Cultivating Resilience:

Singapore's Innovative Solutions for Urban Food Security

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2. **Importance:** Why Singapore Story?
3. **Foodscape:** Singapore's current food situation
4. **Singapore's Innovative Solutions**
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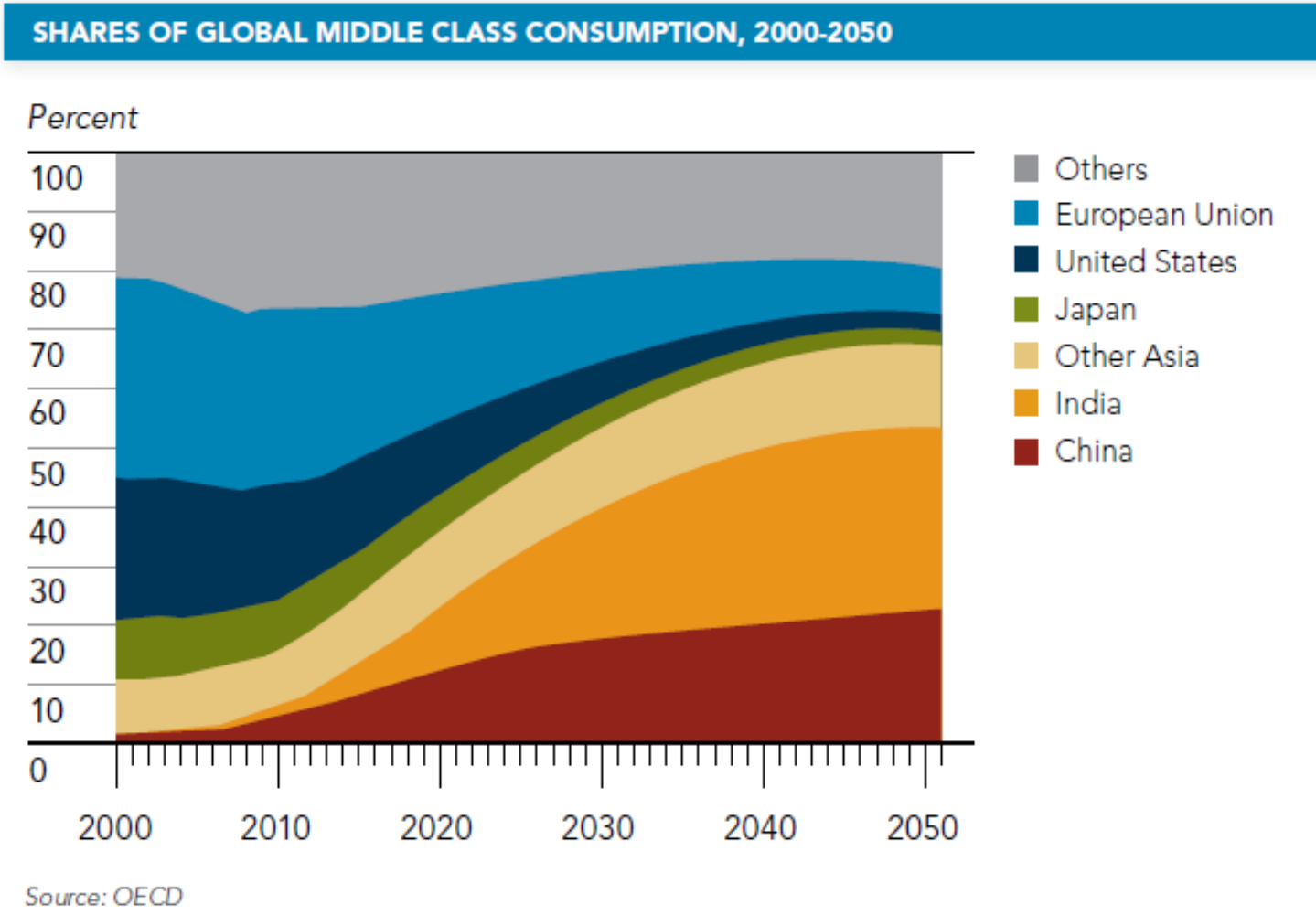
1.

Some Global Trends:

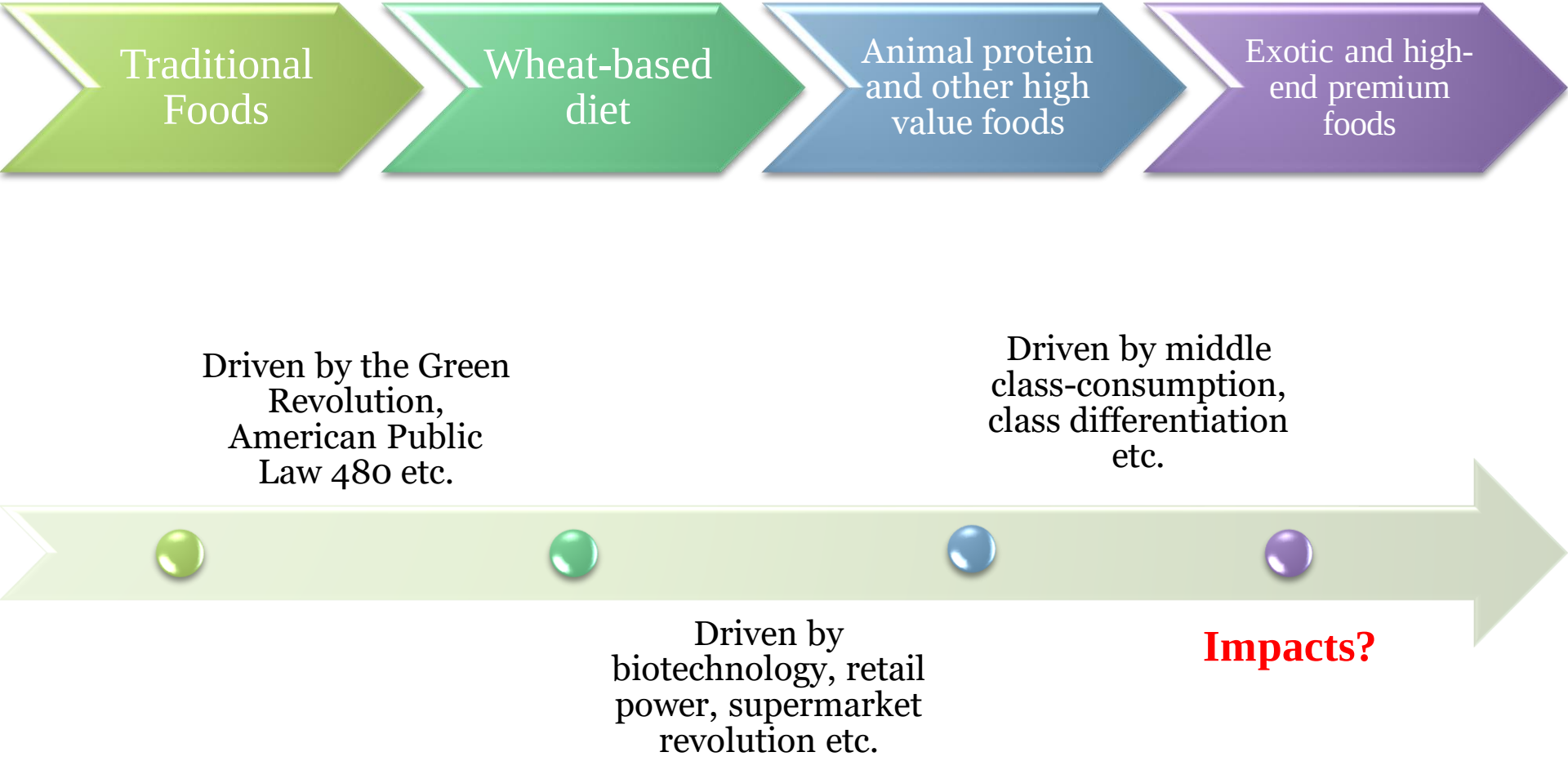
marker of vulnerabilities

Some global trends

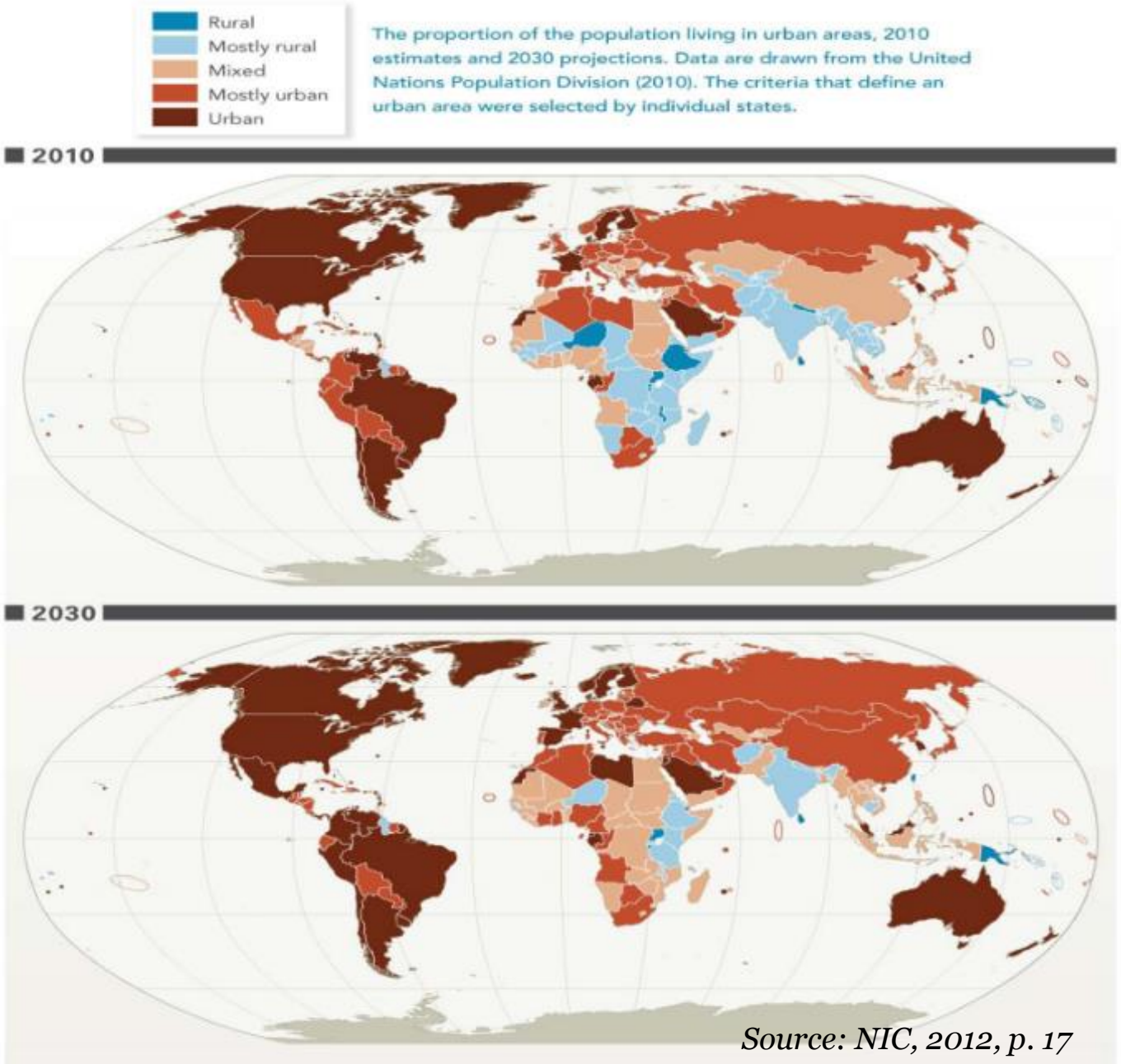
(a) Middle-class consumption



(b) Shifting dietary patterns

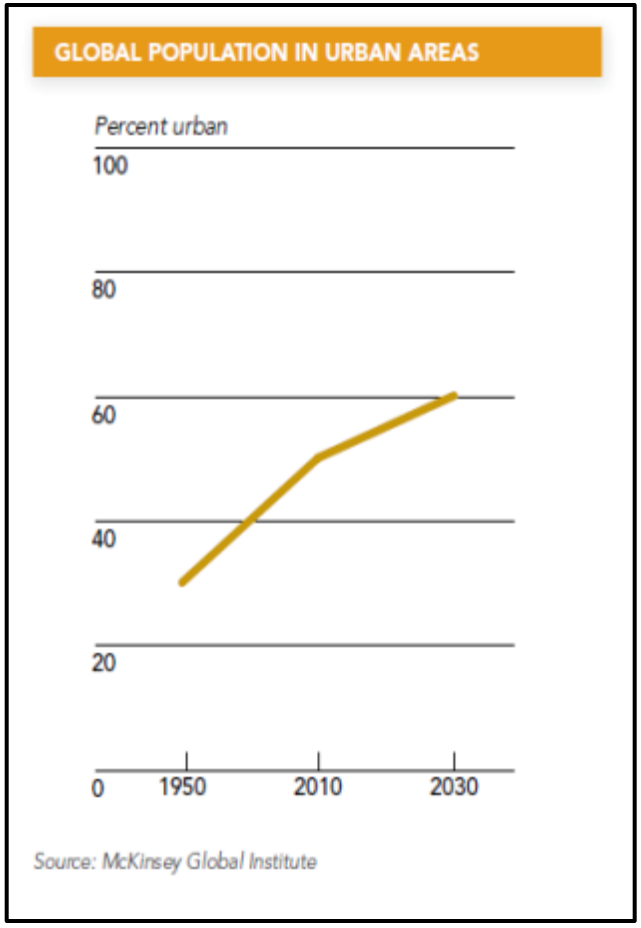


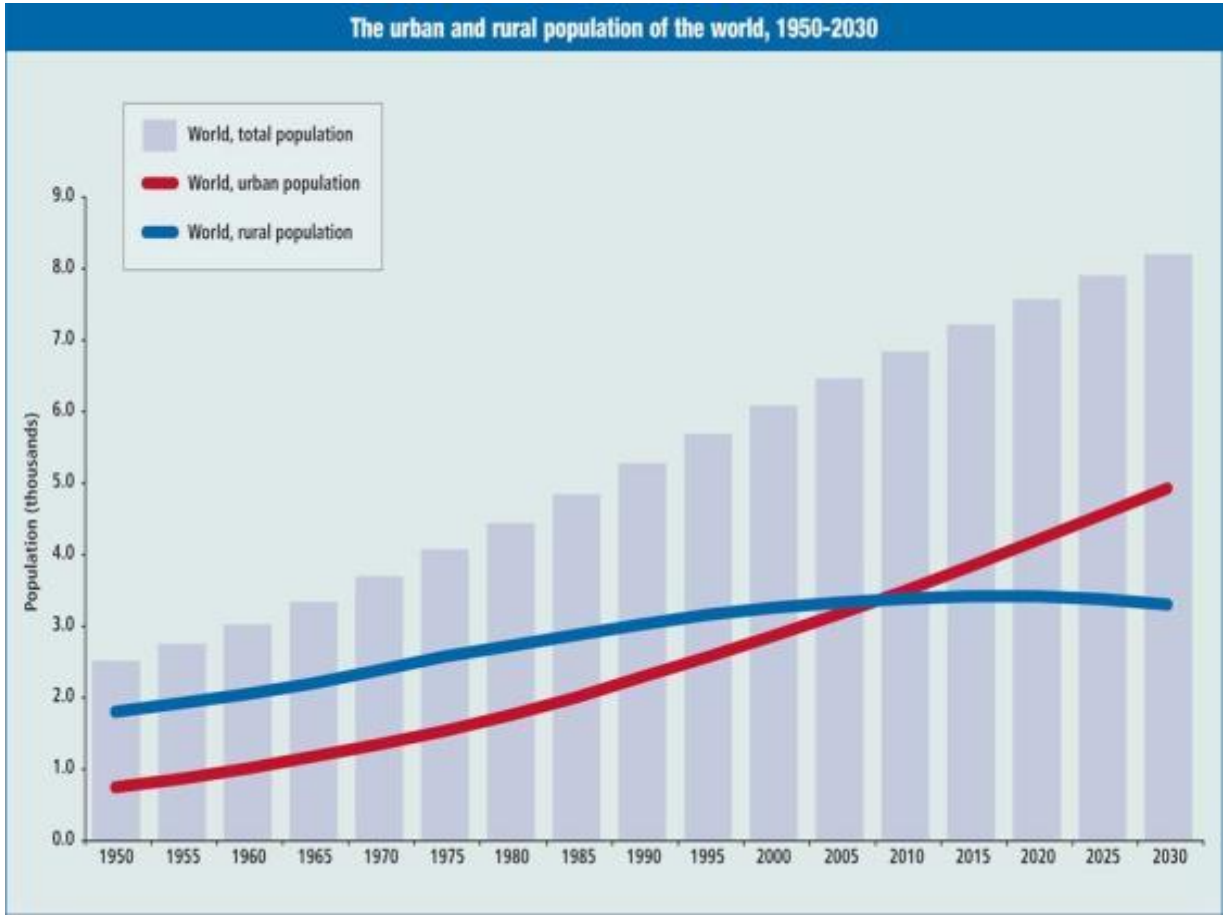
(c) Massive Urbanization



Source: NIC, 2012, p. 17

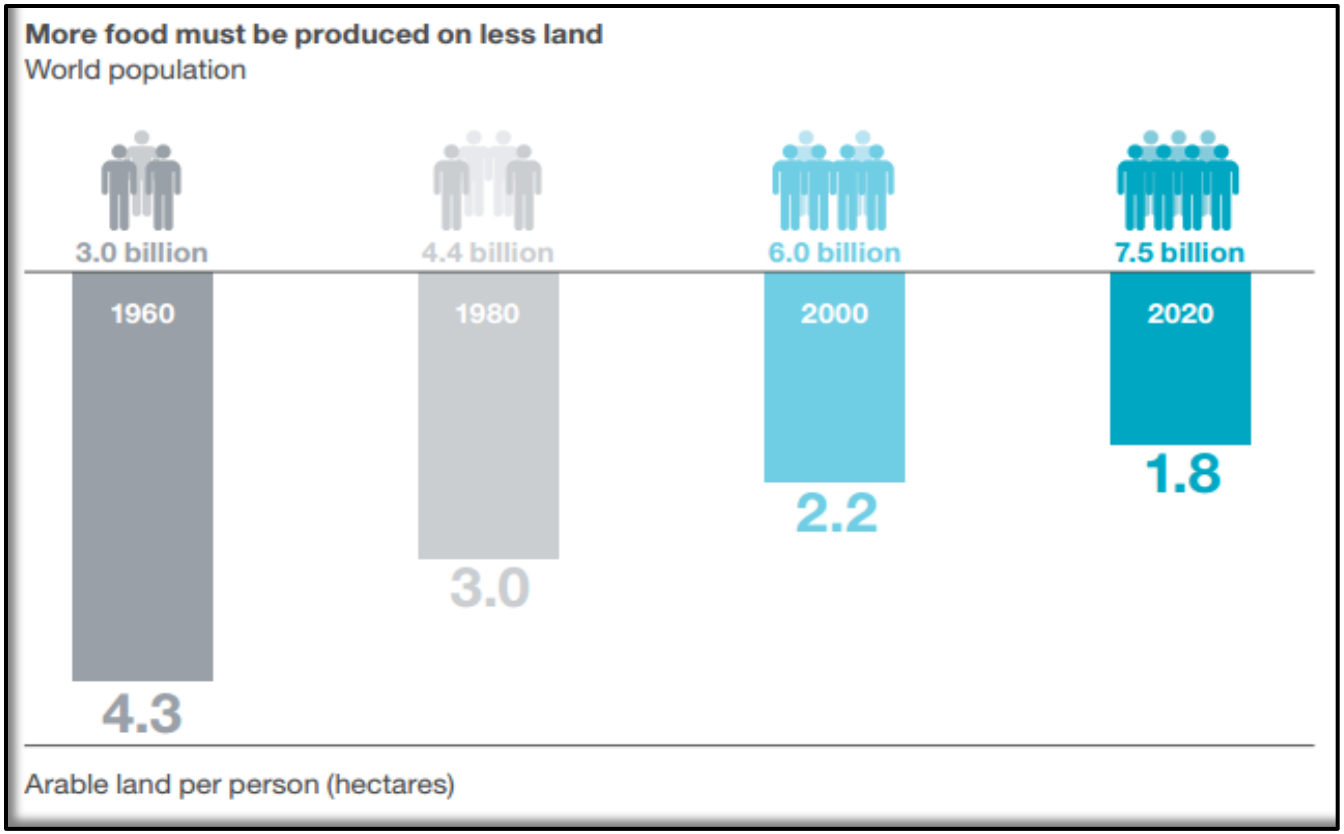
(d) Urban population



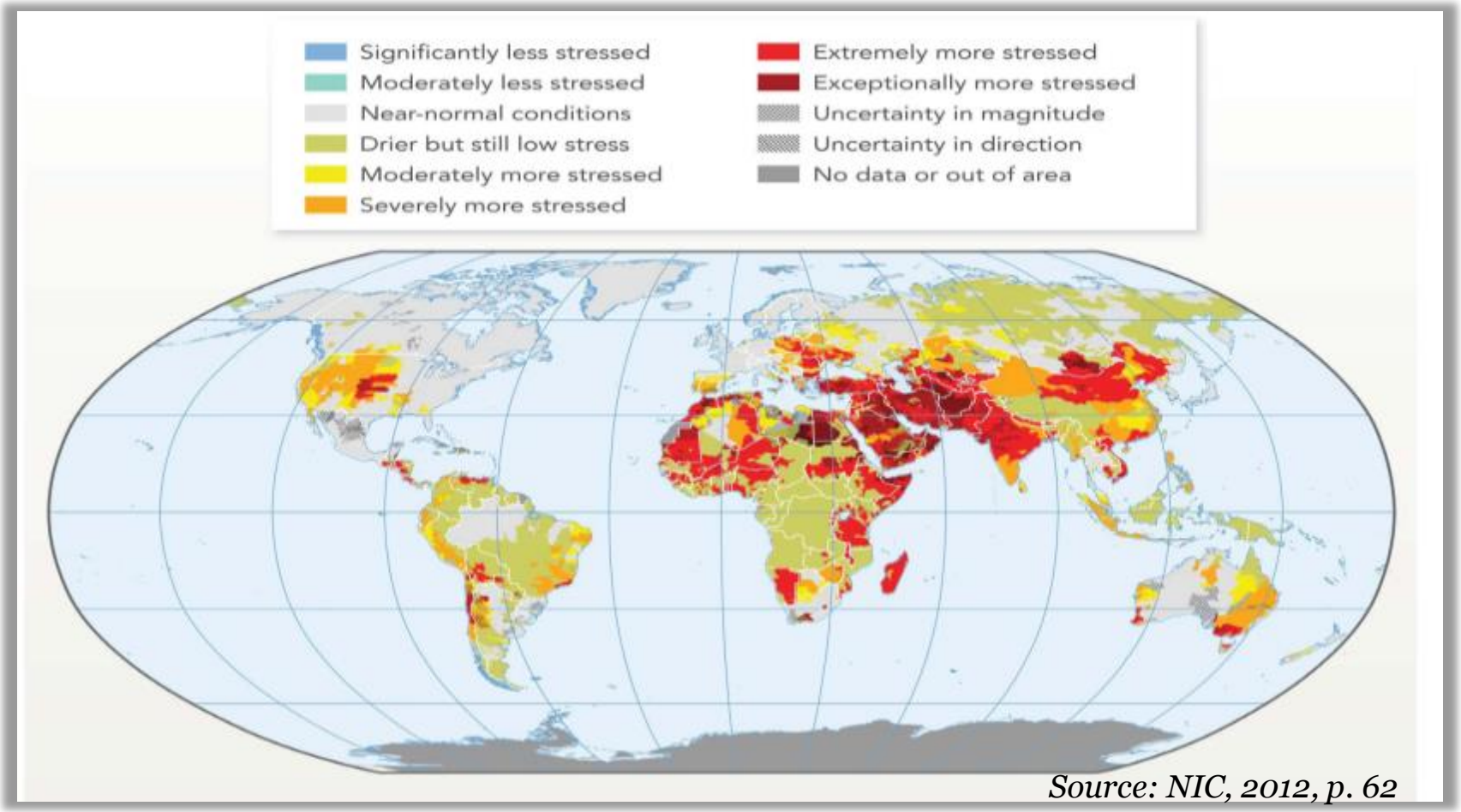


Source: McKinsey Global Institute

Critical Dilemma:



(e) Environmental water scarcity index by basin: high-stress belt by 2030



Source: NIC, 2012, p. 62

(f) Increase in environmental problems

- acid rain
- air pollution
- Smog and haze
- deforestation
- global warming
- greenhouse effect
- indoor air pollution
- landfill over-crowding
- low level nuclear wastes
- ozone depletion
- radiation from power lines
- species extinction
- toxic waste dump
- desertification

g) Pandemic and supply chain disruption

Questions

- How can we **tackle the challenges** of urban food security amid global trends like climate change?

- What insights does **Singapore's experience** offer about its resilience and innovative approaches to urban food security?

2.
Importance:
Why Singapore Story?

Importance: Why Singapore Story?

- **Singapore provides an excellent story** to understand urban food security
- Diverse food **supply networks** across the world
- Over **40% food shipments** of agro-food commodities across Asia pacific goes through Singapore ports
- **Great transformation** from a fishing village to food secured metropolitan

Agricultual Hub (1960s)

- produced 60% of its own vegetable demand
- 80 per cent of poultry
- 100 per cent of eggs
- exported pork to neighboring regions

1. Singapore: 85.9
2. Ireland: 85.5
3. UK: 85.0
3. United States: 85.0
5. Netherlands: 84.7
6. Australia: 83.7
7. Switzerland: 83.5
8. Finland: 83.3
9. Canada: 83.2
10. France: 82.9

Source: *The Economists Intelligence Unit 2018.*

3.
Foodscape:
Singapore's Current Food Situation

(a) A general overview:

- **Population**: 6.05 million
- **Land area**: 750 square km
- **Land for food production**: 1%
- **Priority**: building a modern and urbanized city

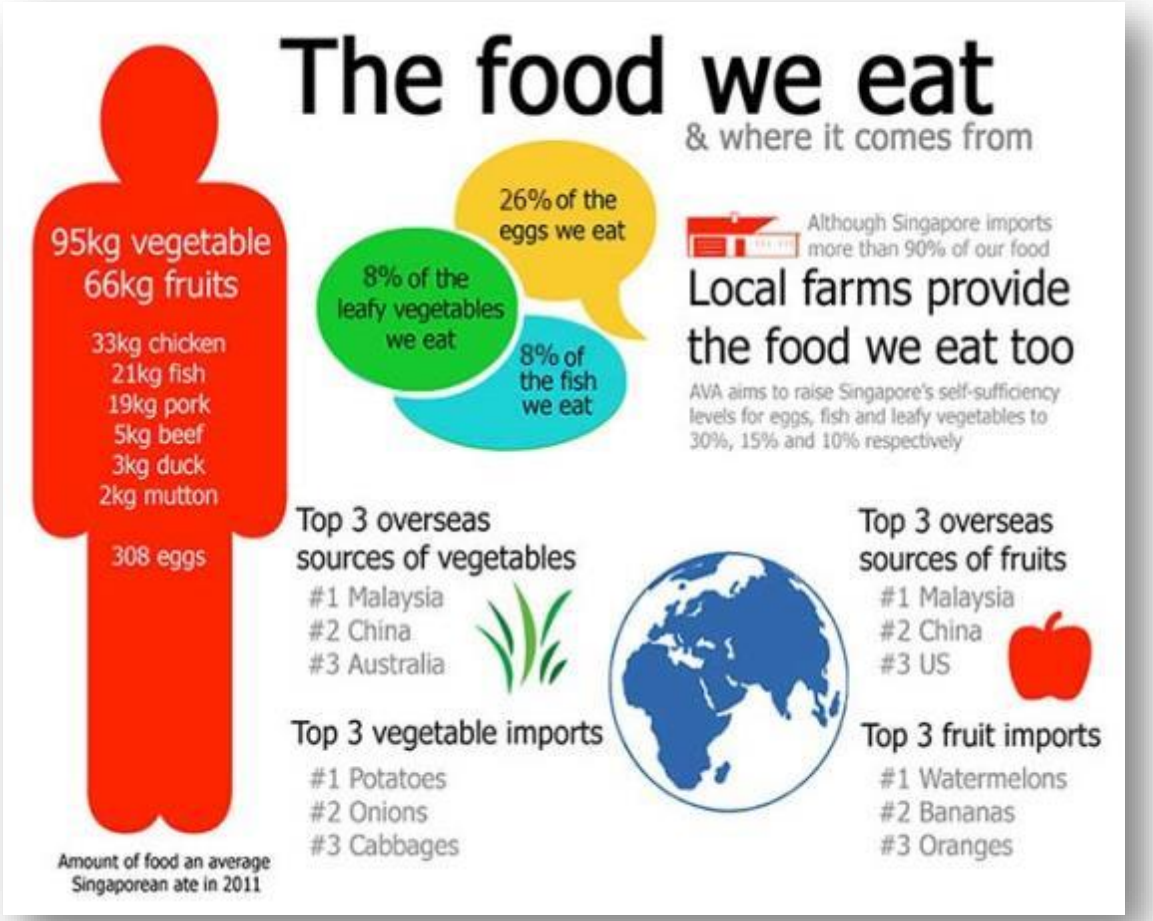
Farms and Farming Area

Year	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Licensed Farms (No.)	263	268	267	266	256	264	248	248	250	250
Farming Area (ha)	807	815	806	769	746	764	738	734	739	729

- *The total farming area has **declined by more than 9.5%** since 2002*

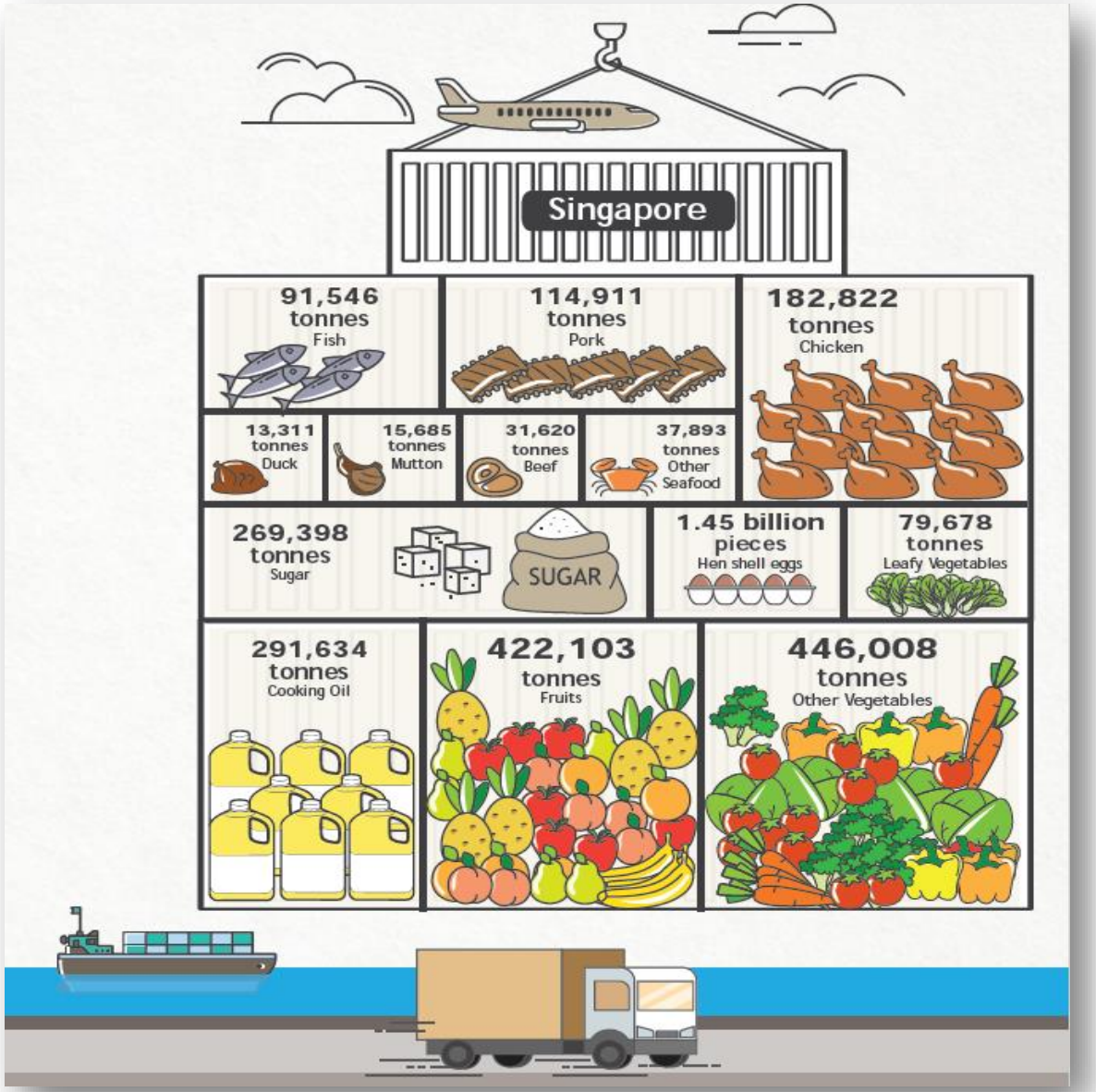
(b) Singapore's Food Needs:

Per Capita Consumption		
Item	2002	2011
Chicken (kg)	28	33
Pork (kg)	18	19
Beef (kg)	4	5
Mutton (kg)	2	2
Fish(kg)	25	21
Vegetables (kg)	89	95
Fruits (kg)	87	66
Hen eggs (pcs)	282	308



Source: Agri-food and veterinary authority of Singapore (AVA)

Major Food Items Imported by Singapore in 2017-18 (AVA 2018)



(c) Singapore's Global Food Supply Network

[Major sources, list not exhaustive]

Brazil (46%), Malaysia (37%), USA (13%), Argentina, Denmark, China, Australia

Brazil (31%), Indonesia (20%), Australia (10%), Netherlands, China, Canada, Mexico, USA

Brazil (54%), Australia (27%), New Zealand (8%), USA, Japan

Australia (90%), New Zealand (9%), USA, UK, Ireland, Argentina

Malaysia (94%), Ireland (4%), Thailand, France, Hungry

Indonesia (21%), Vietnam (19%), Malaysia (15%), Norway, Thailand, China, Singapore

Malaysia (72%), Singapore (26%), Ukraine, Thailand, New Zealand, United States

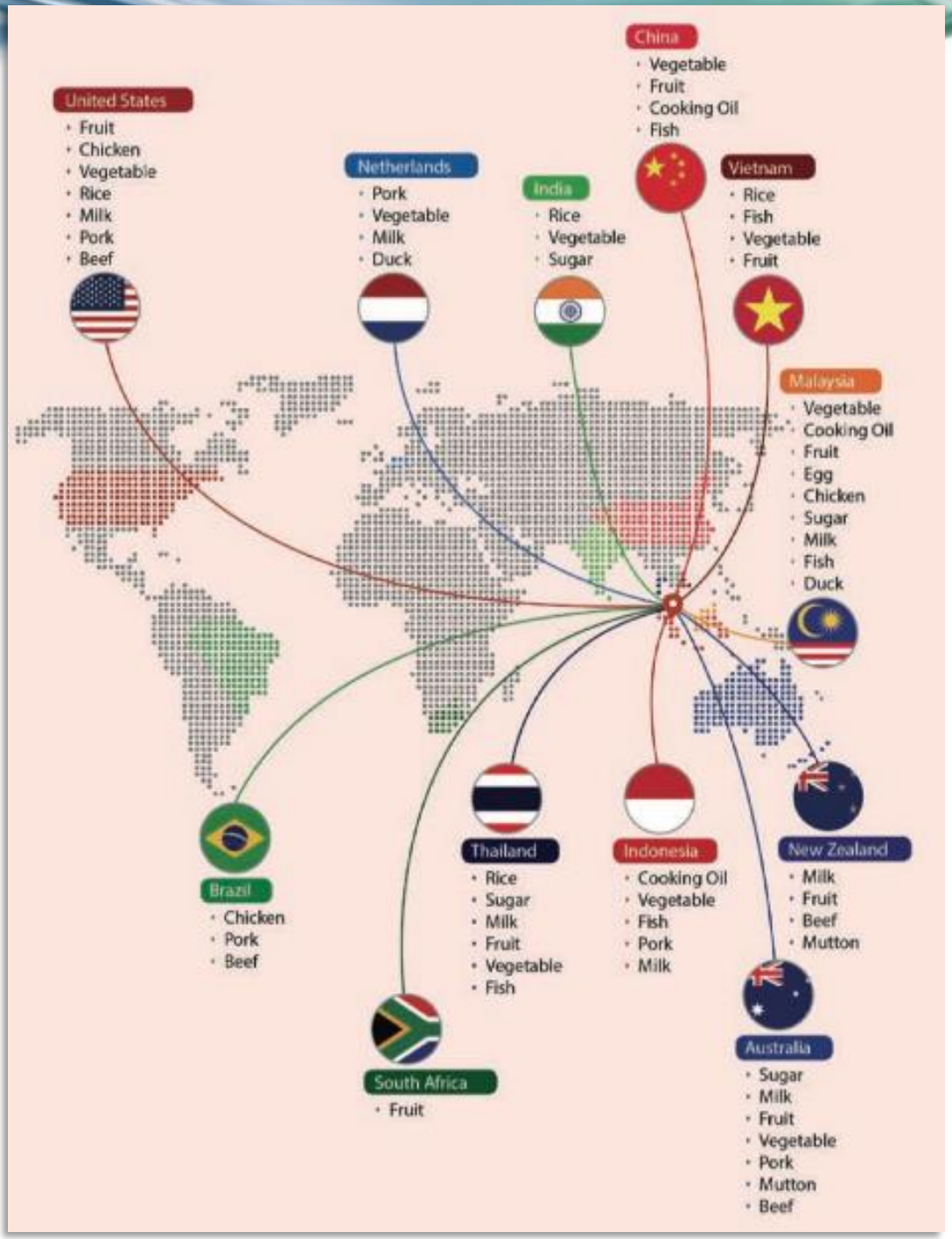
Malaysia (41%), China (27%), India (7%), Australia, Singapore, USA, Thailand, Indonesia

Thailand (35%), India (32%), Indonesia, Vietnam, United States

Malaysia (39%), China (11%), South Africa (8%), Philippines, Australia, United States

Source: Singapore Food Agency (2020)

Singapore's food supply network (by country)



4.
Singapore's Innovative Solutions

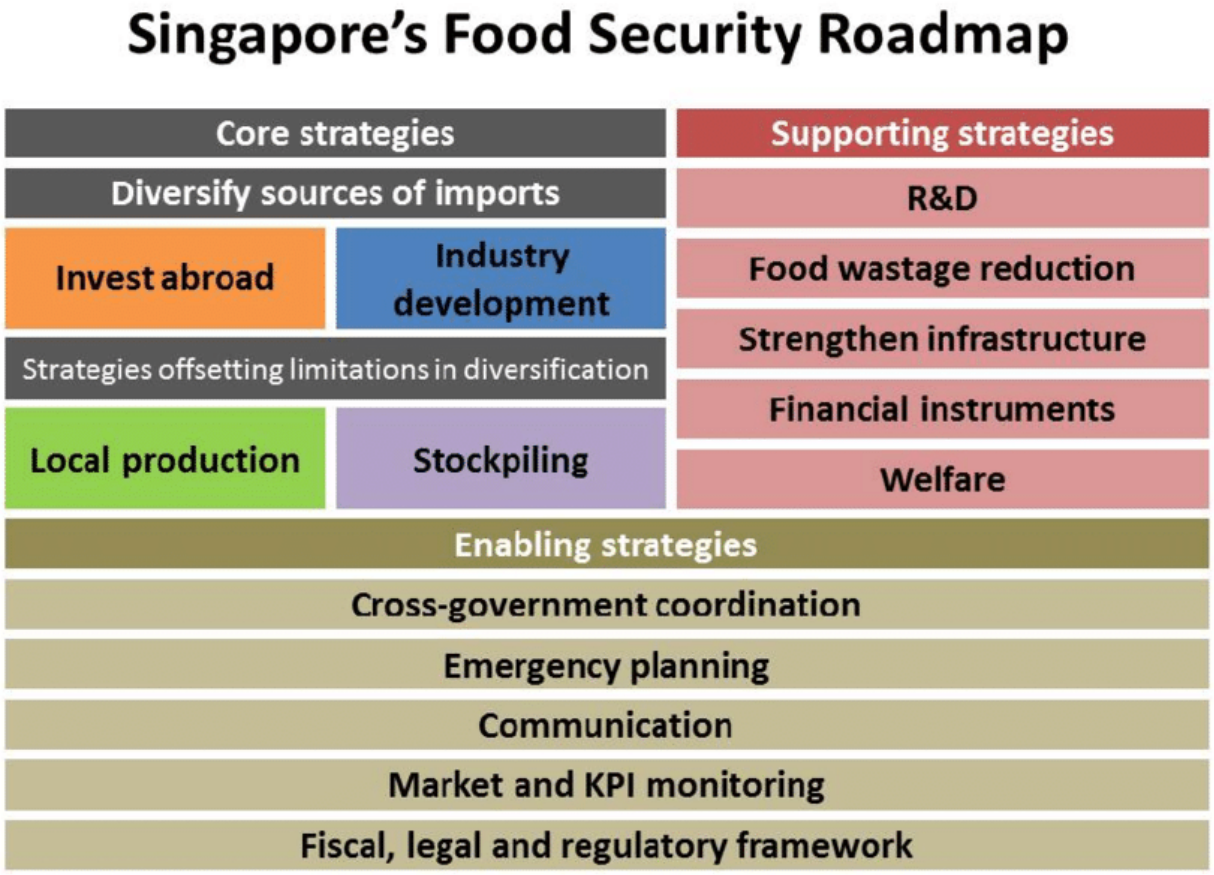
Singapore's innovative solutions for food security

Singapore Food Agency

Safe Food For All

1. Singapore Food fund & 30 by 30
2. R&D hub
3. Vertical fish farming
4. Jilin Food Zone
5. Urban & Peri-Urban Agriculture
6. R&D of local fisheries
7. Reducing Food Wastage
8. Lowest tariffs on agriculture imports
9. Diversification
10. The Singapore Food Agency
11. Cultured meat and new food

Summary:


Singapore's Food Security Roadmap
Core strategies
Diversify sources of imports
Invest abroad
Industry development
Strategies offsetting limitations in diversification
Local production
Stockpiling
Supporting strategies
R&D
Food wastage reduction
Strengthen infrastructure
Financial instruments
Welfare
Enabling strategies
Cross-government coordination
Emergency planning
Communication
Market and KPI monitoring
Fiscal, legal and regulatory framework

Future of farming in Singapore

Sky Greens

*At **Sky Greens**, leafy vegetables are grown vertically in 9-metre-tall towers (5 times more productivity)*

*At **Panasonic Factory Solutions**, indoor vertical farming makes climate control possible. Output is multiplied as the space and essential conditions for plant growth can be optimized*

Dr Koh Poh Koon, Minister of State for National Development and Trade & Industry (7 March 2017), said:

- *"Our modern farmers should be more appropriately called 'agri-technologists' or 'agri-specialists'. We will need a generation of 'agri-specialists' with multi-disciplinary expertise…*

- *(Farming) will no longer just be about toiling in the sun doing manual labour but also about engineering, info-communications technology, entrepreneurship, and R&D."*

- *We envision farms will make use of integrated vertical and indoor systems, automation and robots."*

Sustainable water

Four Strategies for a hydrated nation:

- Importation
- Desalinization plants
- Efficient catchment of rainwater
- Recycling of sewage: NEWater

5.
Critical Areas

Critical Areas (for improvements)

- **State-led ecological modernization** needs more room for civic engagement
- **Diversification** leads too much carbon food prints
- **Food waste** costs about $1 billion a year
- **Food security of the producers** can be incorporated into its food policy framework

Thank You