

**S. RAJARATNAM SCHOOL
OF INTERNATIONAL STUDIES**
A Graduate School of Nanyang Technological University

Importance of Urban Food Security to its various dimensions

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Outline of Presentation

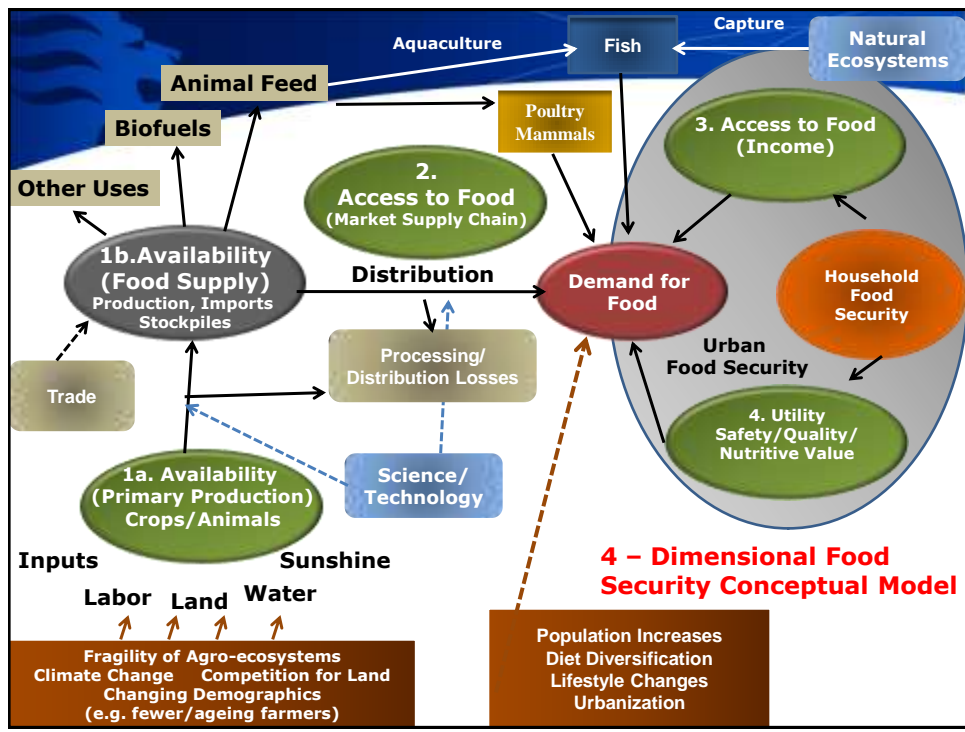
- Dimensions of Food Security: importance of urban food security in Asia
- Issues affecting urban food security
- Meeting the challenges

A. Dimensions of Food Security: importance of urban food security in Asia

“Food Security exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life.”

(Food and Agriculture Organization, U.N.)

<p>Security for Whom?</p> <ul style="list-style-type: none"> Individual Family Unit (Households) Communities (Country) Regions 	<ul style="list-style-type: none"> Sufficiency Safety Economic Access Physical Access Nutrition
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Food Security Landscape in Asia

Unique features of Asia: A contrasting scorecard

- 60% of world's population
- Six of the top ten most populous countries
- Fastest growing economies
- 27% of global GDP
- Half of world's urban population
- More than half of world's slum population
- Eleven megacities
- Large agricultural exporter and importer
- 60% of world's under-nourished

Food Balances in Asia

Crop	Item Million MT	06/07	07/08	08/09	09/10	10/11
WHEAT	Global Production	596	612	682	684	648
	Asia Imports (% of Global Exports)	35 (30)	31 (27)	34 (24)	35 (26)	33 (27)
RICE (milled)	Global Production	421	434	448	440	452
	Asia Imports (% of Global Exports)	10 (31)	8.5 (29)	6.9 (24)	8.6 (28)	8.7 (29)
CORN	Global Production	714	795	799	812	814
	Asia Imports (% of Global Exports)	34 (37)	35 (36)	34 (40)	37 (39)	36 (39)
SOYBEAN	Global Production	237	221	212	261	258
	Asia Imports (% of Global Exports)	39 (56)	48 (61)	51 (66)	61 (65)	68 (69)

Source: USDA FAS

Asia by 2050

Population

	Urban 2010	Rural 2010	Total 2010	Urban 2050	Rural 2050	Total 2050
ASIA	1.8	2.4	4.2	3.4	1.7	5.1
WORLD	3.5	3.4	6.9	6.3	3	9.3

- ~20% increase in total population
- ~89% increase in urban population
- 51% of global GDP (from 27% in 2010)

Food Demand Changes in Asia

- Reduced per capita consumption of rice
- Increased consumption per capita of wheat and wheat-based products
- Increased diversity in the food groups consumed
- Rise in high proteins and energy dense diets
- Increased consumption of temperate zone products
- Rising popularity of convenience food and beverages
- Westernization of diets

Source: Pingali, FAO 2004

Food Demand Changes in Asia (cont'd)

- **Meat consumption**

100 years ago, average 25 kg/person/yr

Today, average 80 kg/person/yr (USA – 124 kg/person/yr)

China: 1962 – 4 kg/person/yr; 2005 – 60 kg/person/yr

- **Fish consumption**

1960s – 9.9 kg/person/yr; 2005 – 16.4 kg/person/yr

China accounted for most of world growth (26.1 kg/person/yr)

- **Vegetable consumption**

- 1970s – 60 kg/person/yr; 2000 – >100 kg/person/yr

- China: 1970 – 44.4 kg/person/yr; 2005 – 270.6 kg/person/yr

Unique Features of Cities

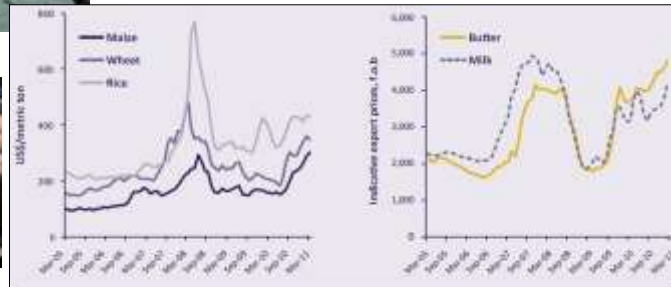
- Most food is purchased
- Food basket is more varied and more diverse in origin
- More vulnerable to changes in int'l markets
- Emergence of supermarket chains and control of access
- Availability of more processed foods
- More vulnerable to food price shocks
- Poor living conditions for urban poor
- Jobs of urban poor and insecure, uncertain
- Less land & water available for agriculture

Importance of Urban Food Security: Dimensions 1-3



"A hungry person with low blood sugar is a very angry person – virtually ungovernable"

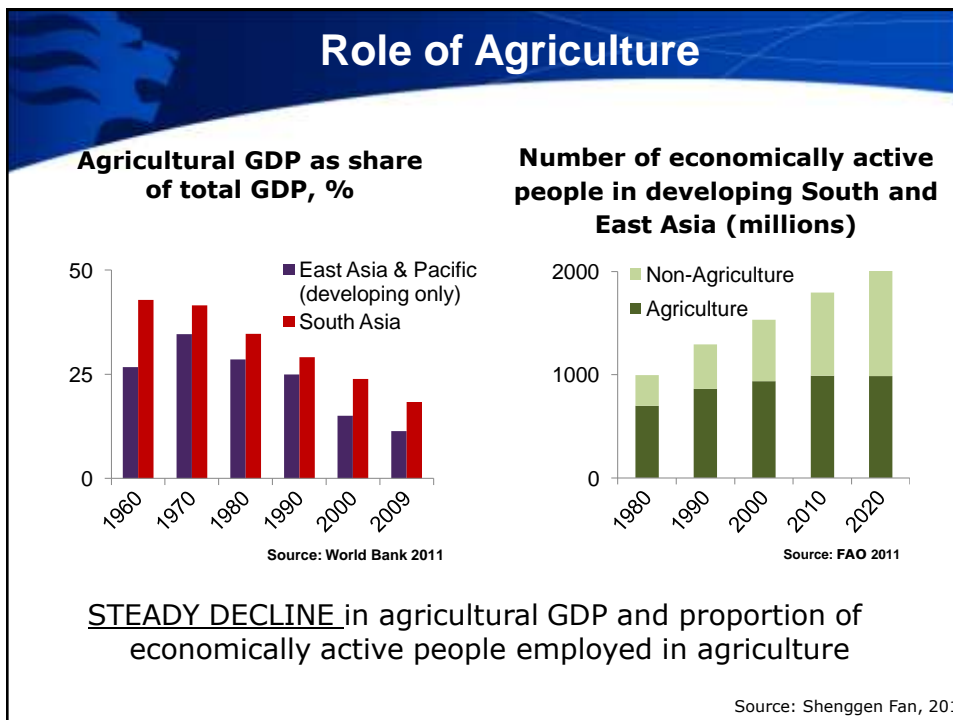
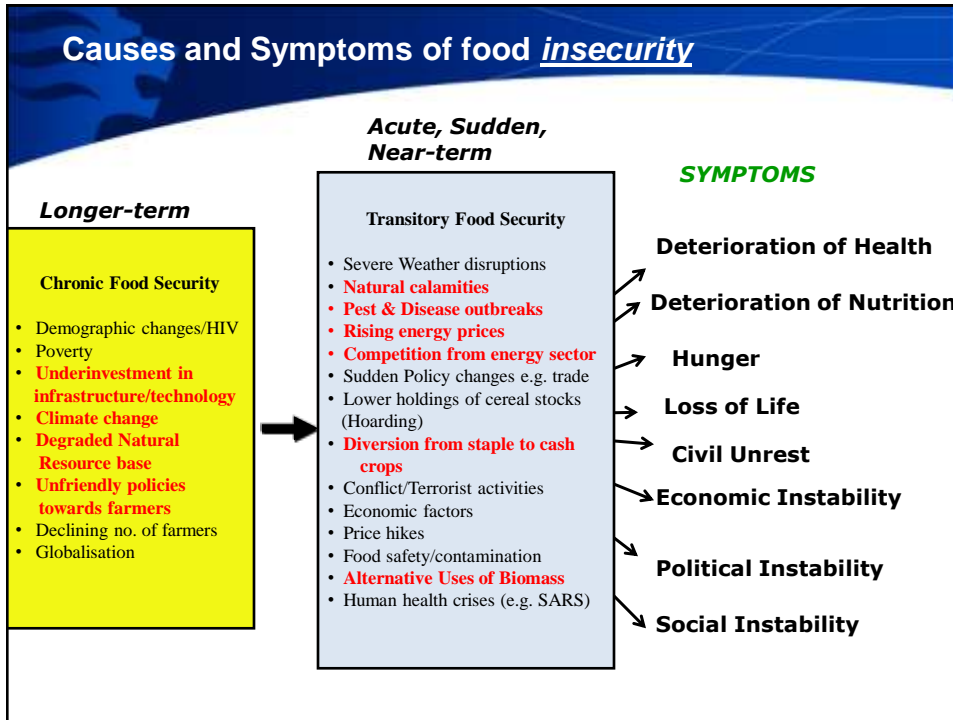
Ruth Oniang'o



Source: FAO (Food and Agriculture Organization of the United Nations), International Commodity Prices Database, accessed March 24, 2011, www.fao.org/price/index.html

B. Issues affecting urban food security

- Declining performance of agriculture in rural areas
- Environmental degradation & climate change
- Increase in oil prices/biofuel expansion
- Rapid transformation of supply chains



Dominance of Smallholder Agriculture

- Smallholder agriculture dominates farming systems
- **87%** of world's 500 million small farms (<2 ha) are in Asia
- Declining farm size -

	Census year	Avg. Farm Size (Ha)	Number of Small Farms (million)
India	1971	2.3	49
	2005/2006	1.2	108
Nepal	1992	1	2.4
	2002	0.8	3.1
Pakistan	1971/73	5.3	1.1
	2000	3.1	3.8

Source: Hazell 2011; Headey, Bezemer and Hazell 2010

Source: Shenggen Fan, 2011



Looking for farmers of the future

Posted by Joel Martinsen, November 12, 2007
7:54 PM

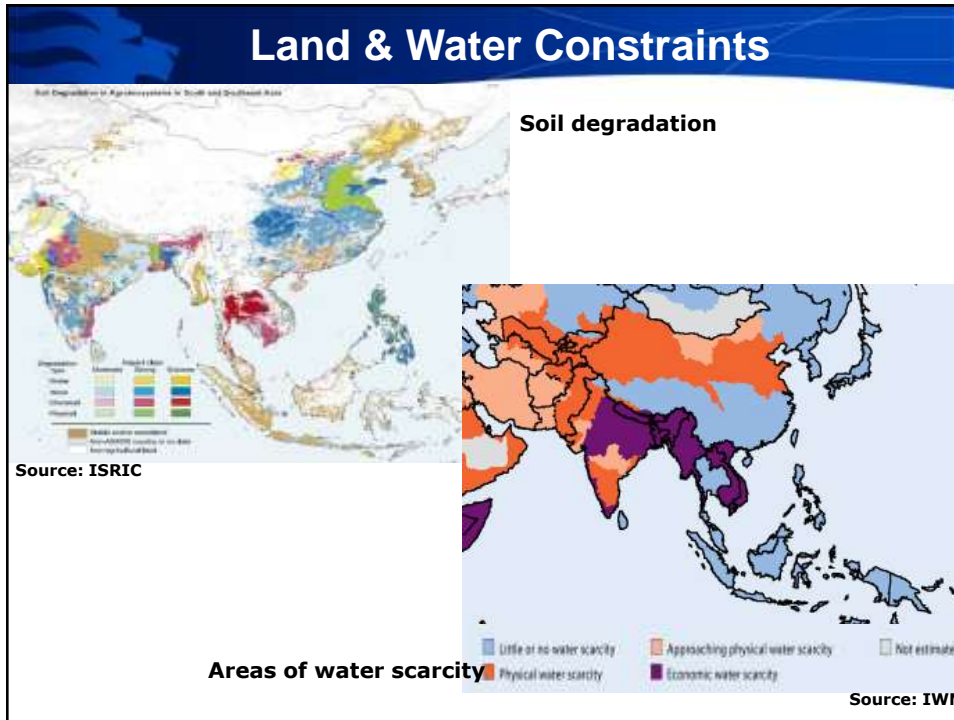
Empty fields.

Writing in *The Beijing News*, He Bing, a professor at China University of Politics and Law, discusses the problem of aging in China's agricultural sector:

In ten years, who will farm the land?

by He Bing / TBN

*“A day without grain is a day without stability. When Japan and Korea are short of grain, they can import from China. When China is short, where can it import from? The global price of grain will inevitably rise. **The lives of many of China's urban residents rely on low-priced grain, oil, and vegetables. If those prices double, the "happiness index" of urban residents will plummet, and all pricing systems will be shaken, creating a political and economic crisis.**”*



Climate change impact on crop yields, 2050

ASIA	
Crop	Change in Production (%)
Rice	
Irrigated	-10.47
Rainfed	0.66
Maize	
Irrigated	-5.54
Rainfed	1.71
Wheat	
Irrigated	-13.50
Rainfed	-1.91
Soybeans	
Irrigated	-6.73
Rainfed	8.58

Source: IFPRI 2011 (preliminary)

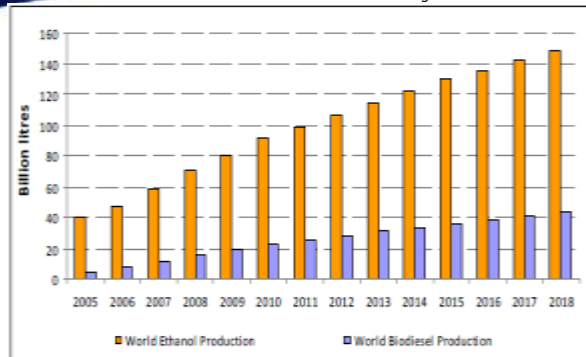
Oil Prices vs Food Prices



- Strong link between oil and food prices influences food security
- Major effect of rising oil prices = rise in demand for biofuels

Biofuel expansion

Source: FAO-OECD Agricultural Outlook 2009-2018



Global biofuel production projected to increase to 192 billion litres by 2018

↓
Increased demand in biofuel feedstock crops (sugar, oilseeds, maize)

↓
Increased competition for resources

Transformation of Supply Chains

- Emergence of supermarkets and large wholesalers/processors in the last two decades
- Rapid transformation of wholesale, logistics, processing, food retail – fastest in the world, in history
- Based mainly on massive investments by private sector (domestic and foreign)
- Higher quality and safety standards

Potential Impact: Lower food prices for urban consumers BUT lower market participation among poorer small farmers

Source: Thomas Reardon, 2011

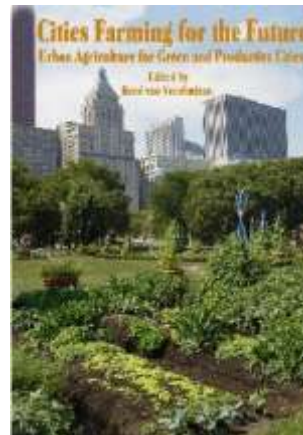
C. Meeting the challenges

<http://www.ruaf.org/node/512>

Urban and Peri-Urban Agriculture (UPA)

Urban agriculture: **the growing of plants and the raising of animals within and around cities.**

- Integrated into the urban economic and ecological system; urban agriculture is embedded in -and interacting with- the urban ecosystem.
- Provides complementary strategy to reduce urban poverty and food insecurity
- Enhances urban environmental management
- Contributes to local economic development, poverty alleviation and social inclusion of the urban poor, particularly women
- Saves energy (e.g. lower transport and storage costs)
- Responds to market demand



Building more Resilient Cities through UPA

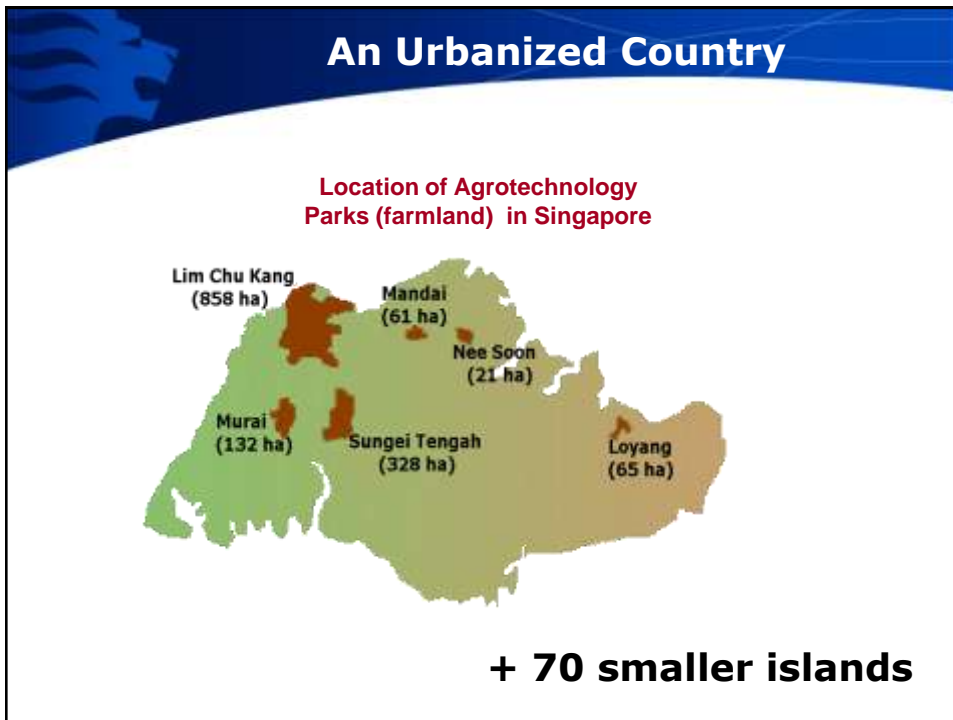
In Singapore, a developed city-state, what Exists and what can be imagined?

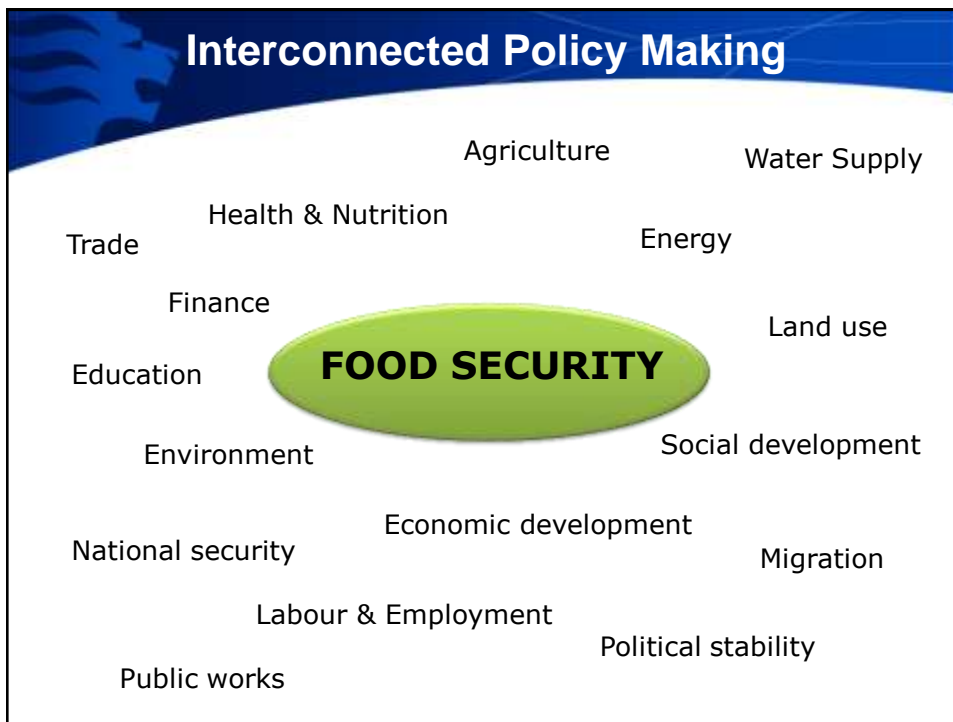
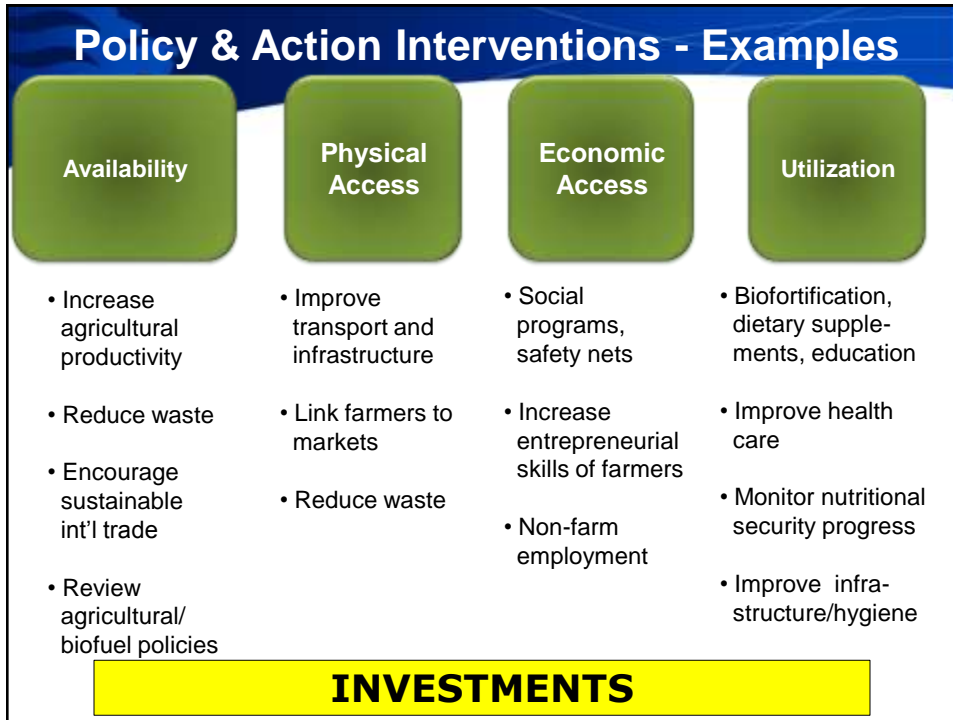


Aerogonics
Or
Growing plants with no soil and water

Aerogonics (hydroponic) blocks, where aeroponics systems can be installed for vegetable production.

The image shows two types of aeroponics systems. On the left, a greenhouse with multiple levels of plants growing in a nutrient solution. On the right, a vertical farm tower with plants growing in a nutrient solution. A diagram on the right shows a building with aeroponics blocks installed on the facade, with a caption: 'Aerogonics (hydroponic) blocks, where aeroponics systems can be installed for vegetable production.'





Conclusions

- Food security in Asia needs to be a priority – threat of hunger & instability could increase
- Emerging trends further threaten food security
- Urban dimensions of food security merit distinct attention
- Food security is multi-dimensional
- More interconnected policy making is critical
- More holistic approach is required