Food Security and Sustainable Agriculture

Presentation developed partly by Food Security Center (FSC), University of Hohenheim

Objectives

1. To mention the daily human nutrient requirements
2. To define the concept of Food and Nutrition Security (FSN)
3. To present the status of Food Security (Globally/ASEAN)
4. To show challenges to Food Security in ASEAN
5. To mention the ASEAN Policy on Food Security

Can we secure food for 9 billion people until 2050

by increasing food production?

BIG CHALLENGE

Mantain high agrobiodiversity for diverse and balance diets

Agrobiodiversity - the Key to Food Security

The ***conservation and sustainable use of the diversity of cultivated plants and domestic animal breeds*** is key to food security.

It is this diversity that has in the past enabled people to settle in almost all the regions of the Earth and to provide food for themselves under even the harshest of conditions.

This potential is currently underutilised and could turn out to be a vast treasure trove, especially for people dependent upon agriculture in marginal rural areas.

1. Daily nutrient requirement

→ Adult female, 31-50 years old, not pregnant or lactating, sedentary lifestyle

Macronutrients	5
Carbohydrate	130g
Dietary Fiber	25g
Linoleic Acid	12000mg
Alpha-Linolenic Acid	1100mg
Protein	47g

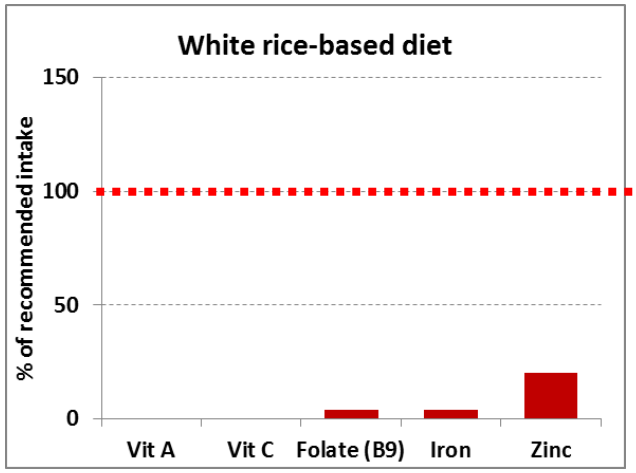
Vitamins	14
Vitamin A	500µg RE
Vitamin C	50mg
Vitamin D	200IU
Vitamin E	15mg
Vitamin K	90µg
Thiamin	1.1mg
Riboflavin	1.1mg
Niacin	14mg
Vitamin B6	1.3mg
Folate	400µg
Vitamin B12	2.4µg
Pantothenic Acid	5mg
Biotin	30µg
Choline	425mg

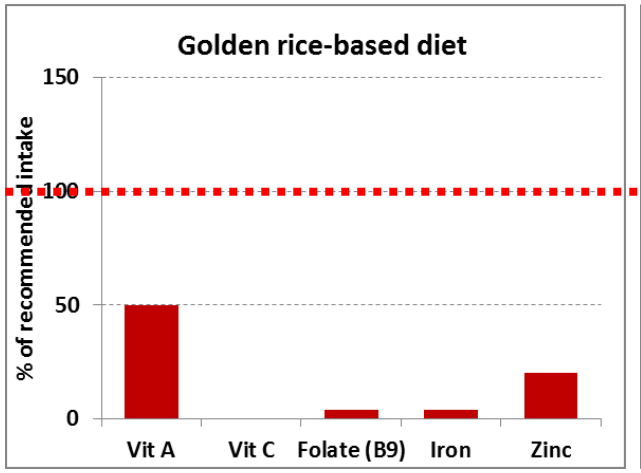
Minerals	12
Calcium	1000mg
Chromium	25µg
Copper	0.9mg
Flouride	3mg
Iodine	150µg
Iron	18mg
Magnesium	320mg
Manganese	1.8mg
Molybdenum	45µg
Phosphorus	700mg
Selenium	55µg
Zinc	8mg

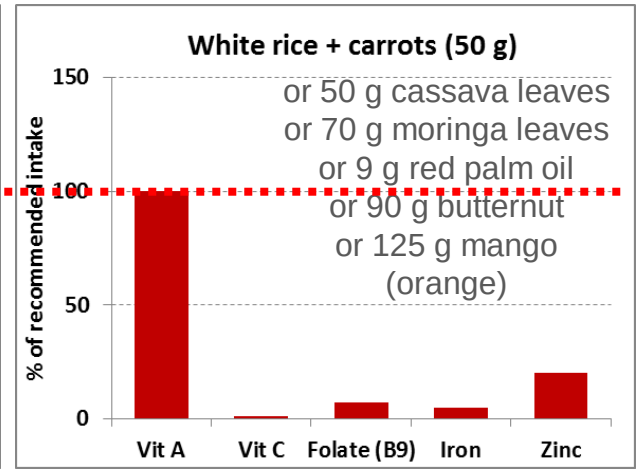
➔ ***31 nutrients to be covered***

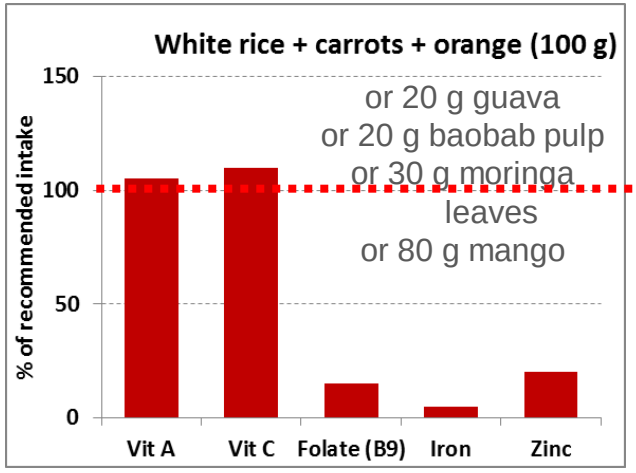
Source: Worms, P. World Agroforestry Centre

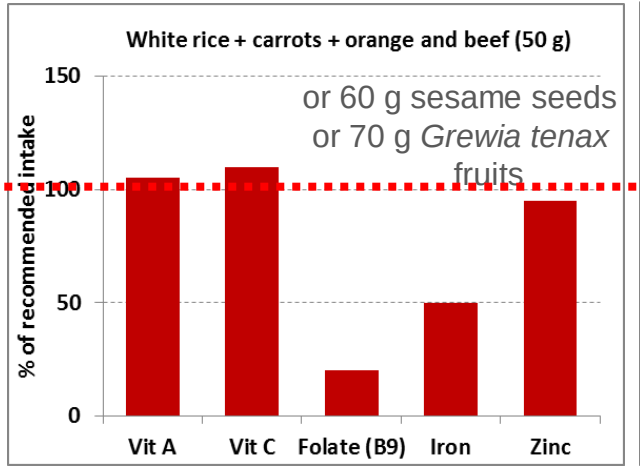
RICE in a balance diet to avoid hidden hunger

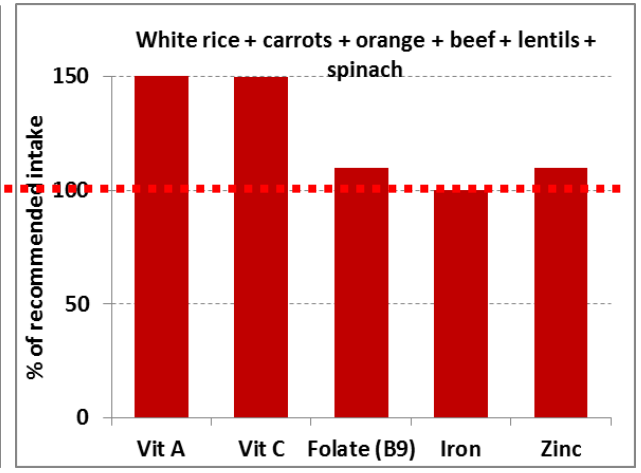












Source: Worms, P. World Agroforestry Centre

2. What is Food Security

Concept of Food Security (Four Pillars)

1. Availability of Food
2. Access to Food
3. Use and Utilisation of Food
4. Stability of Food Security

Availability of food

⇒**physical existence** of food through own production or markets (stock, trade, import)

AVAILABILITY

Access to food

Physical access through infrastructure like roads, markets, etc.

Socio-economic access is ensured when all households and individuals have sufficient resources to obtain appropriate food for a nutritious diet.

=>depends on **capital, labour, education** and **food prices**

AVAILABILITY

ACCESS

Use and Utilization of food

Use refers to socio-economic aspects and decisions on **household level:**

- what food to buy, how to prepare and consume it
- allocation within the household (often unequal distribution; women and children disadvantaged)
- Social /cultural function of food
- knowledge of good nutrition, health, food preparation, processing and storage

AVAILABILITY

ACCESS

USE

=>determined by **knowledge, education, tradition, taboos, status** of household members

Use and Utilization of food

Utilization refers to the ability of the individual person to digest food and convert it into energy or growth

Nutrition: Consumption & good utilization of nutrient-rich food to cover individual needs

Good nutrition requires

- **an divers and adequate diet,**
- **healthy physical environment** (incl. safe drinking water, hygiene, sanitary facilities, shelter),
- **adequate caring capacities** esp. for mothers and children
- adequate **health services**

AVAILABILITY

ACCESS

USE/UTILIZATION (NUTRITION)

Stability in the food supply

=> refers to **temporary dimension** of FNS: stability of the other three dimensions over time .

Problems:

- **Chronic food insecurity**
- **Transitory or cyclical food insecurity** ("hungry or lean period" before next harvest)
- **Acute and temporary food insecurity** due to shocks (i.e. floods, droughts, conflicts, etc.)

AVAILABILITY

ACCESS

USE/UTILIZATION (NUTRITION)

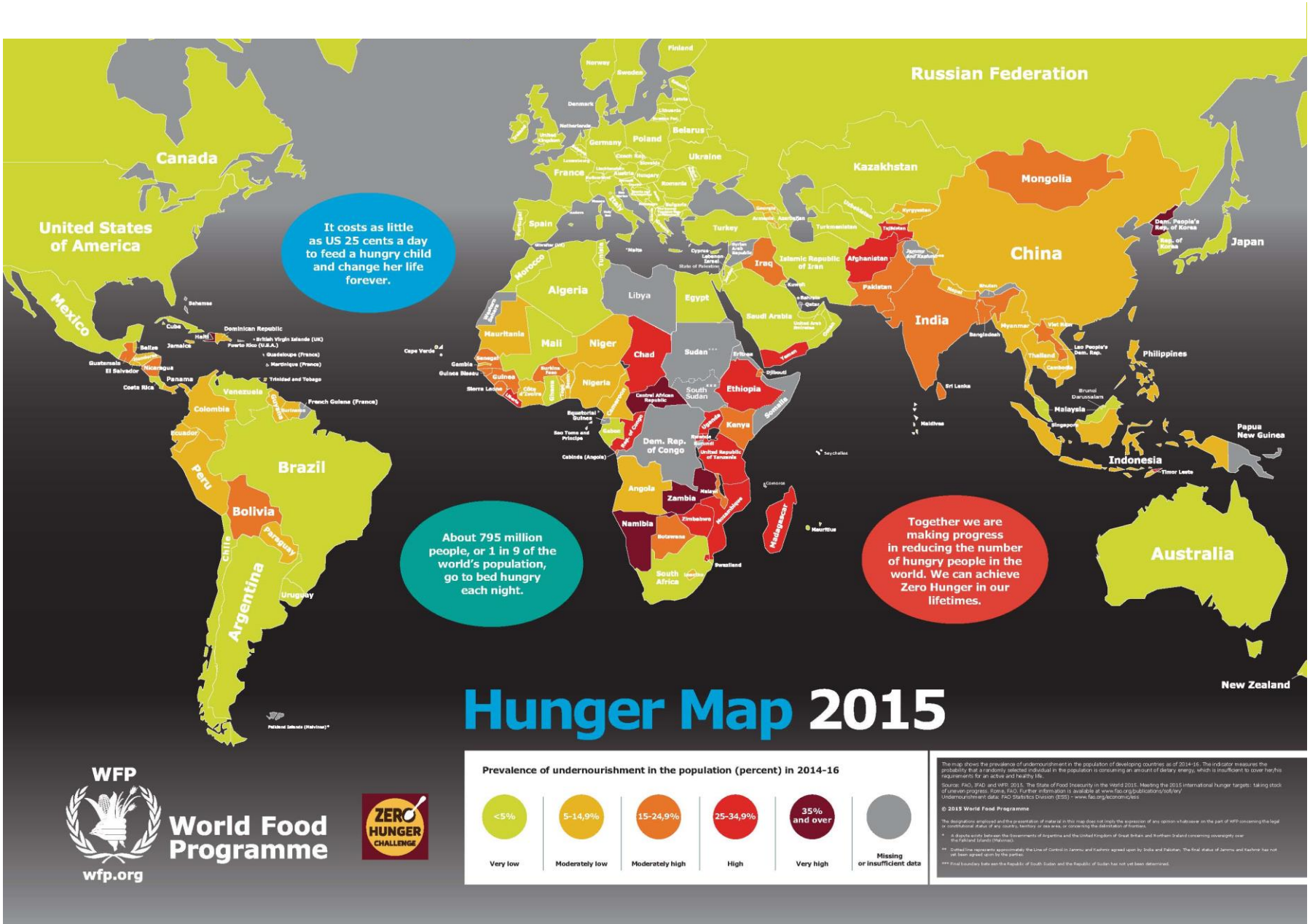
STABILITY

Definition of Food and Nutrition Security (FNS)

"Food and nutrition security exists when all people
at all times have physical, social and economic access to food,
which is safe and consumed in sufficient quantity and quality
to meet their dietary needs and food preferences,
and is supported by an environment of adequate sanitation, health
services and care, allowing for a healthy and active life."

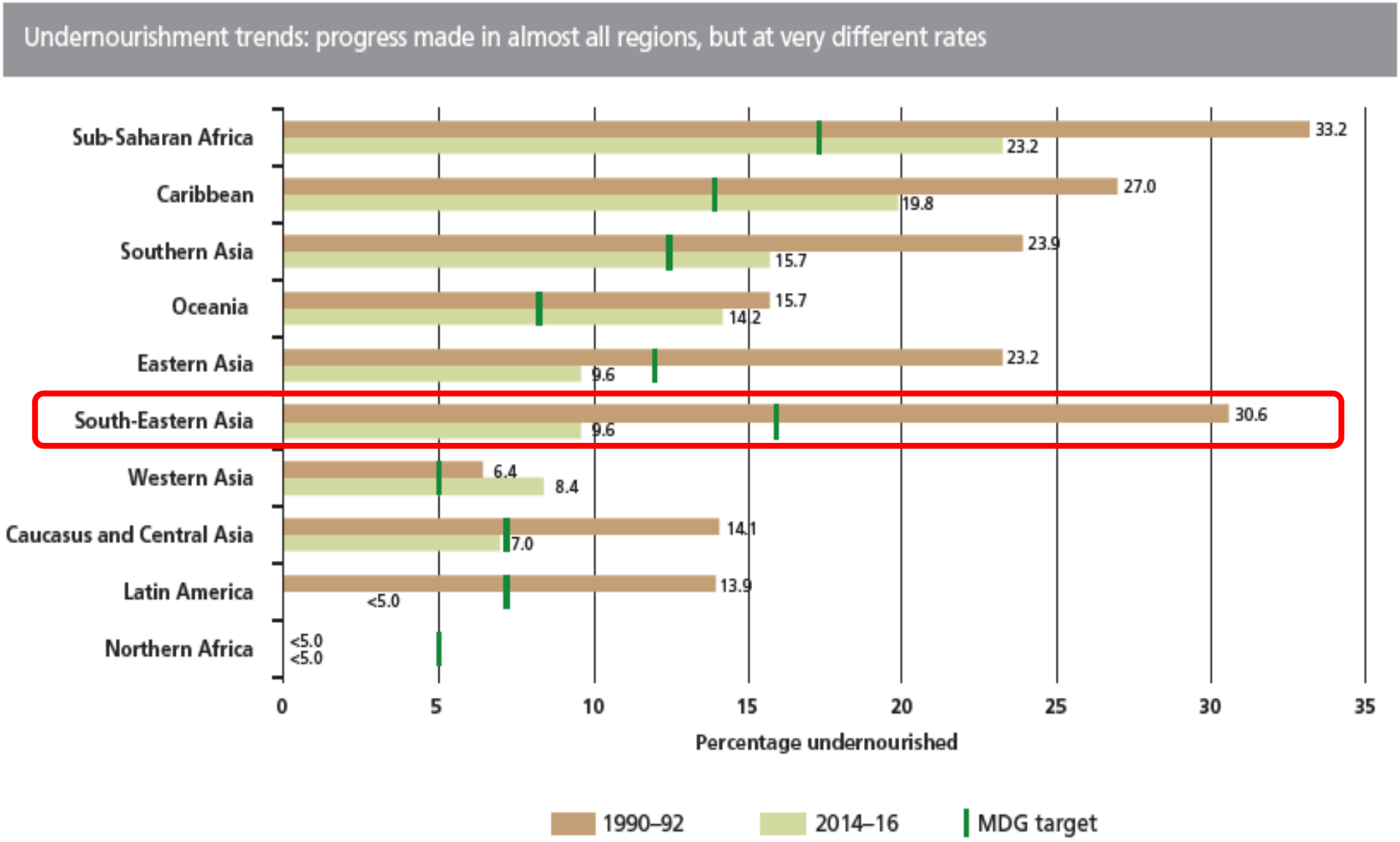
Committee on World Food Security (CFS) 2010

3. Status of Food Security (Globally) (1)



3. Status of Food Security (Globally) (2)

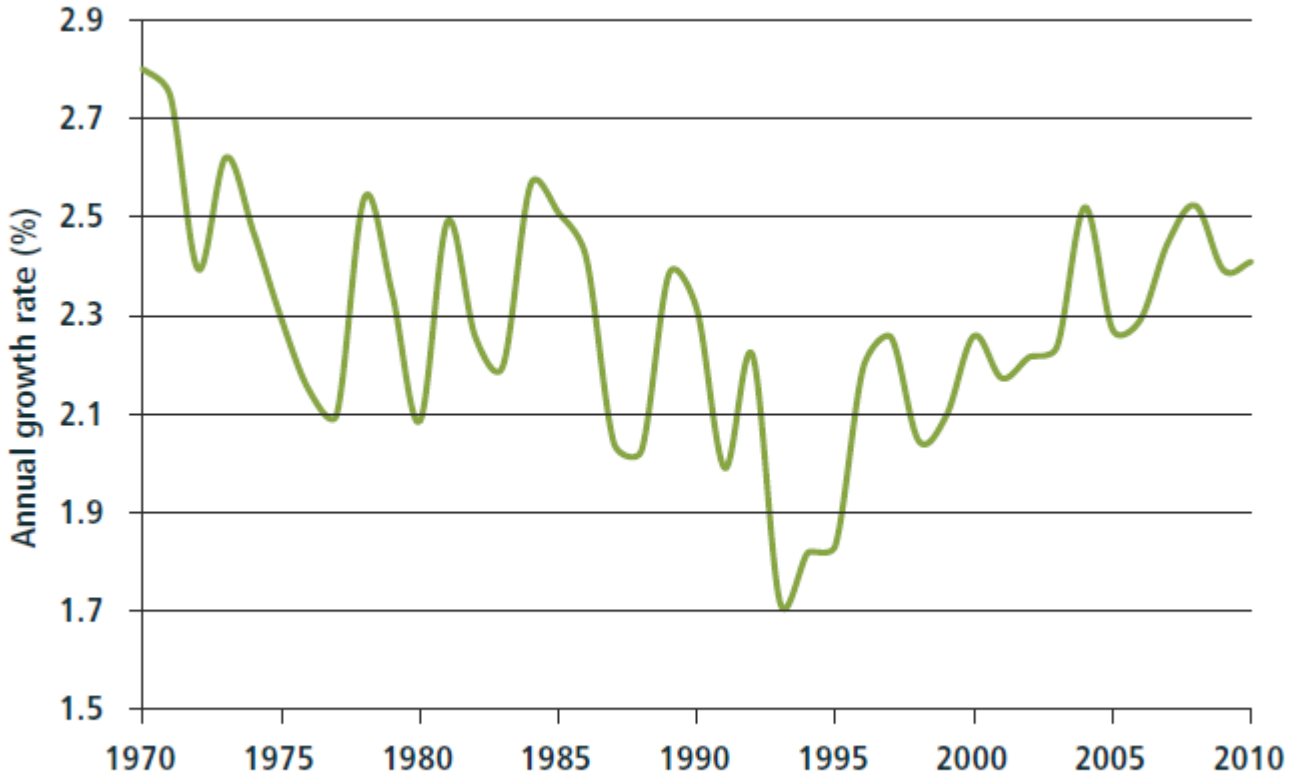
Marked Differences in Progress between Regions



Source: FAO “The State of Food Insecurity in the World 2015”

3. Status of Food Security (Globally) (3)

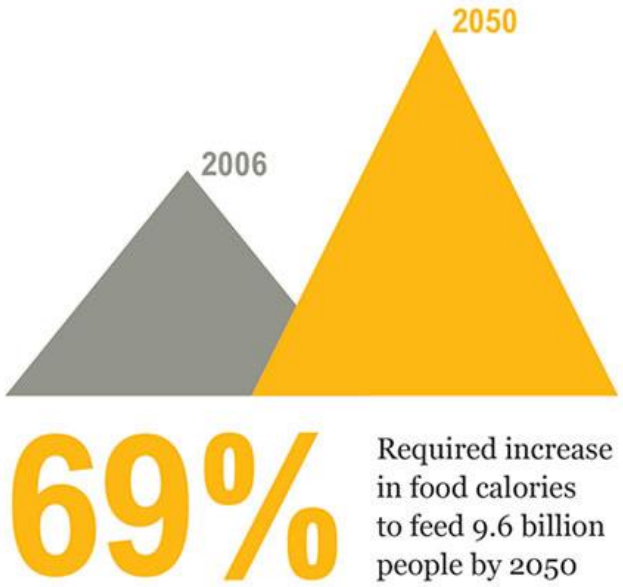
FIGURE 2 Evolution of the annual growth rate of global agriculture, 1970–2010



Source: Elaborated by authors using data from FAOSTAT, accessed May 2012.

3. Status of Food Security (Globally) (4)

Food Gap

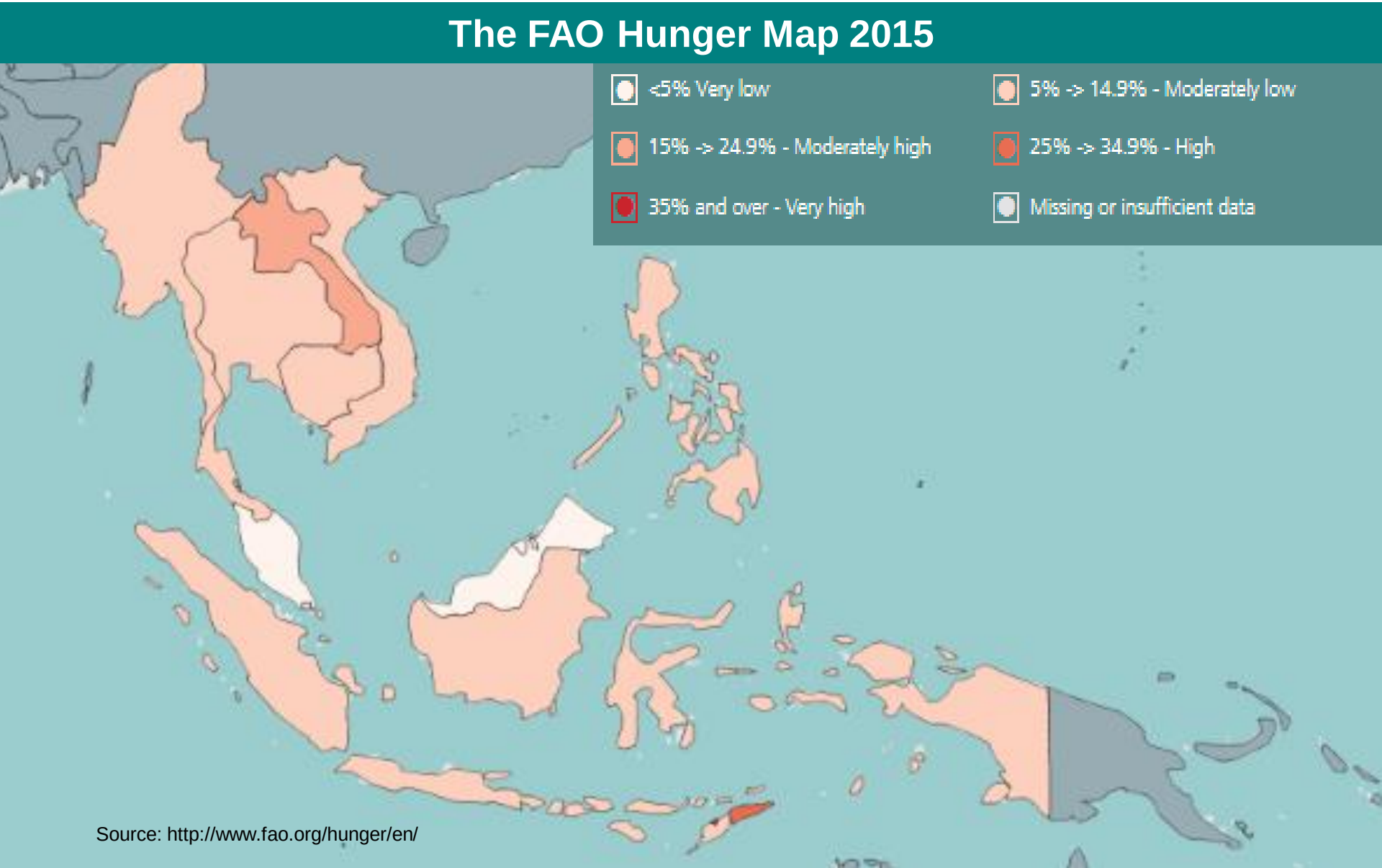


WORLD RESOURCES INSTITUTE

Sources: http://ow.ly/rpfMN

Taking into account a growing population and shifting diets, the world will need to produce 69 percent more food calories in 2050 than we did in 2006.

4. Status of Food Security (ASEAN) (1)



Source: http://www.fao.org/hunger/en/

4. Status of Food Security (ASEAN) (2)

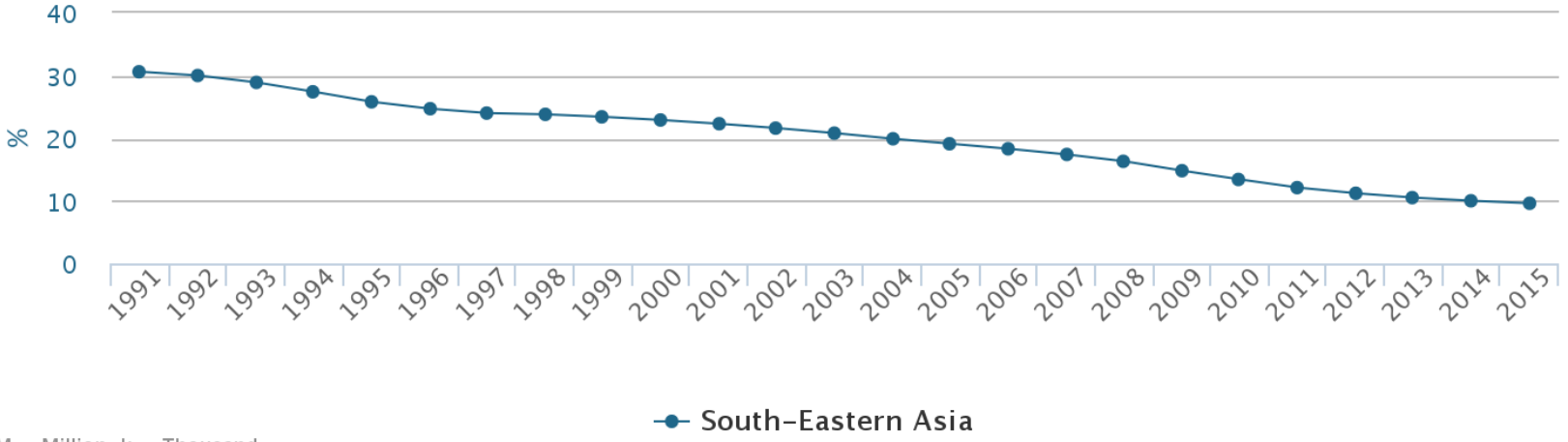
Prevalence of undernourishment and progress towards the World Food Summit (WFS) and the Millennium Development Goal (MDG)2 targets in South-Eastern Asia

Regions/subregions/countries	Number of people undernourished							Proportion of undernourished in total population						
	1990–92	2000–02	2005–07	2010–12	2014–16[3]	Change so far[4]	Progress towards WFS target[5]	1990–92	2000–02	2005–07	2010–12	2014–16[3]	Change so far[4]	Progress towards MDG target[5]
	(millions)					(%)		(%)						
South-Eastern Asia	**137.5**	**117.6**	**103.2**	**72.5**	**60.5**	**–56.0**	✳	**30.6**	**22.3**	**18.3**	**12.1**	**9.6**	**–68.5**	●
Brunei Darussalam	ns	ns	ns	ns	ns	>–50.0	◀▶	<5.0	<5.0	<5.0	<5.0	<5.0	na	●
Cambodia	3.0	3.6	2.7	2.5	2.2	–26.1	◀▶	32.1	28.5	19.6	16.8	14.2	–55.8	●
Indonesia	35.9	38.3	42.7	26.9	19.4	–45.9	▼	19.7	18.1	18.8	11.1	7.6	–61.6	●
Lao People's Democratic Republic	1.9	2.1	1.6	1.4	1.3	–30.6	◀▶	42.8	37.9	26.9	21.4	18.5	–56.8	●
Malaysia	1.0	ns	ns	ns	ns	>–50.0	◀▶	5.1	<5.0	<5.0	<5.0	<5.0	na	●
Myanmar	26.8	24.3	17.0	9.4	7.7	–71.4	✳	62.6	49.6	33.7	18.0	14.2	–77.4	●
Philippines	16.7	16.1	14.3	12.7	13.7	–17.9	◀▶	26.3	20.3	16.4	13.4	13.5	–48.8	●
Thailand	19.8	11.6	7.7	6.0	5.0	–74.9	✳	34.6	18.4	11.7	8.9	7.4	–78.7	●
Timor-Leste	0.4	0.4	0.3	0.3	0.3	–10.0	◀▶	45.2	41.6	34.0	31.2	26.9	–40.4	●
Viet Nam	32.1	20.7	15.9	12.2	10.3	–68.0	✳	45.6	25.4	18.5	13.6	11.0	–75.8	●

Source: FAO "The State of Food Insecurity in the World 2015"

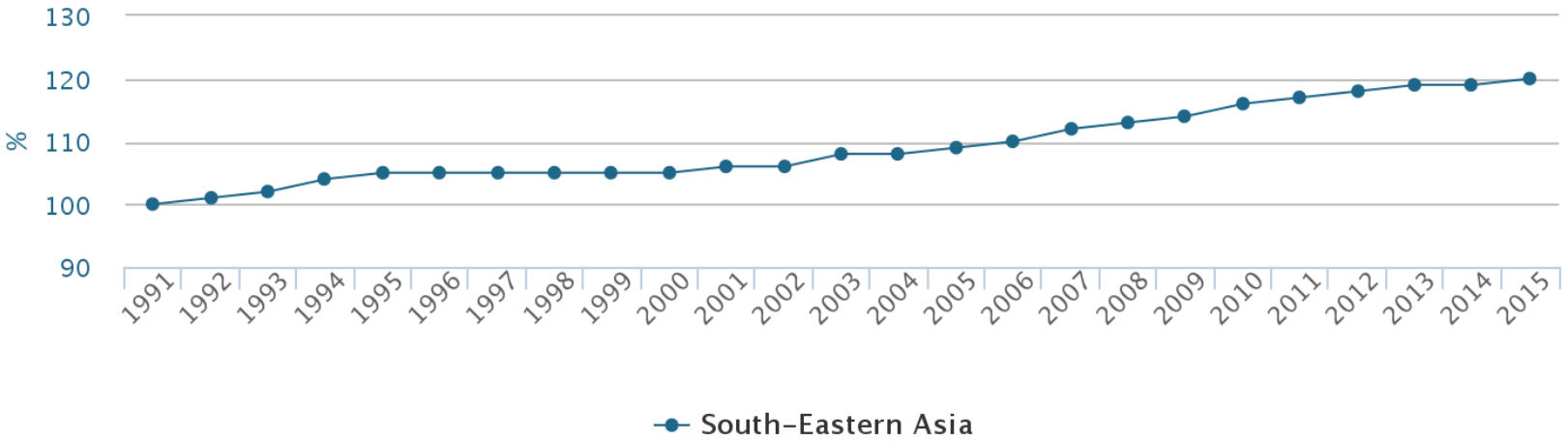
4. Status of Food Security (ASEAN) (3)

Prevalence of undernourishment (%) - 3 years average



M = Million, k = Thousand

Average dietary supply adequacy (%)



M = Million, k = Thousand

Source: FAOSTAT

4. Status of Food Security (ASEAN) (4)

Ratio of rice production to domestic utilization in ASEAN countries, 2014-2016

Unit: Tons

Country	2014			2015			2016		
	Production	Domestic Utilization	Ratio (%)	Production	Domestic Utilization	Ratio (%)	Production	Domestic Utilization	Ratio (%)
ASEAN	132,932,959	111,612,919	119.10	131,824,944	109,499,282	120.39	128,783,279	110,095,627	116.97
Brunei	1,382	34,126	4.05	1,636	34,018	4.81	1,685	35,039	4.81
Cambodia	5,228,330	4,242,719	123.23	5,191,833	2,904,914	178.73	4,356,699	2,832,017	153.84
Indonesia	41,174,499	42,828,781	96.14	42,680,775	42,939,266	99.40	43,411,064	42,952,266	101.07
Lao PDR	2,401,455	2,184,623	109.93	2,428,911	2,272,211	106.90	2,580,000	2,523,595	102.24
Malaysia	1,634,241	2,181,066	74.93	1,684,879	2,247,550	74.97	2,162,733	2,255,551	95.88
Myanmar	16,591,242	14,700,006	112.87	17,753,877	13,515,386	131.36	17,153,070	13,732,685	124.91
Philippines	12,404,958	12,941,533	95.85	11,966,011	13,089,707	91.42	12,010,900	13,281,794	90.43
Singapore	-	297,800	-	-	308,117	-	-	318,228	-
Thailand	24,263,103	10,703,000	226.69	20,879,372	10,646,000	196.12	17,859,729	10,607,000	168.38
Vietnam	29,233,750	21,499,265	135.98	29,237,650	21,542,113	135.72	29,247,400	21,557,453	135.67

Source: AFSIS Secretariat “ASEAN Agricultural Commodity Outlook 2015”

5. Challenges to Food Security in ASEAN (1)

- Pressure on natural resources (land/soil/water/biodiversity)(S)
- Impacts of climate change on agriculture (S)
- Migration of labor from rural areas/overaged farmers (S)
- ASEAN Economic Community but no free movement of unskilled labor (S)
- High opportunity costs to work in farming / low productivity (S)
- High degree of subsidization (S)
- Population growth (D)
- Changing food preferences and patterns - higher quality(D)
- High and volatile food prices (S/D)

S= Supply side

D= Demand side

5. Challenges to Food Security in ASEAN (2)

Impacts of Climate Change on Food Security

Drought and Flood have negative effects on Agriculture

Food Accessibility problems due to natural disaster, especially flood, which is often happen in some countries in SEA

5. Challenges to Food Security in ASEAN (3)

Population growth = Increase demand of rice

	Production million tonnes			Harvested area million ha			Yield tonnes/ha		
	1961/1963	2005/2007	2050	1961/1963	2005/2007	2050	1961/1963	2005/2007	2050
Wheat	235	614	858	206	222	225	1.1	2.8	3.8
Rice (paddy)	230	644	827	118	158	155	1.9	4.1	5.3
Maize	210	736	1 178	106	155	194	2.0	4.7	6.1
Soybeans	27	217	390	24	94	124	1.1	2.3	3.2
Pulses	44	60	100	69	73	62	0.6	0.8	1.6
Barley	84	137	186	59	56	64	1.4	2.4	2.9
Sorghum	44	60	102	47	45	53	0.9	1.3	1.9
Millet	25	32	60	43	37	42	0.6	0.9	1.4
Seed cotton	30	71	100	32	36	39	0.9	2.0	2.6
Rape seed	4	50	99	6	31	36	0.6	1.6	2.8
Groundnuts	15	36	68	17	24	35	0.9	1.5	2.0
Sunflower	7	29	49	7	23	28	1.0	1.3	1.7
Sugarcane	428	1 452	2 822	9	21	27	49	68	104
All cereals (rice milled)	843	2 069	3 009	654	704	763	1.3	2.9	3.9
All crops				978	1 256	1 380	439	924	1 296

Notes: crops selected and ordered according to (harvested) land use in 2005/2007 (excluding fruits and vegetables); Yields for 'all crops' are in ICP$ per ha.

From 1960s – 2050: Increase in Production by **260%**

Increase in harvested area by **only 30%**

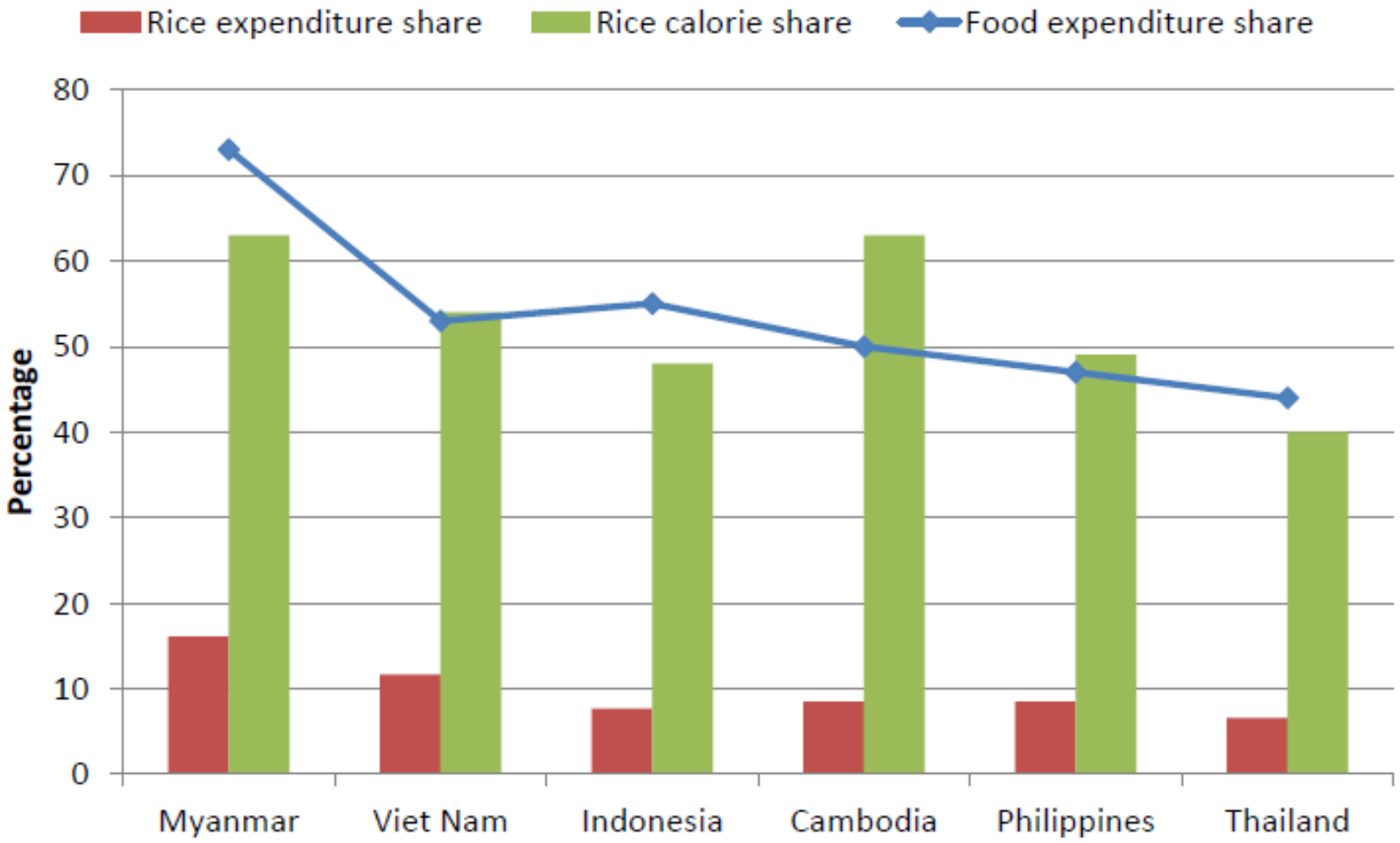
Increase in yield (tonnes/ha) by **2.8 times**

Solutions: Production Technologies and Best Practices

Source: World agriculture towards 2030/2050: the 2012 revision

5. Challenges to Food Security in ASEAN (4)

Access to rice is a critical factor for food security



Source: www.oecd.org

6. ASEAN Policy on Food Security

ASEAN Integrated Food Security (AIFS) Framework and Strategic Plan of Action on Food Security (SPA-FS), 2015-2020

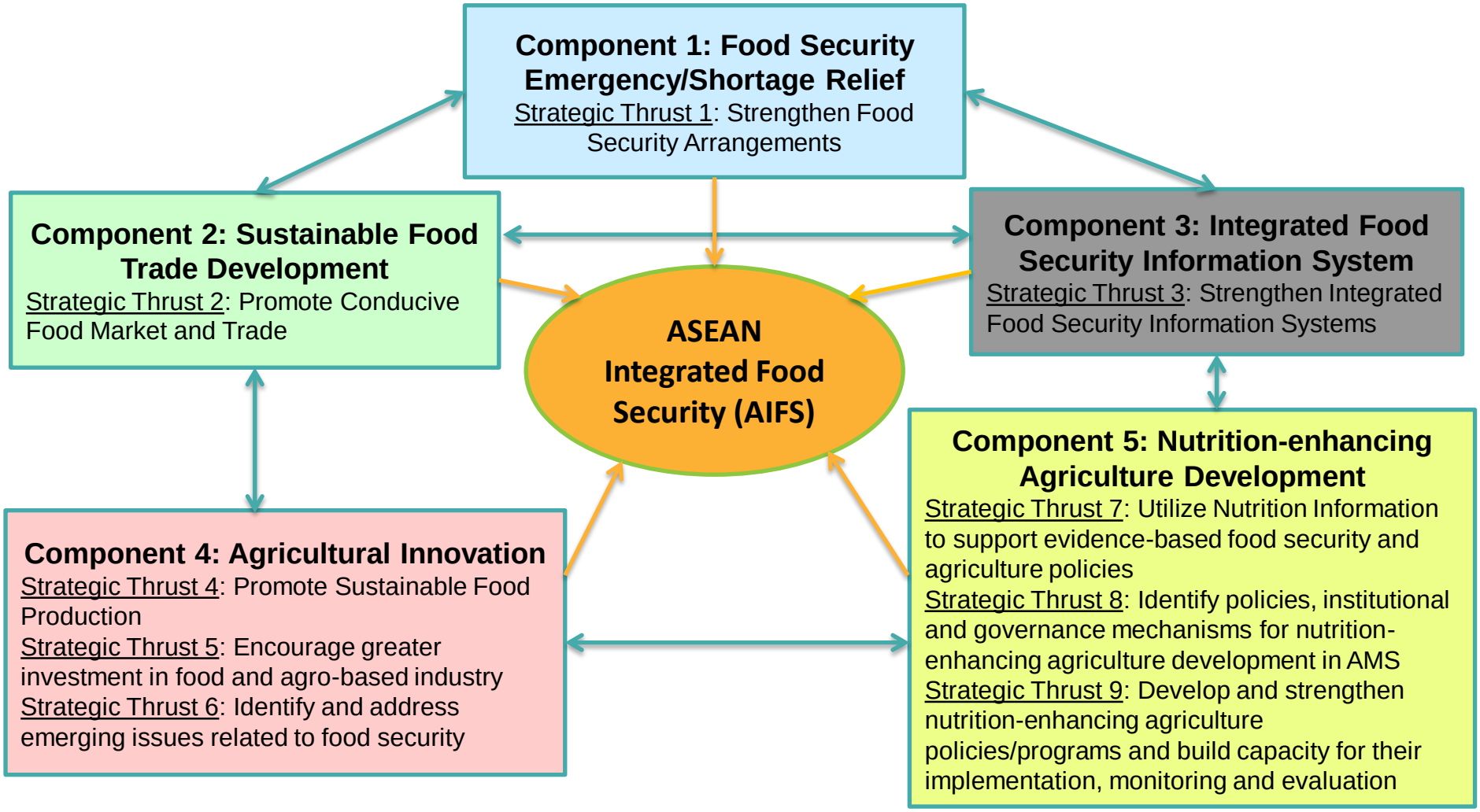
GOAL: to ensure long-term food security and nutrition, to improve the livelihoods of farmers in the ASEAN region.

The SPA-FS shall create a favourable environment, where AMS can integrate, operate and cooperate in various aspects related to food production, processing and trade.

OBJECTIVES

- To sustain and increase food production
- To reduce postharvest losses
- To promote conducive market and trade for agriculture commodities and inputs
- To ensure food stability
- To ensure food safety, quality and nutrition
- To promote availability and accessibility to agriculture inputs
- To operationalize regional food emergency relief arrangements

AIFS Framework and SPA-FS (2015-2020)

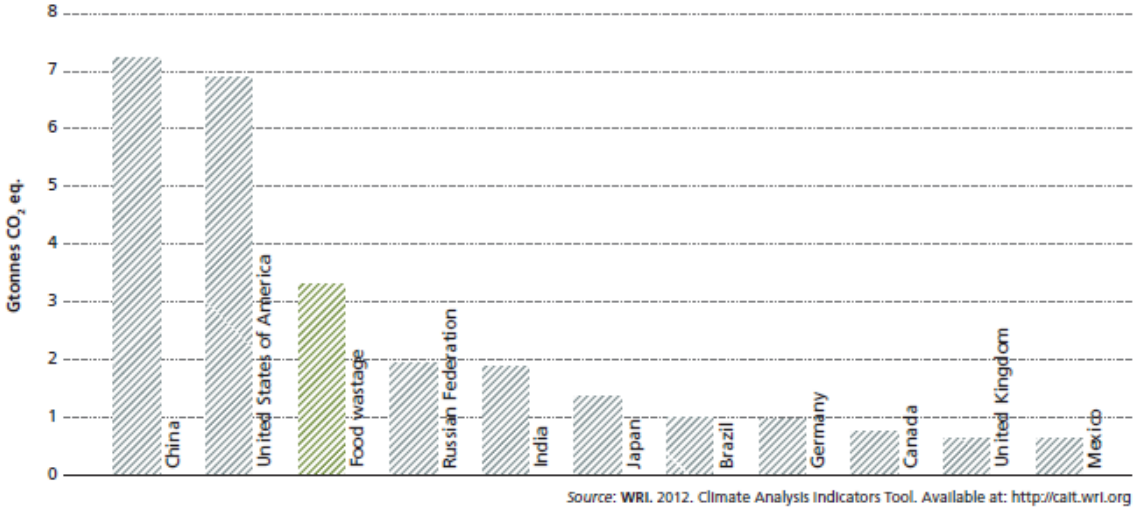


Food Loss and Waste

Source: FAO "Global Food Losses and Food Waste"

Per capita food losses and waste, at consumption and pre-consumptions stages, in different regions

Top ten global greenhouse gas-emitting countries versus food loss and waste, 2005



"One-third of food were wasted worldwide"

Statements of key persons on Food and Nutrition Security

“Agriculture can be an engine of growth in the ASEAN region and achieving this potential will depend on the support of all stakeholders.”

Le Luong Minh, Secretary-General of the ASEAN Secretariat

“It is critical to enhance cooperation for sustainable resource use in the region to help ensure a food-secure future.”

Nguyen Xuan Phuc, Deputy Prime Minister of Vietnam

“We need to increase the productivity of existing land and provide opportunities for farmers. The private sector has a role to play in bringing development to agriculture through market mechanisms.”

Samdech Techno Hun Sen, Prime Minister of the Kingdom of Cambodia

“Asia’s ability to feed itself is of fundamental importance not only to the people living in the region, but also to the world.”

Dan Glickman & M.S. Swaminathan

Co-Chair of Task Force on Food Security and Sustainability in Asia

Thank you!

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On behalf of

Federal Ministry for Economic Cooperation and Development

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and Development