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International Online Seminar

“Food Security & Agriculture Resilience in the Perspective of Water-Use Efficiency”

Management of Food Availability & Supply Chain/Distribution

Presented by,
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Fakulti Biosumber & Industri Makanan
Universiti Sultan Zainal Abidin

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Terminology

- **Food Security** – is ensuring that **everyone** in a population has **access to sufficient food** to meet their dietary needs.
- **Food Availability** – is refers to **sufficient quantities** of food of appropriate quality, **supplied** through **domestic production or imports, including food aid**.
- **Food Distribution/Food Supply Chain** – is refers to the processes that describe how food from a farm ends up on our tables. The processes include **production, processing, distribution, consumption and disposal**.

FAO's Views on Food Security & Availability

SAVING LIVES
CHANGING LIVES

Hunger Map 2019



**Goal 2 – Zero Hunger –
pledges to end hunger,
achieve food security,
improve nutrition and
promote sustainable
agriculture**



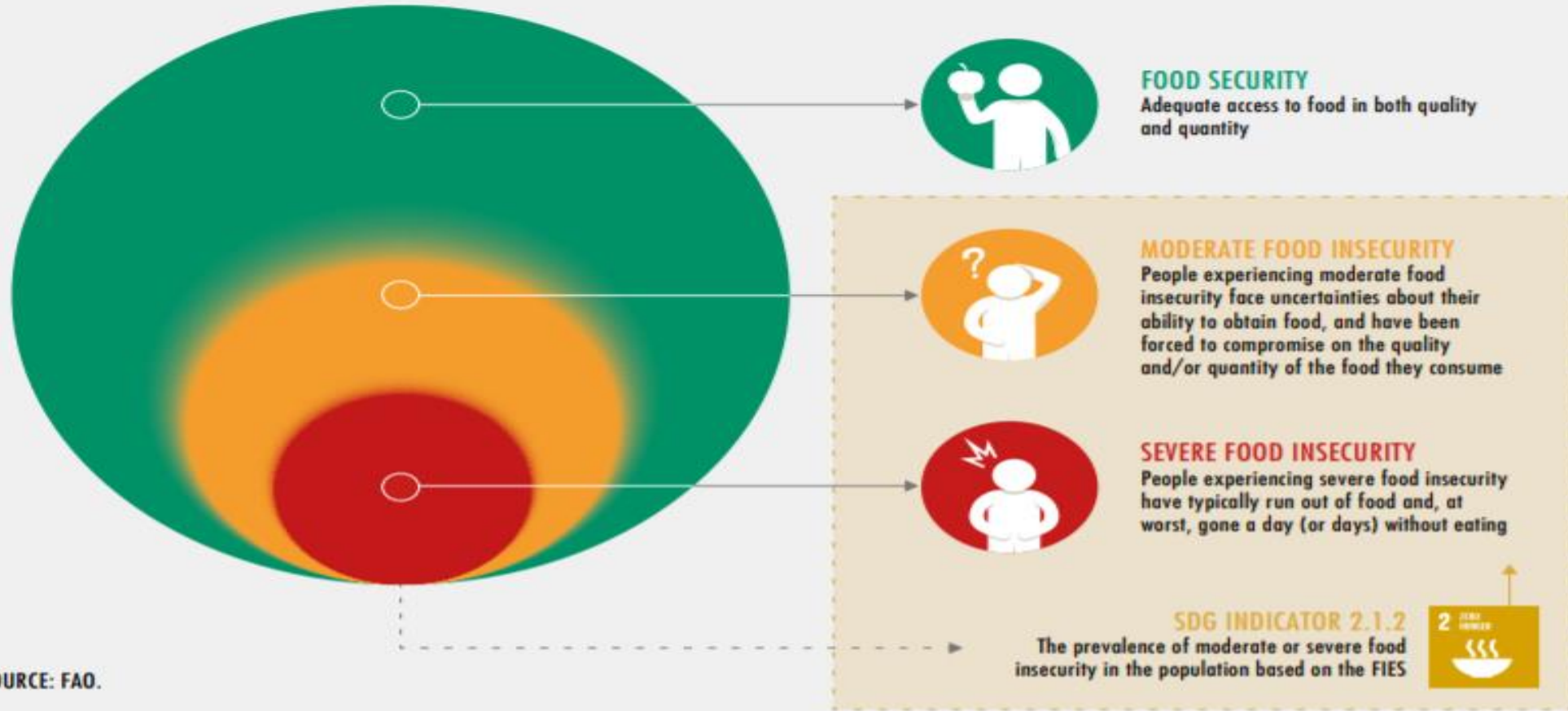
821 million people - more than 1 in 9 of the world population - do not get enough to eat

<2,5% <5% 5-14,9% 15-24,9% 25-34,9% >35% DATA NOT AVAILABLE

Prevalence of undernourishment in the total population (percent) in 2016-18

Undernourishment is defined as the condition in which an individual's intake of food energy is insufficient to provide the amount of dietary energy required to maintain a normal, active, healthy life. The indicator is reported on the prevalence of undernourishment (PoU), which is an estimate of the percentage of the population that are in a condition of undernourishment. To realize the objective of sustainable development in some of the areas being pursued, national governments are reported in a biennial meeting on the State of Food Security and Nutrition in the World 2019. Subsequent updates are available at <https://www.wfp.org/publications/2019-state-of-food-security-and-nutrition>.
The population included in the prevalence of undernourishment indicator is defined as the total population of each country, excluding any territory that is not under the sovereignty of the reporting country.
* If a country has not reported the prevalence of undernourishment in the past five years, the indicator is based on the most recent available data.
** The indicator is based on the most recent available data for the year 2018. The indicator is based on the most recent available data for the year 2018. The indicator is based on the most recent available data for the year 2018.
*** The indicator is based on the most recent available data for the year 2018. The indicator is based on the most recent available data for the year 2018.
— International Boundary ———— Administrative Boundary ———— Other Line of Separation ———— Special Boundary Line

Food Insecurity Severity levels

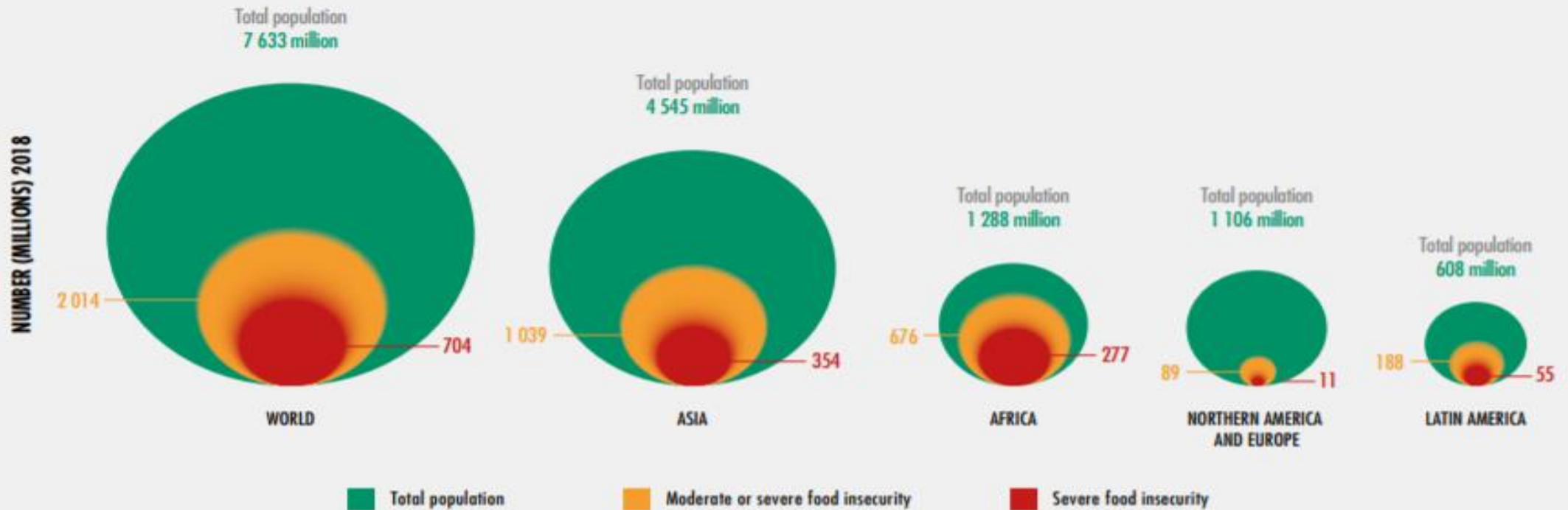


SOURCE: FAO.

¹ UN. 2017. United Nations Statistical Commission – 48th Session (2017). In: *UNSD – United Nations Statistical Commission* [online]. New York, USA. [Cited 4 April 2019]. <https://unstats.un.org/unsd/statcom/48th-session>; and UN. 2017. *Indicator 2.1.2: Prevalence of moderate or severe food insecurity in the population, based on the Food Insecurity Experience Scale (FIES)*. [Cited 4 April 2019]. <https://unstats.un.org/sdgs/metadata/files/Metadata-02-01-02.pdf>

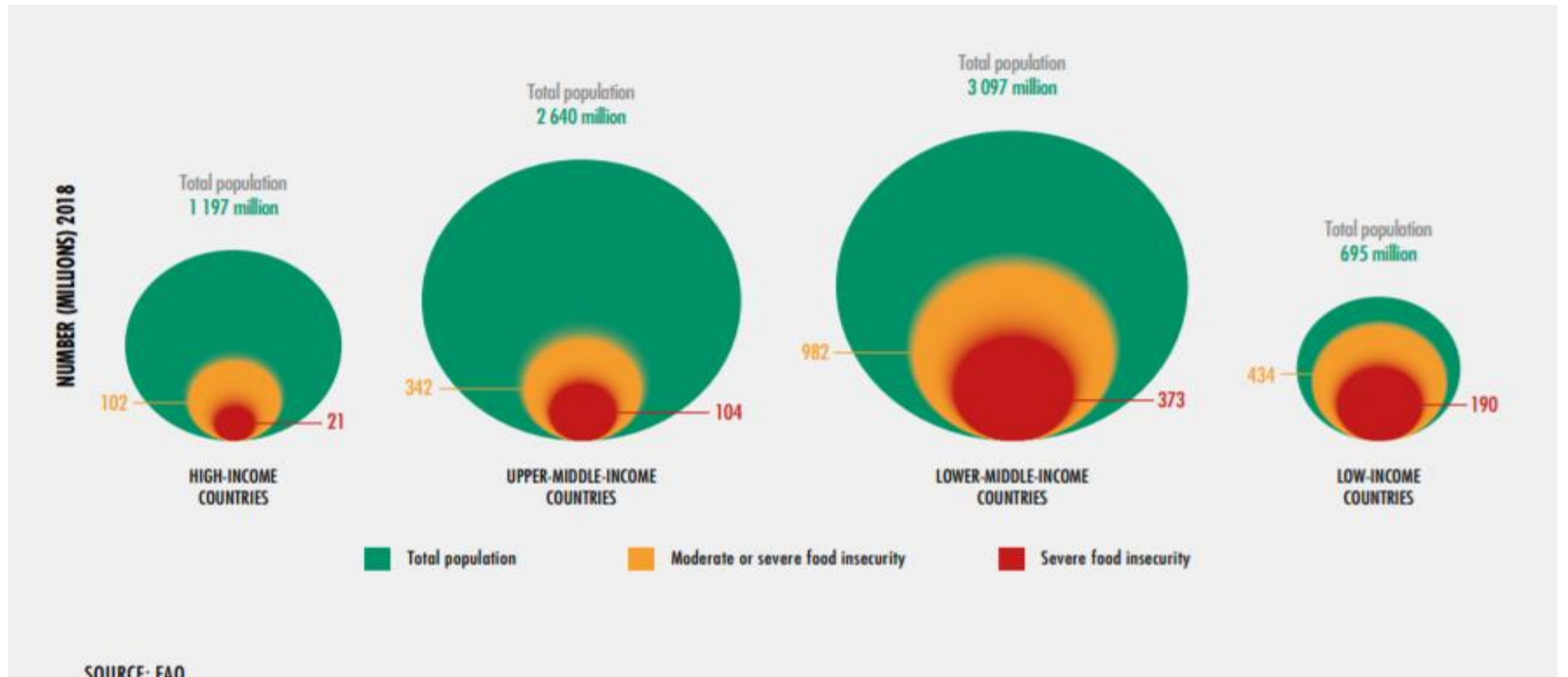
² The other three dimensions of food security are food availability, utilization and stability.

The concentration and distribution of food insecurity by severity differs greatly across the regions of the world

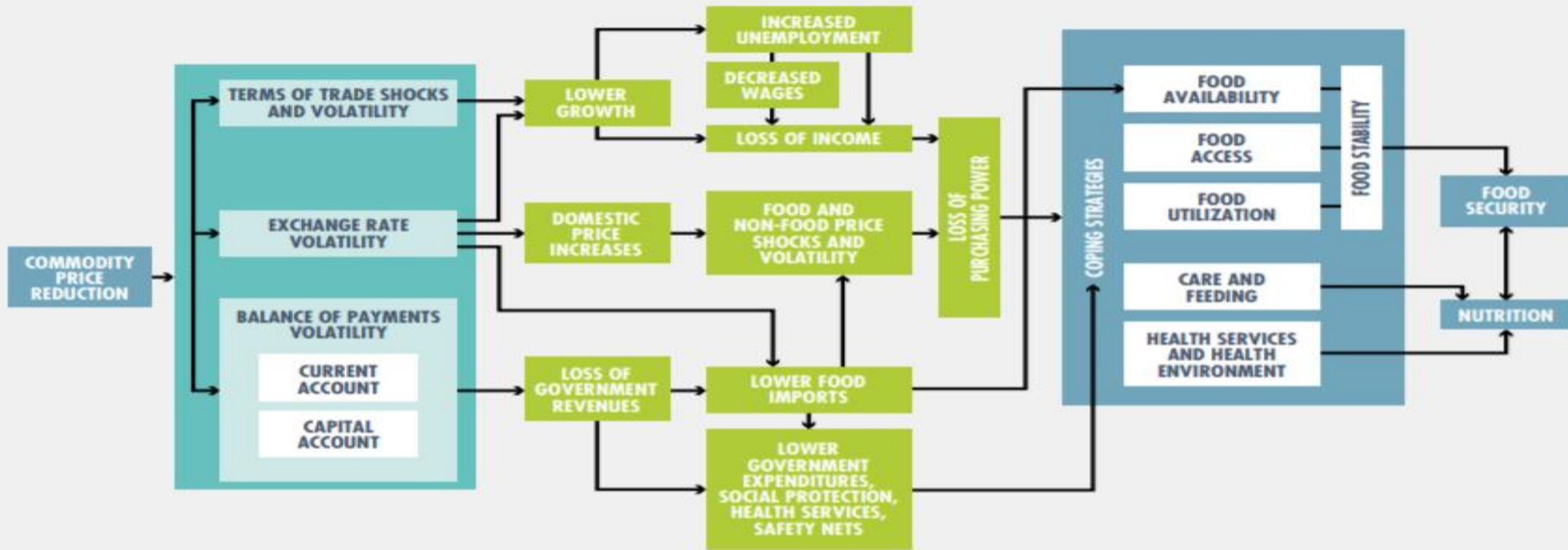


SOURCE: FAO.

As the country level of income falls, the prevalence of food insecurity increases and so does the proportion of severity food security over the total



POTENTIAL NEGATIVE IMPACTS OF INTERNATIONAL COMMODITY PRICE REDUCTIONS ON FOOD SECURITY AND NUTRITION IN COMMODITY-DEPENDENT ECONOMIES: TRANSMISSION CHANNELS



SOURCE: Based on diagram from UNCTAD and FAO. 2017. *Commodities and Development Report 2017. Commodity markets, economic growth and development*. New York, USA, UNCTAD, but modified for this report to focus on the specific transmission channels that affect food security and nutrition.

Malaysia Paddy & Rice Sector at a Glance



GDP 2018 – PERCENTAGE SHARE BY KIND OF ECONOMIC ACTIVITY (CONSTANT 2015 PRICES)

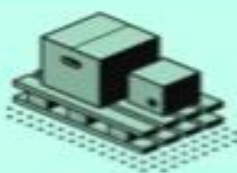
GDP 2018^P : RM1,361.5 billion



Agriculture (%)

	Oil Palm	37.9
	Livestock	14.9
	Fishing	12.5
	Forestry & Logging	6.9
	Rubber	2.8
	Other Agriculture	25.1

EXTERNAL TRADE IN AGRICULTURE SECTOR

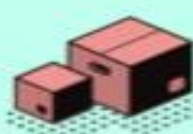


Exports

114,451 2018

126,492 2017

(RM million)



Imports

93,313

95,222



Source: Ministry of Agriculture and Agro-based Industry

PRODUCTION OF SELECTED CROPS

(*000 tonnes)



Fresh fruit bunches (oil palm)



2018: 98,419.4

2017: 101,740.9



Paddy



2018^P: 2,639.9

2017^r: 2,570.5



Cocoa beans



2018^e: 0.8

2017: 1.0



Natural rubber



2018: 603.3

2017: 740.1



Pepper



2018: 31.1

2017: 30.4



Kenaf (dried stem)



2018: 10.0

2017: 3.3

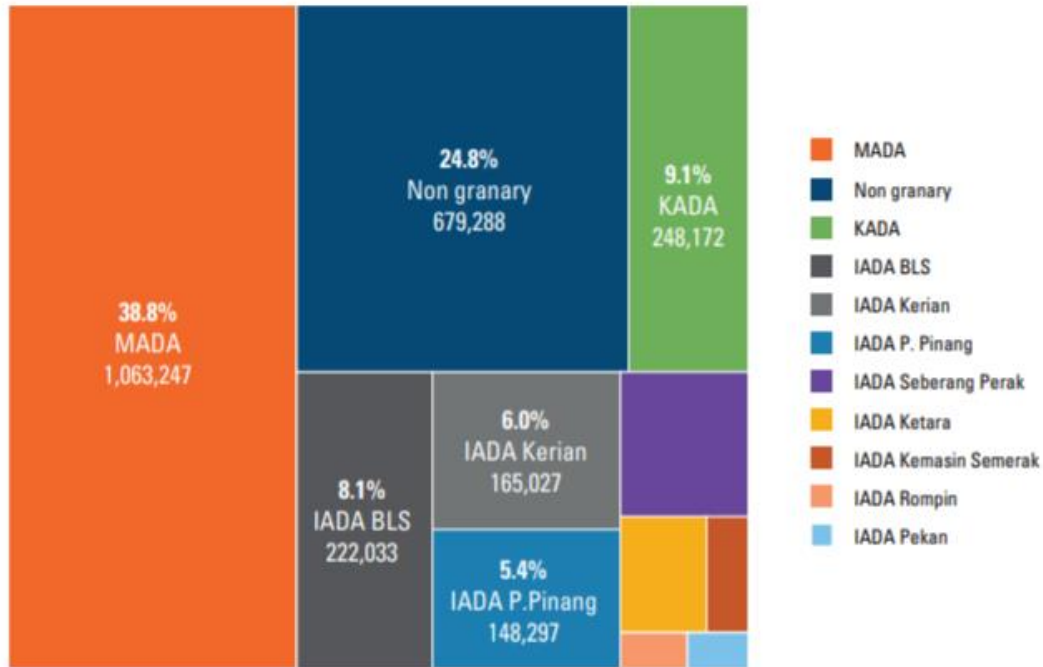
Source: Department of Agriculture Malaysia, Malaysian Palm Oil Board, Malaysian Cocoa Board, Malaysian Pepper Board and National Kenaf and Tobacco Board

p = preliminary e = estimates r = revised

Paddy at a Glance

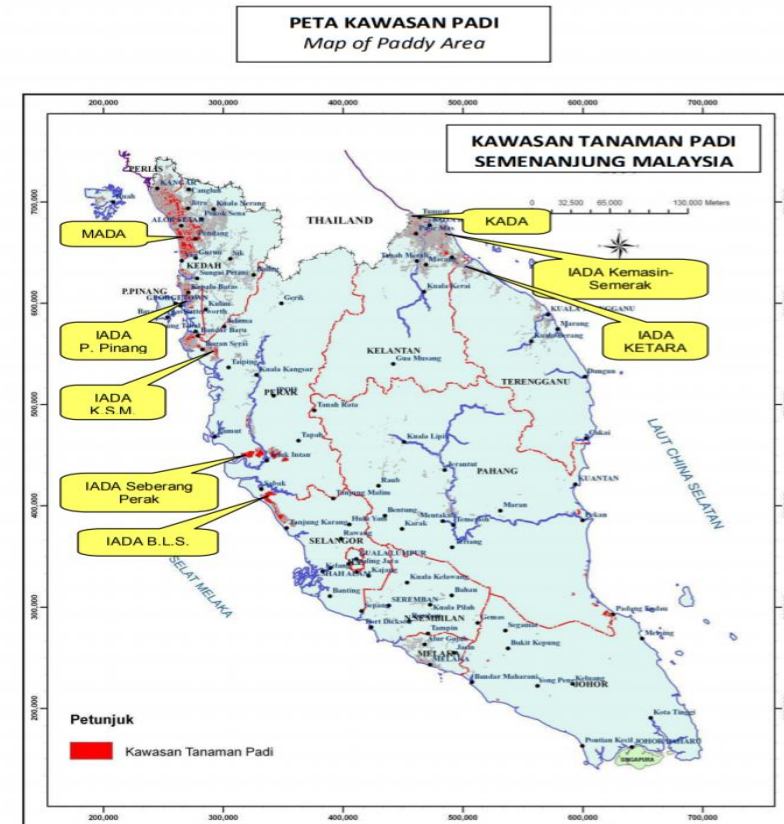
- Paddy is the **third** most widely planted crop.
- Main season -paddy is grown **without depending** wholly on any **irrigation system**. 1st August to 28/29 February
- Off Season - is the **dry period** and **depends** on an **irrigation system**. Between 1st Mac to 31st July of the year.
- Granary Areas refer to **major irrigation schemes** (areas greater than 4,000 hectares) and recognised by the Government in the National Agricultural Policy .
- There are **8 granary areas** in Malaysia: MADA, KADA, IADA KERIAN, IADA Barat Laut Selangor, IADA P. Pinang, IADA Seberang Perak, IADA KETARA and IADA Kemasin Semerak.

Paddy production by granary area, 2016 (MT and percentage of total domestic production)



- Notes:
1. IADA Seberang Perak: 103,388 MT (3.8%)
 2. IADA Ketara: 54,836 MT (2.0%)
 3. IADA Kemasin Semerak: 27,456 (1.0%)
 4. IADA Pekan: 13,425 (0.5%)
 5. IADA Rompin: 14,437 (0.5%)

Source:
Table 3.1.10: Production of paddy of granary area, 2011-2016, *Agrofood Statistics 2016*. MOA
Chart by KRI



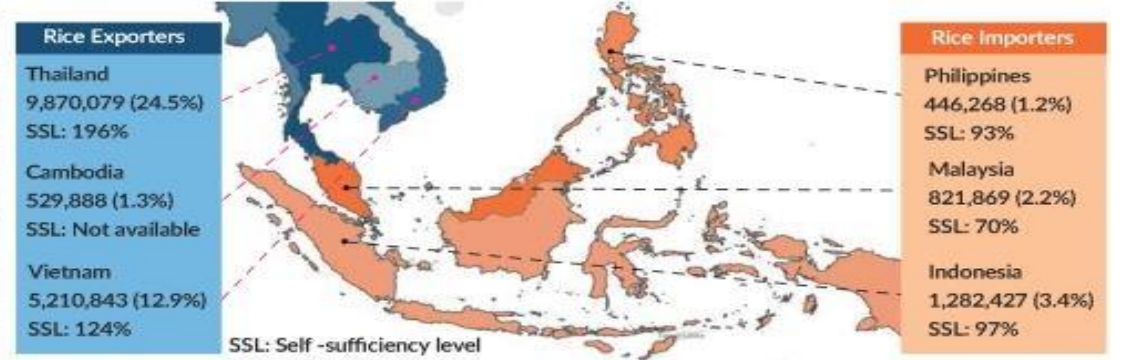
Punca : **Baghagian Pengurusan Tanah**
Jabatan Pertanian, Semenanjung Malaysia
Source : **Soil Management Division**
Department of Agriculture, Peninsular



Malaysia consumed **2.7 million** tonnes of rice in 2016. Of the amount consumed, **67%** was produced locally, while the rest was imported primarily from Thailand, Vietnam and Pakistan.



South-East Asia plays a central role in the global rice economy, accounting for **16 million** tonnes, or **40%**, of world's rice exports, with Thailand and Vietnam being the region's top exporters. Malaysia, Indonesia and the Philippines are net importers

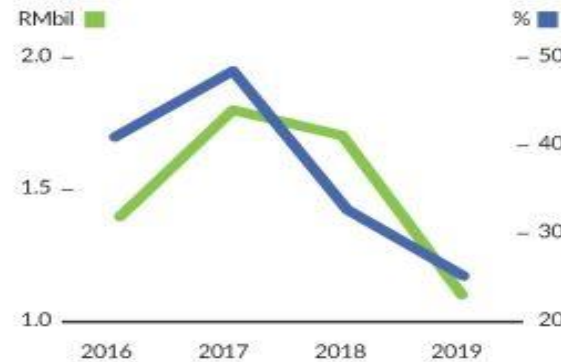


Malaysia performed fairly well in terms of paddy yield, in terms of paddy yield in 2016 at **3.2 million** tonnes per hectare vs Thailand's **2.9 million** tonnes per hectare



Albeit the declining trend, the paddy and rice industry continue to receive more budgetary assistance than any other crops.

Paddy subsidies and incentives vs percentage of Ministry of Agriculture's expenditure



Of the **14 million** employed persons in Malaysia, **1.6 million** workers, or **11.4%**, belonged to the agriculture, forestry and fishing industry. Within this category, around **200,000** were paddy farmers, mostly aged 50 years and above. The monthly household income for paddy farmers stood at **RM2,527**, putting them in the Bottom-40 income category.



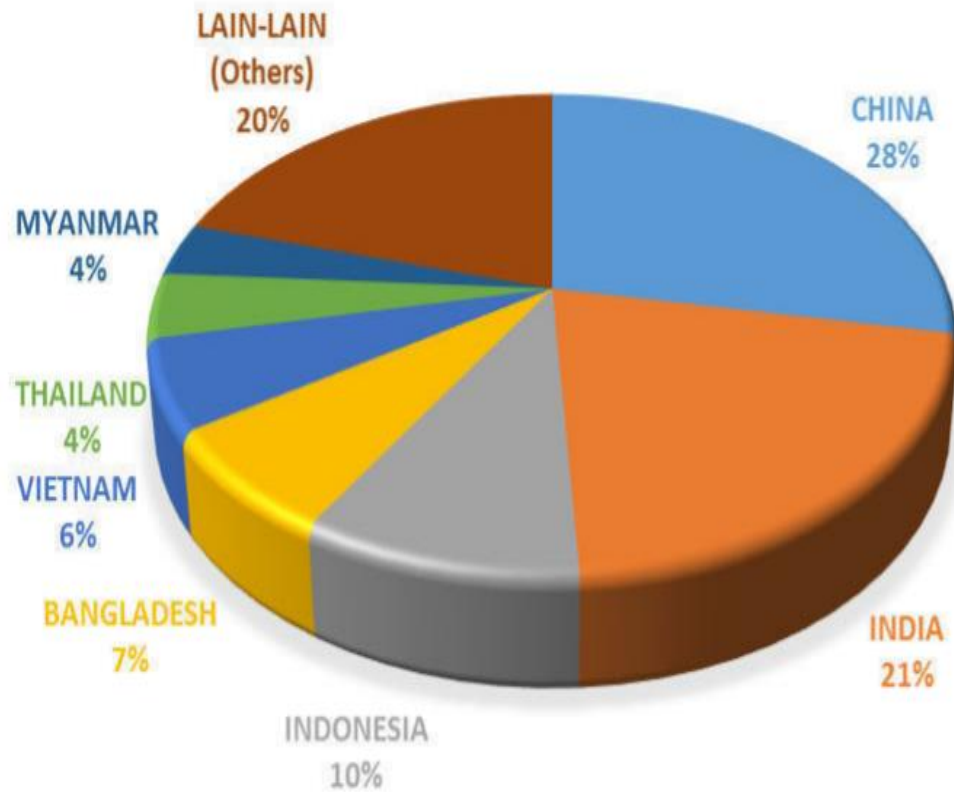
Malaysia's rice consumption grew faster than its production. Compared to neighbouring countries, its rice consumption and production remain relatively small.

	Population (million)	Production		Consumption	
		million tonnes	annual growth rate	million tonnes	annual growth rate
World	7,466.9	501.5	1.5%	497.5	1.4%
Asia	4,462.7	453.2	1.4%	434.4	1.2%
Indonesia	261.1	45.6	2.1%	46.7	1.9%
MALAYSIA	31.2	1.8	1.6%	2.7	1.8%
Philippines	103.3	12.1	2.6%	13.5	2.8%
Thailand	68.9	21.6	1.8%	13.6	2.0%
Vietnam	94.6	28.1	1.8%	22.1	1.2%

Notes: Statistics based on year 2016

Source: KRI

World Main Paddy Producers, 2014



Source: Perangkaan Padi Malaysia, 2014

Rice production, consumption, area harvested and yield for the Southeast Asia region, 2000 – 2016

Country	Population	Production		Consumption		Area Harvested		Rice Yield ^c	
	Thousand	Million MT ^a	Average Annual Growth (%) ^b	Million MT ^a	Average Annual Growth (%) ^b	Thousand Ha ^a	Average Annual Growth (%) ^b	MT/Ha ^a	Average Annual Growth (%) ^b
World	7,466,964	501.5	1.46	497.5	1.36	162,510	0.36	3.1	1.09
Asia	4,462,677	453.2	1.43	434.4	1.20	143,072	0.25	3.2	1.16
Indonesia	261,115	45.6	2.11	46.7	1.88	13,870	1.04	3.3	1.06
MALAYSIA	31,187	1.8	1.62	2.7	1.75	700	0.03	2.5	1.60
Philippines	103,320	12.1	2.61	13.5	2.82	4,722	1.03	2.6	1.53
Thailand	68,864	21.6	1.80	13.6	2.03	10,780	0.69	2.0	0.99
Vietnam	94,569	28.1	1.83	22.1	1.21	7,743	0.07	3.6	1.75

Notes:

^a Year 2016

^b Average annual growth rate (AAGR), year 2000 – 2016

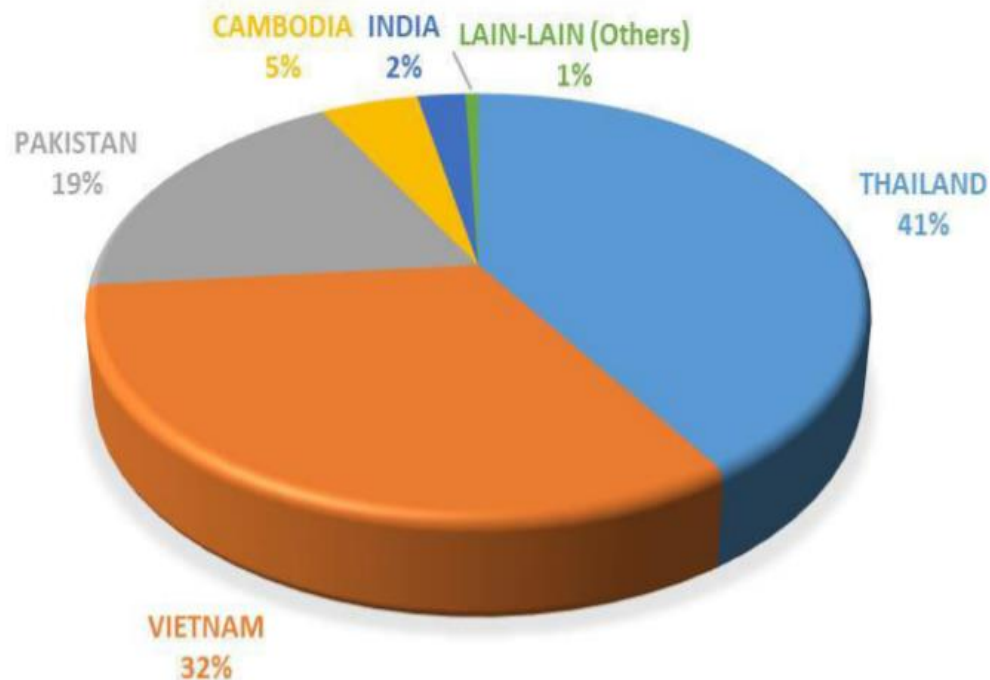
^c Note that the yield reported in Table 1.1 is rice yield, which is different from paddy yield (in Figure 1.14, Figure 2.2 and Figure 4.6). KRI calculation based on rice production and harvested area data from [Agrofood Statistics 2016](#), MOA gives 2.57 MT/Ha of rice yield for Malaysia in 2016 which is similar to the figure reported by OECD-FAO [Agricultural Outlook](#)

Sources:

1. Population data from Special Aggregates: Geographical groups: Total population – Both sexes, [World Population Prospects 2017](#), UN Desa/Population Division (Accessed on 19 Oct 2018)
2. Production, consumption, area harvested, and yield data from [OECD-FAO Agricultural Outlook 2018-2027](#) (Accessed on 25 Oct 2018)

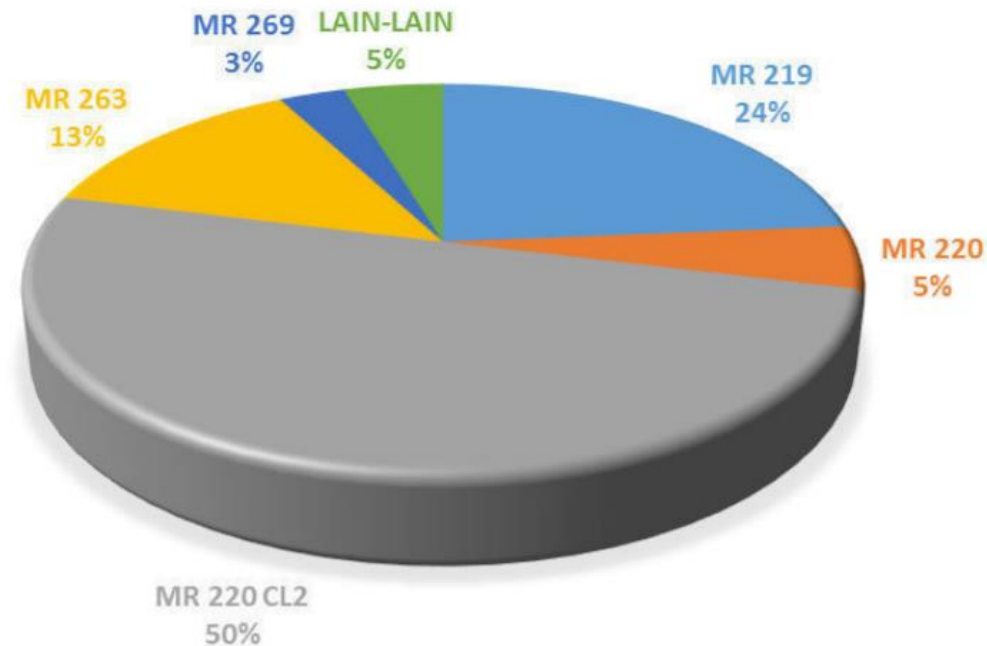
Calculations by KRI

Import of Rice by Country, MALAYSIA 2014



Catatan : Jumlah import beras ialah 920,648 tan metrik
 Notes : Total import of rice is 920,648 metric tonnes

Hectareage of Paddy Varieties for Overall Granary Area, Peninsular Malaysia, 2014



Catatan : Jumlah keluasan bertanam padi ialah 400,733 ha
 Notes : Total hectareage of paddy planted is 400,733 ha

Source: Perangkaan Padi Malaysia, 2014

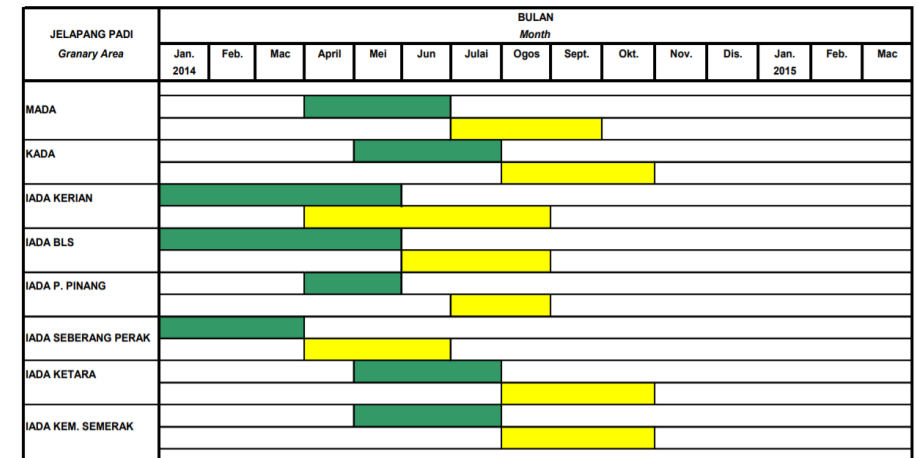
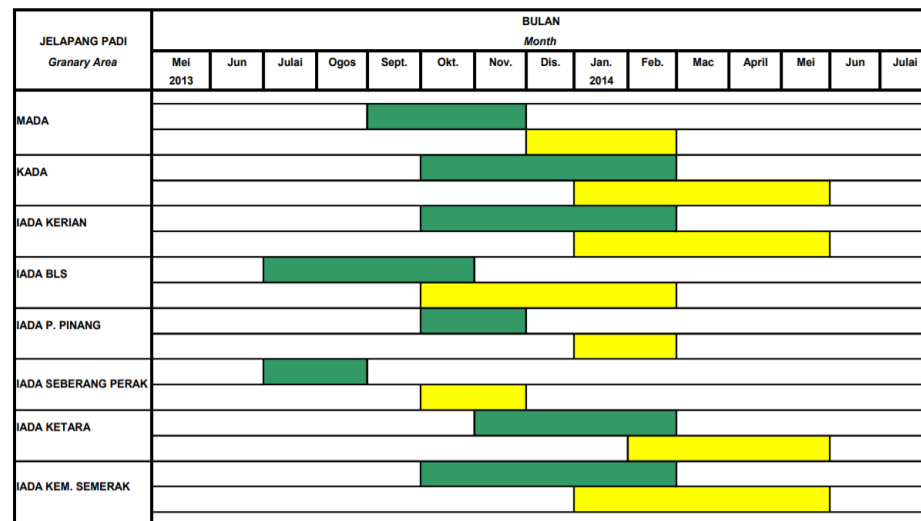
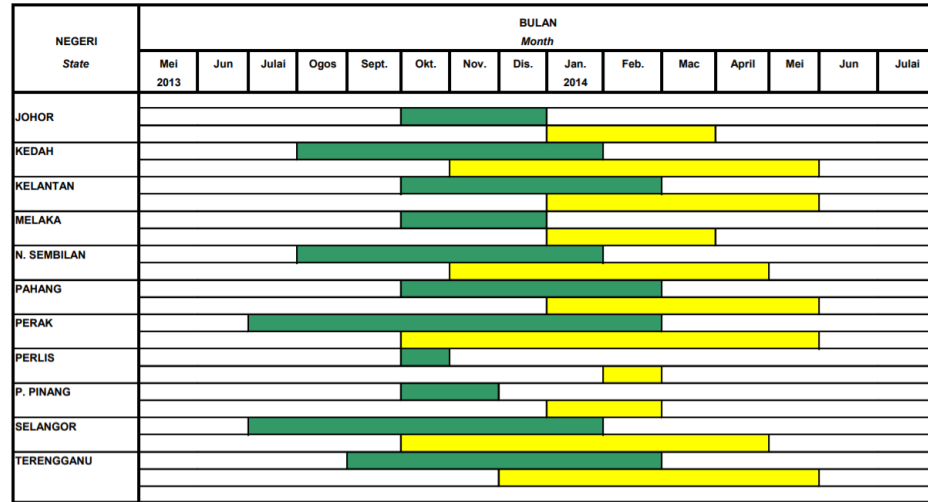
Main information of Paddy & Rice (2013-2018)

PERKARA Item	2013	2014	2015	2016	2017	2018
Keluasan Pasel Padi ² (Ha) <i>Paddy Parcel Area² (Ha)</i>	289,882	289,882	291,086	286,579	284,162	284,047
Keluasan Bertanam Padi (Ha) <i>Paddy Planted Area (Ha)</i>	671,679	679,239	681,559	688,770	685,548	699,980
Pengeluaran Padi ('000 Tan Metrik) <i>Production of Paddy ('000 Tonnes)</i>	2,604	2,845	2,741	2,740	2,571	2,640
Nilai Pengeluaran Padi (RM '000) <i>Production Value (RM '000)</i>	1,915,758	3,209,212	3,090,641	3,088,400	2,888,133	2,953,781
Purata Hasil Padi (Kg/Ha) <i>Average Yield of Paddy (Kg/Ha)</i>	3,876	4,194	4,022	3,978	3,750	3,770
Pengeluaran Beras ('000 Tan Metrik) <i>Production of Rice ('000 Tonnes)</i>	1,677	1,835	1,767	1,766	1,656	1,700
Jumlah Import Beras ('000 Tan Metrik) ³ <i>Total Imports of Rice ('000 Tonnes)³</i>	853	863	961	748	726	776

Sumber : Jabatan Pertanian, ²Bahagian Industri Padi dan Beras
Source : Department of Agriculture, ³Paddy and Rice Industry Division



Paddy Calendar - Planting And Harvesting Period Of Wetland Paddy



2016 Paddy and Rice Supply Chain



Sources:

- ^a Arkib Keputusan Tender Pembekalan Benih Padi Sab Kepada Petani di Bawah Program Benih Padi Sab, Kementerian Pertanian Dan Industri Asas Tani Bagi Tempoh Dua(2) Tahun (2015 - 2016)
- ^b MOA Media Statement – Benih Padi Tidak Sab: Ancam Bekalan Beras
- ^c Booklet Statistik Tanaman (Sub-sektor Tanaman Makanan) 2017, DOA
- ^d Agrofood Statistics 2016, MOA
- ^e As of July 2016. Data from Maklumat Seksyen Kawalselia Padi dan Beras
- ^f FAOSTAT
- ^g Malaysia's population from Special Aggregates: Geographical groups: Total population – Both sexes, World Population Prospects 2017, UN Desal Population Division

Note:

- ^h Under the Paddy Seed Certification Scheme, the government sets the total quota level for seed production at 80,000MT each year, however, only 85% of the quota set are produced

Illustration by KRI

National Agro-Food Policy 2011-2020

General

- a) To address food security and safety to ensure availability, affordability and accessibility;
- b) To ensure the competitiveness and sustainability of the agro-food industry; and
- c) To increase the income level of agropreneurs.

Paddy Industry

- a) An increase in productivity and rice quality;
- b) An increase in automation and mechanisation;
- c) An intensification of the use of rice by-products;
- d) An improvement in the management of the national rice stockpile;
- e) Restructuring of the rice subsidies and incentives; and
- f) Strengthening of the institutional management of paddy and rice.

Impact of Pandemic Covid-19



Agriculture/Food Supply Chain

- **Globalization and trade liberalization** creates more **interconnected supply chain (SC)**.
 - Goods and services pass through multiple stages before reach the end consumer.
 - **National lockdown** and **lockdown** (MCO) disturb the functions and operations.
 - **Staple crops**, such as wheat, rice, etc. and **high-value crops** such as fishery products, fruit and vegetables.
 - **Capital** intensive and **labour** intensive
 - **Transportation, logistic and Labour – SC sustainability**
- Unprecedented stresses on food supply chains:
1. Farm Production
 2. Food Processing
 3. Transport and logistics
 4. Final demand

Malaysia Food Supply Chain Disruption

- Complex network consists of **production, processing, distribution, retailing and consumption.**
- Early stage of MCO, media reported about **panic buying** and **shortage** (masks, sanitizers & groceries).
- Till to date, **no report** regarding **food shortage.**
- **Heavily** dependent on **foreign/migrant labors.**
- **Affects** crops, livestock and fishery sub-sectors production.
- **Impact** on **Food availability** and **market price.**
- Changing of **Consumer Behaviour**
- **Some countries stop exporting to avoid domestic shortage**
- Malaysia imports most of its food from **China, India, Thailand, Indonesia** and **New Zealand.**

Impact on Rice Production

- Paddy planting and harvesting **activities are being carried out smoothly**
- Government has allocated **RM11.2 million** under the Economic Stimulus Package (PRE 1)
- **RM5.4 million** under the Prihatin Economic Stimulus Package (PRE Prihatin) to MADA to assist the agency post-COVID-19.
- Under PRE Prihatin, an allocation of RM200,000 was distributed to each District Farmers' Organisation to develop short-term agrofood projects which benefited 1,810 MADA farmers



Beras kita masih cukup

*Hanya 30% beras diimport,
tidak jejas bekal dalam negara*

Government Aids



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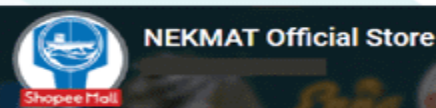
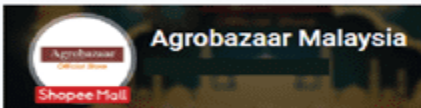


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Corrective Measurements – Better Future

- **Labour shortages** need to be rectified
- **New variety** need to be introduced
- **Stimulus package** for small farmers.
- **Upgrade the irrigation system**
- **Digitalize** the agriculture marketing.
- **Well designed and integrated supply chain**
- **Output-based subsidy**
- Farmer **cooperatives** need to be **strengthen**.
- **Public-private partnership** can complement each other by providing fruitful information.

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