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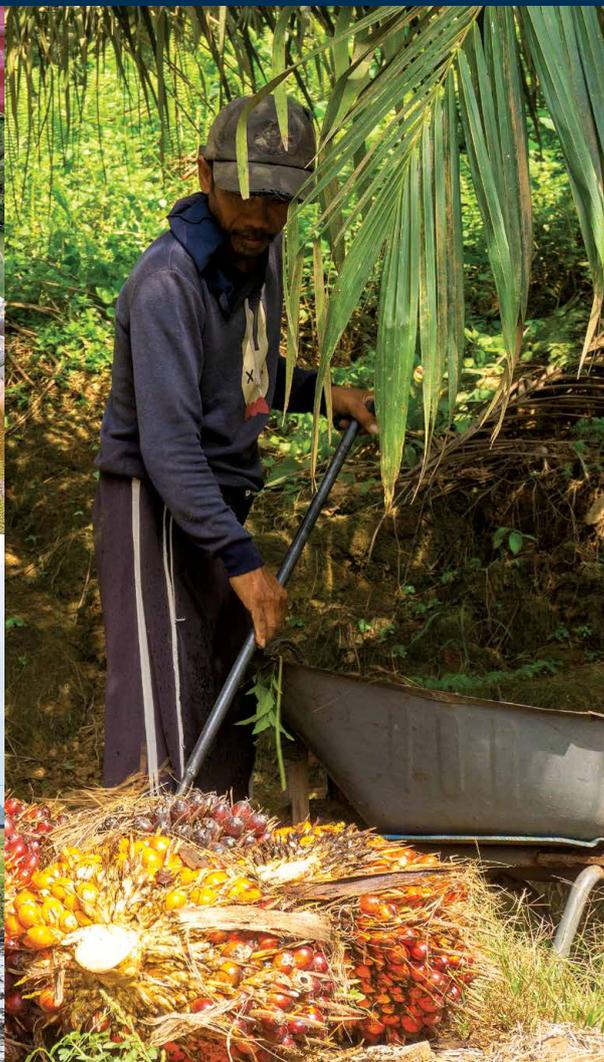


AGRICULTURE AND FOOD GLOBAL PRACTICE
& POVERTY AND EQUITY GLOBAL PRACTICE

NOVEMBER 2019 THE MALAYSIA DEVELOPMENT EXPERIENCE SERIES

Agricultural Transformation and Inclusive Growth

The Malaysian Experience



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Agricultural Transformation and Inclusive Growth

The Malaysian Experience



WORLD BANK GROUP
Global Knowledge & Research Hub
in Malaysia

AGRICULTURE AND FOOD GLOBAL PRACTICE
& POVERTY AND EQUITY GLOBAL PRACTICE

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Table of Contents

Acknowledgements.....	v
List of Figures.....	vi
List of Tables.....	vii
List of Boxes.....	vii
List of Acronyms.....	viii
Executive Summary	1
Introduction	14
Conceptual framework of the report.....	15
Agricultural transformation from a macro perspective.....	17
Framing Malaysia’s agricultural transformation.....	18
I. Overall Policy and Institutional Context	23
The vision and its realization: Institutions as key instruments of policy implementation.....	24
Implementing the vision: Policies and institutions.....	25
Plans and budgets for agriculture, rural development, and poverty reduction.....	25
Plans, policies, and institutions.....	27
II. Value Chain Development with Inclusive Growth: The Tree Crop Subsector	30
Value chain development: Ideal vehicle for diversification to drive transformation.....	31
Dominance of the palm oil complex.....	32
Rubber and cocoa: Increased value addition in processing despite reduced planting.....	36
Achievements in the tree crop subsector.....	38
III. Value Chain Development in the Rice and Non-Rice Agri-Food Subsectors	40
Malaysia’s concept of food security.....	41
Paddy rice policy: Extensive subsidization of an entire value chain.....	42
Selected features of the non-rice agri-food subsector.....	44
Fundamental structural changes impacting food markets in higher-income Malaysia.....	45
IV. Smallholder Farming and Area Development in Malaysia’s Transformation	49
Smallholder agriculture: Definition and characteristics.....	50
Area development.....	52
Regional development.....	54
Agropolitan.....	55

V. Key Lessons from Malaysia Within a Comparative Perspective	56
Rationale and focus of comparative analysis.....	57
Similarities and differences between Malaysia and comparator countries.....	57
Robust pattern in experiences despite diverse contexts.....	58
VI. Main Achievements and Key Remaining Challenges: What’s Next for Malaysia	63
The new context of agriculture in Malaysia.....	64
Conclusion.....	71
Annex A. Institutions and their roles in implementing the government’s vision	74
Annex B. The tree crop subsector: Palm oil, rubber, and cocoa	82
The rise of palm oil: Selected features.....	82
Rubber and cocoa: Brief background.....	86
Annex C. Salient features of the rice and non-rice agri-food subsectors	90
Annex D. The drivers of transformation in Malaysia	97
Sources of agricultural growth.....	98
Conclusions.....	104
Annex E. Smallholder farming and area development in Malaysia	106
Smallholder agriculture: Definition and characteristics.....	106
Smallholder farms and agricultural transformation.....	107
Oil palm farms of smallholders.....	107
Felda, a model to transform the agricultural sector.....	108
Area development.....	110
Nonfarm income: The case of Kada.....	112
Regional development.....	112
Annex F. Quantitative comparisons, Malaysia and selected countries	116

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List of Figures

Figure I.1	Agricultural transformation, main trends, Malaysia	17
Figure I.2	Agricultural value added, annual % growth	18
Figure I.3	Population growth (annual %)	19
Figure 1.1	The development trilogy and the role of agriculture	24
Figure 1.2	Agricultural transformation and policy trends	26
Figure 1.3	The development planning horizon, Malaysia	26
Figure 1.4	Key federal institutions involved in agriculture	27
Figure 2.1	Agricultural raw material exports (% of merchandise exports)	38
Figure 3.1	Rice production and paddy planted area, 1961–2016	43
Figure 3.2	Value of food trade, excluding oil and fat, 1990–2017 (RM, millions)	46
Figure 3.3	Value of food trade, including oil and fat, 1990–2017	47
Figure 5.1	Agricultural value added per worker, Chile, Indonesia, and Malaysia, 1980–2016	61
Figure 6.1	Rural population growth, Malaysia (annual %)	64
Figure 6.2	Contribution to value added, 2016	65
Figure 6.3	A tale of two states	69
Figure 6.4	Rural nonfarm income, farming households, KADA area (% of total income)	70
Figure C.1	Rice yield and production, comparison with the main rice producers, 2014	91
Figure D.1	Decomposition of productivity growth	98
Figure D.2	Growth of the ratio of capital to labor, selected sectors	100
Figure D.3	Rubber yield through the years	102
Figure D.4	Area replanted with natural rubber (hectares, 1,000s)	103
Figure D.5	Export of raw rubber and earnings (RM)	103
Figure D.6	Self-sufficiency in vegetables	104
Figure D.7	Yield of vegetable production	104
Figure D.8	Ratio of agribusiness value added to agricultural value added, 2001	105
Figure E.1	Annual sources of income	112
Figure F.1	Agricultural value added per worker, Chile, France, Indonesia, and Malaysia, 1980–2016	117
Figure F.2	Agricultural, forestry, and fishing value added (% of GDP)	118
Figure F.3	Employment in agriculture (% of total employment) 1991–2018	121
Figure F.4	Agricultural land (square kilometers)	123

List of Tables

Table I.1	Value added in agriculture	19
Table I.2	Shift in consumption patterns	20
Table 2.1	Performance of the MPOB superior planting materials	35
Table 5.1	Resource allocations on R&D, Indonesia	61
Table B.1	Value added in agriculture and agro-based industry, 1990–2010	83
Table B.2	The contribution of agricultural subsectors to GDP, value and share	84
Table C.1	Subsidies and incentives in the paddy and rice subsectors	90
Table C.2	Time series, composition of monthly household consumption expenditure	94
Table D.1	Sources of output growth in agriculture	99
Table E.1	Agropolitan areas, Malaysia	114
Table F.1	The speed of Malaysia’s agricultural structural transformation was relatively rapid	116
Table F.2	Agricultural transformation, Chile, France, Indonesia, and Malaysia, 1960–2016	118
Table F.3	Selected socioeconomic and governance indicators, Chile, France, Indonesia, and Malaysia, 1960–2016	120
Table F.4	Difference in value added, selected countries	122
Table F.5	Agricultural land (square kilometers)	123
Table F.6	Public agricultural research intensity	124

List of Boxes

Box 2.1	Trends in oil palm value addition	32
Box 2.2	Oil palm: Weevil pollination is key to successful adaptation to Malaysia	33
Box 2.3	Public-private participatory partnerships	34
Box 4.1	Independent smallholders in palm oil: Costs and yields	51
Box 6.1	The Republic of Korea: The successor and specialized young farmer programs	67
Box A.1	The development planning horizon in Malaysia	74
Box A.2	FELDA and poverty reduction	76
Box B.1	Malaysian cocoa: A boom and bust industry	87
Box B.2	Evolution of a Malaysian agribusiness	88
Box C.1	A snapshot of Malaysia’s food processing industry	92
Box D.1	The time framework in palm oil research	101
Box E.1	The FELDA model, phases, and activities	109
Box E.2	Poor households diversify differently	113

List of Acronyms

FELCRA	Federal Land Consolidation and Rehabilitation Authority (FELCRA Berhad)
FELDA	Federal Land Development Authority
FFB	fresh fruit bunch
FGV	FELDA Global Ventures Holdings Berhad
GDP	gross domestic product
GNI	gross national income
IADA	Integrated Agricultural Development Area
IADP	Integrated Agricultural Development Project
KADA	Kemubu Agricultural Development Authority
KPF	Koperasi Permodalan FELDA
MADA	Muda Agricultural Development Authority
MPOB	Malaysian Palm Oil Board
NEP	New Economic Policy
R&D	research and development
RISDA	Rubber Industry Smallholders Development Authority
RSPO	Roundtable on Sustainable Palm Oil
RSS	rice self-sufficiency
SME	small and medium enterprise
TFP	total factor productivity
VCD	value chain development
WDI	World Development Indicators

Agricultural Transformation and Inclusive Growth: The Malaysian Experience

Focus of report: The Malaysian story involves a farsighted leadership that has mobilized the considerable assets of a resource-rich country to translate a long-term vision of nation building into action and transformational results. This report analyzes what Malaysia did to achieve transformative results in agriculture. It focuses on four main areas in which the Malaysian experience is distinctive and which have been critical to its success, as follows:

- The role of the public sector, encompassing national leadership, vision, and government action
- The main drivers of transformation and inclusive growth
- The role of value chains
- The inclusiveness of Malaysia's agricultural transformation

Malaysia's experiences in each of these areas have highlighted policy options and insights that may be offered as lessons to policy makers and development practitioners. This report relies on a political economy approach, that is, the analysis of transformation and inclusive growth emphasizes the role of vision, the government and the public sector; their partnership with the private sector and markets; production systems; the distribution of income and opportunities, including poverty reduction and improved equity; and concern about food security and the impacts on food security.

Agriculture in Malaysia, by definition, includes crops, livestock and forestry. This report focuses on crops. Livestock is part of the discussion on food security. Because the report is an outbound knowledge product, it does not address the following topics, which are encountered in the course of any analysis of the Malaysian experience, but should command a separate and full analysis of their own:

- Wage labor (as opposed to smallholder development), including migrant labor, which is increasingly becoming an important source of labor
- Urbanization and the extent of its decentralization
- Dualism: how best to address it to reduce poverty
- Policies to promote agroindustrial development
- The changing structure and trends of the global demand for vegetable oils and fats
- The agribusiness contribution to the overall economy

Although these areas are not reviewed and analyzed fully, they are occasionally examined whenever they surface as relevant factors in understanding the Malaysian agricultural transformation.



Executive Summary

Malaysian agricultural transformation: Harvesting the promise

By any standard of measurement, Malaysia's agricultural transformation is a success story. It is consistent with the stages (or narratives) of agricultural transformation and has delivered on all trademark contributions to economic development, as postulated in agricultural development theory.

First, agriculture has contributed to increased food supplies. This remarkable achievement was accomplished in the face of mounting demand for food driven by three forces: high population growth (reaching 3.2 percent in 1963), rising income (from US\$1,354 per capita in 1960 to US\$11,528 in 2017, an increase of 752 percent), and urbanization (from 27 percent of the population living in urban areas in 1960 to almost 76 percent by 2017).¹ Before 1960, 55 percent of the rice consumed domestically was produced locally and fed a population of less than eight million. By 1970, the country was producing 90 percent of the rice consumed domestically and feeding almost 11 million people. By 2017, production had reached 70 percent self-sufficiency for a population of almost 32 million. This means, by 2017, the agriculture sector, through domestic production, was able to satisfy the rice consumption needs of almost three times the population in 1960.

Second, agriculture has been one of the major sources of the country's foreign exchange earnings. Between 1972 and 2016, export earnings grew by almost 200 percent. In fact, during periods of economic difficulty, agriculture was the sector that the country resorted to in support of its export earnings, demonstrating the resilience of the sector. Thus, the export-oriented part of the agriculture sector is a significant contributor of foreign exchange earnings and, through investment, to higher income and employment.

Third, agriculture was the source of labor supply for the expanding sectors of the economy. At independence, agriculture was the major employment sector (58 percent) as is the case in most other countries during the initial phase of agricultural transformation. As agriculture developed, it released labor to manufacturing, services, and other sectors of the economy, so much so that the contribution of agriculture to overall employment fell from 37.2 percent in 1980 to 12.5 percent in 2016 and to 11 percent in 2018. The infusion of labor from the growing working-age population into nonagricultural sectors has also contributed to Malaysia's growth over the last 25 years.

Fourth, capital transfers from agriculture to the nonagricultural sector: The Malaysian experience is a case of a principled and sustained government commitment to invest in agriculture. At the initial stage, Malaysia depended on tin, timber, and fertile land and, later on, on oil, gas, and petroleum to finance and successfully harness these resources to drive agricultural transformation. Beyond financing infrastructure, institutions, projects, and the development of new agricultural lands, investment included the infusion of capital to buy equity in foreign agricultural firms, thereby taking a major stake in at least 18 firms, including Sime Darby, one of the industry leaders. This buyout was undertaken in 1978–82 by a government-linked investment company. However, once the agricultural sector transformation was mature, Malaysia's agricultural firms not only became major investors in an array of businesses, but these agricultural firms transformed to become transnational companies investing across a number of continents.²

Fifth, the multiplier effect of a transforming agriculture was substantial: As the incomes of farmers increased, their consumption level of goods and services expanded, creating a market for the growing manufacturing sector and revitalizing rural areas and small towns. A study of the Muda River area found that, for every dollar created in the agricultural sector, 80 cents in value addition was generated in the nonfarm economy. Another study reports that, for palm oil, the composite output multiplier was 3.1, the highest multiplier among the eight sectors with high multipliers (tourism, financial services, health care, education, communication content, and infrastructure, Greater KL-Klang, and agriculture), and agriculture, without palm oil, is estimated to have a 2.1 composite output multiplier.³ Since Malaysian downstream processing is substantial, the contribution of agriculture throughout the value chain, plus primary agriculture, could reach 20 percent of gross domestic product (GDP).

Policy insights from the Malaysian experience

The pivotal role of national leadership, the government, and the public sector: National leadership played a pivotal role in launching, shaping, and supporting transformative and inclusive growth in agriculture and agro-based industry. The role of leadership asserted itself in the formulation of long-term policies to remake the Malaysian economy and society. Malaysia's vision for nation building required growth with equity and stability. To turn Malaysia's long-term vision into effective action, the local and central governments of Malaysia built an extensive public sector. Malaysia developed not only long-term policies, but also short- and medium-term plans supported by ample budgets and capable institutions to implement the ambitious agendas. A big public sector did not mean replacing the private sector or markets. It was a partnership among all three, with the government playing a leading role at times and a supportive role at other times. Public investment crowded in private investment instead of displacing it. However, in Malaysia, the government is highly visible in agriculture not only through direct investment and subsidies, but also by influencing the direction of development in the sector and picking winners.

The mission-oriented public sector as a determining factor in successful transformation: Malaysia started on its long march of transformation and inclusive growth when the government launched the New Economic Policy (NEP 1971–90). After independence (August 31, 1957) and during the earlier years (1956–70), Malaysia followed a market-centered approach to growth. The trickle down economy grew at 6 percent a year, but poverty remained widespread, and interethnic tensions ran high. The violent racial riots of May 13, 1969, were a wake-up call. The policy insight is clear: markets alone would not have been able to deliver on agricultural transformation and inclusive growth. Markets alone can deliver growth, but not inclusive growth, especially in a country, such as Malaysia, characterized by dualism and by high income and wealth inequality. Unlike the market-oriented approach of the first two Malaya plans, growth was no longer to be an end in itself, but the necessary means to improve equity, restructure society, and regain social unity and political stability.

Getting agriculture moving is basic to successful transformation: The government made substantial and sustained investments for decades in basic infrastructure for agriculture and the rural sector that were critical to getting agriculture moving. Furthermore, as a result of new discoveries, the production of petroleum and natural gas greatly increased by 1974. These cash-rich industries generated tax revenues for public investment in priority areas and kept the need to raise revenues through the income tax to a relative minimum. So, unlike many governments in developing countries, the government of Malaysia did not cripple the agricultural sector through taxation. A substantial part of the government's revenue was invested back into the agricultural sector. In fact, in the 1970s, on average, 23 percent of the development budget was allocated to agriculture, and, in some years, for example in 1973, the share reached almost 30 percent of the total development budget. The budget allocation was also highly skewed in favor of the development and capital budget relative to recurrent expenditure: the ratio between development and recurrent expenditure was close to 4 : 1.

Avoiding falling prey to the resource curse: Malaysia is a resource-rich country (land, petroleum, natural gas, tin, forests). It is distinctive in that the government transferred funds generated by the resource wealth toward investment in the transformation of agriculture, the reduction of poverty, and the general development of the economy, instead of falling prey to the resource curse.⁴ Why this is so is a complex story, which this report does not analyze. The government's disciplined focus on inclusive development is certainly a main reason. The genesis of Malaysia's transformation is in the effort to address the disparities among ethnic and occupational groups. The government also did not squander resources, but created the Khazanah Nasional Berhad, a sovereign wealth fund with the objective of diversifying revenue sources and holding strategic assets for long-term economic benefits. The fund is a major investor in the agri-food sector. The difference with other countries is that the government and stakeholders in Malaysia continued to diversify revenue sources instead of relying solely on proceeds from natural resources. History is littered with countries abandoning the agricultural sector with the discovery of petroleum. A ready example is Nigeria, which failed to develop palm oil because it sought to rely almost totally on petroleum. Another important factor in the success in Malaysia was the macroeconomic stability fostered by the government's exchange rate policy aimed at avoiding the Dutch Disease.⁵ Malaysia's experience shows the pivotal role national leadership can play in avoiding the resource curse by deciding to transform a nation's resource wealth into a resource blessing by investing wisely in agriculture and other productive sectors.

Value chain development as a major factor in Malaysia's agricultural transformation

Malaysia successfully pursued diversification on at least two fronts in agriculture: First, during independence, Malaysian agriculture and the economy were highly dependent on rubber. The government and stakeholders pursued agricultural product diversification away from rubber to other high-value crops, mainly palm oil. This meant reducing the land allocated to rubber and increasing the size of farmland dedicated to other crops. Second, the importance was recognized of developing downstream activities and product diversification at least in the case of tree crops, including rubber. Informed by research on future market demand and supported by a functioning partnership with the private sector, universities, research organizations, and so on, the government utilized effective policies (such as taxation) to pursue diversification through value addition. It also made the necessary investments. In palm oil, the tax on crude palm oil not only promoted domestic processing, but also attracted foreign direct investment in the refining of palm oil. In rubber, supported by research, Malaysia became the largest exporter of medical latex gloves. In cocoa, Malaysia is the largest cocoa grinder in Asia, and the fifth largest in the world. The country also imports cereals and dairy products for value addition and processes foods for export. Such diversification has allowed value added per agricultural worker to be enormously enhanced – rising from US\$6,294 in 1980 to US\$19,231 in 2016 (in constant 2010 U.S. dollars), a 206 percent increase.

Global demand and domestic investment powered growth through diversification: Without favorable global markets, the government's growth through diversification strategy would not become the pull factor necessary to absorb profitably the country's stream of increased primary and processed output. The main enabling factors included the government's macro and industrial policy, openness to international trade, and the development of marketing strategies to capture market shares abroad. The main domestic supply-side factors that promoted agricultural and agro-based productivity and production were substantial and continual public investment, including building basic hard and soft infrastructure, for example, transport, communication, markets, research and development (R&D), and a legal and regulatory framework. Driven by population growth, labor was sufficient to contribute to agricultural expansion.

The government's principal mode of diversification was value chain development (VCD). In Malaysia, VCD was pursued relentlessly in both tree crops (palm oil, rubber, and cocoa) and food crops (paddy rice and non-rice agri-food). VCD was most successful in tree crops, particularly palm oil, rubber, and cocoa, but less successful with paddy rice and other agri-foods, except poultry. Despite the differential performance across subsectors, the contribution of tree crop value chains, including the palm oil complex contribution (43 percent of agricultural GDP in 2016) transformed Malaysia's agriculture and agro-based industry.

Systematic, sustained diversification advanced the integration of primary agriculture into manufacturing and the broader nonagricultural economy. Such a growth policy helped transform the entire Malaysian economy. Agriculture indirectly contributed to employment and income generation because it supplied intermediate inputs to manufacturing and the industrial sector, including agribusinesses, food processors, and outlets, such as supermarkets. According to FAO (2019) agroprocessing contributed around 10 percent of total value added in manufacturing. Others estimate that food processing industry alone account for "12 percent of the country's manufacturing output and is growing at a pace of roughly three percent per year."^{29a} Seen from the perspective of the total agricultural contribution (including value addition along the supply chain and processing) to the country's GDP, the share is much higher than the 8 percent reported. It is been estimated conservatively at 20 percent.

Diversification, redistribution, and growth are tightly interdependent: The process of diversification generated the sustained agro-based growth that was essential to expanding the economic pie, thus facilitating redistribution. With growth, the Malaysian experience demonstrates, redistribution did not have to be a zero-sum game. The non-Bumiputera population—Chinese and Indians, also had a stake in the system. For at least a generation (25–30 years, from 1970 to 2007), "annual economic growth frequently exceeded 8 per cent and averaged more than 6 per cent so that national income increased more than six-fold."⁶ Malaysia's economy has kept on growing, averaging 5.4 percent

since 2010 and is expected to reach high-income status during the Twelfth Malaysia Plan (2021–2025).⁷ This continued growth performance shows resilience after the Asian financial crisis of 1997–98 and the food (and fuel and financial) crisis of 2008–09; resilience is a key feature of economies that transform successfully.

The nature of the crop and the enabling policy and market environment created conditions favorable to diversification through VCD for tree crops: This was true particularly for oil palm, rubber, and cocoa, or, in general, tree crops, and policy conditions that had not existed for many operations in the agri-food subsector.⁸ Five sets of policy decisions combined to propel VCD in oil palm:

- The government's strategic diversification into palm oil and also into end products of crude palm oil
- The government policy of promoting resource-based manufacturing vigorously and attracting foreign direct investment by the late 1960s and early 1970s through the Investment Incentives Act (1968), the Free Trade Zone Act (1971), the Promotion of Incentives Act (1986), and the First Industrial Master Plan (1985–95)
- The tax on crude palm oil, which attracted foreign direct investment into palm oil refining
- The decision to maintain Malaysia as an open trade economy as in colonial times; external tariffs were modest; the mean ad valorem rate was 25 percent with narrow dispersion (Yusof and Bhattasali 2008)
- Major public investments to promote marketing abroad

Malaysia did pick a winner in palm oil as palm oil proved to be ideally suited for diversification at the processing stage for palm oil can be processed into multiple end products, food and nonfood. Indeed, palm oil has been called “a miracle ingredient in everything from biscuits to shampoo” (Tullis 2019).⁹ This rich array of diversification possibilities are not open to most of Malaysia's processed agri-foods. However, the extent of downstream diversification and extraction of palm oil into different products has yet to be fully realized. There are structural impediments in processing crude palm oil and harvesting the economic benefits, which include the market dominance by strong transnational corporations for which Malaysia is a supplier. The commercial success of palm oil notwithstanding, two key sustainability challenges remain: environmental issues and social issues.

Mission-oriented institutions critical for successful agricultural transformation

Malaysia was able to build competent, mission-oriented public institutions to support its agricultural transformation: Over the years, the government of Malaysia developed a complex system of institutions to undertake economic development planning, budgeting and execution. Malaysia's experience clearly shows the critical importance of a competent public sector at federal and project levels to achieve development results. Their service was essential if the government's ambitious agendas are to be realized; otherwise policy pronouncements remain dead letters. Budget allocations that support policy priorities mean that planning can have impact. Too often, public sector personnel and institutions are unsung heroes of successful development. In Malaysia, federal level ministries work with private sector institutions to guide diversification, for instance, R&D in palm oil. Among land development and resettlement agencies, the Federal Land Development Authority (FELDA) stands out for successfully integrating smallholders in the palm oil value chain, both in the planting and processing stages. Commodity Boards, which in many developing countries are infamous for being extractive tools of government, are in Malaysia, supportive institutions. Another institution with substantial positive impact on smallholder incentives and income is land administration. Unlike land administration in many developing countries, Malaysia's land administration system was able to offer qualified and then full titles (by 2014–15) to smallholders who received public land under the government's land development schemes.

Monitoring and evaluation, an important tool in gauging the performance of institutions. The system of institutions that was established was mission-oriented and focused on results. To maintain the focus on results, Malaysian leadership periodically reviews how the institutions are performing to determine whether midterm corrections or other realignments are required and to help in planning. In 2009, for example, the government launched the Performance

Management and Delivery Unit, with convening power, to work with the building blocks of the public sector to improve performance and design and implement the New Economic Model (2010–20). More recently, it undertook a midterm review of the Eleventh Malaysia Plan (2016–17) to diagnose why the target of achieving inclusive growth and high-income status by 2020, a goal of the New Economic Model, would not be reached and what should be done to improve performance.

Land titling, a critical national institution supporting smallholder integration and addressing extreme poverty:

The government reformed the land administration system in Peninsular Malaysia. Despite the complex institutional and legal context in land administration, it succeeded in issuing provisional and full titles to guarantee property rights and tenure security to all titleholders in Peninsular Malaysia.¹⁰ The title qualification process required relatively rapid submission of land administration information to secure land rights and facilitate the functioning of land markets. The government eventually undertook measures to enable qualified titles to be upgraded to full titles; thus, from December 2014 to June 2015, 85 percent of qualified titles in Peninsular Malaysia were converted to full titles.¹¹ Smallholders who participated in land settlement schemes doubly benefited, first, by receiving the land and, then, the titles. Unlike most laborers worldwide, they owned not only their labor, but also a valuable income-earning asset, land.

However, the land titling issue is still on the agenda: In its approach to reducing poverty among smallholders and integrating them in profitable operations, the government has rightly emphasized access to land and the legalization of land ownership through titling. Wherever the government has not offered land titles to the rural poor, as in paddy areas, productivity is wanting. The lack of titling remains a problem, for example, among the indigenous people of Sabah and Sarawak. Smallholders engaged in non-rice food crop production also have insecure land tenure (FAO, February 2019), which is a challenge in the full realization of the dynamics of the agri-food sector.¹²

Inclusiveness of agricultural transformation centered on strong smallholder support

In Malaysia, smallholders and small farmers dominate the agricultural landscape. Thus, the agricultural transformation was expected to be inclusive. The government's growth strategy through diversification and VCD in tree crops was also structured to benefit the poor, particularly smallholders, poor rural Bumiputeras. Through its land development and resettlement agencies, Malaysia developed either new land (FELDA) or already cultivated land (the Federal Land Consolidation and Rehabilitation Authority [FELCRA] and the Rubber Industry Smallholders Development Authority [RISDA]) to settle smallholders on nucleus estates where they could become outgrowers. Smallholders organized under these schemes were provided housing and other basic amenities. To obtain land and title, smallholders had to sign a contract to supply fresh fruit bunches (FFBs) to FELDA. In addition, FELDA provided supervision, inputs, financing, and extension services to participating smallholders. FELCRA (1961) is similar to FELDA, except that it deals with rehabilitating already cultivated low-cost state schemes or opening up jungles and virgin lands – deforestation practice by FELCRA has now been discontinued. RISDA (1972) is responsible for block plantings for rubber or oil palm.

Support for smallholders was comprehensive and long term: In the case of Malaysia, this included measures to (1) reduce the marketing risks smallholders face by directly linking them as outgrowers to a nucleus estate and processing, serving as a reliable outlet for a highly perishable output, as in the case of FFB palm oil; (2) give them positive incentives to want and be able to be more productive by providing them access and title to a valuable asset, land, provided they agree on contract to supply the FFB at agreed prices; (3) support them by not only providing basic amenities and public infrastructure, but also with credit and extension services; and (4) give them shares in additional agro-processing stages. In the case of paddy growers, the support included infrastructure to subsidies and price support. All these contributed to virtually eliminating extreme poverty and lift millions of smallholders into a higher income trajectory.

The FELDA model has been hailed as a successful approach in integrating smallholders: FELDA's approach in integrating smallholders in value chains has been recognized by some as a well-functioning initiative and criticized by

others as too costly. However, the benefits have surpassed factors that are measurable solely through monetary cost-benefit ratios. The outcomes include a reduction in extreme poverty, uplifted generations that have been able to attain higher education and obtain more highly paid white-collar work, and a fundamental improvement in living conditions. The evidence indicates that the FELDA approach has been far-reaching in restructuring society. FELDA's success clearly shows that integrating smallholders is not likely to be cheap. It does not mean that support must be supplied only for tree crops. However, it does show that, if the crop involves long-term investments and risks generated by uncertain and fluctuating domestic or global markets, smallholders cannot be expected to participate in potentially profitable and high-value added agricultural and agro-based activities unless they are provided with assistance. Smallholders are forced to think in the short term and be risk averse because their lack of any assets except for their unskilled labor constrain their decisions and undermine their ability to break through the vicious cycle of intergenerational poverty, low productivity, and severe vulnerability.

Government support for smallholders and small farmers is not limited to one or two approaches. The government has experimented with intervention mechanisms, including resettlement, in situ development, area development, agropolitans and agricultural parks, rural urbanization, and economic corridors. The support has covered both food and commodity crops. The government has relied on a menu of options in seeking to reduce poverty, improve incomes and living standards among rural smallholders and small farmers, and create a vibrant local economy in lagging areas. The heralded FELDA model is essentially an area-based development approach that strives to change targeted geographical areas through multisectoral and holistic intervention. Thus, agricultural and rural development has been the result of policies that have been centered and promoted through area-based, multisectoral, integrated, and networked approaches.

Food security of primary importance to agricultural transformation

The government's commitment to a high level of food self-sufficiency as a food security policy: After decades of pursuing the goal of full rice self-sufficiency (RSS), the National Food Security Policy espoused a broader concept of food security in response to the global food, fuel, and financial crisis of 2007–08. The objectives of the policy crisis were broader with regard to food, but the goals still assigned top priority to domestic production and substantial self-sufficiency, as follows:

- Increase production and productivity to achieve a high self-sufficiency for agri-food, not only rice
- Ensure food producers earn commensurate income so that food production does not decline
- Ensure an adequate and safe supply of high-quality food

Underlying these concerns about self-sufficiency is the government's fear that running food trade deficits is a major threat to national security because the deficits make the nation vulnerable to sharp rice market price fluctuations. The fear is that social unrest and spikes in world rice prices will become linked.¹³

Rice self-sufficiency is key to political stability and food security: As in much of the rest of Asia, Malaysia views adequate availability of rice as central to political stability, and the achievement of a high RSS level as virtually synonymous with food security. The government views the achievement of high RSS levels as a simultaneous advance on three goals:

- Food security: High levels of RSS is viewed as synonymous to food security as rice occupies a central place in the diets of low-income households, a vast majority in the early decades
- Poverty reduction: Improved equity through the poverty reduction of paddy growers, some of the poorest Bumiputera households, a priority stakeholder group
- Stability: Ensuring price stability and thereby solidifying social peace; severe food insecurity provides fertile ground

for social upheaval as history has repeatedly shown, for example, the French Revolution (1789–99), the Irish Potato Famine (1845–49), and the Rice Riots in Japan (1918)

Bumiputera poverty reduction and price stability were achieved, but at a cost: Poverty among Bumiputera paddy growers in granary areas has been virtually eradicated, and extreme poverty has been reduced throughout Malaysia.¹⁴ Paddy growers are among the bottom 40 percent of the income distribution, but that is relative, not absolute poverty (Omar, Shaharudin, and Tumin 2019). The commitment to rice price stability was tested during the food crisis of 2007–08. The government succeeded in protecting consumers from the price shock by setting a price that was lower than the international price, although, from the 1980s to 2008, the domestic retail price of rice was consistently above the international price. The high financial and opportunity costs of the approach to food security through high RSS are widely acknowledged.¹⁵

The high financial and opportunity costs of the RSS approach to food security: Malaysians pay heavily for the RSS approach as taxpayers and as consumers. Thus, in 2017, 45 percent of the total budget of the Ministry of Agriculture and Agro-based Industry went to supporting rice production. If one adds to these costs what consumers pay through trade policy (which raises domestic prices) and what taxpayers pay through subsidies and compares the total with the total production value of rice, the cost is also high. This measure of the transfers from consumers and taxpayers is known as the producer single commodity transfer. In 2017, the single commodity transfer for rice in Malaysia was 73 percent, which is higher than in other developing and emerging economies. It is higher even than in Japan, where the rice regime is considered the most protectionist in the world. In 2011–13, the transfer actually exceeded the value of paddy production. If one adds to this total the expenditures on granaries, then the single commodity transfer in 2017 rises to 86 percent.¹⁶ A simulation study by the International Rice Research Institute modeled the effects of allowing farmers in one of the most successful rice-growing areas to grow other crops and finds that this change could raise incomes by about 50 percent (World Bank and Ministry of Economic Affairs, February 2019). So, even heavily subsidized farmers would be more well off if they did not plant paddy.

Malaysia's inward-looking and costly approach to food security is in stark contrast to its export oriented and profitable approach to tree crop development. Malaysia's approach is however popular in some corners of the world. But the relevance of Malaysia's experience is a cautionary tale against the approach taken for the results are not encouraging. There are supply and demand sides to consider. On the supply side, despite such high protection, rice production is still not competitive internationally, especially if Malaysia is compared with its close neighbors that are efficient rice exporters, for example, Thailand and Vietnam. On the demand side, a high rice price policy does not serve the consumption interests of the poor who are usually net food buyers. Food security is, after all, a consumer not a producer issue. Moreover, the priority accorded to rice, especially domestic production, is currently misplaced given that Malaysia is undergoing dietary diversification: less rice consumption in favor of a more varied, protein-rich diet. More generally, expenditures on rice and food have declined as shares of urban consumer budgets in a rapidly urbanizing Malaysia.¹⁷ It is not the narrow focus on domestic rice production that has been most instrumental in promoting food security: it is the entire strategy and implementation of inclusive growth through diversification which has transformed Malaysia from a poor country to an upper-middle-income country in a span of five decades or so.

The non-rice agri-food subsector: remaining challenges despite some achievements: This subsector has suffered policy neglect relative to the tree crop subsector.¹⁸ Moreover, the success of the tree crop-based agroindustry did not trickle down to the food sector.¹⁹ The relative policy neglect has contributed to key structural weaknesses, including the following:

- Uneconomic sizes of farms, which constrain mechanization
- Tenancy problems on most fruit and vegetable farms
- Limited access to R&D and infrastructure
- Inadequate institutional support from cooperatives because of a lack of entrepreneurship; this exacerbates the weak bargaining power in the non-rice agri-food subsector relative to other large-scale market participants, such as millers and traders

Taken together, these weaknesses mean that these small units are not firmly integrated in lucrative food value chains. Traditional wet and dry markets operate widely in this subsector, but are a far cry from the integrated supply and value chain that typifies Malaysia's industrial commodity exports and expanding urban consumer markets, the supermarket revolution. In these traditional channels, there are a large number of collectors, primary and secondary wholesalers, and retailers between producers and consumers.²⁰ Other recurrent problems include: rudimentary infrastructure and logistics facilities; sharp price fluctuations; lack of information by producers of consumer preferences in terms of volume, variety, grade and standards; delayed payments to producers. In addition, Malaysia's legal and regulatory framework affecting the agri-food business was weak in comparison with six other Asian countries.²¹ Despite these structural problems, the agri-food processing subsector grew at around 5.9 percent a year in 2010–15. But its performance is well below potential. The government is dissatisfied because it has not helped achieve Malaysia's Food Balance Trade Plan of 2002: achieve a food surplus by 2010.²² Agri-food processing has contributed around 10 percent of total value added in manufacturing (2005–10).²³ Others estimate that food processing industry alone account for "12 percent of the country's manufacturing output and is growing at a pace of roughly three percent per year."^{29a} One brighter spot in this subsector is the case of vertically integrated broiler farms, which are considered internationally competitive. The structure and scale of these farms have been changing in response to rising urban demand. With increasing vertical integration and a limited number of wholesalers, the oligopolistic structure of the broiler industry is, however, a concern, limiting competition, undermining efficiency, and functioning to the detriment of small and medium enterprises (SMEs) and consumers.

Lessons learned

The time period required for agricultural transformation is shorter if the correct policies are adopted and fully implemented. Historical experience shows that earlier transformers required more than 100 years (for instance, the Netherlands and the United Kingdom) or close to 100 (Japan and the United States). Post–World War II transformations are taking around 50 years or less (for example, the Republic of Korea and Malaysia). The key difference is that lessons were readily available to be replicated taking into account specific country contexts; international trade has vastly expanded markets; technology is increasingly shared within a short time framework; and R&D results have become increasingly accessible through market or cooperation mechanisms. So, countries involved in agricultural transformation should take heart from the understanding that transformation can be achieved in a relatively short time relative to the earlier generation of transforming economies.

Markets alone cannot deliver on agricultural transformation and inclusive growth: To get agriculture moving, a sustained level of investment is needed. Unlike the rule-of-thumb approach that prescribes for a 10 percent government budget allocation to agriculture, at the early stage of transformation and until the private sector starts to engage substantially, the government has to do the heavy lifting by committing substantial resources. Malaysia's experience indicates that during the earlier stage of transformation at least 20 percent of the budget was allocated to agriculture. In terms of investment, government role includes commitment to fundamentally improving the livelihood of smallholders and the poor by allocating sufficient resources and building the required institutions. The central lesson is the pivotal role of government leadership firmly committed to inclusive development and realized through substantial budgetary support and catalytic investments.

Structural problems in agriculture cannot be effectively addressed solely through a subsidy and import substitution approach: The contrast in policy approach to agri-food as import substitutes versus tree crops as exports have resulted in different outcomes. The current import-substituting approach to food security does not address the structural forces facing the agri-food sector, for example, limited land size; growth and evolution in demand patterns driven by population; urbanization and income growth; dominance of a few agri-food supply chains; and expansion of supermarkets. Instead of addressing these profound structural changes, the emphasis has been on increasing self-sufficiency in mass consumption food items to reduce Malaysia's vulnerability to volatile imports. There has been some progress. Over the decades, self-sufficiency has increased on many food items in Malaysia, but with fluctuations (for instance, rice, poultry meat, and vegetables). However, the food trade deficit (1990–2017) has widened if one excludes

oils and fats. The food trade has been in surplus if one includes oils and fats. Moreover, the terms of trade have been fairly stable, and the government and stakeholders in Malaysia have always been able to pay for food imports.

High population growth does not necessarily undermine agricultural transformation: In an environment of increasing population, engaging agriculture to reach higher phases of transformation, particularly the surplus creation stage, is even more demanding because there are more people to feed and more labor to employ. The Malaysian authorities, keenly aware of this challenge, have invested substantially in agriculture. The significant budgetary support has helped develop both intensive and extensive agriculture, thus employing the growing population until the additional labor has been able to migrate to the expanding manufacturing and service sectors. Countries have often been urban-biased, neglecting agriculture and investing more in urban areas and in nonagricultural sectors.

Countries with more open trading regimes have transformed more quickly: Experience shows that countries with a relatively open trading system have fared better during transformation: France through the enlarged common market of the European Union, Chile through free trade agreements that reach 80 percent of the world population, and Malaysia through trading arrangements.²⁴ As a result, agricultural transformation occurred relatively more quickly in these countries than in Indonesia, for example. For Malaysia, adopting an open economy policy was critical given the limitations imposed by the size of the domestic market. Trading allowed the agricultural sector to expand by keeping pace with growing global demand, which provided the opportunity for agricultural firms to reach economies of scale, improve competitive efficiency and quality, win market share, and meet international standards. International trade has promoted the transfer of knowledge and the flow of foreign direct investment, which have both contributed to accelerating transformation.

The nature of the crop and the overall policy environment do indeed matter: It is striking that in Malaysia tree crop value chains, namely palm oil, rubber and cocoa have fared well and much better than the paddy rice value chain. On one hand this difference can be explained by the difference in the policy and marketing strategy within which value chains operate. It is also true that some tree crop products possess specific characteristics that make them suitable for a long chain of value addition and processing into different consumer and industrial products. Tree crops, in most cases, are high-value products with returns greater than annual crops. The other major difference relates to the fact that tree crop subsector operates in an export-oriented framework, within which being internationally competitive is essential to thrive. The agri-food subsector operates in an inward-oriented, highly protected environment. The experience in Malaysia demonstrates that trade protection is not necessarily an effective support for efficient development. This comparison again shows that the enabling policy and institutional environment in terms of public investment, the incentive structure, and competitiveness, and the legal and regulatory framework do matter.

Value chain success is not entirely due to their direct link to global or domestic market structure. Their vertically integrated structure is an important feature that can give them market power; but the specifics of their overall policy and marketing environment are at least just as important. Value chains therefore should not be viewed as magic bullets on their own. The observed differential performance among value chains shows clearly that it is not only the closely linked structure of value chains that matters. A determining factor is the policy environment within which value chains operate, and in particular, how smallholders are integrated into the system. Consider the case of Nigeria on policy commitment: Nigeria had a palm oil sector well linked to the global market and has earned the country up to 20 percent of all its foreign exchange earnings. Until 1965 Nigeria was earning more from foreign trade than Malaysia. By 2016, the difference cannot be starker. Malaysia received 1,259 times more foreign exchange earnings than Nigeria during the same year. Kajisa et al. (1997) put the blame squarely on the government for its neglect of agriculture after the oil boom and the inimical policies it pursued.²⁵

Malaysia's agricultural transformation benefited both from the green revolution and the recent tropical oil crop revolution:²⁶ Malaysia implemented the green revolution through integrated rural development programs. The green revolution resulted in production and yield increases, mainly in rice, because of the use of high-yielding varieties and double cropping, following the development of irrigation. Palm oil cultivation expanded much more, on average, almost double and, in some cases, almost triple the green revolution levels. The combined effect of these two revolutions generated sustained growth and poverty reduction in Malaysian smallholder agriculture.

Institutions are critical to realizing agricultural transformation: Malaysia built a wealth of sector institutions to support its agricultural transformation. While most institutions are of the traditional type, such as ministries and research agencies, Malaysia also built institutions that are fit for purpose. Probably the premier institution in this category was FELDA. Other institutions specialized in tree crops are FELCRA, RISDA, and the Sarawak Land Consolidation and Rehabilitation Authority (for states). For in situ development, a number of authorities were created with defined geographic area coverage such as the Muda Agricultural Development Authority (MADA) and the Kemubu Agricultural Development Authority (KADA). The list is expansive, but the lesson is clear: agricultural transformation will require implementation by fit-for-purpose institutions in smallholder support, area development, rehabilitation and replantation, marketing, or crop-based specialization (for instance, commodity boards).

As institutions age they have a propensity to stray from their primary mission: Once institutions have delivered on their mandates, the rationale for their existence should be thoroughly examined, especially if the purpose for the establishment of the institutions was to transform smallholder agriculture. Allowing institutions to broaden their mandates to areas in which they have not developed excellence may introduce inefficiencies and poor governance. If new mandates emerge that require institutional mechanism to manage, it is preferable to distribute the new tasks to existing relevant institutions or devolve to new entities in case it could compromise the receiving institutions' mandate. As public agricultural institutions stretch their presence along the production-marketing-investment chain, and if they combine the regulatory and execution mandates together, efficiency for sure will be the first victim. There are informative lessons from Malaysia.

Malaysian agricultural commodity and crop boards are supportive not extractive institutions: Unlike many agricultural commodity boards in developing countries, such as the Ghana Cocoa Board, boards in Malaysia are not primarily instruments of taxation or control operating in an overall macro and incentive environment inimical to farmer incentives.²⁷ They are supportive not extractive institutions. Although there are variations among the boards, their core functions include supporting production by supplying improved inputs, providing support services such as extension and training, support processing and marketing, and R&D. The functions of these boards are not static, but highly dynamic. They respond to the changing context and anticipate future changes to strengthen preparedness commensurate with evolving circumstances. Their increased power over time is exemplified by the case of palm oil. The Malaysian Palm Oil Board (MPOB), established in 2000, took over the research functions of the previous sectoral boards and registration authorities. Their power can also wane as in the case of kenaf (similar to jute) and tobacco, the importance of which in agriculture has dramatically declined. The clear lesson is that agricultural boards can play a key role provided they are part of the overall policy agenda to transform agriculture, including internal mechanisms to control mission creep and conduct frequent reviews to align activities as circumstances evolve.

Key considerations in advancing Malaysia's agricultural transformation

Going forward, the main policy issue facing the government is the sort of agricultural transformation that should be sought as part of the stated goal of reaching high-income status: To reach the fourth stage of agricultural transformation, the authorities need to consider a number of scenarios, as follows: (i) agriculture with a stable farming population; (ii) agriculture with the farming population at a level comparable with high-income countries, that is, less than 10 percent of the total population or even less than 5 percent; (iii) transformation whereby small and medium towns become dynamic centers of economic activity aided by technology infusion both to farming (to reduce labor demand) and local processing (to provide job opportunities to small farmers moving to urban areas). The choice of policy will inevitably have major ramifications for the income differential between rural and urban sectors. Some insightful lessons are included in this report from France and Korea. At the highest stage of agricultural transformation, income differentials between agriculture and other sectors disappear. In some countries, the median household income is higher among agricultural households than among households in other sectors as a reflection of higher productivity in agriculture relative to nonagriculture.

A reorientation of food security and agri-food subsector policy is needed: The lack luster performance of the rice and non-rice agri-food subsector in comparison with the tree crop subsector shows that a fundamental rethinking and reorientation of Malaysia's policy approach is required. The government's approach to food security has to be reoriented from protecting rice as the main consumption staple of a poor, low-income country to adopting an export-oriented approach (which has worked so well in tree crops) to make the agri-food subsector internationally competitive in an increasingly globalized world economy. Moreover, one should not infer that the policy neglect relative to the tree crop subsector was a necessary trade-off. Rather, at issue for the government is the need to reconsider how to achieve food price stability cost-effectively: how best to balance the desire to obtain 100 percent domestic production through trade protection and the need to complement the advantages of trade with efficient domestic production.

As consumer preferences change, more demand-side interventions are needed: At earlier stages of agricultural transformation, because of awareness of Shultz's food problem, the focus was on the supply side to produce adequate food to feed the growing population. Transformation has, however, generated fundamental changes in consumption patterns in Malaysia and elsewhere; particularly in consumer preferences for more ultra-processed foods and the trend in eating habits to take meals away from home and perhaps also with high sugar content. This has inflicted massive public health costs associated with noncommunicable disease, productive hours lost, and other negative effects on productivity. A pure market solution is not forthcoming, at least in the short run. Educated and informed consumers play a critical part through their demand for healthy foods. There is thus an important role for the public sector in enhancing awareness and educating the public to demand healthy foods. The government has to utilize its regulatory power and partner with private producers and processors. Ushering in a modern food system requires a mix of carrots and sticks to obtain improved outcomes.

Transfer of lessons and models available within Malaysia to lagging subsectors and regions: One important aspect of Malaysian experience in agricultural transformation is government's readiness to try different models of interventions. The FELDA model demonstrates clearly the government's willingness to try a new model and build on it. Integrated rural development programs, development corridors, agricultural parks, Halal, small town development, millennium villages, outgrower schemes, and agro-youth entrepreneurs are some of the intervention mechanisms that have been implemented. They clearly show the depth of experience Malaysia has accumulated in the last 60-plus years. Some have had outstanding impact; some have struggled; and the results of some have been below expectations. It is well known that all regions in a country and all subsectors in agriculture do not transform at equal speed. The various models that have been tested shed light on the design of future interventions in lagging regions and subsectors. Malaysia clearly offers a repository of experience on agricultural transformation from which other countries at a lower level of economic development can learn and profit.

Agriculture in Malaysia needs to reach a level of productivity commensurate with high-income status: The government goal of reaching high-income status requires higher levels of productivity. Key among the steps to be taken are narrowing the productivity difference between smallholders and estate farms and across regions; realizing the full potential of agriculture; and recording productivity that is comparable with productivity in high-income countries. As of 2017, agricultural value added per worker in Malaysia was 45 percent of the average among high-income countries. The government and stakeholders need to double down on the intensity of agricultural research. Investment in research should be accelerated. The advent of the fourth industrial revolution makes the need to enhance intensity in agricultural research more pressing.

From agricultural transformation toward rural transformation: Governments at all levels are striving to create income-generating livelihood activities to spur economic development in diverse localities. Settlement patterns have evolved around clusters in small towns and in peri-urban and urban areas. The growth prospects of agriculture and the rural space are highly intertwined and interlinked and therefore should be treated as a system. Such a holistic approach recognizes that agricultural transformation at this stage of development requires a package of economy-wide interventions. Policy directions should therefore strive toward rural transformation through a holistic approach to revitalize a given geographic area with the aim of treating rural space as an economic entity composed of different sectors wherein agriculture plays a major role.

A shift from extensive farming to an environmentally and socially sustainable intensive farming system:

Future agricultural growth depends on improving agricultural productivity despite the limitations imposed by the lack of land, labor shortages, and rising costs. There are also environmental and social concerns, mainly related to palm oil. The concerns are fourfold: (1) loss of biodiversity through the expansion of plantations in areas considered biodiversity hotspots, such as the Sundaland;²⁸ (2) customary land rights and the land grabs that are affecting indigenous communities and ethnic minorities; (3) greenhouse gas emissions, especially methane from palm oil mill effluent: the most common method of dealing with the effluent is to discharge it into open ponds or lagoons, which is usually favored because it is the least costly solution (the private cost only); and (4) labor rights and disputes involving laborers, who are often poorly housed and experience poor living conditions and who point to violations of basic international labor norms. The government is aware of the challenges that this nexus of sustainability issues poses. Progress has been made on some plantations. However, there is a need to brand Malaysian palm oil as a custodian of sustainable management. As the reliance grows on intensive agriculture, especially through the support of smart agriculture, some of these concerns can be addressed as long as the government continues to use its convening power, discharge its regulatory duties, and utilize incentives for sustainable management. All producers must realize that sustainable management promotes a substantial gain in productivity.

Climate change poses a critical challenge for future agricultural sector performance: Weather phenomena and climate change have a history of negatively affecting the agricultural sector of Malaysia. For instance, the recent El Niño phenomenon has been considered the main factor in a fall in oil palm production. Climate change will have a major impact by reducing productivity. For rice alone, it is estimated productivity will fall between 4 percent and 10 percent depending on the geographical area and the level of temperature increase; for oil palm, the estimated decrease in yield is 2 percent to 5 percent for a 10C temperature increase. Change in rainfall patterns and intensity could have an impact on agriculture, eroding further the gains made in agricultural productivity or curtailing the realization of full potential. Within this framework, the multifunctionality of the various agricultural systems needs to be defined more clearly to allow the country to craft a transformational adaptation strategy in response to climate change. The government is fully cognizant of the problem and has adopted important measures, but needs to build on its actions as new evidence and technologies appear in support of adaptation toward climate smart agriculture.

Improving productivity, yield and diversification: The essence of agricultural transformation is the sustainable growth and enhancement of productivity. Viewed with other, comparable countries, Malaysia lags in terms of productivity and yield. The growth of agriculture has been mainly driven by expansion in agricultural land. Commodity crops dominate (palm oil accounts for more than 70 percent of the cultivated area), and therefore diversification seems to have reversed and it remains as an unfinished agenda. Malaysia's achievement in diversification is more at downstream level than at upstream; the country has developed world-class research and processing capacity but in a limited number of crops. Improvement of skills at all levels commensurate with new technology needs will be required to support productivity enhancement and diversification.

No country has made a transition to high-income status without successful agricultural transformation: "Not taking advantage of the transformative role of agriculture slows and delays economic transformation to the detriment of the growth rate, poverty reduction, food security, and the broad welfare of urban and rural people."²⁹ Thus, at the heart of a country's economic structural transformation is agriculture. Failure to ensure successful agricultural transformation is tantamount to postponing (or delaying, at best) the overall economic transformation, exposing the whole economy to the risk of the middle-income trap. It would also limit the capacity to reduce dualism; address inequality between rural and urban, on one hand; and agriculture and other sectors, on the other; thereby increasing the risk of sociopolitical instability. The need to continue on the journey that Malaysia started some 60-years back: for building on the remarkable achievements made thus far is not an option, but a necessity.

Notes

1. Data of WDI (World Development Indicators) (database), World Bank, Washington, DC, <http://data.worldbank.org/products/wdi>. Here, gross domestic product (GDP) per capita is calculated in constant 2010 U.S. dollars.
2. For example, Sime Darby, which made its fortune in agriculture, invested first in agribusiness and then in car manufacturing, heavy equipment dealerships, supermarket franchising, health care, logistics, media, retail, and renewable energy in Malaysia and across the Asia and Pacific region, while continuing to invest in its primary palm oil and rubber industry businesses. Sime Darby is now a transnational corporation and is not alone in reaching such a level with roots in the agricultural sector. The website is at <http://www.simedarby.com/>.
3. Ahmad Fuad, Siti Nadiyah, and Ahmad Fauzi Puasa (2011), "National Key Economic Area Multiplier Impact on Malaysian Economy: An Input-Output Analysis," *International Journal of Management Studies* 18 (Special Issue): 34–58. Composite means the sum of direct, indirect, and induced output changes resulting from a one-unit output change.
4. The term resource curse or the paradox of plenty was first used by Richard Auty in 1993 to describe how the governments of countries rich in mineral resources were unable to use the wealth to boost the economies.
5. The Dutch Disease refers to the appreciation of a country's currency associated with the profitable export of abundant natural resources, as happened in the Netherlands when a huge natural gas field was discovered in Groningen in 1959. The currency appreciation undermined the competitiveness and development of other sectors. The resource curse, the Dutch Disease, and corruption are not necessary consequences of resource wealth. The critical factor is a government's choice to channel the uses of this wealth for private or public gain.
6. Meerman, Jacob (2008), "The Malaysian Success Story, the Public Sector, and Inter-Ethnic Inequality," in *Globalization and National Autonomy: The Experience of Malaysia*, edited by Joan M. Nelson, Jacob Meerman, and Abdul Rahman Embong, 76–115, Selangor, Malaysia: Institute of Southeast Asian Studies.
7. World Bank (2019), "The World Bank in Malaysia: Overview," March, World Bank, Washington, DC, <http://www.worldbank.org/en/country/malaysia/overview>.
8. Sultan Nazrin Shah (2019), *Striving for Inclusive Development: From Pangkor to a Modern Malaysian State*, Kuala Lumpur: Oxford University Press. The choice of what commodities to pick also matter a lot for poverty reduction, but not in a uniform fashion. Local circumstances matter at least as much as the nature of commodity production.
9. Tullis, Paul, (2019), "How the World Got Hooked on Palm Oil," *Guardian*, February 19, <https://www.theguardian.com/news/2019/feb/19/palm-oil-ingredient-biscuits-shampoo-environmental>.
10. The Torrens title system of land registration was introduced in Malaysia by the British and is the tenure system implemented by the National Land Code (1965). The code provided a uniform system of tenure for the nine Malay States on Peninsular Malaysia and the Federal Territories. There is a separate legal basis for land tenure in Sabah and Sarawak, which have different land administration structures.
11. World Bank (2017), "Enhancing Public Sector Performance: Malaysia's Experience with Transforming Land Administration," *Global Knowledge and Research* (November), Malaysia Development Experience Series, World Bank, Washington, DC, <http://documents.worldbank.org/curated/en/928151510547698367/pdf/121243-REVISED-World-Bank-Report-06-Land-Administration-FA-FULL-Web-V2.pdf>.
12. Carraro, A., D. Parisi, G. Federighi, D. Campus, M. Paganini, and P. Karfakis. 2018. *The Small Family Farms in Transition* team, FAO Rome. FAO (2019), "Malaysia: Agriculture and Food Report." Draft final (February). This report has gone through several drafts. The final draft was available in late May 2019. The various versions referenced here are indicated by date.
13. Omar, Sarena Che, Ashraf Shaharudin, and Siti Aiyshah Tumin (2019), *The Status of the Paddy and Rice Industry in Malaysia*, April, Kuala Lumpur: Khazanah Research Institute.
14. Granaries are areas dedicated to paddy rice production. There are 10 granaries. They represent the hub of paddy production in Malaysia.
15. World Bank and Ministry of Economic Affairs, Malaysia (2019), "Malaysia: Agriculture Sector Public Expenditure Review," February, World Bank, Washington, DC; Ministry of Economic Affairs, Kuala Lumpur.
16. By comparison, in 2015–17, the single commodity transfer ranged from 5 percent in Vietnam to 70 percent in Japan, while the average in OECD countries was 30 percent (World Bank and Ministry of Economic Affairs, February 2019).
17. World Bank (2015), "Malaysia among the Most Urbanized Countries in East Asia," January 26, World Bank, Washington, DC, <http://www.worldbank.org/en/news/feature/2015/01/26/malaysia-among-most-urbanized-countries-in-east-asia>.
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21. *Enabling Business of Agriculture* (2017), "EBA Brief, Malaysia." The other Asian (mainly Southeast Asian) comparator countries are Cambodia, Republic of Korea, Laos, the Philippines, and Thailand.
22. Whether Malaysia has a food deficit or surplus depends on the definition of food. The food trade deficit (1990–2017) has increased if one excludes oils and fats; it has been in surplus if one includes oils and fats.
23. FAO (2019), "Malaysia: Agriculture and Food Report." Draft final (April).
24. The comparator countries are Chile, France, and Indonesia.
25. Kajisa, Kei, Mywish Maredia, and Duncan Boughton. 1997. "Transformation Versus Stagnation in the Oil Palm Industry: A Comparison between Malaysia and Nigeria." Staff Paper 97–5 (February), Department of Agricultural Economics, Michigan State University.
26. The term tropical oil crop revolution was coined by Byerlee, Derek, Walter P Falcon, and Rosalind L Naylor (2016, Oxford University Press). The revolution has brought major improvements in living standards and in poverty reduction. In contrasting between the two agricultural revolutions, they noted rice production increased by 84 percent; wheat 162 percent during 1965–1985 green revolution, while the comparable figure for oil palm was an increase of 300 percent in 1990–2010.
27. The history of boards in developing countries is dismal. Smale, M., and T. S. Jayne, citing Howard and Mungoma (1996), "Kenya's National Cereals and Produce Board Accumulated Losses Equal to 5 Percent of GDP in the 1980s, and the Operating Losses of Zambia's National Agricultural Marketing Board Were Roughly 17 Percent of Total Government Budgets in the late 1980s," in S. Haggblade and P. B. R. Hazell, eds, (2010). *Success in African Agriculture: Lessons for the Future*, Baltimore: Johns Hopkins University Press.
28. The Sundaland comprises over 17,000 islands belonging to both Malaysia and Indonesia; the two largest islands are Borneo and Sumatra; see <https://enviroliteracy.org/ecosystems/hotspots-of-biodiversity/sundaland/>.
29. The quotation is on page 12 of Mellor, John W. (2017), *Agricultural Development and Economic Transformation: Promoting Growth with Poverty Reduction*, Palgrave Studies in Agricultural Economics and Food Policy Series, New York: Palgrave Macmillan.
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Introduction

The focus of the report: In a span of a half century, the economy of Malaysia has been transformed from a low-income, vulnerable, primary commodity exporter to an upper-middle-income and diversified country where extreme poverty has almost disappeared. The focus of this report is on the central role that agriculture played in this transformation and how it was shaped and promoted. This central role is confirmed by the fact that “no country has been able to sustain a rapid transition out of poverty without raising the productivity of its agriculture” (Timmer 2007, 3). Agriculture is essential to food security, and food security is essential to transformative growth. Schultz (1953) identified the food problem that plagues poor countries as a substantial drain on food.³⁰

The audience and the scope of the report: The primary audience of the report consists of policy makers and development practitioners interested in what Malaysian policy makers did on the long march of transformation that made it successful and how they did it. Specifically, the report discusses the major policy decisions and institutional structures which enabled Malaysian leadership and its government machinery to translate vision into instruments that can be implemented and have an impact. The report therefore addresses the following main sets of questions:

- What was the role of national leadership, government and the public sector, including the role of specific institutions?
- What were the main drivers of agricultural transformation and inclusive growth, in terms of productivity and production at both primary and processing levels?
- Within the main drivers, what was the role of value chains in the tree crop subsector which powered transformation in agriculture and agroindustry, increasing labor productivity as measured by agricultural value added per worker?
- How did the government reduce poverty, improve equity and promote inclusive development of smallholders?
- How does Malaysia compare and what have we learned from selected country comparators?

This report also summarizes key messages from prior analyses comparing Malaysia’s agricultural transformation and inclusive growth experience with those of Chile, France, and Indonesia. Including this summary makes this report on Malaysia a consolidated report. Since the report is an outbound knowledge product, it will not address the following topics, which have arisen in the course of analyzing the Malaysian experience but should command a separate and full analysis of their own. These are as follows:

- The changing structure and evolution of global demand for vegetable oils and fats
- Wage labor (as opposed to smallholders), including migrant labor
- Urbanization and extent of its decentralization
- Dualism: how best to address to reduce poverty

Conceptual framework of the report

The conceptual framework guiding the analysis of agricultural transformation in this study is Timmer’s (1988) four stages of agricultural transformation.³¹ There are a number of justifications for utilizing this approach: (1) the framework clearly captures the experience of other countries that has undergone agricultural transformation; (2) the different stages capture well the journey the agricultural sector took in the last 60 years of so; (3) the framework is grounded in the conceptual underpinnings of agricultural development and held true through test of time; and (4) provides the context to identify key resource flows, intersectoral linkages, and policy concerns which characterize each stage. The choice of Timmer’s framework was simplified because it covers the agricultural sector holistically and is a coherent representation of world experience.

Other frameworks considered: Dorward et al. (2004), for example, advocate for three policy phases, focusing on food crops.³² Because tree crops are central to the Malaysian experience and the approach deals with half the balance sheet, it was not chosen as the basis for the analysis in this study. In addition, the model is focused on policy and omits the evolving features of agriculture. Rostow’s (1959) stages are also considered.³³ However, Rostow’s stages are more relevant to the overall economy and not specific to agriculture. Granted Rostow’s first stage (traditional society) deals with agriculture, and the second stage (the preconditions for take-off) offers a treatment of the role of agriculture. Nonetheless, the relevance to agricultural transformation is questionable.

The four stages of agricultural transformation seen from within the sector: Agricultural transformation is a long-term process of laying the foundation for productivity increases, diversification, value addition diversification, integration in the broader open macro economy and reaching industrialization. The strengthening of this dynamic process results in agricultural and economy-wide transformation. Timmer's description of this long-term process as seen from within the sector involves four stages, as follows:

- Stage one, the Mosher Environment, during which agricultural productivity is raised as the state lays the foundations for sustained agricultural productivity and production growth: getting agriculture moving, according to Mosher. During this stage, the agricultural and rural sector is a major recipient of resource flows.
- Stage two, the Johnston-Mellor Environment, during which agriculture can contribute by generating surpluses in labor, food, fiber, savings, and even investment resources as a result of the previous investments and institutional changes. During this stage, important market links are developed between primary agriculture and industry, which include upstream links to supply agricultural inputs and downstream links to process agricultural products and diversify end products.
- Stage three, the Schultz-Ruttan Environment, during which the integration of primary agriculture into the macro economy deepens further. During this stage, the share of food declines in urban consumer budgets as urbanization increases. Whether resource outflows from agriculture continue and to what extent, largely depends on government response to the severity of income distribution issues.
- Stage four, the D. G. Johnson Environment, during which the relative share of primary agriculture in gross domestic product (GDP) is small, while that of nonagriculture—industry and services—dominate. The employment contribution of agriculture usually falls to a single digit and, in mature economies, will be below 5 percent. This is the case of a high-income industrialized economy, a world without agriculture, as Timmer puts it. The agricultural transformation is virtually complete, but issues of productivity growth, income distribution, and the people left behind are still pertinent.

These distinct stages are also indicative of progress made on the long march of transformation and an input to a roadmap on follow-on actions. They identify the direction of intersectoral resource flows needed for strengthening intersectoral market links, which in turn are essential for growing the economic pie, and upon which poverty reduction and sustainable social peace depend. Experience suggests that the sector as a whole might not graduate from one stage to the other – some subsector may operate at a lower stage while others could advance to higher stages. Remaining in a higher stage, after transitioning from a lower stage, is not guaranteed, as experience in many instances has shown. While sustained productivity enhancement provides the basis for progress, there is also a need to respond to changing contexts (such as on markets and in consumer preferences), address emerging challenges (climate change), account for demographic changes (for example, aging farmers), and revamp and modernize institutions (especially under rapid technological change). These are among the factors that will ensure that agricultural transformation remains on the path to success.



Agricultural transformation from a macro perspective

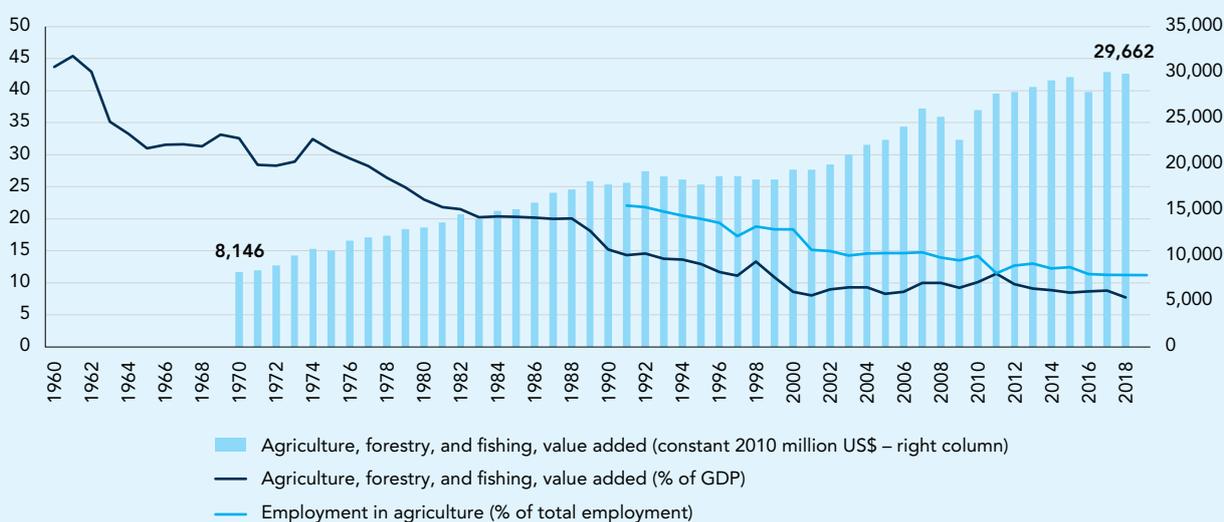
Malaysia's agricultural transformation is similar to the stylized facts that characterize agricultural transformation worldwide, as follows:

- Declining share of agriculture in GDP, while that of the nonagricultural sectors increases³⁴
- Declining share of agricultural employment to total employment³⁵
- The rise of a modern industrial economy
- Transition from high birth and death rates common to backward rural areas to lower ones associated with better health standards in urban areas³⁶

Malaysia's agricultural transformation shares these four stylized facts (figure I.1).

- The share of agricultural GDP in total GDP declined from around 46 percent in 1961 to 7.7 percent in 2018. Nonfarm and nonrural agroindustry processing generated another 6.3 percent of GDP (2010).³⁷
- The ratio of agricultural employment to total employment also declined from 37 percent in 1980 to 27 percent in 1991 and 11.1 percent in 2018.³⁸ In the 1960s, it was nearly two-thirds of total employment.
- By 2014, the IND-GDP ratio had reached 40 percent.³⁹ In 1987, manufacturing overtook agriculture as the major sector for the first time: 22.6 percent versus 21.7 percent, respectively.⁴⁰ Manufacturing was around 9 percent of GDP in 1961 (Yusof and Bhattasali 2008). By 2007, it was 30.1 percent of GDP.⁴¹
- The birthrate per 1,000 was 64.2 and the death rate was 12.4 per 1,000 in western Malaysia (1972).⁴² The 2018 birthrate fell to 15.8 per 1,000 and the death rate to 5.1 per 1,000.⁴³ Consistent with this major improvement in selected life statistics, Malaysia reached upper-middle-income status, at US\$10,460 (2018).⁴⁴

FIGURE I.1. Agricultural transformation, main trends, Malaysia

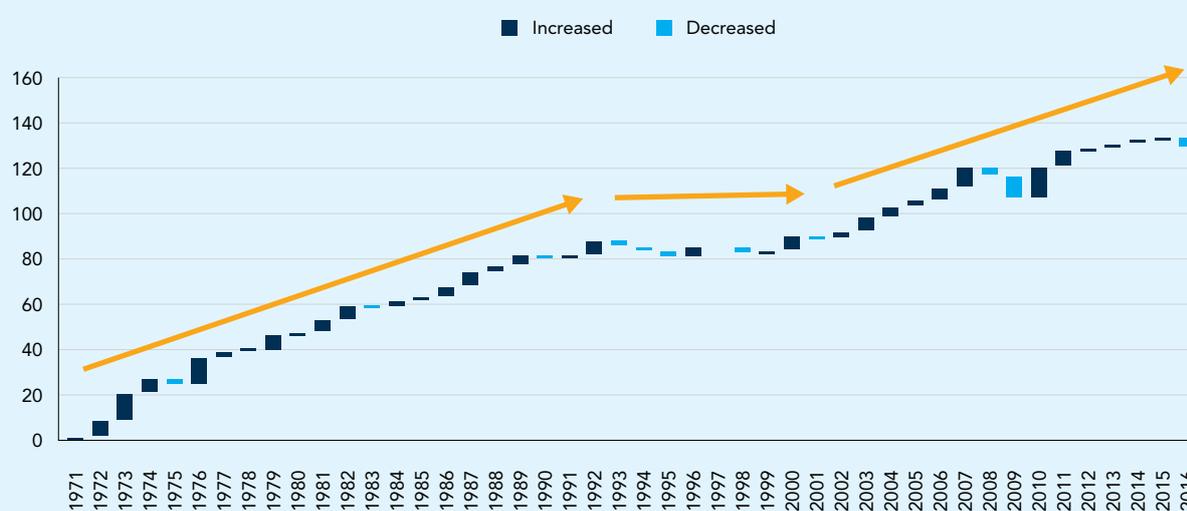


Source: Computed based on WDI data.

These stylized facts serve as markers of the progress achieved and as indicators of the opportunities and policy challenges that policy makers must face economy-wide. For example, the continual decline in agricultural employment as a share of total employment and the value added of that declining share of employment relative to the value added of nonagricultural sectors are indicative of the challenge of generating the gainful, higher productivity employment to pull the agricultural labor released.

The heavy lifting required to launch and support the transformation of smallholder agriculture: The nature of the policies, institutions, and investments needed to enable smallholder and low-productivity agriculture to move up these stages has been hotly debated over at least a half century. Despite the debate, there is consensus that heavy lifting is required to get agriculture moving. Malaysia's experience confirms this consensus.⁴⁵ The higher growth rate in agriculture occurred in 1971–92 at an average annual rate of 4 percent (figure I.2). The heavy investments during the early years of agricultural transformation carried the sector through the 1980s. In 1993–2002, agricultural growth was dismal (0.41 percent). Because of the emphasis on industrialization, agriculture showed an anemic growth through the 1990s until the shift in policy in government started to bear fruit. In 2003–15, agricultural growth reached an average annual rate of 3.2 percent.

FIGURE I.2. Agricultural value added, annual % growth



Source: WDI data.

Framing Malaysia's agricultural transformation

Overall setting and overview: To understand better the journey Malaysia took along the agricultural transformation continuum, examining the trends in agricultural value added and its rate of growth, population distribution between rural and urban, food composition and value added per worker provides insight and a general overview.

The government launched the transformation of agriculture through the first and second Malaya plans. However, the focus was on satisfying export demand, and it was anchored on a market-centered approach. During this period, efforts to lay the basis for agricultural transformation included incipient activities. Although the country registered high overall economic growth during this period, it is only during the second Malaysia Plan and the fundamental changes in the overall policy orientation—the New Economic Policy (NEP 1971–90)—that surpluses started to be created in agriculture. Clearly, agriculture started growing at a more rapid pace during the second and third Malaysia plans (1971–80) (table I.1).

Before 1960, rice self-sufficiency (RSS) from domestic resource was 55 percent for a population size of less than eight million; by 1970, the country reached 90 percent RSS from domestic resources. Clearly, the country has moved to the surplus stage.

Although agriculture had moved to the surplus stage by the 1980s, it only reached a mature surplus stage by 1992 when the urban population surpassed the rural population in size. The population transfer continued, indicating that agriculture was addressing the food problem. In addition to labor, agriculture was generating a number of products for domestic processing and value addition; financial resources were generated, which were reinvested in agriculture and in other sectors. It is also in 1987 that manufacturing was able to overtake agriculture as the major sector of the economy. During the 1990s, the private sector role expanded, and land development was left to the private sector (and state governments) and Federal Land Development Authority (FELDA) ceased to open up new areas, heralding the incubation of the integration stage. Supermarkets also expanded their coverage deepening their integration with the agricultural sector; agricultural firms which made their fortune in the agricultural sector enhanced their investment in other sectors of the economy further deepening integration. The policy statements as expressed in the Second National Agricultural Policy were intended to enhance integration through rural industrialization and commercialization to make agriculture market-led, efficient, and competitive. Between 1980 and 2000, an accelerated agricultural transformation occurred. The sector's share of national GDP fell by half, and its employment share dropped by 63 percent; in the new millennium, agricultural transformation has moved to the integration stage. In 2004, population growth fell below 2 percent for the first time (figure I.3).

TABLE I.1. Value added in agriculture

Annual % growth

1972	1973	1974	1975	1976	1977
1.44	7.62	11.78	6.91	-3.04	12.24

Source: WDI data.

FIGURE I.3. Population growth (annual %)



Source: WDI data.

Introduction

For the most part, Malaysian agriculture is now at integration stage. During the integration stage, there is a reduction in the share of food expenditure from total income and there is also a shift in consumption patterns, as the size of the middle-income class expands (or, generally, as income increases) reflecting Bennett's law. Table I.2 shows clearly that Malaysia is in transition in consumption pattern. Both the intake of sugar and sweeteners and vegetables have increased and that of rice have tumbled. However, the daily consumption of vegetables is below the recommended level indicating of transition is in progress.

TABLE I.2. Shift in consumption patterns

a. Food in household expenditure (%)	2004	2014	2016	b. Per capita consumption (kilocalories)	1963	2011
Food and nonalcoholic beverages	20.1	18.9	18.0	Rice (mill equivalent)	1260	762
Rice	1.8	1.2	1.1	Wheat and products	197	185
Bread and other cereals	2.3	2.5	2.4	Fish, seafood	43	111
Meat	2.8	2.8	2.6	Poultry meat	18	162
Fish and seafood	4.2	4.2	3.9	Bovine meat	7	24
Milk, cheese, and eggs	1.6	1.6	1.5	Mutton and goat meat	2	6
Oils and fats	0.6	0.5	0.5	Vegetables	15	56
Fruits	1.4	1.1	1.2	Vegetable oils	194	400
Vegetables	2.2	2.2	2.1	Sugar and sweeteners	211	411
Sugar, jam, honey, chocolate, confectionary	0.7	0.6	0.6			
Food products	1.3	1.0	1.1			
Coffee, tea, cocoa, nonalcoholic beverages	1.3	1.2	1.1			
Restaurants and hotels	10.9	12.7	13.4			
Expenditure on food away from home	8.7	10.2	10.7			
Expenditure on beverages away from home	1.8	2.1	2.1			

Source: Household Expenditure Survey.

However, this transformation is not uniform across subsectors. Rice is an important example. Although this paper argues that the country was able to expand its rice production to substantially improve its RSS and feed the rising population, it is still in the surplus creation stage.

Rubber and oil palm are both involved in some activities akin to the industrial stage, but the subsectors must be consolidated before they can be considered to be at an industrial stage. Agricultural value added per worker, especially among smallholders, will be the test in these two subsectors as they undergo a full-fledged transformation and enter the industrial stage. Dairy farming is still at an initial stage, notwithstanding that processing facilities have been developed in Malaysia. Supply has remained rigid. This is probably so because of agroclimatic conditions or governance issues that have impeded the subsector from embarking on transformation. Rice is often treated as a political good rather than an economic good.

Organization of the report: The main report is organized in five sections. Following the conclusion are annexes A–F.

Section I describes the stages of agricultural transformation and the overall policy and institutional context within which the transformation is occurring. Specifically, it discusses the following:

- The long-term vision of leadership for nation building and its central goals
- The structural characteristics of Malaysia’s agricultural transformation when viewed from both a macro and sector perspective and their policy significance
- Implementing the vision: policies and institutions

Section II analyzes how the diversification strategy and inclusive growth in the tree crop subsector—palm oil, rubber, and cocoa—have propelled agriculture from the first through the third stages of transformation by strengthening the links between the yields of primary agriculture and value addition in processing and final marketing. Specifically, it discusses the following:

- Guiding agriculture through strategic diversification and export orientation, the first and second stages of transformation
- The oil palm complex: extensive growth and the abundance of land, productivity increases, value chain development (VCD), reaching the third stage, and sustainability challenges
- Rubber and cocoa: contraction in the field and adding value through VCD

Section III discusses the government’s focus on poverty reduction through import substitution, while the government pursues VCD in the agri-food subsector (rice and non-rice). The government and other stakeholders have made progress in achieving RSS goals and Bumiputera poverty reduction, but have fallen short of reaching the food security goals. The agri-food subsector has progressed through stage three of the transformation, although some areas within the subsector are still at stage two. Specifically, it discusses the following:

- Food security through the promotion of RSS and other food crops
- The relative policy neglect of the non-rice agri-food subsector

Section IV presents various programs aiming at reducing poverty among smallholders and small farmers. Specifically, it discusses the following:

- The identity of smallholders and small farmers in Malaysia
- Policies and programs such as FELDA, area and regional development, and agropolitans

Section V discusses key lessons from Malaysia within a comparative perspective that includes the following:

- The speed of transformation in Malaysia relative to selected comparators
- Value chains as the backbone of transformation
- Agricultural research and development (R&D), which play a key role in increased yields and production
- Conclusion: the main achievements and key remaining challenges

Annexes

- A. Institutions and their roles in implementing the government’s vision
- B. The tree crop subsector, palm oil, rubber, and cocoa
- C. Salient features of the rice and non-rice agri-food subsectors
- D. The drivers of transformation in Malaysia
- E. Smallholder farming and area development in Malaysia
- F. Quantitative comparisons, Malaysia and selected countries

Notes

30. Schultz, T. W. (1953), *The Economic Organization of Agriculture*, New York: McGraw-Hill.
31. Timmer, C. Peter. (1988), "The Agricultural Transformation," in *Handbook of Development Economics*, vol. 1, edited by Hollis Chenery and T. N. Srinivasan, 275–331, Amsterdam: North-Holland.
32. Dorward, A. R., S. Fan, J. Kydd, H. Lofgren, J. Morrison, C. Poulton, N. Rao, et al. 2004. "Institutions and Policies for Pro-poor Agricultural Growth." *Development Policy Review* 22 (6): 611–22. See also Birner, Regina, and Danielle Resnick. 2009. "Policy and Politics for Smallholder Agriculture." Paper presented at the Future of Small Farms Research Workshop, Wye College, Wye, UK, June 26–29. The authors point out that, in 1899, Karl Kautsky had discussed whether the German state should support smallholder agriculture in his "The Agrarian Question." The smallholder poverty issue is frequently discussed in the 20th and 21st century development literature..
33. Rostow, W. W. 1959. "The Stages of Economic Growth." *Economic History Review* 12 (1): 1–16.
34. The exact length of the time period it takes varies among countries as historical experience indicates. However, it is always "long". So far, the process of agricultural and rural transformation has been at least several decades long. The practical policy implication of taking the long view is the urgency to build the foundations as the results take time to materialize.
35. Tomich, Thomas P, Peter Kilby, and Bruce Johnston. 1995. *Transforming Agrarian Economies: Opportunities Seized, Opportunities Missed*. Ithaca, NY: Cornell University Press. According to the authors, if the absolute number of people employed in agriculture declines, this is a structural turning point.
36. Barrett, Christopher B., Michael R. Carter, and C. Peter Timmer 2010 *American Journal of Agricultural Economics* 92 (2): 447–68.
37. Tey, Yeong Sheng, and Mark Brindal. 2018. "The Development of Agro Industry and Value Chains: Lessons from the Malaysian Palm Oil Sector," unpublished working paper. The World Bank recommended oil palm as the best diversification alternative. The authors also pointed out that the palm oil yield doubled from 1.8 to 3.5 tons per hectare in 1960–2015, which compares favorably with Indonesia's, at 3.6 tons per hectare. The agro-based industry contribution to GDP was estimated at 3.69 percent (2015) based on the 11th Malaysia Plan (World Bank, Jakarta and Kuala Lumpur, 2018).
38. ILO data retrieved Sept 2018 by WDI, <https://data.worldbank.org/indicator/sl.agr.empl.zs>.
39. FAO. Smallholders Team. Carraro, A and Parisi, 2018 Structural Transformation and Inclusive Growth: Drivers of Growth and Determinants of Transformation. Preliminary Draft.
40. Ahmad, Tengku Moyd Ariff Tengku and Chubashini Suntharalingam. "Transformation and Economic Growth of the Malaysian Agriculture", in *Economic and Technology Management Review*, Vol. 4 (2009): 1-10
41. Rasiah, Rajah. 2011. "Industrialization: I. Industrialization and Export-Led Growth; II. MIDA: Sustaining the Momentum of Success, Malaysian Investment Development Authority." Ch. 6 (147–80; 181–202) in *Malaysia: Policies and Issues in Economic Development*, Institute of Strategic and International Studies, Kuala Lumpur.
42. World Bank. December 21, 1972. Staff Appraisal Report. Malaysia: Population Project. Report PP–12 a.
43. Department of Statistics of Malaysia in "Birth Rate drops this year says Department of Statistics", August 16, 2018 in *Malay Mail*, Kuala Lumpur, <https://www.malaymail.com/news/malaysia/2018/08/16/birth-rate-drops-this-year-says-dept-of-statistics/1662855>.
44. Data posted among World Development Indicators, 2017. Gross national income (GNI) per capita, Atlas method. World Bank latest income group classification: As of fiscal year 2017, low-income economies are defined as those with a GNI per capita (calculated using the World Bank Atlas method) of US\$1,025 or less in 2015; lower middle-income economies are those with a GNI per capita between US\$1,026 and US\$4,035; upper middle-income economies are those with a GNI per capita between US\$4,036 and US\$12,475; high-income economies are those with a GNI per capita of US\$12,476 or more.
45. Successful agricultural transformation generates growth in nonagricultural sectors, which then pull the labor released by a growing agriculture into higher-productivity sectors. The heavy lifting is analyzed and summarized in terms of five conditions common to all successful agricultural transformations in Tsakok, Isabelle. 2011. *Success in Agricultural Transformation: What It Means and Why It Happens*. Cambridge, UK: Cambridge University Press.



SECTION I

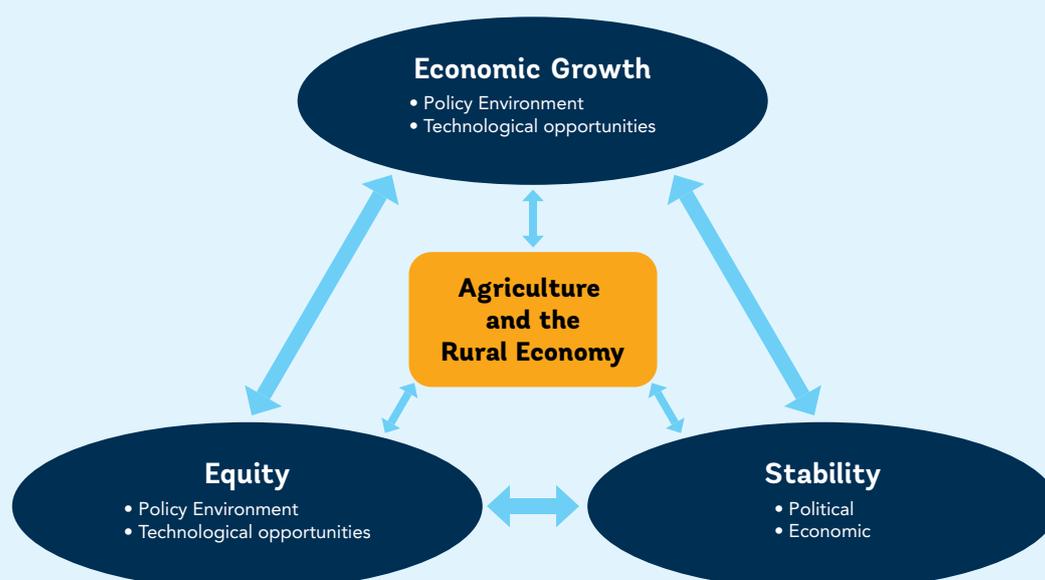
Overall Policy and Institutional Context

The vision and its realization: Institutions as key instruments of policy implementation

The government’s vision of nation building was the rationale that gave impetus to the agricultural transformation: The vision of the Malaysian leadership on nation building profoundly shaped the course of agricultural and therefore economy-wide transformation. This vision was articulated and translated into action after the violent race riots of May 13, 1969. The leadership was determined “to preserve national unity by eradicating poverty irrespective of race and by restructuring Malaysian society to reduce the identification of race with economic function and geographical location” (Yusof and Bhattasali 2008, 4).⁴⁶ In this vision of nation building, distribution issues occupied center stage in the leadership’s strategy and plans. The government abandoned the market-deterministic approach of the first three Five Year Plans (1956–69). Export-driven growth under this approach reached 6 percent a year, but poverty was widespread, and inequality was widening.⁴⁷ The NEP (1970–90) was specifically about the pursuit of growth with equity. Thus, the government sought to increase the size of the pie, while redistributing the pieces of the pie. No more trickle-down approach. The NEP represented a fundamental reorientation in Malaysia’s development.

The development trilogy and the role of agriculture: In addition to growth with equity, the government (like all governments) places great emphasis on stability. Its approach can be characterized as a development trilogy of economic growth, equity, and stability (figure 1.1).⁴⁸ As elsewhere in much of Asia, the government views adequate supplies of rice as central to political stability, and the achievement of high RSS as virtually synonymous with food security. Also, like many of its Asian neighbors, the government has assigned top priority to the sustained development of agriculture as the anchor to realizing a vision of growth with equity and stability. The leadership has given agriculture a central role in achieving nation building.

FIGURE 1.1. The development trilogy and the role of agriculture



Source: Food Security and Scarcity: Why Ending HUNger is So Hard, p.53, C. Peter Timmer, U. Penn Press, 2015

Implementing the vision: Policies and institutions

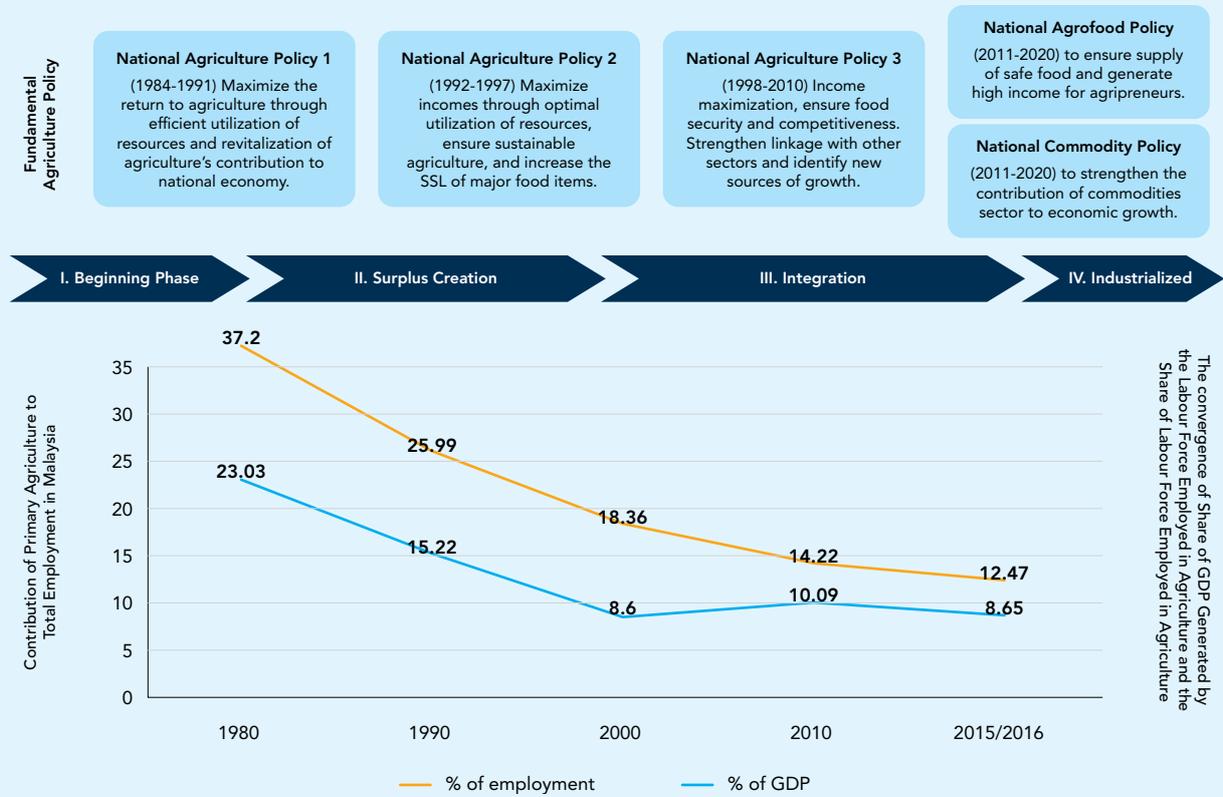
Partnership among government, the private sector, and markets in implementing the ambitious agenda: The Malaysian leadership established a wealth of institutions and set the rules of the game to enable the public sector to implement effectively its policies and priorities (see annex A). The government also worked with the private sector and markets. The government was to lead and support the private sector, rather than suppressing it or supplanting markets. The three groups were partners in development not antagonists. Government policies and investments crowded in private investments rather than crowding them out. This partnership was fundamental because it allowed economic management to benefit from the comparative advantages of each group of actors.

Plans and budgets for agriculture, rural development, and poverty reduction

Ample budgets for the priorities selected represent a major form of support: The government invested heavily in agriculture from the early years and developed many institutions to formulate more specific plans and implement them. Even as early as in the First Malaya Plan (1956–60), the government allocated 26 percent of its total budget to agriculture.⁴⁹ Agricultural and infrastructure projects accounted for 52 percent of the First Malaya Plan allocation. This allocation was directed mainly to the eastern rural part of the peninsula where a large proportion of Malays lived. Over the first three five-year plans (1956–70), agricultural and rural development received 22.3 percent of total spending, while industrial development received only 2.4 percent (Zin 2014). In the Third Malaysia Plan (1976–80), agricultural and rural development accounted for 25.5 percent of the government’s development budget (Adnan, June 2018). So, decades before the NEP (1970–90), the government and stakeholders had already started the process of getting agriculture moving. Dorward et al. (2004) call this phase 1, establishing the basics, except that there was no land reform.⁵⁰ The government budget allocation reflected the government’s stated policy priorities. More generally, this is an important feature of budget allocations for poverty reduction in all the plans, from the Second to the Eighth Malaysia plans (2001–05). In these plans, 25 percent–35 percent of development expenditure was allocated to agriculture (Zin 2014).⁵¹ Budget allocations that support policy priorities mean that planning can have an impact.

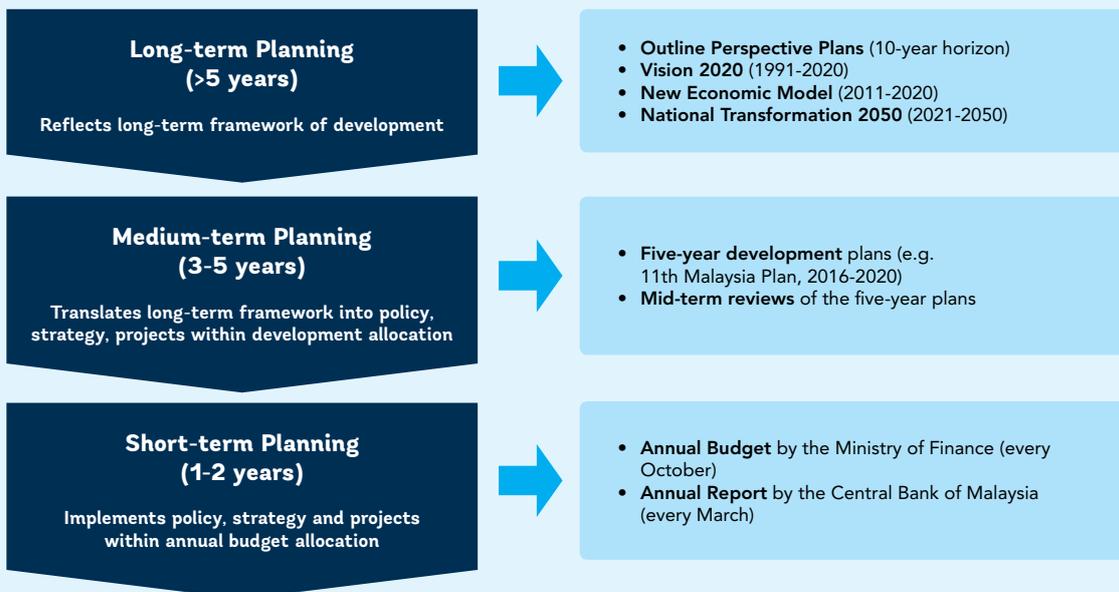
As part of its long-term development vision, the government developed the National Agricultural Policy in 1983 (figures 1.2 and 1.3). The policy was revised four times up to 2020. The first National Agricultural Policy was adopted following the advice of the World Bank on farm efficiency and income equity. The policy aimed to harmonize and direct the efforts of all stakeholders involved in agriculture based on the concept of raising productivity to maximize net farm incomes. It was a reaction not only to the slower rate of expansion in agriculture, but also to the movement of labor out of agriculture. However, the policy came out shortly before the collapse of commodity prices in 1985, forcing the government to revisit some of the central strategies. The second National Agricultural Policy outlined multiple strategies to expand food production, enhance the role of the private sector, set marketing reform in motion, and accelerate agro-based industrial development. The third National Agricultural Policy implemented a two-pronged strategic approach by promoting agroforestry, while mainstreaming the effort to enhance output and achieve high-quality, high-value products. The most recent policy, the National Agro-Food Policy (2011–20), assigns prominence to the agri-food sector and food security in light of the global food crisis in 2008. The production of agri-food commodities is expected to expand 4 percent a year to realize the desired levels of self-sufficiency. Agriculture has also been identified as a National Key Result Area, which is supposed to create more than 109,000 new jobs by 2020, primarily in rural areas. Among the key objectives of the policy are high-value and sustainable agricultural development and private sector investment to modernize agriculture.

FIGURE 1.2. Agricultural transformation and policy trends



Source: Adapted from Adnan, Hezri. 2018. "Agriculture Transformation: Policy and Institution." Unpublished.

FIGURE 1.3. The development planning horizon, Malaysia



N.B. The National Transformation 2050 (2021-2050) was replaced with Shared Prosperity Vision 2030 (2021-2030).
Source: Ministry of Economic Affairs, Malaysia; adapted from World Bank 2019.

Plans, policies, and institutions

The NEP and subsequent plans to implement the government’s vision of growth with equity. The launching of the NEP at a time of crisis was the beginning of a long partnership among the public sector, private business, and various stakeholders to restructure the Malaysian economy and society. The British-owned palm oil plantation companies were nationalized at the end of the 1970s under the NEP.⁵² Agriculture was the crucial sector in which the government vision of growth through diversification and with equity had first to be anchored. A total of 21 federal ministries and agencies were created or tasked to implement the government’s plans. The three relevant federal ministries are the Ministry of Agriculture and Agro-based Industry, the Ministry of Primary Industries, and the Ministry of Rural Development (Adnan 2018). Each ministry has several federal agencies under its jurisdiction. The Ministry of Agriculture and Agro-based Industry has 9, and the Ministry of Primary Industries has 12 (figure 1.4). The broad range of these actors shows the extent of the government’s intervention. The agencies under the jurisdiction of the Ministry of Agriculture and Agro-based Industry are service type institutions, for instance, research, extension, production support, and marketing. The paddy granary areas of the Muda Agricultural Development Authority (MADA) and the Kemubu Agricultural Development Authority (KADA) are under this ministry. The ones under the Ministry of Primary Industries are commodity-based institutions with a strong presence in production, processing, and marketing. The Ministry of Rural Development had six development authorities under its jurisdiction, for example, the Federal Land Consolidation and Rehabilitation Authority (FELCRA), the Rubber Industry Smallholders Development Authority (RISDA), that has now brought under the purview of the Ministry of Economic Affairs and four area development authorities. FELDA is under the Office of the Prime Minister, and now under MEA.

FIGURE 1.4. Key federal institutions involved in agriculture

Federal ministries	Federal agencies
Ministry of Agriculture and Agro-based Industry	Malaysian Agricultural Research and Development Institute
	Farmers’ Organization Authority
	Federal Agricultural Marketing Authority
	Fisheries Development Authority of Malaysia
	Muda Agricultural Development Authority
	Malaysian Pineapple Industry Board
	Kemubu Agricultural Development Authority
	National Entrepreneurial Group Economic Fund
	Agrobank
Ministry of Primary Industries	Malaysian Palm Oil Board
	Malaysian Rubber Board
	Malaysian Timber Industry Board
	Malaysian Cocoa Board
	National Kenaf and Tobacco Board
	Malaysian Pepper Board
	Malaysian Palm Oil Certification Council
	Malaysian Palm Oil Council
	Malaysian Rubber Export Promotion Council
	Malaysian Timber Council
	Malaysian Timber Certification Council
	Malaysian Furniture Promotion Council

Source: Adnan, Hezri. 2018. “Agriculture Transformation: Policy and Institution.” Unpublished.

Dualism in agriculture reflected in federal institutions: The institutional distinction between plantation and nonplantation agriculture at the highest government level shows clearly the dualistic nature of Malaysian agriculture, a dualism rooted in the colonial period. Since colonial days, the export-oriented or plantation sector (palm oil, rubber, and cacao) has received top priority compared with the import-substituting sector, particularly the non-rice food sector.⁵³

The challenge of institutional coordination, policy coherence, and effectiveness with size: This extensive institutional network raises obvious issues of institutional coordination, policy coherence, and effectiveness. The government has been keenly aware of these basic issues about public sector performance, important for any government bureaucracy and not specific only to agricultural and rural development. The Prime Minister's Department established the Economic Planning Unit (now the function of EPU has been taken by the Ministry of Economic Affairs) in 1961 with the authority, resources, and convening ability to develop plans and monitor agencies. The ministry is a powerful unit since it has executive authority to "initiate, undertake and implement development planning and to directly advise and consult with the Prime Minister on development planning."⁵⁴ Over the years, the government developed a complex system to undertake economic development planning, budgeting, implementation, monitoring and evaluation, all focused on results. In 2009, the government established the Performance Management and Delivery Unit (PEMANDU). The unit worked with the existing building blocks of Malaysia's public sector to design and implement the New Economic Model (2010–20). The goal of the model is to transform Malaysia into a high-income country by 2020.⁵⁵

Adaptability and realignment of Malaysia Plans: As important as policy coherence and coordination among different institutions are periodic reviews and realignments of plan priorities and instruments. The most recent example is the Eleventh Malaysia Plan midterm review undertaken for 2016–17. The review is a diagnosis of why the target to achieve inclusive growth and high-income status by 2020, despite substantial progress, will not be reached and what should be done to improve performance. The emphasis is now on lifting the bottom 40 percent of households, irrespective of ethnicity. The growth in total factor productivity (TFP) on which targeted growth increasingly depends was also below required levels. It contributed 37.8 percent to the growth rate; the targeted level was 40 percent.⁵⁶ To strengthen TFP growth, initiatives include a new emphasis on innovation-driven growth through collaboration among the government, private business, and academia to improve the quality of labor; the digitalization of business operations; and the reform of regulations and the business environment. To improve public sector performance and service delivery, the emphasis is on transparency, accountability, and improved governance to regain public trust.

Land: FELDA, FELCRA, and RISDA: Land consolidation and rehabilitation were key components of the government intervention to integrate smallholders in the mainstream of economic life. In the plantation sector, the government wanted to include the poor and landless Bumiputeras in oil palm production and processing in such a way that they would substantially benefit not just as laborers, but as owners of land and of shares, including in downstream processing. To benefit them without launching a possibly divisive land reform, FELDA, since 1961, has been resettling the poor and landless through land development schemes on public land in Peninsular Malaysia, providing each household with housing and basic social amenities.⁵⁷ To obtain land and title, smallholders had to sign a contract to supply fresh fruit bunches (FFBs) to FELDA. In addition, FELDA provides supervision, inputs, financing, and extension services to participating smallholders. FELCRA (1961) is similar to FELDA, except that it deals with rehabilitating already cultivated low-cost state schemes often involving opening up jungles and virgin lands in the fringe of adjoining such rehabilitation areas. RISDA (1972) is responsible for block plantings for rubber including replanting of former rubbers areas to oil palm in later years.

Land titling, a critical national institution supporting smallholder integration: Malaysian leadership reformed the land administration system in Peninsular Malaysia. Land administration is under the purview of state governments. Despite the complex institutional and legal context for land administration, the government succeeded in issuing provisional and full titles that guarantee property rights and tenure security to all holders of these titles in Peninsular Malaysia.⁵⁸ The qualified title process required relatively rapid completion of land administration information that secured land rights and facilitated land market functioning. They did not require information from a full cadaster. Instead, they were based on sketches by non-surveyors, which enabled state governments to complete the initial cadastral map and issue the title. Over time, the government undertook measures that enabled qualified titles to be upgraded to full titles; for instance, between December 2014 and June 2015, 85 percent of qualified titles in Peninsular Malaysia were

converted to full titles.⁵⁹ The tenure security gained through titling and access to affordable land administration systems are denied to some 70 percent of the population worldwide (World Bank, November 2017). In the case of smallholders who participated in land settlement schemes, they doubly benefited: first from receiving the land; then the titles. Unlike most laborers worldwide, they owned not only their labor, but also a valuable income-earning asset, land.

Land, a determining asset for poor farmers to break out of extreme poverty: In its approach to reducing poverty among smallholders and integrating them in profitable operations, the government rightly emphasized the access to land and legalizing land ownership through titling. Where it did not give title to the rural poor, as in paddy areas, productivity performance has been wanting. Lack of title remains a problem as in the case of the indigenous people of Sabah and Sarawak. Smallholders engaged in non-rice food crop production also have insecure land tenure.⁶⁰

Notes

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51. There are no data on funds allocated solely for poverty reduction in the Seventh and Eighth Malaysia Plans, but the funds are believed to be substantial.
52. These were Golden Hope, Kumpulan Guthrie, and Sime Darbie. They were Malaysianized not through expropriation, but through purchase at market value, thus respecting private property rights. See Meerman, Jacob (2008), "The Malaysian Success Story, the Public Sector, and Inter-Ethnic Inequality," in *Globalization and National Autonomy: The Experience of Malaysia*, edited by Joan M. Nelson, Jacob Meerman, and Abdul Rahman Embong, 76–115, Selangor, Malaysia: Institute of Southeast Asian Studies.
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54. The quotation is from page 4 of World Bank, *Primer: Malaysia's Experience with National Development Planning*, updated, October 13, 2017, <http://documents.worldbank.org/curated/en/840341527676890030/pdf/WP-BackgroundNoteTheMalaysianExperiencewithNationalDevelopmentPlanningUpdatedOct-PUBLIC.pdf>.
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58. The Torrens Title System of land registration was introduced in Malaysia by the British and is the tenure system implemented by the National Land Code. The National Land Code (1965) provided a uniform system of tenure for the nine Malay states on Peninsular Malaysia and the Federal Territories. There is a separate legal basis for land tenure in Sabah and Sarawak. They have different land administration structures.
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SECTION II

Value Chain Development with Inclusive Growth: The Tree Crop Subsector

Strategic diversification to reduce the economy's vulnerability: At independence (1957), Malaysian leadership inherited a low-income, dualistic, open economy vulnerable to the ups and downs of commodity markets. Diversification was a strategic and economic necessity. As a major commodity exporter, Malaysia has always been vulnerable to notoriously volatile tin and rubber prices. Indeed, synthetic rubber had been making major inroads in global markets since the 1930s and especially during World War II. In addition, the prospects were dimmed by the anticipated decline in the long-term price of rubber.

Diversification to promote value addition and growth: Diversification has three prongs: (1) diversification away from rubber; (2) diversification away from primary agriculture; and (3) diversification into agroprocessing of the many end products, agroprocessing being a first step into manufacturing. It is noteworthy that Malaysia retained its role as a major trading center under colonial times to remain one of the more open economies in the world. It chose diversification as a way to reduce vulnerability and to grow, unlike many developing countries which chose protection with high tariffs. Its trade-GDP ratio varied between 100 to 200 percent between 1960 to 2016. In 1960, it was 113; in 2016: 130 (WDI).

Value chain development: Ideal vehicle for diversification to drive transformation

VCD, the main engine of Malaysian agricultural transformation: Five sets of policy decisions combine to propel VCD, especially in oil palm:

- The government's strategic diversification not only into oil palm but also into the multiple end products of crude palm oil
- The government's policy to vigorously promote resource-based manufacturing and attract foreign direct investment inflows by the late 1960s and early 1970s through the Investment Incentives Act (1968); the Free Trade Zone Act (1971); the Promotion of Incentives Act (1986), and the First Industrial Master Plan (1985–95)
- Tax on crude palm oil that attracted foreign direct investment into palm oil refining
- Decision to keep Malaysia an open trading economy as in colonial times. External tariff rates were modest. The overall mean ad valorem rate was 25 percent with narrow dispersion (Yusof and Bhattasali 2008)
- Major public investments in promoting marketing abroad

VCD, a major role in the diversification away from primary agriculture into manufacturing: In the 1980s, the government industrialization policy emphasized the development of downstream processing based on natural resources, as promoting manufacturing was a key component of the government diversification strategy. The Malaysian Industrial Development Authority has played a pivotal role in facilitating domestic and foreign investments in industry.⁶¹ To attract private sector and multinationals, the government invested in infrastructure by establishing free trade zones and licensed manufacturing warehouses. The government's industrialization policy led to the influx of multinational companies, which established plants to manufacture high-quality rubber products, such as latex gloves and catheters. Foreign direct investment inflows in rubber manufacture, which was substantial in the 1970s, rose significantly in the 1980s and the next decades (Rasiah 2011).

Choice of palm oil for diversification and value addition was a winner: In oil palm, the government did pick a winner for its diversification strategy as the oil palm fruit itself is structurally diversified (box 2.1).⁶² The FFB gives rise to four broad categories of processed products: (1) palm oil and palm kernel products; (2) oleochemicals, for instance, nonfoods such as soap and cosmetics; (3) biodiesel, a substitute for petroleum; and (4) palm biomass, for example, green plywood. Because these subproducts are spread over a wide range of food and nonfood markets and are income elastic, the risk of terms of trade shocks is automatically spread out and therefore reduced (Hameed and Arshad 2007). Indeed, palm oil has been called "a miracle ingredient in everything from biscuits to shampoo" (Tullis 2019).

BOX 2.1

Trends in oil palm value addition

In 1977, soon after the establishment of refining capacity, the exported volume of processed palm oil surpassed that of crude palm oil, and already in the early 1980s the latter was of no significant importance in total exports of palm oil products. Up to 1970 palm kernels were exported without further local processing but exports of palm kernel oil and palm kernel cake took off in the mid-1970s and increased substantially in the 1980s; palm kernels have not been exported since 1979. Furthermore, the composition of processed palm oil products has changed, reflecting the development of production technology: Exports of basic refined products have gradually developed into more advanced fractionated products such as palm olein and stearin. Exports of palm kernel oil have changed in composition as well. Up to 1983 only crude palm kernel oil was exported (Ong and Santhiapillai 1989) but since then the importance of crude palm kernel oil in exports declined markedly, and already by 1991 nearly two thirds (in volume terms) of palm kernel oil exports consisted of processed products. In addition, exports of further processed palm oil transformed into consumer goods started, such as soap, margarine, vanaspati ghee, and other prepared edible fats. Exports of oleochemical products (fatty acids, glycerin, and so on) also expanded after the establishment of oleochemical plants in the early 1980s, and export earnings increased steadily during the 1980s.

Source: Fold, Niels, and Lindsay Whitfield. 2012. "Developing a Palm Oil Sector: The Experiences of Malaysia and Ghana Compared." DIIS Working Paper 2012–08.

Diversification away from rubber into oil palm: During the first two Malaya plans (1956–60, 1961–65), and the first Malaysia Plan (1966–70) diversification away from rubber into oil palm proceeded apace. Rubber dominated the total value of major agricultural commodities before independence. In 1948–52, it accounted for 70 percent of this total value. But the contribution of rubber to total national output fell from 38 to 15 percent during this early decade. However, the relative shares devoted to each plantation crop were soon almost reversed. The area planted to oil palm tripled during 1960–70.⁶³

Dominance of the palm oil complex

"Basically, because of the price prospects for rubber, the existing heavy investment in rubber will probably not be a source of further income growth," explained a World Bank (1967) report on Malaysia's agriculture that set the stage for the need for diversification away from rubber. "Oil palm, however, will be a dynamic factor. There is thus a pressing need to diversify into other crops."⁶⁴

Diversification in favor of oil palm has been supported by the abundance of land: By 1985, oil palm had overtaken rubber to become Malaysia's largest agricultural commodity (box 2.2). Its contribution to total agricultural output rose to nearly 30 percent (Tey and Brindal 2018). By 2016, the palm oil complex was contributing 43 percent to agricultural

BOX 2.2

Oil palm: Weevil pollination is key to successful adaptation to Malaysia

Oil palm (*Elaeis guineensis*) was introduced from West Africa in the 1870s, but the first commercial planting was not until the 1890s, and it expanded gradually at first. The original area planted was 54,000 hectares (1960). The first constraint that planters faced was pollination, which had to be done by hand. For some reason, the native oil palm pollinator, the weevil (*Elaeiodobius kamerunicus*) had not been brought over from West Africa when the oil palm was transplanted to Malaysia. The introduction of this weevil in 1981 from Cameroon was a major turning point. It vastly improved pollination and expanded the area planted. Weevil pollination yielded bigger and more compact FFB, and there were savings in labor also. The ratio of oil to bunch improved, from under 19 to 23–25 percent. In only one year (by the end of 1982), the FFB yield had increased to 20.1 tons per hectare.

Sources: Tey and Brindal 2018; Wong 2011.

GDP and 6 percent to GDP and employed nearly 441,000 people, excluding some 281,000 smallholders (Tey and Brindal 2018).⁶⁵ After over 50 years, oil palm occupied 75 percent of the total arable land in Malaysia. By 2017, this cultivated area had reached 5.8 million hectares (Tey and Brindal 2018). The complex has been a major contributor to the high annual growth rate of the agroindustry in recent years (11 percent in 1990–2005). By the 2010s, it accounted for some 39 percent of world palm oil production, 12 percent of the world's production of fats and oils, and 44 percent of world palm oil exports. Though a major palm oil exporter, Malaysia is still a price taker as there are many substitutes for the associated food (for instance, vegetable oils and fats) and nonfood products (for example, personal care, plastics).⁶⁶ By any measure, the government's choice of oil palm as part of its strategic diversification strategy was a success.

Favorable market conditions for palm oil exports: Several market-relevant factors combined to make oil palm production and processing a lucrative business. The government reduced the export tax on palm oil, which encouraged the substitution of rubber by palm oil. The export-oriented structure of Malaysia's economy since British rule enabled palm oil to benefit from growing world demand. Global demand for palm oil has been rising consistently as population and incomes have increased. Demand has increased from less than 1 million metric tons (1960s) to around 50 million metric tons (2013) (Tey and Brindal 2018), and 62.6 million metric tons by 2015 (Tullis 2019). Thus, despite the volatility of prices in global palm oil markets, growing global demand over decades is the fundamental reason public and private investments in oil palm have been profitable. Given Malaysia's small population (almost 32 million in 2017) and small domestic market, growing global demand has been essential for Malaysia's palm oil complex to thrive. The country also has a yield and cost advantage. Relative to the yields of other vegetable oils per hectare per year, palm oil yields are much greater. Oil palm also has a major cost advantage over other vegetable oils (for instance, sunflower, rapeseed, or soybean): it uses a quarter less land than other sources for a given unit of oil. The cost per unit of palm oil is followed by soy (20 percent higher); the highest ratio is rapeseed oil.⁶⁷ The favorable relative yield and cost features of palm oil have contributed to palm oil market expansion over the years.⁶⁸

Continued integration of primary into manufacturing and marketing: Viewed from the development of the palm oil complex, it is clear that it played a determining role in propelling Malaysian agricultural transformation to the third stage. The major expansion in milling capacity and the proliferation of further downstream processing of palm oil end products is precisely the process of the supply chain integrating primary agriculture with industry, both food and nonfood. By late 2000s, the government had established five palm oil industrial clusters.⁶⁹ In fact, the current overall environment characterized by rapid urbanization and industrialization shows that the palm oil complex is definitely operating in a Schultz-Ruttan environment.

Palm oil institutions to integrate smallholders in VCD: FELDA FELCRA, and RISDA:⁷⁰ To integrate the poor and landless Bumiputeras in oil palm production and processing, the government created FELDA (since 1961), FELCRA (1961), and RISDA (1972).⁷¹ FELDA is the biggest of the three agencies. Smallholders received land and title in return to supplying FFB through a contract.

Research, development, and innovation in oil palm: R&D on plantation crops is undertaken in both the public and the private sectors. (See the discussion on support services, such as R&D and extension for main plantation crops, in annex A.)⁷² Arshad (2007) points out that, despite the continued emphasis on R&D in Malaysia, increases in productivity have been relatively slow and that there has been an imbalance in favor of production-oriented research versus the postproduction phase or marketing problems. Olsson and Meek (2013) point out that Malaysia faces major challenges in making the R&D and the research and innovation systems more effective.⁷³ The challenges include low productivity and limited technological and institutional capabilities, both public and private. On the positive side, the government and stakeholders have made substantial progress over the last two decades in strengthening the management of the research and innovation system, including through public-private partnerships (box 2.3). Indeed, the government spends far more on research and innovation relative to the governments of Southeast Asian neighbors (except Singapore). It substantially increased gross expenditure on R&D from 0.22 percent of GDP in 1996 to 0.82 percent in

BOX 2.3

Public-private participatory partnerships

The MPOB, Malaysian Palm Oil Council, and the Malaysian Palm Oil Association work closely at the national level to tackle various issues, including farm production and marketing. The R&D initiatives of the MPOB are generally informed by both the council and the association. The R&D outputs of the MPOB are disseminated to the industry through the council and the association. These organizations also serve as catalysts to initiate research collaboration with the private sector and research institutes. In some cases, the MPOB establishes pilot commercial plants with the private sector so as to provide the latter with an incubating base. Given the sheer size of the monocrop, the MPOB also plays an indispensable role in reaching out to the relevant subsectors, especially smallholders, on prevention measures (informed by industry players) to effectively counter imminent threats (for example, pests and diseases).

Source: Tey, Yeong Sheng, and Mark Brindal. 2018. "The Development of Agro Industry and Value Chains: Lessons from the Malaysian Palm Oil Sector," unpublished working paper.

2008, with the aim of raising the ratio to 2.0 percent by 2020 (Olsson and Meek 2013). Despite these increases, the outcomes were considered far from satisfactory. The Consultative Group on Malaysia recommended that more funds should be allocated to fundamental long-term research instead of the current focus on economic development and the commercialization of research outputs.

Need for continued productivity improvement: Productivity in FFB yields and in the oil extraction rate has been stagnant for decades. The government's 2020 target for FFB yields is 35 tons per hectare; the yield has averaged 18.6 tons per hectare since the late 1970s. The oil extraction rate of 3.6 tons per hectare has not changed since the 1960s. The potential rate is 8.8 tons per hectare (Hameed and Arshad 2007). The government was aware of the need to improve productivity, which has been limited by the narrow genetic base, which also exposes the product to pests and disease. To address this issue, the MPOB undertook missions starting in the 1970s to collect germplasm from Africa and Latin America. The MPOB now has the largest germplasm collection in the world.⁷⁴ The cloned varieties have enhanced yields by as much as 80 percent (table 2.1). The major obstacle identified is implementation gaps.

TABLE 2.1. Performance of the MPOB superior planting materials

Material	FFB (t ha ⁻¹ yr ⁻¹)	O/B (%)	OY (t ha ⁻¹ yr ⁻¹)
PS 1.1	28.6	28.0	>8.0
Clone P456	33.0	29.0	8.0-10.0
Clone P325	29.0	37.5	10.4
Clone P126 (HD)	32.3	28.0	9.0
National average	18.2	20.3	3.7

Source: Zulkifli et al. 2017.

Note: The highest in each category is highlighted in yellow. The national average is based on data for five years, from 2012 to 2016. FFB = fresh fruit bunch. t ha = tons per hectare. yr = year. O/B = oil to bunch. OY = oil yield.

Additional factors contributing to this stagnant productivity include: expansion into marginal areas with unsuitable soils; low replanting rate; and disparity in extension facilities between private and public estates on one hand; and between estates and smallholders on the other. FFB yields for independent smallholders (who cultivate 17 percent of total oil palm land (2017)) are 20-40 percent lower than yields on commercial estates: 17.5 tons per hectare versus 25 tons per hectare (Tey and Brindal 2018). Thus, despite the great expansion and profitability of the palm oil complex, continued productivity improvements are essential for it to keep its competitiveness. Key considerations are:

- **Cost and quality of labor:** Malaysia is concerned that low-skilled foreign labor under short-term contract dominates in plantations, in both private estates and government land schemes.⁷⁵
- **Agricultural land for expansion:** Scarcity of land for expansion is partly due to the recent decision of the Ministry of Primary Industries to halt all oil palm expansion, given the government's decision to keep 50 percent of land under forest, under its commitment to the Paris Agreement (2015).⁷⁶
- **Monoculture:** With the enormous expansion of oil palm cultivation, the risks attendant on monoculture rise, for instance, loss of biodiversity; decreased resistance to unforeseen diseases, pests, and climate change impacts; susceptibility to weeds, insects, and increased soil erosion; greater vulnerability to major market downturns.⁷⁷

Sustainability: environmental and social issues: In addition to productivity increases, a major challenge in palm oil production is sustainability. Sustainability as certified by the Roundtable on Sustainable Palm Oil (RSPO) has come

under increasing criticism. The certification has been labeled a greenwash exercise. Pye (2018) argues that the palm oil industry is “neither sustainable nor a viable development model despite the certification of sustainability” by the RSPO (FAO 2018, 49). Corporate managers and members of the RSPO argue that sustainable palm oil makes sense because the environmental bottom line and the social bottom line do not contradict the economic bottom line; this is referred to as the triple bottom line. The criticism is, however, that RSPO certification is merely a sustainability gloss, because the RSPO has not been able to sanction members who break the RSPO Principles and Criteria, as some famous cases exemplify (see annex B). Members who break the rules still receive RSPO certification; therein the reason for the erosion in consumer trust. The concerns are fourfold: (1) loss of biodiversity through the expansion of plantations in areas considered biodiversity hotspots, such as Sundaland;⁷⁸ (2) land grabs that infringe the customary land rights of indigenous communities and ethnic minorities; (3) greenhouse gas emissions, especially methane from palm oil mill effluent: the most common method of dealing with the effluent is to discharge it into open ponds or lagoons, which is favored because it is the least costly solution (only the private sector cost); and (4) labor rights and disputes involving laborers who are housed poorly and experience poor living conditions and who point to the widespread violation of basic international labor norms (see annex B). The government is well aware of the challenges that this nexus of sustainability issues poses. The Malaysian Sustainable Palm Oil Standard became mandatory at the end 2019. The mandatory deadline involves three stages. For plantations that already have RSPO certification, the mandatory deadline is December 31, 2018, and, for those without the certification, it is June 30, 2019; for smallholders, it is December 31, 2019.⁷⁹ The challenge is to make the certification credible with sustainability-conscious consumers, an increasingly important stakeholder group.⁸⁰

The presence of abundant land has permitted the historic expansion of oil palm. The government has invested in the development of infrastructure and institutions for research (the MPOB), agricultural diversification (FELDA), and the promotion of positive socioeconomic outcomes to guide the expansion. The abundance of land removed the main constraint to the inclusion of smallholders. The establishment of mills provided the rationale for locating institutions in rural areas to advance the socioeconomic goal of inclusive development. The government investment in infrastructure and institutions also facilitated the expansion of the private sector. As a result, production increased. The government used its policies to enhance value added domestically. The role of the government in expanding markets globally was also critical because the increased production may have not been used to supply traditional foreign markets alone (the United States and Western Europe), and the government was quick to identify countries with growing demand for palm oil.

“Of significant importance in this process was the strong coordination within and between agricultural subsegments due to the dominant influence of state capital, the representation of most actors via business associations and regularized interaction with state institutions, and a shared conception of institutional solutions on common industry problems” (Fold and Whitfield 2012, 37).

Rubber and cocoa: Increased value addition in processing despite reduced planting

Diversification away from rubber: Given the profitability of oil palm, rubber could not compete. Rubber trees that were due for replanting were replaced by oil palm. The decline in rubber cultivation was policy induced, which was itself a response to its price volatility and its declining global market prospects. The big plunge in world rubber prices in the late 1980s (approximately 1987-1994) confirmed these poor price prospects. The decline was also partly caused by the growing shortage of tappers from the late 1988 to 1993. Because of this labor shortage, low-intensity tapping system was being introduced by RISDA.⁸¹ After the 1970s, smallholders dominated, as the majority of private estates left, to a large extent were replanted with the more lucrative oil palm. From the peak production of around 1.6 million tons in the late 1970s, production declined. By 2005, smallholders contributed nearly 95 percent of total production, or around 1.2 million tons.⁸² In 2016, smallholders produced 620,000 tons out of a total of 673,500 tons, while the number of estates had shrunk from a peak of 2,249 (1967) to 173 (2016).⁸³



Diversification of end products of rubber: However, despite the major decline in cultivated acreage of rubber, value addition through processing increased. Given the favorable incentive and institutional environment of the government's industrialization policy and building on its 120-plus years of experience in rubber planting and processing, Malaysia produced new rubber products, for example, tires, latex products such as high quality medical devices and gloves, and rubber footwear. Malaysia has become a major exporter of catheters, latex thread, and rubber gloves in the 21st century (Yusof and Bhattasali 2008). By 1990–2000, latex products were being widely manufactured: footwear, latex gloves, tires, and so on (Tey and Brindal 2018).

Structural changes in cocoa in response to the adverse market and agronomic developments: Similar to the situation in rubber, cocoa planting has declined. It has been declining since 1990 under persistently low world prices and large-scale cocoa pod borer infestations. The latter problem was largely self-inflicted as "government and industry players failed to invest in fundamental research, which resulted in pests and diseases decimating the industry" (FAO, February 2019, 5).⁸⁴ As in the case of rubber, the relative importance of estates relative to smallholders was reversed, reflecting the fact that cocoa was not as profitable for estates as oil palm. World prices have been declining since the early 1980s, averaging US\$1,000–US\$2,000 per metric ton against US\$4,000 per metric ton in 1977 (Latif 2007). It is estimated that income from oil palm was RM 4,794 per hectare (MPOB 2014), twice the level that cocoa farming could generate (Arshad and Ibragimov 2015).⁸⁵ Over the decades, the relative importance of estate plantations to smallholdings changed. Estates dominated in 1980 at a ratio of 63 : 47, but smallholdings were dominating in 2005, at a ratio of 28 : 72 (Latif 2007, 434). Since the early 1980s, the relative importance of the locations of cocoa bean production have been (1) Sabah and, to a lesser extent, Sarawak and (2) Peninsular Malaysia. This was a reversal of the pre-1980s situation, when plantings in Peninsular Malaysia dominated.

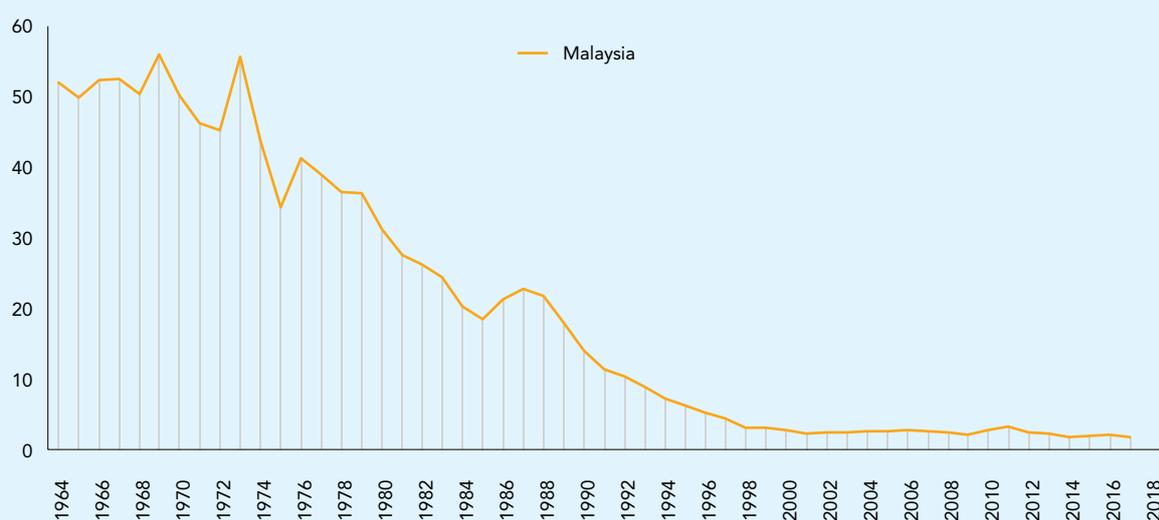
Value addition in cocoa grinding:⁸⁶ Following these structural changes spanning several decades, Malaysia is no longer a major cocoa bean producer but has become a major cocoa butter producer. Through processing, it has added value to its decreased bean production. Malaysia's cocoa grinding industry, which started in 1973, expanded rapidly in the 1980s. Today, it is the largest cocoa grinder in Asia, and the fifth largest in the world.⁸⁷ As Malaysia's own cocoa production has declined and cannot satisfy its grinding capacity, Malaysia imports cocoa beans mainly from Ghana, the Ivory Coast and many other countries. While cocoa production and total value cannot compare with palm oil or even rubber, the unit value of production at RM 6,024 per ton (2010) is the highest, well above that for palm oil, at RM 1,764 per ton, and for rubber, at RM 391 per ton (Arshad et al. 2014).

Cocoa R&D and extension of continuing critical importance: In operation since 1989, the Malaysian Cocoa Board under the Ministry of Primary Industries is responsible for R&D and extension in cocoa, the promotion of the quality of cocoa, and cocoa processing and marketing. Given the ambitious target of the National Commodity Policy (2011–20) for an increase in the bean production target, from 10,000 tons in 2010 to 60,000 tons in 2020, and in yields, from 1.2 tons per hectare to 1.5 tons per hectare in the same period, the role of the board in R&D and extension is critical (Arshad and Ibragimov 2015).

Achievements in the tree crop subsector

Reaching stage three of agricultural transformation in the tree crop subsector: The government's diversification strategy in the plantation subsector—VCD and poverty reduction—obviously worked because Malaysia is no longer a low-income agricultural economy vulnerable to volatile rubber and tin markets. It is now a major manufacturer and exporter of diversified agro-based processed products. It has achieved this while maintaining price and political stability and shown resilience to repeated global shocks. The government picked a winner in palm oil, an agricultural commodity with lucrative global markets and rich in profitable diversifiable end products. For the two other tree crops, rubber and cocoa, in which cultivation was reduced, the government emphasized value addition through processing and marketing. Imposing a duty on primary exports and creating the enabling environment for local value addition, the government successfully reduced the export of unprocessed agricultural products from 55.4 percent in 1973 to 1.6 percent in 2017 (figure 2.1). In addition to the duty on exports, a driving force in the diversification from rubber emanated from the fall in international rubber prices. By 1980–90, the government had created sufficient rubber processing capacity and never stopped building on the gains.

FIGURE 2.1. Agricultural raw material exports (% of merchandise exports)



Source: WDI.

Malaysia's policy of integrating Bumiputeras as outgrowers of nucleus estates also contributed to reducing their poverty. Over the decades, extreme poverty among smallholders is almost a thing of the past. The growth multiplier from its integration of agriculture in the wider economy through agroindustry has worked. Urbanizing Malaysia will soon have to address issues of urban-rural productivity and income gap typical of countries at the fourth stage of agricultural transformation.

What remain as challenges: Despite Malaysia's success with its diversification strategy, productivity growth is still wanting in particular with respect to agricultural labor productivity, and in oil palm in terms of FFB yield, oil extraction rate, and further agroprocessing. There is still substantial scope for additional value addition in terms of diversified, processed end products of palm oil as around 75 percent–80 percent of production is still unprocessed crude palm oil.⁸⁸ In addition, the commercial success and dominance of oil palm raise the risks attendant on monoculture, especially in a context of climate change. Given growing environmental and social concerns on sustainability and given that the trust in the RSPO certification has been undermined, Malaysia must, as of 2020, meet the challenge of giving credibility to its certification with the Malaysian Sustainable Palm Oil Standard, namely, that the certification indicates the palm oil is indeed sustainable.

Notes

61. The authority was created in 1967 following a recommendation of a World Bank mission in 1963. Its original mandate was to promote and coordinate industrial development in Malaysia.
62. Tey, Yeong Sheng, and Mark Brindal. 2018. "The Development of Agro Industry and Value Chains: Lessons from the Malaysian Palm Oil Sector," unpublished working paper. The World Bank recommended oil palm as the best diversification alternative. The authors also point out that the palm oil yield doubled from 1.8 to 3.5 tons per hectare in 1960–2015, which compares favorably with Indonesia, at 3.6 tons per hectare.
63. Yusof, Zainal Aznam, and Deepak Bhattasali. 2008. "Economic Growth and Development in Malaysia: Policy Making and Leadership." Commission on Growth and Development Working Paper 27, World Bank, Washington, DC.
64. The quotation is from page 2, World Bank. 1967. *Malaysia: Review of the Economic Situation: Agriculture in West Malaysia*, vol. II.
65. More than a half million people are estimated to have benefited from FELDA schemes (FAO, February 2019).
66. In fact, the range of uses of oleochemicals is astounding. See link, accessed March 17, 2019, http://www.europarl.europa.eu/hearings/20060601/itre/decooman_en.pdf.
67. Thoenes, P. October 2006. "Biofuels and Commodity Markets: Palm Oil Focus." FAO, Commodities and Trade Division. http://s3.amazonaws.com/zanran_storage/www.rlc.fao.org/ContentPages/15778750.pdf.
68. It is clear that these costs exclude major dis-externalities inflicted on the environment. Nongovernmental organizations agitating in favor of human and labor rights point out that the profitability is on the backs of labor, without any protections.
69. These are in Sabah (Lahad Datu and Sandakan); Sarawak; Johor, and East Coast Economic Region.
70. Smallholders in oil palm are those with landholdings less than 50 hectares. By 2017, the average small landholding was 4 hectares (Tey and Brindal 2018). Independent smallholdings average 1-2 hectares (FAO, February 2019).
71. FELDA was created in 1956 prior to independence. Its task then was to manage and funnel financial aid to state governments to create land development schemes in the respective states along with coordinating land development in these states, where movement of population within these states was involved.
72. Malaysia has always emphasized research. Unfortunately, the measure of agricultural research intensity—the ratio of agricultural research expenditure to agricultural GDP—declined from a peak of 1.92 percent (2000) to 0.99 percent (2010) (Nipon Poapongsakorn. January 30, 2019. Comparative Review of Malaysia and Thailand in Agricultural Transformation.)
73. Olsson, Asa and Lynn Meek, eds. 2013 Effectiveness of Research and Innovation Management at Policy, and Institutional Levels: Cambodia, Malaysia, Thailand, and Vietnam. OECD. This paper was part of a project presented at the "International Workshop on the Effectiveness of Research and Innovation Management at Policy, and Institutional Levels" held in Kuala Lumpur, February 27–March 1, 2013. The Consultative Group on Malaysia consisted of policy makers at the Ministry of Economic Affairs, the Ministry of Higher Education, and Universities.
74. Zulkifli, Y., A. Norziha, M. H. Naquiddin, A. M. Fadila, A. B. Nor Azwani, M. Suzana, K. R. Samsul, M. Ong-Abdullah, R. Singh, G. K. A. Parveez, and A. Kushairi. 2017. "Designing the Oil Palm of the Future." *Journal of Oil Palm Research* 29 (4): 440–55.
75. Most foreign labor is Indonesian and speak bahasa Indonesia, with similarities and differences with bahasa Malaysia. <https://www.daytranslations.com/blog/2018/02/interesting-facts-about-bahasa-indonesia-and-bahasa-melayu-10869/>.
76. In 2018, 55 percent of Malaysia's land was under forest reserves, a total of 18.28 million hectares (Tey and Brindal 2018).
77. Biodiversity. (Accessed March 31, 2019), <http://sustainbiodiversity.weebly.com/dangers-of-monoculture.html>.
78. Sundaland consists of more than 17,000 islands belonging to Malaysia and Indonesia; the two largest islands are Borneo and Sumatra, <https://enviroliteracy.org/ecosystems/hotspots-of-biodiversity/sundaland/>.
79. <https://certifications.controlunion.com/en/certification-programs/certification-programs/mspo-malaysia-sustainable-palm-oil>.
80. The FELDA Case Study. December 2015. LMC International. Consulting Study 12, 6: "There has been mounting pressure by NGOs [nongovernmental organizations] on sustainability and by the health fraternity against the use of palm oil. This pressure is increasingly evident in the European Union."
81. World Bank. 1995. *Malaysia: Rubber Industry Smallholders Development Authority (RISDA) Project: Project Completion Report*. Report 14637 (June).
82. Latif, Ismail Abdul (2007), "Rubber Industry in Malaysia," in *50 Years of Malaysian Agriculture: Transformational Issues, Challenges, and Direction*, edited by Fatimah Mohamed Arshad, Nik Mustapha Raja Abdullah, Bisant Kaur, and Amin Mahir Abdullah, 795–815, Serdang, Malaysia: Universiti Putra Malaysia Press.
83. Getah (Rubber) data of 1965–2016.
84. The cocoa tree is susceptible to pests and diseases right from the time it is planted. The cocoa pod borer was first reported in Sabah in late 1980.
85. Arshad, Fatimah Mohamed and Abdulla Ibragimov. September 2015. "Malaysia's Cocoa Bean Decline: A Prognosis." *International Journal of Agriculture, Forestry and Plantation* 1. According to the International Cocoa Organization (2015), global demand for cocoa is expected to exceed supply in the years to come. https://www.researchgate.net/publication/283205355_MALAYSIA'S_COCOA_BEANS_DECLINE_A_PROGNOSIS
86. Grinding is the process by which cocoa nibs are ground into "cocoa liquor", which is also known as unsweetened chocolate or cocoa mass. Cocoa beans are roasted and separated from their hulls to produce cocoa nibs. About 54–58% of the cocoa nibs is cocoa butter. The cocoa nibs are ground to form cocoa mass, which is liquid at temperatures above the melting point of cocoa butter and is known as cocoa liquor or chocolate liquor. Chocolate liquor is pressed to separate the cocoa butter from the nonfat cocoa solids.
87. *Business Wire*, May 3, 2017. "Malaysia Cocoa Industry Report 2017: Research and Markets." <https://www.businesswire.com/news/home/20170503005811/en/Malaysia-Cocoa-Industry-Report-2017---Research>. Also in Arshad Fatimah Mohamed, Kusairi Mohd Noh, Syahaneem Mohamad Zainlabidin. eds. 2014. *Agricultural Policy and Institutional Policy Reforms in Malaysia: Experiences, Impacts, and Lessons*. Southeast Asian Regional Center for Graduate Study and Research in Agriculture.
88. FAO. Rome. Carraro, A., D. Parisi, G. Federighi, D. Campus, M. Paganini, and P. Karfakis (2018), The Small Family Farms in Transition team. Malaysia: Agriculture and Food Report.



SECTION III

Value Chain Development in the Rice and Nonrice Agrifood Subsectors

Malaysia's concept of food security

Solving the food problem, a cornerstone of sustained growth: Schultz (1953) argued that, unless subsistence needs are met, societies cannot begin the long process to achieve modern economic growth. Unless agriculture generates a surplus to solve the food problem, societies are constrained by the high food drain in which a dominant share of the prevailing low income is required just for food consumption.⁸⁹ Solving the food problem holds the key to sustained growth. Schultz's hypothesis has been proven correct time and time again and reemphasized by a substantial development literature.

Food security, poverty reduction, and stability through RSS: Growth requires price and political stability, and stability requires food security. What emerges from the various government policies and initiatives is that reaching high levels of RSS is seen to advance three goals simultaneously:

- **Food security:** High levels of RSS is viewed as synonymous to food security as rice occupies a central place in the diets of low-income households, a vast majority in the early decades;
- **Poverty reduction:** More equity through the poverty reduction of paddy growers, some of the poorest Bumiputera households, a priority stakeholder group; and
- **Maintaining stability and social peace:** Severe food insecurity is a fertile ground for social upheaval, as history has repeatedly shown, for instance, the French Revolution (1789–99), the Irish Potato Famine (1845–49), and the Rice Riots in Japan (1918).

Poverty rates were high in the early decades of the newly independent Malaysia: 49.3 percent in the Peninsula in 1970, 58.3 percent in Sabah in 1976, and 56.5 percent in Sarawak in 1976.⁹⁰ Among the Bumiputeras, 65.9 percent were poor, compared with 27.5 percent of Chinese and 40.2 percent of Indians. The rural poverty rate was 58.7 percent, and the urban poverty rate was 21.3 percent (1970). Income inequality was wide and increasing. The Gini coefficient of income in 1957–76 (primarily during the *laissez faire* period) rose from 0.412 to 0.529, and the income share of the top 20 percent of households in the distribution rose from 48.6 percent to 57.7 percent (Zin 2011). Wide income inequality can be socially destabilizing. Moreover, the close correspondence between income status and ethnicity means that income inequality is also a political problem in Malaysia. This close correspondence was inherited from British Malaya, when Chinese immigrants and Indian laborers were brought in to work in the tin mines and cultivate rubber. The immigrants settled in the more progressive states, where they thrived because of the better economic opportunities, while the indigenous population remained in the less well developed areas. The British took measures to prevent the entry of non-Malays into rice cultivation. Paddy growing was reserved for Bumiputeras to preserve the Malay character.⁹¹

From RSS to the National Food Security Policy: As in much of Asia, the government of Malaysia has accorded special treatment to rice, which is considered essential to life and the maintenance of social peace. After decades of pursuing the goal of full RSS, the National Food Security Policy espoused a broader concept of food security in response to the global food, fuel, and financial crisis of 2007–08. In earlier decades (until the Fourth Malaysia Plan, 1981–85), the goal had been to achieve an RSS of 90 percent–100 percent. Subsequently, the targets were lowered, varying between 65 percent and 85 percent before settling at around 70 percent in the National Agro-Food Policy, the fourth iteration of the National Agricultural Policy (Sidique and Shaharudin 2019). How the government establishes the self-sufficiency target is unclear. The food security objectives of the National Food Security Policy in response to the food crisis were broader, but the goals still assigned top priority to domestic production and substantial self-sufficiency, as follows:

- Increase production and productivity to achieve significant self-sufficiency in agri-food, not only rice
- Ensure that food producers earn commensurate income so that food production does not decline
- Ensure an adequate and safe supply of high-quality food

Underlying these concerns about self-sufficiency is the government fear that running a food trade deficit represents a serious threat to national security because such deficits make the nation vulnerable to sharp price fluctuations on the rice market, and social unrest and spikes in world rice prices may become linked.⁹²

Paddy rice policy: Extensive subsidization of an entire value chain

Substantial and sustained subsidization throughout entire paddy-rice value chain: Given the historical context of paddy cultivation in British Malaya; the great depression of the 1930s; the rice shortage during the Japanese occupation (1942–45) and during the immediate years after World War II, the political importance accorded to full RSS in Malaysia is understandable and justifiable. However, achieving this has proved so far to be costly and difficult to achieve as Malaysia has always been a relatively small rice producer relative to its Southeast Asian neighbors. To achieve full RSS, and because paddy growers were primarily poor Bumiputeras, a key political constituency, the government intervened extensively throughout the entire paddy-rice value chain.⁹³ The list of subsidies and other supports to paddy and rice shows how extensive the government's support has been (Sidique and Shaharudin 2019) (see annex C). This list does not include other subsidies through credit and mechanization services.

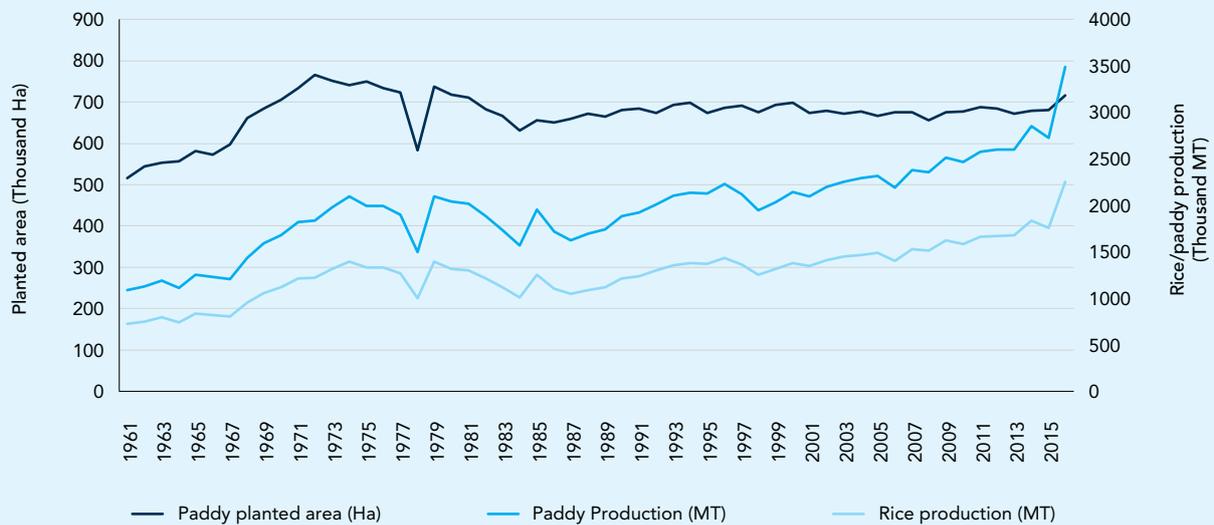
Protection of rice through pricing and marketing: In addition to the production subsidies, prices are fixed at every point in the value chain, from production through milling, marketing, and sales. Unlike the tree crop subsector, the entire rice chain has been highly protected since the 1960s.⁹⁴ The distortions introduced are substantial as measured by the estimates of the nominal rate of assistance for paddy and rice. The rate rose from around 8 percent in the earlier decades to an average of 158 percent in 1985–89. It was halved subsequently, but remained substantial, at around 70 percent in 2000–04 (Athukorala and Loke 2007).⁹⁵ Until June 2018, importing rice was a monopoly of BERNAS. The MOA administers rice policy and retains regulatory authority over production and imports.⁹⁶

Subsidies, taxation, and rice price stability: While paddy growers are heavily subsidized through the guaranteed minimum price and other means, consumers are taxed, though they are protected from price spikes and shocks. The retail price of local rice is controlled the government. During the 2007–08 food crisis, the government succeeded in protecting consumers from the price shock by setting prices lower than the high international prices, though, from the 1980s to 2008, the domestic retail price of rice was consistently above the international price. It is clear that the two major goals of the government's approach to food security—shock prevention and price stability—are highly valued by consumers even though they pay dearly through higher international prices and as taxpayers.⁹⁷ Rapid increases in food prices are considered to have a significant adverse effect on Malaysian consumers as food still carries a large weight of 30 percent in the consumer price index (Sidique and Shaharudin 2019).⁹⁸ The bottom 40 percent of the income distribution spent around 25 percent of total household expenditure on food, compared with the top 20 percent, which spent only around 12 percent; on rice alone, the respective shares were 1.7 percent versus 0.6 percent (Sidique and Shaharudin 2019).

Impact of paddy rice policy on the stated goals

The production and consumption of rice: Rice production increased, but productivity growth has been slow (figure 3.1; also see annex C). Rice production expanded from 726,000 tons in 1961 to 2.9 million tons in 2016 (FAO, April 2019), enabling around 70 percent of the RSS level to be reached (2016). Despite the special treatment benefiting paddy growers, domestic rice production increased by only 0.8 percent per year (1980–2015), while consumption increased by 1.8 percent per year (Sidique and Shaharudin 2019).

Poverty reduction among paddy growers: With the massive subsidies, what has been the poverty reduction impact on the target group? In the early years after independence, rural poverty, predominantly Bumiputera, was widespread. Extreme poverty was prevalent among paddy growers (88 percent) and fishermen (73 percent) (Sidique and Shaharudin 2019). By 2000 however, rural poverty level had been reduced to 10 percent and urban poverty by 1.9 percent.⁹⁹ In 2014, extreme rural poverty fell to less than one percent; poverty level among rural Bumiputeras to 1.8 percent. Although there is no poverty reduction data solely for paddy growers, the battle to eradicate extreme poverty in some granary areas is considered largely won (World Bank and Ministry of Economic Affairs 2019). Although, paddy farmers as a

FIGURE 3.1. Rice production and paddy planted area, 1961–2016

Source: Sidique and Shaharudin 2019.

group remain in the bottom 40 percent of the income distribution, they are relatively poor, but not overwhelmingly among the extreme poor (Omar, Shaharudin, and Tumin 2019). However, despite these substantial subsidies, many farmers abandon the land planted to rice, especially in Sabah and Sarawak. In Sarawak, 40 percent of the cultivable land in state systems is abandoned, and only 12 percent is planted to paddy (World Bank and Ministry of Economic Affairs, February 2019).

The high financial and opportunity cost of paddy rice policy

The high financial cost of the RSS approach to food security. The financial cost of the approach is high by any standard. In terms of subsidies to paddy growers, and expenditures on granary areas, the cost has been extremely high. In 2017, 45 percent of the total budget of the Ministry of Agriculture and Agro-based Industry went to support rice production. In 2011, the share was even higher: 57 percent. If one adds to these what consumers pay through trade policy (which raises domestic prices) and what taxpayers pay through subsidies and compares that total with the total production value of rice, the cost is also high. Such a measure of transfer from consumers and taxpayers is known as the producer single commodity transfer. In 2017, the single commodity transfer for rice in Malaysia was 73 percent, which is higher than in other developing and emerging economies and higher even than in Japan, which is considered to possess the most protectionist rice regime in the world. In 2011–13, the single commodity transfer actually exceeded the value of paddy production. If one adds to this total the expenditures on granaries, then the single commodity transfer in 2017 rises to 86 percent (World Bank and Ministry of Economic Affairs, February 2019).¹⁰⁰

The high opportunity cost of the RSS approach to food security: Even with such extensive subsidies and transfers, there is no evidence that the competitiveness of Malaysia's rice production has improved. Indeed, since 1979, when high subsidies began, Malaysian yield growth in paddy has not kept up with comparator countries. A simulation study by the International Rice Research Institute showed precisely that: it modeled the effects of allowing farmers in one of the most successful rice-growing areas to grow other crops and finds that this change could raise their incomes by about 50

percent (World Bank and Ministry of Economic Affairs, February 2019). Research and reality show that the RSS approach to food security needs to be rethought as the interests of smallholders, small and medium enterprises (SMEs) in agri-food, and millions of consumer households need to be more effectively served in increasingly globalized food markets.

The high cost of the RSS approach to food security demands a fundamental rethinking: The high cost raises a serious doubt that these substantial subsidies may not be an effective tool of poverty reduction or productivity increases among paddy producers. Moreover, the significant protection in favor of the rice sector represents a regressive tax on the poor. In effect, it imposes a 5 percent tax on the average poor household. This is because, in the absence of the protection, the rice price would have been 19 percent lower (Zin 2011).¹⁰¹ In addition to the high cost, the government's approach to food security is unidimensional, while food security is multidimensional. Improvements in rice productivity have contributed directly to poverty reduction, but the achievement has also been supported through the subsidies. One study estimates that the contribution of subsidies to the incomes of paddy rice farmers is 10.3 percent.¹⁰² The subsidies are focused primarily on production, not on consumption, and mainly on rice. This disregards the ongoing dietary diversification among consumers. Omar, Shaharudin, and Tumin (2019) argue that the government should reorient its approach in view of the multifunctionality of the food security concept. The bottom line is that the high financial and opportunity cost of the subsidies and the oversimplistic concept of food security warrant a fundamental rethinking of the entire RSS approach.

Selected features of the non-rice agri-food subsector

Small units dominate the non-rice agri-food subsector: Turning to the non-rice agri-food subsector, we find that small units dominate with SMEs being the major players. Small farm sizes vary between 1- 4 ha; even smaller for fruit cultivation, at around one hectare. (FAO 2019: 30, 45)¹⁰³ The SME sector is composed of (approx. in percent): vegetables and fruits (20); livestock -ruminant and nonruminant (17); fish and related products (14); palm oil products (10); agrobiological (10); and other food-based products (27).¹⁰⁴ Vegetables mainly grown in peri-urban areas, are dominated by smallholders, except for a few larger producers in the Cameron Highlands, and Johor close to the Singapore market. Pig and poultry (includes eggs) industries have graduated from backyard subsistence enterprises to commercial and internationally competitive production systems in a relatively short time. Broiler farms have increased in scale from small (less than 10,000 birds) to large (100,000 birds) which constituted 61 percent of all farms and contributed to more than 70 percent of broiler production.¹⁰⁵ The feed conversion ratio of 1.67 of these integrated operations make them internationally competitive.¹⁰⁶ The annual mortality rate of 4.32 percent was also low. The domestic poultry market has been protected from an influx of imported chickens, due to restrictions such as strict Halal standards, import permit regulations, and the requirement of a single channel of import entry through the National Farmers Organization. The main source of financing working capital is commercial banks –around 70 percent; the balance from nonmainstream financing sources.¹⁰⁷

Distribution channels for agri-food (excluding rice and plantation crops): Traditional wet and dry markets still operate widely in the agri-food subsector which is dominated by smallholders, SMEs, and small retailers. These traditional channels operate in parallel to the integrated supply and value chain that typifies Malaysia's industrial commodity exports and the expanding urban consumer markets, supermarket revolution. In these traditional channels, there are a large number of collectors, primary and secondary wholesalers, and retailers between producers and consumers.¹⁰⁸ To the extent they are oligopolistic, these markets leave small producers and sellers vulnerable to the collusive behavior of intermediaries. Other recurrent problems include: rudimentary infrastructure and logistics facilities; sharp price fluctuations; lack of information by producers of consumer preferences in terms of volume, variety, grade and standards; delayed payments to producers.

Relative policy neglect of smallholders and SMEs in the non-rice agri-food subsector: For a government preoccupied with rising food trade deficits and volatile global prices that threaten food security, the structural weaknesses of the non-rice agri-food subsector have been a major concern, as evidenced by the Food Balance Trade Plan of 2002 to achieve a food surplus by 2010. The weaknesses of the subsector that have contributed to the nonachievement of this



plan are, however, largely a result of policy neglect as Arshad (2007) argues: the government's dualistic approach to agricultural diversification has prioritized the export crops (the plantation crops of oil palm, rubber and cocoa) at the expense of the food crops, except for paddy on which it has lavished support.¹⁰⁹ This lavish approach has not led to high productivity and a competitive rice sector. Key structural weaknesses of the non-rice agri-food subsector include the following:

- Uneconomic sizes of farms which constrain mechanization
- Tenancy problems in most fruit and vegetable farms
- Limited access to R&D and to infrastructure
- Inadequate institutional support from cooperatives due to lack of entrepreneurship. This latter inadequacy exacerbates their weak bargaining power vis-s-vis other large-scale market participants, such as millers and traders

Taken together, these weaknesses mean that these small units are not solidly integrated in lucrative food value chains. The success of the tree crop based agroindustry sector did not trickle down to the food sector.¹¹⁰ Thus, the government prioritized resources on tree crops at the expense of non-rice food crops. In addition, Malaysia's legal and regulatory framework affecting agri-food business has been found to be weak relative to the corresponding frameworks in six other Asian countries.¹¹¹

Fundamental structural changes impacting food markets in higher-income Malaysia

Emerging challenges to agri-food subsector in a rapidly changing market environment: Fundamental structural changes are reshaping food markets not only in rice. These major forces are domestic and global, and both are largely beyond the control of the government. Key forces are as follows:

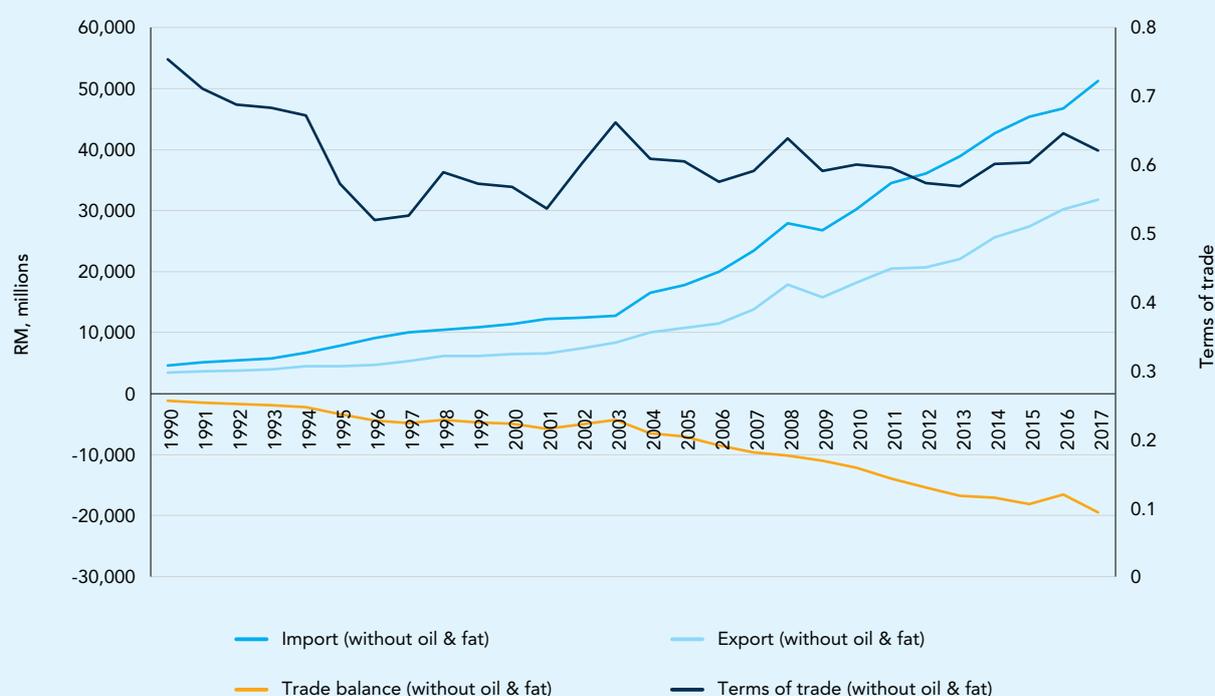
- **Demand:** The ongoing dietary transformation process means that rice alone no longer dominates consumption. The calorie supply in rice consumption (kilocalories per capita per day) declined from 1,260 (1963) to 290 (2013), while that from poultry rose from 18 (1963) to 162 (2013) (Sidique and Shaharudin 2019).
- **Nutrition and health:** With sustained income growth, dietary change, and more sedentary urban lifestyles, the consumption of sugars and animal fats has greatly increased. For example, the total caloric supply from meat rose by 611 percent in 1963–2013, much higher than the caloric supply from vegetables, which was only 273 percent. The decline in malnutrition because of poverty reduction is being followed by a rapid increase in obesity and in noncommunicable diseases such as coronary heart disease, hypertension, and diabetes, a phenomenon known

as the double burden of disease.¹¹² According to the 2017 National Health and Morbidity Survey, 73 percent of Malaysians die from noncommunicable diseases, and half these deaths are caused by cardiovascular diseases (Sidique and Shaharudin 2019).

- **Population, urbanization, and income growth:** The population of the low-income, primarily agrarian economy numbered around 8 million at independence (1957), among which the share living in rural areas was about 73.4 percent in 1960.¹¹³ By 2016/17, the population had increased to around 32 million, about 75 percent of which was urban. Thus, the balance of rural versus urban was almost totally reversed. Malaysia has now achieved upper-middle-income status, at a gross national income (GNI) per capita (2017) of US\$9,750 (Atlas method).¹¹⁴
- **The spread of supermarkets and global food value chains:** As elsewhere in Asia, there has been a spread of supermarkets, and fast food chains to cater to the changing demand structure. In Malaysia, the share of supermarket sales in modern trade is 66 percent (2019) (Poapongsakorn, Jan 2019: 36) These new markets present both an opportunity and a threat to smallholders: an opportunity because these urban consumers have higher purchasing power; but a threat because they are more demanding in terms of food safety and what they consider quality.

The contrast in the policy approach to agri-food as import substitutes versus tree crops as exports: the critical importance of food price stability: The current import-substituting approach to food security does not address structural forces because it emphasizes the increase in self-sufficiency in mass consumption food items to reduce Malaysia’s vulnerability to volatile imports. Over the decades, self-sufficiency has increased in many food items, but with fluctuations (for instance, rice, poultry meat, and vegetables). However, the food trade deficit (1990–2017) has widened if one excludes oils and fats; it has been in surplus if one includes oils and fats (figures 3.2 and 3.3). Moreover, the terms of trade have been fairly stable, and the government has always been able to pay for food imports (Sidique and Shaharudin 2019). So, the real problem is not food trade deficit per se (because that disappears when the definition is changed), but price volatility for food items of mass consumption and the vulnerability such volatility implies. The government also reserves the right to control the prices of any goods it deems necessary under the Price Control and Anti-Profiteering Act (2011), formerly the Price Control Act (1946) which was revised in 2017 to Price Control and Anti-

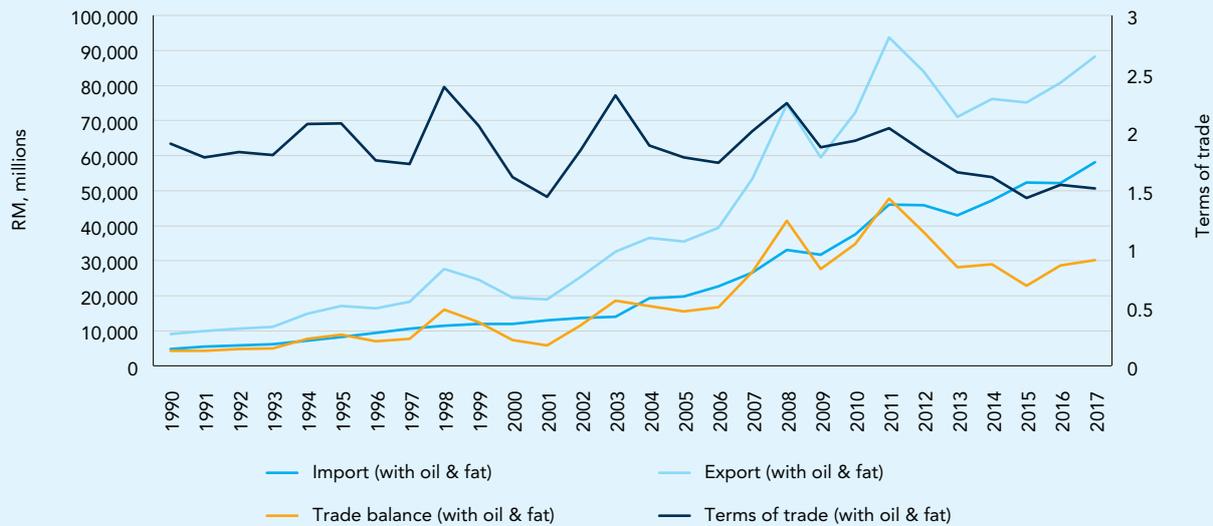
FIGURE 3.2. Value of food trade, excluding oil and fat, 1990–2017 (RM, millions)



Source: Ministry of Economic Affairs.

Profiteering Amendment Act. Priority accorded to price stability largely explains the continued emphasis on protecting key import substitutes, mainly rice and other basic food items. The dire warnings of climate change for Southeast Asia which is considered a particularly vulnerable region (Montlake 2009) add urgency to the need to reconsider the entire approach to promoting the agri-food subsector in general; and domestic rice production and food security in particular.¹¹⁵

FIGURE 3.3. Value of food trade, including oil and fat, 1990–2017



Source: Ministry of Economic Affairs.

Key emerging challenge: a food security policy for an urbanized, higher-income Malaysia: The government's food security approach has to be reoriented from protecting rice as the main consumption staple of a poor country to adopting an export-oriented approach (which has worked so well in tree crops) to make its agri-food subsector internationally competitive in an increasingly globalized and competitive world economy. At issue is its reconsideration on how best to achieve food price stability: 100 percent domestic production through protection or through skillful balance of trade and efficient domestic production.

Malaysia in the Schultg-Ruttan environment of stage three: The government's consistent pursuit of growth with equity has been the most important factor in the promotion of food security because incomes have increased, and extreme poverty has been nearly eradicated. The share of food in the consumer budget has certainly declined, and diets are diversifying (see annex C, table C.2). Though the RSS has fluctuated over the decades, the level is currently around 70 percent. But this achievement is not sufficient for Malaysian leadership because the government also wants and has achieved growth with stability (both price and political). Over the decades, average household income has risen higher than food price inflation (1970–2016) (Sidique and Shaharudin 2019). While costly, the control of food prices worked: the government was able to keep rice prices stable during the 2007–08 global food crisis. The main challenge with respect to supply remains to cost-effectively improve yields for paddy as well for many SMEs in the agri-food subsector. The government is fully cognizant of this challenge in its midterm review of the Eleventh Malaysia Plan (see annex C). To the extent the new initiatives are fully implemented, the government is writing the Malaysian success story for the next stage.

Notes

89. Gollin, Douglass, Stephen L Parente, and Richard Rogerson. Feb 2004 "Structural Transformation and Economic Development". The substantial literature includes Johnston and Mellor (1961) and Timmer (multiple publications), <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.613.9168&rep=rep1&type=pdf>.
90. "Malaysia: 30 Years of Poverty Reduction, Growth and Racial Harmony," paper presented by the Economic Planning Unit. A case study, Reducing Poverty, Sustaining Growth: What Works, What Does Not, and Why. A Global Exchange for Scaling Up Success. Scaling Up Poverty Reduction: A Global Learning Process and Conference Shanghai, May 25–27, 2004.
91. Zin, Ragayah Haji Mat. 2014. "Malaysian Development Experience: Lessons for Developing Countries." *Institutions and Economies* 6 (1): 17–56.
92. Omar, Sarena Che, Ashraf Shaharudin, and Siti Aiyshah Tumin (2019), *The Status of the Paddy and Rice Industry in Malaysia*, April, Kuala Lumpur: Khazanah Research Institute.
93. Malaysia has a long tradition with government building irrigation infrastructure. The first major scheme was in 1880. The World Bank helped finance several irrigation projects from around 1965 to early 1980s. The current irrigation infrastructure is therefore decades old, requiring rehabilitation. For more information, World Bank. June 1991. *Malaysia, Project Performance Audit Report on Four Loans (loan 1522, 1632, 1717, 1957-MA)*. Report 9714, <http://documents.worldbank.org/curated/en/288481468915093274/pdf/multi-page.pdf>.
94. The tree crop commodities were taxed. Palm oil, cocoa, and rubber were taxed to generate government revenue. Export taxes were a major source of funds for government investment (Athukoralal and Loke 2007).
95. The nominal rate of assistance is defined as the percentage by which government policies raise (or lower if the rate is less than 0) the gross returns to producers above (or below) the gross returns they would have received without the government intervention. The returns are considered gross because the cost of inputs has not been subtracted.
96. Though privatized, and still retaining regulatory functions, BERNAS was delisted from the Malaysian bourse in mid-2004. This makes its operations and financial activities not accessible to public scrutiny. As of 2018, the government was considering removing the monopoly status of BERNAS.
97. For shock prevention, the rice stockpile was increased from 92,000 metric ton to 552,000 metric ton for an estimated 90 days of consumption. These measures helped the government prevent any panic during the 2007–08 food crisis.
98. Subsidized items considered basic food were: rice, sugar, cooking oil, gas and wheat flour until 2010 when the Najib administration (2009-18) removed sugar, cooking oil and gas; and instituted another program called 1Malaysia's People's Assistance Scheme (BRIM) in 2012 to assist low-income households.
99. Abhayaratne, Anoma. 2004. Economic growth and Poverty Reduction: Lessons from Malaysia.
100. By comparison, the single commodity transfer in 2015–17 ranged from 5 percent in Vietnam to 70 percent in Japan, while the average in OECD countries was 30 percent (World Bank and Ministry of Economic Affairs, February 2019).
101. World Bank. Nov 28, 1988. *Malaysia: Review of Rice Industry. Sector Report*. Report 9395-MA. Thirty years ago, this report already estimated the high cost to the consumer of government rice policy, and the structural weaknesses in the entire approach. It was clear then that this costly approach could not succeed (World Bank 1988), <http://documents.worldbank.org/curated/en/236261468049813397/pdf/multi-page.pdf>.
102. Ibrahim, Ahmad Zubir, Chamhuri Siwar, and Basri Abdul. 2013. "Determining Sources of Income among Paddy Farmers in Muda Irrigation Area, Malaysia." *Journal of Humanities and Social Science* 17 (4): 100–05.
103. In the 1970s, a little over one million families were working in smallholder agriculture, cultivating about 4.4 million acres (1.78 million hectares). (World Bank. 1971. *Malaysia: Agriculture Sector Survey* (3 vols.). vol. 1, *General Report*. Report PA–86 a. <http://documents.worldbank.org/curated/en/378091468300313625/pdf/multi0page.pdf>.
104. Bhuiyan AB et al. (2016). The innovation drivers, strategies and performance of food processing SMEs in Malaysia. *Malaysian Journal of Society* 12: 2 (cited in FAO, February 2019).
105. Kaur, Bisant, and Fatimah Mohamed Arshad (2007), "Marketing of Poultry in Malaysia: Structural Issues and Challenges," in *50 Years of Malaysian Agriculture: Transformational Issues, Challenges, and Direction*, edited by Fatimah Mohamed Arshad, Nik Mustapha Raja Abdullah, Bisant Kaur, and Amin Mahir Abdullah, 795–815, Serdang, Malaysia: Universiti Putra Malaysia Press.
106. The feed conversion ratio indicates the broiler's efficiency in converting animal feed into desirable increases in bird weight.
107. "A Snapshot of Malaysia's Food Processing Industry," FAO (February 2019, 16).
108. Rahim, Haron, A. (2007), "Marketing of Food Products," in *50 Years of Malaysian Agriculture: Transformational Issues, Challenges, and Direction*, edited by Fatimah Mohamed Arshad, Nik Mustapha Raja Abdullah, Bisant Kaur, and Amin Mahir Abdullah, 795–815, Serdang, Malaysia: Universiti Putra Malaysia Press.
109. Arshad, Fatimah Mohamed (2007), "Malaysian Agricultural: The Future," in *50 Years of Malaysian Agriculture: Transformational Issues, Challenges, and Direction*, edited by Fatimah Mohamed Arshad, Nik Mustapha Raja Abdullah, Bisant Kaur, and Amin Mahir Abdullah, 795–815, Serdang, Malaysia: Universiti Putra Malaysia Press.
110. Arshad, Fatimah Mohamed, Kusairi Modh Noh, and Syahaneem Mohamed Zainalabidin (2014), *Agricultural Policy and Institutional Reforms in Malaysia: Experiences, Impacts and Lessons*, 2nd ed. Southeast Asian Agriculture and Development Primer Series, Laguna, the Philippines: Southeast Asian Regional Center for Graduate Study and Research in Agriculture.
111. Enabling Business of Agriculture (2017), "EBA Brief, Malaysia." The other Asian (mainly Southeast Asian) comparator countries are Cambodia, Korea, Laos, the Philippines, and Thailand.
112. WHO: "The Double Burden of Disease" (accessed April 24, 2019), https://www.who.int/nutrition/topics/2_background/en/index1.html.
113. FAO Smallholders Team. Carraro, A and Parisi, D. 2018. Structural Transformation and Inclusive Growth: Drivers of Growth and Determinants of Transformation. Preliminary Draft.
114. As of fiscal year 2017, low-income economies are defined as those with a GNI per capita (calculated using the World Bank Atlas method) of US\$1,025 or less in 2015; lower middle-income economies are those with a GNI per capita between US\$1,026 and US\$4,035; upper middle-income economies are those with a GNI per capita between US\$4,036 and US\$12,475; and high-income economies are those with a GNI per capita of US\$12,476 or more.
115. Montlake, Simon. 04/28/2009. Climate change: Southeast Asia falls short. *Christian Science Monitor*. P 6-6. High vulnerability is due largely to the importance of forestry and agriculture and millions of people living along the coast and major rivers.



SECTION IV

Smallholder Farming and Area Development in Malaysia's Transformation

Government support for smallholders and small farmers is not limited to a single or a couple of approaches.

The government has experimented with intervention mechanisms, including resettlement, in situ development, area development, agropolitans and agricultural parks, rural urbanization, and economic corridors. The support covers both food and commodity crops. Palm oil has exerted a greater impact in improving living standards among the poor. In rice-growing areas, nonfarm income is an important contributor to the earnings of small farmers, representing 30 percent to 50 percent of income.

Smallholder agriculture: Definition and characteristics

In Malaysia, smallholders and small farmers dominate the agricultural landscape. Except for palm oil, in which estates account for 60 percent and smallholder farms 40 percent of the land under production, all other crops are dominated by smallholders and small farmers. Thus, Malaysian agriculture is still predominantly the domain of smallholders and small farmers. Indeed, the total area farmed under smallholders and small farmers is expanding.

The definition of smallholder differs depending on the context and locality. In general, smallholders are synonymous with small farmers. In the Malaysian context, smallholders are normally associated with small operators farming industrial crops, such as rubber, oil palm, coconut, cocoa, pepper, and kenaf, while small operators of food crops, such as paddy, fruits, and vegetables, are referred as small farmers. Following the taxonomy in the country, smallholders operate farms of less than 99 acres or about 40 hectares. However, the majority of smallholders and small farmers operate on less than 2 hectares. Thus, the average farm size for paddy is 1.1 hectares; fruits, 0.7 hectares; vegetables, 1.0 hectares; cocoa, 1.1 hectares; coffee, 1.1 hectares; coconut, 0.9 hectares; oil palm, 1.8 hectares; and rubber, 1.6 hectares.¹¹⁶ It follows that smallholders are typically farmers who are operating in palm oil on a land area of less than 40 hectares.

The main driving force in transforming smallholder agriculture lies in the affirmative action policies embedded in the NEP (1971–90). In the aftermath of the racial clashes in May 1969, the government implemented an affirmative action policy embedded in the NEP, which incorporates the two-pronged objective of reducing poverty by raising incomes and increasing employment and of restructuring society to correct economic imbalances based on race, region of residence, or socioeconomic status. Zainal Aznam (1994) asserts that agricultural and industrial policies and programs played an important part in the package of distributional policies and programs, involving the acceleration of the growth in agriculture and industry and the intersectoral shift in the economy. This enabled the lifting of Bumiputeras (the majority of whom are smallholders) from traditional low-income, low-productivity agricultural activities into the modern, high-income, productive industrial sector. The package involves the modernization of rural-agricultural life, the rapid and balanced growth of industrial-urban activities, and the creation of a commercial and industrial community among the mainly indigenous smallholders (Bumiputeras).

Rural and Agricultural Development was prioritized to address poverty, inequality and stability: Within the context of the NEP and economic transformation, agricultural development and progress in Malaysia has been accorded a high priority. This is because agricultural (and rural) development is viewed as vital for political and cultural stability (Abdul Aziz 1994), in view of the abundance of poor and low-income families among agricultural and rural households. Asan et al. (2018) regard oil palm smallholders as the most successful inclusive growth story in Malaysia.

Oil palm smallholders

Among smallholders operating in palm oil, there are three main categories of arrangements for palm oil production: These are independent smallholders, government-supported smallholder schemes and collective landowner schemes. The first category, independent smallholders, refers to growers who receive no direct assistance from the government or private entities. They sell their crops to local mills directly or through intermediary buyers. The second category is organized smallholders who receive support from the government or the private sector. This

support may be provided through loans, technical assistance, guaranteed markets or prices, assistance with land access or titling, legal support, or institutional development. In Malaysia, this scheme is primarily driven by three main agencies, FELDA, FELCRA, and RISDA. Three main agencies are involved in Sarawak in this scheme, namely, the Sarawak Land Development Board, the Sarawak Land Consolidation and Rehabilitation Authority, and the Land Custody and Development Authority. The third category is collective landowner schemes. In terms of functional relationship, these three categories can be grouped into independent smallholders and organized smallholders (organized plus collective). By the end of 2017, the number of people directly employed in the palm oil industry was 440,262, exclusive of 280,977 independent smallholders. However, smallholder palm oil farms face lower yields compared with estates (box 4.1).

BOX 4.1

Independent smallholders in palm oil: Costs and yields

Technically, the production cost average of the independent smallholder sector is lower than the production cost average of the estate sector. In 2000, it was estimated that FFBs production of the smallholding model cost RM 1,772 per hectare, while estates recorded an average expense of RM 2,276.63 per hectare (Ismail, Simeh, and Noor 2003). The average production cost of independent smallholders is anticipated to rise at a faster pace (in terms of percentage) than the estate sector due to their constraint in spreading increasing minimum (contract) wages and input costs over their limited landholdings.

Importantly, the FFB yields of independent smallholders (presently at 17.5 tons per hectare) have traditionally been 20 percent–40 percent less than those of estate companies (presently at 25 tons per hectare). It has been mandated that TUNAS (Tunjuk Ajar dan Nasihat – Demonstrate, Teach, and Advice) realize an average FFB yield of 22 tons per hectare for independent smallholders (in comparison with the 28 tons per hectare target of the estate sector) by 2020. Consequently, TUNAS has been tasked with clustering independent smallholders.

Source: Tey, Yeong Sheng, and Mark Brindal. 2018. "The Development of Agro Industry and Value Chains: Lessons from the Malaysian Palm Oil Sector," unpublished working paper.

FELDA, a model to transform the agricultural sector¹¹⁷

FELDA's model has evolved from relatively small schemes to a complex system.

"Individual schemes of about 400–500 families and 1,600–2,000 hectares were replaced by complexes of about 1,000–2,000 families and 4,000–8,000 hectares developed in successive phases," note Fold and Whitfield (2012, 26). "Moreover, the regional pattern of schemes changed. Early schemes were distributed in a scattered manner, whereas newer schemes or complexes (a cluster of adjoining schemes) were located in regional concentrations even constituting virtual regional development programs." The FELDA complex system involved the development of urban areas and therefore at its zenith (and during individual schemes) FELDA's model was essentially an area-based development. The extensive support that FELDA program provided, the integration of different support mechanisms and how FELDA resettlements evolved into small towns providing services to rural people that otherwise would have been supplied by the urban sector is touched on below.

FELDA chose the productive section of the population for its settlement schemes within the 21 and 50 years range, physically fit and married. In addition, FELDA schemes were area-based that is within a defined geographic location; and included integrated support – from land, agricultural training, education, social amenities, economic and social infrastructures. The settlements evolved into small towns and center of economic activities further amplifying the impact of the palm oil resettlement schemes. Processing plants were established that created additional employment opportunity within the rural settings.

Beyond the settlers, FELDA was also active in supporting entrepreneur skills development to benefit the settlers and their families. For example, FELDA supported the training of the young people in settler households through the Tunas Mekar Program, one of the most successful entrepreneur creation programs in Malaysia. The program sought to develop entrepreneurial skills among young people who had earned high-level education diplomas or degree qualifications. Among the businesses that these generations of FELDA trainees have successfully established are marketers of agricultural products such as chilis, lemongrass, and oysters and cybercafes, restaurants, boutiques, and spas. Many business training activities were conducted among this community of young people. Funds were also provided to this group to help with the founding of businesses. FELDA support included assistance in family planning, youth services, and maternal and pediatric care and the supply of information on opportunities for work in houses of worship.

The sum of FELDA's interventions were also reflected in the observed improvement in mobility of smallholders. Jobs were created within the settlement complexes that provided additional off-farm opportunity in the growing urban centers within the settlements, mills and other professional, business and processing activities. The improvement in income, educational support and training has allowed intergenerational mobility as clearly seen with the education attainment of the children of the original settlers. In fact, it is sometimes reported that farmers have moved to providing management of their farms using hired hands mainly immigrant labor.

Area development

In Malaysia, rural development is concerned with the reduction of rural poverty. Initially, as the majority of the rural poor live in backward and remote rural areas, poverty reduction involves transforming traditional villages into modern ones with adequate basic amenities and infrastructures. Rural development involves a multisectoral approach that includes agricultural development, rural industrialization, infrastructural development, and welfare support. Because the majority of the rural population is engaged in agriculture-related employment and activities, agricultural and land development typically form the crux of rural development programs. This is especially true of programs focused on agricultural income and productivity to transform traditional to modern agriculture through the infusion of modern technology and the provision of support services, subsidies, and amenities aimed at increasing yields and incomes and, ultimately, to reduce poverty among rural households (Chamhuri 1994).

Hence, agricultural and rural development have been accorded special priority in Malaysian annual and five-year development plans as may be seen in the high and significant sectoral budget allocations, ranging from 26 percent during the First Malaysia Plan (1966–70), 24 percent during the Second Malaysia Plan (1970–75), and 22 percent during the Third Malaysia Plan (1976–80), although it subsequently decreased to 16 percent during the Sixth Malaysia Plan (1991–95). Notwithstanding the share reduction in sectoral allocations, the budget commitment is still significant and could not be reduced because these sectors support the majority of the poor households in the country (Chamhuri 1994).

In Malaysia, the integrated rural development approach, consisting of area development, was incorporated as the rural development strategy in the NEP (1970–90s) through poverty reduction and the restructuring of society. The approach was translated into regional development by incorporating it into initiatives in the Integrated Agricultural Development Project (IADP). The regional development strategy was aimed at redressing the economic

and structural imbalances between regions, slowing rural-urban migration, and promoting agricultural and industrial development. The agricultural component of the integrated rural development approach is the IADP, which is designed to revitalize and rehabilitate in situ or existing agricultural area development that is hindered by problems of poverty and low productivity, through an integrated package of infrastructure, agroservices, technology, and inputs coordinated by specific area development institutions (Chamhuri Siwar 1994). The Integrated Agricultural Development Area (IADA) is a variety of agricultural program designed to reduce poverty among rural people. The program has adopted several strategies that are designed to increase productivity, maximize farm household incomes, and modernize farm operations (Nor Diana and Chamhuri 2015). In 1970, the Ministry of Agriculture implemented six IADPs, namely, the Kemubu IADP under KADA, the Muda IADP under MADA, the Kemubu and Besut irrigation schemes, and the North West Selangor and West Johor schemes. The programs were responsible for providing irrigation, drainage, farm machinery, inputs for high-yielding varieties, infrastructure, and agricultural extension services.

IADAs supported diversification of agricultural products by small farmers: A report by KADA (2017), shows that of the KADA area of 82,900 hectares, 47 percent (30,215 hectares) contained mixed orchards, rubber estates, water resources, and other features; paddy land accounted for 37,670 hectares. The paddy land was used for paddy only one season a year. It is also suitable to be planted and potentially developed for the production of various other agricultural products. The area is supported by 13 regional KADA farming establishments that provide input facilities, marketing services, and other services to the entire population in the IADA (KADA 2019). Other case studies on IADAs have focused on the impacts of the agricultural development area in increasing incomes, socioeconomic performance, and issues and challenges facing the agricultural sector. Here, a brief analysis of the MADA and KADA experience is provided to show mainly the nonfarm contribution. The examination of nonfarm income is constrained because of the lack of data or comprehensive studies covering the country. However, some of the information is useful.

Muda IADA (MADA)

The study by Zubir et al. (2013) on income determinants among 225 paddy farmers in MADA revealed that MADA had positive impacts on improvements in the living standards of farmers.¹¹⁸ The implementation of the project reduced the poverty level among farmers in the study area from 72.0 percent in 1966 to 1.4 percent in 2008. The study found that 30 percent of the total income among the farmers was contributed by nonpaddy income. Through a double log regression analysis, the study showed that indicators of land ownership and rental, nonagricultural income, subsidy distribution, educational attainment, and the share of part-time jobs among household members have significantly contributed to the income of paddy farmers. Paddy income contributed a large share (73 percent), but this also included paddy price subsidies of the government. This means that farmers still depend on off-farm income to achieve a comfortable life.

KADA

More than half the total household income of farmers consists of non-rice and nonfarm income in some years, for example, 1998–2003/04. The non-rice income includes earnings from agricultural crops other than paddy, such as sheep, poultry, and freshwater fish breeding, honey-based cosmetics, goat farms, and melon crops. During the period it was found that incomes from paddy still form a major portion of household income, but nonpaddy and nonfarm income sources contributed substantially to the total income of farmers, justifying the diversification of income sources pursued by the IADPs.

Higher income contributions from nonagricultural jobs was also noted by Pazim (1992), where he states that it was a driving force for the agricultural industry to compete with other industries in raising the household income of farmers, especially in the KADA area.¹¹⁹ Rita and Mohamed (2011) also find that, in the East Coast of Malaysia, especially farmers in Kelantan still rely on off-farm income to sustain their livelihoods.

Regional development

The Third Malaysia Plan (1976–80) was the second stage in the implementation of the NEP, which focused on efforts to reduce poverty and restructure society. These efforts were carried out through agricultural and industrial development to increase productivity while enabling employment opportunities and improving the standard of living of the people, especially in rural areas. As a rural development strategy to reduce poverty and promote regionally balanced development, the regional development strategy was introduced to bridge the economic gap between regions through frontier and new town development programs, including programs of the Southeast Johor Development Authority, the Southeast Pahang Development Authority, the Central Terengganu Development Authority, the South Kelantan Development Authority, FELDA, and KEDA.

The Southeast Pahang Development Authority was established to spearhead integrated development strategies through the adoption of the authority's master plan by the government. Emphasis was placed on efforts to gather resources, provide networking links, and develop new and complete centers of growth and new cities. The development strategy was based on the concept of urbanization with its inhabitants in the cities and working in the area developed under three categories of development, namely forestry, agriculture and industry. Among the cities of intensive planning in terms of infrastructure are planned according to plans such as the towns of Muadzam Shah, Tun Abdul Razak, Chini and others complete with residential houses, schools, recreation facilities and various other facilities arranged according to need.



Agropolitan

The agropolitan (agrocitcity) approach focuses on achieving rural development from below through economic and social empowerment among the rural poor. The implementation of the concept in Malaysia has the objective of reducing extreme poverty in rural areas through the establishment of economic and social growth centers anchored on agriculture. The initiative is part of the government's High Impact Agriculture Program. It originated in the approach proposed by Friedman and Douglass (1978).¹²⁰ It encompasses agro-based and rural industry expansion and processing. In terms of management, the agropolitan centers, under the supervision of the Prime Minister's Department and four ministries, including the Ministry of Rural Development, have been tasked with assisting the government in reducing poverty. Of the 10,000 extreme poor, 5,600 have benefited from the support of the Ministry of Rural Development, while the rest have been managed through economic corridor development projects.¹²¹

Overall, the aim of the agropolitan projects is to reduce poverty and create a viable and vibrant local economy, while contributing to the overall economic development of the country. The projects are based on developing the commodity subsector, mainly palm oil and rubber. A review indicates that the interventions have managed to enhance the incomes and living conditions of direct beneficiaries and local populations through the financing of economic and social infrastructure. A study that evaluated the Pulau Banggi, Sabah, agropolitan project reported that the target group seemed to have enjoyed numerous benefits, including an increase in average incomes from around RM 250 to RM 1,200 per individual per month, that is, an increase of 380 percent. Another benefit for all residents was the provision of infrastructure and utilities.¹²² Another study that reviewed three agropolitan projects reported an income improvement of 60 percent among 62 percent of the beneficiaries.¹²³ A comprehensive review of the approach will provide an important lesson for the future transformation of Malaysia into a high-income country and for the rest of the developing world that is on the long journey of inclusive agricultural transformation.

Notes

116. Ong Khun Wai (2001), cited in Asan, Ibrahim Ngah, and Shri-Dewi (2018).
117. In addition to FELDA, the South Kelantan Development Authority is involved in the development of land schemes. Here only FELDA is considered due to its significance.
118. Zubir, Ahmad Ibrahim, Chamhuri Siwar, and Basri Abdul Talib. 2013. "Determining Sources of Income among Paddy Farmers in Muda Irrigation Area, Malaysia." *IOSR Journal of Humanities and Social Science* 17 (4).
119. Pazim Othman. 1992. Land abandonment in rice sector: An Economic Analysis. *Jurnal Ekonomi Malaysia*. 26.
120. Friedmann, J., and M. Douglass. 1978. *Growth Pole Strategy and Regional Development Policy: Asian Experience and Alternative Approaches*, edited by F.C. Lo and K. Salih, 163–92. Oxford, UK: Pergamon.
121. H. A. M. Shaffril, A. F. A. Nasir, K. Idris, J. Uli, and J. L. D'Silva. 2010. "Agriculture Project as an Economic Development Tool to Boost Socioeconomic Level of the Poor Community: The Case of Agropolitan Project in Malaysia." *African Journal of Business Management* 4, 2354–61.
122. Ahmad, Yusof, Yendo Afgani and Hamid Saad. Undated. "Implementation of Agropolitan Approach in Malaysia: Preliminary Study at Pulau Banggi." <https://ft.unand.ac.id/ICCFAM/16%20Author.pdf>. Accessed July 19, 2019.
123. Ahmad, Yusof, Yendo Afgani and Hamid Saad. Undated. "Implementation of Agropolitan Approach in Malaysia: Preliminary Study at Pulau Banggi. Procedia." *Social and Behavioral Sciences* 153, 479–90.



SECTION V

Key Lessons from Malaysia Within a Comparative Perspective

Rationale and focus of comparative analysis

The rationale for the choice of countries: The country cases were selected because their experiences of transformation share important similarities with Malaysia's, although they are at different stages in their transformation path. As measured by GNI per capita (2017, Atlas method), these countries range from lower-middle-income Indonesia (US\$3,540), upper-middle-income Malaysia (US\$9,650), and high-income Chile (US\$13,610) to high-income industrialized France (US\$38,990).¹²⁴ At the start of their quest for growth, they had similar initial conditions in three important respects: (1) the agricultural sector was important either for growth or for poverty reduction or both; (2) smallholders were the majority in agriculture, and poverty was widespread; and (3) general economic conditions were dire. They also had similar goals of economic growth; poverty reduction; price and political stability; and food security within which food self-sufficiency was important.

Main questions addressed by comparative studies: The analysis of the agricultural transformation experience of four countries (Malaysia, Indonesia, Chile, and France) was undertaken to highlight the experience of Malaysia's agricultural transformation and inclusive growth within a comparative perspective. The four case studies all addressed the same set of questions, namely, (1) What are the key features of each country's agricultural transformation? (2) What are the key policy choices made that enabled and supported agricultural transformation? (3) What are the main drivers of agricultural transformation? and (4) How do the lessons from the other countries compare with lessons from Malaysia? The countries for comparative purpose were selected joint by the then EPU (MEA) and the World Bank.

Similarities and differences between Malaysia and comparator countries

Similarities and differences with Malaysia among comparator countries in initial conditions: Among the three countries chosen, Indonesia, a close neighbor, shared the most features with Malaysia. Soon after independence (Aug 1947) and the tumultuous years under Sukarno (1949–66), Indonesia had under Suharto a government able to maintain political stability (continuous from 1966/67 until 1997/98) and driven by the long-term goal to promote growth, equity and stability, the development trilogy. The other similarities were as follows:

- The importance of paddy in food crops; and of oil palm, rubber, cocoa, coconut, in tree crops
- The predominance of smallholder households and widespread poverty
- The importance of achieving RSS considered critical in furthering food security, and reducing poverty
- Rich mineral resources including gold, tin, copper, coal, petroleum, natural gas
- Importance of commodity (tree crops and mineral) exports

Chile shared the following initial conditions:

- Agriculture was dualistic, but it was a minor sector. Since the 1960s, its contribution to GDP had fluctuated between 5 percent and 10 percent, but its contribution to employment was more substantial. Smallholders were mostly poor. Some 40 percent lived in poverty (1987).¹²⁵ Large (over 1,000 hectares) farms, which occupy 70 percent of all farmland, coexist alongside a semi-subsistence, smallholder agriculture. Income and wealth inequality is high. In 1998, the Gini coefficient of income was 0.56 (unadjusted by income transfers).
- Poor economic conditions prevailed in Indonesia. Chile's economy was in turmoil under the Marxist-socialist, Allende (1970–73) when Pinochet, in a coup, took control on September 11, 1973. For example, monthly inflation was averaging 20 percent; production and employment were falling; government and public enterprises were operating at enormous deficits; and disarray was widespread among private enterprises.

- Chile had two major vulnerabilities: a predominance of copper in export earnings and the high debt service ratio.¹²⁶ Dependence on one major commodity export, copper, made the country vulnerable to wide swings in world prices. Copper exports accounted for nearly 50 percent of total merchandise exports.
- Food price stability was considered a key component of food security. Chile first abolished price bands, but had to reinstate them in 1983.¹²⁷
- Pinochet (1973–90) was succeeded by democratic governments that basically kept the country’s market- and open-economy orientation but used government policy to improve on income distribution and accelerate poverty reduction. The transition from military to democratic rule has been peaceful.

France, now a high-income industrialized country, faced dire conditions after the end of World War II. Indeed, following World War I and World War II, French women had to take over much of the farmwork because millions of men from rural areas had served and died on the front. Smallholder farms were fragmented and showed low productivity. For war-torn France, achieving food self-sufficiency was a top priority, a major rationale for joining the European Economic Community in 1957, and the Common Agricultural Policy in 1962. With peace, expanded markets, substantial funds from the Marshall Plan (1948–51) and from the Common Agricultural Policy, and with French leadership determined to transform French agriculture, France experienced the Glorious Thirty (les Trente Glorieuses) in 1945–75.¹²⁸ At the center of France’s agricultural development was a determination and dedication toward inclusiveness.

“France, which traditionally followed an agrarian policy designed to protect the peasant family farm [la petite exploitation familiale) from external competition and internal social change. . . . Since 1960, stimulated by increased demand for the protected EEC [European Economic Community] market, output and productivity of French agriculture have expanded at a rapid rate.”¹²⁹

Robust pattern in experiences despite diverse contexts

The synthesis of Malaysia’s experience of agricultural transformation in comparative perspective shows that there is indeed a robust pattern despite heterogeneity in country contexts and historical experiences. The strong pattern offers policy insights and suggests lessons in the following areas.

Government commitment and leadership with long-term vision of nation building: In all four countries, national leadership and government commitment played a determining role in launching, shaping and supporting transformation. Achieving a sustainable balance requires skillful governance and long-term commitment. These commitments were realized through credible, consistent policy initiatives (with the necessary adjustments as the sector passes through different phases of transformation); preparation of medium- and long-term plans that are implementable through action plans; allocation of sufficient budget to finance investments and other support services; readiness to respond to changing and evolving conditions through institutional renewal, and restructuring or formation of new entities or institutions. The long-term commitment needed is for several decades. All these countries rose from the ashes of violent conflict to achieve transformative growth.

Macroeconomic stability in an open economy framework: Agricultural transformation cannot occur in isolation from other sectors. Macroeconomic and price stability with open trade and a conducive foreign exchange framework are necessary conditions for successful agricultural transformation. Evidence strongly suggests that the broader markets made possible by more open economies linking agriculture with international trade were fundamental to promoting growth and transformation. Thus, the more open economies of Malaysia and Chile fared better than Indonesia. France too greatly expanded its markets by joining the European Economic Community (1957), and the Common Agricultural Policy (1962).

Key importance accorded to food security: Food security was a priority for all four governments for they regarded food security as essential for achieving sociopolitical stability, which in turn was a necessary condition for achieving agricultural transformation. In the short term, achieving this goal was operationalized by them in terms of achieving food price stability and increasing domestic production. The central importance they gave to solving the food problem is consistent with the early insight of T.W. Schultz, namely, that solving the food problem is fundamental as this problem acts as a stranglehold on generating the surplus required for investing in growth. Approaches to achieving food security by each country have differed. However, the common element has been that they all emphasized domestic supply over imports as better insurance for availability and price stability.

Smallholder households: the policy design needed to ensure poverty reduction and inclusiveness: The governments of all four countries intervened directly in various forms to enable poor, smallholder households, participate in and benefit from growth. Their economies all grew but the growth would not have been inclusive if governments had relied only on the trickle-down approach. Malaya's earlier years is a case in point: it generated high growth of around 6 percent per year (1957–69) but widespread poverty persisted, and sharp ethnic tensions prevailed. Malaysia through FELDA and other land development and resettlement programs was able to integrate substantial numbers of smallholders. Indonesia was committed to a strategy of pro-poor growth. Under its "New Order", Indonesia's expenditure ratio, (which is a meaningful measure of support since it takes into account the importance of the agricultural sector in the economy),¹³⁰ averaged 0.4 versus 0.3 for the sample of comparator countries. France did even more to integrate its smallholders into a dynamic, commercial agriculture. France had two major initiatives: (1) land consolidation; and (2) voluntary associations of family farms and of young farmers into economically viable larger units. France created the legal and regulatory framework for associations and provided credit and extension advice. For its aging farmers, France gave life-long pensions to those who were willing to sell their land. Chile, like Malaysia and France, also effectively dealt with land and helped smallholders. The measures taken by consecutive governments were different, but they benefited smallholders even under Pinochet. Under Frei (1964–70) and Allende (1970–73), the land reform had forcibly expropriated some 50 percent of all farmland and redistributed it to *asentamientos*, which were cooperatives created along the model of the *kolkhoz* of the Soviet Union. Frei and Allende did not transfer the land to smallholders. Pinochet distributed around 60 percent of the land expropriated under the land reform to the beneficiaries of the *asentamiento* system in privately owned small farms and returned some 28 percent of the expropriated area to their former owners.¹³¹ Pinochet abolished the *asentamientos* and transferred most of the remaining expropriated land to smallholders. He did not completely reverse Allende's land reform because he did not return to the *latifundia* land ownership structure. A comparison of 1965 and 1979 data on land distribution shows that the major difference is a decrease in the concentration of land in large farms (defined as greater than 80 basic irrigated hectares). Initiatives in these three countries worked because they transferred land, a highly desired income-generating asset, and gave ownership titles to farm families. However, these initiatives required substantial direct public intervention and funding. Thus, the integration of smallholders has required political decisions at the highest levels that depend on evaluations of the cost of such transfers in social terms to determine if not carrying out the transfers would be more costly for society. The bottom line is that the reduction in widespread, extreme poverty and the promotion of social inclusion are public goods. Because the process takes time and resources, fundamental, long-term political and social support is vital.

Resilience in response to shocks—openness does not necessarily imply greater vulnerability: Agricultural transformation is a long-term process—decades long. Within this long period, the likelihood is high of being buffeted by shocks emanating from natural or market forces (also lack of consistency in government policy or intense political conflicts). The countries which built in resilience mechanisms in their economic management were able to weather these severe shocks relatively unscathed and thereby remain on the path onto higher stages of transformation. The two more open economies of Malaysia and Chile are more resilient and have performed better than Indonesia that is more closed. In fact, Indonesia and Suharto's regime collapsed under the Asian financial crisis (1997–98). Chile since Pinochet has embraced foreign trade. Like Malaysia, it has a small population (18 million in October 2017), and it requires global access to grow since openness is critically important for Chile's export enterprises to reach economies of scale. Successive governments have actively negotiated free trade agreements with many countries (OECD 2008).¹³² Thereafter the economy not only expanded, but market access also diversified, a key factor in improving Chile's resilience to market downturns. The government's commitment to openness and to global trade integration resulted in



free trade agreements with countries accounting for 80 percent of the global population and 85 percent of the global value added.¹³³ Prevailing effective tariff rates on agricultural products have actually been much lower (an average of 2 percent) than the official most-favored-nation rate of 6 percent. The comparison of Chile and Malaysia on one side and Indonesia on the other clearly shows that being more closed is not a protection against shocks. Indeed, it can cause more damage.

Agricultural and other public, quasi-public and private institutions critical for translating vision into action:

Government policies are as good as the institutions that convert the statements of intent into actions. Their competence, dedication to public service, and ability to work with private sector are critical for effective implementation. Malaysia's case clearly shows this. In the earlier stages, public sector institutions must perforce play the critical role to kick start the process; but as transformation progresses their role necessarily evolves as they interact with a strengthened private sector which can assume a more prominent role. Chile's institutional capability is also instructive. Within Latin America, Chile is highly respected for its smooth transition to democracy and for the quality of its governance. Some specific aspects resulting in good governance are (1) large reforms are analyzed in depth by technocrats, specialists, and interest group representatives, and public reports are produced with substantial and detailed recommendations; (2) full reform implementation accords with reform blue prints and is well executed; (3) corrections and fine tuning of complex reforms are introduced frequently; (4) policies and institutions are improved through learning from mistakes; (5) except for the shock fiscal treatment at the beginning, 1974–77, reforms have been gradual; (6) reforms tend to favor the adoption of rules and regulations limiting the scope for government discretion; (7) well-designed political institutions promote transparency, accountability, and stable policy-making processes; (8) large consensus on national reform needs; and (9) low likelihood of reform reversals due to the weak influence of reform losers and blockers. As a result, Chile is at the forefront of the design and implementation frontier of many reform areas, for instance, free trade agreements, public and private partnerships, inflation targeting, fiscal policy rules, and pension systems.¹³⁴

Agribusiness value chains: powerful engines of growth: The promotion of agricultural value addition throughout all segments of the agribusiness value chain (production, aggregation, processing, and marketing), including vertical integration and links to global value chains, has proved to be an effective way of transforming agriculture. Indeed, value chains have been the backbone of transformation in Malaysia. By policy design, the development of value chains has contributed significantly to reducing rural poverty. VCD in tree crops, particularly in palm oil, was a driving force

in adding value and integrating primary agriculture with agribusiness. In Chile, too, there has been an increase in the number of value chains, vertically integrated through contracts with farms through agroprocessing, with an increasing concentration at the buyer end. Supermarkets also have increased their share in the food distribution sector from 49 percent to 62 percent (1994–2004).¹³⁵ Comparing Malaysia’s and Chile’s experiences shows that value chains can power growth, but whether value chains promote inclusive growth or not depends on policy design.

Agricultural R&D and extension services essential for sustained productivity growth: Emphasis on agricultural R&D is long-standing in Malaysia and has been a major driver of growth. Investment by the public and private sectors in R&D in palm oil and rubber has produced a stream of vital innovations over the years that have raised crop productivity and quality and reduced costs (FAO 2019). This commitment to R&D is captured by estimates of agricultural research intensity, which was 1.9 percent in 2002.¹³⁶ The government of France also heavily emphasized the development of an entire system of agricultural research, extension, and education for the post–World War II generation of young farmers. The French government’s commitment to research in fact goes back to 1917, to Eugène Tisserand who argued that a close link should be developed among universities, agricultural colleges, and agricultural experiment stations, thus ensuring that theory and practice were combined.¹³⁷ An important contrast is between the agricultural value added per worker (as an indicator of agricultural productivity) of Malaysia versus that of Indonesia (figure 5.1). Indonesia’s much lower agricultural value added per worker partly derives from the fact that Indonesia has always struggled to provide sufficient funding for R&D. Table 5.1 highlights the low level of agricultural research investment allocated by the government of Indonesia to the system.

FIGURE 5.1. Agricultural value added per worker, Chile, Indonesia, and Malaysia, 1980–2016



Source: World Development Indicators.

Note: Agriculture comprises value added from forestry, hunting, and fishing as well as cultivation of crops and livestock production. Value added in agriculture measures the output of the agricultural sector less the value of intermediate inputs.

TABLE 5.1. Resource allocations on R&D, Indonesia

Indicator	1961–65	1971–75	1981–85	1991–95	2001–03	2009
Agricultural R&D, % of agricultural GDP	na	0.2	0.3	0.3	0.2	0.4

Sources: Pardey, P. G., J. M. Alston, and R. R. Piggott, eds. 2006. *Agricultural R&D in the developing world: Too little, too late?* Washington, DC: International Food Policy Research Institute; World Bank. 2010. *Indonesia Agriculture Public Expenditure Review, 2010*. Jakarta, Indonesia.

Notes

124. In terms of purchasing power parity, the estimates of GNI per capita in 2017 U.S. dollars are Indonesia: US\$11,910; Malaysia: US\$28,720; Chile: US\$23,780; and France: US\$45,120 (WDI data).
125. World Bank. August 2001. *Poverty and Income Distribution in a High Income Economy: The Case of Chile (1987–98)*. Report 22037-CH. vol. 1.
126. World Bank. February 2002. *Republic of Chile: Country Assistance Strategy*. Report 23329-CH. Washington, DC: World Bank.
127. However, under the free trade agreement between Chile and the United States (2003–04), according to which Chile imports wheat, wheat flour, and sugar from the United States, the price bands were to be completely phased out and removed within 12 years of the 2002 World Trade Organization ruling, that is, 2015–16.
128. This term was first coined by the French demographer Jacques Fourastié with the publication of his book in 1979: *Les Trente Glorieuses ou La Révolution Invisible de 1946 à 1975*.
129. The quotation is from Hayami and Ruttan (1985, 130); see page 309, Timmer, C. P. 1988. *Handbook of Development Economics*, vol. I, Elsevier Science Publishers.
130. The expenditure ratio is defined as the ratio of (agricultural expenditures / total expenditures) to (agricultural GDP / total GDP). The higher the ratio is to 1, the higher the support.
131. Valdes, Alberto, Eugenia Muchnik, and Hernan Hertado. 1990. *Trade, Exchange Rates, and Agricultural Pricing Policies in Chile*. vol.1. *The Country Study*. World Bank Comparative Studies. Washington, DC: World Bank.
132. Major economies include the European Union (2003), the United States (2004), China (2005), Japan (2007), and, partially, India (2007).
133. Valdes, Alberto, and William Foster. 2017 "Agricultural and Rural Policies in Chile." Ch. 13 in *Handbook of International Food and Agricultural Policies*, vol. 1, *Policies for Agricultural Markets and Rural Economic Activity*. William H. Meyers and Tim Josling, eds.
134. Schmidt-Hebbel, Klaus. 2009. *Chile's Growth and Development: Leadership, Policy Making Process, Policies and Results*. Commission on Growth and development, Working Paper 52, <http://documents.worldbank.org/curated/en/360541468010916102/pdf/577510NWP0Box353767B01PUBLIC10gcwp052web.pdf>.
135. OECD. 2008. *Review of Agricultural Policies: Chile*.
136. The measure is an estimate of total agricultural research spending as a share of total agricultural output. As a rule of thumb, allocation of 1 percent of agricultural GDP to R&D is taken to be a good commitment for countries at an early stage of development. As countries grow, the number is expected to be much higher. See the example of Japan in annex F, table F.6.
137. Eugène Tisserand was a senator of the Republic, a member of the Académie des Sciences, and founder of the Institut National Agronomique in 1876 and its director until 1879.



SECTION VI

Main Achievements and Key Remaining Challenges: What's Next for Malaysia

The new context of agriculture in Malaysia

The agricultural sector went through various phases of transformation and supported the transformation of the whole economy through transfer of labor, industrial inputs, capital, providing food for expanding population and as a source of feed. The structure of the sector has fundamentally changed: the country has limited the expansion of agricultural land to new frontiers, aging farmers and the youth are leaving agriculture, there is shortage of farm labor, more people live in urban areas and agriculture is facing rising costs. Demand is favorable however consumer preference is evolving and have already demonstrated the shift to protein rich food and the trend will continue as income rises.

In 2016, Malaysia has more rural people than it had when embarking on agricultural transformation in 1960. Rural population has increased by 28 percent according to World Bank data. However, the current context cannot be more markedly different from 1960. Poverty, for all practical purposes, has been drastically reduced if not eliminated. Living standards have improved markedly and some smallholders cannot be called subsistence farmers. Food security has taken a different shape – from malnutrition to obesity. Further, hereto food security so far has focused almost exclusively on supply, and within supply on rice. Food security is basically a demand issue determined by consumers preference. Farmers are, to varying degrees, integrated in markets and improvement in land tenure has benefited a lot of rural dwellers changing their life for good, in a positive way. A number of Human Development index clearly show the advances made.

In 1960, the Republic of Korea (at 72 percent of the population living in rural areas) and Malaysia (at 73 percent) were practically equal by this measure. By 2017, 25 percent of the Malaysian population was living in rural areas, while, in Korea, the share had fallen to 18 percent. Meanwhile, the employment share in agriculture had fallen to 5 percent in Korea, compared with 11 percent in Malaysia. In Malaysia, whatever pockets of poverty remain are concentrated in rural areas (1.6 percent in rural areas versus 0.3 percent in urban areas). However, the growth rate of the rural population entered negative territory in 1994 and has remained in the same territory since then (figure 6.1).

The fact that more people are living in rural areas today compared with the 1960s means there is a need for a clear policy on the future of rural areas, smallholder agriculture, and small farmers. The future of smallholder

FIGURE 6.1. Rural population growth, Malaysia (annual %)

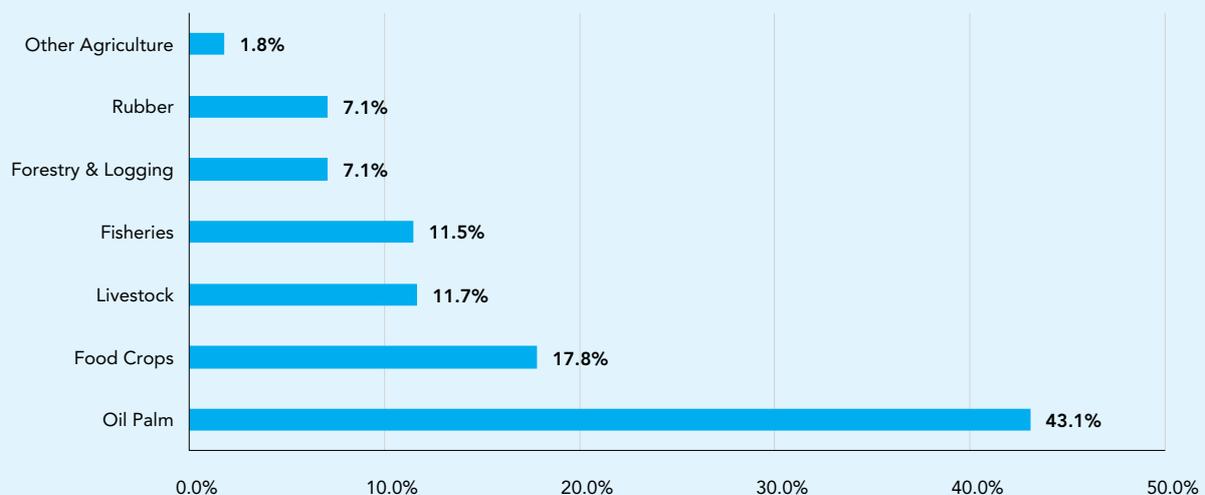


Source: WDI data.

agriculture is compounded by aging among farmers and the reluctance of the youth to join the farming sector, although the government has succeeded in attracting some youth entrepreneurs. Only a small range of crops dominate on the land used for agriculture, thereby limiting diversification. The sector relies on migrant labor. The enabling environment has remained a constraint in some important areas, and uneven development and regional differences have hampered overall agricultural transformation. The challenge is therefore now to continue the transformation by establishing a sustainable and vibrant agricultural system that is highly productive and comparable with the systems in high-income developed countries. Land is also becoming scarce because of the government's policy of restraining the expansion of farmland to forest areas. The future of agriculture will be dependent on intensive farming, that is, reliance on improving productivity. In specific areas, the government must implement clear policies. Some of these areas are the following.

Reducing the risks associated with a single crop: Palm oil now accounts for more than 75 percent of the cultivated land. This could be interpreted as specialization. However, the risk is too great to maintain the status quo. Agriculture faces a number of daunting problems related to climate and weather conditions, pests, international prices, and changing consumer preferences. In Malaysia, the impacts of pests and weather phenomena on crops are familiar. Oil palm has become an important input in food, cosmetics and personal care, and fuel, and it has a positive income elasticity. As a source of renewable energy through biodiesel fuels, it can benefit from the increase in the global population, coupled with the rise in incomes across countries and the growing demand for palm oil among consumers. However, consumer preferences are not static. Indeed, there has been a shift that might be labeled herd behavior (following Keynes). The demand for oil palm shot up following the publication of the Renewable Energy Directive of the European Union, but it can as easily drop after some unforeseen event. Because palm oil must be transported great distances in bulk tanks, it has a high carbon footprint and is thus a good target among interest groups. A major strategy that the government of Malaysia has adopted through the years and that would be relevant in this case is the acceleration in downstream processing to create new products or to enhance the input of oil palm in existing products. This is a medium-term goal and requires a lot of investment in areas dominated by multinational corporations in products such as vitamins, cosmetics, fuel, and pharmaceuticals, where successful entry into the market is not assured nor cheap. Yet, given the significant exposure, stakeholders in the country should be able to identify the appropriate level of risk that will not endanger economic well-being, given that palm oil has a strong presence and constitutes an important sector of the economy. A case can also be made on efficiency grounds: Palm oil accounts for more than 75 percent of the farmland, but contributes 43 percent of agricultural value added (figure 6.2).

FIGURE 6.2. Contribution to value added, 2016



Source: Ministry of Economic Affairs.

Convergence of productivity between agriculture and other sectors: By 2011, it seemed for a moment that the gap in productivity had been closed between agriculture and other sectors of the economy. However, because the fundamentals have not yet evolved, the large number of smallholder farmers still had only limited opportunity to close the gap in productivity with the estate subsector and thus the income gap with other sectors that is determined by land size. The gap will therefore continue to exist and act as a drag on the economy. All regions and sectors do not seem to have reached the same extent of agriculture-nonagriculture integration. Yields are still low, especially in comparison with yields in countries that have recently transformed. Smallholders still dominate in the production of some crops which exhibit only slow improvement in productivity or a reversal of gains in productivity, as in the case of rubber. In Malaysian agriculture, the gains in productivity growth are directly related to agricultural research intensity. However, in the recent past, the government seems to have been reluctant to build on its history of investment in agricultural research. As countries reach middle-income status and governments strive to industrialize, governments must improve their sectoral performance by increasing agricultural research intensity. The need to enhance agricultural intensity is more pressing now with the advent of the fourth industrial revolution, which requires research intensity to be maximized. The focus of researchers in Malaysia is on palm oil (39 percent), fruit (19 percent), and rice (10 percent).¹³⁸ Taking into account the evolving context and recognizing the changes taking place in the composition of agricultural subsectors, government agricultural research allocations should be reviewed. This is also the case because of the impending new agricultural revolution.

The agri-food sector as the dominant sector of agriculture in the future: There is now a good opportunity to diversify the agricultural sector by supporting the agri-food subsector, thereby reducing reliance on palm oil. There is a consensus that the agri-food subsector will be the main beneficiary of the Internet of Things in agriculture, especially through smart farming and precision agriculture. Unlike tree crops, the technology in the agri-food subsector has advanced to such a point that it could address the critical problems agriculture is facing today in Malaysia. Drones are now collecting tomatoes. Harvesting that started with combiners has advanced rapidly and may soon no longer require human laborers. A driverless combiner harvester and a driverless tractor collecting the harvest and transporting it to a warehouse automatically controlled for temperature and humidity are science fiction no more. The moisture and nutrient content of soil is not only measurable at individual farms, but also for each plant. Cows can be monitored through smart devices that promote maximum production. The promise of the new technology is boundless and so, too, is the potential of replacing humans. But the implementation of the fourth industrial revolution in agriculture will require deliberate policies formulation. A study conducted as part of this analytical task makes recommendations that would be worth including in the deliberation, as follows:

- Liberalization of the food subsector is necessary to encourage private participation and healthy competition. Stringent regulations and obstructionist bureaucracies discourage private investment. Any semblance of anticompetition such as mandated monopoly as in the case of BERNAS should be put to a halt. At the same time, the role of BERNAS as the administrator of guaranteed minimum price and buyer of last resort should be taken over by a regulatory body akin to the previous National Paddy Board to ensure that farmer welfare is taken care of in the transition process toward a more competitive market. (Sidique and Shaharudin 2019, 50)

Determining the future of small farmers: The future of smallholder farmers is part of these policy deliberations. Malaysia is moving from aging farmers to old farmers and this could happen quickly as youth move to urban areas thanks to education and social media. The aging problem will exacerbate the rural-urban income differential that has been widening for some time. Other countries have also faced this problem during the transformation of agriculture. In France, the government was willing to buy out aging farmers and grant them secure lifelong pensions before proceeding to change the rural farming system through grants and loans to youth entrepreneurs, which were instrumental in the consolidation of farms. The Korean government is applying a variant of France's strategy through retirement packages and the payment of pensions to old or aging farmers (box 6.1). The payments allow these people to retire from the land. In addition to releasing land for productive farmers (or smallholders who can earn good incomes that will support them throughout life). The government of Malaysia should seriously consider such an option.

BOX 6.1

The Republic of Korea: The successor and specialized young farmer programs

The key program in Korea is the Farm Successor Fostering Program, which was established in 1981 and happens to be one of the country's longest standing farmer support programs (Ma 2014). It is fairly unique in that its aim is to select and support at least one farm successor per village. To those it selects, the program provides low interest (2–3 percent) loans of up to US\$280,000 (300 million, or nearly 4 billion in international depository receipts) repayable over 15 years, plus help accessing other funding, technical assistance and training, and mentors (Ma 2014; Im and Jeong 2014).^a

Early on, the program selected on the order of 10,000 successors per year, but that number was reduced to 1,000–1,500 in the 1990s. The age limit for eligibility gradually increased from 30 years of age when the program started, to 50 in 2008; but the years of farming experience were capped (to less than 10) and an agricultural degree was required (KREI 2015). By 2010, the program was supporting over 131,000 successors, or an average of three per village, representing around 10 percent of farms (KREI 2015; Ma 2014). Over time, the farming activities of successors have significantly diversified away from staple grains and into horticulture and livestock production. According to a 2010 evaluation of the program, about 90 percent of successors remained in farming long term (Ma et al. 2010 in KREI 2015). Moreover, their average income and scale were larger than those of other farms. Another noteworthy initiative in Korea is a subsidy program that incentivizes older farmers to transfer their land to a younger farmer. Since this direct payment program was put in place in 1997, farmers ages 65 or more who are willing to sell or rent their land to full time farmers for a period of more than five years have been eligible to receive a lump-sum payment. As of 2014, retiring farmers could receive annual payments of up to US\$2,727 (KRW 3 million) per hectare for ten years (Im and Jeong 2014).

The government has also supported efforts to mint highly skilled and specialized young farmers. In 1997, for example, the government established Korea's National College of Agriculture and Fisheries, a vocational, higher education program that gives graduates priority access to the Young Successor program (Ma 2014, KREI 2015). And in 2006 programs were put in place to revitalize agricultural high schools and colleges, and ensure that they teach business skills, offer on-the-job learning via farm visits and internships, exposure to professionals, job search support, and so forth (Ma 2014).

Source: Cassou, Emilie. 2018. World Bank.

a. In 2016, the government launched a program to extend grants (up to US\$942 for three years), technical assistance, and land leases to innovative farming and distribution projects proposed by applicants ages under 40.

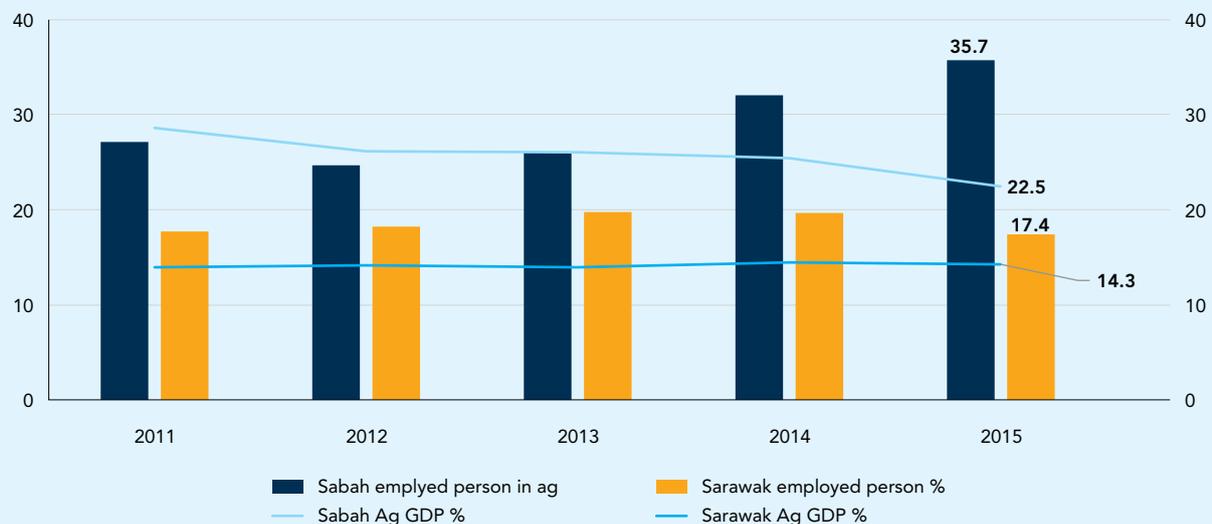
Consolidating farms and strengthening SMEs: For those who are productive and active, consolidation of farming has to be pursued. However, the new technology seems farm-size neutral, especially with the expansion of hiring services for smart agricultural machines. Experience is such that businesses are picking the provision of such services, and apps are appearing everyday to support the management and control of smart devices. SMEs will be major players in this area. As in the past, beyond full automation of agricultural practices, value addition through SMEs should be pursued because they will create job opportunities for farmers replaced by technology. Several forms of business partnership could develop with among who have the titles to the land as long as the enabling environment is supportive and rewarding. Any strategic initiative should be supported by a detailed diagnostic analysis on costs, benefits, and all ramifications. As part of this, there is a need to review the capacity and role of farmer associations and cooperatives, including raising their skills in management and smart farming practices, managing distribution systems, and running farms as an enterprise.

Sustainable management: While improvement in technology could significantly improve weather related phenomena, the major improvements are expected to be in efficient utilization inputs (fertilizer, pesticide (may be its total absence) water or any other input) will be determined by a sophisticated algorithm. While this takes time to take hold, in the meantime there is ample room to improve the management of plantations while at the same time getting gains in productivity. In addition to gains in productivity, improving sustainable management can also serve as promotional tool in the market place especially in the European Union market. Currently, being a good steward of the environment is coming with premium in form of higher prices. Related to sustainable management, planning to build resilient agricultural system through climate smart agricultural investment should be part of the overall equation.

Spatial approach: There are regional differences in the agricultural transformation across the regions of Malaysia. The government has pursued regional development since the Fourth Malaysia Plan (1981–85) by creating regional authorities. Malaysia was then divided into six regions: the Northern, Central, Eastern, Southern, Sabah, and Sarawak regions. Each region covered huge areas and encompassed several states.¹³⁹ As in most other development-oriented agencies, the mission of the regional authorities was poverty reduction, including in backward and isolated areas, through rural development. The regional authorities were considered more well suited than the central government in delivering economic development. They would redress regional structural and economic imbalances, slowing rural-urban migration and promoting local agricultural and industrial development. They are considered to have reduced poverty by raising rural incomes and welfare.

Regional differences, when they are substantial, will act as a brake on the structural transformation of agriculture. Figure 6.3 illustrates the case of Sabah and Sarawak where agricultural transformation is lagging relative to national average – the lag in productivity in Sabah is glaring. Convergence among regions and subsectors productivity (and thus income) is the hallmark of a matured stage of agricultural transformation – that is the integration stage. Once the sector reached an industrialized stage, on average, household income of farming households is higher than other households and so is productivity of agriculture compared with other sectors.

Revitalizing institutions and improving governance: Malaysia's agricultural transformation is being realized through the creation of dedicated agencies. In the process, the country has built exemplary models of institutional support for agricultural transformation. Over the years, the institutions have evolved, fulfilled their mandates, or need to be reformed to reflect the new reality. To implement the Internet of Things effectively in agriculture, institutions must be revitalized to support the digital revolution and the introduction of smart technology. The lessons learned by those who have deployed smart farming show that agricultural researchers and mechanical and software engineers are active in an unending loop of innovation and improvement. As part of such an effort in Malaysia, big data systems should be established in agriculture to prepare the backbone on which the Internet of Things can develop. A formal agreement should be reached on who owns the data collected from farmers and on how farmers will benefit.

FIGURE 6.3. A tale of two states

Source: Department of Statistics, Malaysia.

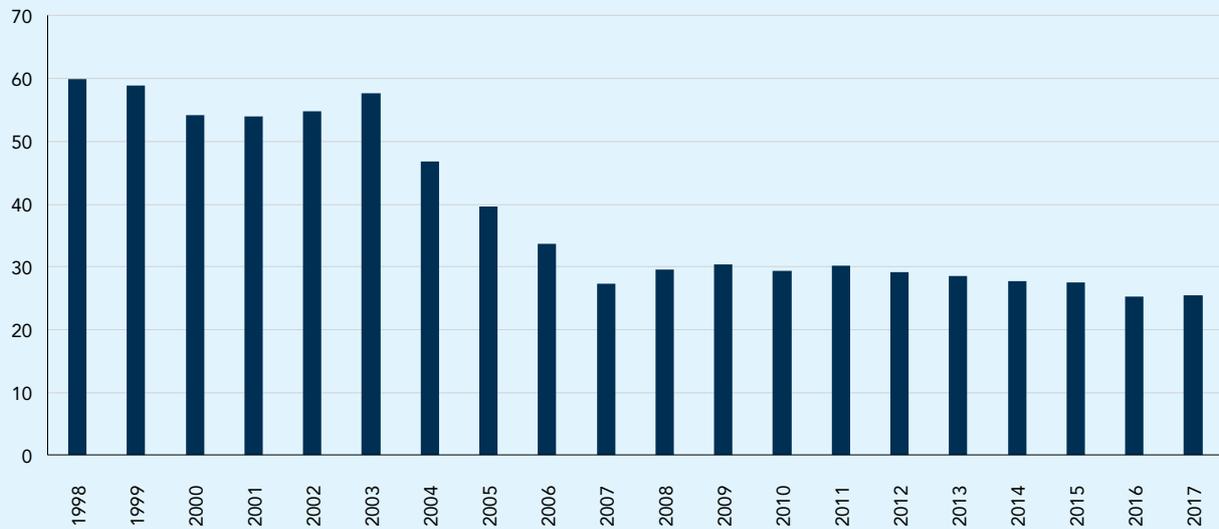
Branding is an area worth pursuing for a country that aims to export processed products: Agricultural products are usually fungible. Branding allows products to be differentiated from like products or competitors. This might involve a trademark or a focus on special qualities associated with the agroecological conditions of the country or consumer taste. Food branding has been shown to have a substantial impact on a local economy, including on tourism. However, each country can develop specific products that are niche products, that are otherwise specific to the country's agroecological resources, or that can be processed as distinct brands. Common examples of fungible agribusiness products rendered distinct by branding are beers and wines, cheeses, and olives.

"Shoppers attracted to branded products spend three to four times more on groceries than do private-label shoppers," report Giddens et al. (2002).¹⁴⁰ Brand products also command higher prices, such that a "number one brand in a category can command a 10 percent price premium over the number two brand and a 40 percent premium over the store brand." Stakeholders in Malaysia need to think of developing their own brands of selected agricultural products that respond to consumer taste and demand among the members of the Association of Southeast Asian Nations and beyond. It is the natural continuation of the focused value addition culture that has emerged in the last 50 years and a response to the stage of agricultural transformation the country has achieved.

Rural nonfarm income is a key contributor to rural development: The importance of nonfarm income has been recognized by the government throughout the development of the agricultural sector. Data on rural nonfarm income are too limited for a thorough analysis. Data on the KADA development area indicate, however, that, in 1998–2017, rural nonfarm income contributed from 25 percent (in 2017) to 60 percent (in 1998) of farm household incomes, with a median value of 30 percent (figure 6.4). The rural population is still relatively large. Building on ongoing efforts to enhance rural nonfarm income is therefore critical.

Commitment to bold actions: Malaysia is rated high on future readiness for the disruption that is expected to follow the fourth industrial revolution.¹⁴¹ The country needs to extend this readiness to the agricultural sector. Most important of all, interventions in the sector should not be considered marginal, undertaken with a half-hearted approach. What worked in Malaysia is boldness to bring about change. Some question the cost of the operation led by FELDA and not the outcome. The outcome should justify the means. The alternative to FELDA's costly operations would have been

FIGURE 6.4. Rural nonfarm income, farming households, KADA area (% of total income)



unchecked inequality and entrenched poverty, fomenting instability, all of which would have impeded the transformation of the sector and thus the structural transformation of the national economy. To usher in the fourth industrial revolution in the agricultural sector, a commitment to allocating the required investment is badly needed, and this requirement is not limited to the public sector. The public sector can be an enabler and a catalyst in this process because Malaysia has a mature, well-developed private sector and an SME sector that could change the rural landscape if the challenges are addressed.



Conclusion

The government of Malaysia has achieved what many poor countries would consider a dream come true: (1) transforming agriculture, (2) virtually eradicating extreme poverty, and (3) establishing growth with equity and stability (price and political). It has succeeded in generating a virtuous circle within which the achievement of each goal required the simultaneous achievement of the other two. Its policies unleashed synergistic interactions among all three goals. Without sustained high growth, the pursuit of equity would have been socially divisive, threatening stability, which would undermine growth. The experience shows that governments can and should pursue all three goals.

Malaysia was a low-income country at independence from the United Kingdom in 1957. Its GNI per capita increased to an estimated US\$9,650 in 2017; life expectancy rose to the 70s (73.2 years for men and 77.6 years for women); and literacy reached an average 95 percent for all (in 2009) and 98 percent for the young (ages 15–24). Malaysia is now an upper-middle-income country, with consumers who are no longer totally dependent on rice and starchy staples, but who can afford more diversified, protein-rich diets.

These achievements did not happen overnight, for transformation is “slow magic”. It takes decades. It is the cornerstone of economic transformation. Malaysian leadership has given it the time and persistence required. The long time needed and accorded is an important factor in Malaysia’s success.

For policy makers and development practitioners, Malaysia’s achievements reinforce some basic (some even consider obvious) lessons in agricultural development and economic management. These are:

- A sustainable investment in agriculture for a relatively long period before moving to extract capital from the sector – avoid crippling the sector with taxation
- Promote not only primary agriculture, but also further processing and value addition
- Use foreign trade to expand your markets instead of resorting to high trade barriers
- Work with private sector and markets instead of supplanting them
- Ensure access to land and tenure security to poverty-stricken smallholders
- Build competent and mission-oriented institutions and fund them fully
- Ensure agricultural research intensity is maintained and expanded as transformation proceeds to higher stage
- Have a long-time horizon planning with a short-time implementable segments
- No substitute to targeted intervention by the government in support of smallholder agriculture. Malaysia’s experience clearly demonstrate that an area-based, multisectorally integrated and networked approach have delivered on inclusive growth.
- The food problem and food security can be addressed not only through domestic intensive and extensive agriculture, but through the complement of external trade. Subsidy toward food security at the earlier stage of development may be justifiable depending on local and international contexts. As transformation progresses, such policy should be critically examined in view of advances made recognizing the role external trade can play and factoring ability to finance imports. It also needs to be cognizant of the changes in consumer consumption patterns.
- Structural changes will require close monitoring and updating of policy and institutional mandates as a response to changing contexts following the structural shifts as transformation passes through the different stages
- Agricultural transformation requires a relentless pursuit. A shift in focus could reverse the gains made and stall transformation. In the 1990s, agriculture registered an anemic growth due to the 1980s changes in priority. Thanks to the high commitment and investments made in the 1970s, agriculture managed to absorb the 1980s shift in focus and didn’t falter immediately.

In agriculture and agroindustry, Malaysia has developed a profitable palm oil complex with global reach, with multiple processed end products; and although it cut back on their production at primary level, the manufacture of high-quality rubber products as well as a substantial cocoa grinding industry. The development of the agri-food subsector though

growing at nearly 6 percent per year in recent years (2010–15) (FAO 2019) lags in the productivity growth and dynamism shown by the tree crop subsector. Within the transformed agricultural and agroindustrial sectors, the more dynamic subsector is tree crops; the lagging subsector is agri-food, despite the massive subsidies and the protection of the paddy rice subsector. Despite the transformation, agriculture remains dualistic in two respects: between plantations and smallholders and between tree crops and food crops.

In the effort to reach high-income status within a decade or so and to have a food security policy adapted to the changing socioeconomic structure and circumstances, key challenges facing the government of Malaysia include (1) ensuring sufficient purchasing power and market access to adequate quantities of high-quality food among all by balancing considerations of trade and domestic comparative advantage; (2) achieving transformative growth in agri-food production and increasing productivity in the primary and processing levels of the tree crop subsector of oil palm, rubber, and cocoa; and (3) ensuring sustainability in the face of climate change and the rising environmental and social concerns of consumers. The government has to foster expansion in the scale and depth of transformation and anchor this expanded transformation on firm environmental and social grounds.

Notes

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139. Hassan, Asan Ali Golam, Ibrahim Ngah, and Shri-Dewi Applanaidu. October 21, 2018. "Agricultural Transformation in Malaysia: The Role of Smallholders and Area Development." Unpublished.
140. Giddens, Nancy, Melvin Brees, and Joe Parcell. 2002. "Building Your Brand." Missouri Value Added Development Center, University of Missouri. <http://www.muextension.missouri.edu>.
141. See Global Economic Forum 2018 Competitiveness Report.



Annexes

Annex A. Institutions and their roles in implementing the government's vision

The primacy of institutions: Acemoglu and Robinson argue that “institutions are the fundamental cause of economic growth and development differences across countries,” and they accept North’s definition that “institutions are the rules of the game in a society or more formally are the humanly devised constraints that shape human interaction.”¹⁴² As they rightly point out, this broad definition of institutions is both an advantage and a curse. It is an advantage in that it enables one to undertake an analysis of institutions without getting bogged down on taxonomies. It is a curse if one remains too general and does not focus on specific institutions. The focus of this report is on macro, trade, sectoral, and subsectoral policies and institutions that Malaysian leadership has created and that have largely shaped the extent to which the vision of growth with equity and stability has been realized. Box A.1 shows the cascade of long-term policies and perspective plans, five-year plans, and medium- and shorter-term plans. The entire planning architecture, when backed by ample budgets and skilled manpower, has proven to be a powerful tool of government shaping Malaysia’s long march of transformation.

BOX A.1

The development planning horizon in Malaysia

Initial five-year plans

- First Malaya Plan (1956–60)
- Second Malaya Plan (1961–65)
- First Malaysia Plan (1966–70)

Long-term planning

- Vision 2020 and National Transformation 2050 (TN50)
- First Outline Perspective Plan and the New Economic Policy (NEP 1971–90)
 - » Second Malaysia Plan (1971–1975)
 - » Third Malaysia Plan (1976–1980)
 - » Fourth Malaysia Plan (1981–1985)
 - » Fifth Malaysia Plan (1986–1990)
- Second Outline Perspective Plan and the National Development Policy (1991–2000)
 - » Sixth Malaysia Plan (1991–95)
 - » Seventh Malaysia Plan (1996–2000)

- Third Outline Perspective Plan and the National Vision Policy (2001–10)
 - » Eighth Malaysia Plan (2001–05)
 - » Ninth Malaysia Plan (2006–10)
- New Economic Model (2010–present)
 - » Tenth Malaysia Plan (2011–15)
 - » Eleventh Malaysia Plan (2016–20) and the National Development Strategy

Medium-term planning

- Five-year development plans, such as the 11th Malaysia Plan (2016–20)
- Midterm review of the five-year plans
- Government Transformation Program
- Economic Transformation Program

Short-term planning

- Annual budget

Source: Adnan, Hezri. 2018. Agricultural Transformation: Policy and Institutions. Unpublished.

Federal level and state institutions to serve agriculture and poverty reduction: Section I, figure 1.4 sets out the main institutions in agriculture created to implement the leadership’s ambitious restructuring of the economy and society. Beyond the institutions represented at the federal level, there are many agencies that were created outside agriculture, but which had a major impact on agricultural and rural incentives. The full range of ministries and agencies are discussed by Fletcher and Arshad (2007).¹⁴³ The authors rightly point out the danger of policy incoherence in a crowded institutional landscape. We discuss this below.

Medium- and long-term planning: continuity, variation and adaptability: An important feature of Malaysian planning is that it spans the medium term and the long term and the annual budget that eventually provides resources to execute project and programs outlined in the five-year medium-term plans.

The successive Outline Perspective Plans—the NEP of 1970–90, the National Development Policy (NDP) of 1991–2000, the National Vision Policy (2001–10), and Vision 2020—the New Economic Model (2010–20)—provided the overall strategic framework for the design and implementation of successive five-year plans (from the Second Malaysia Plan, 1971–75, to the Eleventh Malaysia Plan, 2016–20). The goal throughout is national unity and cohesion pursued through growth and social restructuring to achieve more equity and poverty reduction. This common thread offers continuity and direction in policy. The amount of growth and restructuring to be led by the state or driven by the private sector is an important variable across the successive plans. For example, in 1970–85, the NEP approach was primarily state led, while the NDP was primarily private sector driven, while the public sector played a supportive role.

Key features of planning: The NVP is a continuation of the NEP and NDP policies contained in the Third Outline Perspective Plan (2001–10), but it places new emphasis on building the nation’s resilience (as a response to the rice price shock of 2007–08); and on building a knowledge-based economy to raise the value added of all sectors and thus improve its competitiveness in a more globalized world economy. The government has also shown its adaptability in its willingness to admit outright implementation failures.¹⁴⁴

The combination of continuity, with adaptability in the face of changing circumstances, is a strength of governance in Malaysia. Moreover, whether state-led or private sector driven, the public sector is extensive and plays a major socioeconomic role. The number of institutions and agencies that are active in food, agriculture, and the environment is over 60, not including land administration offices with a major impact on agricultural and rural development (Fletcher and Arshad 2007).

A wealth of sector level institutions for growth with equity: In addition to institutions which operate at the macro and trade level, Malaysian leadership created a wealth of institutions to intervene directly in the agricultural and the rural sectors. The focus in this report is only on those with an important impact on the sector; in particular those which impact on poor rural areas and regions; on access to and use of key resources, for example, land and labor; and on services, for instance, R&D, extension and training, and markets; all vital to the transformation and inclusive growth of the agro-based sector

Poor rural areas: IADPs: Integrated rural development is the government’s core approach to reducing poverty in rural areas either by a new development area or by in situ development. The mission of IADPs was to deliver an integrated and coordinated package of basic physical and economic infrastructure and social amenities such as irrigation and drainage; settler houses, rural roads, water, and rural electrification; health facilities, schools, and community centers. IADPs have developed paddy areas, for example, MADA and KADA.¹⁴⁵ Other IADPs are in West Johor I and II, West Palang, Malacca, and Negeri Sembilan Timur.

Land: FELDA, FELCRA, and RISDA: Land consolidation and rehabilitation represent the other component of integrated rural development. In the plantation sector, the government wanted to include the poor and landless Bumiputeras in oil palm production and processing in such a way that they would substantially benefit not only as laborers, but also as owners of land and of shares, including in downstream processing (box A.2). To benefit them

without launching a potentially divisive land reform, FELDA has, since 1961, resettled the poor and landless through land development schemes on public land in Peninsular Malaysia, providing each household with housing and basic social amenities. To obtain land and title, smallholders have to sign a contract to supply FFB to FELDA. In addition, FELDA provides supervision, inputs, finance and extension services to participating smallholders. FELCRA is similar to FELDA, except that it deals with rehabilitating already cultivated low cost state schemes or opening up jungles and virgin lands. RISDA (1972) is responsible for block plantings for rubber or oil palm.

BOX A.2

FELDA and poverty reduction

The primary income of FELDA settlers derives from their oil palm harvest. Despite volatility in crude palm oil prices, settler income has grown above both the presettlement level and Malaysia's minimum monthly wage of RM 800 (in 2014). An impact evaluation by the World Bank (1987) concluded that the income of oil palm settlers was 300 percent–350 percent above the rural poverty level and greater than the income of rubber growers. FELDA's primary goal of poverty reduction is considered a success.^a

Settlers receive a secondary income in the form of dividends. Koperasi Permodalan FELDA (KPF) was established in 1980 to enable settler participation in FELDA companies and value chains. Settlers have enjoyed good annual dividends (in the range of a 10 percent–18 percent dividend yield over 30 years) arising from the profits of the entity's 51 percent interest in FELDA Holdings and 0.63 percent interest in FELDA Global Ventures Holdings Berhad (FGV). They are also recipients of a trust fund seeded with 20 percent of FELDA's shares in FGV. Today, KPF owns not only palm oil enterprises, but also real estate, financial services, and other investments.

In 2015, shareholder equity in KPF had grown from RM 340,000 at inception to approximately RM 4.7 billion. The creation of economic value through KPF has enabled inclusive growth.

In particular, the extent to which the performance of FGV impacts settlers can be seen through both direct ownership of shares in FGV and indirect ownership in KPF. Poor financial performance muddied by political interference, questionable corporate deals, and illegitimate spending at FGV caused the share prices to plummet (Y. L. Khor 2017). Consequently, KPF has been downscaling its stake in FGV. The elimination of political interference and the restructuring of government-linked companies are mandates of the newly elected government.

The interests of settlers are represented by a number of FELDA nongovernmental organizations, such as the FELDA Malaysian Youth Council, the Coalition of Professional FELDA Thinkers, the Alumni Asrama FELDA Malaysia, and the National FELDA Settlers' Children's Association.

Source: Tey, Yeong Sheng, and Mark Brindal. 2018. "The Development of Agro Industry and Value Chains: Lessons from the Malaysian Palm Oil Sector," unpublished working paper.
a. A 1.0 hectare FELDA holding earns 9.3x crude palm oil price; a 4.9 hectare holding earns 9.5x, and a 5.7 hectare holding earns 12.4x crude palm oil price (Khor et al. 2015).

Main FELDA operations on plantations: As of 2017, FELDA developed settlements covering 12 percent of total land; FELCRA 3 percent and RISDA one percent. The big estates cover 61 percent of total cultivated land. More than half a million people benefited from the land development schemes of FELDA, which also became the largest palm oil marketing group in Malaysia.¹⁴⁶ The total number of smallholders organized and assisted by the three institutions are around 940,000 compared with 980,000 independent smallholders, who cultivate 17 percent of total land.¹⁴⁷ In the early years, the small plots were cultivated separately. But, over the years, land was gradually pooled and managed as plantations, and smallholders received shares and dividends according to the area to which they contributed. In 1991, the status of FELDA was also changed to enable it to prioritize its commercial over its social development role. It was restructured, and public funds were no longer available for its business operations (Tey and Brindal 2018).

State land development agencies: In addition to the federal agencies, there are numerous state agencies that are in charge of land development programs and that have social objectives similar to the federal agencies, including the Sarawak Land Consolidation and Rehabilitation Authority, the Cooperative Land Development Societies of Sabah, and the State Land Development Boards. These seek to complement the work of the federal agencies.

Land titling in Malaysia's complex land institutional structure: The importance the government has given to having a well-functioning land administration system is consistent with the tenet of many economists such as North, Acemoglu and Robinson (2005),¹⁴⁸ that enforcement of private property rights is fundamental to private incentives, investment, growth and development. In Malaysia, there is division of power with respect to land administration between the Federal and the State governments;¹⁴⁹ such division being considered the backbone of the federation structure of Malaysia. Despite the complex institutional and legal context for land administration in Malaysia, the government succeeded in issuing provisional and full titles¹⁵⁰ which guarantee property rights and tenure security to all holders of these titles in Peninsular Malaysia.¹⁵¹ The qualified title process required relatively rapid completion of land administration information that secured land rights and facilitated land market functioning. They did not require information from a full cadaster. Instead, they were based on sketches by nonsurveyors which still enabled State governments to complete the initial cadastral map and issue the title. Over time, the government undertook measures that enabled qualified titles to be upgraded to full titles; for example, between December 2014 to June 2015, 85 percent of qualified titles in Peninsular Malaysia had been converted to full titles.¹⁵² The tenure security gained through titling, and access to affordable land administration systems is denied to some 70 percent of the population worldwide (World Bank, November 2017). In the case of smallholders who participated in land settlement schemes, they doubly benefited: first from receiving the land; then the titles. Unlike most laborers worldwide, they owned not only their labor, but also a valuable income-earning asset, land.

Not all Malaysian smallholders enjoy private property rights: The Torrens System of land registration and titling has not been extended to apply to all smallholders outside these land development schemes. For example, there are frequent land disputes and encroachments on land over which the indigenous peoples of Sabah and Sarawak claim customary rights (FAO 2018). Smallholders engaged in non-rice food crop production also have insecure land tenure (FAO, February 2019) often involving Temporary Occupation License (TOL) which requires annual renewal. This insecurity of tenure invariably dampens any efforts in infrastructural and on-farm or field improvement, effectively putting a lid on potential productivity increases.

Cooperative development: Cooperative development for smallholders has been encouraged by the government. Land management rights have been outsourced to cooperatives, enabling them to manage their land as estates, thus increasing their FFB productivity and incomes through wages and dividends. Furthermore, it is much more cost-effective for mills to deal with cooperatives than with individual smallholders (Tey and Brindal 2018). The cooperatives are able more easily to undertake certification, acquire modern technologies, adopt information and communication technologies and portals, and venture into processing. Small Bumiputera agroentrepreneurs have also been encouraged to form cooperatives to increase their capacity, thus contributing to their potential income earning ability and commercial success. As elsewhere, cooperatives have also proved to be useful conduits for funneling extension advice, inputs, and financing, while helping smallholders diversify risks.¹⁵³

Support services: R&D and extension in the main plantation crops: Emphasis on agricultural R&D is long-standing in Malaysia. In the 1900s, the British colonial government undertook R&D programs to select superior varieties and higher yielding seeds. Thus, “neglect of research means in fact a cutting off of the knowledge from which all future development will flow. . . . Research therefore must be continuous and expanding.”¹⁵⁴ Ever since the 1950s, Malaysian leadership has fully appreciated the key role of effective technology transfer in rendering commercial agriculture productive and competitive. This is particularly true because commercially successful diversification requires constant and rapid learning by smallholders. R&D was essential given that Malaysia’s three main tree crops were imported from abroad: oil palm from West Africa (the 1870s) and rubber and cocoa from South America (the 1890s and the 1950s, respectively). R&D was essential in properly adapting these imported tree plants and making the crops commercially viable. In more recent years (the early 2000s), research in biotechnology has been espoused by the government and is said to be able to revolutionize agriculture (Wong 2011). Responsibility for research was entrusted to the Agro-Biotechnology Institute Malaysia and to Malaysian Bioeconomy Development Corporation.¹⁵⁵ The latter is to work with the Malaysian Agricultural Research and Development Institute and Universiti Putra Malaysia and develop links with centers of excellence in agricultural biotechnology worldwide.¹⁵⁶ Important examples of continuing research by major tree crop are as follows:

- **Oil palm:** The Oil Palm Genetics Laboratory (1960) increased yields, thereby inducing the commercialization of oil palm cultivation. The Palm Oil Research Institute of Malaysia (1979) undertook research with private research stations.¹⁵⁷ It merged with the Palm Oil Registration and Licensing Authority to become the MPOB in 2000. MPOB research, adequately financed by the cess on crude palm oil, encompasses all activities, from production and quality enhancement to consumption (Tey and Brindal 2018). The MPOB also works with foreign palm oil research institutes; for instance, in Colombia, France, Indonesia, and Nigeria. Biotechnology research in the palm oil industry is expected to lead to the development of molecular markers to increase production, higher-quality oils through DNA recombinant technology, and oleochemicals for diversified downstream processing. The MPOB has intensified its research in biotechnology to produce high-yielding clones and breeds and develop more high-value products.
- **Rubber:** Research was undertaken under the British by the Rubber Research Institute Malaysia, which began operation in 1926. The estate sector invested in R&D and increased productivity through the use of high yielding clonal varieties. It is hoped that biotechnological techniques such as tissue culture, genetic engineering, and molecular marker, will result in yield increases from 3,500 kilograms per hectare to 5,000 kilograms per hectare (Yusoff 2007).
- **Cocoa:** The Malaysian Cocoa Board is responsible for R&D in cocoa. The boom and bust world market conditions and the continued decline in cocoa bean prices have been poor incentives for production, especially on the estates, although the profits from grindings have risen.¹⁵⁸ The number of estates has contracted from 697 (111,500 metric tons) in 1988 to only 7 (96 metric tons) in 2015.¹⁵⁹ Given the ambitious target of the National Commodity Policy (2011–20) for an increase in bean production, from a target of 10,000 tons in 2010 to 60,000 tons in 2020, and in yields, from 1.2 tons per hectare to 1.5 tons per hectare, the role of the Malaysian Cocoa Board in R&D and extension must expand.¹⁶⁰ It is hoped that biotechnology will develop a high-quality cocoa resistant to disease (pod borers and root diseases) with high butter content and improved cocoa flavor.

Support services: R&D and extension for agri-food: Relative to the focus given to the plantation sector, the government has accorded less priority to the delivery of support services to the agri-food sector. It was not until after the food (fuel and financial) crisis of 2008–09 that increased policy attention was accorded to the (non-rice) agri-food sector. The National Agro-Food Policy identified R&D, innovation and technology as major areas of weakness for the sector; and announced the creation of the Council of Agricultural Research and Development, Innovation, and Commercialization.¹⁶¹ This council, with members from all relevant stakeholders, would develop databases and e-networks to facilitate research and thus add to the work of the Malaysian Agricultural Research and Development Institute, which has programs in numerous subsectors, for example, food crops, livestock, poultry, and fisheries. For example, the institute has been active on R&D for fruits, with commercial importance, for instance, pineapple, durian, and mango. The state departments of agriculture and veterinary services also deliver extension services working with farmers’ associations, which have merged with agro-based cooperatives to form the Farmers’ Organization Authority in 1973. These extension services become particularly important given the advanced average age of many farmers, above

50 or so. Another important consideration: the research has not sufficiently addressed problems of obtaining higher and more stable yields and for smallholders and SMEs, and to accessing marketing.¹⁶² Biotechnology holds promise for food crops too resulting in for example: more disease-resistant strains; improved supply of quality hybrids and of quality planting materials; and longer shelf life of fruits and vegetables. Biotechnology application is however still its research phase in Malaysia, being carried out mainly by research institutions and universities.

Finance: export taxes, foreign inflows, and domestic banks: To finance its vision and its plans for agricultural diversification, the government depends on export taxes on tin, palm oil, and rubber and tax revenue from oil and gas discoveries; thus, petroleum taxes accounted for 16 percent of total taxes in 2005 (Meerman 2008).¹⁶³ In 1956–61, the long-established, publicly owned Commonwealth Development Corporation financed plantation-based projects, including FELDA. The government relied increasingly on international financial institutions such as the Asian Development Bank, the Kuwait Fund for Development, the Overseas Economic Cooperation Fund, and the World Bank. When the central bank, Bank Negara Malaysia, was created in 1959, the domestic banking sector was dominated by foreign banks, mainly British banks. The central bank pushed the government to launch institutions to provide financing in sectors considered too risky by commercial banks. In 1969, the government created Agrobank.¹⁶⁴ The focus of this bank in the 1960s was to meet the short- and medium-term credit needs of production areas beyond the granary paddy areas (for example, the Muda and Kemubu areas). The bulk of the financial needs in agriculture (90 percent) was met by commercial banks, however, not by Agrobank, and this financing goes mainly (70 percent) for plantation crops, such as palm oil and rubber. More generally, the wealth of Malaysia's natural resources (timber, tin, oil, gas, petroleum, huge uncultivated areas of fertile land, and the ready availability of labor) has been skillfully exploited to generate the resources needed to finance the government's ambitious development plans not only in the agricultural and rural sector (FAO, February 2019). Thus, Malaysia's transformation was not undermined by the resource curse.

Finance: smallholders and SMEs in the agri-food business: Commercial banks are not interested in lending to smallholders and SMEs as they consider them too risky. Agrobank provides the Centralized Agriculture Credit Scheme to smallholders in Peninsular Malaysia. It has remained the main source of funding (88 percent) for individual farmers diversifying into farm and nonfarm activities, including for food related activities (FAO, February 2019). Poor smallholders in Sarawak have an alternative, the Development of Sarawak Smallholders Agriculture Scheme, which supports new and small businesses and works with banks to facilitate government-backed interest free loans to poor borrowers to increase income. There is also a micro-finance network in which identified commercial banks, development financial institutions, and credit cooperatives provide finance to viable microenterprises. The 11th Malaysian Plan (2016–20) has emphasized the development of agri-food and the importance of improving farmer and SME access to affordable finance (FAO, February 2019).

Finance, the missing polar: Despite these multiple avenues of finance for smallholders and small entrepreneurs, there are still many small farmers and SMEs who are too poor and do not have the collateral to be of interest to commercial banks, and too rich to qualify for government loans to new companies on generous terms (FAO, February 2019). Meeting these collateral requirements is still considered to be a major challenge for most smallholders. The government is developing new financial instruments to extend the reach of its concessional financing.

Commodity boards, development authorities, and other key supportive agencies: A hallmark of the Malaysian transformation is the important supportive role played by development-oriented commodity boards in mobilizing and managing resources to achieve the national socioeconomic and political goals of productivity growth, increases in incomes, and poverty reduction. Unlike many agricultural commodity boards in developing countries, such as the Ghana Cocoa Board, the boards in Malaysia are not primarily instruments of taxation that operate in a macro and incentive environment inimical to farmer incentives.¹⁶⁵ They are supportive not extractive institutions. The major boards are (1) in the plantation subsector: rubber (the Malaysian Rubber Board), oil palm (MPOB), and cocoa (the Malaysian Cocoa Board) and (2) in food: paddy rice, pepper, livestock, and fisheries. They all share a core of common functions, although there is substantial variation. At the production stage, they supply subsidized inputs (for example, high-quality planting materials) and support services (for instance, extension and training). For tree crops and paddy rice, they are active in processing and marketing as well. Their functions evolve as conditions change, or they even disappear as

their functions are assumed by other entities. In 1965, Peninsular Malaysia relied on the Federal Agricultural Marketing Authority to market rice and other commodities. The National Paddy and Rice Board was established in 1971 to take over the marketing functions of the authority, which now assists smallholders and SMEs in drafting contracts with supermarkets. The results are mixed.¹⁶⁶ In eastern Malaysia, the Sabah Paddy Board (1967) encouraged double cropping and mechanization and undertook milling and marketing. In the Second Malaysia Plan (1971–75), the National Paddy and Rice Authority was created. BERNAS was corporatized in 1994 and privatized in 1996. The withdrawal of its import monopoly is being considered. The MOA administers rice policy and retains regulatory authority over production and imports. The growing power of boards is exemplified by the case of palm oil. The MPOB, established in 2000, took over the research and registration functions of previous boards and authorities. The power of a board can also wane, as in the case of kenaf and tobacco, the agricultural importance of which has declined dramatically (Tey and Brindal 2018).

Market institutions and distribution channels for agri-food (excluding rice and plantation crops): In a market economy, the structure of market institutions are of fundamental importance. Traditional wet and dry markets operate widely in agri-food which is dominated by smallholders, SMEs, and small retailers. These traditional channels are a far cry from the integrated supply and value chain that typifies Malaysia’s industrial commodity exports and the expanding urban consumer markets with the “supermarket revolution”. In these traditional channels, there are a large number of collectors, primary and secondary wholesalers, and retailers between producers and consumers.¹⁶⁷ To the extent they are oligopolistic, these markets leave small producers and sellers vulnerable to the collusive behavior of intermediaries. Other recurrent problems include: rudimentary infrastructure and logistics facilities; sharp price fluctuations; lack of information by producers of consumer preferences in terms of volume, variety, grade and standards; and delayed payments to producers. As a response to these and other problems, in the Seventh Malaysia Plan (1996–2000), the government encouraged small farmers to participate in contract farming. The Federal Agricultural Marketing Authority has been assisting small farmers in various ways, for example, by helping draft preharvest agreements between producers and contractors on the conditions of the sale of crops. In the Ninth Malaysia Plan (2006–10), it used an information and communication technology application to assist with marketing.¹⁶⁸

The Malaysian experience offers additional evidence that institutions matter in agricultural transformation and play a pivotal role in facilitating and coordinating the process. The vision of the government and other stakeholders in agricultural development was expressed in long-term planning and the establishment of and budgetary support for responsible institutions to carry out and monitor the implementation of the plans. Recognizing the importance of skilled manpower, the institutions were staffed by qualified and dedicated individuals.

“Societies with economic institutions that facilitate and encourage factor accumulation, innovation, and the efficient allocation of resources will prosper,” argue Acemoglu et al. (2005, 389). Within this framework, these institutions have facilitated and enabled the transformation of agriculture in Malaysia. Government commitment is necessary, but, without the institutional mechanisms to realize this commitment, any elegant plan will remain only a plan. From service provision to the delivery of goods and knowledge, from regulation to enforcement; from production to marketing, from facilitating private sector involvement to smallholder empowerment require effective institutions. The experience of FELDA in empowering smallholder farmers and integrating them into value chains and FELDA’s extensive impact locally and economy-wide represent an exemplary undertaking that provides a lesson to other countries and serve as a foundation on which stakeholders in Malaysia may build.

Notes

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150. The Torrens Title System of land registration was introduced in Malaysia by the British and is the tenure system implemented by the National Land Code. The National Land Code (1965) provided a uniform system of tenure for the 9 Malay States on Peninsular Malaysia and the Federal Territories.
151. There is a separate legal basis for land tenure in Sabah and Sarawak. They have different land administration structures.
152. World Bank (2017), "Enhancing Public Sector Performance: Malaysia's Experience with Transforming Land Administration," *Global Knowledge and Research* (November), Malaysia Development Experience Series, World Bank, Washington, DC, <http://documents.worldbank.org/curated/en/928151510547698367/pdf/121243-REVISED-World-Bank-Report-06-Land-Administration-FA-FULL-Web-V2.pdf>.
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157. Oil palm cultivation took off when in 1981, weevil pollination was introduced from West Africa. Previously, it had to be pollinated by hand. Somehow, the native African oil palm weevil was not brought together when the oil palm was first transplanted from West Africa (Wong 2011).
158. Grindings refer to the grinding of cocoa beans, the output of which is melted into chocolate liquor and then cocoa butter. For detailed information on the production of chocolate from cocoa beans, see International Cocoa Organization, <https://www.icco.org/about-cocoa/processing-cocoa.html>.
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Annex B. The tree crop subsector: Palm oil, rubber, and cocoa

The increasing dominance and spread of value chain development: VCD in agriculture and agri-food has been a major phenomenon in the developing world since the 1990s. In food, it has been largely driven by the supermarket revolution, which was driven by rapid urbanization rates, the rise of an urban middle class, and the dietary transformation this entails. The revolution proceeded in waves (Reardon, Timmer, and Minten 2012).¹⁶⁹ The first wave started in Central Europe, Latin America, and South Africa in the early 1990s. The second wave involved the spread to Southeast Asia in the mid- to late 1990s (outside transition countries such as Vietnam), Central America, and Mexico. The third wave started in the late 1990s and 2000s in China, Vietnam, India, and the Russian Federation. In all these countries, a key challenge is how best to integrate smallholders in the value chain in such a way that they benefit from direct access to growing and lucrative markets. This is also a challenge in industrial crop VCD; in all VCDs, the asset endowments of smallholders influence whether and how they participate in VCD and whether they benefit. These asset endowments can include land ownership; information on market prices and quality grades; and membership in a producers' cooperative or other collectives, and so on. Furthermore, the bargaining power smallholders determine the level of benefits that accrue to them. In the case of Malaysia, what these assets are depends largely on the actual crop and the government policy and projects for that crop.

The rise of palm oil: Selected features

Importance of oil palm can hardly be overstated: Oil palm rose to become the backbone of Malaysia's agriculture during the National Economic Plan (NEP 1971–90), which covered four planning periods (the Second Malaysia Plan through the Fifth Malaysia Plan). In simple terms, palm oil is king. The government took the lead in investing heavily in the palm oil subsector, with FELDA (established in 1956) spearheading the effort. More generally, public and private investment in oil palm estates gained momentum from the 1960s on. The investment was not just on primary production, but also on the value adding stages of processing and marketing. The collection of the cess on crude palm oil and also on rubber enabled the government, through the MPOB and the Malaysian Rubber Board to finance its multiple operations, for instance, R&D, extension, commercialization, and so on. More generally, the importance of agroprocessing and the diversification of the end products can be seen by estimates of the contribution of agro-based industry to GDP (1990–2010) (tables B.1 and B.2). The contribution of agro-based industry is almost as large as the contribution of primary agriculture (2010).

Expansion of palm oil refineries: The first palm oil refinery was set up in 1972; by 2005, 18 million tons were being refined. The first oleo chemical plant was set up in 1980; by 2005, there were 41 plants with a 3 million ton capacity. Biodiesel research started in the early 1980s and the government launched the National Biofuel Policy in 2005 (Hameed and Arshad 2007). By the late 2000s, the government had established five palm oil industrial clusters.¹⁷⁰

Major sources of expansion: The rise of oil palm as a major driver of Malaysia's agricultural transformation is not because of its sustained productivity growth since the early decades. Indeed, FFB grew from 12 tons per hectare (1960) to reach 18.6 tons per hectare by the mid-1970s, but stayed more or less constant since.¹⁷¹ In addition, the mill oil extraction rate has, since the 1960s, fluctuated at around 20 percent (Tey and Bridal 2018). Thus, the yield per hectare of FFB and the oil extraction rate are high, but have not increased in decades. Instead of sustained productivity growth, the palm oil complex expanded because of extensive land cultivation and expanded milling capacity, as follows.

- There was a phenomenal increase in oil palm cultivation as evidenced by the 55,000 hectares (1960) which had expanded to 4.1 million hectares by 2005 and to 5 million hectares in 2011,¹⁷² including opening up new land in Sabah and Sarawak especially during more recent years. After over 50 years, oil palm occupied 75 percent of the total arable land in Malaysia. By 2017, it had reached 5.8 million hectares (Tey and Brindal 2018).
- Expansion of FFB supply was accompanied by expanded milling capacity as it is necessary that FFB be milled within 24–48 hours of harvest to preserve the quality of the oil. Milling capacity increased to nearly 84 million tons of FFB by the 2000s; from 46 mills to nearly 400 in the early 2000s.¹⁷³
- By 2017, the total downstream processing infrastructure consisted of 454 FFB mills; 47 palm kernel crushers; 53 refineries; 19 oleochemical plants; and 29 biodiesel plants; a major expansion from the early decades (Tey and Brindal 2018).

TABLE B.1. Value added in agriculture and agro-based industry, 1990–2010

RM, millions, 1987 prices

Commodity	1990	1995	2000	2005	2010
Agriculture	17,308	17,114	18,662	21,585	27,517
	(16.33)	10.27)	(8.86)	(8.24)	(7.83)
Industrial commodities	12,041	10,980	11,033	13,278	15,521
Oil palm	3,350	4,235	5,850	7,915	10,068
Forestry and logging	5,194	4,139	3,055	3,016	2,761
Rubber	2,634	2,129	1,868	2,264	2,554
Cocoa	863	477	250	83	138
Food commodities	5,267	6,135	7,629	8,308	11,996
Fisheries	1,534	1,964	2,493	2,389	3,875
Livestock	1,098	1,531	1,520	2,089	2,483
Other agriculture	2,635	2,640	3,616	3,830	5,638
Agro-based industry	8,102	11,174	13,584	16,928	22,221
	(7.64)	(6.71)	(6.45)	(6.46)	(6.33)
Vegetable and animal oils and fats	1,036	1,203	2,526	3,639	5,614
Other food processing, beverages and tobacco	2,642	3,504	4,010	4,790	6,333
Wood products including furniture	1,776	3,030	2,934	2,972	3,761
Paper and paper products, printing and publishing	1,116	1,888	2,293	2,640	3,275
Rubber processing and products	1,532	1,549	1,821	2,887	3,238
Total agriculture and agro-based industry	25,410	28,288	32,246	38,513	49,738
	(23.97)	(16.98)	(15.31)	(14.70)	(14.16)
Gross domestic product at purchaser prices	105,977	166,625	210,558	262,029	351,297

Source: Ninth Malaysia Plan (2006–10); adapted from Tey, Yeong Sheng, and Mark Brindal. 2018. "The Development of Agro Industry and Value Chains: Lessons from the Malaysian Palm Oil Sector," unpublished working paper.

Palm oil institutions to integrate smallholders in VCD: FELDA, FELCRA, and RISDA:¹⁷⁴ To integrate the poor and landless Bumiputeras in oil palm production and processing, the government created FELDA (in 1961), FELCRA (1961), and RISDA (1972).¹⁷⁵ FELDA is the largest of the three agencies. Although there is little doubt that these land development schemes did integrate smallholders in the oil palm growth engine, the cost per beneficiary of the FELDA approach has been criticized for being high and its selection criteria of smallholder households biased in favor of not the poorest Malay households. “By 1981, FELDA’s cumulative expenditures financed by the government stood at about RM 3 billion, while the total number of settler households was about 70,000. Hence, average costs per settler family were then just under RM 43,000.”¹⁷⁶ In addition, the smallholder households chosen were not in the rural northern agricultural states of greatest need (Perlis, Kedah, Kelantan, Terengganu) but in the remaining states of the peninsula (other than Selangor). Based on a survey conducted in 1974, on average these settlers were cultivating 10.6 ha, and they were in the third income quintile, well above the poverty line. Zin argued that was that although smallholders were included, they were not the poorest.¹⁷⁷

TABLE B.2. The contribution of agricultural subsectors to GDP, value and share

RM, billions

	2011		2012		2013		2014		2015e		2016p	
	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%
Total Agriculture	88.6	10.2	89.4	9.8	91.2	9.5	93.0	9.2	94.2	8.9	89.5	8.1
Commodities	58.8	6.8	57.6	6.2	57.3	6.0	57.0	5.6	57.5	5.3	51.3	4.7
Oil Palm	41.5	4.8	41.4	4.5	42.5	4.5	43.5	4.3	44.1	4.1	38.5	3.5
Rubber	9.4	1.1	8.6	0.9	7.8	0.8	6.3	0.6	6.8	0.6	6.4	0.6
Other (Commodities)	7.9	0.9	7.6	0.8	7.0	0.7	7.2	0.7	6.6	0.6	6.4	0.6
Livestock	7.7	0.9	8.3	0.9	9.1	1.0	9.8	1.0	10.0	0.9	10.4	0.9
Poultry	4.5	0.5	5.0	0.5	5.5	0.6	6.0	0.6	6.2	0.6	6.5	0.6
Cattle	0.9	0.1	0.9	0.1	1.0	0.1	1.0	0.1	0.9	0.1	0.9	0.1
Other (Livestock)	2.3	0.3	2.5	0.3	2.6	0.3	2.8	0.3	2.9	0.3	3.0	0.3
Food Crops	12.9	1.5	13.9	1.5	15.0	1.6	16.2	1.6	16.6	1.6	17.5	1.6
Paddy	2.0	0.2	2.0	0.2	2.1	0.2	2.2	0.2	2.1	0.2	2.2	0.2
Vegetables	4.7	0.5	5.2	0.6	5.7	0.6	6.2	0.6	6.4	0.6	6.8	0.6
Fruits	3.1	0.4	3.3	0.4	3.6	0.4	4.0	0.4	4.1	0.4	4.4	0.4
Other (Food Crops)	3.1	0.4	3.4	0.4	3.6	0.4	4.0	0.4	4.0	0.4	4.2	0.4
Fisheries	9.2	1.1	9.6	1.1	9.8	1.0	10.0	1.0	10.0	0.9	10.3	0.9
Marine fishing	6.2	0.7	6.4	0.7	6.5	0.7	6.6	0.7	6.7	0.6	7.0	0.6
Aquaculture	3.0	0.4	3.2	0.4	3.2	0.3	3.3	0.3	3.3	0.3	3.2	0.3
GDP at PP	864.9		912.3		955.1		1012.4		1063.4		1108.2	

Source: Department of Statistics, Malaysia.

Private estate management, FELDA and smallholders in the 2000s: The dualistic structure of the palm oil complex has persisted despite government schemes to include smallholders organized essentially as outgrowers of nucleus estates. Private estates occupy 61 percent of oil palm planted area; FELDA and other government schemes: 22 percent; and independent smallholders: 17 percent (2019), (FAO, 2018: Fig 27, 45-46). The plantations cover huge areas, 2,000 to 10,000 hectares each; with most plantations depending on foreign workers (mainly Indonesians), hired through contractors. The FELDA schemes are also extensive and mostly managed as if they were plantations. Young, educated rural Malays have been migrating to urban areas since the 1980s; so that many plantations have lost all their original Malay workers, except for older people still inhabiting land development schemes and smallholdings. Independent

smallholders have farms of one or two hectares. In addition to the sizable capital, including processing plants, and extensive market penetration, the major advantage that private estates and the various government land agencies (both private and public agencies constitute the corporate palm oil industry) have over independent smallholders has been their substantial investments in R&D. R&D is critical in enabling corporate palm oil to keep a competitive advantage in world markets. However, independent smallholders who occupy 17 percent of cultivated area, do not have this advantage, namely access to extension services, as the Department of Agriculture does not adequately furnish them with those services. Partly as a result, the FFB yield of smallholders (including in FELDA) is about 20-30 percent lower than the level achieved on private estates (Poapongsakorn 2019).

Sustainability issues are of increasing concern: The RSPO was launched in 2002 by key retailers and end users, palm oil producers (for example, the Malaysian Palm Oil Association), and the Worldwide Fund for Nature. It encompasses a substantial portion of the industry along the entire global supply chain. The RSPO has issued comprehensive guidelines on environmental and social sustainability issues. There are eight principles in the RSPO Principles and Criteria (Pye 2017).¹⁷⁸ Principle 5 covers environmental responsibility and the conservation of natural resources and biodiversity. Principle 6 is on the responsibilities of employees and of individuals and communities affected by growers and mills. Companies that adhere to all eight principles obtain a certification, RSPO Certified Sustainable Palm Oil, which carries a premium in the market because more and more end users are demanding the certification. The criticism is that the RSPO certification is merely a sustainability gloss because the RSPO has not been able to sanction RSPO members who break the Principles and Criteria. Members who break the rules still receive RSPO certification, therein the erosion of customer trust. Examples include the following:

- **Loss of biodiversity:** A major source of conflict is between plantation expansion and biodiversity. Expansion since 1997 has been taking place in frontier regions, thus threatening irreversible destruction of habitat.¹⁷⁹ The main areas of oil palm expansion belong to the biodiversity hotspot, Sundaland.¹⁸⁰ Studies of plantations established there have found a drastic reduction in biodiversity. The loss in biodiversity is exacerbated by fragmentations in lowland forests brought about by large-scale plantations. An example is the fragmentation of the Kinabatangan River in Sabah, one of the last remaining floodplain forest landscapes in Malaysia, home to the dwindling elephant and orangutan populations (Pye 2017).
- **Customary land rights land grab:** Another major source of conflict is land clearing in customary rights land and other villagers' land without prior consultation and due land acquisition process, as in the case of three subsidiaries of Wilmar in Sambas, West Kalimantan, Indonesia (Pye 2017). More generally, ethnic minorities in Peninsular Malaysia, Sabah, and Sarawak are being dispossessed as their lands are being encroached upon, for example, the Orang Asli tribes,¹⁸¹ the Dayak communities, and the Iban cultivators of Sarawak (FAO 2018); hence, the skepticism regarding the application of Principle 6.
- **Greenhouse gas emissions, especially methane from palm oil mill effluent:** Palm oil mill effluent is a major contributor to greenhouse gas emissions following land conversion and the draining of peat land. Presenters at the International Palm Oil Sustainability Conference in 2008 argued that the palm oil industry would be a net storer of carbon once the methane released by the effluent is captured. According to Pye (2017), most of the 410 mills in operation in Malaysia opt for an open pond or lagoon system to treat the effluent because this is the least costly solution. The RSPO has not even published guidelines to address this environmental issue (Pye 2017). Under the Economic Transformation Program's Entry Point Project on Developing Biogas Facilities at Palm Oil Mills, emissions associated with the effluent were substantially reduced in 2015. Under the Paris Agreement (2015), Malaysia is committed to reducing greenhouse gas emissions by 45 percent by 2030 based on the benchmark of the emissions intensity of GDP in 2005 (Tey and Brindal 2018). The Renewable Energy Directive of the European Union also mandates methane capture.
- **Labor rights and disputes:** On labor issues, the RSPO requires that pay and conditions meet minimum standards and are sufficient to provide decent living wages. However, many national and international nongovernmental organizations have documented the poor living conditions on oil palm plantations, claiming widespread violations of basic international labor norms, including child labor and long-term abuse of temporary contracts (McCarthy and Cramb 2017).¹⁸²

Rubber and cocoa: Brief background

Rubber, a major export earner with R&D support was primarily an estate crop: In British Malaya, rubber and tin were the major export earners. They contributed 86 percent of total export earnings. By 1960, rubber exports contributed 55 percent of total export earnings, and palm oil only 1.7 percent (Ariff and Nambiar 2011).¹⁸³ Europeans dominated the plantation sector by the late 1930s and the dualism of this plantation sector was well established. In 1926, the British set up the Rubber Research Institute, which released high-yielding seeds. The seeds boosted rubber yields leading to rapid increases in production between 1930s until 1980s, trebling the returns per acre for estates and doubling it for smallholders. The adoption rate by the estate sector rose from 30 percent of the total area in 1955 to 70 percent by 1970. Over the same period, the adoption rate by smallholders was much less, varying between 36 percent and 59 percent of the total, because they faced many more constraints to replanting. One major constraint under the Rubber Industry Replanting Scheme was the minimum acreage requirement which meant that nearly 50 percent of their land had to be allocated to replanting to receive the grant. Many could not afford the income forgone. Only the larger smallholders owning holdings of 25–100 hectares replanted (Ariff and Nambiar 2011). It was not until the Rubber Industry Replanting Smallholders Scheme was introduced in 1956 and following the implementation of the Mudie Report (Mudie 1954) that the replanting grant was increased and the constraints on smallholder replanting reduced. The rate of replanting by smallholders then accelerated. This new scheme was continued under the First Malaysia Plan (1966–70). RISDA, created in 1972, gave a further boost to smallholders, which, together with the withdrawal of many estates from rubber, made rubber primarily a smallholder crop after the 1970s.



Structural changes in cocoa in response to adverse market and agronomic developments: Malaysia has around a 60 year-long experience with cocoa (box B.1). Commercial plantings which started in the early 1950s increased as prices rose in the 1970s and 1980s. Similar to rubber, cocoa plantings declined subsequently: since 1990, it has been declining under persistent low world prices and large-scale infestation of the cocoa pod borer. The latter problem was largely self-inflicted as “government and industry players failed to invest in fundamental research, which resulted in pests and diseases decimating the industry” (FAO, February 2019).¹⁸⁴ From a peak of 247,000 tons in 1990, it declined to nearly 28,000 tons by the early 2000s.¹⁸⁵ As in the case of rubber, the relative importance of estate versus smallholder was reversed, reflecting the fact that cocoa was not as profitable for estates as oil palm: world prices have been declining since early 1980s averaging US\$1,000–US\$2,000 per metric ton against US\$4,000 per metric ton in 1977 (Latif 2007). It is estimated that income from oil palm was RM 4,794 per hectare (MPOB 2014), twice the level that cocoa farming would generate (Arshad and Ibragimov 2015).¹⁸⁶ Over the decades, the relative importance of estate plantations to smallholdings changed with estates dominating in 1980 at 63:47 ratio, and smallholdings dominating in 2005 at 28:72 ratio (Latif 2007). Since the early 1980s, the relative importance of locations for cocoa bean production have been in (1) Sabah and to a lesser extent, Sarawak; and (2) Peninsular Malaysia; a reversal from the pre-1980s situation, when plantings in Peninsular Malaysia dominated.

BOX B.1

Malaysian cocoa: A boom and bust industry

The first commercial-scale cocoa crop was 50 acres planted in 1950 in Trengganu, as a joint venture between Harrison and Crossfield, Cadbury of London and the Commonwealth Development Corporation. Prospects for the industry remained dampened due to severe dieback disease. Following independence in 1957, the Department of Agriculture in Sabah established a cocoa research station that promoted the industry mainly through the development of improved planting materials. Cocoa proved to be an excellent intercrop, especially with coconut, that led a number of coconut estates to adopt interplanting. Governments also promoted intercropping for coconut smallholders. During the 1970s and 1980s, high global prices and low production costs rapidly transformed the industry into a highly profitable venture that attracted the estate sector to invest in cocoa plantations bringing “industrial plantation farm management technology” into cocoa bean production. Plantation companies (including FELDA) adopted cocoa as a means to broaden the local agricultural base and increase profits (due to falling returns from rubber, palm oil and pepper). At its height, the share of estate production reached 201,615 hectares or 49 percent of the total cocoa area in 1989. The average rate of production growth was highest in the 1980s at 24.2 percent per annum indicating an industry responding to global price signals. After a stellar performance in the 1990s, the cocoa area and beans production declined rapidly due to a slump in global prices and widespread infestation of the Cocoa Pod Borer Disease. In stark contrast, the oil palm planted area in Malaysia continued to expand over the same period. Although domestic cocoa prices subsequently rebounded during the 2000s, this was not enough to revive the local industry as Malaysia’s agricultural focus had predominantly shifted to oil palm. Collectively, these factors contributed to the exit of producers from the industry, especially the estate sector, with smallholder growers now comprising over 90 percent of the production area.

Sources: FAO (2019); adapted from: Rahman, A (1990). *The Cocoa Industry in Malaysia*, Kiel Working Paper 449; Khazanah Research Institute (2018). “A Monograph of a Malaysian Cocoa Smallholder,” Technical Report. Kuala Lumpur; Arshad, F., and Ibragimov, A (2015). “Malaysia’s Cocoa Beans Decline: A Prognosis.” *International Journal of Agriculture, Forestry and Plantation* 1 (September)

Value addition in tree crops allowed the development of agribusiness even in the face of dwindling production in rubber and cocoa. Clearly, this allowed the accumulation of capital within the agricultural sector, which later became associated with found investments in other sectors (box B.2).

BOX B.2

Evolution of a Malaysian agribusiness

When agriculture generated up to 50 percent of GDP for the first decades after independence, most successful agribusinesses diversified their industrial mix to seek profitable business opportunities in other economic sectors. For example, Sime Darby made its initial wealth in rubber and machinery and then palm oil and coconuts on plantations. It successfully bought out former British agribusiness companies (for instance, Guthries, Harrisons). This accumulation of wealth from its agricultural businesses allowed Sime Darby to invest in other industries, including car manufacturing (for example, BMW), heavy equipment dealerships (Caterpillar), supermarket franchising, health care, logistics, media, retail, and renewable energy in Malaysia and across the Asia and Pacific region, while continuing to invest in the primary palm oil and rubber businesses.



Source: FAO 2019.

Notes

169. Reardon, Tom, C. Peter Timmer, and Bart Minten. 2012. "Supermarket Revolution in Asia and Emerging Development Strategies to Include Small Farmers." *PNAS* 109 (31): 12332–37. <https://www.pnas.org/content/pnas/109/31/12332.full.pdf>.
170. These are in Sabah (Lahad Datu and Sandakan); Sarawak; Johor, and East Coast Economic Region.
171. FAO Smallholders Team. Carraro, A and Parisi, D. 2018. Structural Transformation and Inclusive Growth: Drivers of Growth and Determinants of Transformation. Preliminary Draft. Note that, for Tey and Brindal (2018), the FFB yield is 17.89 tons per hectare (2015).
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173. Hameed, Amma Awal Abdel, and Fatimah Mohamed Arshad (2007), "The Malaysian Palm Oil Industry: Development and Challenges," in *50 Years of Malaysian Agriculture: Transformational Issues, Challenges, and Direction*, edited by Fatimah Mohamed Arshad, Nik Mustapha Raja Abdullah, Bisant Kaur, and Amin Mahir Abdullah, 795–815, Serdang, Malaysia: Universiti Putra Malaysia Press.
174. Smallholders in oil palm are those with landholdings less than 50 hectares. By 2017, the average small landholding was 4 hectares (Tey and Brindal 2018). Independent smallholdings average 1–2 hectares (FAO, February 2019).
175. FELDA was created in 1956 prior to independence. Its task then was to manage and funnel financial aid to state governments to create land development schemes in the respective states along with coordinating land development in these states, where movement of population within these states was involved.
176. Zin, Ragayah Haji Mat, 2014. *Malaysian Development Experience: Lessons for Developing Countries* Institutions and Economics 6 (1).
177. Zin, Ragayah Haji Mat. 2011. "Strategies for Poverty Alleviation" 503–30 in *Malaysia: Policies and Issues in Economic Development*. Institute of Strategic and International Studies. Zin draws on Jacob Meerman's February 1979. *Public Expenditure in Malaysia: Who Benefits and Why*. World Bank Research Publication 10113. The criticism is that a considerable number of settlers were chosen because of political affiliation and not on their poverty level, <http://documents.worldbank.org/curated/en/829381468774588868/pdf/multi0page.pdf>.
178. Pye, Oliver. 2017. "Deconstructing the Roundtable on Sustainable Palm Oil." Ch 13 (409–41) in Rob Cramb and John McCarthy, eds. *The Oil Palm Complex: Smallholders, Agribusiness, and the State in Indonesia and Malaysia*. Singapore: National University of Singapore Press.
179. Some of the most famous endangered species are the orangutan, the proboscis monkey, and the Sumatran rhino (Pye in Cramb and McCarthy 2017).
180. Sundaland comprises over 17,000 islands belonging to both Malaysia and Indonesia; the two largest islands are Borneo and Sumatra, <https://enviroliteracy.org/ecosystems/hotspots-of-biodiversity/sundaland/>.
181. The Orang Asli tribes are the indigenous people and the oldest inhabitants of Peninsular Malaysia.
182. McCarthy, John and Rob Cramb. "Conclusion." Ch 14 (442–64) in Rob Cramb and John McCarthy, eds. *The Oil Palm Complex: Smallholders, Agribusiness, and the State in Indonesia and Malaysia*. Singapore: National University of Singapore Press. The source of this information is International Labor Rights and Sawit Watch, 2013.
183. Ariff, Mohamed, and Shankaran Nambiar. 2011 "International Trade and Trade Policy." Ch 3 (69–100) in *Malaysia: Policies and Issues in Economic Development*. Institute of Strategic and International Studies.
184. The cocoa tree is susceptible to pests and diseases right from the time it is planted. The cocoa pod borer was first reported in Sabah in late 1980.
185. Latif, Ismail Abd (2007), "Cocoa Industry of Malaysia," in *50 Years of Malaysian Agriculture: Transformational Issues, Challenges, and Direction*, edited by Fatimah Mohamed Arshad, Nik Mustapha Raja Abdullah, Bisant Kaur, and Amin Mahir Abdullah, 795–815, Serdang, Malaysia: Universiti Putra Malaysia Press.
186. Arshad, Fatimah Mohamed and Abdulla Ibragimov. September 2015. Malaysia's Cocoa Bean Decline: A Prognosis. *International Journal of Agriculture, Forestry and Plantation*, vol. 1. According to the International Cocoa Organization (2015), the global demand for cocoa is expected to exceed supply in the years to come, https://www.researchgate.net/publication/283205355_MALAYSIA'S_COCOA_BEANS_DECLINE_A_PROGNOSIS.

Annex C. Salient features of the rice and nonrice agrifood subsectors

Subsidies are substantial and sustained throughout the paddy rice value chain: The government has intervened extensively throughout the paddy-rice value chain. It subsidized paddy production heavily, built irrigation and other infrastructure, expanded operations in rice milling and marketing, and monopolized rice imports.¹⁸⁷ In the First Malaysia Plan (1966–70), over 30 percent of the development budget on agriculture was allocated to irrigation and drainage. Substantial expenditures continued until the Ninth Malaysia Plan (2006–10) (Sidique and Shaharudin 2019).¹⁸⁸ In 2018–19, the budget allocated to paddy subsidies and other incentives was still substantial—around 25 percent–33 percent of the expenditures of the Ministry of Agriculture and Agro-based Industry—and more than any other crop (Omar, Shaharudin, and Tumin 2019). In 1980, the government introduced the paddy price subsidy scheme: farmers were given a coupon per ton of paddy sold. The list of subsidies and other supports to paddy and rice shows how extensive the government’s support has been (table C.1). This list does not include other subsidies through credit and mechanization services.

Producers, production, and productivity performance of paddy: In accepting these subsidies, the paddy growers must also accept restrictions; for example, it is illegal for them to utilize different varieties of rice in any area designated for a certain rice strain. Thus, if there is a market for aromatic rice, only farmers in designated areas are permitted to

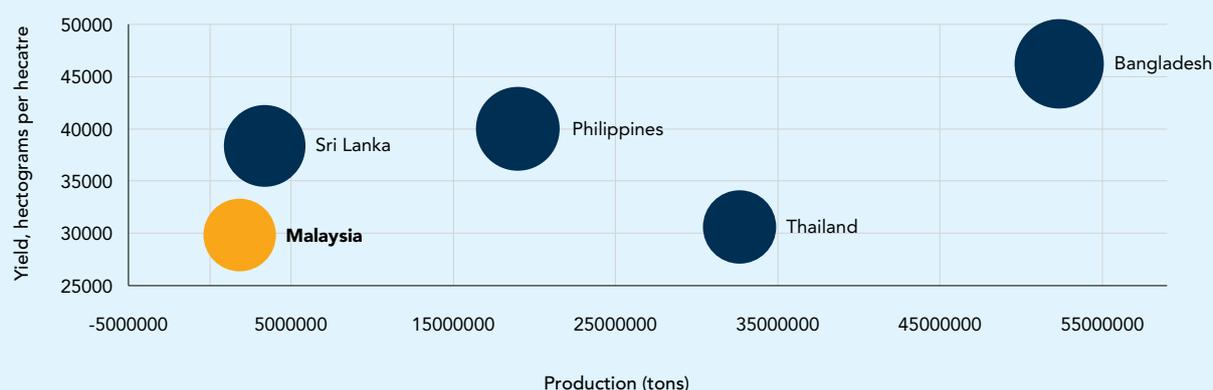
TABLE C.1. Subsidies and incentives in the paddy and rice subsectors

Subsidy	Period	Details
Federal Government Paddy Fertilizer Scheme	1979–present	Compound fertilizer: 240 kilograms per hectare per season Urea fertilizer: 80 kilograms per hectare per season Maximum: 10 hectares per farmer per season
Paddy Price Subsidy Scheme	1981–present	MR 300 per metric ton
Paddy Production Incentive Scheme	2007–present	Additional fertilizer: MR 140 per hectare per season Organic fertilizer: 100 kilograms per hectare per season Foliar: 6 liters per hectare per season Growth enhancer: 3 bottles per hectare per season NPK fertilizer: 150 kilograms per hectare per season @ 25 kilograms per bag Pesticide (herbicide): Discount coupons (Max: MR 200 per hectare per season) Liming: 3 tons per hectare (MR 970 per hectare per season) @ once in three years Ploughing: MR 100 per hectare per season
Certified Paddy Seed Incentive	2008–present	Certified paddy seeds are purchased at a ceiling price of MR 1.40 per kilogram (cost of production = MR 2.43 per kilogram) Certified paddy seed subsidy for suppliers: MR 1.03 per kilogram
Fertilizer and Pesticide Subsidy for Hill Paddy	2015–present	Compound fertilizer: 200 kilograms per hectare per season Foliar fertilizer: 15 liters per hectare per season Pesticide/herbicide: 10 liters per hectare per season

Source: Sidique, Shaufique Fahmi, and Ashraf Shaharudin. 2019. “Malaysia’s Agricultural Transformation: National Food Security.” Institute of Agricultural and Food Policy Studies, Universiti Putra Malaysia.

grow aromatic rice. The hub of paddy production is in the 10 granary areas the government established as they account for almost 75 percent of total paddy area of Peninsular Malaya; the remaining 25 percent being nongranary areas. The biggest granary area is MADA, supplying nearly 39 percent of total paddy production (2016) (Omar, Shaharudin, and Tumin 2019). The government developed extensive irrigation. By 2000, roughly 34 percent of the total area under paddy was irrigated. In the mid-1960s, the government had also financed the adoption of green revolution technology, high-yielding varieties and related inputs of seeds and fertilizer, which improved paddy yields. In nongranary areas, these yields averaged 2.38 tons per hectare (1961–79), 2.85 tons per hectare (1980–2000), and 3.59 tons per hectare (2000–15). However, these are still well below world and Southeast Asian averages; for example, Vietnam’s was at 5.05 tons per hectare (2014) (Sidique and Shaharudin 2019). In 2015, granary areas covered nearly 406,000 hectares, while nongranary areas covered nearly 276,000 hectares. Their respective yields averaged 4.9 tons per hectare and 2.7 tons per hectare, and their respective relative contributions to total production were 73 percent and 27 percent (Sidique and Shaharudin 2019). The average rice yield has been consistently lower in Malaysia than in comparator Asian countries; for instance, in 2016, Malaysia yield averaged 3.2 tons per hectare versus 5.4 tons per hectare in Indonesia, 5.6 tons per hectare in Vietnam, 5.9 tons per hectare in China, and 4.6 tons per hectare in Bangladesh (figure C.1).¹⁸⁹

FIGURE C.1. Rice yield and production, comparison with the main rice producers, 2014



Source: FAO 2019; FAOSTAT.

Between 1980–82 and 2013–15, paddy yields in Malaysia grew by 43 percent, while those in Southeast Asia rose by 70 percent, and those in the world by 60 percent. In addition, TFP growth of Malaysian rice production in 1980–2000 actually regressed and is lower than comparator Southeast Asian countries. In 2001–05, TFP growth has been positive, however.¹⁹⁰

SMEs and small farms dominate in the non-rice agri-food subsector: In non-rice agri-foods, small units dominate (box C.1). Small farm sizes vary between one and four hectares; the farm sizes are even smaller in fruit cultivation, at around one hectare.¹⁹¹ The SME sector is composed of vegetables and fruits (approximately 20 percent); livestock, ruminants and nonruminants (17 percent); fish and related products (14 percent); palm oil products (10 percent); agrobiological products (10 percent); and other food-based products (27 percent).¹⁹² Vegetables mainly grown in periurban areas, are dominated by smallholders, except for a few larger producers in the Cameron Highlands and in Johor close to the Singapore market. Pig and poultry industries (including eggs) have graduated from backyard subsistence enterprises to commercial and internationally competitive production systems in a relatively short time. The main source of financing for working capital is commercial banks, which account for around 70 percent of enterprise financing; the balance derives from nonmainstream financing sources.¹⁹³ Nearly 50 percent of the SMEs in the 2010s are partnerships; 15 percent are joint ventures; and 35 percent are sole proprietors. Foreign ownership in food processing is minor, only 6 percent. There are multiple signs of dynamism in the SME food processing industry, for example, developing new products, finding

new ways to improve operational efficiency, and discovering alternative supply pathways. SMEs have limited access to R&D to assist them in renewing technology and increasing productivity and competitiveness, unlike the situation in estate agriculture and agro-based industry for which long-term investment in R&D and access to its findings have been critical to competitiveness. The importance of research and extension services to an aging (average 55-60 years old) farming population cannot be overemphasized given that more well educated rural youth increasingly migrate for urban jobs and lifestyles. The government has been addressing this age issue through a program to attract technology-savvy younger agroentrepreneurs (ages 30–49). In 2012–15, the involvement of youth increased by 6.4 percent.¹⁹⁴

BOX C.1

A snapshot of Malaysia's food processing industry

There are few large companies; the industry is dominated by SMEs: 20 percent are involved in fruits and vegetable products, 16.6 percent in livestock products, 14.2 percent in fish and related products, 12.1 percent in agrobiological products, 10.1 percent in palm oil products, and 27.1 percent in various other food-based products.

Among companies, 67 percent employ fewer than 10 employees, and 20 percent have 10–50 employees.

Among companies, fewer than 67 percent have less than 5 years experience in their field of enterprise; 13 percent have 6–10 years experience.

Most (48 percent) SMEs are structured as partnerships, with 34.8 percent sole proprietors, and 13.4 percent joint ventures.

Malaysian Chinese and Malays are equally represented (44.5 percent) in the ownership of food processing companies. Only 6 percent of food processing companies are foreign owned, while 1.6 percent have some foreign ownership in a joint venture structured company.

Among food processing SMEs, 56.7 percent have annual sales of RM 200,000 to RM 1 million (US\$50,000–US\$250,000); 32.4 percent have sales between RM 1 million and RM 5 million (US\$250,000–US\$1.2 million); and 4.9 percent have sales between RM 5 million and RM 10 million (US\$1.2 million–US\$2.5 million).

Commercial banks are the main source of financing among food processing companies; 70.4 percent of SMEs borrow to acquire working capital; 18.2 percent borrow from nonmainstream financial sources.

Among food processing companies, 51.4 percent have produced or introduced a new product within the past three years; 53.8 percent have developed a new operational process to improve their production efficiency; 52.2 percent have introduced improved management processes; 51 percent have introduced new or innovative products; and 56.3 percent have found alternative sources of supply.

Sources: FAO 2019; Bhuiyan AB et al. 2016. The innovation drivers, strategies and performance of food processing SMEs in Malaysia. *Malaysian Journal of Society* 12: 2.

From SME to larger scale, vertically integrated farms: the case of broiler farms: The structure and scale of broiler farms are changing in response to rising demand. In 1980, consumption was 8.4 kilograms per capita; by 2016, it had risen to 50.8 kilograms per capita (Sidique and Shaharudin 2019). Small-scale (less than 10,000 birds) broiler farms dominated in the mid-1980s. By 1999, the large farms (more than 100,000 birds) constituted 61 percent of all farms and contributed to more than 70 percent of broiler production.¹⁹⁵ Many large broiler operations are fully integrated with breeder farms, feed mills, grower farms, processing plants, and in some cases, retail outlets. The feed conversion ratio of 1.67 of these integrated operations make them internationally competitive.¹⁹⁶ The annual mortality rate of 4.32 percent was also low. Feed mainly imported (from Argentina and Brazil), accounts for around 65-70 percent of the broiler industry's production cost (Kaur and Arshad 2007). Contracting is now widespread. Around 75 percent of broilers are produced by small- and medium-scale farmers that have a private contract arrangement with integrators (2011) (Sidique and Shaharudin 2019). With increasing vertical integration and a limited number of wholesalers, the oligopolistic structure of the broiler industry is a concern, limiting competition, undermining their efficiency, and working to the detriment of both SMEs and consumers. The domestic poultry market has been protected from an influx of imported chickens, due to restrictions such as strict Halal standards, import permit regulations, and the requirement of a single channel of import entry through the National Farmers Organization. However, with Malaysia's several free trade agreements through the Association of Southeast Asian Nations (1992) and with Japan (2008); Australia and New Zealand (2010); China, India, and Korea (2010); and members of the World Trade Organization (1995), competitive pressures have increased (Sidique and Shaharudin 2019).

Supportive policy environment problematic for the agri-food subsector: Malaysia's legal and regulatory framework affecting agri-food business was assessed to be weak relative to six other Asian countries.¹⁹⁷ The Enabling Business of Agriculture scores for Malaysia (2017) were particularly weak for the fertilizer industry and for truck licensing and crossborder trade. The indicator for markets and finance were also weak. Land was not evaluated.¹⁹⁸ However, insecurity of land tenure is an issue because SMEs in vegetable cultivation receive only temporary occupation licenses (Sidique and Shaharudin 2019). Because traditional wet and dry markets still prevail in agri-food, producers bear the risk of not being directly connected to lucrative consumer markets through contracts with value chains. Those that are (for instance, increasingly for broilers) have weak bargaining power since they are operating in an oligopolistic market (Sidique and Shaharudin 2019). There have been previous attempts to assist the agri-food subsector, including the creation by the government of permanent food production parks on public land owned by state governments. These parks are equipped with infrastructure, collection centers, electricity supply, and other facilities to attract private investment. By the end of the Eighth Malaysia Plan (2001–05), Malaysia had eight such parks. Under the Ninth Malaysia Plan (2006–10), the government created the National Food Terminal, issued the National Biotechnology Policy, launched three new land development programs; and encouraged land consolidation among aging farmers.¹⁹⁹ The share of the agri-food sector in the total value added in agriculture increased to 38.8 percent (2017), but is unlikely to reach the target of 42.4 percent by 2020.²⁰⁰

New initiatives to assist the non-rice agri-food subsector: Consistent with its tradition of reviewing past implementation and results achieved relative to target, the government has identified ways to increase the productivity and incomes in agri-food and reduce food trade deficits. The midterm review of the Eleventh Plan has identified new initiatives to revitalize the agri-food sector which include measures to:

- Improve the enabling environment for business in agriculture²⁰¹
- Undertake studies to reform the service delivery of ministries and agri-food agencies
- Improve infrastructure, farming technology, market information
- Improve access to financing for farmers and smallholders

To improve the productivity and competitiveness of SMEs, the government will also intensify its efforts to empower their human capital; increase adoption of technology and innovation; and improve their access to financing (Mid-Term Review). For food safety, the government is promoting quality assurance programs, for example, Malaysian Good Agricultural Practices and Hazard Analysis and the Critical Control Point. A major emphasis is on human capital formation for an increasingly knowledge-intensive economy; improving competitiveness and moving up the value adding ladder.

It is clear that the midterm review seeks to address key constraints that smallholders and SMEs in agri-food struggle against. The structural forces reshaping the agri-food sector present stiff challenges to government and business alike.

Fundamental structural changes impacting on the nature of consumer demand and therefore on the approach to food security: These changes are outside the control of the government. They are in a sense largely the result of success. Incomes have increased continuously, and consumption priorities have changed as well as modes of delivery in a more globalized world economy.

- **Demand:** The ongoing dietary transformation process means that rice alone no longer dominates consumption. The calorie supply in rice consumption (k cal./cap per day) declined from 1,260 (1963) to 290 (2013) while that from poultry rose from 18 (1963) to 162 (2013). Calorie supply from wheat and wheat-based products has increased while that from rice has decreased. Over this decades-long period, per capita consumption of protein and vegetables have grown tremendously. Poultry meat as a source of protein (g/cap/day) has risen from 1.3 to 13.3 over the same period. With sustained income growth, the percentage of household expenditure spent on food and nonalcoholic beverages has declined from 24 to 18; on rice alone - from 2.5 to 1.1; all from 1994 to 2016, respectively (Sidique and Shahrudin 2019) (table C.2).
- **Nutrition and health:** With sustained income growth, dietary change and more sedentary urban lifestyles, the consumption of sugars, and animal fats has greatly increased: for instance, the caloric supply from meat increased by 611 percent from 1963 to 2013, much higher than the caloric supply from vegetables, only 273 percent during the same period. The decline in malnutrition due to poverty reduction is being followed by a rapid increase in obesity; and in noncommunicable diseases such as coronary heart disease, hypertension and diabetes, a phenomenon known as the double burden of diseases.²⁰² According to the 2017 National Health and Morbidity Survey, 73 percent

TABLE C.2. Time series, composition of monthly household consumption expenditure

Expenditure group	Percentage composition					
	1994*	1999*	2004	2009	2014	2016
Food and nonalcoholic beverages	23.8	22.6	20.1	20.3	18.9	18.0
Rice	2.5	2.4	1.8	1.9	1.2	1.1
Bread and other cereals	2.4	2.6	2.3	2.4	2.5	2.4
Meat	3.6	3.0	2.8	2.9	2.8	2.6
Fish and seafood	4.6	4.5	4.2	4.5	4.2	3.9
Milk, cheese and eggs	2.1	1.9	1.6	1.8	1.6	1.5
Oils and fats	0.7	0.7	0.6	0.6	0.5	0.5
Fruits	2.2	1.8	1.4	1.2	1.1	1.2
Vegetables	2.9	2.8	2.2	2.1	2.2	2.1
Sugar, jam, honey, chocolate and confectionery	0.9	0.8	0.7	0.6	0.6	0.6
Food products n.e.c	1.1	0.9	1.3	0.9	1.0	1.1
Coffee, tea, cocoa, and nonalcoholic beverages	1.1	1.2	1.3	1.3	1.2	1.1
Restaurants and hotels	12.5	12.8	10.9	10.9	12.7	13.4
Expenditure on food away from home	10.3	10.9	8.7	8.9	10.2	10.7
Expenditure on beverages away from home	1.6	1.7	1.8	1.8	2.1	2.1

Sources: Household Expenditure Survey, DOSM; adapted from Sidique and Shahrudin 2019.

of Malaysians die because of noncommunicable diseases, and half these deaths are caused by cardiovascular diseases (Sidique and Shaharudin 2019).

- **Population, urbanization, and income growth:** While Malaysia transitioned from a low-income, primarily agrarian economy, the population of the country rose from around 8 million at independence (1957), with rural areas accounting for about 73.4 percent of the total in 1960, to around 32 million in 2016/17, with urban areas accounting for about 75.0 percent of the total, almost exactly reversing the balance of rural versus urban.²⁰³ Malaysia is now an upper-middle-income country, with a GNI per capita of US\$9,750 (Atlas method, 2017 prices).²⁰⁴ Over this 60-year period, extreme and widespread poverty has been drastically reduced. Consistent with Bennett's law, the relative importance of starchy staples has decreased as incomes have increased. Higher-income consumers want greater dietary diversity. However, the RSS approach to food security launched during the early decades after independence has not fundamentally changed to address this dietary diversification.
- **The spread of supermarkets and global food value chains:** As elsewhere in Asia, there has been a spread of supermarkets, and fast food chains to cater to the changing demand structure. In Malaysia, the share of supermarket sales in modern trade is 66 percent (2019) (Poapongsakorn, Jan 2019: 36) The operations of supermarkets also represent an opportunity and a threat to smallholders –an opportunity because they can have more direct access to expanding consumer markets; and a threat, because they are not able to deliver in terms of the reliability, scale and consistent quality required. Simply put, they are not competitive as the supermarkets, often a link within global value chains, want bulk and reliable supplies of safe, quality foods, a requirement which smallholders may not be able to satisfy unless organized in cooperatives with long-term contracts with these chains.

According to Schultz (1953) without addressing hunger and ensuring food supply, it is impossible to start agricultural transformation: this he termed the food problem. Thus, most countries first strived to increase productivity of food crop production by investing heavily on infrastructure, for example, irrigation and research as a means toward securing food or avoid food shortages. Securing food supply was therefore widely recognized as being necessary for agricultural transformation (Schultz 1953; Johnston and Mellor 1961;²⁰⁵ Johnston and Kilby 1975;²⁰⁶ Timmer 1988). In fact, Diamond (1997)²⁰⁷ ascribes the capacity to produce more food as the core explanatory factor for the observed difference in stages of development achieved by different countries. Those who can produce more food were able to support a large population that enabled higher production and then higher development.

In summary, Malaysia's food sector, both production and processing, is dominated by smallholders and processors. There already clear evidence that the consumption basket of typical consumer has entered a dynamic process of change. Consider rice; the average per capita consumption has fallen by 40 percent between 1963 and 2013. Population growth has stabilized, and, with it, the rise in incomes is expected to continue although at a lower rate than the historical average. As the middle-income class continue to expand, consumption pattern will continue to evolve not less driven by healthy eating habits and consumer awareness and demand for sustainable production methods. These are direct outcome of the structural changes that the sector and the society has undergone and therefore production systems have to respond to the evolving demand pattern. As demand for fresh products continue to expand, it is imperative that smallholder be positioned to profit from this shift in demand. Improving the skills of small farmers and small operators will be of a necessity to improve their readiness for smart agriculture.

Notes

187. Malaysia has a long tradition with government building irrigation infrastructure. The first major scheme was in 1880. The World Bank helped finance several irrigation projects from around 1965 to early 1980s. The current irrigation infrastructure is therefore decades old, requiring rehabilitation. For more information, World Bank. June 1991. Malaysia, *Project Performance Audit Report on Four Loans (loan 1522, 1632, 1717, 1957-MA)*. Report 9714, <http://documents.worldbank.org/curated/en/288481468915093274/pdf/multi-page.pdf>.
188. The Tenth and Eleventh Malaysia Plans under the Najib administration do not have detailed sectoral budgets.
189. FAO draft final. April 2019. Malaysia: Agriculture and Food Report.
190. World Bank and Ministry of Economic Affairs, Malaysia (2019), "Malaysia: Agriculture Sector Public Expenditure Review," February, World Bank, Washington, DC; Ministry of Economic Affairs, Kuala Lumpur.
191. In the 1970s, a little over one million households were working in smallholder agriculture, cultivating about 4.4 million acres (1.78 million hectares). (World Bank. 1971. General Report, vol. 1 of Malaysia: *Agriculture Sector Survey*. Report PA-86a), <http://documents.worldbank.org/curated/en/378091468300313625/pdf/multi0page.pdf>.
192. Bhuiyan AB et al. (2016). The innovation drivers, strategies and performance of food processing SMEs in Malaysia. *Malaysian Journal of Society*, 12: 2 (cited in FAO February 2019).
193. "A Snapshot of Malaysia's Food Processing Industry" (FAO, February 2019).
194. Malaysia Productivity Corporation, Ministry of International Trade and Industry. 2017. The Malaysia Productivity Report. 24th Productivity Report 2016/2017.
195. Kaur, Bisant, and Fatimah Mohamed Arshad (2007), "Marketing of Poultry in Malaysia: Structural Issues and Challenges," in *50 Years of Malaysian Agriculture: Transformational Issues, Challenges, and Direction*, edited by Fatimah Mohamed Arshad, Nik Mustapha Raja Abdullah, Bisant Kaur, and Amin Mahir Abdullah, 795–815, Serdang, Malaysia: Universiti Putra Malaysia Press.
196. The feed conversion ratio indicates the broiler's efficiency in converting animal feed into desirable increases in bird weight.
197. Enabling Business of Agriculture (2017), "EBA Brief, Malaysia." The other Asian (mainly Southeast Asian) comparator countries are Cambodia, Korea, Laos, the Philippines, and Thailand.
198. Land will be evaluated in Enabling Business of Agriculture in 2019. See Enabling Business of Agriculture (2017), "EBA Brief, Malaysia."
199. The three land development programs—the Modern Farm, the Agriculture Concentrated Development Area, and the Agriculture Special Development Program—were launched in the spirit of creating a new agriculture. They are being implemented on abandoned and unproductive land and on large farms on state-owned public land. The schemes are being carried out on land bordering on smallholder farms. A total of 21 of the farm projects were developed and leased to the private sector (Sidique and Shaharudin 2019).
200. Mid Term Review of the Eleventh Malaysia Plan 2016–20.
201. World Bank Press Release. Nov 1, 2018. Malaysia carries out significant business environment reforms and regains place among top ranking economies, <http://www.worldbank.org/en/news/press-release/2018/11/01/malaysia-carries-out-significant-business-environment-reforms-and-regains-place-among-top-ranking-economies>.
202. WHO: "The Double Burden of Diseases" (accessed April 24, 2019), https://www.who.int/nutrition/topics/2_background/en/index1.html.
203. FAO Smallholders Team. Carraro, A., and D. Parisi. 2019. "Structural Transformation and Inclusive Growth: Drivers of Growth and Determinants of Transformation." Preliminary draft.
204. As of fiscal year 2017, low-income economies are defined as those with a GNI per capita (calculated using the World Bank Atlas method) of US\$1,025 or less in 2015; lower-middle-income economies are those with a GNI per capita between US\$1,026 and US\$4,035; upper-middle-income economies are those with a GNI per capita between US\$4,036 and US\$12,475; and high-income economies are those with a GNI per capita of US\$12,476 or more.
205. Johnston, Bruce F., and John W. Mellor (1961), "The Role of Agriculture in Economic Development," *American Economic Review* 51 (4): 566–93.
206. Johnston, B. F. and Peter Kilby. 1975. *Agriculture and structural transformation: economic strategies in late-developing countries*. Economic development series Oxford University Press. 1975.
207. Diamond, Jared. 1997. *Guns, Germs and Steel – the Fates of Human Societies*. New York, W. W. Norton.

Annex D. The drivers of transformation in Malaysia

Agricultural transformation in Malaysia has been driven by the government through deliberate policy and unwavering determination. Malaysian planners were looking for transformational results. So, they were keen on making midterm corrections and allocate the necessary budgets to effect the change. At the center of any transformation is sustained productivity growth both within and outside, as well as across sectors.

“Everyone knows that the spectacular industrial revolution would not have been possible without the agricultural revolution that preceded it,” argues Nurkse (1953, 52). Rostow (1960) identifies increases in agricultural productivity as a necessary condition for a successful take-off. Gollin, Parente, and Rogerson (2002, 2007) provide a modern formalization of these ideas.

“Improvements in agricultural productivity can hasten the start of industrialization and, hence, have large effects on a country’s relative income,” write Collin et al. (2002, 164).²⁰⁸ They also observe (page 160) that “growth in agricultural productivity is central to development.” Productivity growth in agriculture acts as the main driver of structural transformation, according to Ngai and Pissarides (2007).²⁰⁹

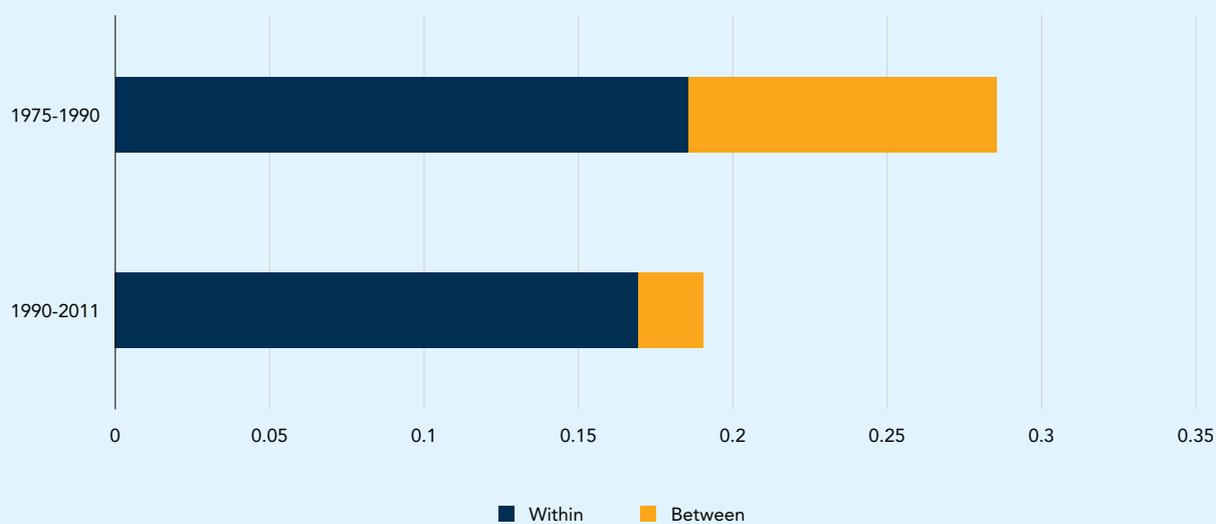
To understand the driving forces behind the agricultural transformation of Malaysia, the McMillan-Rodrik (2014) model was employed to untangle the role of within-sector force and the structural change force. The assessment also examined changes achieved from the perspective of TFP to better understand TFP’s contribution to the sector’s transformation.²¹⁰ Productivity growth within can be achieved “through capital accumulation, technological change, or reduction of misallocation across plants” (McMillan and Rodrik 2014, 18).²¹¹ The outside force, which is also referred as structural change, takes place when a shift of labor across sectors occurs. A growth-enhancing structural transformation is achieved when people move from low-productivity sectors to high-productivity sectors as a result of pull factors.

The analysis divides the period into two, 1975–90 and 1990–2011. The first is a government-led era, and the second is characterized by globalization. The within-sector force was the largest contributor to transformation in both periods. In Malaysia, both components have positively affected overall productivity growth (figure D.1). Structural change contributed significantly in the earlier phase; this seems confirmed by the significant amount of labor movement out of agriculture during the earlier phase.

The reduction in the second phase can be explained by the relative decline in productivity gaps across sectors. McMillan and Rodrik (2011, ii) identify a key problem in structural transformation.²¹²

“In countries with a relatively large share of natural resources in exports, structural change has typically been growth reducing,” they argue. “Even though these enclave’ sectors usually operate at high productivity, they cannot absorb the surplus labor from agriculture.” This is an important consideration in policy formulation in agricultural transformation. Through a deliberate policy to integrate smallholders, the government of Malaysia has avoided the risk of creating an enclave that does not benefit smallholders.

Both structural and within-sector growth contributed to agricultural transformation. However, the structural part is weakening. This is consistent with the observation that the service and manufacturing sectors are not creating jobs as they did during the initial phase of transformation, when this had a direct impact on structural transformation. With the Malaysia’s transformation to an upper-middle-income country, the living standards of the population have improved. In such circumstances, it is difficult to create a labor-intensive industry and remain competitive. Already, when people are moving from manufacturing to services, manufacturing has become a lower-productivity sector.

FIGURE D.1. Decomposition of productivity growth

Source: FAO. 2019 Drivers of Growth and Determinants of Transformation. (Background paper, unpublished).

Sources of agricultural growth²¹³

A background paper undertaken as part of this study relied on two methods to identify the sources of agricultural growth in Malaysia and Thailand. The summary findings relevant to Malaysia are now presented.

Total factor productivity

Available TFP data are either not comparable or are not consistent across different sources. The first method used for estimating TFP is the net fixed capital investment data for the 1990–2015 period. The methodology is based on the index approach adapted by Tinnakorn and Sussangkarn (1998).²¹⁴

First, the analysis shows Malaysian agricultural GDP grew at an annual average of 4 percent between 1961 and 2015, while annual TFP growth was 2.7 percent which accounted for 66.7 percent of agricultural growth. The large contribution of TFP to agricultural output growth is mainly explained by the heavy public investment in agricultural research and extension services, which have boosted long-term yield of important crops. Rungsuriyawiboon (2009) decomposes the TFP changes into technical efficiency and technical change and finds that for Malaysian agriculture, technical efficiency (0.217 percent) is slightly more important than technical change (0.202 percent) in 1979–2004.²¹⁵

Second, TFP growth was most rapid in 2001–10, when the government plan emphasized competitiveness and value addition. The largest contribution went to agricultural value added (94.9 percent).

Using the Tinnakon-Sussangkarn method with fixed capital investment data, the results also show that (a) TFP contribution to growth is higher in Malaysia than in Thailand; and (b) it is the fourth largest source of growth in both countries.

However, although the U.S. Department of Agriculture's results tend to produce overestimated contribution of TFP growth,²¹⁶ the findings are roughly consistent with previous studies. Said et al. (2010, cited in Arshad et al. 2014) find that TFP is the largest source in Malaysia during 1970–2000, accounting for 80 percent of agricultural growth.

Finally, TFP growth, using the U.S. Department of Agriculture’s method, showed a significant slowdown in 2010–15, findings that are consistent with a decline in public agricultural research intensity in both countries. Arshad et al. (2014) argue that the TFP contribution in Malaysia declined from the highest growth of 4.65 percent during 1970–80, compared with 1.54 percent during 1991–2000. The deterioration continued during 2007–11 to reach 0.55 percent (table D.1). However, the Malaysian Productivity Corporation data show that TFP increased during 2012–16.

The Malaysia Productivity Corporation reports that there has been an upswing in TFP recently. In 2012–16, TFP contributed to the substantial growth in agriculture, construction, and services sectors, which reflects the improvements in productivity in the sectors. In agriculture, the contribution was 2.6 percent (see table D.1).

TABLE D.1. Sources of output growth in agriculture

Source	2007–11	2012–16
Capital	0.64	0.87
Structure	0.04	0.14
Transport	0.03	0.02
Information and communication technology	0.13	0.26
Machinery and equipment	0.02	0.08
Biological assets	0.41	0.37
Mineral exploration	n.a	n.a
Labor	-0.80	2.13
Low-skilled	-0.89	0.30
Medium-skilled	0.03	1.52
High-skilled	0.06	0.31
Intermediate inputs	-0.39	-0.69
TFP	0.55	2.64
Output	-0.01	4.95

Source: Malaysia Productivity Corporation. 2017. Productivity Report 2016/2017.

Note: The approach relies on the KLEMS method, which measures the source of output growth, where output is computed by adding intermediate inputs, imported commodities, taxes, and gross value added.

A number of factors contribute to TFP, but, in agriculture, research is the essence and major determining factor because it determines knowledge utilization, incubating innovation, and the development of efficiency improvement mechanisms. Labor contribution during 2007-2011 was negative for low-skilled indicating the presence of redundant labor during the period. Training and improvement in skills seems to have contributed to the change observed.

What is also clear is that the capital intensity of agriculture showed remarkable growth in 2010–16 relative to 2001–08 (figure D.2). Capital intensity, measured by capital-labor ratio has grown faster than other sectors, including manufacturing. This indicates that as living standards improve and income rises (higher value addition per worker) investors will opt for higher capital/labor ratio, which will enable the growth of productivity. Although, labor productivity in agriculture has been below other sectors, with increase in capital-labor ratio and as the number of people employed in the sector decreased, labor productivity has shown improvement and is converging to the productivity level with the manufacturing sector.²¹⁷

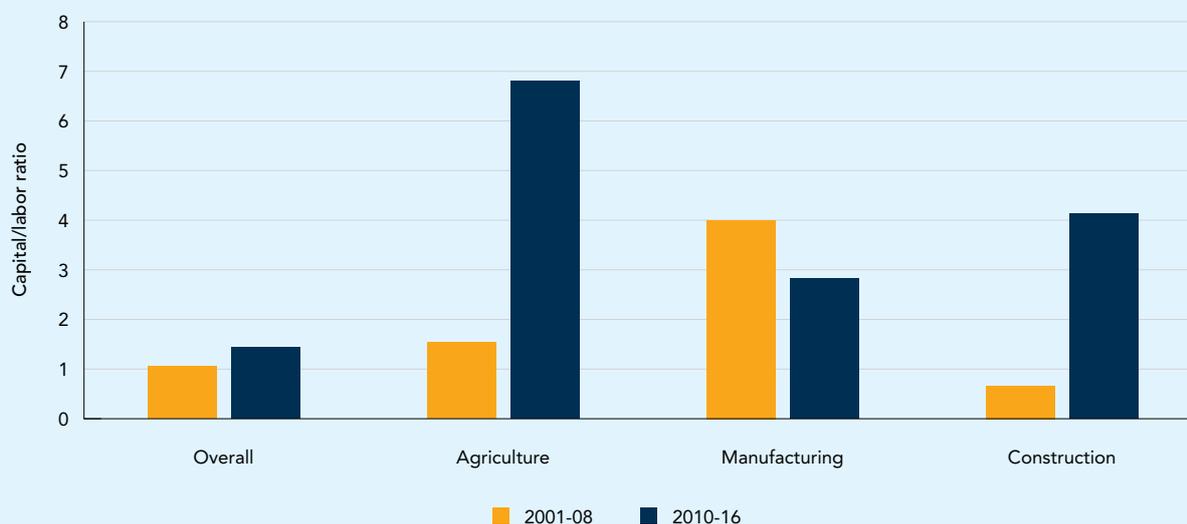
Overall productivity changes

The core of agricultural transformation is the increase in productivity. At the initial stage, this productivity growth is fostered mainly to ensure that sufficient food is being produced, that is, the goal is to feed a growing population, including the labor shifting to other sectors and the expanding urban population. It also drives overall economic development because increases in productivity are the heart of economic expansion. It encourages increases in income, which may widen inequality.

In the case of Malaysia, production of a food surplus has always been an important part of the development aim of the government. This was justifiable at the early stage of development. While pursuing the production of sufficient food, the government and stakeholders also pursued the development of tree crops, mainly oil palm, rubber, and cocoa, which are colonial legacy crops. The government saw the potential in the development of these tree crops. This strategy worked because Malaysia is an open economy. Trade was used to power agricultural transformation. For a small country such as Malaysia, the volume of palm oil produced only makes sense within a global trade framework. The government expressly adopted an export promotion strategy that allowed trade (through signals transmitted through price) to determine resource allocations. The decline of rubber as the main crop is an example of how trade determined resource allocations.

Enhancing productivity in these perennial crops is different from the approach one might take toward annual crops that are not native to Malaysia and need to be adapted to their new home. Thus, for the success of a perennial crop such as oil palm, even pollination initially had to be performed by human labor until the weevil was introduced from Cameroon (see section 2, box 2.2).

FIGURE D.2. Growth of the ratio of capital to labor, selected sectors



Source: IMF. 2018. Malaysia Country Report 18/62.

Palm oil

In addition to agroecological conditions (land and soil texture and depth, moisture and rainfall, temperature, latitude, and so on), numerous other factors determine palm oil yields, including the quality and timeliness of inputs, lighting and radiation, concentration and planting material, planting density (120–150 palms per hectare), canopy management, pollination, harvesting, the suitability of ground vegetation, pests, and diseases (box D.1). Yields may be close to null after a severe infestation. These factors need to be addressed in pursuing productivity of this and other tree crops. In addition, among tree crops, introducing new, improved high-yielding varieties is not easy because the palm oil tree has a long life span, around 25 years.

Recognizing that the development of a new variety is time-consuming and affected by multiple factors (see box D.1), two strands may be used to measure yield: FFB and crude palm oil. In general, FFB yield hovers around 18 tons per hectare compared with the optimal yield of 20–25 tons per hectare; crude palm oil production is around 4 tons per hectare. A pilot experiment achieved 12 tons per hectare, and the maximum theoretical yield can be as much as 18.5 tones per hectare.

Clearly, there is ample room to improve productivity. However, any increase in the production of palm oil will be realized mainly through the expansion of farmland. This was the case in 1974–2016, when the land coverage was increased from 565,766 hectares to 5,737,985 hectares, an expansion of 916 percent within 32 years.

Several explanations can be advanced for the observed phenomena. The fact that land was relatively easily available for palm oil crop cultivation may have postponed innovation and intensification on existing farms. The selection of palm

BOX D.1

The time framework in palm oil research

Breeding is time-consuming and does not always produce the best seeds. So, in the 1970s, scientists turned to cloning. Researchers realized that they could cut open the top of the trunks of their highest-yielding trees, extract stem cells, and grow up clones by the thousands in lab dishes. At first, clones helped to increase oil production on plantations, but, in 1977, something strange started to happen.

Field assistants started noticing atypical fruits forming on a plot of land that was populated by clones... The fruits were jagged, disfigured, and tulip shaped. Many of these mantled fruits produced no oil at all, though they were genetically identical to high-yielding plants.

It took nearly 40 years to unpick the mystery. In 2015, a plant biotechnologist at the MPOB identified the culprit: Karma, a mobile piece of DNA known as a transposon, inserted in the middle of an important gene for normal oil-palm fruit development called DEFICIENS. Cells can silence transposons by attaching methyl groups to them. The fruit develop normally if the Karmas are highly methylated (scientists call this good Karma). But low methylation—bad Karma—results in mantled fruit.

Source: Yan, Wudan. 2017. "A Makeover for the World's Most Hated Crop." *Nature* 543 (March 16): 306–08.

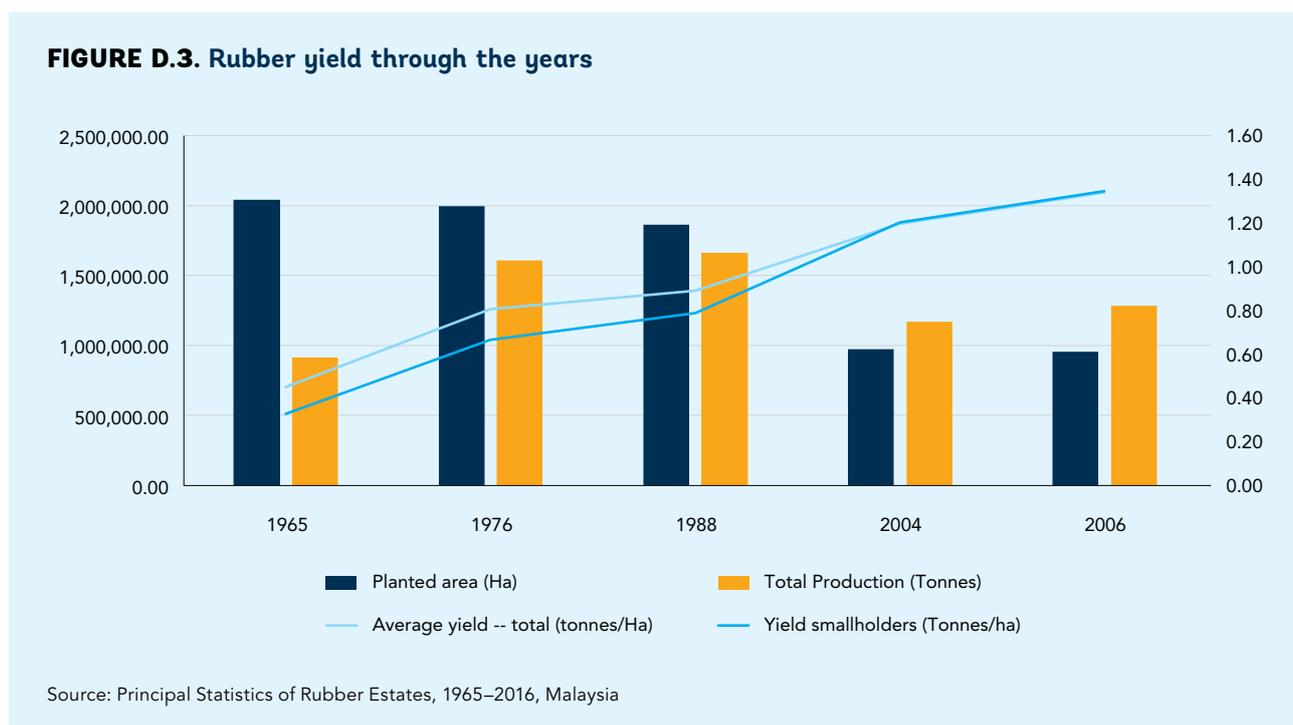
oil as a winner subsector and the continued policy of the government to expand palm oil cultivation may have enabled operators to put off efforts to enhance productivity. Palm oil fruits can be harvested starting in a tree’s third year after planting and could continue producing up to an average of 25 years. In addition, lack of fierce competitors in oil palm production globally and rising demand for palm oil may have made expansion an easier strategy, which could also help in cornering the market and making entry difficult for newcomers. Also, land expansion has helped some Malaysian companies (for example, Sime Darby) have a global reach and have attained status as multinational corporations, which allows them to build a global knowledge on future supply, demand and the overall state of the sector in other countries.

Rubber

Rubber cultivation has been in contraction for some time. It was reduced by 142 percent, from 2,043,700 million hectares in 1965 to almost 1 million hectares in 2006. However, the yield of rubber was increasing until 2006, but started to fall thereafter (figure D.3).

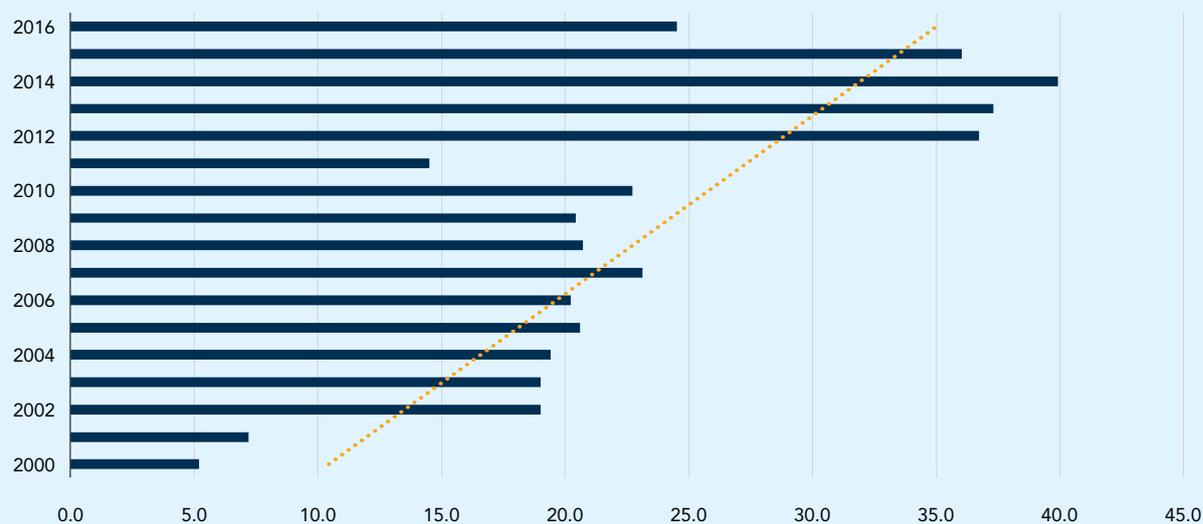
Unlike palm oil where we observe a yield difference between estate and smallholder farms, in rubber, smallholder farm yield has converged with estate yield (volume per hectare) and has even marginally surpassed the latter recently. Smallholders doubled their yield from 0.67 tons per hectare in 1965 to 1.35 tons per hectare in 2006. This yield increase was achieved in the face of a policy that encouraged diversification away from rubber (which was the appropriate policy at the time). However, such a development highlights the resilience of the crop and probably its suitability for smallholder farming.

Notwithstanding the decline in the area planted under rubber, the downstream diversification and value addition is exemplary (figure D.4). In 2016, the value of rubber products processed domestically was valued at RM 16.0 billion, which included RM 10.4 billion worth of rubber gloves. It does not include the export of natural rubber, which was valued at RM 3.8 billion in 2018 (figure D.5). Rubber is still an important contributor to the national economy. Total export earnings reached RM 30.3 billion in 2018. (It had reached RM 31.7 billion in 2011) according to data from Department of Statistics of Malaysia. Malaysia also imports various forms of rubber, including rubber smoked sheets and crumb rubber from ASEAN countries for in-country processing.



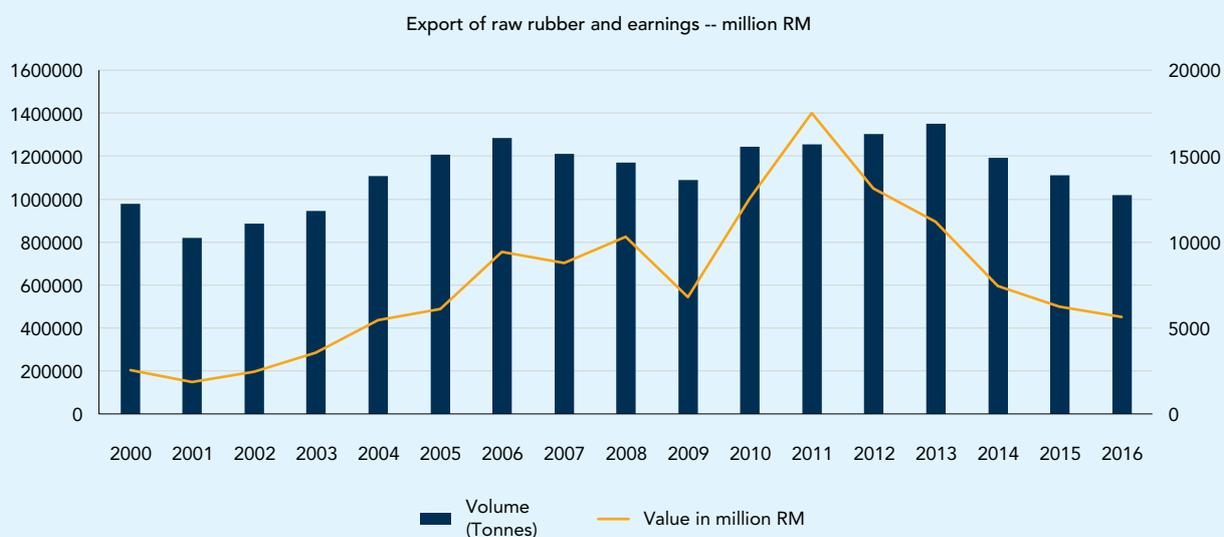
It may be the recognition of the importance of the sector not only as input to downstream processing (for which the country is importing natural rubber to fill the deficit of the demand among processing units), but is also testimony to its resilience that the government has recently made a tangible in-road in replanting (see figure D.4).

FIGURE D.4. Area replanted with natural rubber (hectares, 1,000s)



However, in the face of increasing volume of export (natural rubber) the export earning has been falling recently after reaching a peak in 2011. The volume of export was on the rise until 2013 (a year volume reached its peak). Volume dropped by only 18.83 percent from its peak in 2011 to 2016, while earnings (value) fell by 67.75 percent for the same period.

FIGURE D.5. Export of raw rubber and earnings (RM)

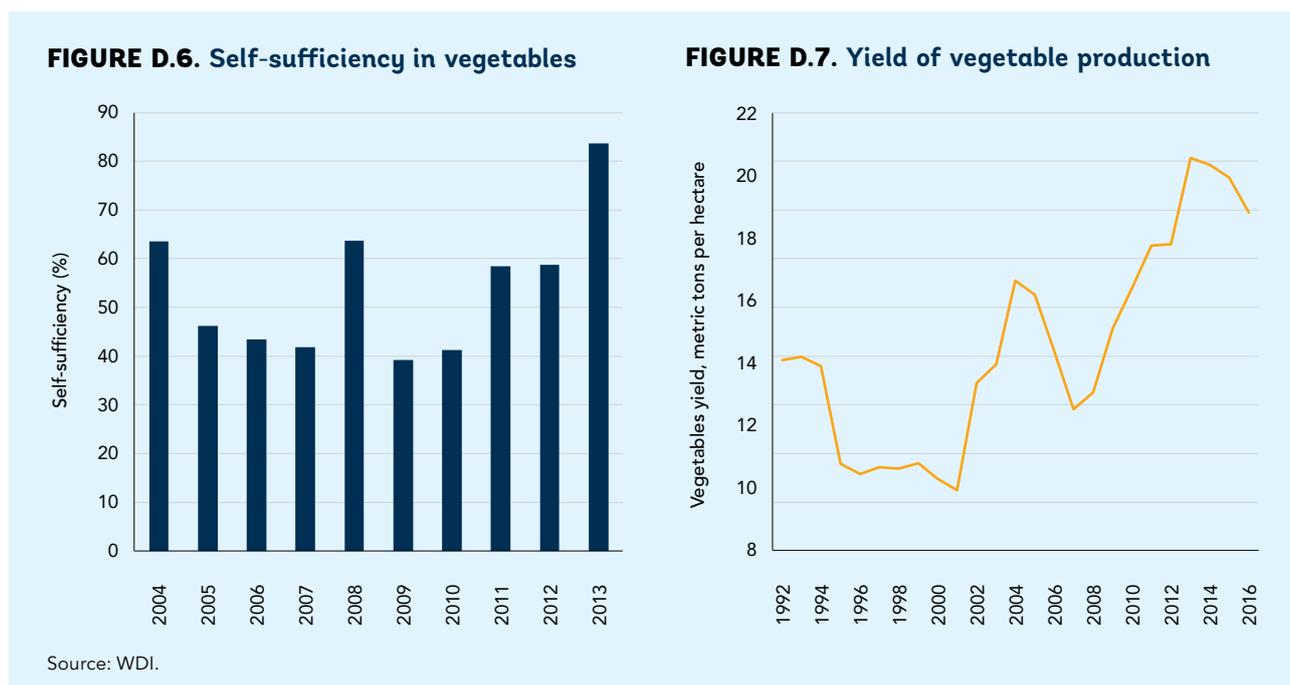


Source: WDI.

Food crops

The food crops sector has contributed to the overall agricultural transformation although scholars in the country argue that it has not been given the attention it deserves especially given that smallholders dominate the production ecosystem. However, there are success stories – poultry, vegetable, fruits, livestock and fishery have all grown remarkably.

The case of vegetables, which showed the highest increase in per capita consumption between 2000-15 has shown a remarkable response to demand. Self-sufficiency reached 83.7 percent and productivity also responded favorably (figures D.6 and D.7).



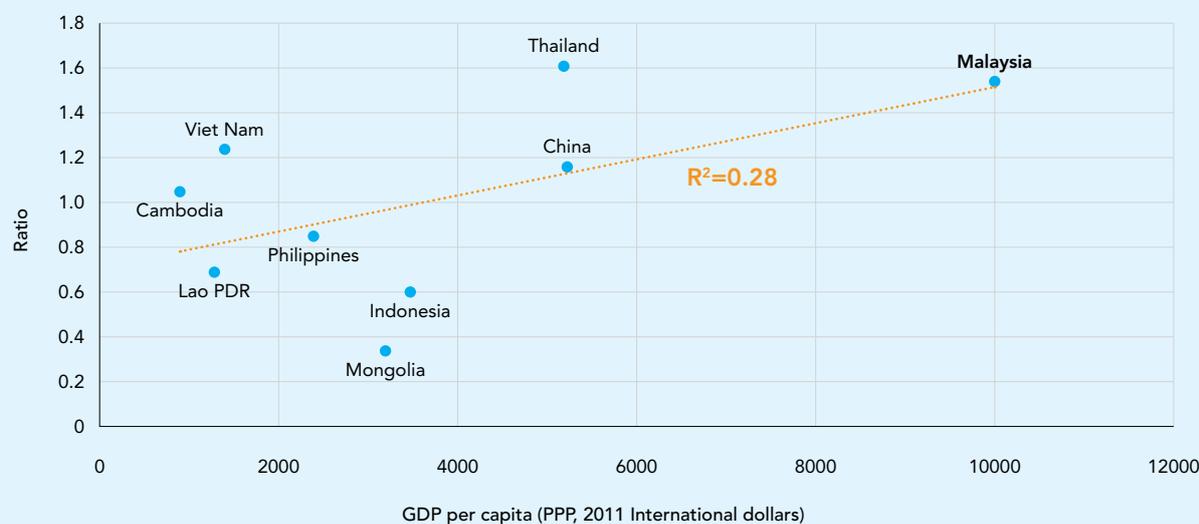
Going forward, the government’s new focus is on smart farming and precision agriculture that is expected to benefit food crops in the immediate future until tree crops could benefit fully from Internet of Things. Private sector interest confirms that investors are upbeat about the food sector.

“More than 190 automation vendors were looking at the food processing and chemical industries as their new target market,” according to Malaysia Productivity Corporation (2017, 73). “Their focus on these two industries strongly suggests that the present scenario of Malaysia’s manufacturing sector actually calls for greater automation.”

Conclusions

Malaysian agriculture benefited both from intensification and extensive agricultural practices. No doubt TFP was driving the gains made in agricultural productivity. This gain was however made more at processing (down-stream level) than at farm level. Diversification of end products have contributed substantially to the transformation achieved.

As noted in value chains discussion, Malaysia’s agricultural transformation was made possible through downstream processing and agribusiness development. It is estimated that, for every unit value created in agriculture, agribusiness creates an additional value of 1.5 or more, on average (figure D.8). This came about through induced policy than a forward linkage occurring through market forces.

FIGURE D.8. Ratio of agribusiness value added to agricultural value added, 2001

Source: Adapted from FAO 2018, *Dynamic Development, Shifting Demographics, Changing Diets*, Bangkok.

Malaysia also invested substantially in agricultural research that was instrumental in diversifying end products. This is particularly true in the case of tree crops, which dominate the sector. The palm oil subsector has shown only limited improvement in productivity for decades. Some point to the limited downstream diversification relative to rubber. However, given that the agricultural sector is now operating with a smaller workforce, productivity growth is now pivotal. The development of other sectors was also important in the transformation of agriculture because this strengthened the pull factor, that is, the development of the manufacturing and service sectors enabled agriculture to release its surplus labor to higher-productivity employment. It stands as a testimony to the progress the country's agriculture has achieved not only in directly contributing to the reduction of poverty, but also by feeding a population that has expanded from 8 million in the late 1950s to around 32 million today.

Notes

208. Gollin, Douglas, Stephen Parente, and Richard Rogerson. 2002. "The Role of Agriculture in Development." *American Economic Review* 92 (2): 160–64.
209. Alvarez-Cuadrado, Francisco, and Markus Poschke. 2009. *Structural Change out of Agriculture: Labor Push versus Labor Pull*. IZA Discussion Paper 4247 (June).
210. The assessment was done by FAO (2018) as part of this analytical task.
211. McMillan, Margaret S., Dani Rodrik, and Íñigo Verduzco-Gallo. 2014. "Globalization, Structural Change, and Productivity Growth, with an Update on Africa." *World Development* 63, 11–32.
212. McMillan, Margaret S., and Dani Rodrik. 2011. "Globalization, Structural Change, and Productivity Growth" NBER Working Paper 17143 (June), National Bureau of Economic Research, Cambridge, MA.
213. The sources of growth section is a summary of Poapongsakorn, Nipon. 2019. "Comparative Review of Agricultural Transformation in Malaysia and Thailand." January 30.
214. Tinnakorn, P., and C. Sussangkarn. 1998. *Total Factor Productivity Growth in Thailand: 1980–1995*. Bangkok: Thailand Development Research Institute.
215. Rungsuriyawiboon, S. 2009. "A Decomposition of Agricultural Productivity Growth in Asia and GMS countries." In Mingsarn Kaosa-ard and Andrew Adam, editors. *Flying with Dragon*. CMU Mekong Series. Chiangmai: Chiang Mai University Press.
216. For example, the TFP contribution to Thai agricultural growth between 2010 and 2015 was 129.1 percent. This is not possible. The main reason is that, despite the low agricultural growth in this period (1.4 percent a year), the growth of inputs was negative, resulting in high TFP growth. One reason for negative input growth was probably the methods of estimating the value of inputs.
217. World Bank. 2018. "Productivity Unplugged: The Challenge of Malaysia's Transition into a High-Income Country."

Annex E. Smallholder farming and area development in Malaysia

Government support for smallholders and small farmers is not limited to a single or couple of approaches.

There is experience with a number of intervention mechanisms: resettlement, in situ development, area development, agropolitans and agricultural parks, rural urbanization, and economic corridors. The support covers both food and commodity crops. Palm oil has had the greater impact on the living standards of the poor. In rice-growing areas, nonfarm income is an important contributor to the income of small farmers; the share ranges from 30 percent to 50 percent. Overall, the government has relied on a menu of options in seeking to reduce poverty, improve income and living standards of rural smallholder households, and create a vibrant local economy in areas that are lagging. The policies are area-based, multisectoral, integrated, and networked.

Smallholder agriculture: Definition and characteristics

In Malaysia, smallholders and small farmers dominate the agricultural landscape. Except palm oil, wherein estates account 60 percent and smallholders farms constitute 40 percent of the land under palm production, all other crops by far are dominated by smallholders and small farmers. Thus, Malaysian agriculture is still dominated by smallholders and small farmers. Total area farmed under smallholders and small farmers is expanding.

“Between 2000 and 2011, the area devoted to oil palm by smallholders has more than doubled, reaching over 700,000 hectares.”²¹⁸ This was a result of direct government intervention, but “even when policies favor private estates over smallholders’ assistance, as is the case in Sarawak . . . smallholders are still able to adopt this crop as part of successful livelihood strategies.” The net impact has been the expansion of smallholders palm oil cultivation. The same holds true for rubber that is mainly driven by the public sector.

“RISDA and, to a lesser extent, FELDA and FELCRA are largely responsible for the success of rubber smallholders in Malaysia which now produce over 80 percent of total rubber in Malaysia and control 94 percent of rubber land” (Bissonnette and De Koninck 2015, 5). This derives not only from the shift of rubber estate cultivation to other cultivation, but also from the expansion in the land dedicated to rubber production by smallholder farmers.

The definition of smallholder differs depending on the context and locality. In general, smallholders are synonymous with small farmers. In the Malaysian context, smallholders are normally associated with small operators producing industrial crops, such as rubber, oil palm, coconut, cocoa, pepper, and kenaf, while small operators producing food crops, such as paddy, fruits, and vegetables, are referred to as small farmers. Following the taxonomy in the country, smallholders are farmers operating in the industrial crops subsector, namely, oil palm, rubber, cocoa, pepper, and kenaf, while small farmers operate in the food crops subsector, such as rice, vegetables, and fruits. By official definition, smallholders operate farms of less than 99 acres or about 40 hectares. However, the majority of smallholders and small farmers operate on less than 2 hectares of land. For instance, the average farm size for paddy is 1.06 hectares; fruits, 0.67 hectares; vegetables, 1.01 hectares; cocoa, 1.07 hectares; coffee, 1.07 hectares; coconut, 0.93 hectares; oil palm, 1.84 hectares; and rubber, 1.6 hectares (Ong Khun Wai, 2001, cited in Asan, Ibrahim Ngah, and Shri-Dewi 2018). It follows that smallholders are farmers operating in palm oil with land areas of less than 40 hectares.

Smallholder farms and agricultural transformation

The main driving force in transforming smallholder agriculture lies in the affirmative action policies embedded in the New Economic Policy (NEP 1971–90). In the aftermath of the racial clash on May 1969, Malaysia implemented an *affirmative action policy* embedded in the NEP, which incorporates a two-pronged objective of reducing poverty by raising income levels and increasing employment and of restructuring society to correct economic imbalances among race, regions, and strata. Zainal Aznam (1994) asserts that agricultural and industrial policies and programs played an important part in the package of distributional policies and programs.²¹⁹ This involved the acceleration of the growth of both sectors and the intersectoral shift in the economy, enabling the absorption of Bumiputeras (a majority of whom are smallholders) from traditional low-income, low-productivity agricultural activities into the modern, high-income productive industrial sector. This package involves the modernization of rural agricultural life, rapid and balanced growth of urban industrial activities, and the creation of a commercial and industrial community among the mainly indigenous (smallholder) Bumiputeras.

Rural and Agricultural Development was prioritized to address poverty, inequality and stability: Within the context of the NEP and economic transformation, agricultural development and progress in Malaysia has been accorded a high priority. This is because agricultural (and rural) development is viewed as vital for political and cultural stability (Abdul Aziz 1994), in view of the abundance of poor and low-income families among agricultural and rural households.²²⁰ Malaysia experimented and implemented a number of approaches in support of smallholders and small farmers: resettlement, in situ development, area development, agropolitans and agricultural parks, rural urbanization, and economic corridors. The support covers both food and commodity crops. Palm oil has exerted a greater impact on living standards among the poor. In rice-growing areas, nonfarm income is an important contributor to the incomes of small farmers, ranging between 30 percent and 50 percent of the total earnings of small farmers.

Several reviews, including Asan et al. (2018), regard oil palm smallholders as the most successful inclusive growth story in Malaysia.²²¹

Oil palm farms of smallholders

Historically, smallholders were not encouraged or incentivized to grow palm oil – in fact, some argue that there was a policy to make smallholders entry into palm oil difficult.

The first palm oil estate emerged in 1918 and oil palm cultivation increased gradually during the 1920s. Up to the late 1950s, oil palms were only grown on private estate land supported by the idea that oil palm could only be grown successfully by estates: As early as 1934 the British colonial government helped to promote this idea by stating that an area of at least 200 acres must be taken up by any person desiring to alienate land for oil palm cultivation... During the colonial period Malay smallholders were basically limited to producing rice (the staple crop of Malaysia) and other food crops. Colonial policies restricted paddy-land to Malays... Expansion of local paddy production was also considered to be an important means to increase colonial revenue, burdened by costly imports of rice... In the early 1960s, a number of independent smallholders started to plant oil palm, imitating the new estate strategy of shifting from rubber to oil palms. (Khera 1976)²²²

However, driven by government policy to diversify agriculture, expand the frontier and the inclusiveness agenda, smallholders participation in palm oil has been on the rise since 1960s.

Among smallholders operating in palm oil, there are three main categories of arrangements in palm oil production: independent smallholders, government-supported smallholder schemes, and collective landowner schemes. The first category refers to growers without any direct assistance from the government or private entities. They sell their crop to local mills either directly or through buyers. The second category is organized smallholders, that receive support from the government or the private sector. This support may be in the form of loans, technical assistance, guaranteed markets or prices, assistance with land access or titling, legal support and/or institutional development. In Malaysia, this scheme is primarily driven by three main agencies, namely, FELDA, FELCRA, and Rubber Industry Smallholder Development Authority (RISDA). Three main agencies are involved in Sarawak in this scheme, namely, the Sarawak Land Development Board, the Sarawak Land Consolidation and Rehabilitation Authority, and the Land Custody and Development Authority. The third category is collective landowner's scheme. In terms of functional relationship, these three categories can be grouped into independent and organized (organized plus collective). By the end of 2017, the number of people directly employed in the palm oil industry stood at 440,262 (exclusive of 280,977 independent smallholders).

FELDA, a model to transform the agricultural sector²²³

The FELDA model has also evolved from a relatively small scheme to a complex system.

"Individual schemes of about 400–500 families and 1,600–2,000 hectares were replaced by complexes of about 1,000–2,000 families and 4,000–8,000 hectares developed in successive phases," note Fold and Whitfield (2012, 26). "Moreover, the regional pattern of schemes changed. Early schemes were distributed in a scattered manner, whereas newer schemes or complexes (a cluster of adjoining schemes) were located in regional concentrations even constituting virtual regional development programs."

The FELDA complex system involved the development of urban areas, and, at its zenith (and during individual schemes), FELDA's model was therefore essentially an area-based development. The extensive support the FELDA program provided, the integration of various support mechanisms, and the way FELDA resettlements evolved into small towns providing services to rural people that otherwise would have been supplied by the urban sector, is touched on below.

FELDA chose productive segments of the population for its settlement schemes. The target population was individuals ages 21–50, physically fit, and married. In addition, FELDA schemes were area-based, that is, they were within a defined geographical location. They included integrated support from land, agricultural training, education, social amenities, and economic and social infrastructure. The settlements evolved into small towns and centers of economic activities, thereby amplifying the impact of the palm oil resettlement schemes. Processing plants were established that created additional employment opportunities within the rural settings.

Beyond the settlers, FELDA was also active in supporting entrepreneur skills development to benefit the settlers and their families. For example, FELDA supported the training of young people in settler families through the Tunas Meka Program, one of the most successful entrepreneur creation programs in Malaysia. The program sought to develop entrepreneurial skills among those young people who had earned high-level diplomas or degree qualifications. Among businesses that these generations of FELDA have successfully set up are marketers of agricultural products, such as chilis, lemongrass, and oysters and cybercafes, restaurants, boutiques, and spas. Many business training activities are being conducted among this community of young people, who are also being provided with funds to help them in founding businesses. FELDA support has also included assistance in family planning, youth services, and maternal and pediatric care and even employment opportunities in houses of worship (box E.1).

BOX E.1

The FELDA model, phases, and activities

A number of different government smallholding schemes have been undertaken in Malaysia. The largest are run by FELDA, which was established in 1956 with the mandate of diversifying agriculture and resettling landless families. The schemes are being implemented relatively far from rural villages. They involve new urban settlements linked to large, newly established plantations.

The FELDA contract system is complex. The strategy has changed several times. In the initial phase, settlers were given individual titles to land, and each settler family was provided with about 4 hectares, a house, and a garden plot situated within a larger management block of land. FELDA's role was to improve the physical infrastructure around the settlements, provide advisory and management services, offer credit, supply agricultural inputs such as seed, fertilizers and pesticides, and market the crops. Settlers worked on an individual piece-rate basis and participated as equal owners with no rights over any particular plot of land.

A second phase in the 1970s changed the approach to a block system with the aim of increasing the collective responsibility of the settlers and facilitating links among settlements, while maintaining estate-like efficiency, productivity, and product quality (Fold 2000). It also sought to address problems of absenteeism and of farmers subcontracting land to illegal Indonesian workers (Ghee and Dorall 1992). Access to credit was facilitated, and the amount of land under cultivation rapidly increased. Under this system, each settler was responsible for roughly 4 hectares. Settlers were organized into groups of 20 for cooperative work. Each cooperative operated a block or roughly 80 hectares of oil palm. Settlers received housing, infrastructure, and agricultural inputs, and each block included 1.5 hectares for subsistence farming. Individual farmers were responsible for the transport of the oil palm fruit bunches from their own field to the local road, but the communal block paid for the transport to FELDA-oriented processing facilities. Profit from the block sales of fruit bunches was divided equally among members.

Title to land is only given to farmers once they have repaid the debt incurred to finance the costs of agricultural inputs. It takes most settlers on existing schemes a minimum of 15 years to accomplish this (Ghee and Dorral 1992). Once the debt has been repaid, smallholders are given the choice to opt out of FELDA arrangements and cultivate palm oil independently or to renew a 25-year agreement with FELDA (this reflects the life cycle of replanting the palms). A small share of smallholders choose to opt out of FELDA arrangements and cultivate palm oil independently. Most prefer to stay within the FELDA scheme because there may be little access to alternative plantation-owned or independent mills or affordable inputs.

FELDA introduced a third phase in 1985. This involved a share-system whereby settlers were expected to work for a fixed wage and receive dividends from a share equivalent to 4 hectares of oil palm. After the debt repayment, the settlers obtained title to a house with a small adjacent plot of land or subsistence production and a share in the plantation. However, this system was unpopular with settlers, and the arrangements returned to the block system (Pietcher 1991).

By the 1990s, FELDA's put increasing emphasis on commercial success and financial independence from government, rather than social development (Sutton and Buang 1995). The FELDA management of settler schemes remains, but new land has also been developed into nonsettler plantations owned by FELDA subsidiaries and worked by laborers who earn wages and bonuses at similar rates to private plantations. Many workers are immigrants and are employed on a casual or contractual basis.

FELDA is no longer opening up new land for development. Its main activity has become the rehabilitation of the older palm oil and rubber schemes through FELCRA and RISDA and the opening up of native customary rights lands for plantation development.

Source: Vermeulen, S., and N. Goad. 2006. "Towards Better Practice in Smallholder Palm Production." Natural Resource Issues Series 5, International Institute of Environment and Development, London.

The sum of FELDA's interventions were also reflected in the observed improvement in mobility of smallholders.

Jobs were created within the settlement complexes that provided additional off-farm opportunity in the growing urban centers within the settlements, mills and other professional, business and processing activities. The improvement in income, educational support, and training has allowed intergenerational mobility as clearly seen with the education attainment of the children of the original settlers. In fact, it is sometimes reported that farmers have moved to providing management of their farms using hired hands mainly immigrant labor.

In closing this section, we note that (1) replication of the FELDA model in other regions, for instance, Sarawak, did not manage to duplicate the achievements of FELDA. The Sarawak Land Development Board, established in 1972, was given the authority to bring FELDA's success in Peninsular Malaysia to Sarawak through resettlement schemes; (2) FELDA is now facing several challenges, which includes an overextension of its activities and mandate beyond its original aim. Recently, issue of governance has taken a center stage in the operation of FELDA. During the writing of this report, this was a developing story and most importantly an in depth look into the governance of the institution is beyond the scope of this paper. However, it has to be mentioned that the role of FELDA into the 21st century should be reviewed and assessed if the country wants to avoid mission creep.



Area development

In Malaysia, to a large extent the strategy of rural and agricultural development took an area-based development approach. The much heralded FELDA model is essentially an area-based development approach that strived and managed to change specific geographical areas through multisectoral and holistic interventions. Rural urbanization and economic corridors are other strands of the government's strategy to bring about a change in rural areas. Thus, agricultural and rural development was the result of an area-based development approach.

Rural development, in Malaysia, is much concerned with the alleviation of rural poverty. Initially, as the majority of the rural poor live in backward and remote rural areas, the alleviation of poverty involves transforming traditional villages into modern ones with adequate basic amenities and infrastructures. Rural development involves a multisectoral approach that includes agricultural development, rural industrialization, infrastructural development, and welfare support. Because the majority of the rural population is engaged in agriculture-related employment and activities, agricultural and land development typically form the crux of rural development programs. These programs usually seek to use agricultural income and productivity to transform traditional agriculture into modern agriculture through the infusion of modern technology and the provision of support services, subsidies, and amenities that increase yields and incomes and ultimately to reduce poverty among rural households.²²⁴

Agricultural and rural development has been accorded special priority in Malaysian annual and five-year development plans: This is demonstrated through the significant sectoral budget allocations, ranging from 26 percent during the First Malaysia Plan (1966–70), 24 percent during the Second Malaysia Plan (1970–75), and 22 percent during the Third Malaysia Plan (1976–80), although the allocations subsequently decreased to 1 percent during the Sixth Malaysia Plan (1991–95). As can be seen throughout the Malaysia Plans, the sectoral allocations for agricultural and rural development are significant and clearly show the government’s commitment to the inclusive agenda.

In Malaysia, the integrated rural development approach is based on area development and was incorporated as the main rural development strategy in the NEP (1970–90s) to reduce poverty and restructure of society and translated into regional development and IADPs. Regional development strategy was aimed at redressing the economic and structural imbalances between regions, to slow down rural urban migration and to promote agricultural and industrial development. The agricultural component of integrated rural development is the IADP, which is designed to revitalize and rehabilitate in situ or existing agricultural areas facing poverty and low productivity. The chosen support mechanism is the provision of integrated packages of infrastructure, agroservices, technology, and inputs. The coordination and implementation are directed through specific area development institutions (Chamhuri Siwar 1994).

IADA is one variety of agricultural program designed to reduce poverty among rural people. The program has adopted several strategies, designed to increase productivity, maximizing farmers income and modernizing the farm operations (Nor Diana and Chamhuri, 2015). In 1970, the Ministry of Agriculture implemented six IADPs, namely, the Kemubu IADP under KADA, the Muda IADP under MADA, the Kemubu and Besut irrigation schemes, and the North West Selangor and West Johor schemes. The programs were responsible for providing irrigation, farm machinery, high-yielding varieties, and infrastructure and agricultural extension services.

IADAs supported the diversification of agricultural products by small farmers: A report of KADA (2017) shows that, in the KADA area of 82,900 hectares, 47 percent (30,215 hectares) consisted of mixed orchards, rubber estates, water resources, and other cultivations apart from the paddy land of 37,670 hectares. The paddy land had significance only for one season a year, and it was also suitable for planting and eventual development for the production of various agricultural products. This is supported by 13 regional farming establishments in KADA that provide input facilities, marketing services, and other services to the entire population in the IADAs (KADA 2019). Other case studies on IADAs have focused on the impacts of agricultural development areas in increasing incomes, the socioeconomic performance, and issues and challenges facing the agricultural sector.

Muda IADA (MADA) had positive impacts on the incomes of the targeted beneficiaries: improvements of the living standards of farmers. The Zubir et al. (2013) study on income determinants among 225 paddy farmers in MADA revealed that the implementation of the project reduced the poverty level of farmers in the study area from 72.0 percent in 1966 to 1.4 percent in 2008.²²⁵ They found that 30 percent out of the total income was contributed from the nonpaddy income sources. With the double log regression analysis, the result shows that the indicators of ownership of lands, land rental, nonagricultural income, subsidies recipients, education level, and a number of part-time job of household members have significant effect on the income of paddy farmers. Even though the paddy income contributed a large portion (73 percent) in the total of RM 1,597.28, but it included the paddy price subsidies by government. This means that they still need the off-farm income.

Nonfarm income: The case of KADA

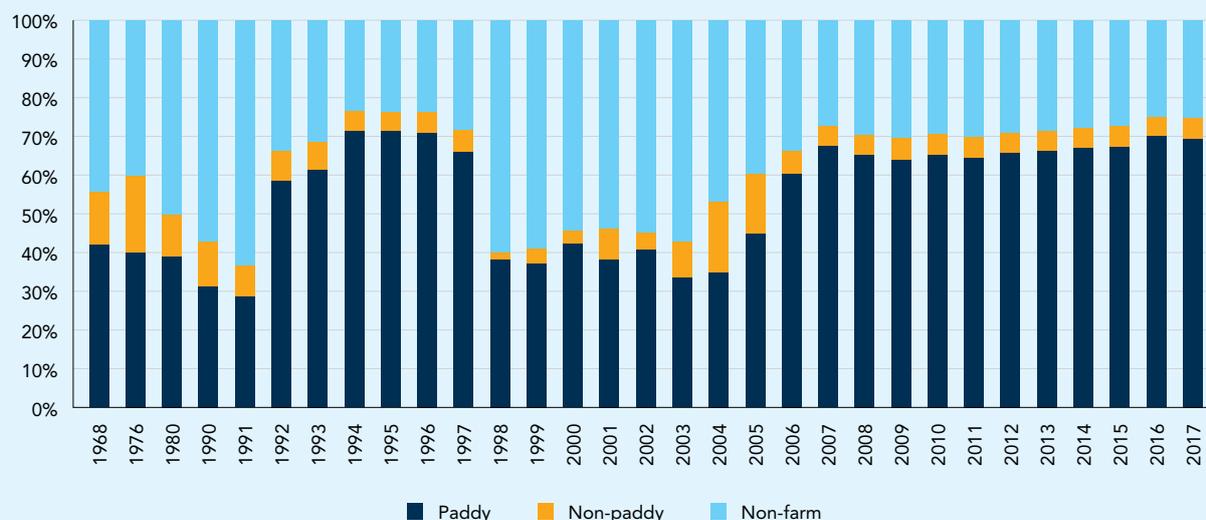
The analysis of nonfarm income is compromised because of a lack of data or comprehensive studies covering the country. However, there are some pieces of information. Figure E.1 illustrates the share of nonfarm income from 1998 up to 2005 in the KADA Region. In some years, for example, 1998–2003/04, more than half the total household income of farmers consisted of non-rice and nonfarm earnings. The non-rice income includes agricultural crops other than paddy such as sheep, poultry, and freshwater fish breeding, honey-based cosmetics, goat farms, and melon crops. During the period, it was found that incomes from paddy still formed a major portion of household income, but nonpaddy and nonfarm income sources contributed substantially to the total income of farmers, justifying the diversification of income sources pursued by the IADPs (box E.2).

The higher income contribution of nonagricultural jobs was also noted by Pazim (1992), who points out that it was a driving force for the agricultural industry to compete with other industries in raising farm household incomes, especially in the KADA area.²²⁶ Rita and Mohamed (2011) also find that, on the east coast of Malaysia, especially farmers in Kelantan still rely on off-farm income to sustain livelihoods.

Regional development

The Third Malaysia Plan (1976–80), the second stage in the implementation of NEP, focused on efforts to reduce poverty and restructure society. These efforts were carried out through agricultural and industrial development to increase productivity, while enabling employment opportunities and improving the standard of living of the people, especially in rural areas. As a rural development strategy to reduce poverty and promote regionally balanced development, a regional development strategy was introduced to bridge the economic gap between regions through frontier and new town development programs, such as the programs of the Southeast Johor Development Authority, the Southeast Pahang Development Authority, the Central Terengganu Development Authority, the South Kelantan Development Authority, FELDA, KEDA.

FIGURE E.1. Annual sources of income



Source: Siwar, Chamhuri and Nor Diana Mohd Idris. 2019. The Role of Smallholder farming and area development in Malaysia's Agricultural Transformation: Driving Forces and Lessons. Unpublished.

BOX E.2

Poor households diversify differently

Following a boom in rice production in the Muda River region of Malaysia during the 1970s, agricultural employment and wage rates rose sharply, by over 50 percent in real terms. This induced a subsequent phase of widespread agricultural mechanization. By the 1980s, virtually all farms in the region harvested paddy by combine, either owned or rented. The resulting labor displacement in agriculture led local household members, particularly married men, to diversify into nonfarm activities. As a result, a study in one village of this region found that the share of married men engaged primarily in nonfarm activities increased from 5 percent in 1977 to 30 percent in 1987.

Yet the character of that employment differed significantly between the poor and the rich. Members of poorer households, slightly under half of the nonfarm workers, found employment in low-wage nonfarm jobs such as construction labor, quarry work, lorry driving, and rice mill labor. The remainder, from more well off households, found nonfarm work in more lucrative pursuits such as transport and trade enterprises, government jobs, and brokering and contracting services. On average, this more well off group earned incomes triple those of the low-wage group. Better education, larger landholdings (which enabled rental income or sales), and strong political contacts enabled this group to finance and access the more lucrative segments of the rural nonfarm economy. As in most places, the rich and the poor diversify differently because of differential access to human, financial, physical, and political capital (Hart 1994).

Source: Reardon, Thomas, Julio Berdegue, Christopher B. Barrett, and Kostas Stamoulis. 2019. "Household Income Diversification into Rural Nonfarm Activities." In S. Haggblade, P. B. Hazel, and T. Reardon, eds.. *Transforming the Rural Nonfarm Economy: Opportunities and Threats in the Developing World*. p.130.

The Southeast Pahang Development Authority was the first regional development agency to be established in Malaysia to spearhead integrated development strategies through the adoption of the authority's master plan by the government. Emphasis was placed on efforts to gather resources, provide networking links, and develop centers of growth and new cities. The development strategy was based on the concept of urbanization among inhabitants in cities and work in areas under three categories of development, namely, forestry, agriculture, and industry. Among the cities of intensive planning in terms of infrastructure, the program provided residential houses, schools, recreation facilities, and various other facilities based on local needs. The towns were expected to become growth centers. Financing included public-private partnerships and foreign direct investment.

The implementation of agropolitans in Malaysia has focused on the objective of poverty reduction in rural areas through the creation of growth centers anchored on agriculture. The approach is aimed at improving rural areas by establishing a viable local economy through the integration of economic and social centers in local economies. For the most part, the approach is based on agriculture and encompasses expansion and processing in agro-based rural industries. The projects in this approach aim to reduce poverty among the extreme poor. In terms of management, the agropolitans under the supervision of the Prime Minister's Department and four ministries, including the Ministry of Rural Development, have been tasked with assisting the government in reducing poverty. Of the 10,000 extreme poor, 5,600 benefited from Ministry of Rural Development support, and the rest were managed through economic corridor development projects.²²⁷

Sarawak has been implementing agropolitan development projects that are similar to those in Peninsula Malaysia. The Sarawak government developed 800 hectares of agropolitan area near Sri Aman, Lingga, upon the request of the government, so as to assist in the production of food and raw materials (table E.1). Development and implementation are based on feedback from local communities.

TABLE E.1. Agropolitan areas, Malaysia

Agropolitan	Stakeholder	Area, hectares	Participant	Project	Development period
Gahai, Lipis, Pahang	RISDA	232.69	80	Rubber	2007–13
Chemmi, Bentong, Pahang	RISDA	656.50	200	Rubber	2010–16
Ganda, Gerik, Perak	RISDA	1,011	400	Rubber	2010–18
Sik, Kedah	KEDA	222	130	Rubber	2009–15
Pulau Banggi, Kudat, Sabah	FELCRA Berhad	1,402	200	Rubber	2007–14
Gana, Kota Marudu, Sabah	KKLW/LIGS	1,402	200	Rubber	2011–18
Batang Lupar, Sri Aman, Sarawak	FELCRA Berhad	1,600	320	Oil palm	2010–15
Batang Sadong, Samarahan, Sarawak	FELCRA Berhad	825	138	Oil palm	2010–15
Pulau Bruit, Mukah, Sarawak	FELCRA berhad	1,824	360	Oil Palm	2010–15
Gunung Sadok, Saratok, Sarawak	RISDA	349	150	Rubber	2010–16
Nanga Sekuau, Sibuan, Sarawak	RISDA	634	518	Rubber	2010–16
Total		10,247.99	2,946		

Source: KKLW 2018.

In Sabah, a comprehensive economic, social and physical development plan for the proposed Beluran (Ulu Lingkabau) agropolitan area is prepared. This project is proposed under the Sabah Development Corridor is designed to eliminate extreme poverty within the agropolitan area by accelerating rural economic growth through agriculture and related activities. The anticipated growth was planned to help bridge the disparity in development between rural and urban areas and would reduce by half the overall incidence of poverty.

Overall, the aim of this agropolitan projects is to eliminate poverty and create a viable and vibrant local economy while contributing to the overall economic development of the county. They are based on developing the commodity subsector, mainly palm oil and rubber. Review of these interventions indicate they have managed to improve income and living conditions of direct beneficiaries and the local population at large through the economic and social infrastructures financed through this mechanism. A study that evaluated the Pulau Banggi, Sabah, agropolitan project reported that “there seems to be numerous benefits received by the target group such as increase in average income from around RM 250 to RM 1,200 per month per individual. Provision of infrastructure and utilities also gave benefit to the whole resident[s].”²²⁸ Thus, the monthly incomes of beneficiaries improved by 380 percent. Another study that reviewed three agropolitan projects reported an improvement of 60 percent among 62 percent of the beneficiaries.²²⁹ A comprehensive review of the approach will provide an important lesson for the future transformation of the country into a high-income country and to the rest of the developing world on the long-journey of agricultural transformation inclusive of smallholders.

Notes

218. The quote is from page 8 of Bissonnette, Jean-François and Rodolphe De Koninck. 2015. *Large Plantations versus Smallholdings in Southeast Asia: Historical and Contemporary Trends*. Land grabbing, conflict, and agrarian-environmental transformations: perspectives from East and Southeast Asia Conference Paper 12.
219. Zainal Aznam Yusof, (1994), "Growth and Equity in Malaysia," in INTAN, *Malaysian Development Experience: Change and Challenges*, National Institute of Public Administration (INTAN), Kuala Lumpur.
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221. Asan Ali Golam Hassan, Ibrahim Ngah, Shri- Dewi Applanaidu (2018) "Agricultural Transformation in Malaysia: The Role of Smallholders and Area Development". (Unpublished).
222. Fold, Niels, and Lindsay Whitfield 2012. "Developing a Palm Oil Sector: The Experiences of Malaysia and Ghana Compared." DIIS Working Paper 2012-08.
223. In addition to FELDA, the South Kelantan Development Authority is involved in the development of land schemes. Here only FELDA is considered because of its significance.
224. Chamhuri Siwar, (1994) "Rural Development, Poverty Alleviation and Rural Transformation" in INTAN, *Malaysian Development Experience: Change and Challenges*, National Institute of Public Administration (INTAN), Kuala Lumpur.
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226. Pazim Othman. 1992. "Land Abandonment in Rice Sector: An Economic Analysis." *Journal Ekonomi Malaysia* 26. 21-45.
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Annex F. Quantitative comparisons, Malaysia and selected countries

Speed of Malaysia’s agricultural transformation in a comparative perspective: The speed of Malaysia’s transformation journey, even though decades long, has been much more rapid than the corresponding journeys of the industrialized countries compared here: Japan, the Netherlands, the United Kingdom, and the United States (table F.1). Malaysia has benefited from the technologies that have been developed by the industrialized countries and possibly even by looking into the promises and pitfalls of these past experiences.

TABLE F.1. The speed of Malaysia’s agricultural structural transformation was relatively rapid

Country	Agricultural share of GDP			Agricultural share of employment		
	Year of 40%	Year of 7%	Years required	Year of 40%	Year of 16%	Years required
Netherlands	1800	1965	165	1855	1967	102
United Kingdom	1788	1901	113	1800	1868	68
United States	1854	1950	96	1897	1950	53
Japan	1896	1969	73	1940	1971	31
China	1967	2016 (8.6%)	>45	2007	2016 (27.8%)	>9
Korea, Rep.	1965	1991	26	1977	1991	14
Malaysia	1960 (43.7%)	2017 (8.8%)	>57	1980 (37.2%)	2000/01 (18.4/15.1%)	20/1

Source: WDI

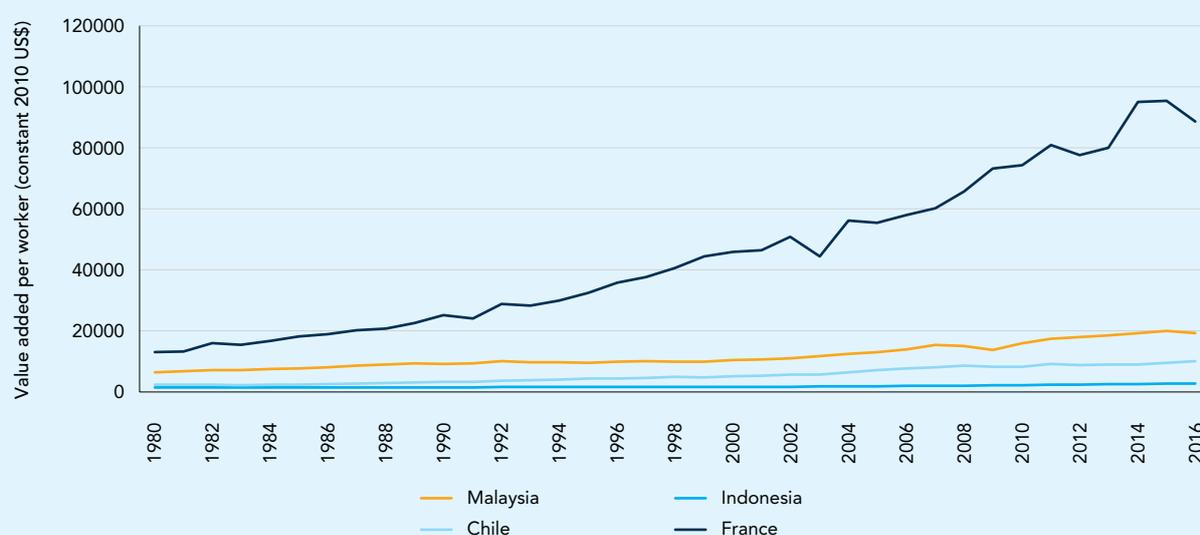
Malaysia was one of the 13 countries which the Commission on Growth and Development (2008) identified as a success case in that the Malaysian economy grew at 7 percent or more for 30 years or more.²³⁰ While favorably comparing Malaysia’s development experience as it exhibited economy-wide features in common with the other 12 countries, the report cautions against looking for recipes for replication. While there are no recipes, policy insights from analyzing the development experiences of different countries with the same goals for inclusive growth can shed much light on promising options to consider, as well as pitfalls to avoid.

This report builds on the insights of the Commission, but extends them in two directions: in terms of the period covered, that is, about a decade since 2008, and in terms of sectoral depth to understand Malaysia’s agricultural transformation, its distinctive features, achievements, and remaining challenges. This annex offers quantitative comparisons among Chile, France, Indonesia, and Malaysia (see table F.1).

Differences in agricultural value added per worker and as a share of GDP: Malaysia is compared with selected countries that are at different stages of agricultural transformation and economic development, but that share the challenge of transforming agriculture to generate inclusive growth. These countries are high-income, industrialized France; high-income Chile; lower-middle-income Indonesia, and other Southeast Asian countries of the Philippines, Thailand, and Vietnam. Growth in value added per worker is a good, though not complete indicator of the progress of transformation. There are two sets of comparisons, as follows:

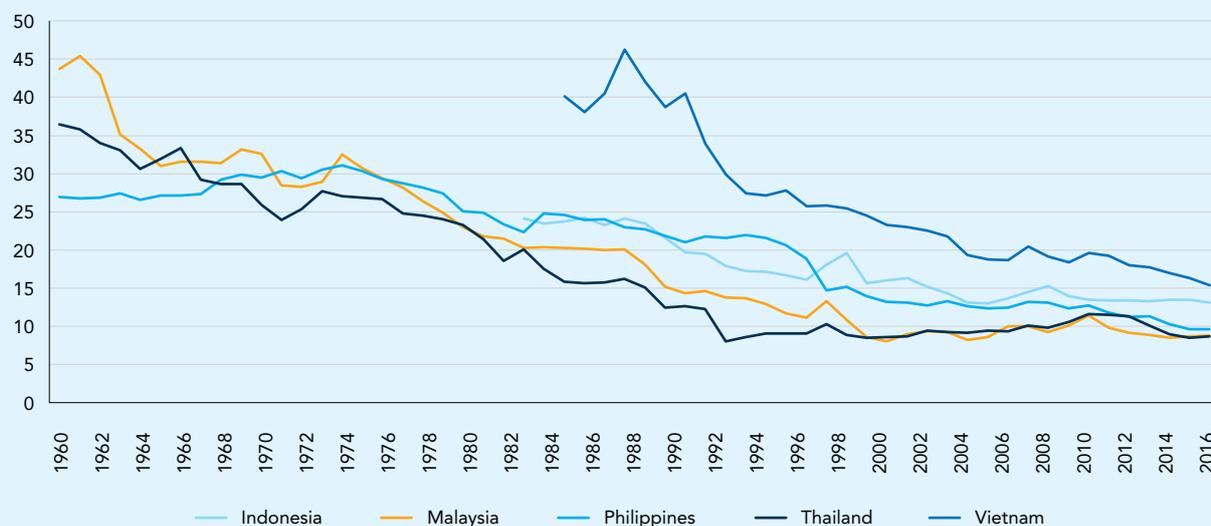
- **First set:** The value added per worker in 2010 constant U.S. dollars was much lower in Malaysia in 2016, at US\$19,²³¹ than in France, at US\$88,578, but higher than in Indonesia, at US\$2715.77. Indonesia had the lowest growth rate in value added per worker between 1980 and 2016 (107.5 percent). The rate was 205.5 percent in Malaysia, 350.0 percent in Chile, and 585.7 percent in France. Because Chile is a high-income country, and its ratio of primary agricultural GDP to total GDP was only 4 percent in 2016, much less than the ratio in Malaysia, at around 8 percent. The value added per worker was thus lower in Chile, at US\$9,942, but the growth rate was higher in Chile than in either Indonesia or Malaysia (figures F.1 and F.2; tables F.2 and F.3).
- **Second set:** Agricultural value added as a share of GDP in 1960–2016 is declining in Malaysia as in all the comparator Southeast Asian developing countries. This is a well-known stylized fact worldwide. The sharper decline in Vietnam is more evident because Vietnam has recently joined the small group of miracle countries (figures F.1 and F.2).

FIGURE F.1. Agricultural value added per worker, Chile, France, Indonesia, and Malaysia, 1980–2016



Source: World Development Indicators.

Note: Agriculture comprises value added from forestry, hunting, and fishing as well as cultivation of crops and livestock production. Value added in agriculture measures the output of the agricultural sector less the value of intermediate inputs.

FIGURE F.2. Agricultural, forestry, and fishing value added (% of GDP)

Source: WDI.

TABLE F.2. Agricultural transformation, Chile, France, Indonesia, and Malaysia, 1960–2016

		Malaysia	Indonesia	Chile	France
Share of agriculture in GDP (%)	1960	43.72	36.8 ^{aa}	10.82	–
	1970	32.58	35.2 [*]	7.01	7.52
	1980	23.03	24.6 [*]	7.65	4.06
	1990	15.22	21.55	9.15	3.50
	2000	8.60	15.60	5.92	2.34
	2010	10.09	13.93	3.93	1.78
	2016	8.65 ^p	13.45	4.30	1.48
GNI per capita (constant 2010 US\$)	1960	1341.58	685.16	3751.45	–
	1970	1964.16	762.14	4563.68	–
	1980	3198.95	1174.69	5102.20	27156.29
	1990	4359.04	1622.65	5678.04	32737.27
	2000	6470.61	1988.44	9203.40	39244.31
	2010	8782.80	3030.58	11946.77	41534.20
	2016	10722.12	3840.63	14629.51	42952.59
Agricultural value added per worker (constant 2010 US\$)	1980	6293.98	1308.47	2210.43	12917.15
	1990	9146.00	1412.68	3243.50	25145.60
	2000	10426.36	1544.83	5091.71	45774.10
	2010	15962.13	2124.26	8197.17	74177.02
	2016	19231.07	2715.77	9942.13	88578.25
Share of agriculture in total employment (%)	1980	37.2	56.39	16.27	8.37
	1990	25.99	55.87	19.25	5.57
	2000	18.36	45.28	14.44	4.14
	2010	14.22	39.46	10.61	2.89
	2015	12.47	32.88	9.64	2.71

		Malaysia	Indonesia	Chile	France
Trade (% of GDP)	1960	113.42	24.09	28.89	26.97
	1970	87.12	28.68	28.33	31.13
	1980	112.99	52.65	48.12	43.24
	1990	146.89	52.61	61.75	42.43
	2000	220.41	71.44	59.32	55.26
	2010	157.95	46.70	69.06	53.97
	2016	128.08	37.39	56.09	60.58
Agricultural total factor productivity (average annual growth (%))	1961–70	0.0308	0.0173	0.0138	0.0011
	1971–80	0.0212	0.0134	0.0209	0.0148
	1981–90	0.0301	0.0038	0.0096	0.0100
	1991–2000	0.0188	0.0062	0.0175	0.0179
	2001–10	0.0344	0.0290	0.0250	0.0149
	2001–13	0.0285	0.0265	0.0256	0.0195
Paddy yield (kilograms per hectare)	1961	2108.60	1762.30	2720.70	4051.20
	1970	2385.80	2376.30	3022.80	4217.70
	1980	2852.40	3292.80	2336.90	3833.30
	1990	2769.40	4301.80	4173.40	5946.10
	2000	3064.00	4400.70	5241.40	5835.80
	2010	3636.10	5015.30	3859.90	5043.2
	2014	3835.00	5134.80	6022.10	4978.4
Oil palm (fruit) yield (kilograms per hectare)	1961	11546.80	13357.10	–	–
	1970	14376.30	13000.00	–	–
	1980	16465.40	16666.70	–	–
	1990	17754.30	16569.50	–	–
	2000	18406.50	18063.60	–	–
	2010	20572.60	16920.40	–	–
	2014	20486.30	17053.20	–	–
Cocoa bean yield (kilograms per hectare)	1961	461.5	154.1	–	–
	1970	800.0	214.4	–	–
	1980	1017.9	531.3	–	–
	1990	830.0	896.3	–	–
	2000	927.4	561.6	–	–
	2010	779.5	511.4	–	–
	2015 ^c	700.0	532.6	–	–
Wheat yield (kilograms per hectare)	1961	–	–	1339.8	2395.0
	1970	–	–	1765.4	3422.3
	1980	–	–	1770.1	5181.0
	1990	–	–	2948.1	6478.7
	2000	–	–	3812.0	7117.1
	2010	–	–	5765.8	6441.9
	2014	–	–	5329.0	7353.0

Sources: World Bank (1992), "Indonesia: Agricultural Transformation Challenges and Opportunities". Report 10504–IND. Data of World Development Indicators, United States Department of Agriculture, Food and Agriculture Organization of the United Nations.

Note: The differences in the estimates of GNI per capita used in the text and here arise because of the different years and the deflation of some estimates.

a. Share of agriculture in GDP in 1969 in Indonesia.

b. 8.80 percent in 2015 (Ministry of Economic Affairs).

c. Average yield of smallholder farms reported by Departments of Statistics of Malaysia (DSM) and Indonesia (BPS). This average is used instead of the FAO average because the FAO average appears to be too small.

TABLE F.3. Selected socioeconomic and governance indicators, Chile, France, Indonesia, and Malaysia, 1960–2016

		Malaysia	Indonesia	Chile	France
Percentage of population living on less than US\$1.90 a day	1980s	0.40	25.85	3.10	–
	1990s	0.10	15.56	1.70	–
	2000s	0.07	5.48	1.43	0.00
	2010s	–	1.77	0.67	0.02
Percentage of population living on less than US\$3.20 a day	1980s	12.37	91.80	23.10	–
	1990s	10.2	84.06	15.42	–
	2000s	3.03	64.93	9.33	0.04
	2010s	–	40.33	3.47	0.04
Inflation, consumer prices (annual %)	1960	0.06	39.59	11.56	4.14
	1970	1.84	12.35	32.51	5.85
	1980	6.67	18.02	35.14	13.54
	1990	2.62	7.81	26.04	3.38
	2000	1.53	3.72	3.84	1.70
	2010	1.71	5.13	1.41	1.53
	2016	2.13	3.53	3.79	0.18
Urbanization (% of urban population in total population)	1950	20.36	12.40	58.42	55.23
	1960	26.6	14.59	67.84	61.88
	1970	33.45	17.07	75.23	71.06
	1980	42.04	22.10	81.25	73.28
	1990	49.79	30.58	83.27	74.06
	2000	61.98	42.00	86.07	75.87
	2010	70.91	49.92	88.58	78.35
	2017	76.00	55.18	89.86	79.98
Corruption perception index (100 = no corruption; 0 = total corruption) ^a	1995	52.80	19.40	79.40	70.00
	2000	48.00	17.00	74.00	67.00
	2005	51.00	22.00	73.00	75.00
	2010	44.00	28.00	72.00	68.00
	2015	50.00	36.00	70.00	70.00
	2016	49.00	37.00	66.00	69.00
Government effectiveness (percentile rank) ^a	1996	68.85	23.50	86.89	85.79
	2000	83.08	46.15	84.62	90.77
	2005	83.82	38.24	85.29	92.16
	2010	82.78	46.89	86.60	89.00
	2015	76.92	45.67	83.17	88.46
	2016	75.96	53.37	79.33	89.90

Sources: Data of World Development Indicators, Transparency International, Food and Agriculture Organization of the United Nations, Worldwide Governance Indicators.

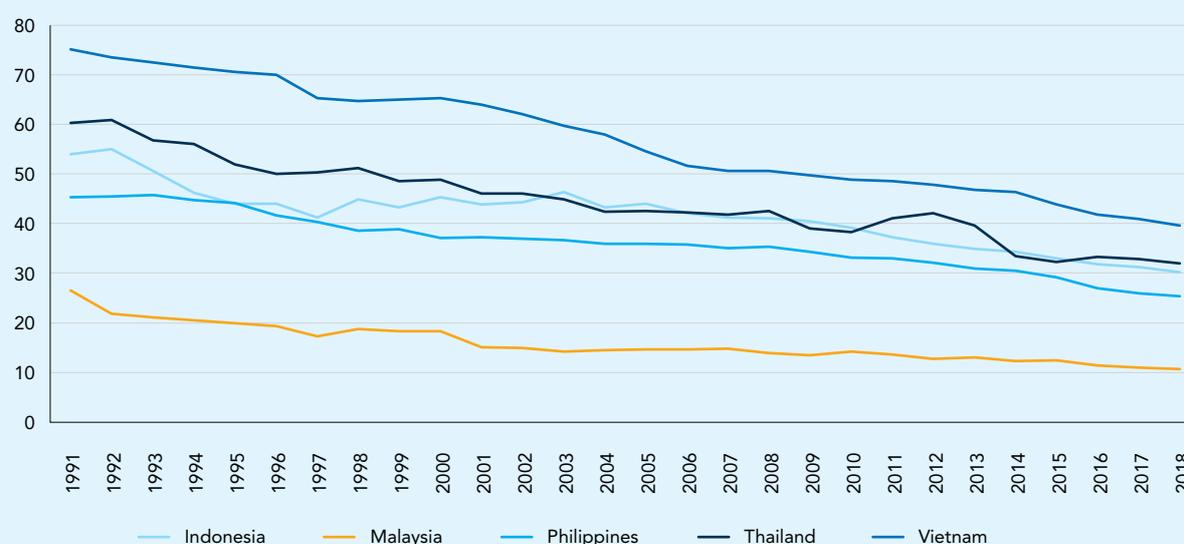
a. The benchmark countries for government effectiveness and corruption perception index are Denmark and New Zealand. In 2016, the government effectiveness for Denmark and New Zealand were 99.03 and 97.1, respectively, and the corruption perception index was 90 in both countries.

The extent of the decline in the ratio of agricultural GDP to total GDP: A well-known stylized fact is that, as agricultural value added and productivity increase, the ratio of agricultural GDP to total GDP falls. The extent of the decline is significant. In Indonesia and Vietnam, the ratios reached 13 percent and 15 percent, respectively. In the Philippines and Thailand, the contribution of primary agriculture to GDP fell to single digits. By 2017, Thailand's agricultural contribution was at 8.6 percent (the lowest in the group), while, in Malaysia, the ratio was 8.8 percent. In Vietnam, the ratio declined from the peak of 46.3 percent in 1988, reflecting an agriculture-based economy, to 15.3 percent in 2017, a drop of 46 percent in only 30 years. Vietnam's experience shows that more recent cases of agricultural transformation (more recent than today's industrialized countries) require much less time.²³¹ The secular decline is not smooth though, as Indonesia and Thailand highlight. Although Thailand's ratio fell below 10 percent (to 8.03 percent) in around 1993 (ahead of Malaysia, which achieved a similar decline by 1999), the ratio rose back to 11.5 percent in 2012. This may have been caused by urban-rural migration and the additional land put under cultivation (an expansion of 865,000 hectares between 1993 and 2016). The ratio in Indonesia also rose.²³²

The declining agricultural contribution to total employment: Another well-known stylized fact of sociopolitical significance is the declining share of agriculture in total employment as transformation proceeds. This is significant as a sign of the absorptive capacity of the nonagricultural sectors in offering higher productivity and higher-income jobs to rural-urban migrants. If this capacity is insufficient, the migrants will essentially represent an export of lower-productivity rural labor (lower than manufacturing or services) to crowded urban slums. Its lower ratio of agricultural employment to total employment indicates that Malaysian agriculture is at a higher stage of transformation relative to comparator Southeast Asian countries. In 1991, 27 percent of the labor force in Malaysia was employed in agriculture. By 2018, the ratio had dropped to around 11 percent. This was the highest rate of reduction (60 percent) among these countries. The ratio in the other countries had fallen to between 25 percent and 40 percent during this period. For example, Vietnam, which showed a high ratio of 75 percent of the labor force employed in agriculture in 1991, was able to reduce the ratio to 40 percent by 2018. The other three countries exhibited comparable declines (figure F.3).

Convergence in productivity between agriculture and nonagriculture: The difference between the ratio of agricultural employment to total employment and the ratio of agricultural GDP to total GDP is a measure of the difference in intersectoral productivity or value addition per worker. Among the five Southeast Asian countries,

FIGURE F.3. Employment in agriculture (% of total employment) 1991–2018



Source: WDI.

sectorwide productivity in Malaysia stands out for its proximity to convergence between agriculture and nonagriculture. A comparison of the differences between the ratios in 1991–2018 shows clearly that the difference for Malaysia, 2 percent–3 percent, is much smaller than the corresponding difference in comparator countries, 16 percent–26 percent. For example, in Thailand and Vietnam, the divergence in value addition in agriculture and nonagriculture is wide (table F.4). The wide divergence in these other countries means that they have a lot of ground to cover to reduce intersectoral productivity gaps. Wide gaps are an important source of social tension as they reflect sharp income gaps among workers in agriculture and workers in nonagriculture. As a consequence, the political pressure for income transfers increases.

TABLE F.4. Difference in value added, selected countries

Difference in value added among countries

Country	Employment %	Ag GDP %	Difference
Indonesia	31.17	13.14	18.03
Malaysia	11.01	8.78	2.23
Philippines	25.96	9.66	16.30
Thailand	32.80	8.65	24.14
Vietnam	40.87	15.34	25.52

Source: WDI

Main drivers of agricultural transformation: The fundamental driver of any agricultural transformation is sustained productivity growth either at the primary level in terms of yields (crop and/or livestock) and/or at levels of further agroprocessing in terms of processed diversified end products. Such sustained productivity growth results from a combination of policies, institutions, investments, and resource use. For Malaysia, these have been discussed at length in the previous section. The focus here is on country comparisons, both similarities and differences (see table F.4). Detailed information and data are in the accompanying country case studies.

Comparison of Malaysia with the higher-income countries of Chile and France: Governments in all three countries—Malaysia, France, and Chile—played a pivotal role in promoting, shaping, and supporting the decades-long transformation of agriculture. They maintained macro and political stability. They enlarged market access and domestic, regional, and global markets for their farmers. They invested heavily in agricultural infrastructure, such as roads, market infrastructure, communication, and irrigation. They also invested heavily in the software of agriculture, such as law and order, the legal and regulatory framework for the enforcement of contracts and private property rights, land consolidation and cooperative formation (France), and research, extension, and education. Irrespective of political ideology, they built a competent government machinery, which they improved over time (for example, in Chile after Pinochet). They all treated agriculture as a value adding, potentially profitable commercial sector despite initial poverty and widespread market failures. They did not consider agriculture primarily as a welfare sector, despite subsidies and other forms of assistance to smallholders and the rural poor.

Comparison of Malaysia with Indonesia, the Philippines, Thailand, and Vietnam:²³³ There are both important similarities and differences between Malaysia’s transformational experience and the selected Southeast Asian comparators, in particular with respect to drivers. The important drivers are as follows:

- **Export orientation and openness:** These have expanded markets and enabled specialization in the production of crops they have comparative advantage in; and have diversified into higher value activities. Growth of Thailand’s exports of agricultural and food products are (per year, percent) is 12.4 (1980–2016); and for Malaysia 13.3 percent over the same 30-plus year period (Poapongsakorn 2019). Since the launch of Doi Moi reforms (1986), Vietnam, once one of the poorest and an almost closed economy, has become one of the most open and dynamic. Exports have grown at over 18 percent per year (1996–2013), and foreign direct investment has expanded from around 2.4 percent per year in the early 1990s to 14.0 percent in 2014.²³⁴
- **Abundant land for extensive agricultural cultivation:** In the five Southeast Asian countries, agricultural growth was extensive in land use. “A key driver of input growth has been an increase in land use,” states FAO (2017, 18). In Malaysia, cultivated agricultural land increased by 180 percent between 1961 and 2016; in Thailand by 90 percent; in Indonesia by 48 percent; in Vietnam by 94 percent; and in the Philippines by 61 percent. In absolute terms, the expansion of the agricultural frontier in Indonesia was the highest among the five countries, totaling 18.4 million square hectares between 1961 and 2016 (figure F.4; table F.5). During this same period, Thailand added 10.5 million square hectares of land under cultivation, the second highest. Clearly, land abundance enabled these countries to substantially expand the agricultural frontier. For Malaysia, the expansion of agriculture accounted for an additional 5.5 million square hectares.
- **R&D:** For decades, Malaysia has invested heavily in R&D, a major reason for the production and productivity growth, for its tree crops, in particular for their downstream processing and refining stages. This commitment to R&D is captured by the estimate of agricultural research intensity, which was 1.9 percent in 2002.²³⁵ Malaysia’s R&D also benefits from investment by the private sector on tree crops only, mainly for palm oil and rubber. As table F.5 clearly indicates, Malaysia’s agricultural research intensity is three times that of the other countries—except Japan, which is included to demonstrate that, as agricultural transformation proceeds to a higher stage, agricultural research intensity has to increase—and 5.5 times that of Vietnam, the lowest in the group (table F.6). Vietnam has increased its budgetary allocation to R&D from US\$61.6 million in 2000 to US\$136 million in 2010 (a 120 percent increase in 2011 purchasing power parity dollars), but the increase has not kept pace with the growth and diversification in agriculture.

FIGURE F.4. Agricultural land (square kilometers)



Source: WDI

TABLE F.5. Agricultural land (square kilometers)

Country	1993	2016	Change, %
Thailand	212450	221100	4.1
Malaysia	68914	86270	25.2
Philippines	110650	124400	12.4
Indonesia	420160	570000	35.7
Vietnam	70870	121780	71.8

TABLE F.6. Public agricultural research intensity

Country	Researchers per 100,000 population ^a	Public agricultural research expenditure, % of AgGDP	Year
Indonesia		0.31	2008
Japan		5.46	2008
Malaysia	102.8	0.99	2010
Philippines		0.33	2008
Thailand	16.4	0.32	2008
Vietnam	12.5	0.18	2010

Source: ASTI.

Note: AgGDP = agricultural GDP.

a. Economically active agricultural population.

Main achievements: poverty reduction and improved equity: In the Southeast Asian comparator countries, growth has been generally pro-poor (except for the Philippines) although the extent of reduction has varied by country and over time. In terms of poverty reduction:

- Malaysia's success in reducing poverty is considered the strongest and most impressive in the region: from an estimated incidence of 49.3 in 1970, it was drastically lowered to 0.6 percent in 2014.
- In Thailand, due to the rapid economic growth and economic transformation of the late 1980s and early 1990s, there was a continuous reduction in poverty incidence (percentage of population living on less than US\$3.2/ day) reaching 0.4 percent in the 2010s (Poapongsakorn 2019).
- In Indonesia, too, poverty reduction during the 30-year period (1966–97) was impressive, though there was a sharp reversal following the Asian financial crisis (1997–98) and the collapse of the Suharto government. Poverty incidence (at extreme poverty level) has declined to around 17 percent during the postcrisis years (2001–06); and to 15.9 percent (2012).²³⁶
- In Vietnam, extreme poverty fell dramatically from 50 percent in 1993 to less than 3 percent today (2016) (World Bank 2016).
- Of the five countries, poverty incidence is the highest in the Philippines. National poverty incidence (percent) rose from 49 (1971) to 58 (1985) according to official estimates. Rural and urban poverty incidence both rose.²³⁷ By 2013, using the National Poverty line, the poverty rate declined to 25 percent of the population, encompassing some 24 million. More recently, poverty incidence fell from 26.6 percent in 2006 to 21.6 percent on 2015.

Progress in improving equity has been much slower, if it happened at all. Malaysia in 1970 was among the most unequal countries in Southeast Asia. The Gini index was 51.3. Over 44 years, the index was reduced by 5 Gini points, but inequality is still wide relative to the sample average. Also, Thailand appears in this quadrant of the graph even though its rate of structural change per year was lower relative to Malaysia. With a similar rate of structural change, the Philippines and Vietnam experienced an increase in income inequality. The same applies to China, and Indonesia: all these countries experienced structural transformation and substantial poverty reduction, but greater inequality.

A continuing challenge: dualism: Dualism means the coexistence of a vibrant and dynamic agricultural subsector with a low productivity, subsistence level subsector. Except for France, many selected comparator countries are dualistic. In Malaysia the division is between the industrial commodities one the one hand and the agri-food subsector including paddy/rice on the other; and within the tree crop sector, between the estates and the smallholders. Chile is also dualistic: its dynamic component is the export-oriented agri-food subsector. Its agriculture exhibits a production

system that ranges from modern agricultural companies closely linked to the international markets, to smallholders and small enterprises, more traditional in nature, even including self-consumption. Thus, while the modern sector makes use of adequate levels of capital, technology, and information, the traditional sector finds itself with severely “limited access to markets, use of technology and information.”²³⁸ Indonesia’s agricultural sector also exhibits dualism, dominated “by very small farm units, more than 85 percent of total holdings (or 18.8 million) have less than 2 hectares,” explains Cervantes-Godoy (2015, 38, 42). “There are large landholders, who represent a small proportion of all holdings. About 30 percent of the land under perennial crops is owned by large operations, either private or state-owned. These approximately 2,300 large operations have on average 2,600 hectares.”²³⁹

Notes

230. Commission on Growth and Development. 2008. *The Growth Repo: Strategies for Sustained Growth and Development*. Report 44986. The 13 economies identified are Botswana; Brazil; China; Hong Kong SAR, China; Indonesia; Japan; Korea; Malaysia; Malta; Oman; Singapore; Taiwan, China; and Thailand. The economy-wide features are leadership; an effective, pragmatic government that has a long planning horizon, that is able forcefully to implement the plans and stay the course, and that works with private business and markets instead of substituting for them; a high national savings rate of around 20–25 percent of GDP; and openness to international trade. Also mentioned is a tradition of honest public service, which Malaysia lost under Najib Razak, the former prime minister, on trial for corruption scandals (April 3, 2019), *New York Times*. <https://www.nytimes.com/2019/04/03/world/asia/najib-case-malaysia.html>.
231. World Bank. 2016. *Transforming Vietnamese Agriculture: Gaining More from Less*. Vietnam Development Report. Washington, DC, World Bank. Vietnam’s sudden surge can be explained by a significant increase in mechanization and a steady rise in yields. For example, in 2011, machinery was used on more than 90 percent of paddy farms for land preparation and threshing.
232. The Suharto government collapsed under the Asian financial crisis 1997–98. Poverty shot up with the economic and political collapse. There was a reverse urban-rural migration as people were forced back to the land as a social safety net and security.
233. WDI: the GNI per capita in current US\$ Atlas method and in constant 2010 US\$ in 2017: Malaysia: US\$9,650 and US\$11,221.3; Thailand US\$5,950 and US\$5,838.6; Indonesia: US\$3,540 and US\$4,000.3; the Philippines: US\$3,660 and US\$3,479.3; Vietnam: US\$2,160 and US\$1,740.7. Malaysia and Thailand are upper-middle-income countries; the other three are lower-middle-income countries.
234. World Bank. 2016 *Vietnam: Systematic Country Diagnostic: Sustaining Success—Priorities for Inclusive and Sustainable Growth*. <http://documents.worldbank.org/curated/en/334491474293198764/pdf/108348-REVISED-PUBLIC-ACS.pdf>.
235. The measure estimates total agricultural research spending as a share of total agricultural output. As a rule of thumb, allocation of 1 percent of agricultural GDP to R&D is taken to be a good commitment for countries at an early stage of development. As countries grow the number is expected to be much higher. See the example of Japan in table F.6.
236. WDI 2016. The 2012 poverty estimate uses the extreme poverty level of US\$1.90-a-day poverty line. At the US\$3.10-a-day poverty line, poverty incidence rose to 46.3 percent.
237. World Bank. October 17, 1988. *The Philippines: The Challenge of Poverty*. Report 7144–PH. According to World Bank estimates, the national and rural poverty incidence did not go up, but urban incidence did rise in 1985. The absolute number of poor did increase from around 20 to 30 million; an increase of 10 million people, a substantial number.
238. The quotation is from page 1 of Osorio, José Diaz. June 22, 2007. “Farm Family Agriculture: Factors limiting competitiveness and policy suggestions”. Report prepared for the OECD review of agricultural policy in Chile. <http://www.oecd.org/tad/agricultural-policies/40324332.pdf>.
239. Cervantes-Godoy, D. (2015), “Strategies for Addressing Smallholder Agriculture and Facilitating Structural Transformation”, OECD Food, Agriculture and Fisheries, in Papers, 90, OECD, Paris.



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