

# Post Production Issues of Food Security in the Growing World

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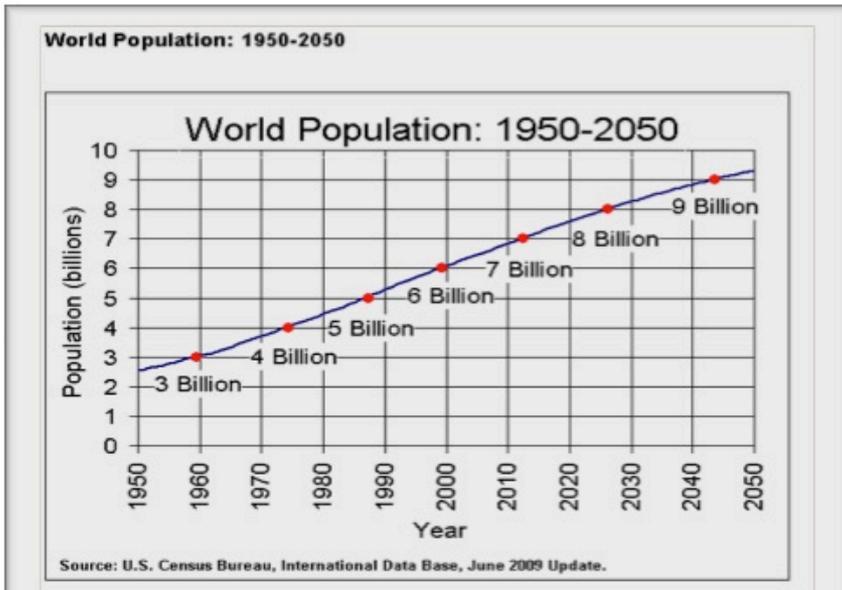


# What is food security???

- The World Food Summit of 1996 defined food security as existing **“when all people at all times have access to sufficient, safe, nutritious food to maintain a healthy and active life”**.
- Commonly, the concept of food security is defined as including both **physical and economic access** to food that meets people's dietary needs as well as their food preferences.



# Why do we need to secure food???

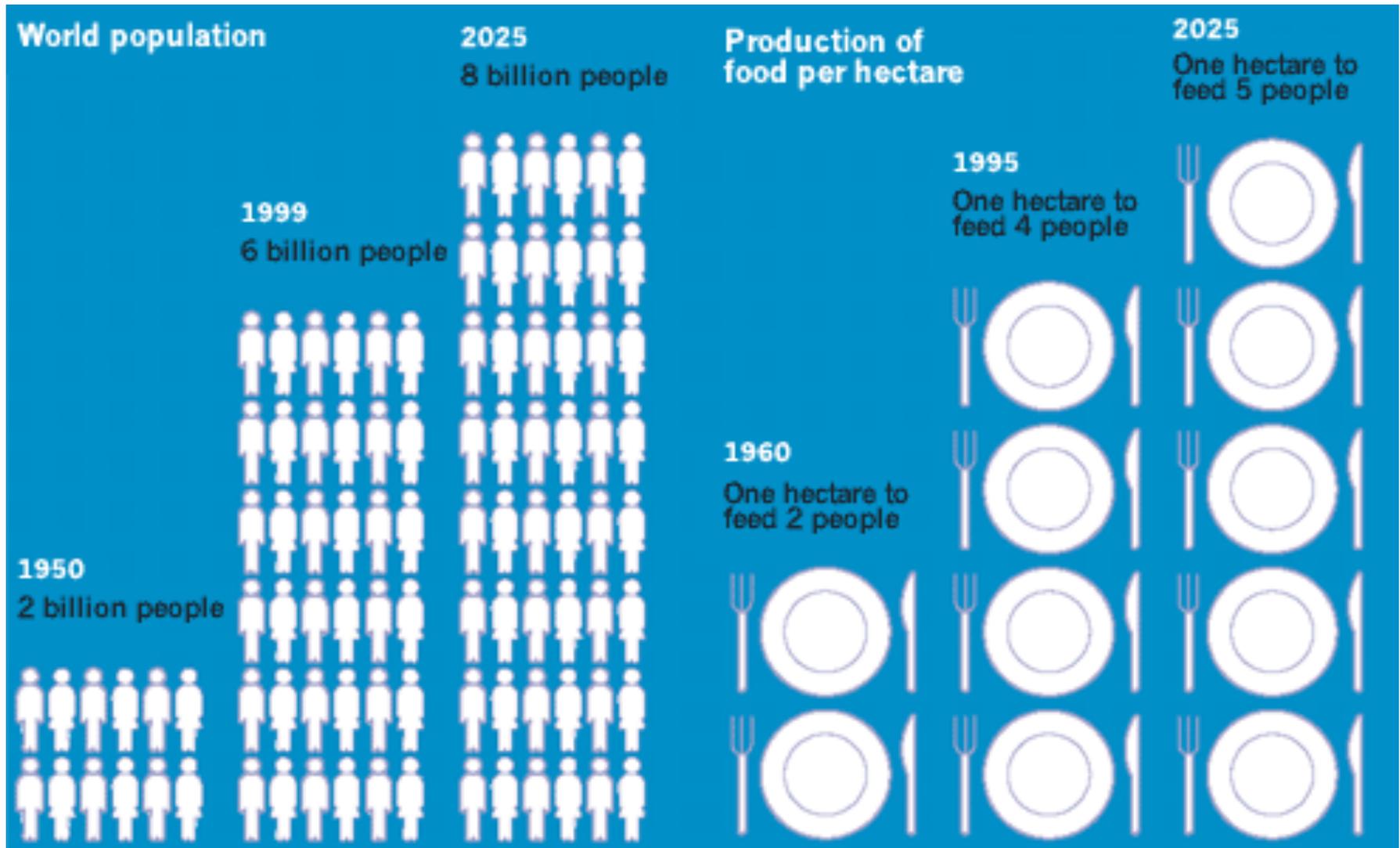


Population growth



More mouths to feed

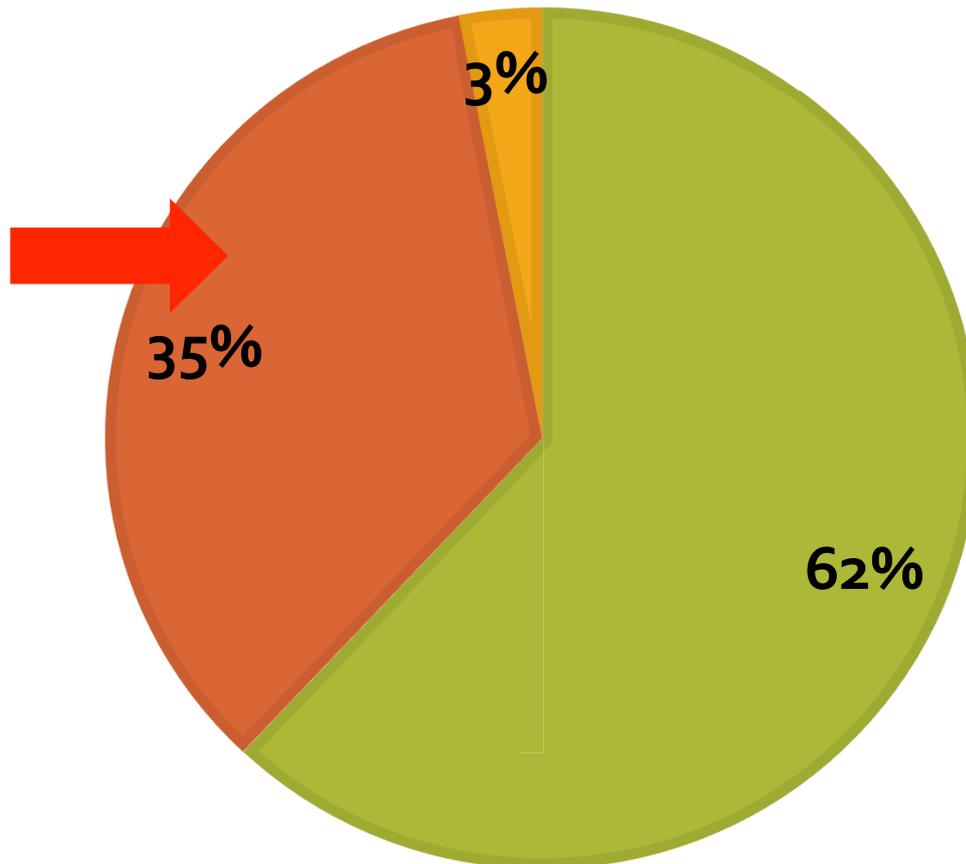
# Predicted demand by 2025



# Hotspots of food insecurity

## GLOBAL FOOD PRODUCE USAGE

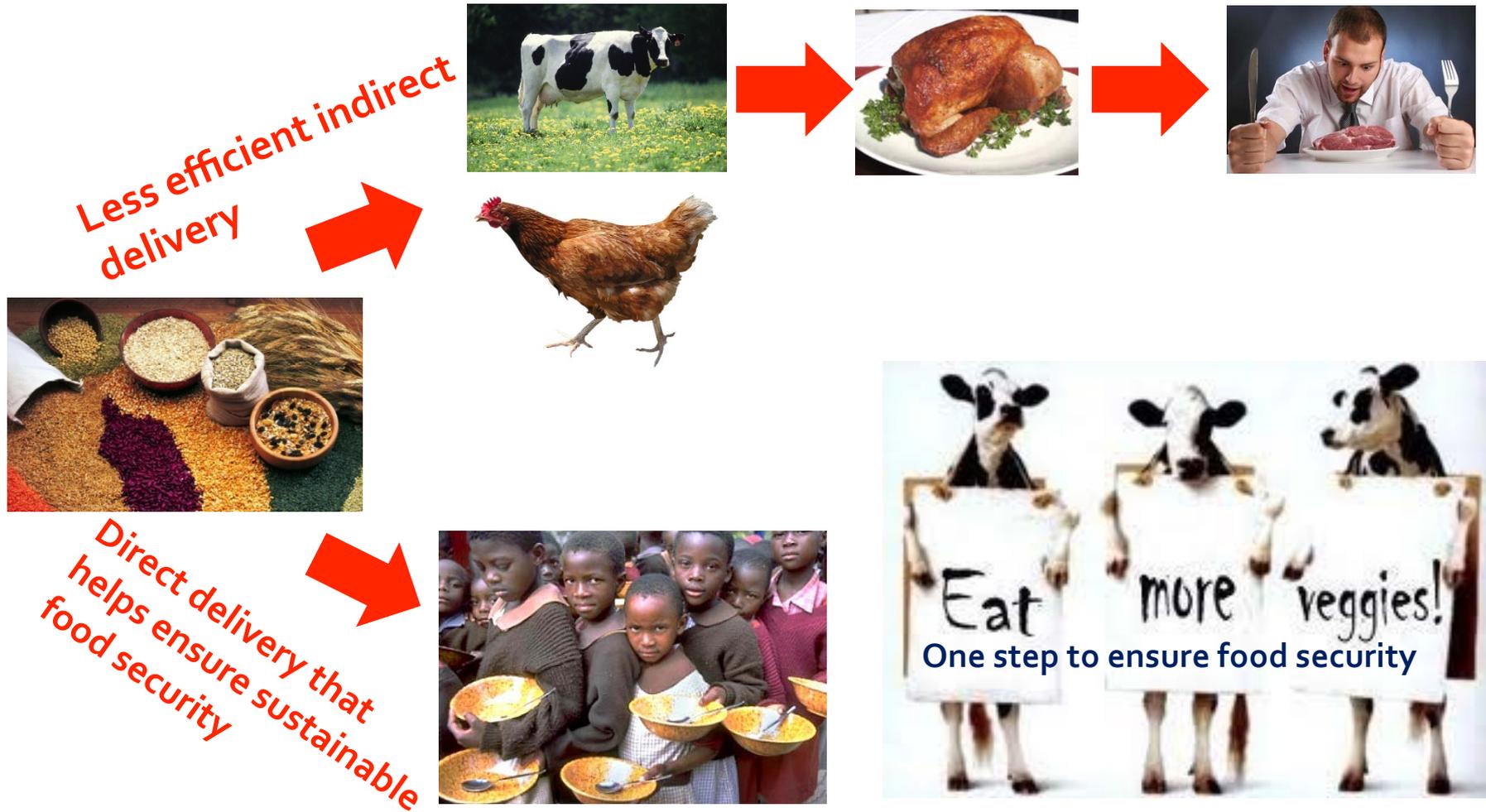
■ Human food   ■ Food as feed   ■ For bioenergy



Change in meat dietary preference will reduce the land used for animal feed!!!

Foley et al., 2011.

# What as an individual we could do?



Foley et al., 2011.

# Hotspots of food insecurity



Improper post harvest  
management (storage  
and pests)



One-third wasted

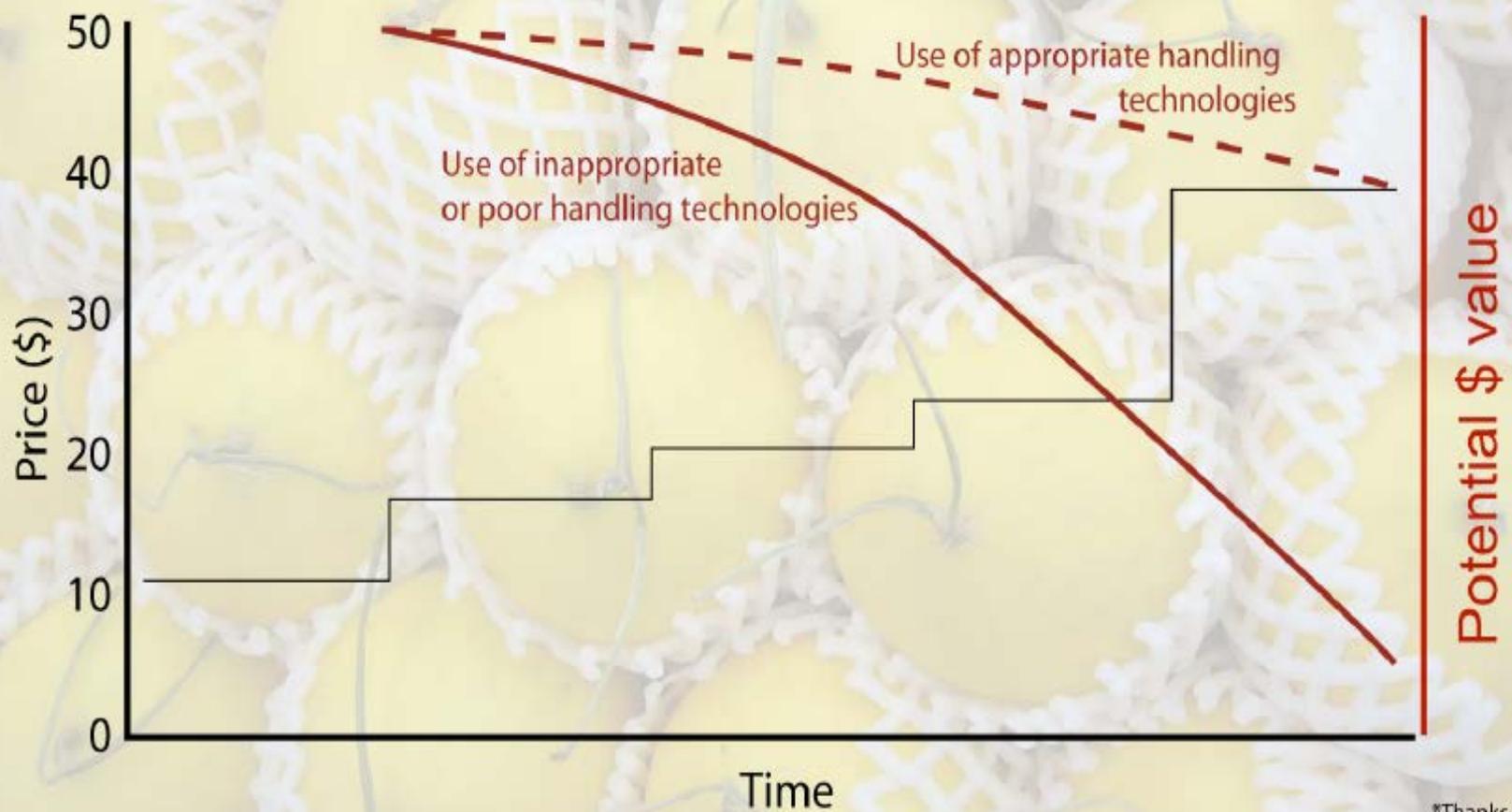


Non-perishable produce

40% loss

Perishable produce

100% loss



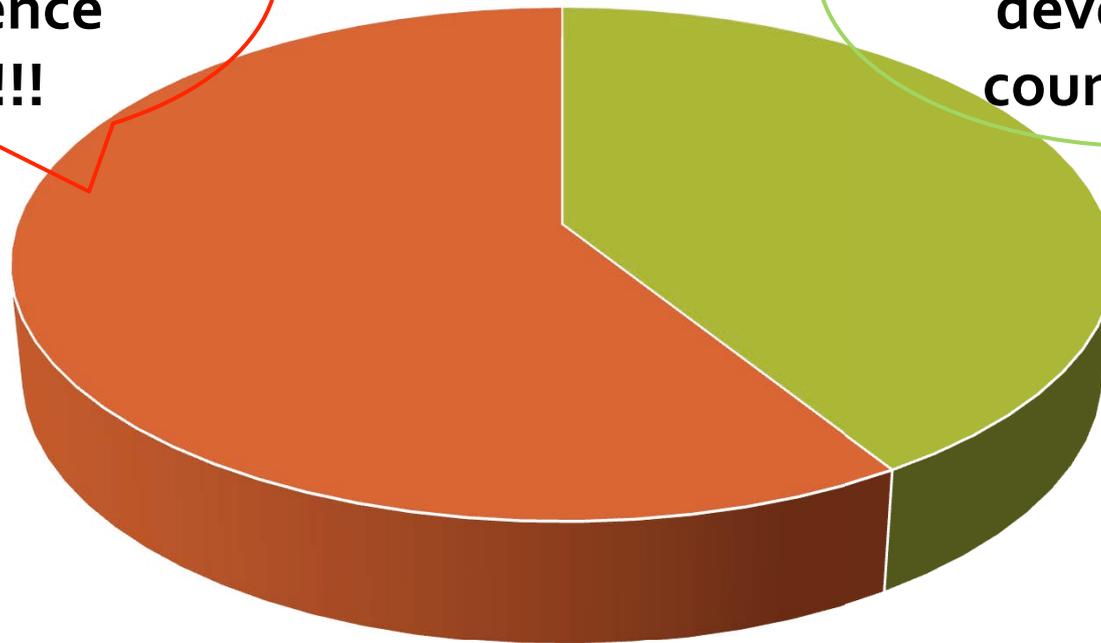
\*Thanks Ray!

# Immediate change possible!!!

## Potential to ensure Food Security

Might need global dietary preference shift!!!

Scientific intervention in developing countries!!!!

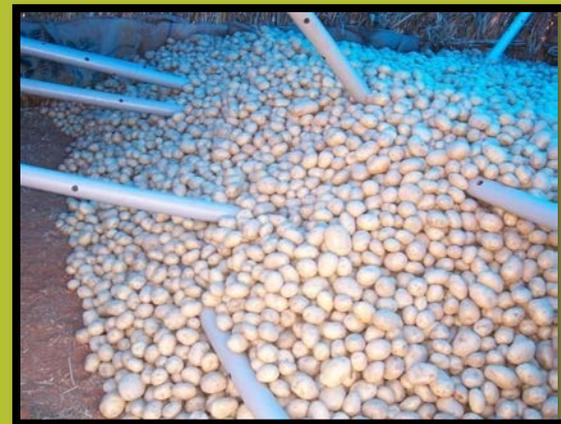


- 100% Food produced for Humans
- Scientific Intervention to cut food loss

# ONE SUCH EFFORT IN INDIA TRANSFORMATION OF POTATO STORAGE IN INDIA TO ENSURE FOOD SECURITY



Before Scientific intervention

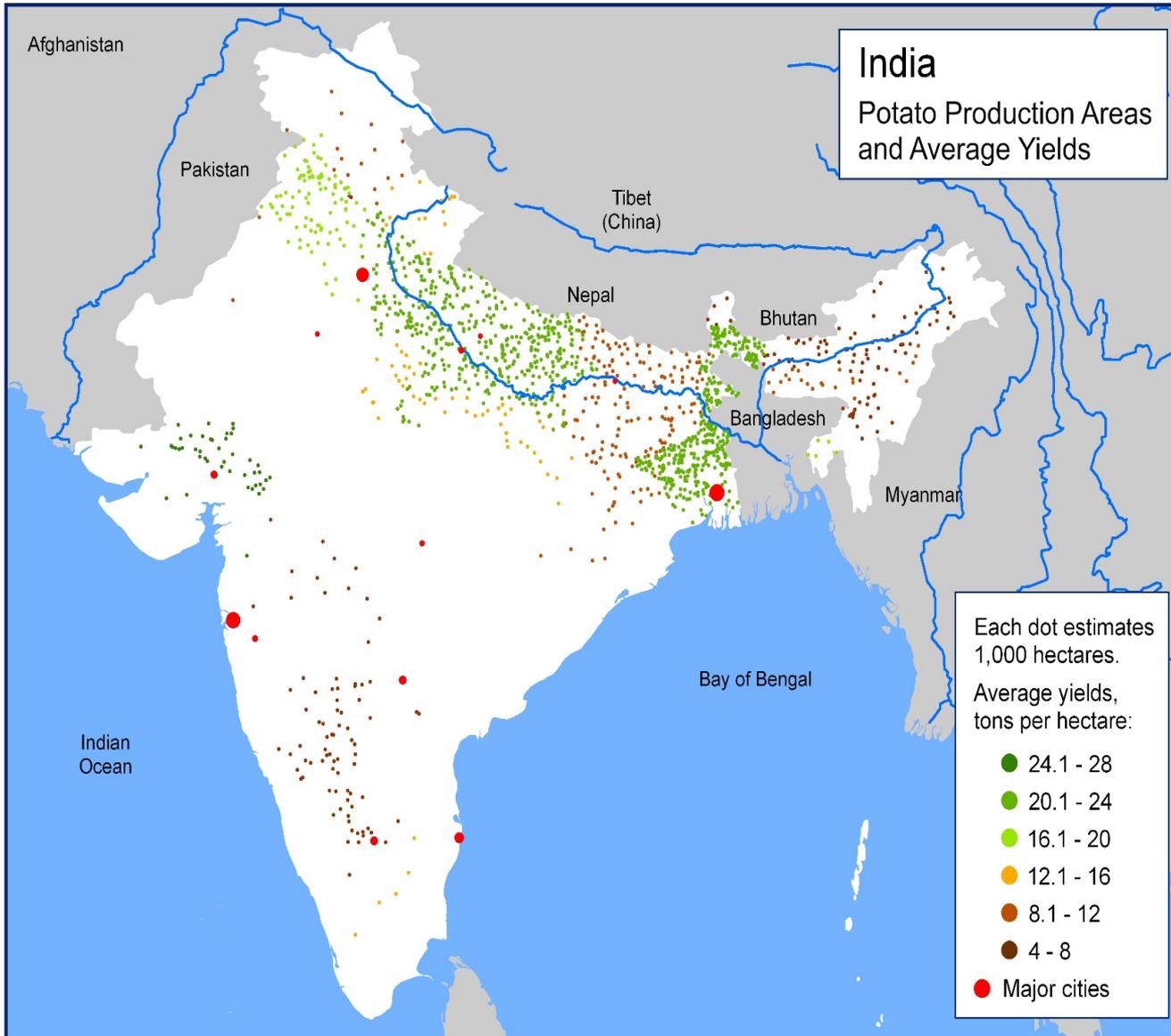


After scientific intervention

# Importance of potato

- **FAO declared 2008 as International Year of Potato & Food of Future.**
- **Potato a significant vehicle for targeting alleviation of :-**
  - **Physical hunger ,**
  - **Hidden hunger and**
  - **Poverty.**
- **Preventing post harvest spoilage of potato can add rhythm to above issues.**

# Status of potato in India



- **38,870.47 tonnes** produced in 2012.
- **25-60%** storage loss incurred due to lack of proper storage techniques.

# Major problems with potato storage

- Adverse weather
- Mix-up of rotting and good tubers
- Improper harvesting
- Respiratory heat production during storage
- Improper aeration during storage

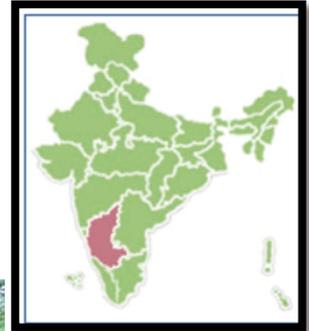


Hot weather



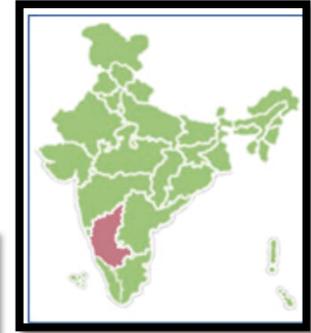
Harvesting  
damage

# Traditional storage structures



Traditional potato "thumboo or daddi" storage in production fields

# Before scientific intervention – Potato storage



**Problems:** **Poor aeration** to maintain **uniform respiration** in the heap.  
**Overheating of tubers** at the bottom or in the middle.

# General observations with traditional storage

- **25-60% loss** of total stored produce within **30- 45 days**
- **Rotting** observed at lower **layer and center** of the heap
- **Rodents damage** was also seen in traditional storage structures



# Losses noticed in traditional storage structure



**Rodents damage -10-15%**



**56-80 % potato rotted**

# After CIDA scientific intervention: Potato storage



Traditional Storage  
Structure



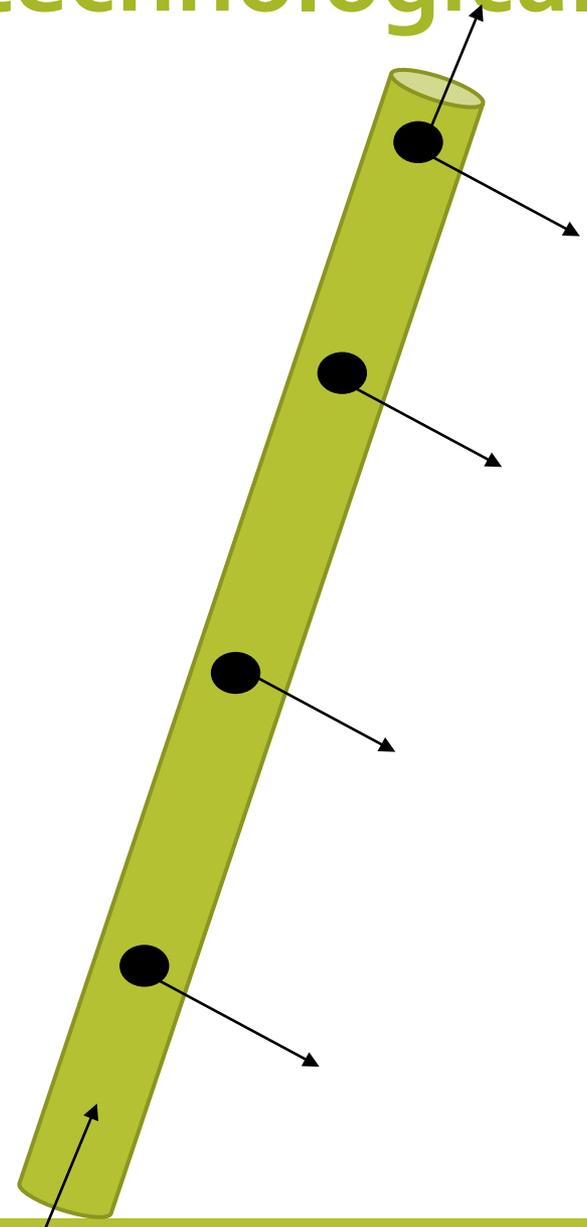
CIDA Improved Storage  
Structure



**PVC pipes with perforations** inserted into the heaps in **crisscross fashion** to facilitate better aeration and thereby **prevent damage.**

# Salient features of this technological innovation

- The air enters through one end of pipe absorbs **the heat through perforations** and takes away the heat through other end due to air current.
- Heat from the **Potato heap is removed by natural evaporative cooling system** through perforated PVC pipes kept at different zones of Potato heaps.



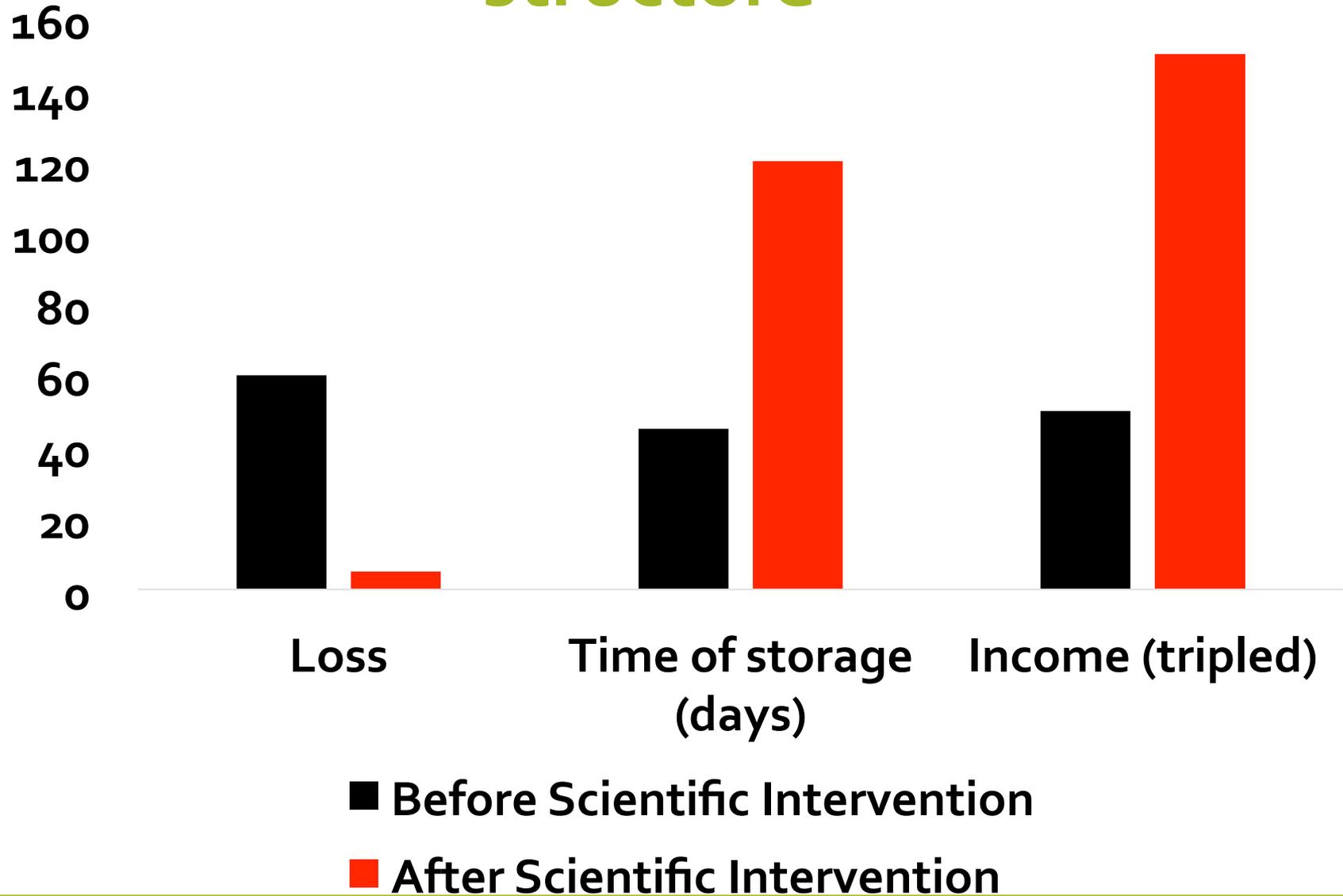
# Potatoes after 4 months In Improved storage structure

3-5%  
rotting

No  
rodent  
damage



# Traditional Vs CIDA improved structure



# Promoting awareness in the other regions of the state



# Promoting awareness – Future Agricultural Engineers



# Conclusion

- We are in need of ensuring food safety to support the growing population.
- One area where scientific intervention could lead to food consolidation and security is to address food post harvest losses.
- CIDA improved structure for potato storage in India has helped consolidation of potato in India.