



INTERNATIONAL FOOD POLICY  
RESEARCH INSTITUTE

# Changing roles of agriculture and food sector in Asia

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Director General

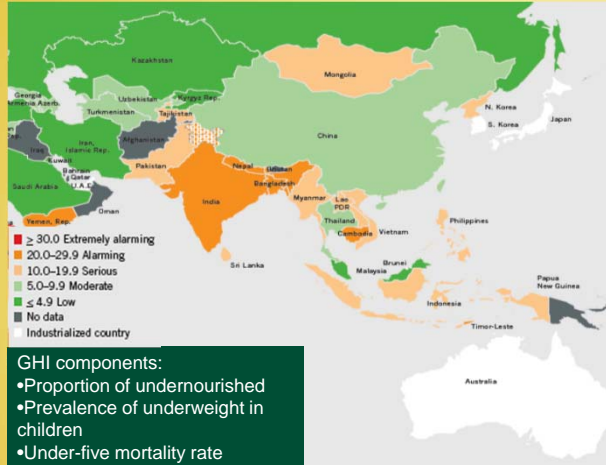
International Food Policy Research Institute

SEARCHA  
June 29, 2011

## Key messages

- Food security in Asia is under stress
- Agriculture needs to be adapted to dynamic changes and emerging trends
- Policies and investments must be redesigned to promote agricultural growth for broader development outcome

## 13 countries in Asia have serious/alarming levels of hunger (2010 GHI)

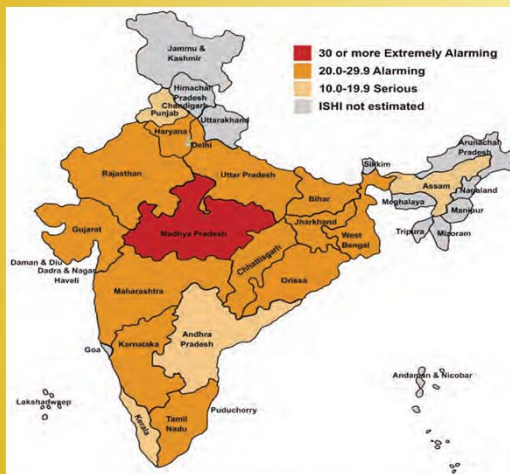


Source: von Grebmer et al. 2010

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## Significant variability in hunger within countries

### India State Hunger Index, 2008



### State-level hunger in India

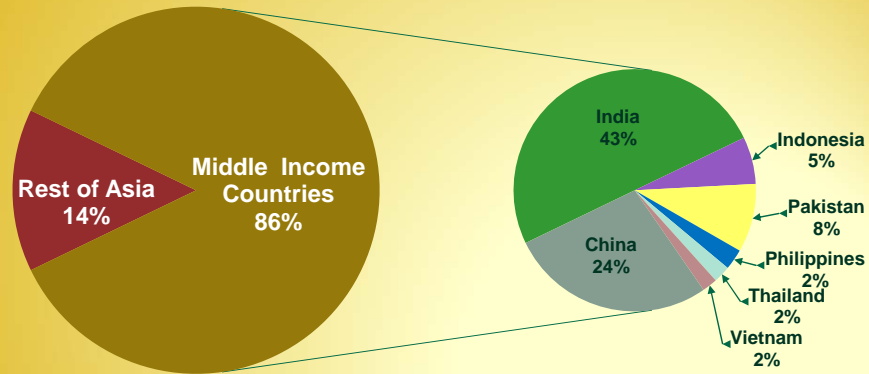
- 4 states: "serious"
- 12 states: "alarming"
- 1 state: "extremely alarming"

Source: IFPRI 2009

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## Food Insecurity: “Missing middle” in Asia

Share of Asia's undernourished population, 2007



**Large percentage of Asia's undernourished are in middle income countries**

Source: World Bank 2010

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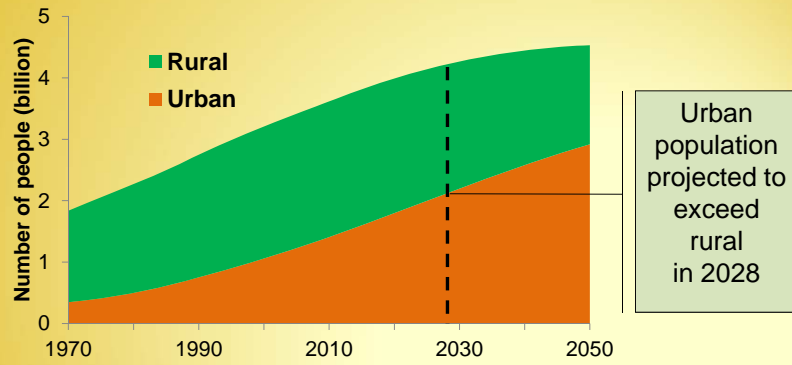
## Food security is under stress from a complex web of factors

- Population growth and urbanization
- Land and water constraints
- Climate change
- High and volatile food prices
- Rising energy prices/biofuel expansion

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## Population and demographic trends

Developing South and East Asia's rural and urban population



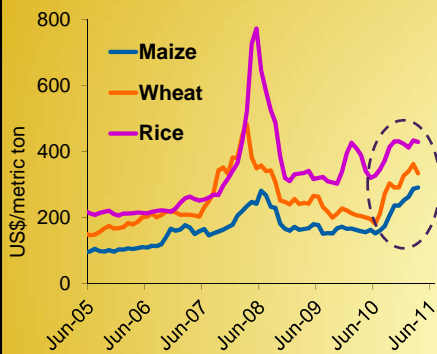
Source: World Bank 2011

**Larger and more urban population = increased demand for more and better food**

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## Global and domestic food price hikes and volatility

### GLOBAL

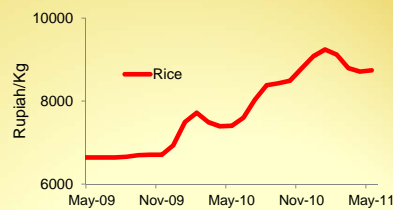


Global hikes since June 2010

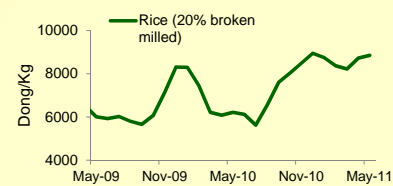
- Maize: 105%
- Wheat: 88%

### DOMESTIC

Retail prices in Indonesia, national average



Retail prices in Dong Thap, Vietnam

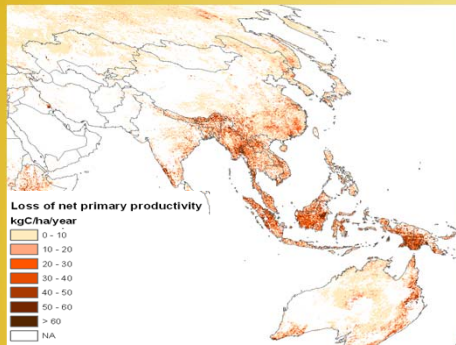


Source: Data from FAO 2011

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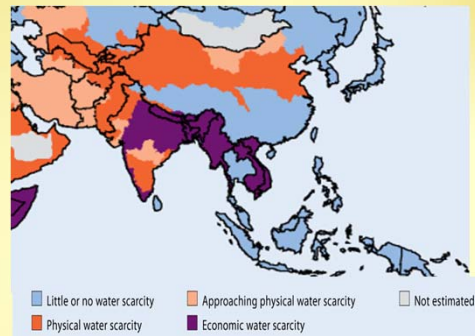
## Land and water constraints are high

### Land degradation, 1981-2003



Source: Bai et al. 2007 (LADA, FAO/ISRIC)

### Areas of physical and economic water scarcity, 2007



Source: IWMI 2007

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## Climate change will affect agriculture and food security

- **Lower agricultural yields, production, and land availability** due to
  - Higher temps. and changes in precipitation patterns
  - Sea-level rise
  - Extreme events: soil erosion, droughts, floods, landslides, etc.
    - Forest fires in Indonesia
    - Salt water intrusion in Vietnam
    - Floods in Pakistan
- **Higher food prices**

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## Climate change impact: Crop yields, 2050

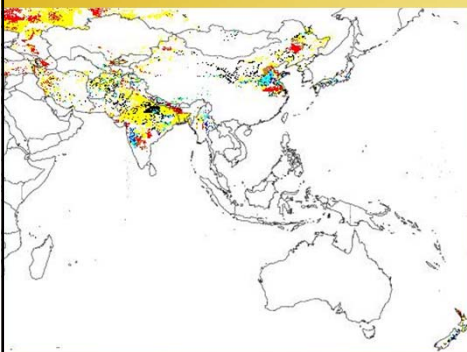
ASIA	
Crop	Change in Production (%)
<b>Rice</b>	
Irrigated	<b>-10.47</b>
Rainfed	<b>0.66</b>
<b>Maize</b>	
Irrigated	<b>-5.54</b>
Rainfed	<b>1.71</b>
<b>Wheat</b>	
Irrigated	<b>-13.50</b>
Rainfed	<b>-1.91</b>
<b>Soybeans</b>	
Irrigated	<b>-6.73</b>
Rainfed	<b>8.58</b>

Source: IFPRI 2011

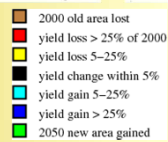
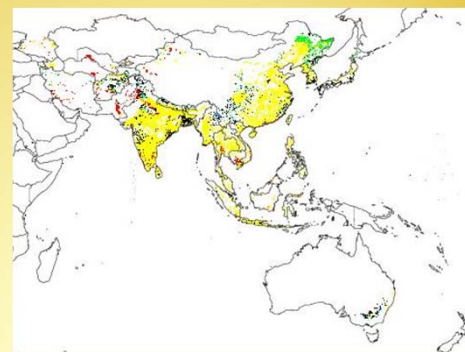
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## Climate change impact: Crop yields, 2050

Rainfed Wheat



Rainfed Rice

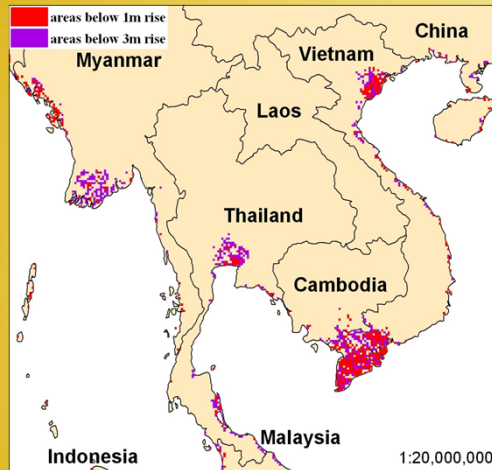


Source: IFPRI 2011

**Variation in impact across crops, countries, and regions**

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## Climate change impact: Agric. land



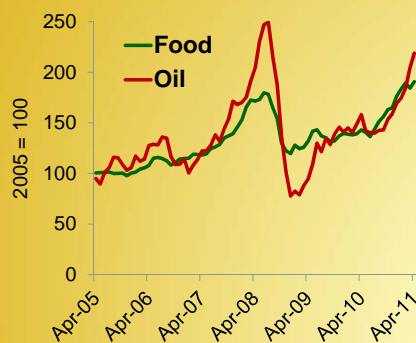
	With 1 meter rise ('000 ha)	With 3 meter rise ('000 ha)
Myanmar	295	1,214
Thailand	199	796
Cambodia	35	118
Vietnam	2,513	4,281

30 percent of Vietnam's rice growing area

Source: Nelson 2010

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## Strong link between oil and food prices influences food security



Source: IMF 2011

Note: Oil = Average crude oil price of U.K. Brent, Dubai, and West Texas Intermediate

- Rising oil prices cause food prices to increase, rather than the reverse

(Heady and Fan 2010)

- Rising oil prices make biofuels more profitable, rather than agricultural production more expensive

(Abbott, Hurt, and Tyner 2008)

**Rise in oil prices particularly severe for Asian countries as many are net oil importers**

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## Biofuel expansion

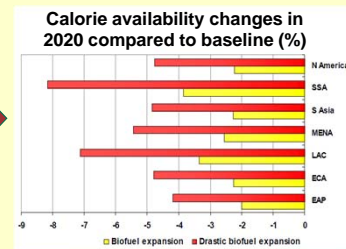
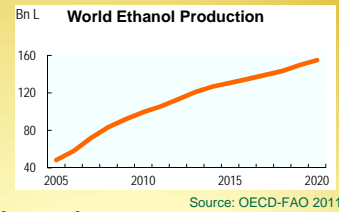
- Increased biofuel production due to rising oil costs, etc.



- Increased demand for biofuel feedstock crops
- Increased competition for resources



- Increased global food prices
  - Biofuels account for 30% of increase in weighted average grain prices, 2000-2007 (Rosegrant 2008)



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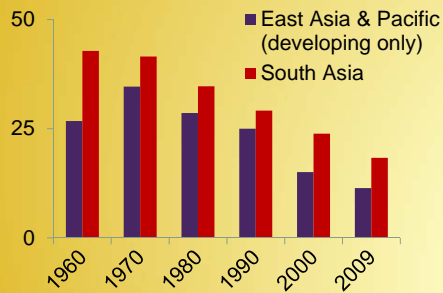
## Changing Role of Agriculture

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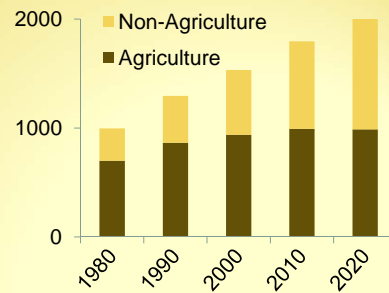
## Agricultural GDP declining but employment remains important

Agricultural GDP as share of total GDP, %



Source: World Bank 2011

Number of economically active people in developing South and East Asia, millions



Source: FAO 2011

**About 70% of poor in Asia live in rural areas and depend on agriculture for their livelihood (IFAD 2010)**

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## Smallholder agriculture will continue

- Estimated **87%** of world's 500 million small farms (<2 ha) are in Asia (Thapa and Gaiha 2011)
  - China and India home to 193 mil. and 93 mil. small farms, respectively
- Declining trends in farm size:

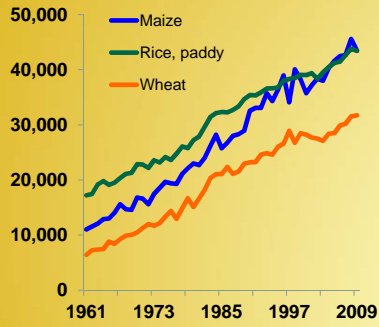
	Census year	Avg. Farm Size (Ha)	Number of Small Farms (million)
<b>India</b>	1971	2.3	49
	2005/2006	1.2	108
<b>Nepal</b>	1992	1	2.4
	2002	0.8	3.1
<b>Pakistan</b>	1971/73	5.3	1.1
	2000	3.1	3.8

Source: Hazell 2011; Headey, Bezemer and Hazell 2010

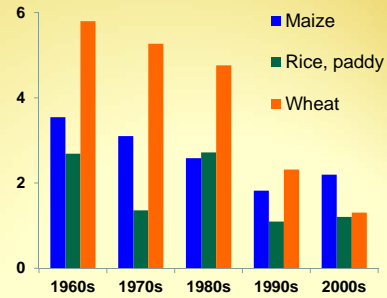
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## Growth in Crop Yields Declining

Crop yield, hg/ha (millions)



Growth in crop yield, %



Source: FAO 2011

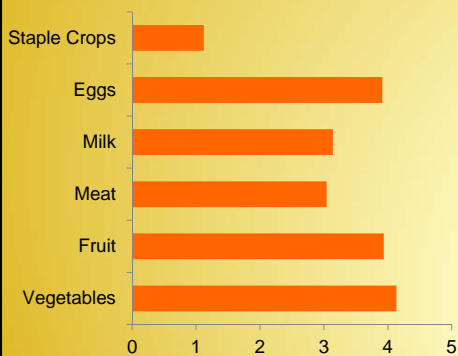
**Recent yield growth of staple crops in Asia has either modestly increased or been on the decline**

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## Consumption and production is more diversified

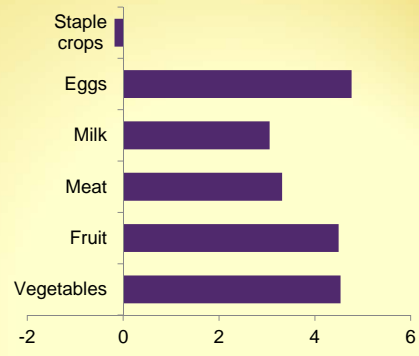
Production

Annual Growth, 1990-2009 (%)



Consumption

Annual Growth, 1990-2007 (%)



Source: FAO 2011

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## Large Gender Equality in Agriculture

- Women make up large share of ag. workforce but have less access to resources and services
- Closing gender gap in agriculture (FAO 2011):
  - Increases ag. production by 2.5–4%
  - Reduces number of undernourished people by 12–17%

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## Conflict and Agriculture

- Conflicts are directly/indirectly related to agriculture:
  - Poverty and underemployment of young men
  - Inequalities in land, water, and other natural resources
- Recent uprisings in Arab region driven partially by food insecurity and high unemployment (Breisinger et al. 2011)

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## Actions needed to enhance Asia's food security

### Short term

- |   |   |
|---|---|
| 1 | Invest in productive social safety nets   |
| 2 | Support transparent, fair, and open trade |
| 3 | Set up regional strategic grain reserves  |
| 4 | Prevent biofuel expansion                 |

### Long term

- |   |                                  |
|---|----------------------------------|
| 5 | Promote smallholder productivity |
|---|----------------------------------|

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## 1. Invest in productive social safety nets

### ▪ Better-targeted and more productive social protection policies need to:

- Secure basic livelihoods
- Protect poor people from risk and vulnerability

### ***Bangladesh Vulnerable Group Development Program***

- Combines income-generating and food security interventions
- Increased per capita food consumption by 45-66 kcal per *taka* transfer (Ahmed et al. 2009)

**Programs depend on needs, capacities, and resources**

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## 2. Support transparent, fair, and open trade

- **Eliminate harmful trade restrictions and prevent new ones to:**
  - increase market efficiency
  - reduce price fluctuations
- **Potential costs of failed Doha Round could be high** (Bouet and Laborde 2009):
  - **11.5% loss** of developing country exports
  - **US\$353 billion loss** in world welfare

**Quick completion of the Doha Round is crucial**

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## 3. Establish regional strategic grain reserves

- **Create regional emergency reserve with grain donations from large food exporters**
  - Located in these countries, and also in poor food importing countries, e.g. Bangladesh
- **Some regional initiatives are emerging e.g.**
  - Asean+3 Emergency Rice Reserve
  - SADC Regional Food Reserve Facility
- **Can address food crises, but need to**
  - lower operating costs
  - overcome moral hazard and other challenges

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## 4. Prevent biofuel expansion

- **Halt expansion of biofuels from food crops to end competition between biofuel and food crop production**
  - Develop biofuel technologies that
    - Convert crop residue into biofuels
    - Enable use of land not suitable for food crops
  - Curtail biofuel subsidies
- **Flexible mandates and biofuel call options**
  - Divert agricultural products from biofuels to human consumption during food crises

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## 5. Improve smallholder productivity

- **Invest in smallholder-friendly ag. R&D and infrastructure**
  - Access to technology, high-quality seeds, and fertilizer
  - Rural infrastructure
- **Link smallholders to markets, esp. high-value**
  - Increase vertical and horizontal coordination
  - Strengthen private sector participation
    - Reform laws and reduce corruption
    - Promote public-private partnerships
      - » *Indian Rural Business Hubs* → public-private-panchayat (village council) partnership

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## 5. Improve smallholder productivity

- **Link smallholder production w/ health and nutrition outcomes**
  - Develop more nutritious varieties of staple food crops
  - Improve safety regulations and postharvest handling
- **Use agriculture to resolve conflicts: e.g. Pakistan, Afghanistan and Addressing Gender Gaps**
- **Invest in climate change mitigation & adaptation**
  - **Win-win-win:** agricultural investments should provide mitigation, adaptation, and productivity benefits for smallholders

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**The most effective and sustainable actions must be country-led and country-owned**

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