

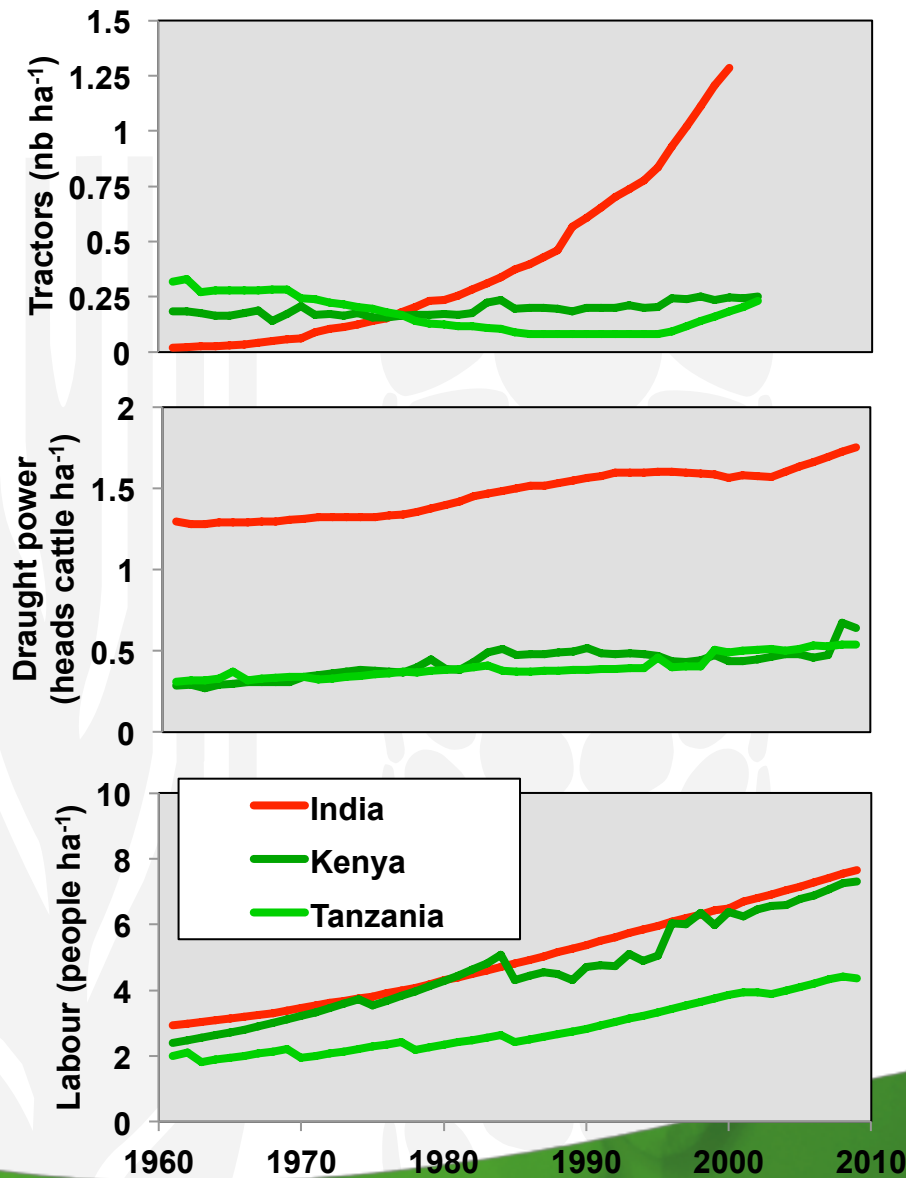
# Farm Power & Conservation Agriculture for Sustainable Intensification



**Frédéric Baudron,**

Bruno Gérard, John Blackwell, Rajiv Pradhan, Heiko Bamman, Moti Jaleta,  
Saidi Mkomwa, Pascal Kaumbutho, Wilfried Mariki, Girma Moges,  
Raymond Nazare

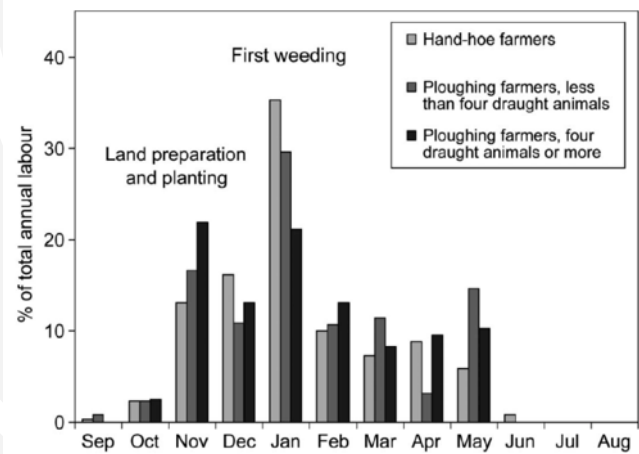
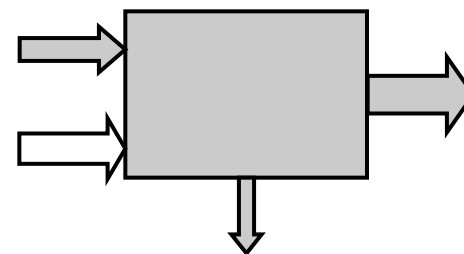
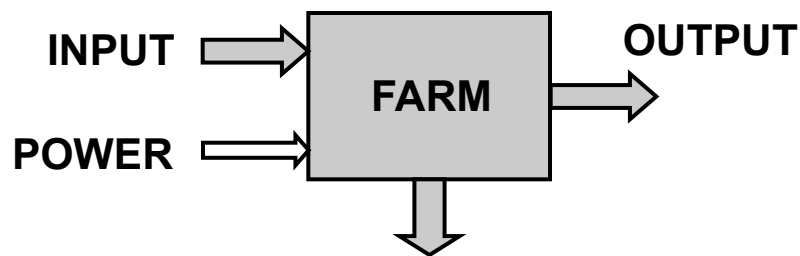
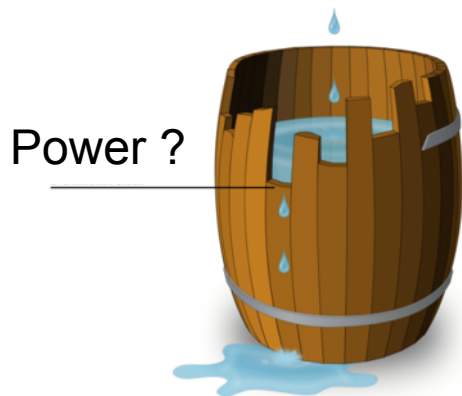
# Declining Farm Power in SSA



# Drudgery (mainly placed on Women): Sub-Saharan Africa vs. South Asia



# Could Farm Power be as Limiting as (or more limiting than) Seeds, Water & Nutrients?



(from Baudron et al., 2012)

# Addressing the Issue of Declining Farm Power



*Increasing power supply:  
Mechanization*



*Decreasing power demand:  
Conservation Agriculture*

# Cons Ag-Small Mech: Synergies

The suppression of inversion tillage reduces power requirements by 50%, allowing for the use of smaller and cheaper sources of power



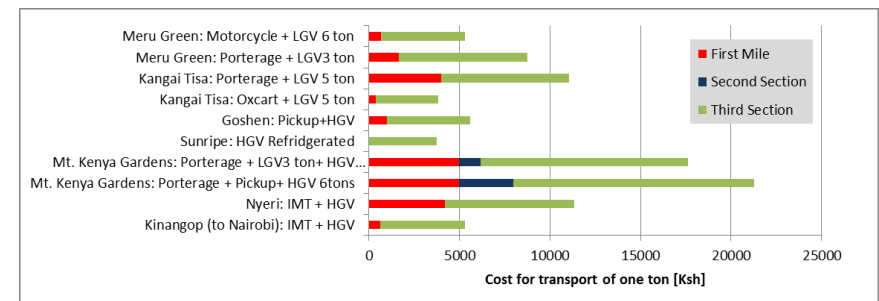
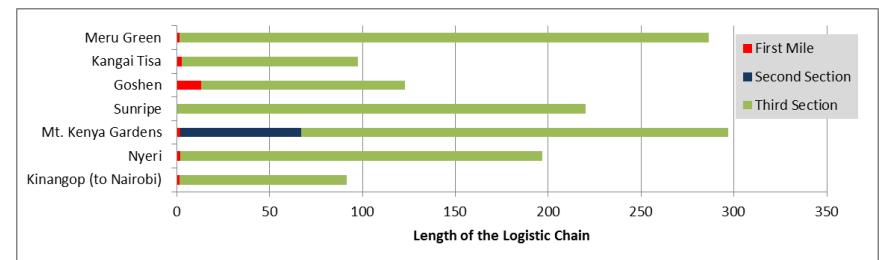
# High Transport Cost on the 1<sup>st</sup> Mile (Farm-Collection Point)

Poor transport leads to:

- Low productivity (*high input costs, high transaction costs to move commodities to the market*)
- High losses (*before commodities reach the market*)



0.4 to 10% of the supply chain length,  
20 to 37% of the transport cost



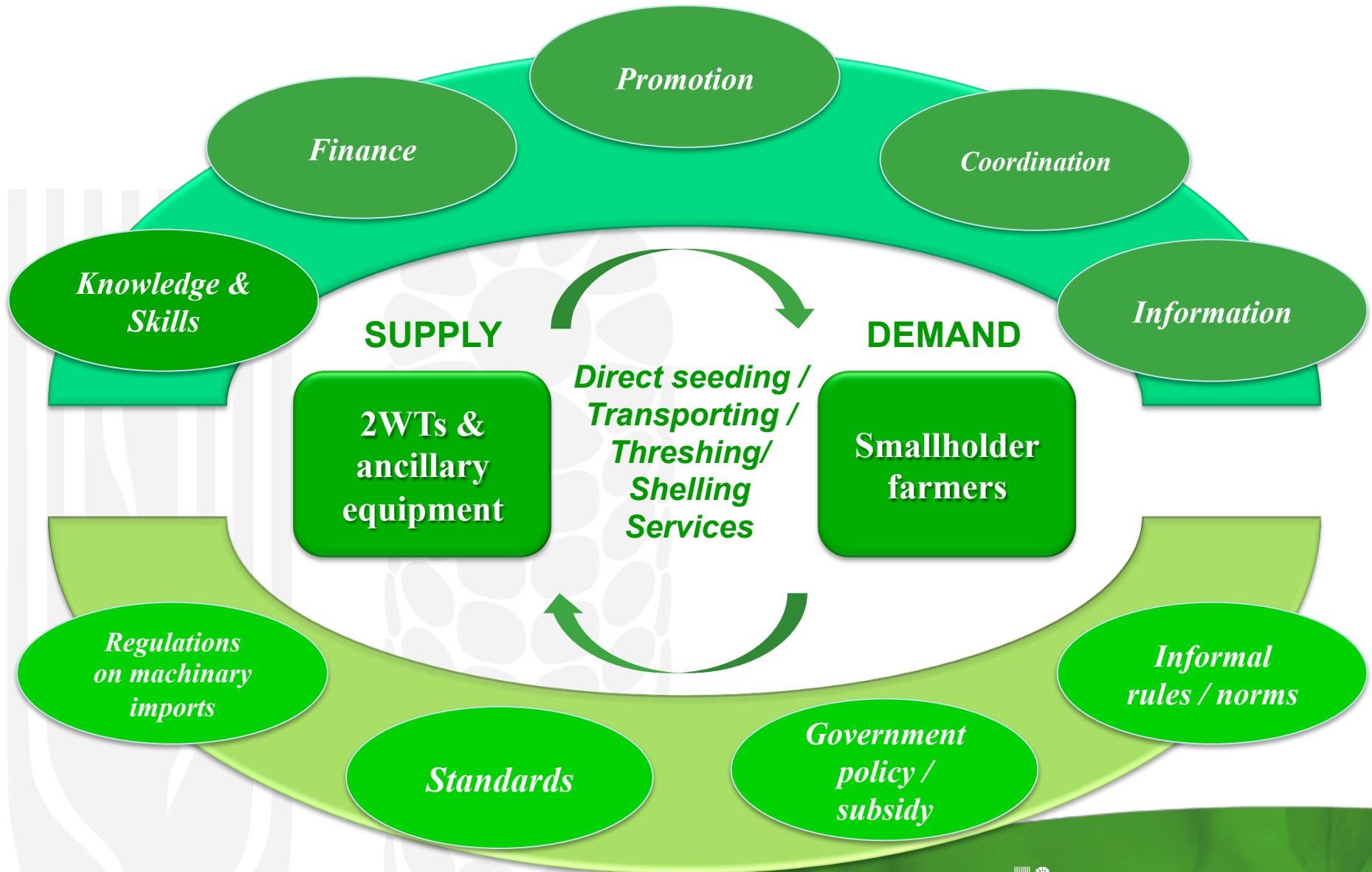
# The Business Model Approach

- Utilizing private sector service providers to support market systems
  - Bundle of services (*e.g. information, training, output aggregation, access to dealers and traders*) embedded in the price of the product
- The case of the treadle pump (*1.5 million units distributed in Bangladesh*)
  - Linkage to output market (*increase of purchasing power*)
  - Promotion (*branding*),
  - Capacity-building of private service providers (*manufacturers, installers*).





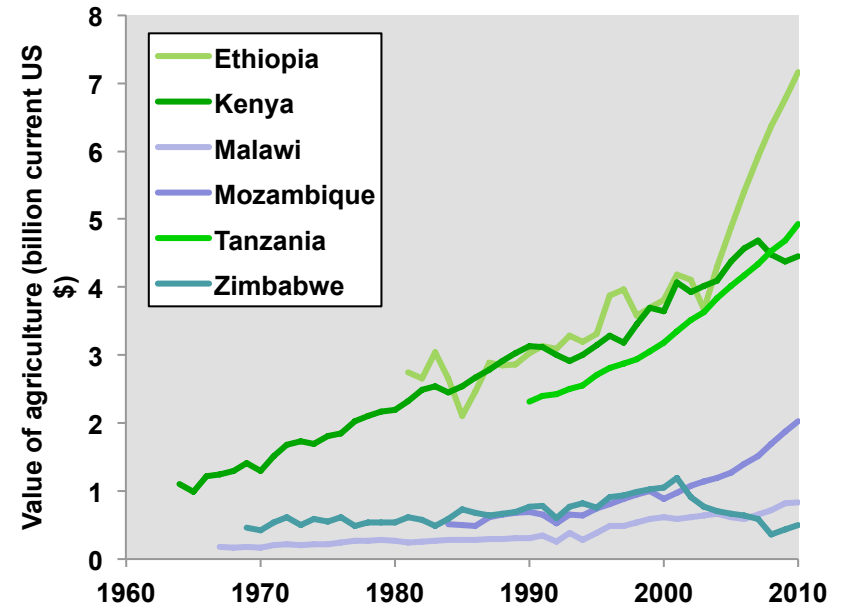
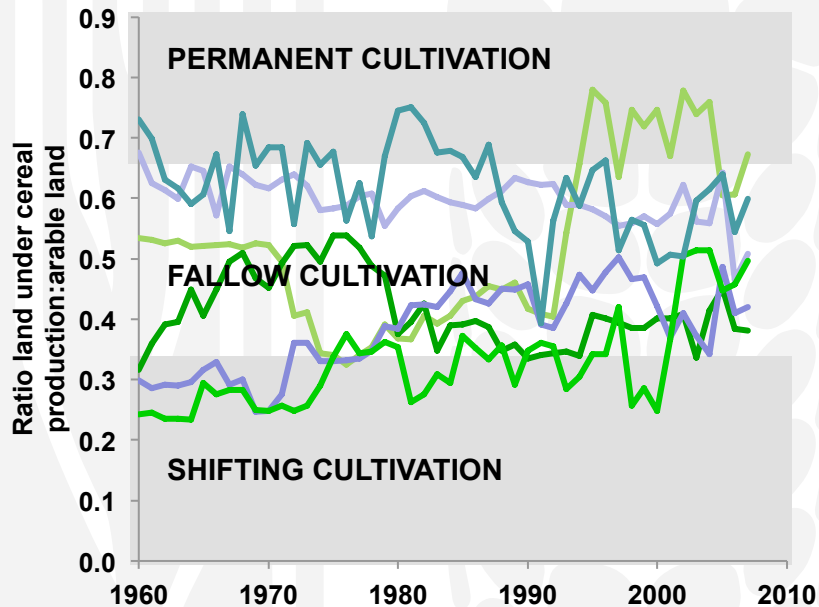
# SUPPORTING FUNCTIONS



REGULATORY FUNCTIONS

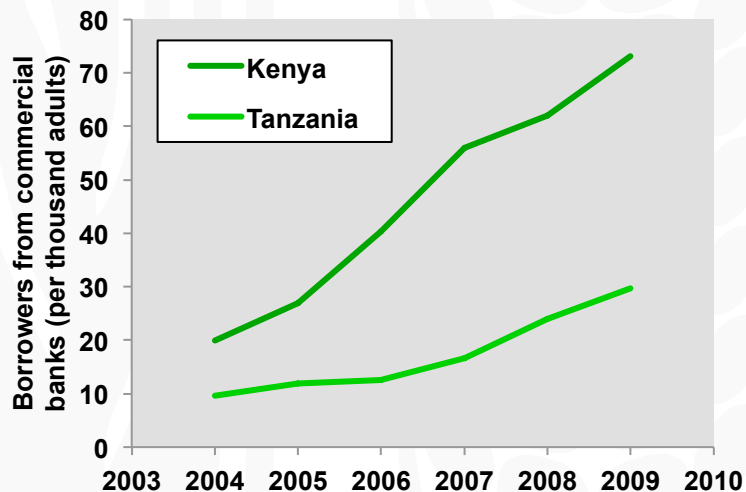
# Conclusion: Why Should it Work This Time?

- Demand for mechanized services has increased (*intensification, commercial orientation*)



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- Past focus on 4WTs (*inappropriate for small and fragmented fields, and too costly for many African smallholders*)

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- Past focus on 4WTs (*inappropriate for small and fragmented fields, and too costly for many African smallholders*)
- Past public sector focus (*inefficient and uneconomic government-run tractor hire schemes*)



# Thank you!

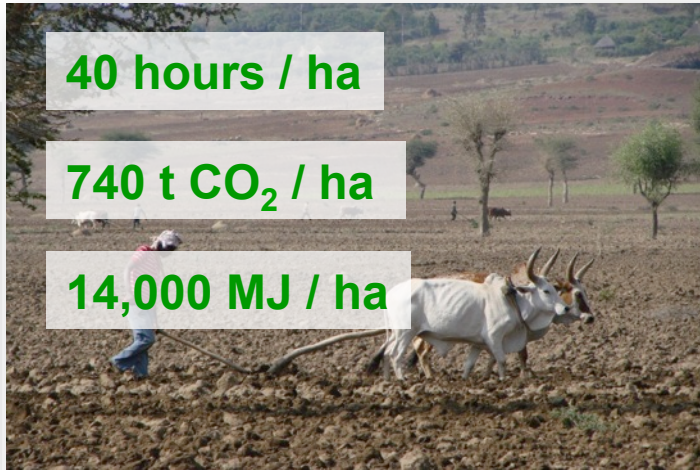


# Benefits of Mechanization

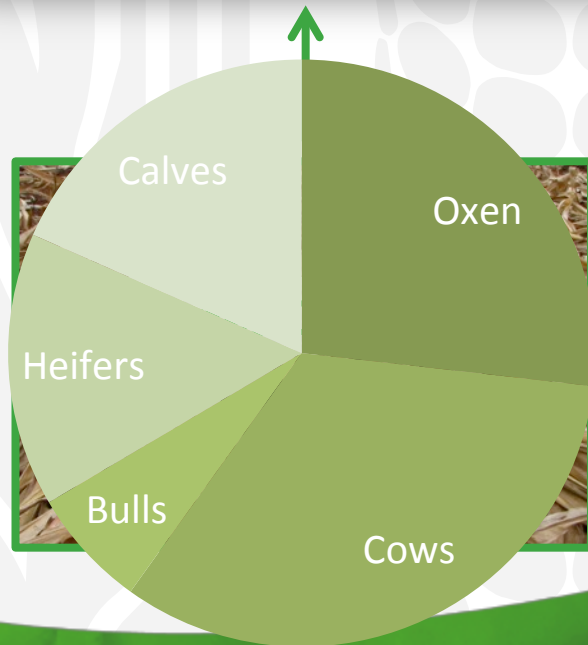
- Increased area under cultivation
  - Manual → ADP → tractor:  
1.5 ha → 4 ha → 8 ha
- Increased land productivity
  - Timeliness
  - Faster turn-around between crops
  - Quality of operations
- Increase labour productivity; reduced labour drudgery
- Increased profitability
  - Reduced costs of cultivation, transport and processing
- Employment creation
  - Freed time during labour peak
  - Increased demand for post harvest operations
  - Support services



# Beast vs. Machine



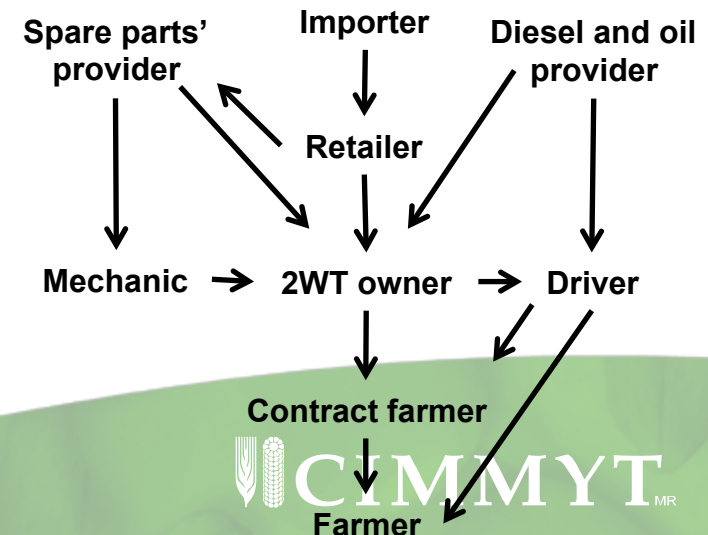
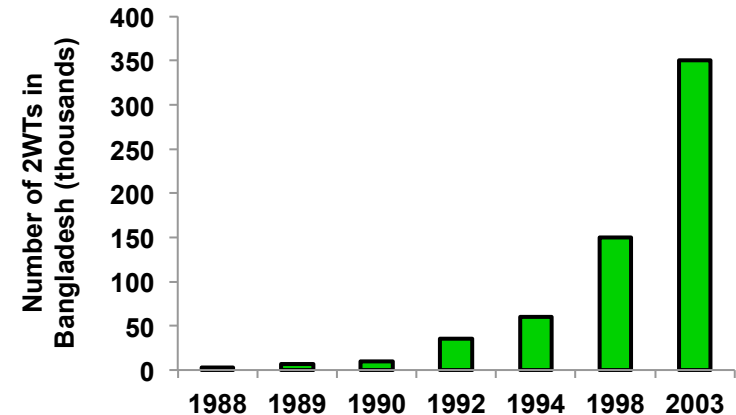
vs.





# A New Look at Mechanization: the Case of Bangladesh

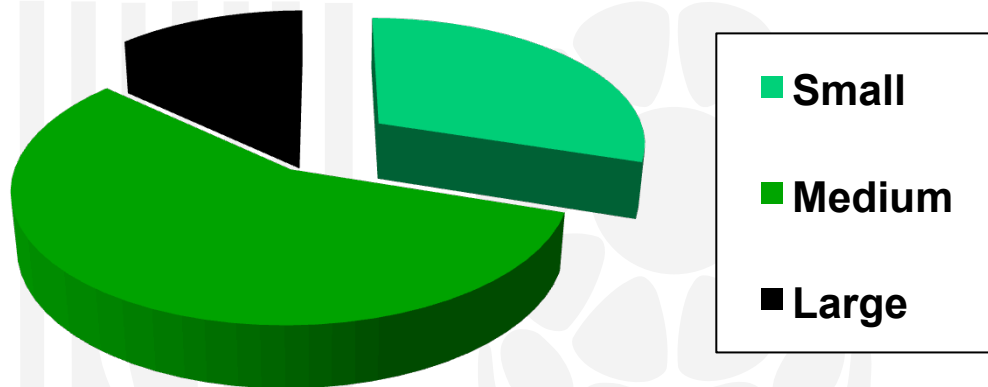
- 80% of land preparation is mechanized
- 1988: removal of duties, sale taxes, standardization restriction
- 350,000 2WTs (vs. 15,000 4WTs)
- Rural entrepreneurs
  - Only 1 in 30 farmers owned a tractor
  - Equity: even the poorest access 2WTs services



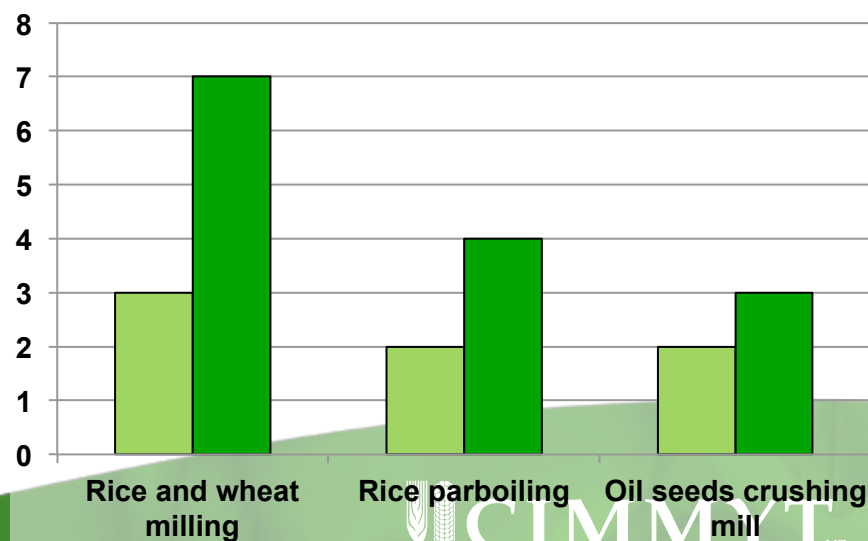
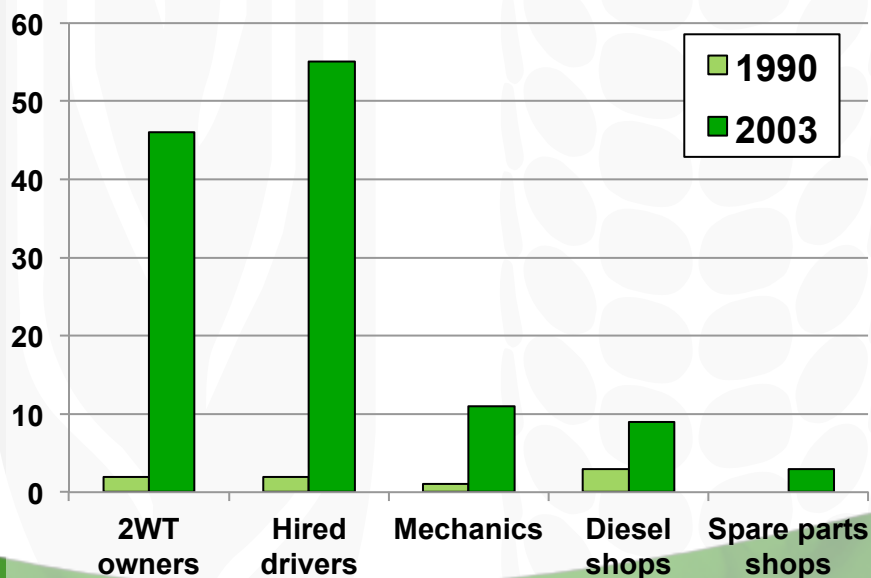
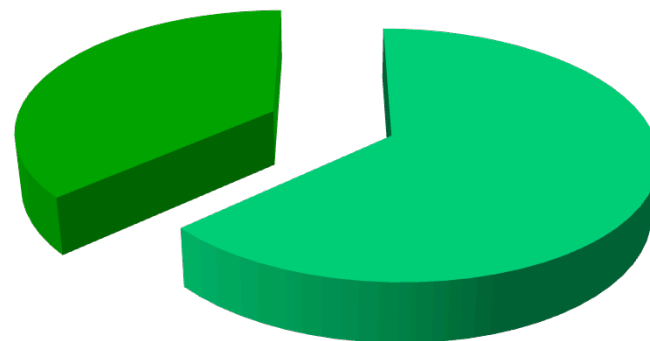
# Social and Economic Impacts

(after Adam et al., 2003)

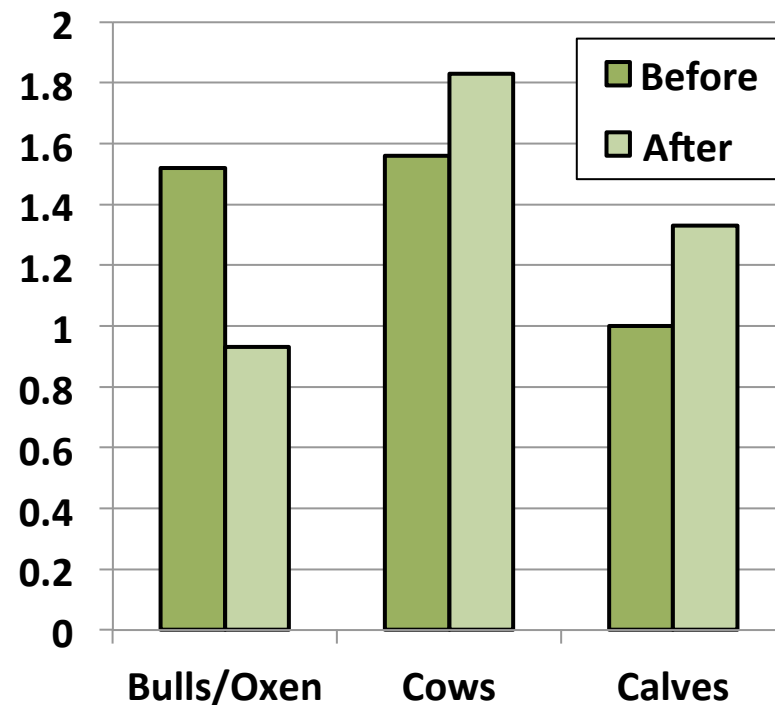
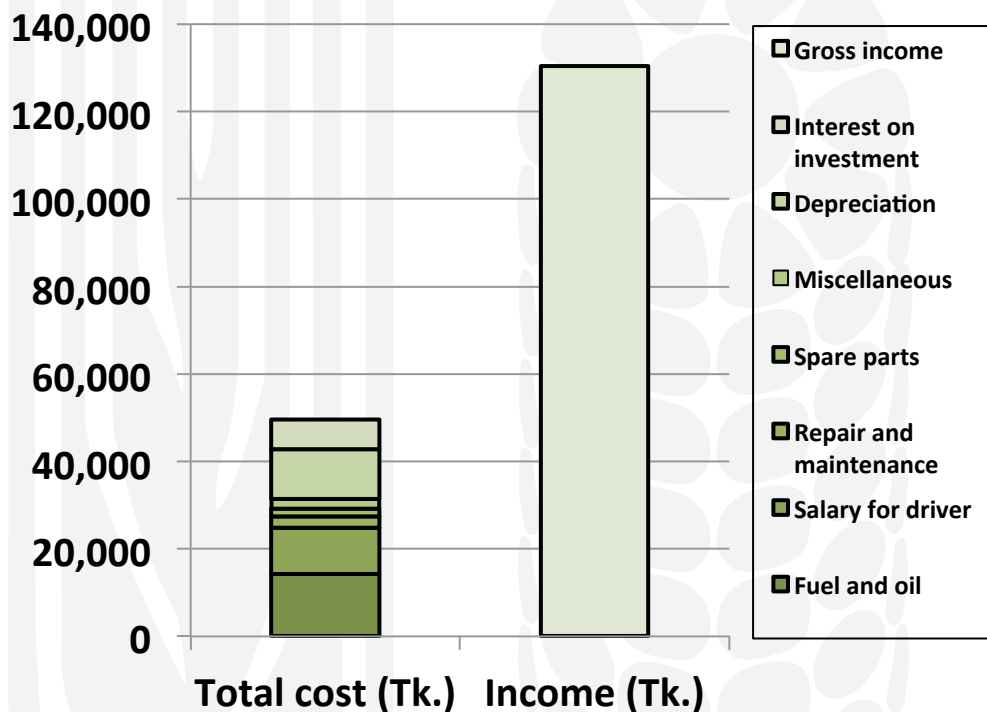
2WT owners



2WT users



# Impact of 2WT-Operated Seeder in Bangladesh *(after Miah, 2008)*

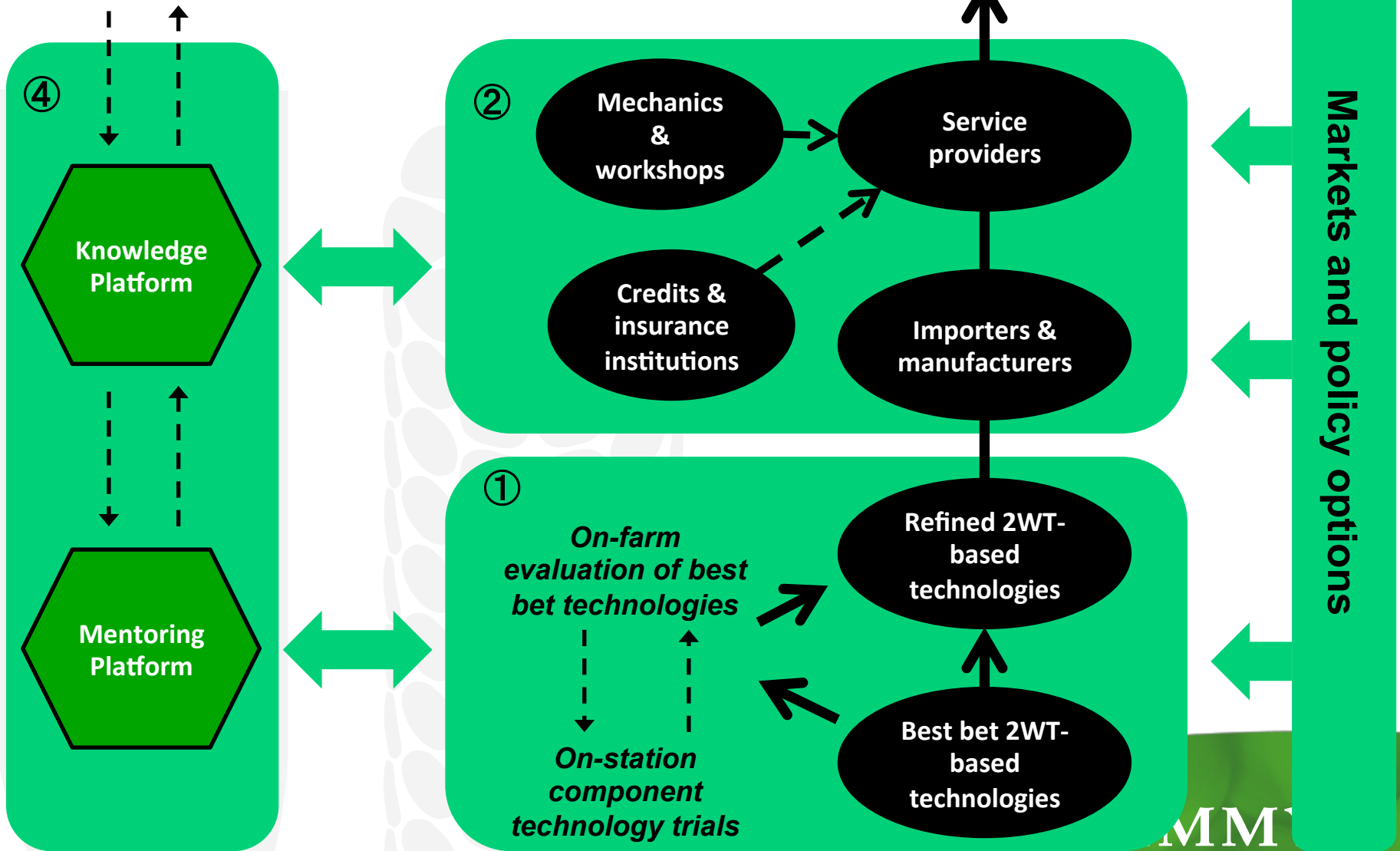


# Stengthening, not Creating, Market for 2WT-based services

	Importer	Manufacturer
Ethiopia	Agricultural Equipment & Technical Service Share Company	Agricultural Equipment & Technical Service Share Company; Amio Engineering PVT
Kenya	Sheik Ali Traders	Ndume
Tanzania	Highland Estate	Intermech Engineering; Nandra
Zimbabwe	Fiver Motors (PVT)	Grownet

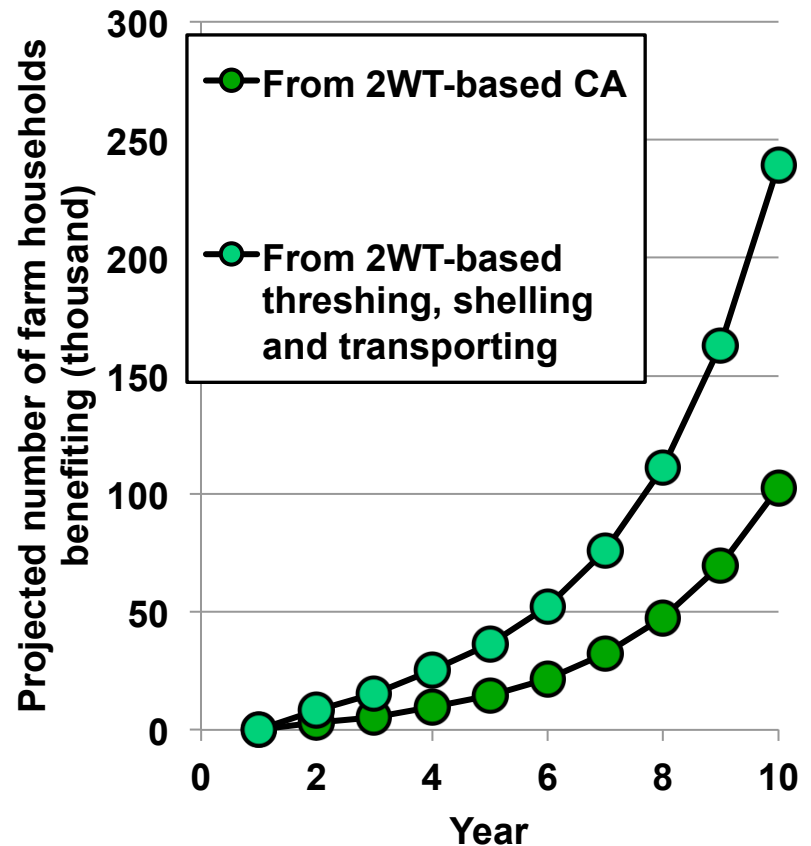
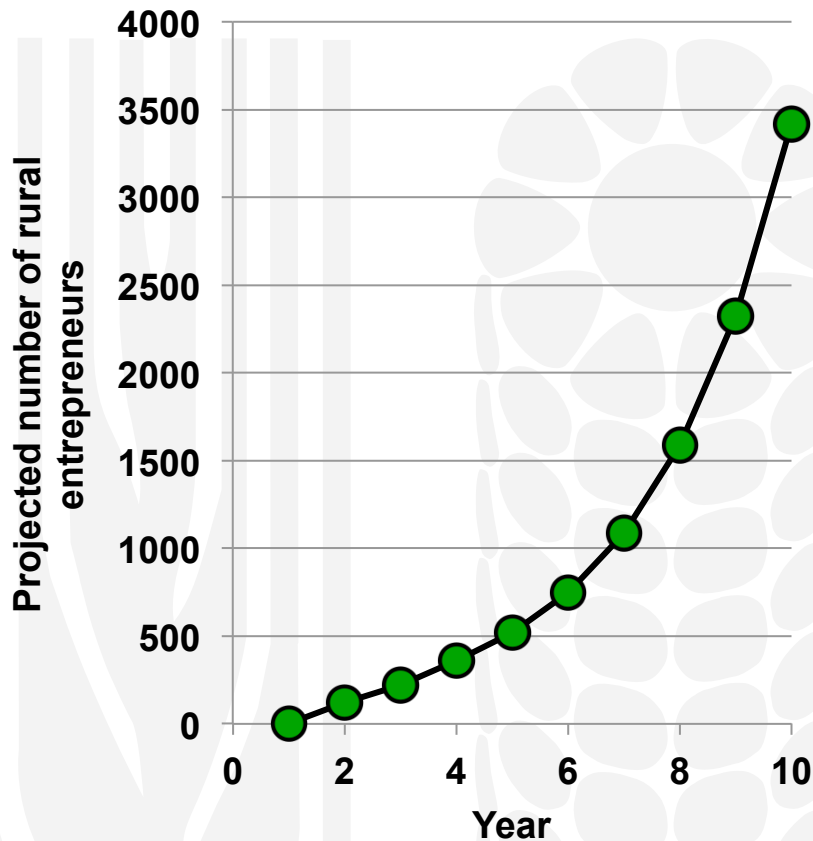


*Experience from  
Africa, South  
Asia & Australia*



MM

# Projected Adoption Pathway





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