacturing sector and increase value addition approaches in local industries.


The policies will facilitate not only merging industries but also strengthening the economic ecosystem of the country against global challenges.

# CHAPTER 7

# CONCLUSION AND FUTURE DIRECTIONS

Nurnaddia Nordin

**Key Summary of Each Chapter**

This book has discussed various aspects related to the development of Malaysia's industry by 2030, focusing on the challenges and opportunities in key sectors:

Chapter 2 examines the development of the automotive industry and the transition towards electrification and green technology.

Chapter 3 examines the sustainability of paddy production through technological innovation and government policies.

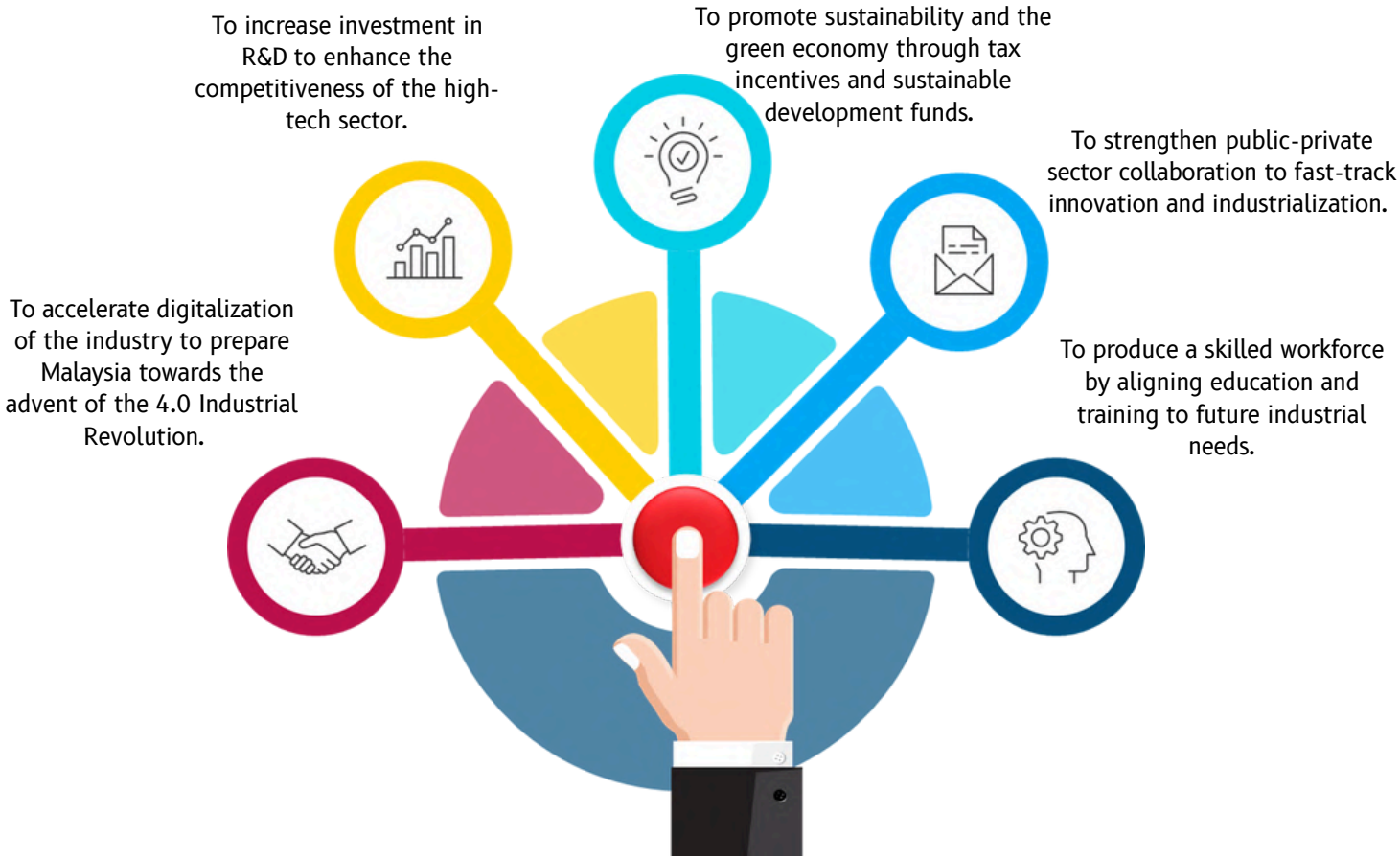
Chapter 4 highlights the resilience of the rubber industry and strategies to ensure competitiveness in the global market.

Chapter 5 discusses the transformation of the retail and wholesale sectors driven by digitalization.

Chapter 6 outlines the importance of synergy between key sectors and policies in shaping a more competitive Malaysian industry.

## Policy Recommendations for Malaysia 2030

The analysis hints at several policy implications that have to be taken into consideration.




## Conclusion

This book is an attempt provide an understanding of the direction of Malaysia's industry and the need for suitable strategies to ensure sustained economic growth. Close collaboration among the government, the private sector, and the academia will empower Malaysia to build a much stronger, competitive, and future-ready industrial ecosystem.

# THE FUTURE OF MALAYSIAN INDUSTRIES 2030: GLOBAL CHALLENGES AND FUTURE DIRECTIONS

**What will Malaysia's industries look like in 2030? This book takes you on a thoughtful journey through the future of five major sectors automotive, paddy, rubber, wholesale and retail unpacking the challenges, opportunities, and innovations that will shape their paths forward.**

**Through seven carefully crafted chapters, the book connects the dots between industry trends, policy directions, and national goals. It highlights how collaboration between government, industry players, and academia can drive sustainable and inclusive growth.**

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