

# **New Food Security Dynamics: the Food-Water-Energy Nexus, Green Growth and the Role of the Private Sector**

***Keynote Address***

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***[The views expressed herein are entirely those of the author and do not necessarily reflect the position of the agency he serves]***

## **OUTLINE:**

- 1. INTRODUCTION –**
- 2. BACKGROUND – new dynamics of food security and  
3 key nexus of global risks**
- 3. FOOD-WATER-ENERGY SECURITY NEXUS & GREEN  
GROWTH**
- 4. INCREASING ROLE OF THE PRIVATE SECTOR**
- 5. THE WAY FORWARD**
- 6. CONCLUSION**



## INTRODUCTION:

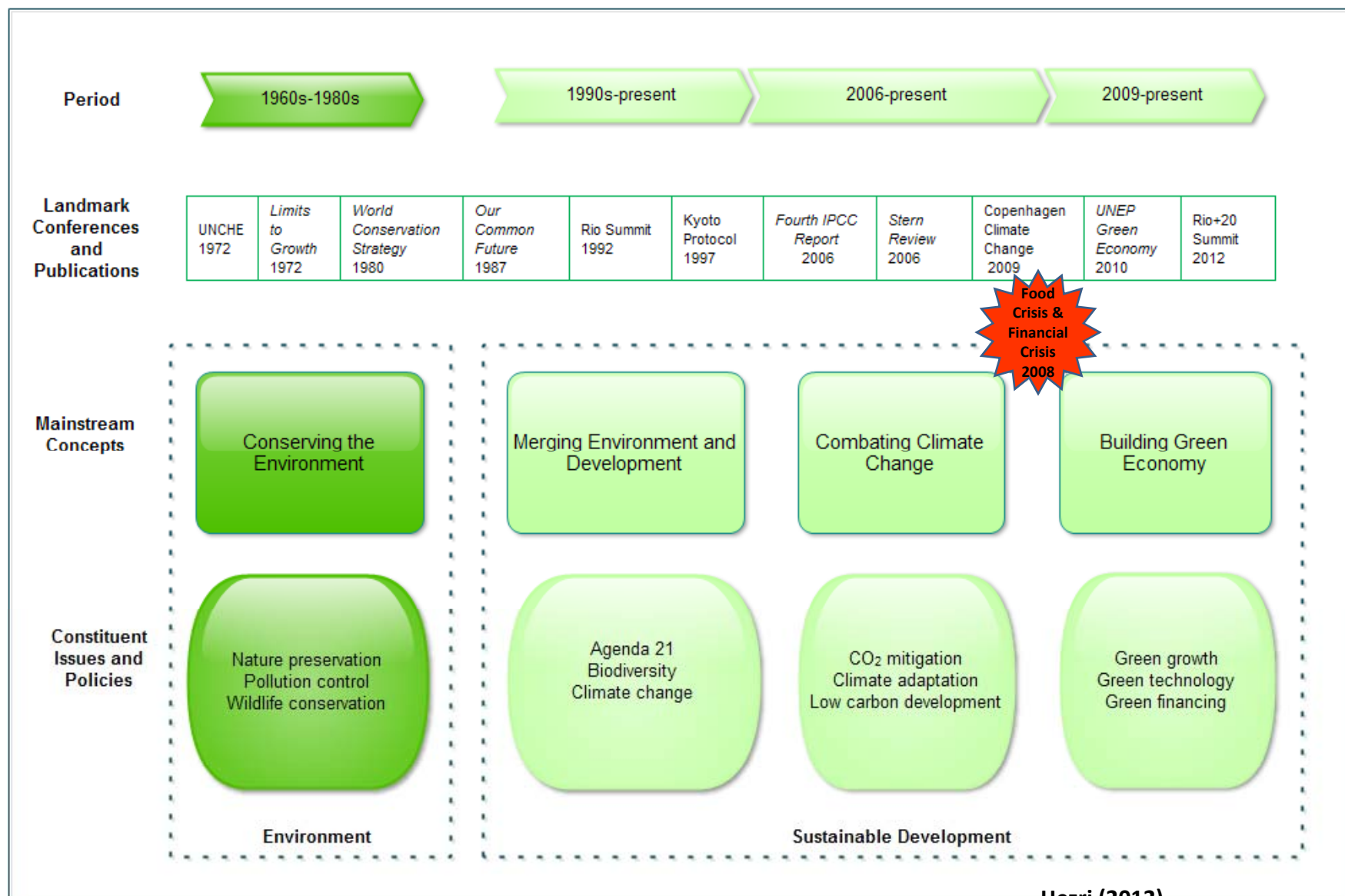
- ***Purpose:*** Provide an appreciation of the new dynamics in **Food Security**, especially that of **Food-Water-Energy Nexus, Green Growth** and the increasing **role of the private sector**, with an **ASEAN slant**.
- ***Underlying theme:*** It is crucial to have **public and policy dialogue** so as to understand the new dynamics in Food Security, especially that of the **food-water-energy security nexus, green growth/economy** and the increasing role of the **private sector**, in order to continue getting the **‘basics’ and ‘balance right’**.



## KEY TAKE-HOME MESSAGES:

- Food Security – increasingly **more complex, multi-scale and interdependent** – so, need to continuously **(re)frame problems well**
- Need **trans-disciplinary, networked solutions** factoring in supply chains and trading networks and new dimensions rather than **isolated solutions** aimed at just one problem, issue or even sector in an increasingly interlinked **food-water-energy security nexus** that is increasingly private sector driven - **Public Vs Private goods** dichotomy increasingly blurred
- **Food, Water and Energy security, represent 3 pillars of Sustainable Development**
  - **Food and Water**: Basic social needs
  - **Water**: needed by all in the environment, often a limiting factor. Yet at times water can be so destructive
  - **Energy**: driver of economic growth
- Guided by the new dynamics in food security, we should be **wary of being trapped in the mindset of the 1970s** and ignoring the **realities of the 2010s** when formulating food security policy and strategies – **rice-centric, production-centric, supply-centric, public sector-centric, and nation-centric** (self-sufficiency rather than self-reliance)

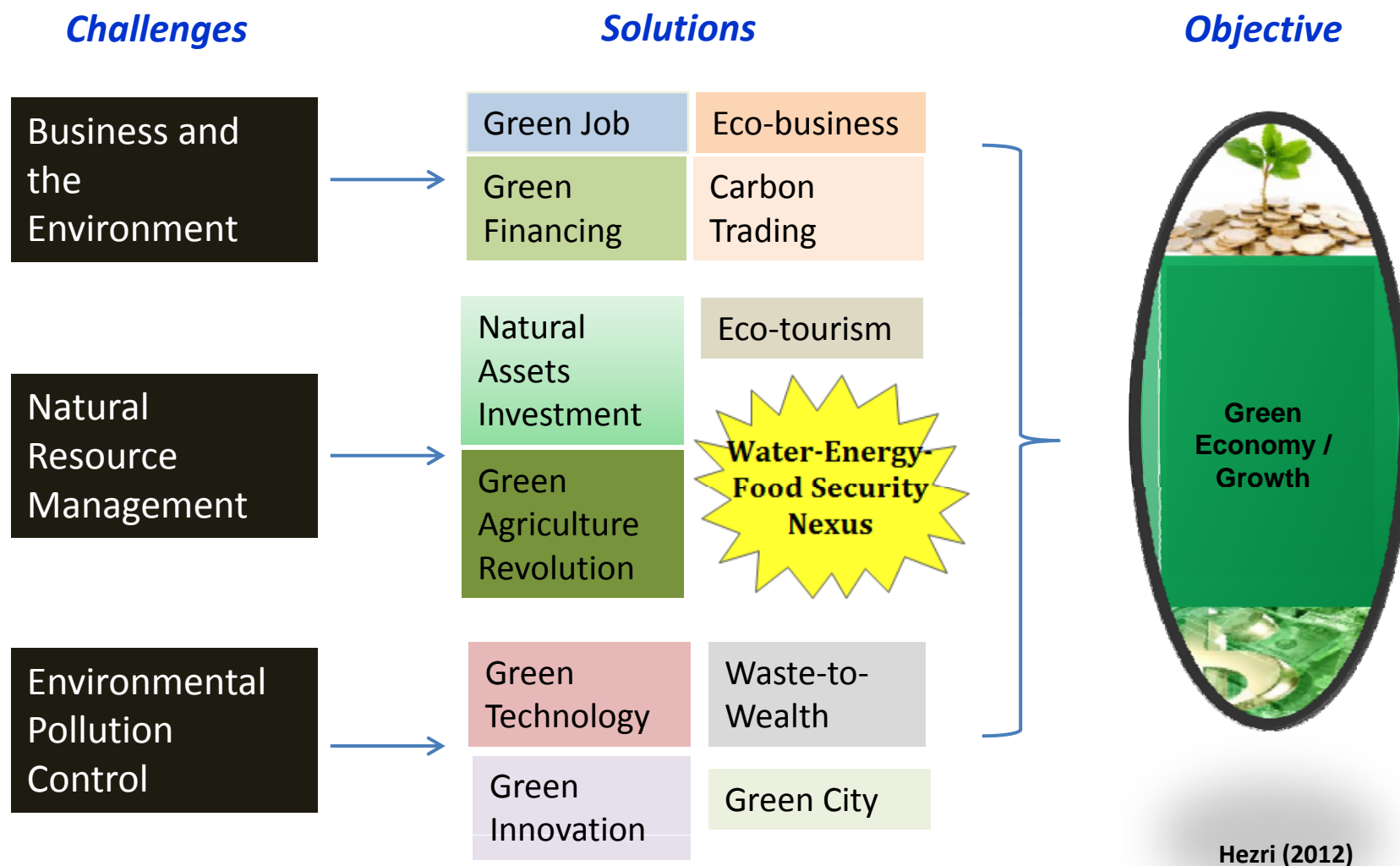




## Evolution of sustainable development thinking



# Green Growth/Economy strategies for sustainability



*Securitization of natural resources management?*



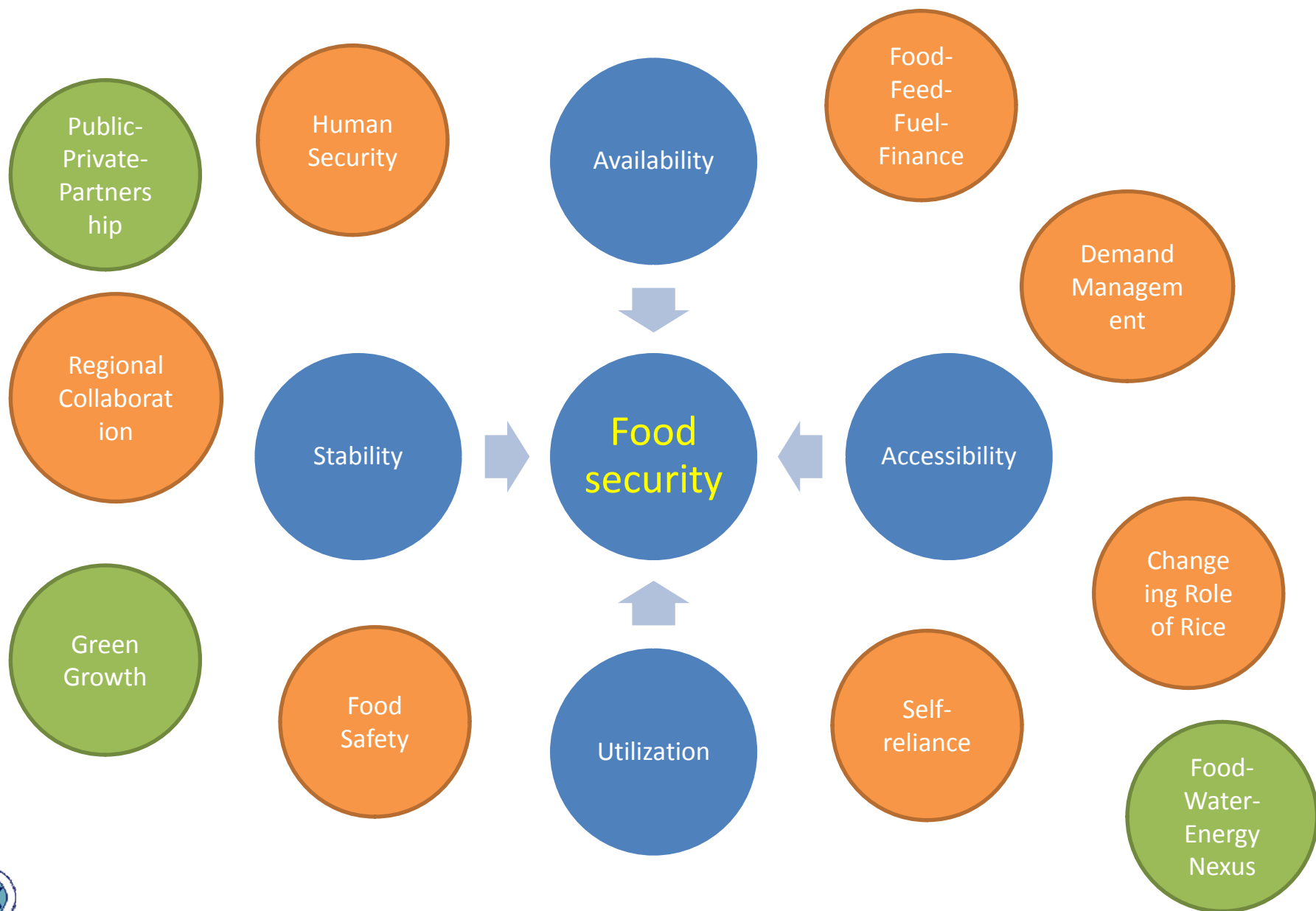
## FOOD SECURITY:

**“...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”**

Source FAO, 1996



# FOOD SECURITY: FROM TRADITIONAL TO NEW DIMENSIONS





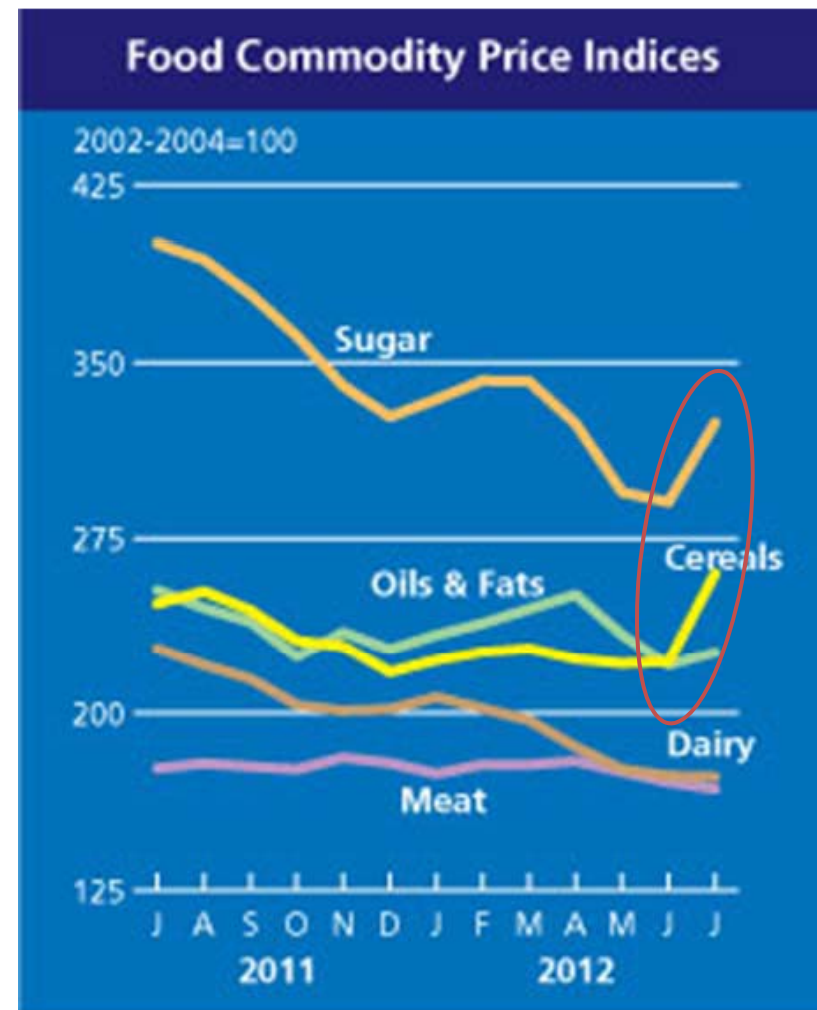
## OTHER CONSIDERATIONS:

- FAO (2009) – future production growth – **10:20:70 rule** (10% area expansion, 20% cropping intensity increases, BUT 70% from Technology, Innovation and Policy)
- Ambler-Edwards et al. (2009) –Future food **production/Supply systems** going to be **more uncertain and prices more volatile**; food **wastage** along supply chain – **highest at consumer level**
- Need **to increase productivity along entire supply chain** (not only at production level – where **land, water, labour and capital** are traditional sources of productivity increases) within context of **structural transformation**
- **‘More with less’, ecosystem services – ‘More Crop per Drop’,**
- **Hunger for Land and Thirst for Water**
- **Cross-border investments** – can help develop **comprehensive supply chains and trading networks, transfer of technology, export platforms** – ASEAN as a common market and production base – AEC - ASEAN 2015; ADBI’s ASEAN 2030

Study – **‘Towards a Resilient, Inclusive, Competitive, and Harmonious (RICH) ASEAN’**



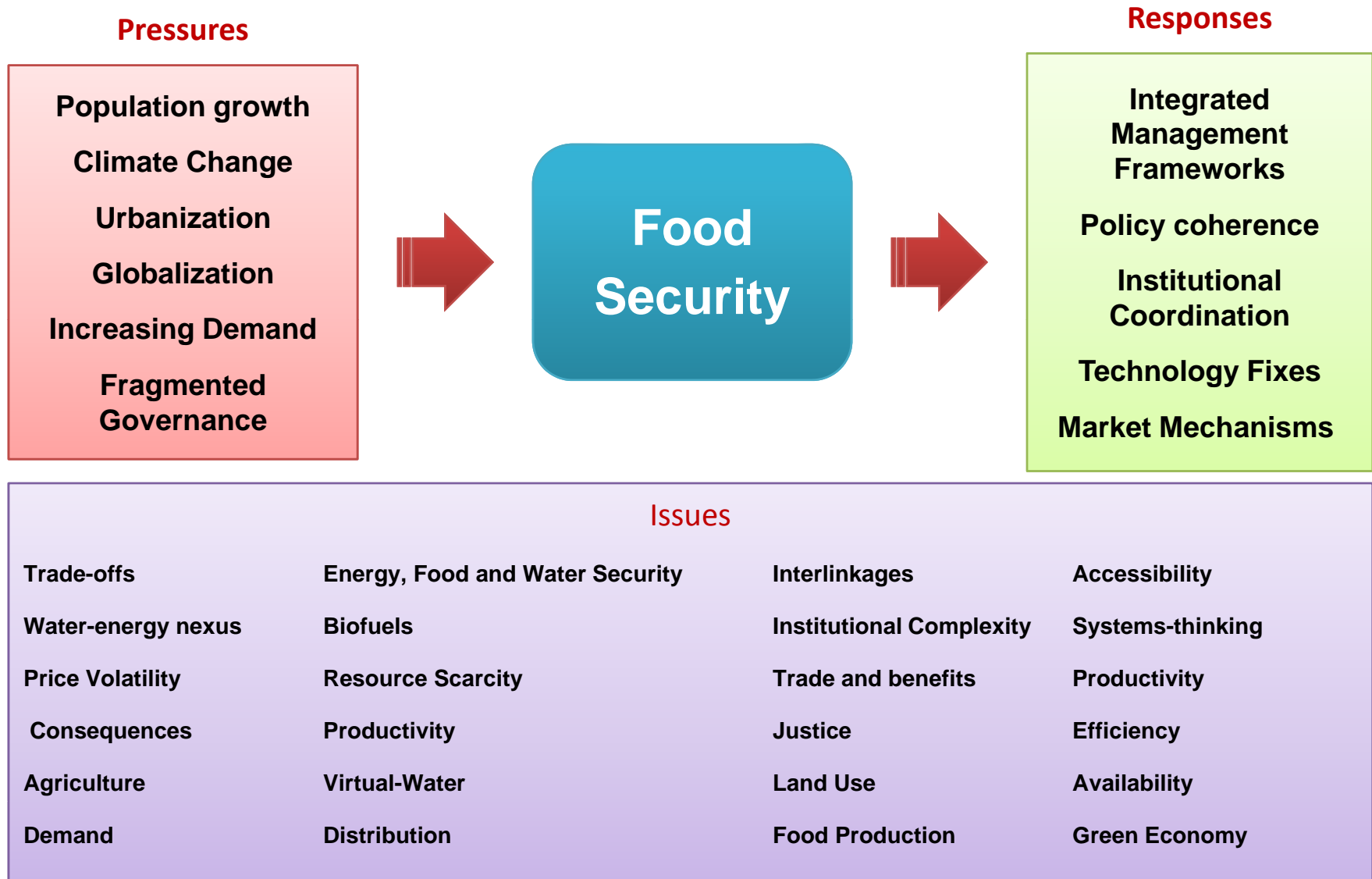
## FAO'S FOOD PRICE INDICES BY CATEGORIES



Source: FAO (2012)



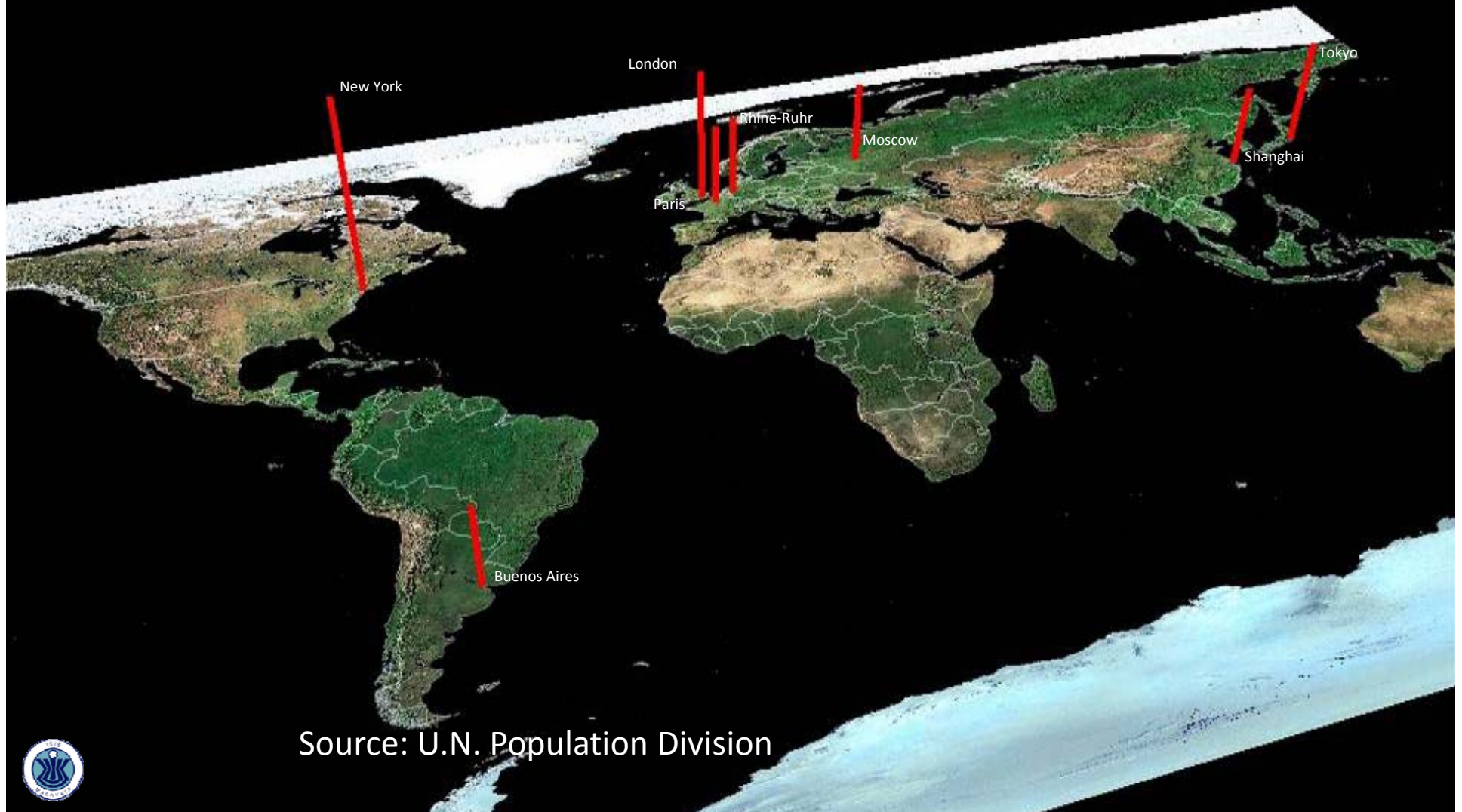
# FOOD SECURITY – PRESSURES, ISSUES AND RESPONSES



# URBANIZATION

## *Megacities 1950*

(Population > 5 million)

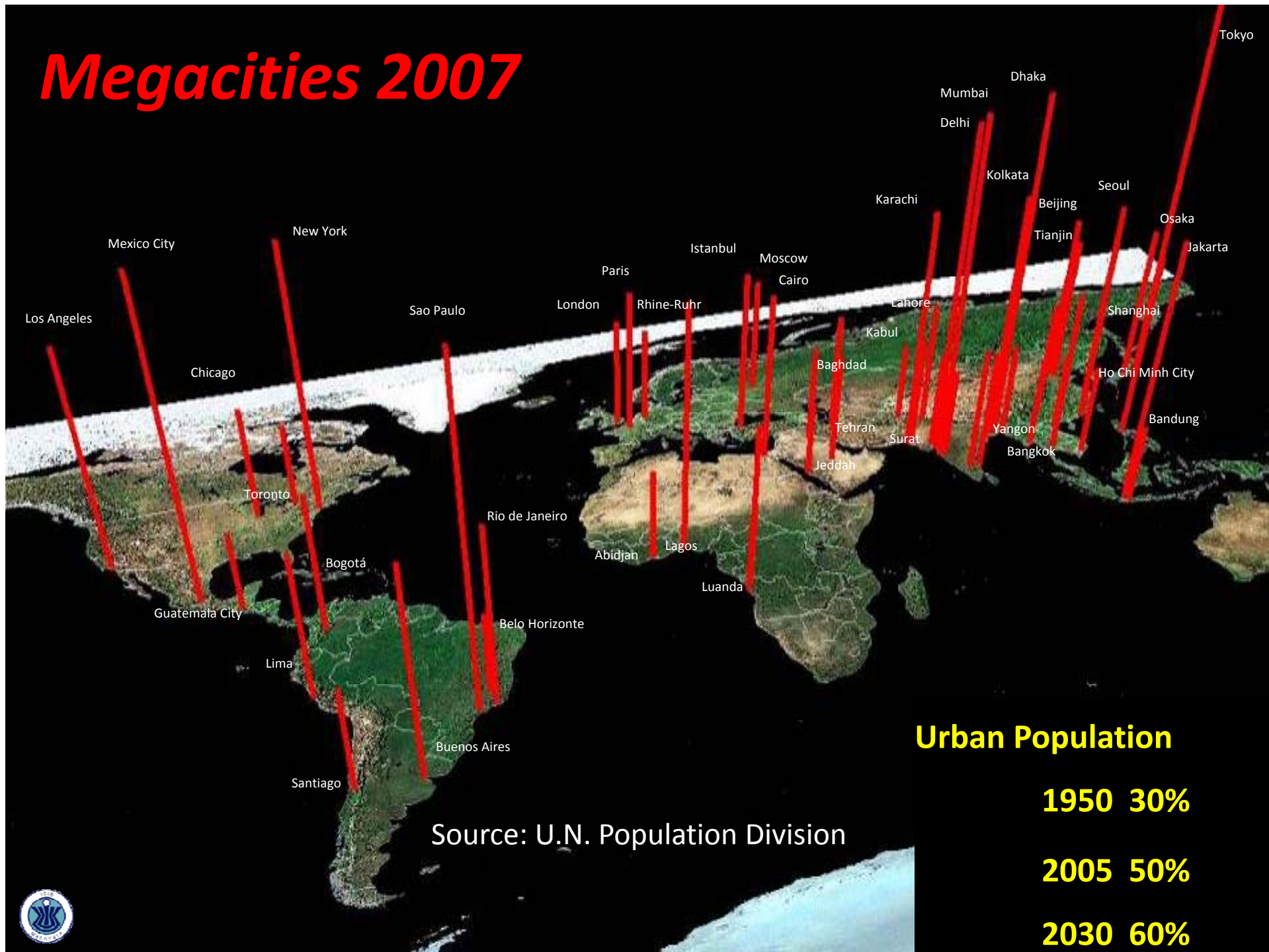


Source: U.N. Population Division





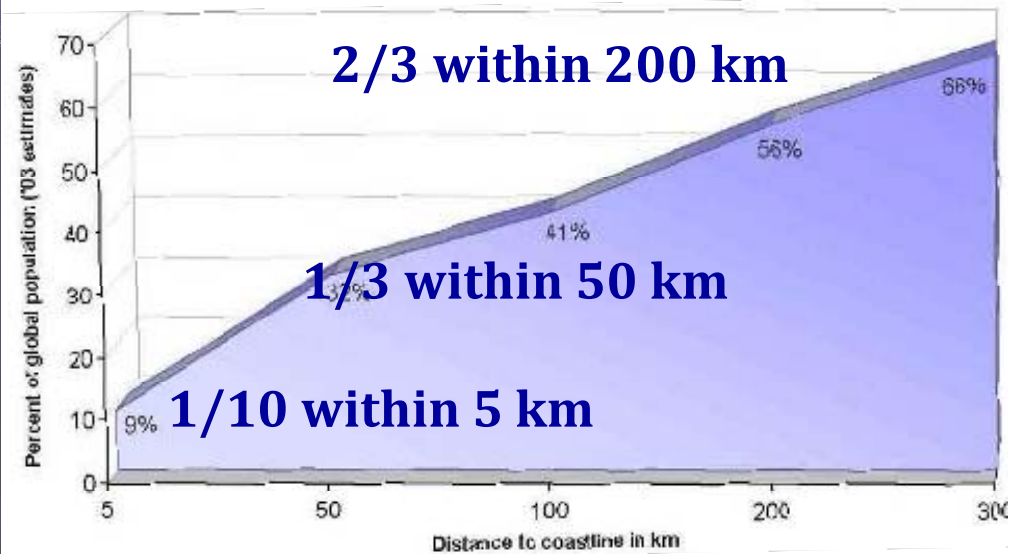
# Megacities 2007



## Concentration of Population in Coastal Areas

The earth at night

### Population in coastal areas (2003)

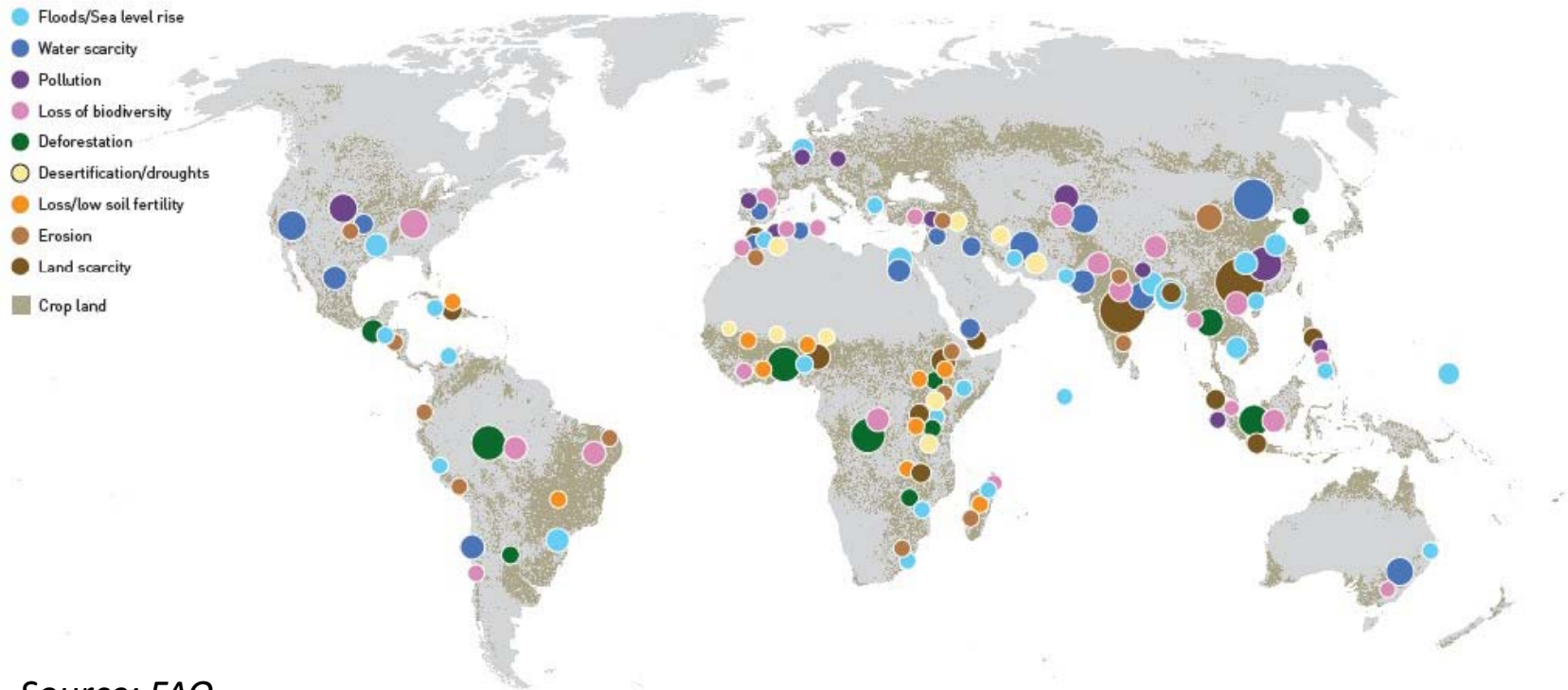


Value concentration along coasts



# Geographical hot spots for water-food nexus

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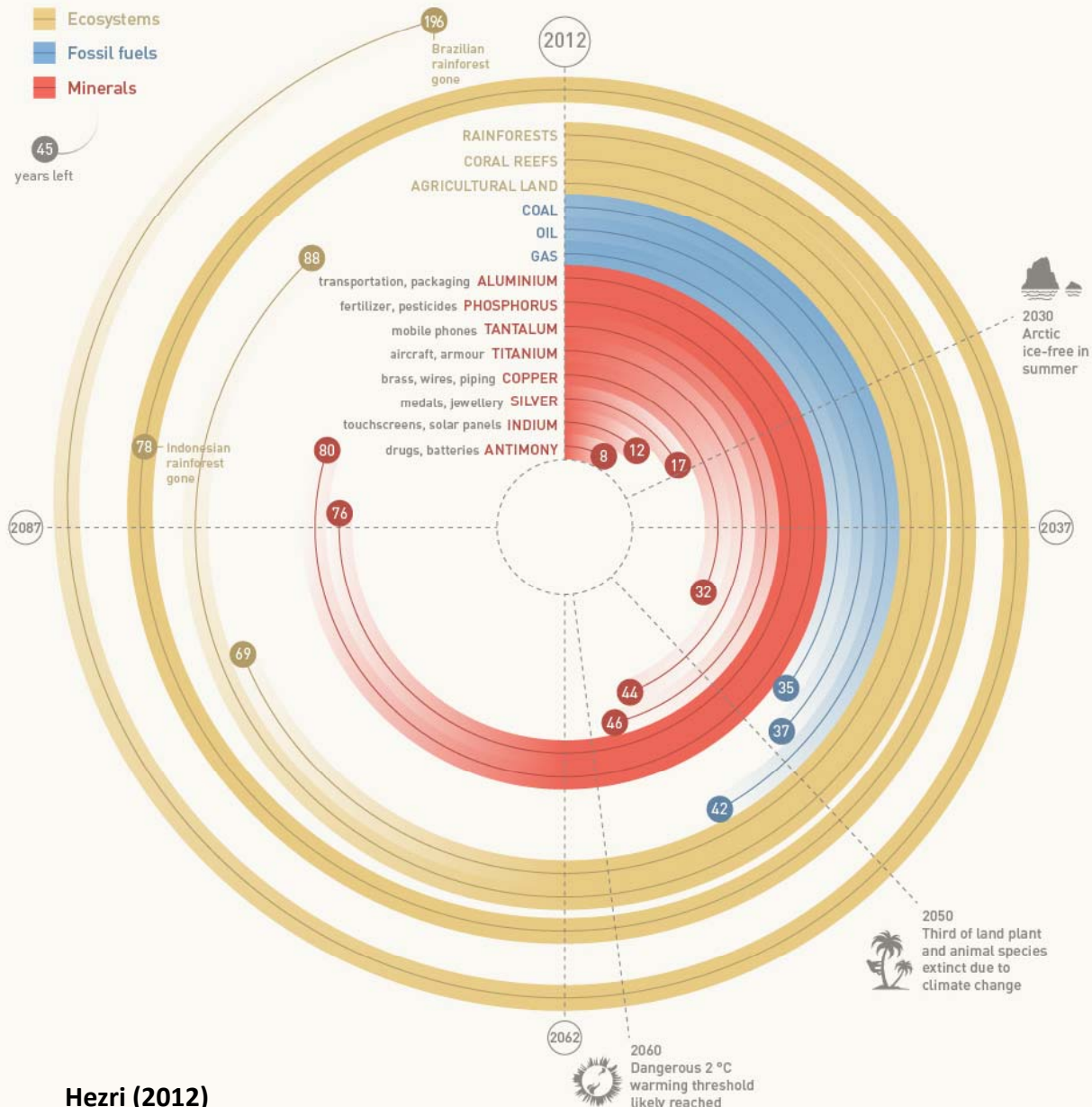
Source: FAO

Highlighting risks associated with main agricultural production systems and interactions across the nexus (i.e. interdependence between water & food)



# Stock Check

Estimated remaining world supplies of non-renewable resources



Hezri (2012)

## Resources running out? Again?

Today, resources are priority concerns at all levels of government, corporate boardrooms, and local communities.

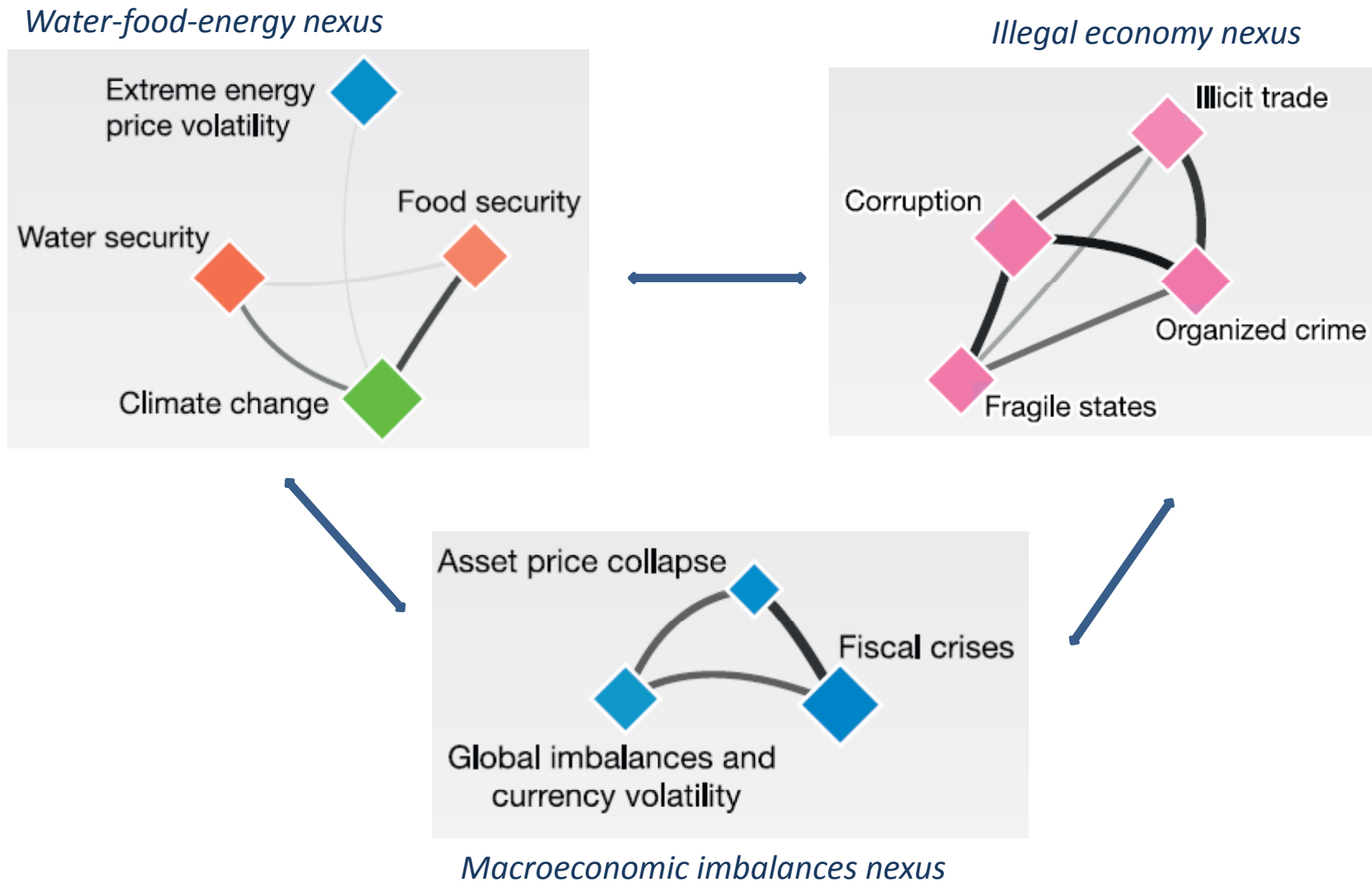
3F (Food-Feed-Fuel) conundrum - fears about resource and food prices and access

Beyond the physical scarcity of single natural resources

Multiple resources, multiple scarcities? Connections? Ramifications?



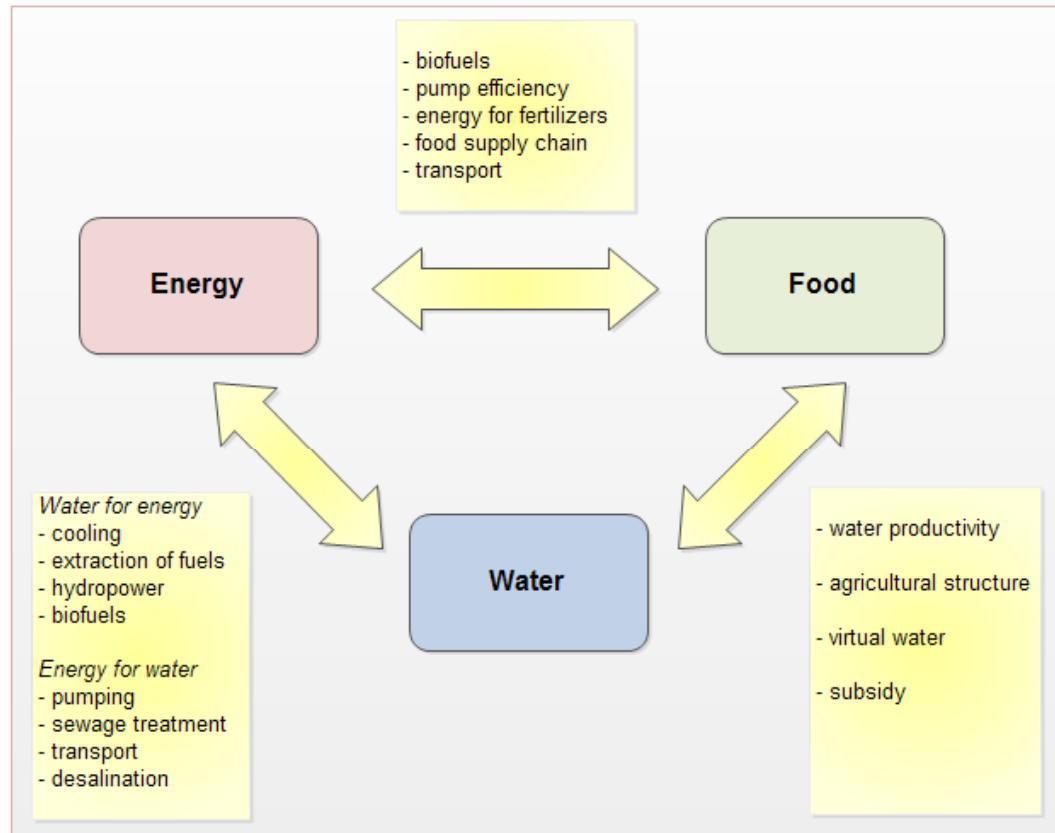
## WEF 2011 GLOBAL RISKS – THREE KEY NEXUS:



Source: Adapted from  
WEF 2011

# Energy, water and food resources:

Energy, water and food are inextricably linked



- **Water for energy** currently amounts to about **8% of global water withdrawals** (45% in industrialized countries, e.g. in Europe).

- **Food production** and supply chain is responsible for around **30% of total global energy demand**

- **Food production** is the largest user of **water** at the global level, responsible for **80% of consumptive blue water use**



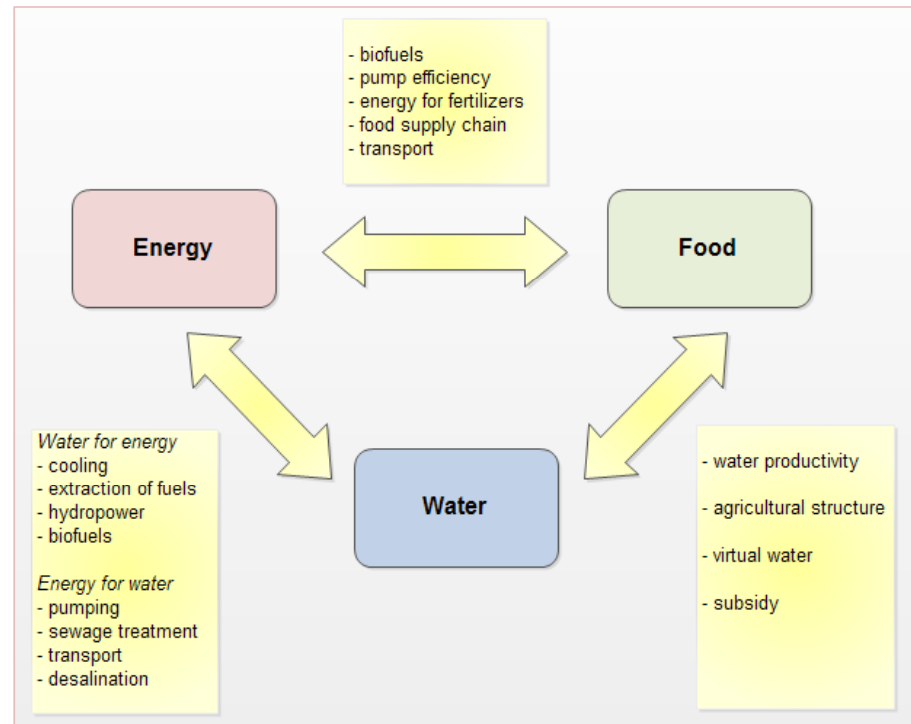
# The Nexus Approach:

Recognizes **interconnectedness** of water, energy, and food across space and time. Its objectives are:

- Improve energy, water, and food security
- Address externality across sectors, and decision-making at the nexus
- Support transition to sustainability

## Projections for 2050 with 9.2 billion people:

- 70% increase in agricultural demand for food by 2050
- 40% energy demand increase by 2050
- But by 2030: confronting water supply shortage of ~ 40%

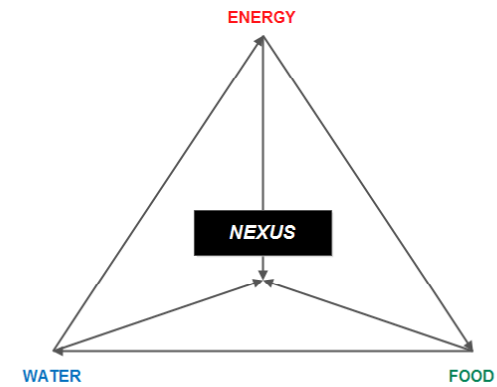


# Why Water, Food, Energy (these three resources)?



Source: Adapted from Bazilian et al 2011

...unsustainable pressures on these 3 **strategic** resources



Recognize the consequences of one sector on another to achieve efficiency using systems thinking



## ASIDE: TOWARDS ASEAN FOOD SECURITY:

2008 global food crisis – recognition that food security one of most important **cross-border issues** where countries acting alone are unable to handle – top priority issue in **ASEAN and East Asia (ASEAN+3)** levels

**11<sup>th</sup> ASEAN+3 Summit, Nov 2007** – food security identified as the key area where regional cooperation need to be advanced

**14<sup>th</sup> ASEAN Summit, March 2009, Thailand** – adopted ASEAN Integrated Food Security Framework (**AIFSF**) and Strategic Plan of Action on Food Security in the ASEAN Region (**SPA-FS**)

**NEAT Working Group in East Asian Food Security, July 2009** – need to build on East Asia Emergency Rice Reserve (**EAERR**) piloted in **2004** and **ASEAN Food Security Information System (AFSIS)** initiated in **2003** and weave into **AIFSF and SPA-FS**

**AMAF** finally signed ASEAN Plus Three Emergency Rice Reserve (**APTERR**) agreement on **7<sup>th</sup> Oct 2011**



## ASEAN COUNTRIES – MAJOR AGRI-FOOD COMMODITIES PRODUCED AND WORLD RANKING:

Country	Major Ag Commodities Produced	World Ranking
Brunei	rice, vegetables, fruits; chickens, water buffalo	
Burma (Myanmar)	rice, pulses, beans, sesame, groundnuts, sugarcane;	2- pigeon pea, cowpeas; 3- sesame
Cambodia	rice, rubber, corn, vegetables, cashews	
Indonesia	rice, cassava (tapioca), peanuts, rubber, cocoa, coffee, palm oil, copra; poultry, beef, pork, eggs	1- palm oil, cloves, cinnamon, coconuts; 2 – rubber, pepper; 3 – coffee, cocoa
Laos	sweet potatoes, vegetables, corn, coffee	
Malaysia	rubber, palm oil, cocoa, rice, coconuts, pepper, poultry, eggs	2 – palm oil; 3 - rubber
Philippines	sugarcane, coconuts, rice, corn, bananas, cassavas, pineapples, mangoes; pork, eggs	2 – coconuts, pineapple
Singapore	orchids, vegetables; poultry, eggs; fish	
Thailand	rice, cassava (tapioca), rubber, corn, sugarcane, coconuts, soybeans	1 – rice & shrimp exporter; 1 – rubber, pineapple; 2- eggs
Vietnam	rice, coffee, rubber, cotton, tea, pepper, soybeans, cashews, sugar cane, peanuts, bananas; poultry; fish, seafood	1- cashew pepper; 2 - coffee; 2 – rice exporter

Source: FAO (2009)



## ASEAN: AGRI-FOOD TRADE BALANCES, 2007. US\$ BILLION

Country	Exports	Imports	Surplus (Deficit)
Indonesia	23.4	10.5	12.9
Malaysia	20.5	10.6	9.9
Thailand	25.0	8.4	16.6
Vietnam	11.7	6.1	5.6
Cambodia	0.1	0.3	(0.2)
Laos	-	-	-
Myanmar	-	-	-
Brunei	*	*	*
Philippines	3.2	4.3	(1.1)
Singapore	6.0	8.3	(2.3)

**ASEAN**  
**WORLD**

**89.9**  
**1128.0**

**53.2**  
**1128.0**

**36.7**

Source: R. Dy. 2009



## THE ROLE OF THE PRIVATE SECTOR – ASEAN Integrated Food Security (AIFS) Framework Strategic Thrust 2 – Towards Promoting Food Market & Trade

- **Bello (2005)** - Ensuring Food Security via **ASEAN Integration** (focused on rice, maize and wheat)
- **Noraini (2007)** - **Food Safety** in Southeast Asia – Challenges & Response
- Mostly focus on what Governments can and should do.

### HOWEVER:

- *‘International Cooperation is far too important to be left to Governments alone’ ~ Willy Brandt*
- Our Contention: One of the **key role** of private sector (on it’s own or through Public-Private Partnership) is to **develop, manage and orchestrate agri-food supply chains & regional trading networks** towards promoting Food Market and Trade and ultimately **sustainable ASEAN Food Security**





## THE ROLE OF THE PRIVATE SECTOR (Cont'd)

- **TNCs** active in the region – Nestle, Cargill, Tesco, Carrefour – regional chains, export platforms, CSR, also CSV (“**Creating Shared Value**”)
- **Cross Border Investments** – ASEAN Business Council (ASEAN Business Advisory Council); Business Angel Network of Southeast Asia (BANSEA); Malaysian South-South Association (MASSA)
- **Comprehensive Cross Border Investments** - along entire supply chain(s)
  - **Oil Palm** – FELDA, Sime Darby, KLK, SinarMas
  - **Livestock** – Charoen Pokphand Group (in Malaysia, Indonesia, Viet Nam, Cambodia, Myanmar – animal feed, layers, broilers, pigs, shrimp); Leong Hup Holdings (in Indonesia, Viet Nam – animal feed, layers and broilers).
  - Initial step is to supply host country’s market – subsequently integrate sourcing of inputs and marketing on regional basis
  - New -‘**Super Farm**’ – 600,000 ha in Cambodia
  - **Rice** – more sensitive – need to **stabilize supplies & prices** of BOTH **domestic and international (export/import) market** – to balance the interests of farmers, consumers and regional food security – cross-border investment: comprehensive supply chain Vs ‘land grab’ (water grab?)



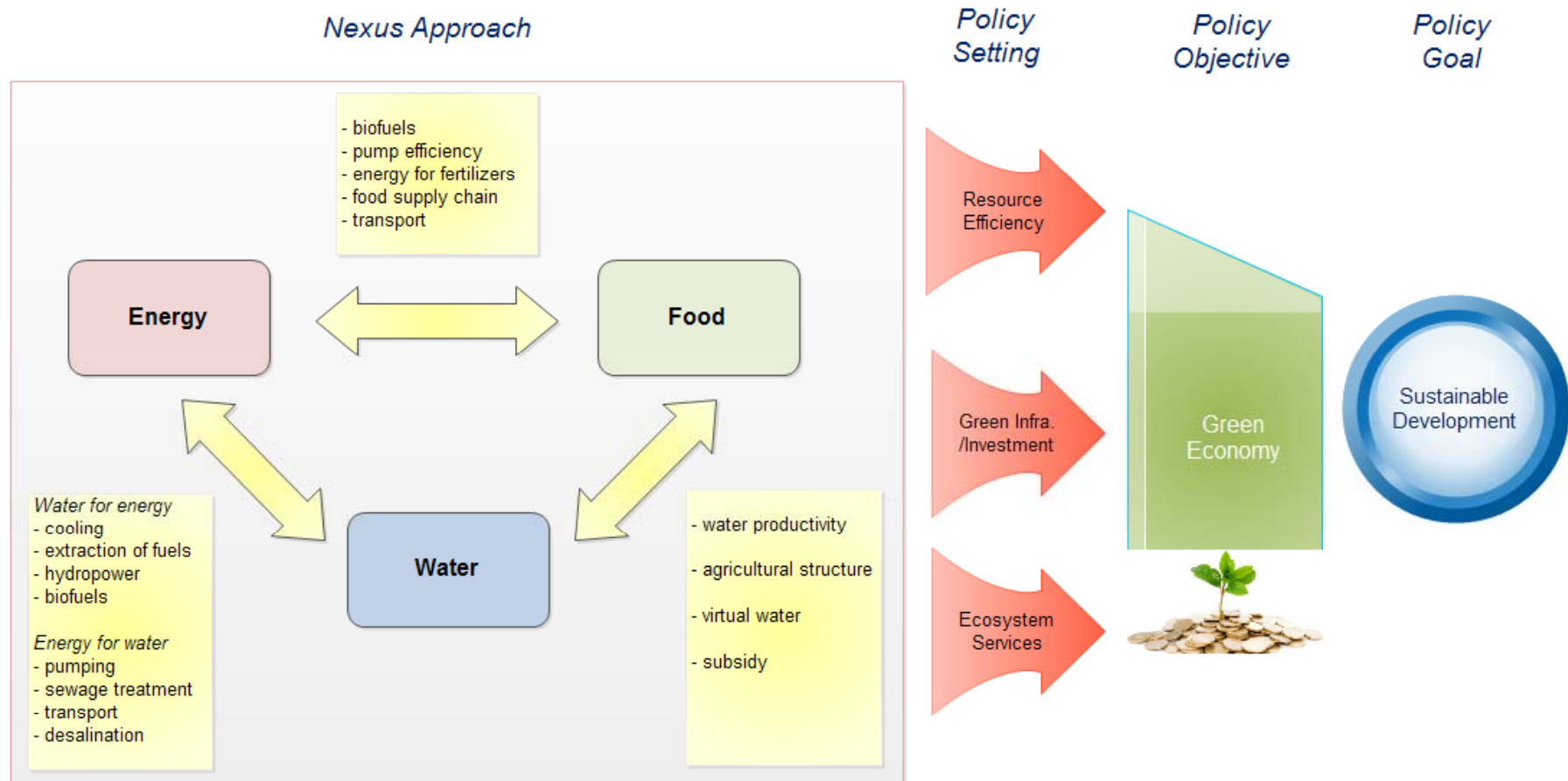
## ASIDE: CHANGING ROLE OF RICE

- Rice increasingly food of the **poor and rural segment** – impacted most by **volatility** as well as ‘**high stable**’ (incentive) **prices** as mechanism to achieve **food security at macro level** and high level of **self-sufficiency**
- **Urbanization** lowers **per capita consumption** of rice – variety of substitutes – changing diets
- Better **food supply chains/systems** – rural h/h can afford to be **< self-sufficient** in food **production and consumption**, especially rice
- Relatedly, modern supply chains/supermarkets **have linked and changed interactions** between farmers, markets and consumers
- **Share** of total **calories** from rice **declining**, **food budget share** of rice declining **even faster** **< 20%** (higher for poor); **> 80%** on other food, including processed & convenience
- Consequently, **share** of rice in **agricultural output** and in **overall economy** also **declining rapidly**

Unfortunately, current food security debate **still mired in the mindsets of the 1970s** .. rice-centric, production-centric, nation-centric (self-sufficiency), etc... **ASEAN can and should do better**



# Recap- situating the nexus approach:

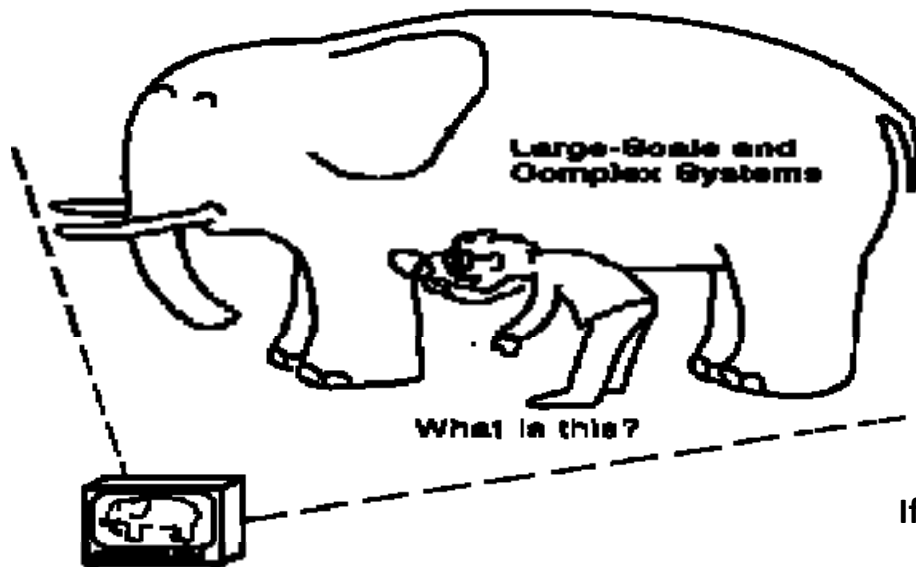


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## We are dealing with... 'Wicked Problem'



Synoptic View



If all you have is a hammer, then everything looks like a nail!



We are all in agreement then.

Stakeholders have different perspectives of the best solution to the problem & will continue to adhere strongly to them



## MOVING FORWARD:

- Increasing role of the private sector – utilize **ASEAN as both a common production base and market**, ahead of 2015. This can be leveraged to enhance ASEAN Food Security.
- Simultaneously, other Immediate, mid-term, longer-term efforts should include:
  - **Supply-side – supply response** to price, exploit **biotechnology & innovation, infrastructure, rationalise/repackage subsidies, more mindful use of water and energy , ecosystem services** as public goods, encourage **public-private partnerships** – along entire supply chain
  - **Demand-side** – reduce demand (reduce **wastage**, especially at **consumer level** ), consumption patterns, **diversify diet - eat < meat, increasing efficiency of use**
  - Strengthen & orchestrate **food supply chains and international trading networks** -



## MOVING FORWARD (Contd):

- Relatedly, the increasing **private sector efforts** in integrating ASEAN-wide modern farming along **agri-food supply chains and international trading networks** –should involve technology and innovation transfer, supply network serving both domestic and international markets
- New dynamics – new consideration to **‘getting prices right’** (balance between food-water-energy, as inextricably linked)
- **Water and energy wastage is embedded** in food wastage & excessive consumption – especially of processed/value-added food
- Requires major rethink of sustainable food security (as a **‘wicked’ problem**) and develop **a policy dialogue approach** utilizing **Issues Based Information System (IBIS)**



## CONCLUSION:

- Food Security – increasingly **more complex, multi-scale and interdependent** – so, need to continuously **(re)frame problems well**
- Need **trans-disciplinary, networked solutions** factoring in supply chains and trading networks and new dimensions rather than **isolated solutions** aimed at just one problem, issue or even sector in an increasingly interlinked **food-water-energy security nexus** that is increasingly private sector driven – **Public Vs Private goods** dichotomy increasingly blurred
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- Guided by the new dynamics in food security, we should be wary of being **trapped in the mindset of the 1970s** and ignoring the **realities of the 2010s** when formulating food security policy and strategies – **rice-centric, production-centric, supply-centric, public sector-centric, and nation-centric** (self-sufficiency rather than self-reliant)



## CONCLUSION – (Contd):

- With increasing **interconnectivity/interdependence** in Technology, Productivity and Food Security – need to view as **food ecosystem** – increasingly develop and apply **systems and trans-disciplinary approach**,
- Interesting work is being conducted incorporating **‘complex theory’** – involving systems approach innovatively combining hard and soft systems analysis, coupled with systems **to manage information/knowledge** for **‘wicked’ problems**
- New dynamics arising from food-water-energy nexus, green growth and increasing role of private sector requires an urgent **rethink of food security** and the development of a **new framework for regional/national/policy dialogue** in order to get the **basics and balance right**, ultimately targeted at **inclusive and sustainable growth** in each member country as well as **a Resilient, Inclusive, Competitive and Harmonious (RICH) ASEAN** .
- Underscores continuing **important role of APAP Forum** – leveraging it’s **collective ability** to **investigate, interpret, inform and influence** policy and business decisions --- well manifested in the spectrum of ‘heavy hitters’ assembled at this 11<sup>th</sup> APAP Forum and reflected in the Forum program.





# THANK YOU!



*Adelynn – @ 10 days, Melbourne*

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