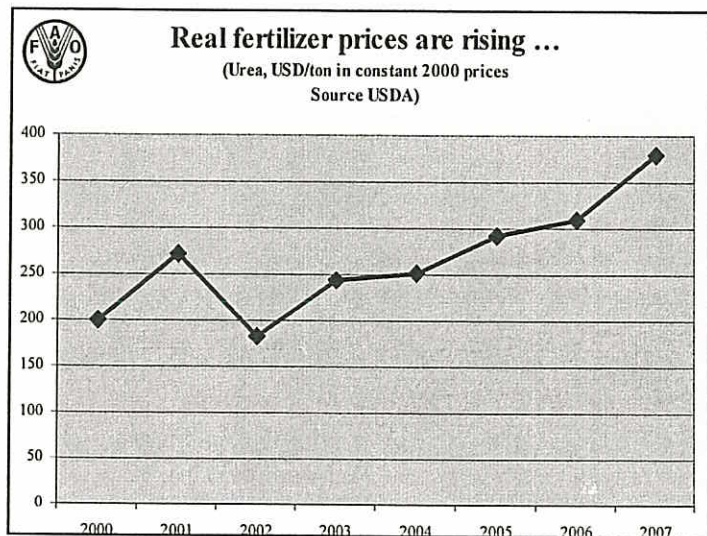
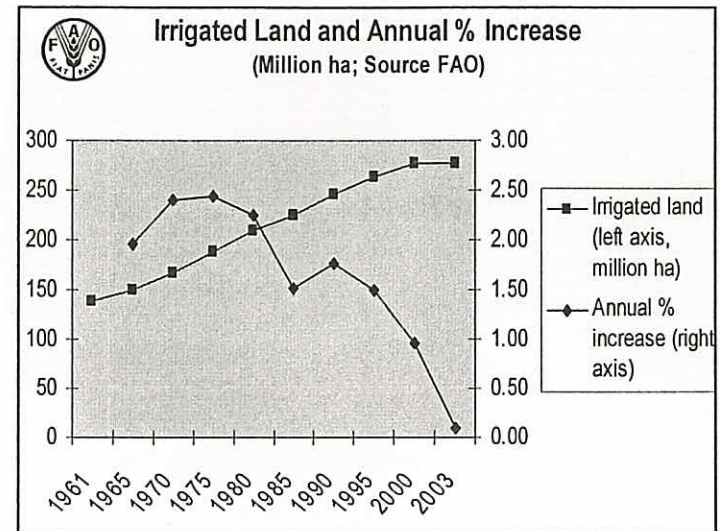
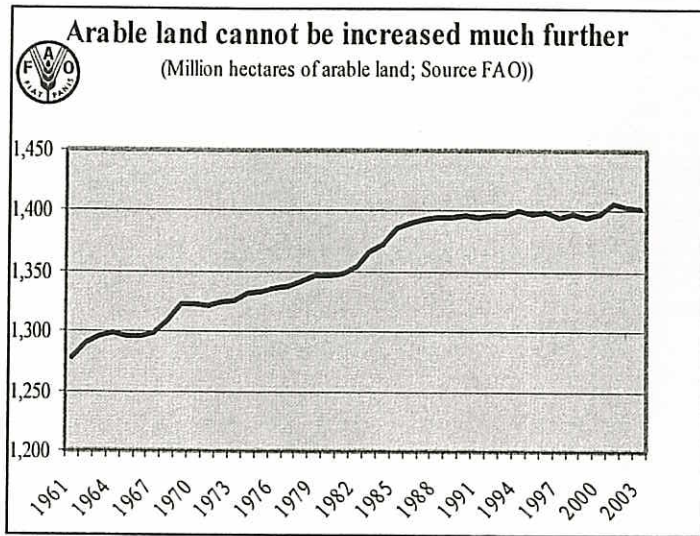


**Global Food Security  
in a Changing Environment**

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### Competition from bio-fuel crops

- Land under bio-fuels estimated at 25 million ha (2007), up from 1 million in 2000. Still less than 2% of arable land.
- Competition for land
- Competition for dual-use crops and commodities: maize, sugarcane, rapeseed, palm oil, wheat

## Global Warming

- The net effects are difficult to predict
- Short term effects are probably negative (IRRI for rice)

## Global Food Security: Demand and Supply Issues

- Demand factors (wheat, rice, maize):
  - Population growth of 1.1 – 1.2 percent
  - Demand from the livestock sector for maize
- Supply constraints:
  - Yield growth is slowing
  - New arable land is in short supply
  - Growth in irrigated area is slowing
  - Fertilizer, chemical inputs more expensive in real terms
  - Competition from bio-fuels
  - Effects of global warming

## Effects, threats, opportunities

- Potential to revitalize the agricultural sector....
- ... through permanently higher agricultural commodity prices ...
- ... threatening the food security of the poorest, especially landless and those in urban areas.
- Agricultural land prices will increase
- Part of the up to 2 billion hectares of degraded land (UNEP) may be used for bio-fuel crops

## Strategies

- Proper regulatory frameworks that take care of environmental concerns and provide transparent information on lands suitable for biofuel production.
- Avoid distortion of markets for farmers, investors, consumers
- Invest in new technologies (efficient irrigation, energy saving, new varieties)
- Invest in agricultural research
- A social safety net is needed for those who will be affected by higher food prices

Thank you