


# Mungbean in Asia: From an underutilized crop to an important part of rural livelihoods



J.D.H. Keatinge  
Jacqueline d'A Hughes  
Andreas Ebert  
Kartini Luther



# Mungbean forty years ago...

- Semi wild and underutilized
- Planted on marginal lands with minimal effort
- Very low productivity (400 kg yield / ha)



## Some relative benefits



Earlier maturing and more drought tolerant than soybean



Similar nutrition to cowpea grain - can be used as a vegetable or a grain



More drought tolerant than dry beans (*Phaseolus vulgaris*)





# Potential

- High protein content and iron to enhance nutrition in meals
- Diversify cereal-cereal cropping systems for higher productivity and resilience
- Generate additional income for the poor





# Early constraints to production of mungbean



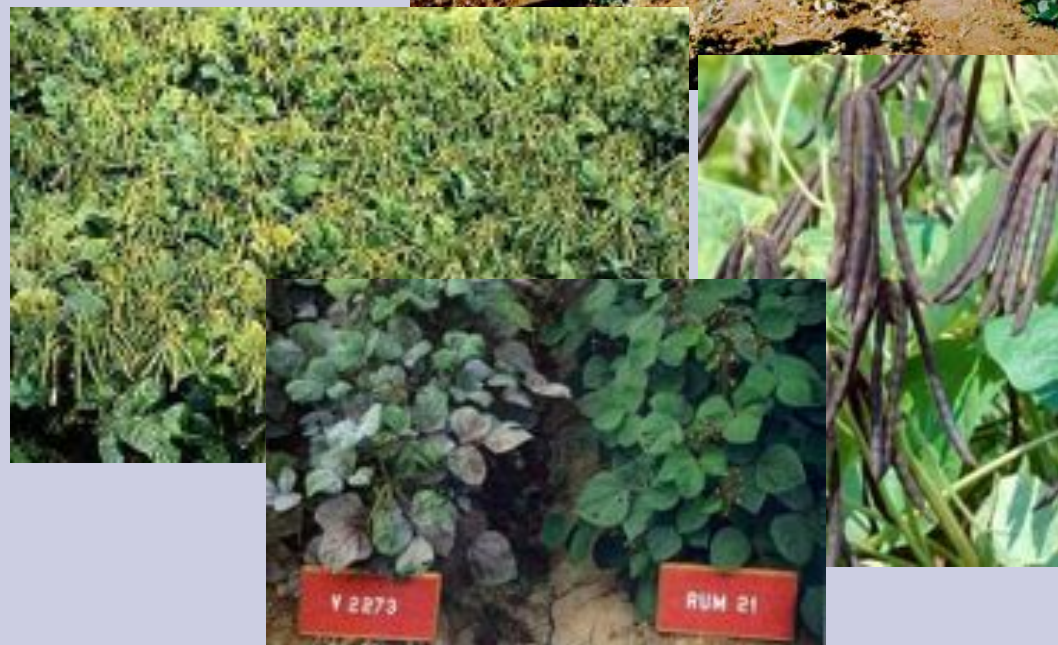
- Growth period (90-110d) too long, does not fit between cereal-cereal crops
- Beans do not mature simultaneously, require several harvests and higher labor demand
- Low yielding
- Bean pods shatter easily
- Susceptible to many diseases and pests



## Research 1980s - 2000

### Goals:

- Shorter growth period (60-75 d)
- Stable, high yield  $\pm$  2 t/ha of larger seeds
- Non-shattering pods, synchronous maturity
- All the bean pods at the top of the plants for easy harvesting
- Resistant to major diseases and pests





# AVRDC's R&D approaches

- Screened diverse germplasm from the region conserved in the genebank
- Bred for desired traits
- Multi-location, multi-season, participatory variety trials



*These achievements indicate the collection, introduction, evaluation, and utilization of mungbean genetic resources are fast and effective ways to increase mungbean production.*

He et al. (1998)



# AVRDC's R&D approaches



- Established South Asia Vegetable Research Network (Bangladesh, Bhutan, China India, Myanmar, Nepal, Pakistan, Sri Lanka and Thailand)
- Supported partners to gradually take over responsibility for their national improvement programs

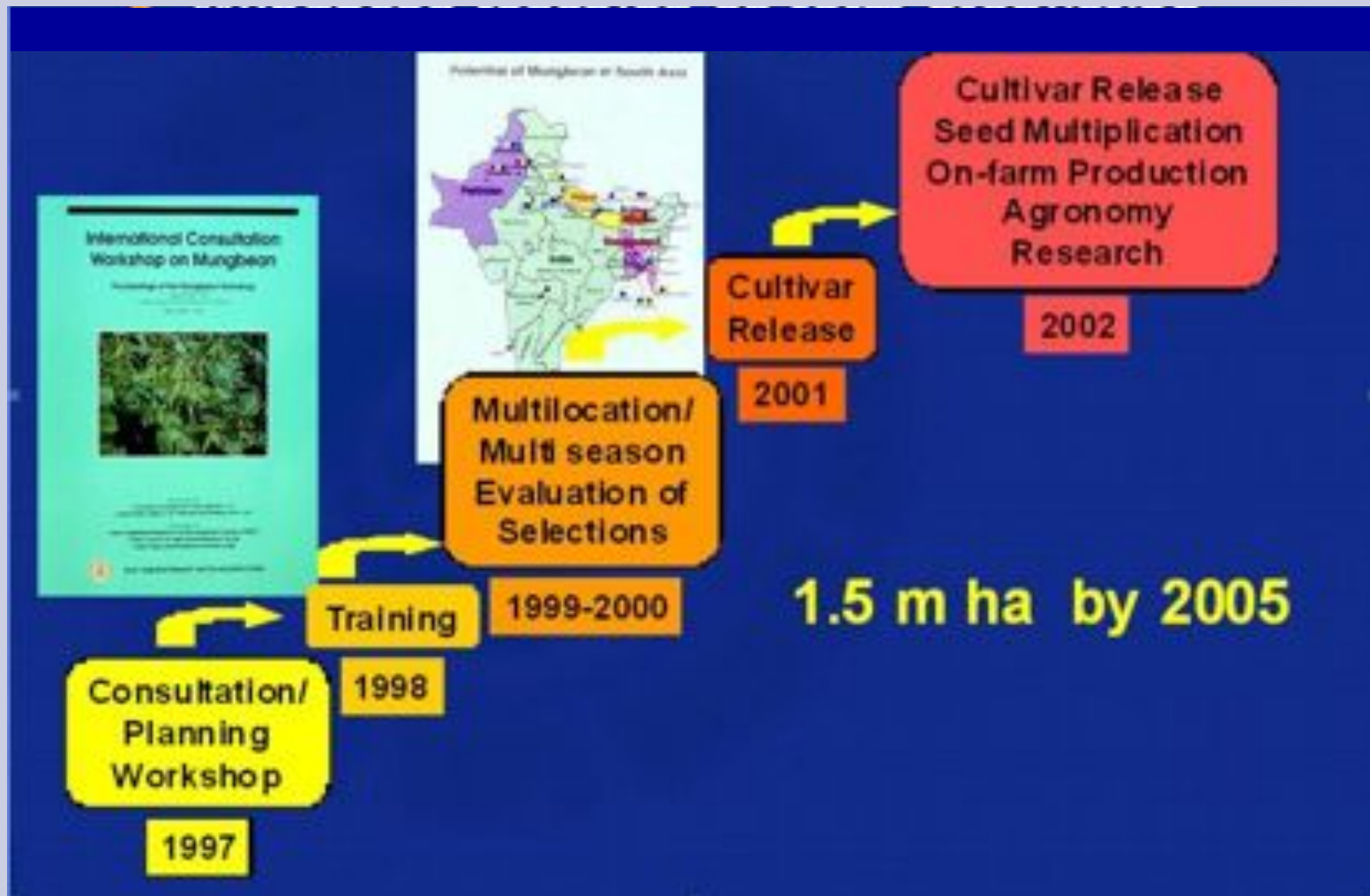
- **Instrumental:**

Farmers' initiative to produce seeds to be shared with others  
– *Seed Village Program* in India





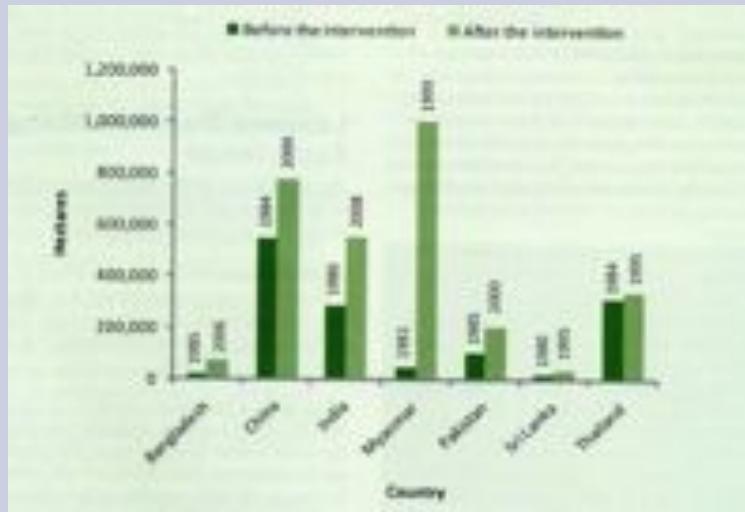
# Mungbean reaching on-farm production





# Research results

- 12% increase in production: 1985-2000
- By 1990, 40 improved varieties released (in China, India, Australia, Bangladesh, Bhutan, Botswana, Cambodia, Costa Rica, Ecuador, Fiji, Indonesia, Korea, Myanmar, Nepal, Pakistan, Sri Lanka and Thailand)
- By 2001, more than 25% of world production used AVRDC improved varieties
- Currently, 112 improved lines in 27 countries





# Impact

- Improved mungbean production revenue estimated at US\$20 million per year in Pakistan
- Potential increase of productivity of anaemic female workers up to US\$ 3.5-4.2 million annually in Pakistan
- Supplementing diets with high-iron mungbean improved the children's overall physical stamina in India





## Challenges and further research needs

- Re-emergence of *Mungbean yellow mosaic virus*
  - Climate change extends geographic range of the virus vectors
  - Pesticides misuse resulting in pesticide-resistant vectors
- Broader genetic base for nutritional quality
- Postharvest damage to mungbean seeds
- Waterlogging tolerance