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# Priorities and Partnerships for Accelerating Agricultural Development in South Asia

**P.K. Aggarwal**

**Indian Agricultural Research Institute  
New Delhi, India**



# Agriculture led development in past

- Food production increased from 65 to 230 million tons since 1960s
- **Land saved - more than 50 million ha**
- Calorie intake increased from 1900 to 2500 Kcal/capita/day
- **Poverty decreased in rural areas from 55% (in 1973) to 26% (in 1998)**
- Human development index improved from 0.41 (in 1972) to 0.619 (in 2007-08)



## And yet problems persist

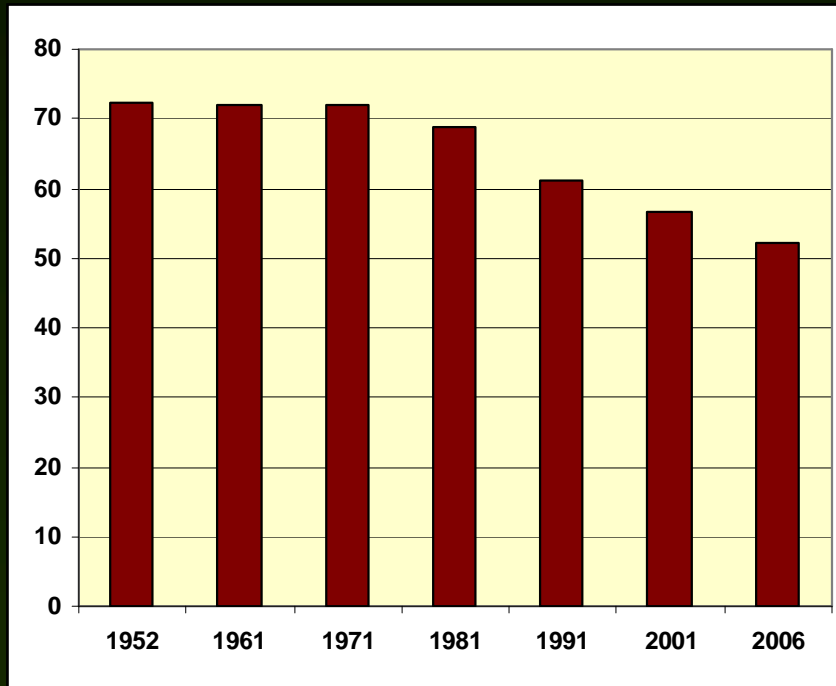
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- 1/4<sup>th</sup> of the world's hungry
- 40% of the world's malnourished children and women
- Lagging in meeting MDGs
- Deceleration in TFP growth
- Given a choice, 40% farmers would like to leave farming (NSSO, 2005)

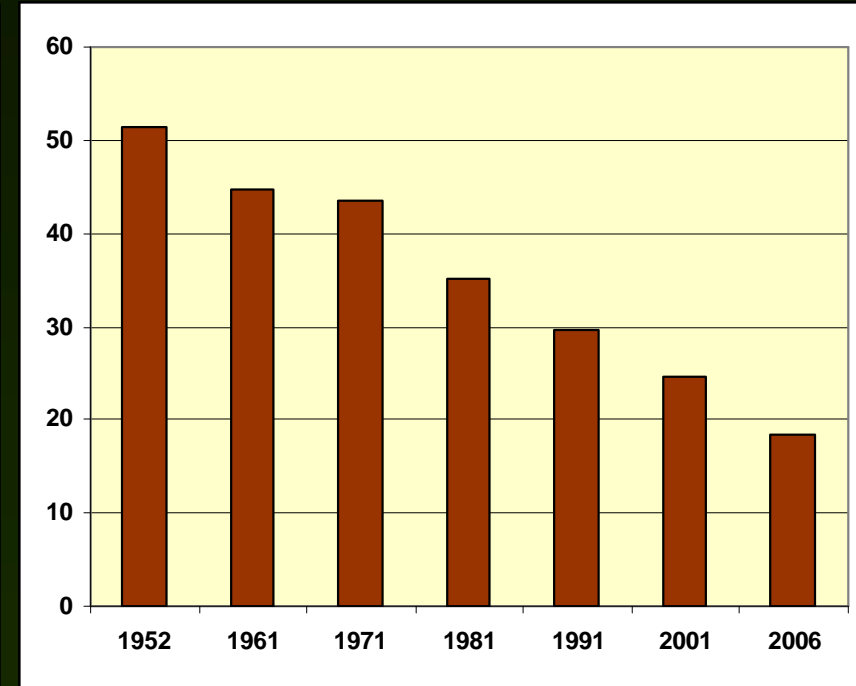


# Changing Importance of Indian Agriculture

## Share in Employment, %

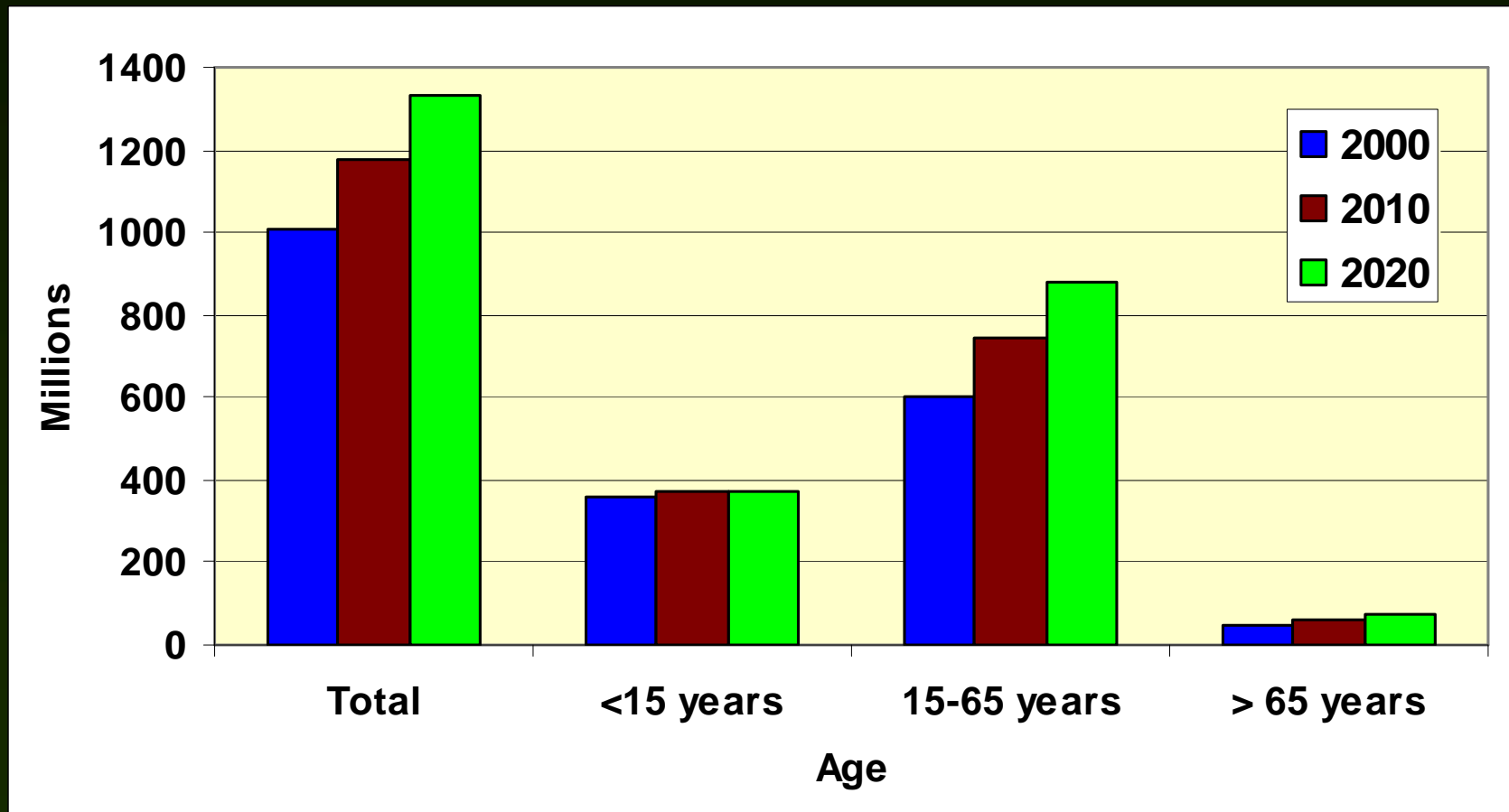


## Share in GDP, %



# Increasing population: Part of a problem or solution?

## Demographic changes in India





# Challenges for future food security

- Increasing demand for food
  - Reducing/stagnating crop yields
- Increasing competition for resources
  - For land, water, capital, and labour from industry and urban settlements
- Increasing variability of global supplies, and prices
- Increasing climatic risks





# National Agriculture Policy

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## To attain

- **Growth** rate of 4% per annum
- **Growth** based on efficiency and conservation of resources
- **Growth** that is inclusive and equitable
- **Growth** that is demand driven
- **Growth** that is sustainable



# Priorities and partnership:

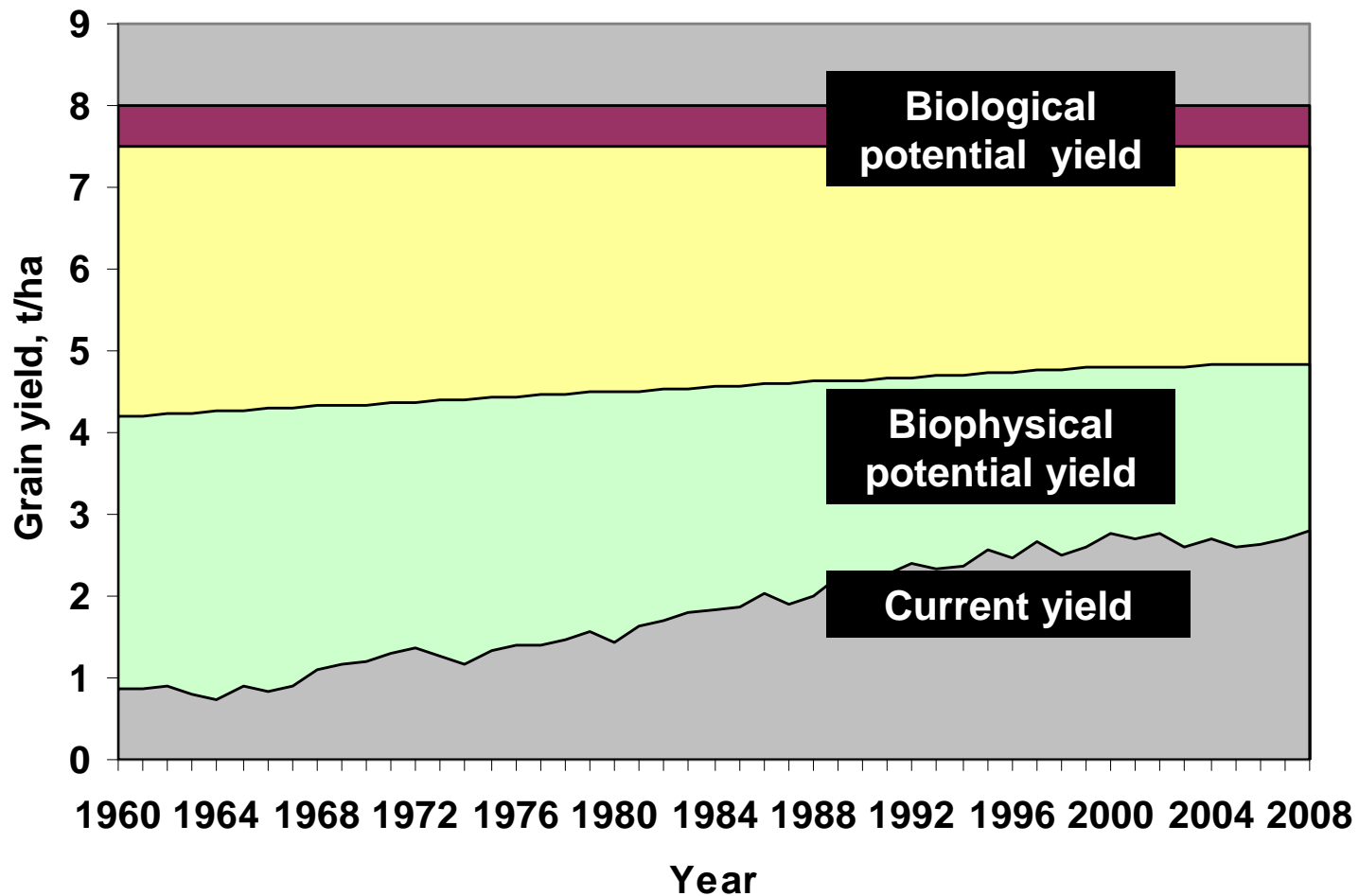
## Key points

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1. Technologies are available that can meet food requirement in short-term. Innovation needed in input delivery and market linkage mechanisms
2. **Managing current climatic risks is crucial for poverty alleviation and for equitable development**
3. Agricultural growth should stimulate overall rural development
4. **Adapting to climate change is key to future food security**
5. Partnerships are needed for yield and nutrition improvement, bio-energy, and human resource development

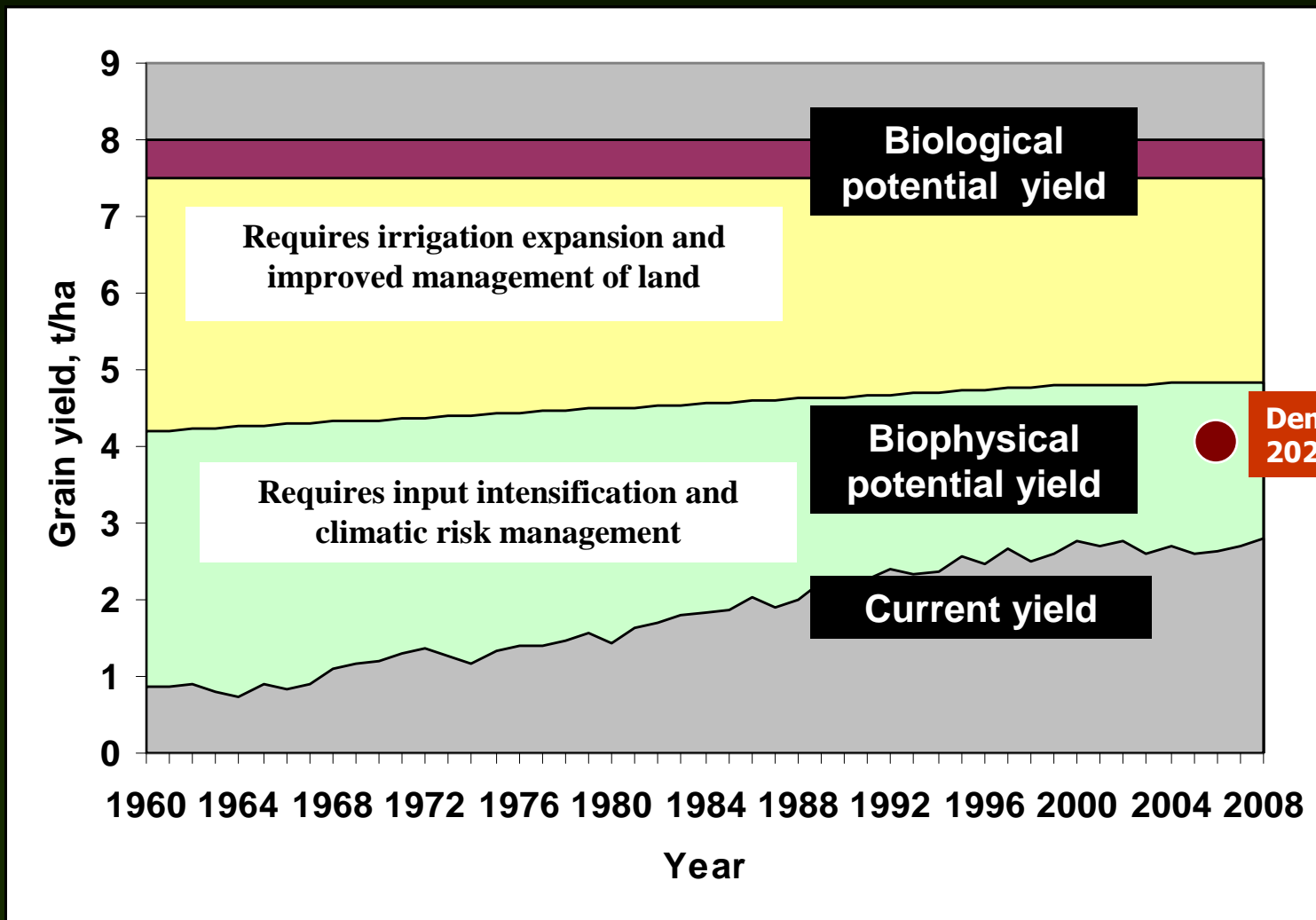


# 1. Crop production has increased in past by bridging yield gaps: Example of wheat





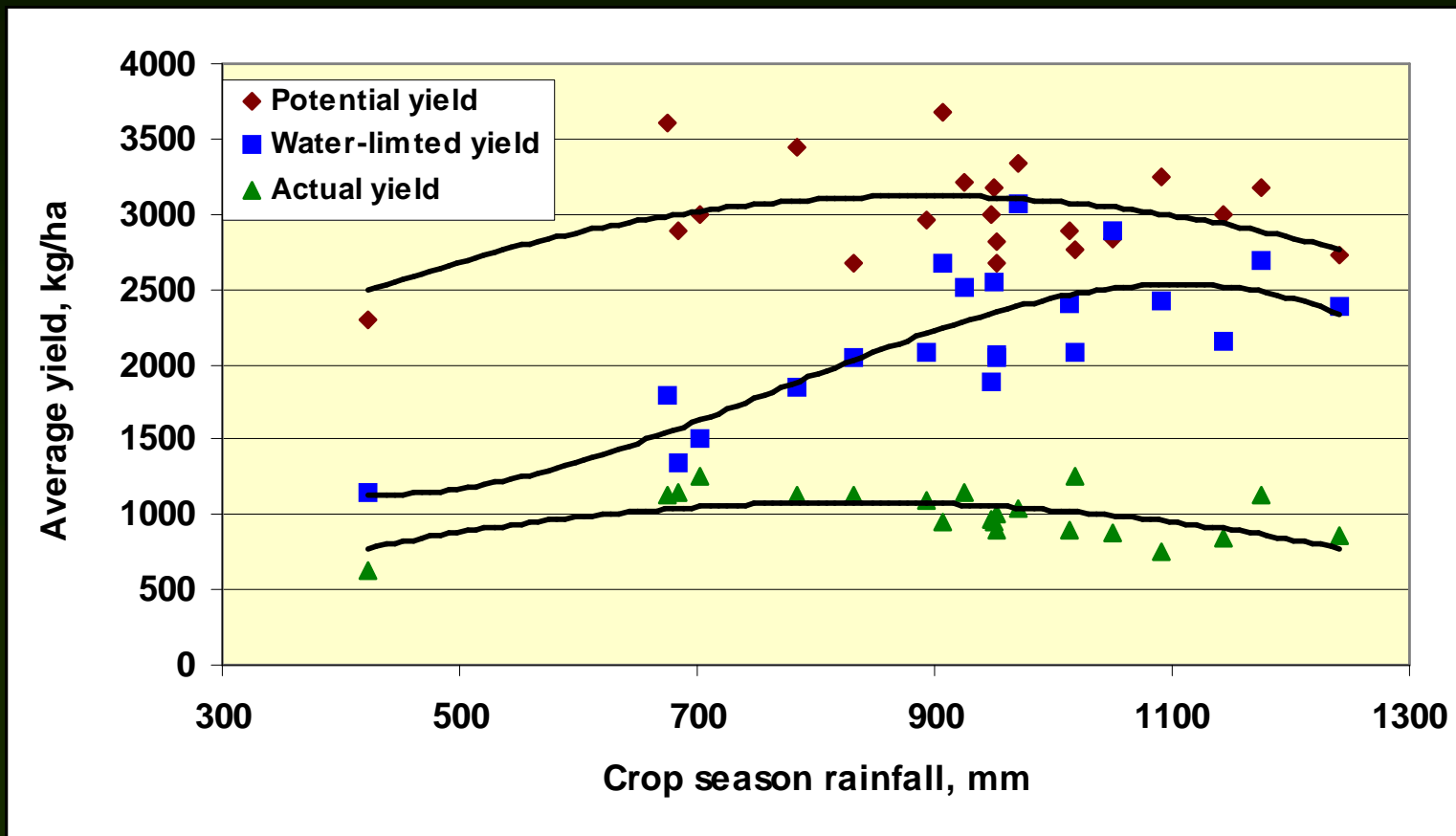
# Bridging yield gap can meet wheat requirement in short-term





# Yield gaps exist in all crops

## Yield gaps in soybean in India





# Research-Industry-Extension Partnerships to Bridge Yield Gaps

- Input delivery systems: seeds, fertilizer, chemicals: Partnerships with industry
- Real-time agro-advisories: Partnership with Met and irrigation depts
- Post harvest marketing support- Partnership with industry and markets



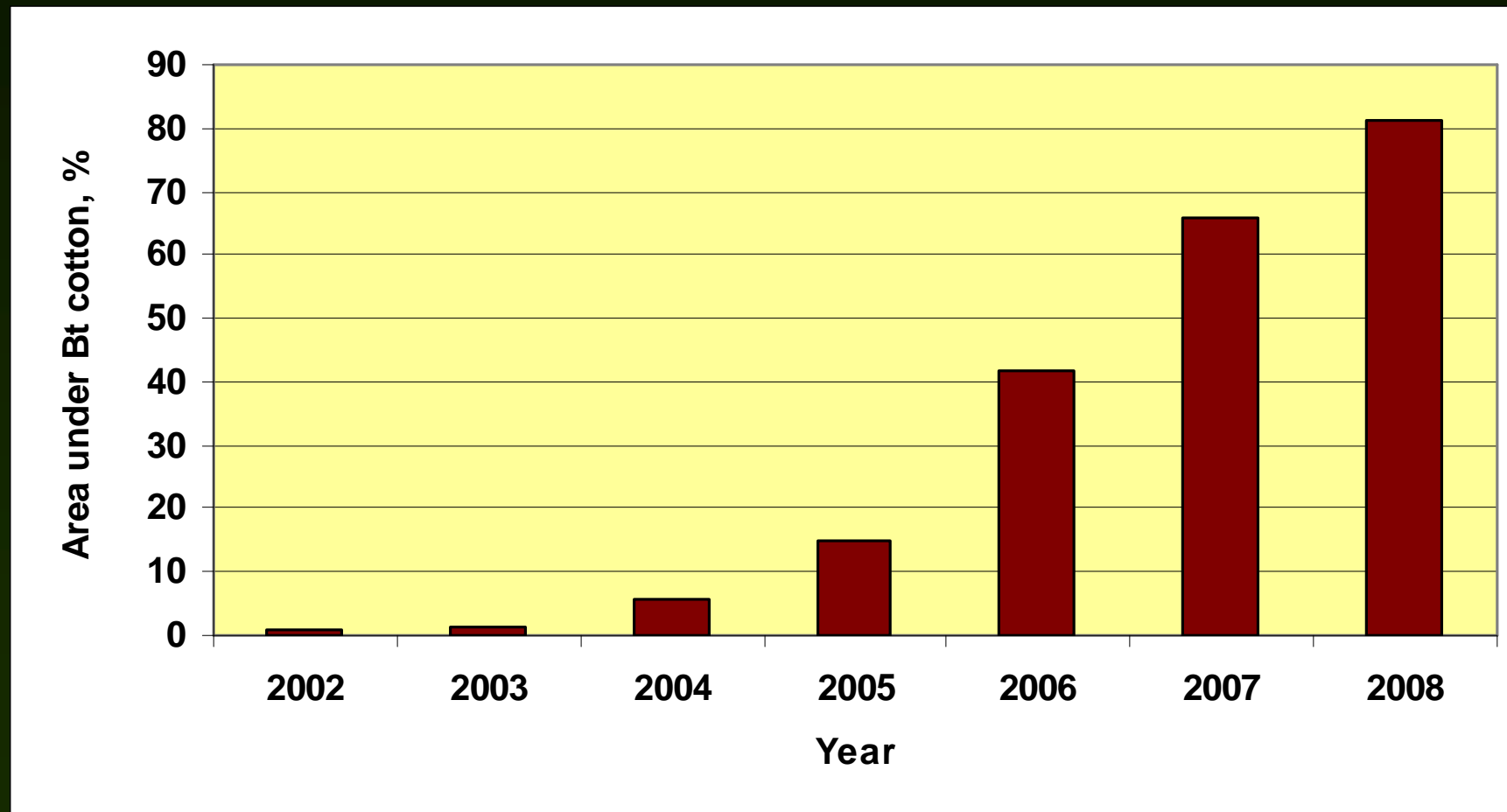
## Role models for partnerships are continuously evolving

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- Dairy cooperatives
- Growth in poultry sector
- Public-private-farmer partnerships for seed production
- Contract farming for vegetables and fruits
- Public-private-people partnership for input delivery and market linkages
- Bt cotton



# Area under Bt cotton in India







## Increasing efficiencies of resource use are to be addressed simultaneously

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- Soil restoration for improved productivity and income (including carbon benefits)
- Water conservation and efficient use
- Nutrient placement systems for increased efficiency







# Assist farmers to cope with current climatic risks

- Improving collection and dissemination of weather related information
- Risk management research-application of weather info/forecasts
- Establishing an early warning system of climatic risks/disasters
- Promoting insurance for climatic risk management
- Strengthening pest surveillance and forecasting mechanisms
- *Public-private partnerships for weather data collection and for weather derivatives*



### 3. Agri-led regionally differentiated, resilient rural development

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- Consider crops, horticulture, feed and fodder, fish and livestock; and other livelihood strategies together
- **Input delivery and output marketing systems**
- Post-harvest primary processing hubs in rural areas for employment and income-  
China model
- **Adopt villages in contrasting AEZs to demonstrate complete rural development models:** food, energy, income, employment, environment



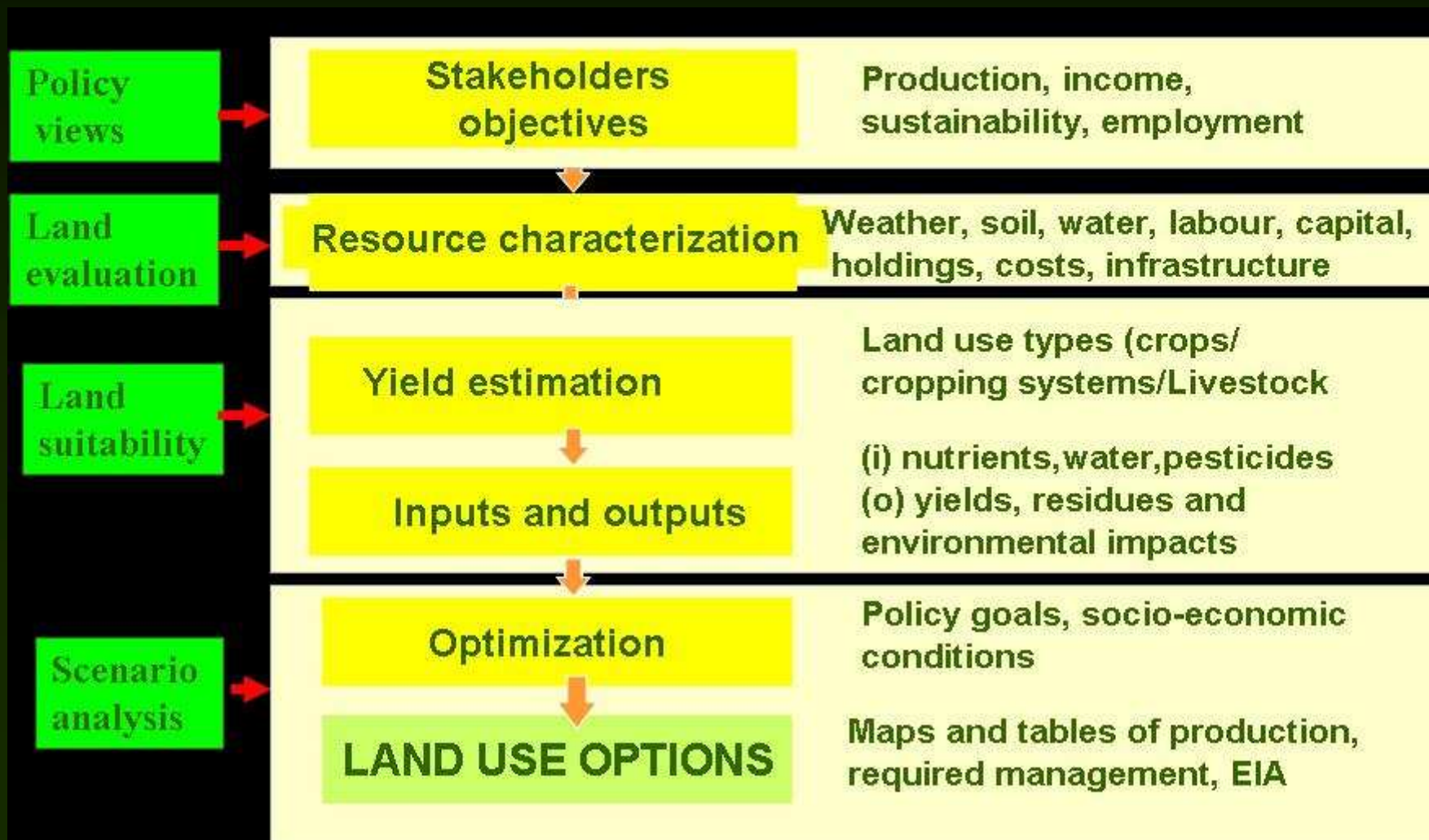
# National Food Security Mission and NREGA

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- Districts with potential identified
- Regionally differentiated technology mix identified
- Input delivery system strengthened
- Credit supply system activated
- Insurance for climatic risks
- Output procurement assured
- NREGA: Rural employment guarantee



# Decision Support System for Food Security Analysis and Planning





## 4. Adapt to climate change

Climatic risks associated with global warming are increasing

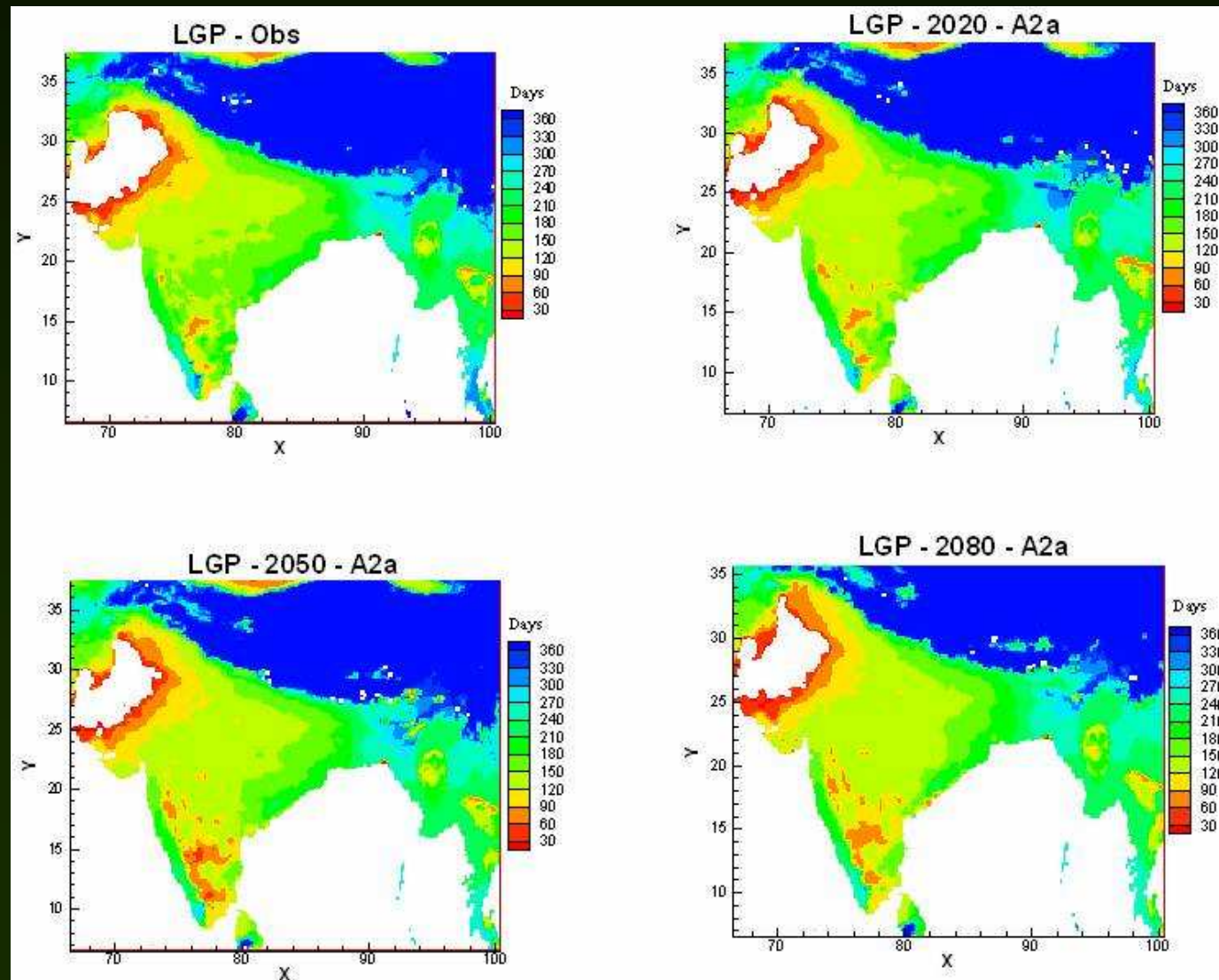
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- Increasing number of hot days, hot nights, and heat waves
- Increasing frequency of heavy precipitation events- more droughts and floods
- Increased snow melt- implications for irrigation
- Sea level to rise to be 0.18 - 0.59 m





# Impact of climate change on length of growing period







# Water is the key issue for future food security

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- Crucial for increasing food production
- Competition from urban and industrial areas
- Receding Himalayan glaciers
- Higher rate of evaporation due to temperature
- Increasing variability in rainfall
- Transboundary disputes
- Virtual water trade



# Climate change and agriculture in India: Research Partnership

- A Network on Climate Change launched in 2004 with 16 research institutes for impact assessment, adaptation and mitigation options
- **Current membership 23 institutes; 120 scientists**
- Coverage - crops, horticulture, plantations, soil, water, fish, livestock, poultry, socio-economics; vulnerable ecosystems- hill, coastal, rainfed
- **Funding: Govt of India**
- Awareness campaigns- Ministers, Parliamentarians, administrators, industry, scientists, students, farmers
- CGIAR linkages with such networks



## 5. Partnerships needed to address longer-term priorities

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- Frontier, capital intensive projects such as biotechnology for enhancing yield and nutrition potential
- **Human resource development**
- Adaptation to and mitigation of climate change
- **Second generation biofuels; competition for biomass; lessons learnt from Jatropha**
- Food quality, storage and management technologies and policies
- **Waste management (including from agro-processing industry)**
- Agri-health relationship



# Conclusions: Key points

1. Technologies are available that can meet food requirement in short-term. Innovation needed in input delivery and market linkage mechanisms
2. Managing current climatic risks is crucial for poverty alleviation and for equitable development
3. Agricultural growth should stimulate overall rural development
4. Adapting to climate change is key to future food security
5. Partnerships are needed for yield and nutrition improvement, bio-energy, and human resource development

