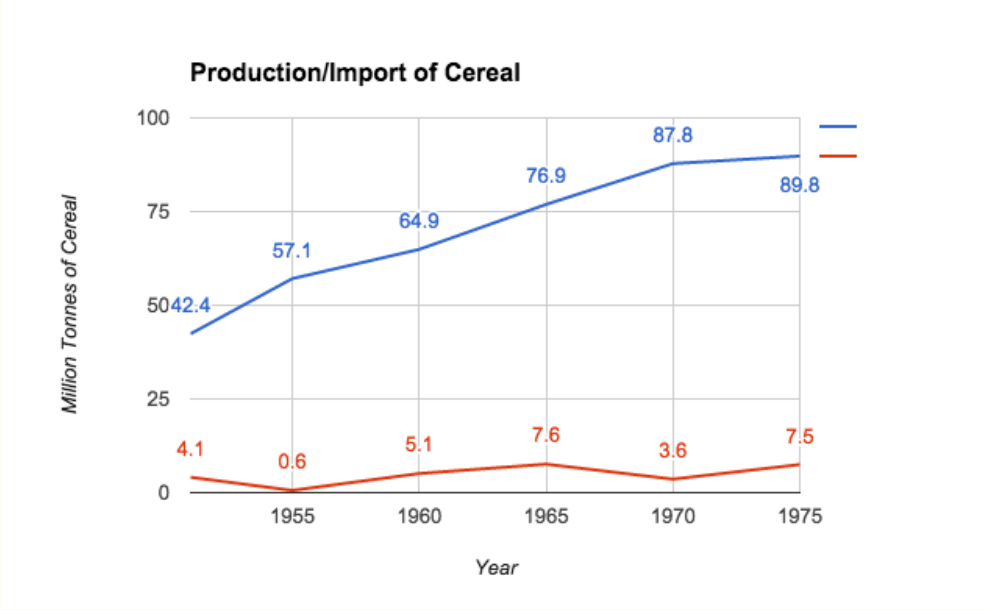
The Green Revolution in India

Importance of an Individualized Approach

With many thanks to Anna Jungbluth, Bhupendra Khetani, Bashar Zeitoon, Jorge Phillips

Indian Agriculture Pre-Green Revolution

- Rule of the British Raj (Acharya)
  - Indian cereal grain supply dependent on Britain/trade (Arnold-Baker)
  - Most cannot afford high trade prices (Acharya)
  - Bengal Famine–1943 (Arnold-Baker)
    - trade difficulties cause rice shortage (Arnold-Baker)
    - news of difficulties lead to hoarding (“Global Governance”)
    - Raised prices (“Global Governance”)
    - 1 million people die (Arnold-Baker)
- Independence–1947
  - Food Shortages (Acharya)
  - Government tries to make grain supply self dependent (Acharya)



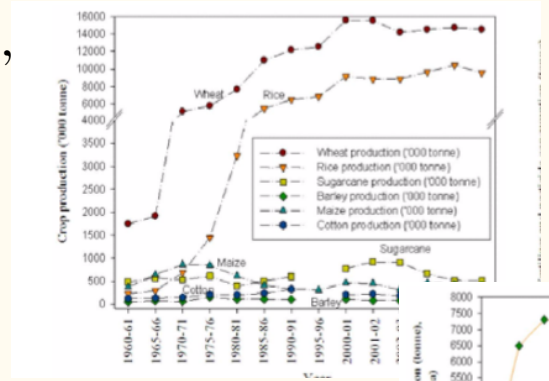
Graph Data: (Nawani)

Production

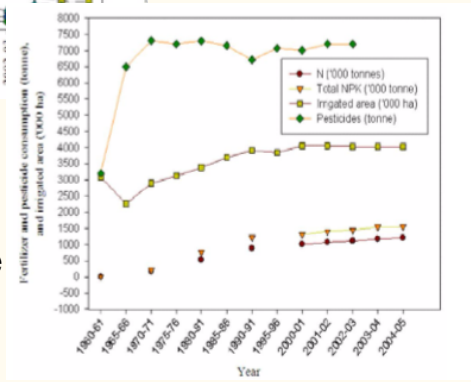
Import

Crops

- From low-yield, diverse system, to high yield, high concern
- Rice, wheat, jowar, bajra, barley, maize,
- Wheat no. 8156 (Rajaram)
  - Better growing season and yield (Rajaram)
  - Requires fertilizer (N) (Rajaram)
  - Reduction biodiversity
- Rice T(N)-1 ("Agriculture")
  - Strains the soil (Sangha)
  - Water requirement ("Agriculture," Sangha)

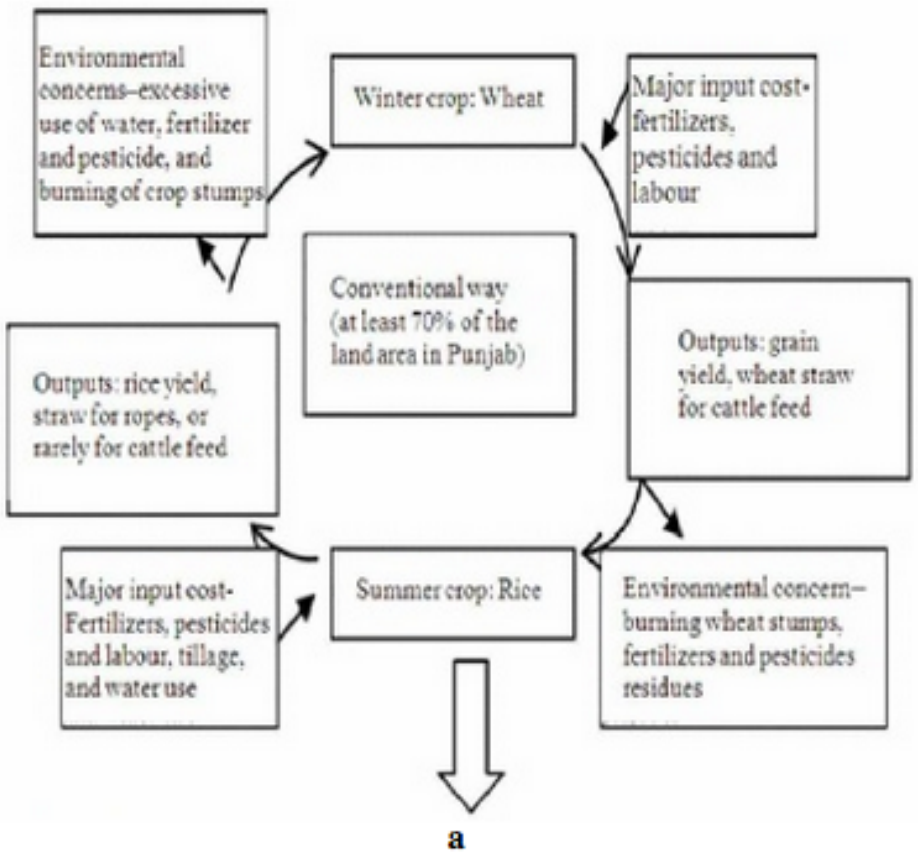


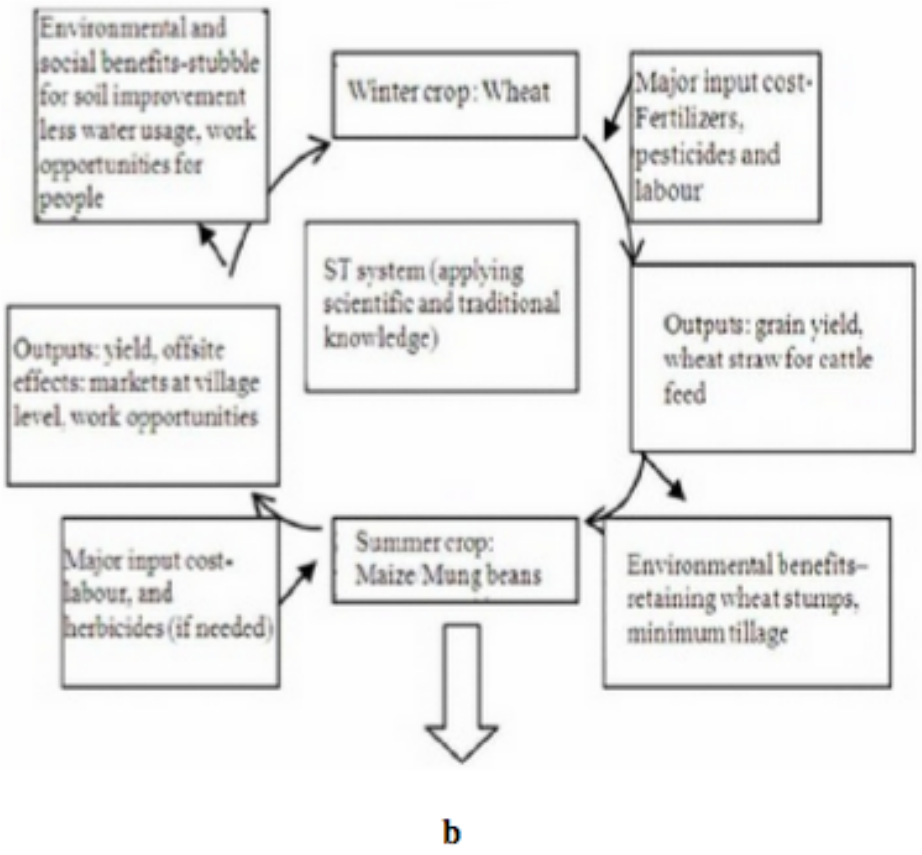
Crop yield



Fertilizer use

Sangha, 333





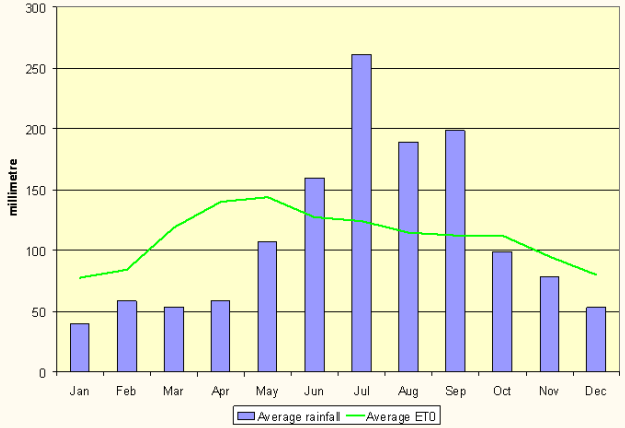
Sanghal, 338, fig. 5. Worked example of a tailored approach based on research of inputs, outputs, and country-specific resources.

Technical Focus: Irrigation


Irrigation Channel

- Colonial times "Maddison"
  - Canals and irrigation channels mainly used for poppy fields
  - Emphasis on cash crops decreases production, leads to famine
- The need for innovation in irrigation ("The Green Revolution")
  - One rainy season: monsoon
  - Only one growing season
- Irrigation projects of the Green Revolution
  - Various undertakings: water channels, dams
  - Permitted double-cropping ("the Green Revolution")
- From 1947 to now (Dehadrai)
  - Potential irrigated land has tripled as of 2001
  - Actual net irrigated land is much less

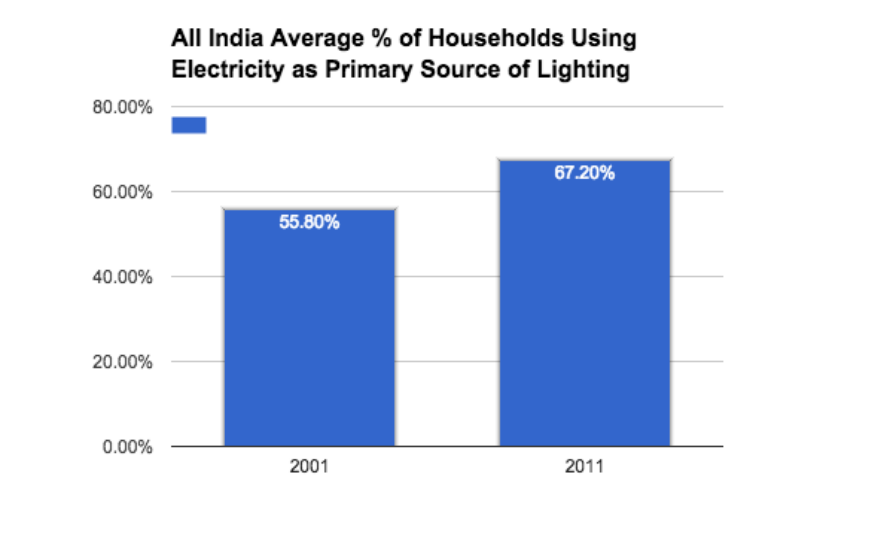
Annual Rainfall



Maddison, A. (1970), *The historical origins of Indian poverty*, PSL Quarterly Review, 23(92), pp. 31-81 cite "maddison"

Technology Systems

- Rural electrification (Mondal)
  - 86% Indians villages electrified by 2004
- Infrastructure (Mondal)
  - Road network in the rural connected villages with markets
- Farm mechanisation (Mondal)
  - Reduced human labor
  - Expedited operation
  - Increase productivity and efficiency



Graph Source: (CURRENT STATUS)

Public Policy

- Command Area Development (CAD)-1975 (Mondal)
  - Enhanced the use of irrigation potential & water management
  - Road improvement
  - Afforestation & erosion control
  - Project organization buildings & minor flood protection
  - Agricultural research
  - Training of staff in on-farm development
- Agricultural Credit (Mondal)
  - Pro: Federal loan for farmers
  - Con: Failed to meet the needs of small and marginal farmers
- Agricultural Prices Commission (Sharma)
  - Pro: Established minimum procurement prices
  - Con: Reduced competition and restricted the market

Socioeconomic Effects

- Dramatic increase food production:
  - India is second largest rice exporter (“Hunger in India”)
- Rapid industrialization of economy widens the income gap between landless laborers and landowners. (Frankel 98) (Sen 103)
  - Laborers suffer: replaced by machines
  - Government policies support large landowners’ production of food
    - do not support laborers or small landowners
  - Landowners benefit
- Mass poverty causes malnourishment (“Executive Summary)
  - 15.2% of the modern Indian population undernourished (“Hunger in India”)
  - Due to poverty related living conditions and diet, 3000 Indian children die every day (“Hunger in India”) (“Executive Summary”)

Environmental Effects

- High yield crops depleted soil nutrients (Rahunvanshi, Zwerdling)
- Irrigation systems
  - More dependable growing seasons (Mondal)
  - Irrigation systems required more water for farming (Zwerdling,)
- Improper handling of chemicals, fertilizers, pesticides
  - polluted the water and possibly led to increase in health problems (Pepper)
- Greater demand for land for farming
- Decrease biodiversity in crops (Rajaram)

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In Conclusion: production target reached, at what cost?

- **Changes need to be tailored to each country**
  - Crop rotation
  - irrigation systems & sprinkler systems
  - transportation of yield
  - more self-sufficient farmers through policy
  - Soil health, biodiversity, and pollution

- Consensus
  - The green revolution in India worked in regards to the desire to produce more food, but failed in the distribution of the food and maintaining the health of the soil.

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