

# Agricultural Research for Sustainable Development (ARD): Challenges and Trends



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# Structure

**Introduction**

**Key challenges**

**Institutional responses**

**Decentralization**

**Conclusion**

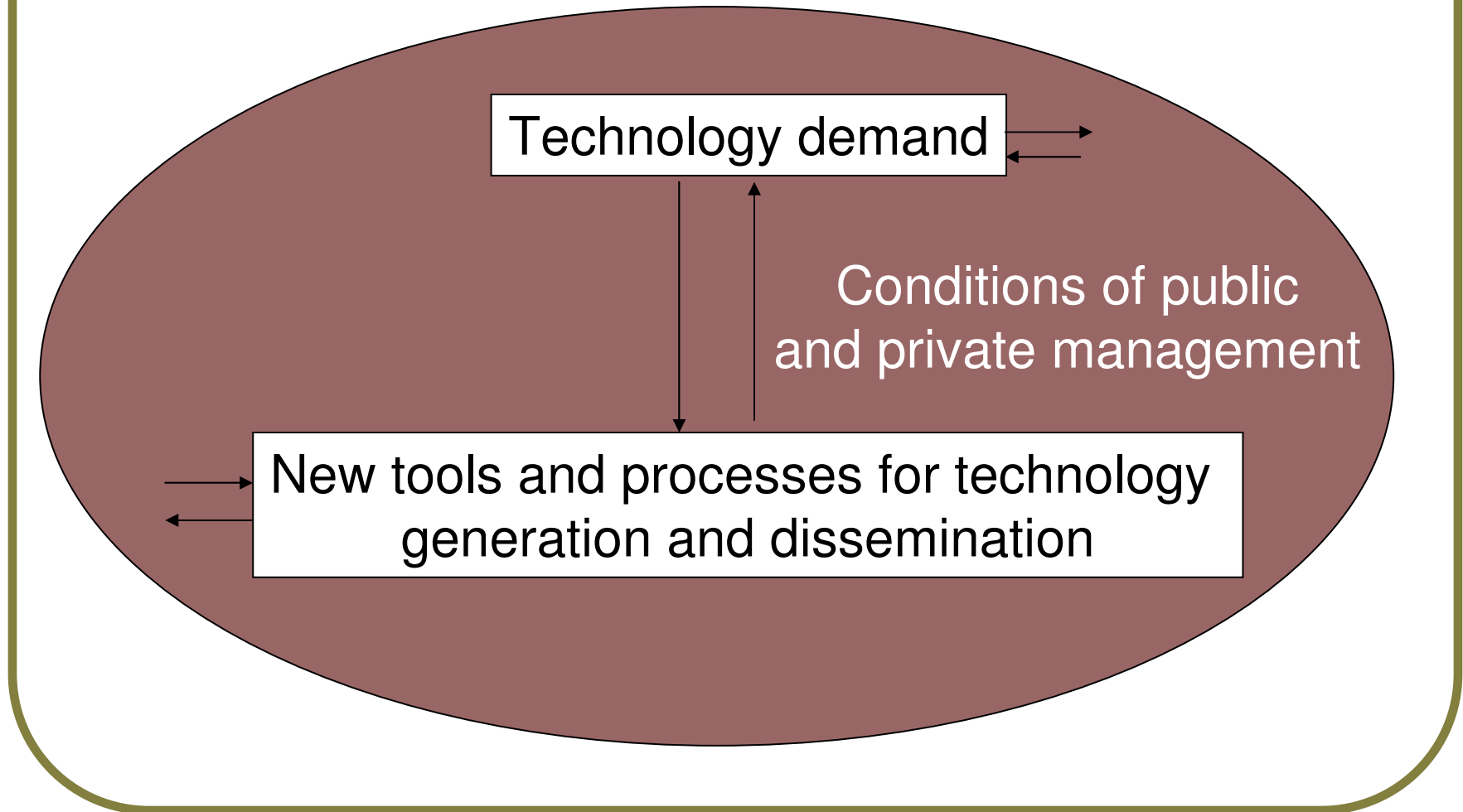
# Introduction

## Agricultural research

- Tools & instruments for **use & management** of land, forest and fish resources
- Contributed to **successes in productivity, specialization and marginalization**

**Despite productivity increase, 800 million people are food insecure**

# Key challenges



# Changes in technology demand

## **Technologies and knowledge for**

- **Sustainable natural resources use for food production**
- **Food safety and better market access (global/local)**
- **Agro-industrial development**

# Changes in technology demand (2)

As income grows...

Low → Middle → High

..consumer demands change..

Basic calories, mostly carbohydrates → Diversified diet including meat and dairy products → Food quality, variety, convenience

... and so do research priorities

Productivity of subsistence products → High nutrition and increased production efficiency → Convenience & processed food  
food safety, environmental quality

# Changes in tools & processes

- **Research advances (e.g. biotech) → institutional collaboration (costs, specialization)**
- **Improved communication tools → international scientific exchange**
- **Increased use of Intellectual property rights (IPR)**

# Changes in public and private sectors' roles (1)

## **Public sector (NARS)**

**Funding ARD (>90% in developing countries versus about 50% in developed countries)**

**Role of public and private sector?**

**Can vary from country to country.**

# Changes in public and private sectors' roles (2)

## **Public ARD advantage for non-saleable products**

- **Can benefit resource-poor farmers -  
→ of little or no interest to commercial sector**
- **Environmental conservation e.g.  
Integrated pest management**

# Changes in public and private sectors' roles (3)

## Criticism of NARS

- **Lack of efficiency and cost control**
- **Not meeting stakeholder needs**
- **Outdated methods**
- **Wrong priorities**

# Institutional responses

## Response options of decision makers

- **Strengthen existing institutions**
- **Change structure of system**

## Evaluation of research systems

- **Efficiency (results: inputs)**
- **Relevance (response to ext. changes)**

# Strategies for institutional change

Condition of NARS	Internal efficiency		
		Low	High
External relevance	Low	Independent new institutions	New innovation within system
	High	Improve function of system	Continue improvement

# Relevant and efficient NARS

Characterized by

- Separating financing and implementation
- Pluralistic structure
- Focus on public goods and diversify funding
- Complementary to private sector
- Institutional autonomy
- Stakeholder involved in defining research agenda
- New models for technology transfer
- Strengthening IPR legislation

# Institutional innovations

## Fields

- **Governance and direction**
  - **Financing**
  - **Management and implementation**
- **Increased relevance and efficiency of research**

# Decentralization (1)

## Decentralization of governance and implementation

- to **increase the relevance** of ARD in the welfare of society (towards **more sustainable agriculture**) through **end-users' participation**
- **decentralization of implementation depends on type and nature of research**

# Research type & implementation

Type of research	Research Program Output	Locus of Execution
Basic research	Knowledge & skills	Concentrated globally
Strategic research	Products (inputs to applied R&D)	Concentrated, often globally
Applied research	Product for users	Concentrated globally or within a country
Adaptive Research	Adaptation to local conditions	Dispersed at regional level within a country
Technology Dissemination	Client adoption	Dispersed at the community level

## **Decentralization (2)**

**Decentralization of financing to extent possible to diversify funding sources**

**Centralization of administration to the extent possible to maximize efficiencies**

# New participatory approaches

## **emphasize**

- **Importance of local knowledge**
- **Farmers' capacity to experiment and innovate**
- **Farmer-to-farmer-diffusion of technology**
- **Need for diversity of technological options, since farmers are heterogeneous**

# How to implement participatory approaches to ARD?

- Develop institutional system linking research with farmers and to extension activities
- System effectiveness depends on the principle of **linking “formal” with “informal”** to create a **feedback mechanism** between them
  - linking scientific knowledge with local knowledge
  - formal experiments with farmers experiments
  - formal diffusion and extension systems with farmer-to-farmer diffusion of technology

# Challenges for more participation in research

- **Mentality** change among stakeholders
- **New skills** for systematic dialogue between stakeholders
- Research and extension institutions need to **incorporate mechanisms for participation**
- **Increasing demand for use of communication** methods and tools and capacity building

# Summary & conclusions

Challenges (demand & type of technologies, role of public/private)


Institutional responses

Decentralization and increased participation of stakeholders to improve efficiency and relevance.

System required that links “formal” with “informal” and increasingly demand communication methods and tools.

# Questions & answers





“Today’s scientists need to be both disciplinary and multidisciplinary, to have the breadth to see problems, and the depth to solve them (Reis, 2000)”

Understanding requires **efficient communication among wide range of stakeholders!**

## Further reading

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