

# **Application of Innovation Systems Perspective in AR4D: Prospects and Challenges**

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# Purpose

- Trace the evolution of systems thinking in AR4D
  - Knowledge/Technology to innovation
  - NARIs to AIS
- Status of current research within AIS
- Identify the key challenges and issues in integration

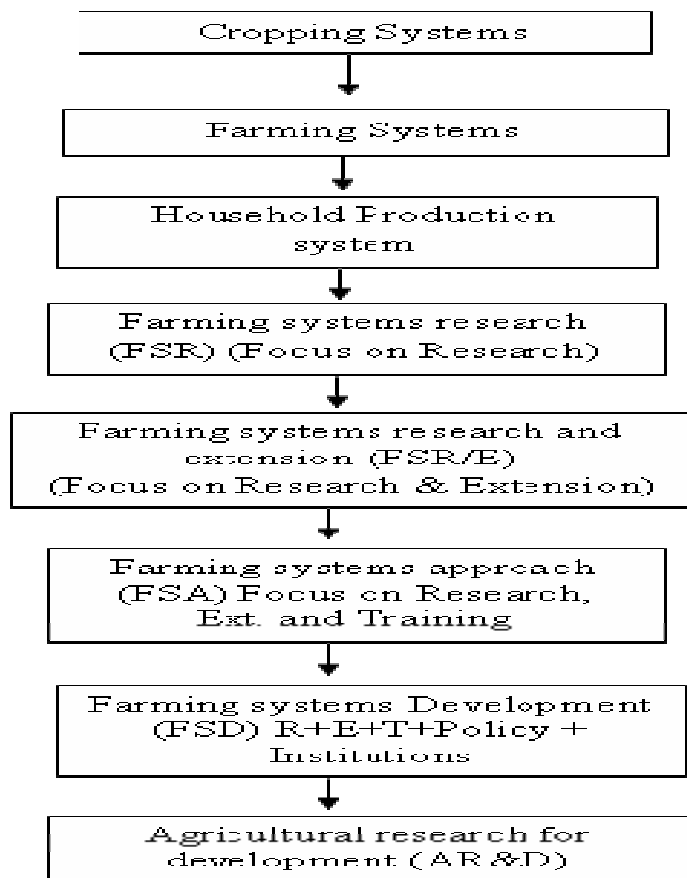
Not to present prescription, but to provide input for deliberation

# Application of Systems Thinking in Agriculture

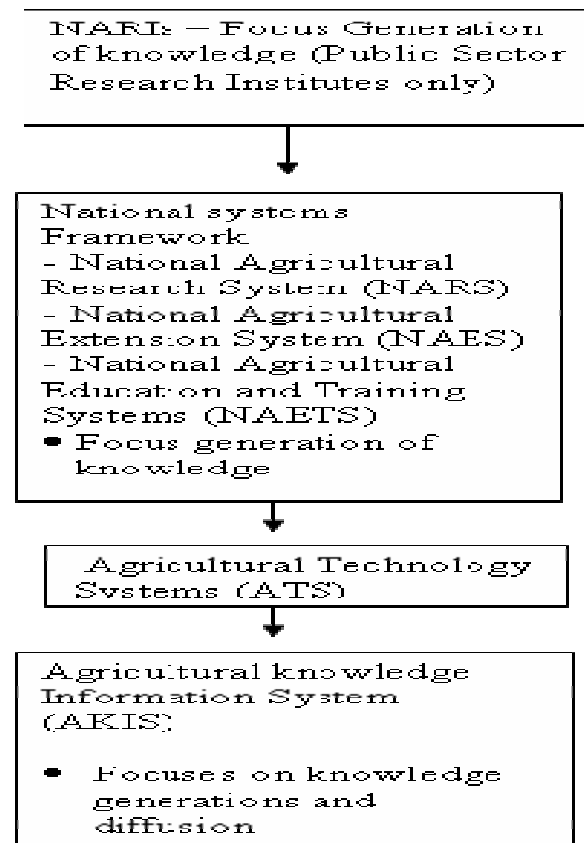
- Framework for Technology Development and Dissemination (TDD)
  - FSR to AIS
- Organizational analysis within R&D
  - NARIs to AIS
  - ❖ Both are interlinked
- Both thinking evolved simultaneously

# Systems Thinking and its application in Agriculture

## Framework for Technology Development



## Framework for Institutional Analysis



Agricultural Innovation System (AIS)  
Focus on knowledge, generation, diffusion and application

# Application to Organizational Analysis

## Components, Partners and Environment

No.		NARI	NARS	TDT	AKIS	AIS
1	Commodity, factor and Thematic Research Institutes	C	C	C	C	C
2	National Coordinating Body or Mechanism	C	C	C	C	C
3	Universities and Faculties of Agriculture	E	C	C/P	C/E	C
4	International Agricultural Research Centers	E/P	E/P	E/P	E/P	C
5	Other International Research Organizations	E/P	E/P	E/P	E/P	C
6	Advanced Research Institutes	E/P	E/P	E/P	E/P	C
7	Universities in Advanced Countries	E/P	E/P	E/P	E/P	C
8	Private Sector Research (domestic and international)	E/P	E/P	E/P	E/P	C
9	Farmer Organizations and Commodity Organizations	E/P	E/P	E/P	E/P	C
10	National extension or parastatals development organizations	E/P	E/P	C	C	C
11	Agricultural input and output marketing organizations	E	E/P	E	E	C
12	Cooperatives and farmer based intermediaries	E	E/P	E/P	C	C
13	Non-governmental organizations: agricultural	E	E/P	E/P	C	C
14	Non-governmental organizations: community based	E/P	E/P	E/P	E/P	C
15	Sub Regional, Regional, Global coordinating bodies	P	P	E/P	P	C
16	National policy making mechanisms	E	E	E	E	C
17	External S & T context				E	C

# **As one moves from NARI to AIS..**

- The goal of the system becomes broader
- The number of organizations considered as “components” become larger and all inclusive
- Issues of linkages, partnerships and interactions become central to organizational performance

# **Factors Contributing to the adoption of ISA in Agriculture**

A number of factors contributed to the adoption of AIS:

- Successful application of the concept in the industrial sector
- Inadequacy of the existing framework to be all-inclusive in terms of coverage
- Multiple sources of innovation model
- Inadequacy of the linear model to explain the process of innovation
- Increased demand for demonstrated developmental impact – Impact orientation

# **Innovation System and Innovation Systems Perspective**

- Soft system – social and analytical construct that does not exist physically
- Not a theory but an organizing principle, useful for empirical analysis
- Benefiting from other existing theoretical foundations

# Focus of Innovation Systems (IS) Research

- Understanding the innovation process
  - Case studies
  - Best Practices
- Analytical Framework to facilitate empirical analysis
  - Diagnostic tool at the sectoral level
  - Options for intervention
- Concepts, Tools and Methods development for studying Innovation – Networks and Partnerships
- Using IS Perspective in the design and implementation of AR4D!!!

# **Analytical Framework**

## **World Bank Study - 2006**

- Purpose: assess the usefulness of IS concept in guiding investments to support the development of Agricultural technology
  - An operational AIS concept for client countries
  - Options for intervention (30)

# **Analytical Framework and Diagnostic tool (sectoral level)**

- Basis
  - Actors who start the process – public, private
  - Factors that trigger innovation – policy, market
- Selected case studies
  - Shrimp (Bangladesh); Food processing (Bangladesh); medicinal plant (India); Vanilla (India); Pineapple (Ghana); Cassava processing (Ghana and Columbia); cut flowers (Colombia).

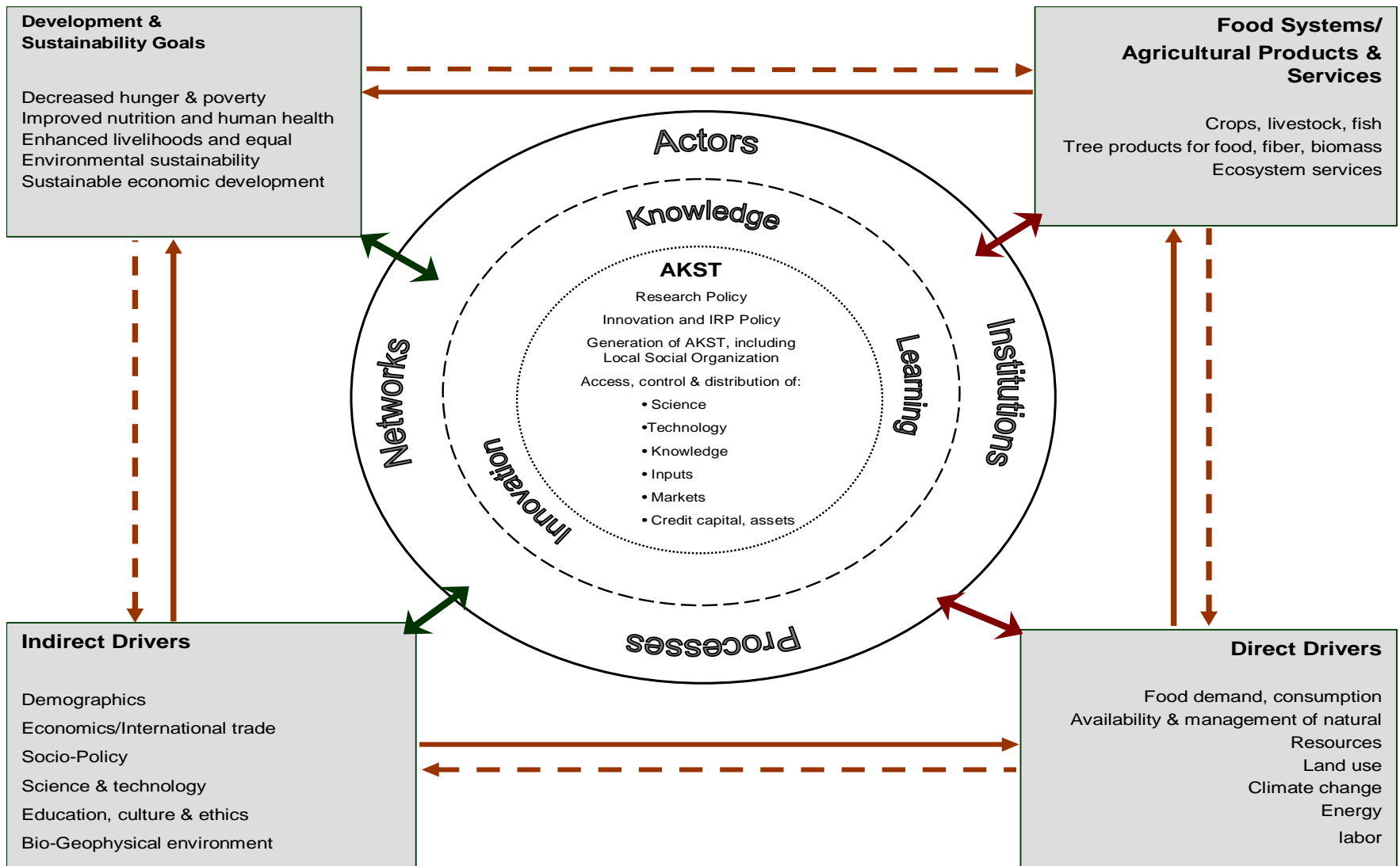
# Innovation Trajectories and Phase

<b>Orchestrated Trajectory (Government)</b>	<b>Opportunity driven Trajectory (Private sector – companies and individuals)</b>
<p><b>1. Pre-planned Phase</b></p> <ul style="list-style-type: none"> <li>• No research or policy intervention made</li> <li>• New opportunities not yet identified</li> </ul>	<p><b>1. Nascent Phase</b></p> <ul style="list-style-type: none"> <li>• Private sector is more proactive</li> <li>• New market opportunities identified, but a recognizable sector not emerged</li> </ul>
<p><b>2. Foundation Phase</b></p> <ul style="list-style-type: none"> <li>• Priority sector and commodities identified</li> <li>• Support through policy intervention</li> <li>• Limited effect on growth</li> </ul>	<p><b>2. Emergence Phase</b></p> <ul style="list-style-type: none"> <li>• Rapid growth due to private sector, NGOs</li> </ul>
<p><b>3. Expansion Phase</b></p> <ul style="list-style-type: none"> <li>• Interventions to link actors (projects and programs)</li> </ul>	<p><b>3. Stagnation Phase</b></p> <ul style="list-style-type: none"> <li>• Increase pressure to innovate competition, changing consumer demand, trade, rules</li> </ul>
<p><b>4. DYNAMIC SYSTEM OF INNOVATION</b></p> <ul style="list-style-type: none"> <li>• High degree of public-private involvement</li> <li>• Socially inclusive and environmentally sustainable economic growth</li> </ul>	

# Comments on Framework

- Useful for system diagnosis at sectoral level
- May not accommodate all possible scenarios
- Prescription Vs. Principles and broader guidelines
- No universally applicable blue print
- Potential application of the concept in agriculture requires empirical validation
- Need to be careful about over generalization

# AKST – Analytical Framework



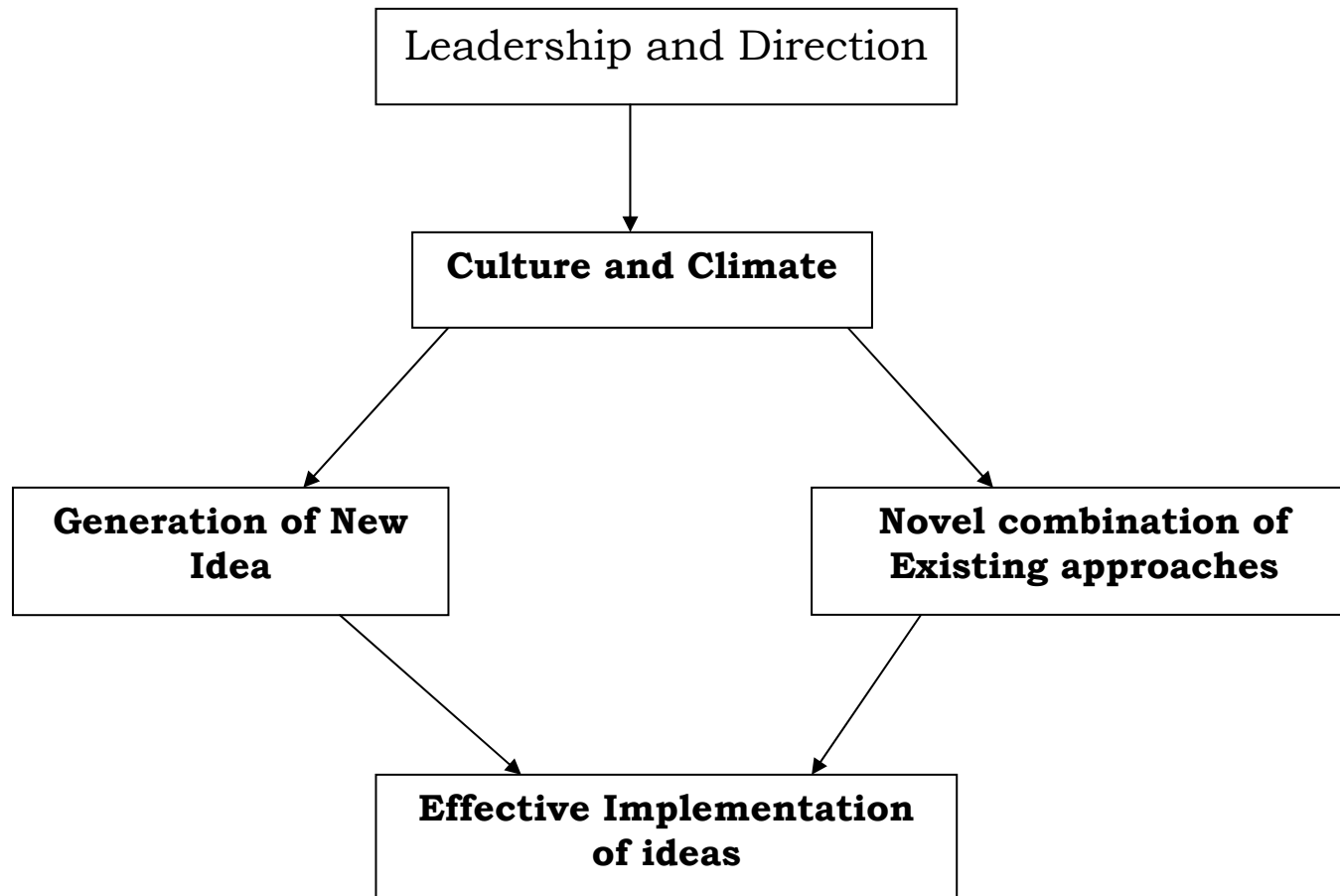
# Key Issues/Questions

- How can the R4D managers and practitioners utilize the available knowledge and understanding?
- How to apply the ISP to enhance the performance and impact of AR4D?
- How do we internalize the concepts and procedures (Institutionalization)?
- What are the implications and challenges?

# **Preconditions for Successful Institutionalization:**

- Clear demonstration of the utility of the process
- Policy and organizational commitment – including resources
- A clear national strategy for institutionalization
- Trained capacity to implement
- A national capacity to offer continuous training
- Broader participation and effective linkages

# Critical steps towards building the culture of innovation



# **Developing an Institutional Structure for AIS**

Strategic principles:

- Systems development and networking
- Introduction of new funding mechanisms for publicly subsidized services
- Organizational Capacity development of individual Service providers

# **Developing an Institutional Structure for AIS Cont...**

- Support institutions which promote communication and public debate on agricultural problems and thus help to identify the guidance and social control of public R&D institutes.
- Foster capacity to manage and account for external funds with a greater degree of accountability and impact orientation.

# Implications and Challenge

- (1) How to develop productive and sustainable institutional arrangements for AIS?
  - Growing interrelationships between participants
  - Intensive communication between stakeholders
  - Political and economic context
- What are the preconditions needed to achieve this?
- How do we institutionalize the AIS thinking
- How do we facilitate the creation of learning institutions?

# Implications and Challenges

## cont...

- (2) How to create the capacity for innovation?  
Building up of collective capacity of networks or systems of actors interactively linked with a view to innovate.
- (3) How to assess successful partnerships, networks and innovations? How to reward and provide incentives? How do we demonstrate the utility and added value?

# Implications and Challenges

## cont...

- (4) How do we scale up the capacity to innovate? Scaling up the innovation as well as the capacity to innovate.
- (5) How to ensure adequate attention is given to such factors as socio-economic equity, and environmental sustainability? - How to promote pro-poor innovation?

# Implications and Challenges

## cont...

- (6) How can we better understand the factors that contribute to the successful and sustainable innovations?
- (7) What are the central concept, methodologies and principles that contribute to the institutional and organizational transformations needed to promote successful innovations?

# Top Ten killers of Innovation

- Not creating a **culture** that supports innovation
- Not getting buy-in and **ownership** from business unit managers
- Not having a widely understood, system-wide **process**
- Not allocating **resources** to the process
- Not tying projects to organizational **strategy**
- Not spending enough time and energy on the **fuzzy front-end**
- Not building sufficient **diversity** into the process
- Not developing **criteria and metrics** in advance
- Not **training and coaching** innovation teams
- Not having an **idea management system**

# Conclusions

- Innovation is an essential ingredient for success in R&D
- How to identify/generate commercially relevant innovation and how to achieve it consistently
- The innovation concept is empirical
- Developing, nurturing and Managing a productive and sustainable institutional structure and modalities of operation takes time and long term commitment.

**Thank you!**