

From technology transfer (TT) to agricultural innovation systems (AIS)

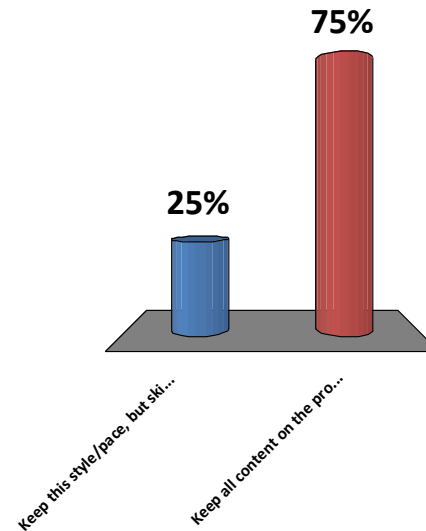
Iddo Dror

SEARCA Forum-workshop on Platforms, Rural Advisory Services, and Knowledge Management: Towards Inclusive and Sustainable Agricultural and Rural Development, Los Banos, 17-19 May 2016



There's too much on the program to cover if we continue at this speed... What would you prefer?

- A. Keep this style/pace, but skip over some content.
- B. Keep all content on the program, but go through much quicker.



Objectives of the module

The core objectives of the module include:

- To introduce agricultural innovation systems and to examine their main features
- To examine the evolution of approaches to the resolution of agricultural problems
- To provide an overview of the various participatory tools

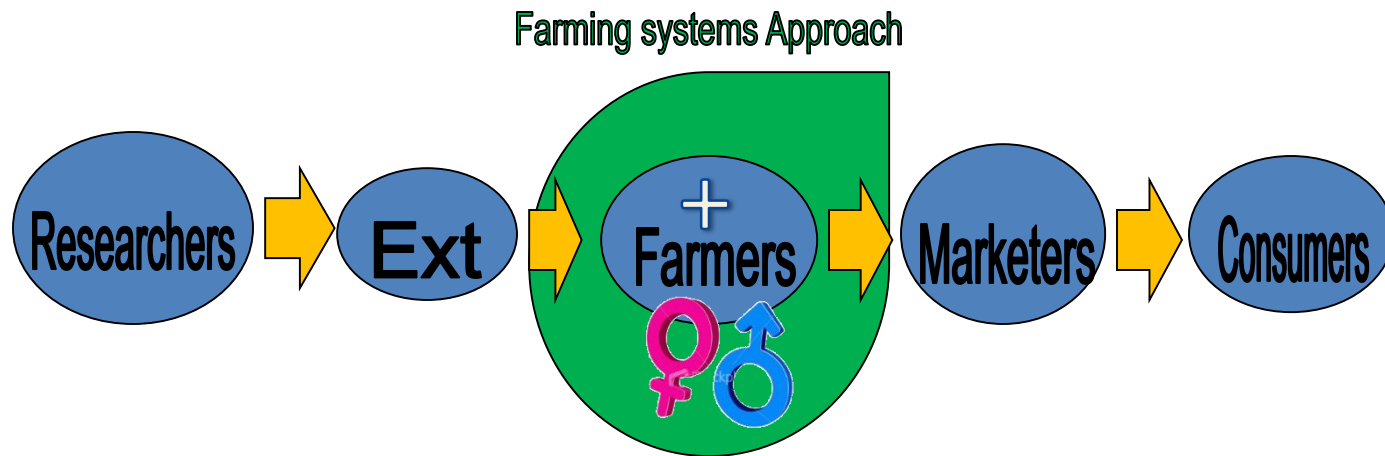
Technology transfer approach



- The traditional approach of agricultural research and extension follows a linear approach where experts produce new knowledge and technology and transfer it to the end users
- The linear approach assumes that agricultural research, through technology transfer, leads to technology adoption and increased productivity.
(Source: ILRI, 2008)

Organization of Actors in a linear configuration

Linear approach for ARD



Technology transfer Approach

- The linear approach assumes that agricultural research, through technology transfer, leads to technology adoption and increased productivity.
- Emphasis is placed on building capacity of research (through investment in scientific infrastructure and human capital)
- Research is not linked to technology users and other actors in the sector

(Source: ILRI, 2008)

Agricultural Innovation Systems

- From technology-oriented to systems approaches to innovation – a journey through time...

	Technology Transfer (TT)	Farming Systems Analysis (FSR)	Agricultural Knowledge and Information Systems (AKIS)	Agricultural Innovation Systems (AIS)
Era	From 1960's	From 1970's/ 1980's	From 1990's	From 2000's
Approach	Research develops technologies that are transferred to farmers	Research identifies and tackles constraints (land, labour) of farmers	Research collaborates with extension officers and farmers in developing solutions	Create an enabling environment for innovation

Agricultural Innovation Systems

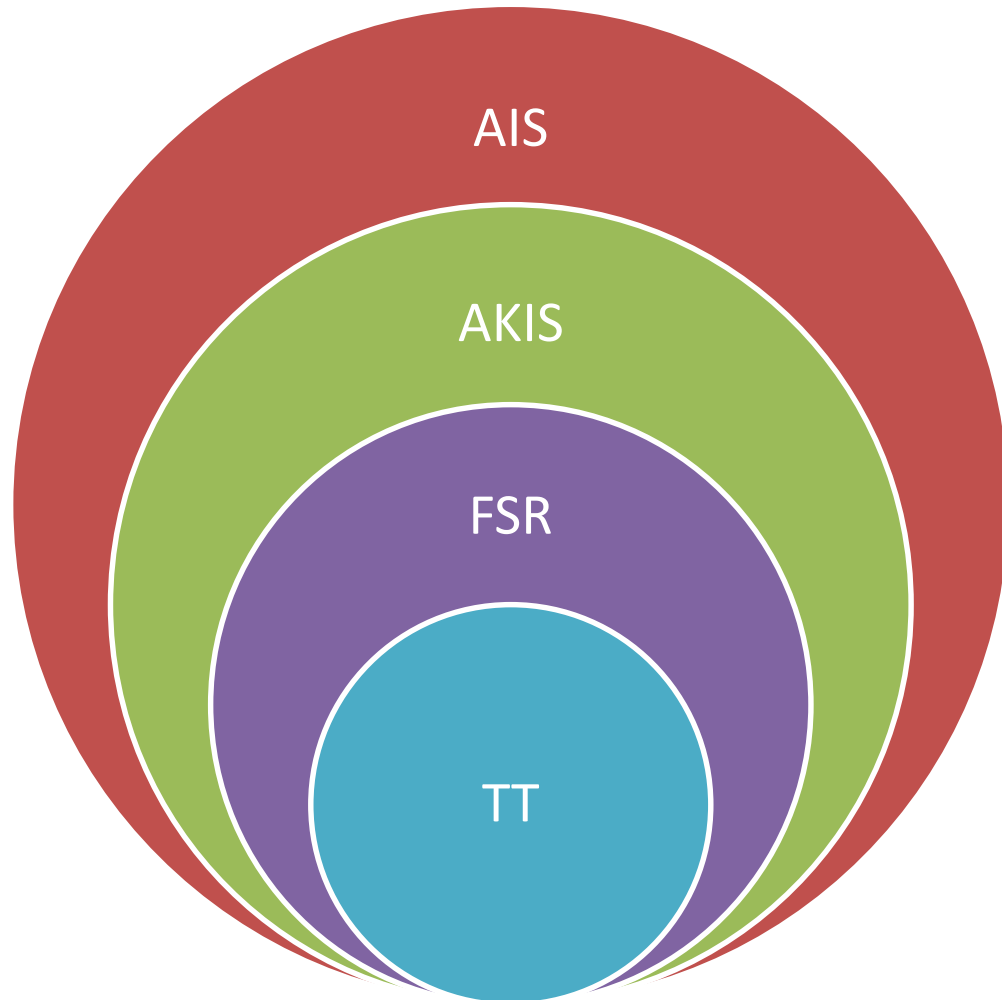
	Technology Transfer (TT)	Farming Systems Analysis (FSR)	Agricultural Knowledge and Information Systems (AKIS)	Agricultural Innovation Systems (AIS)
Roles of farmers	<ul style="list-style-type: none"> Adopters of technologies 	<ul style="list-style-type: none"> Adopters of knowledge and technologies Source of information 	<ul style="list-style-type: none"> Experimenters Experts 	<ul style="list-style-type: none"> Partners Entrepreneurs Part of innovation network
Roles of research and researchers	<ul style="list-style-type: none"> Developers of knowledge and technologies 	<ul style="list-style-type: none"> Experts 	<ul style="list-style-type: none"> Capacity builders Facilitators of learning 	<ul style="list-style-type: none"> Enhance innovation capacity in the system Members innovation network

Agricultural Innovation Systems

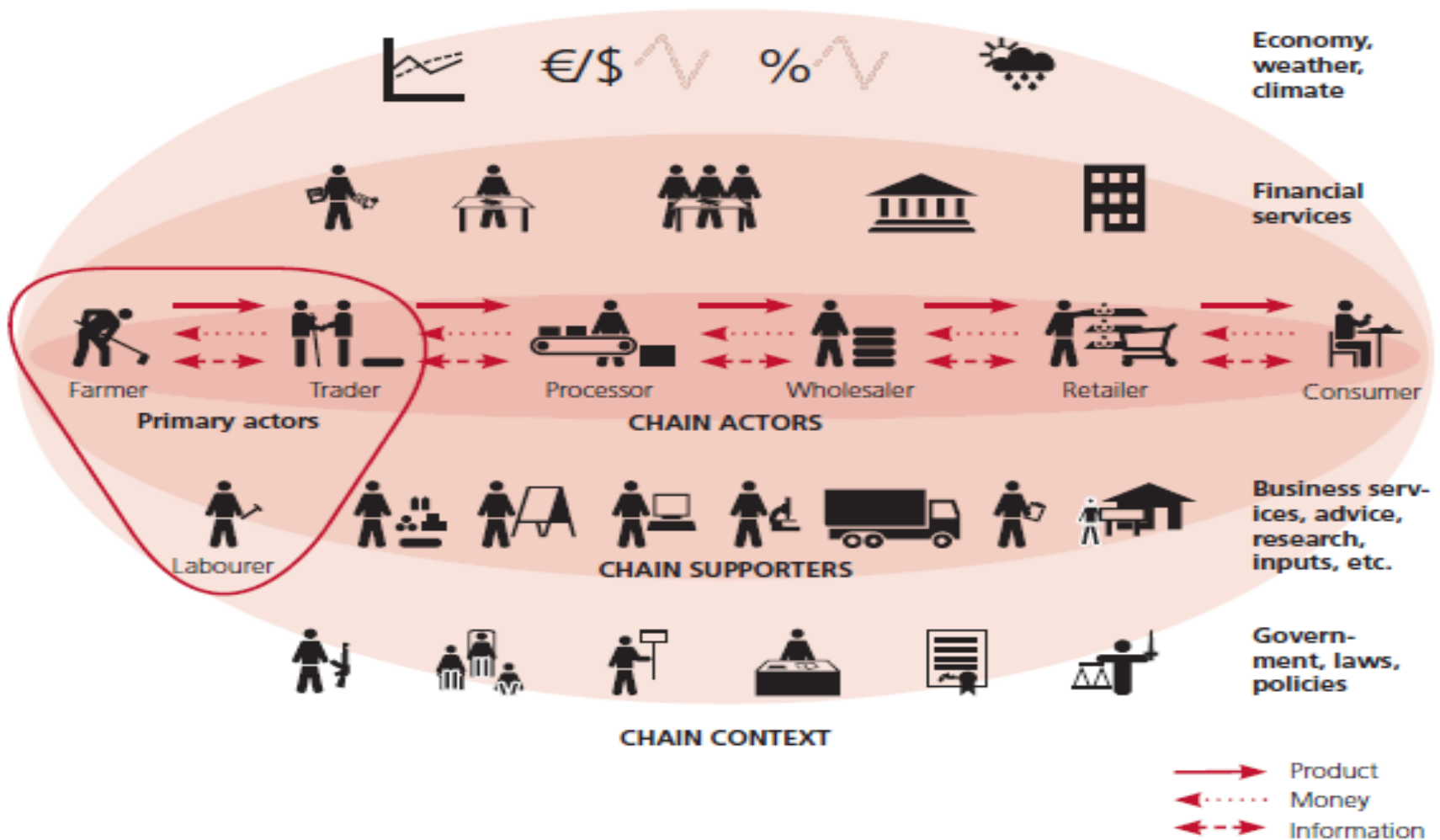
	Technology Transfer (TT)	Farming Systems Analysis (FSR)	Agricultural Knowledge and Information Systems (AKIS)	Agricultural Innovation Systems (AIS)
Intended outcomes	Technology adoption and uptake	Adapt technologies to farming systems	Joint development of technologies	Capacities to co-innovate, learn and change
Key intervention approach	Technology dissemination through extension and mass media	Surveys, typologies, modelling of impact	Participatory research, Farmer Field Schools	Establish, implement and support multi-stakeholder platforms
Weaknesses	Disregards farmer involvement and adoption context	Focus on field and farm level	Local orientation, costly, scaling up and scaling out	Lacks strong empirical evidence, system's boundaries are difficult to define

Source: Klerkx et al 2012

Agricultural Innovation Systems



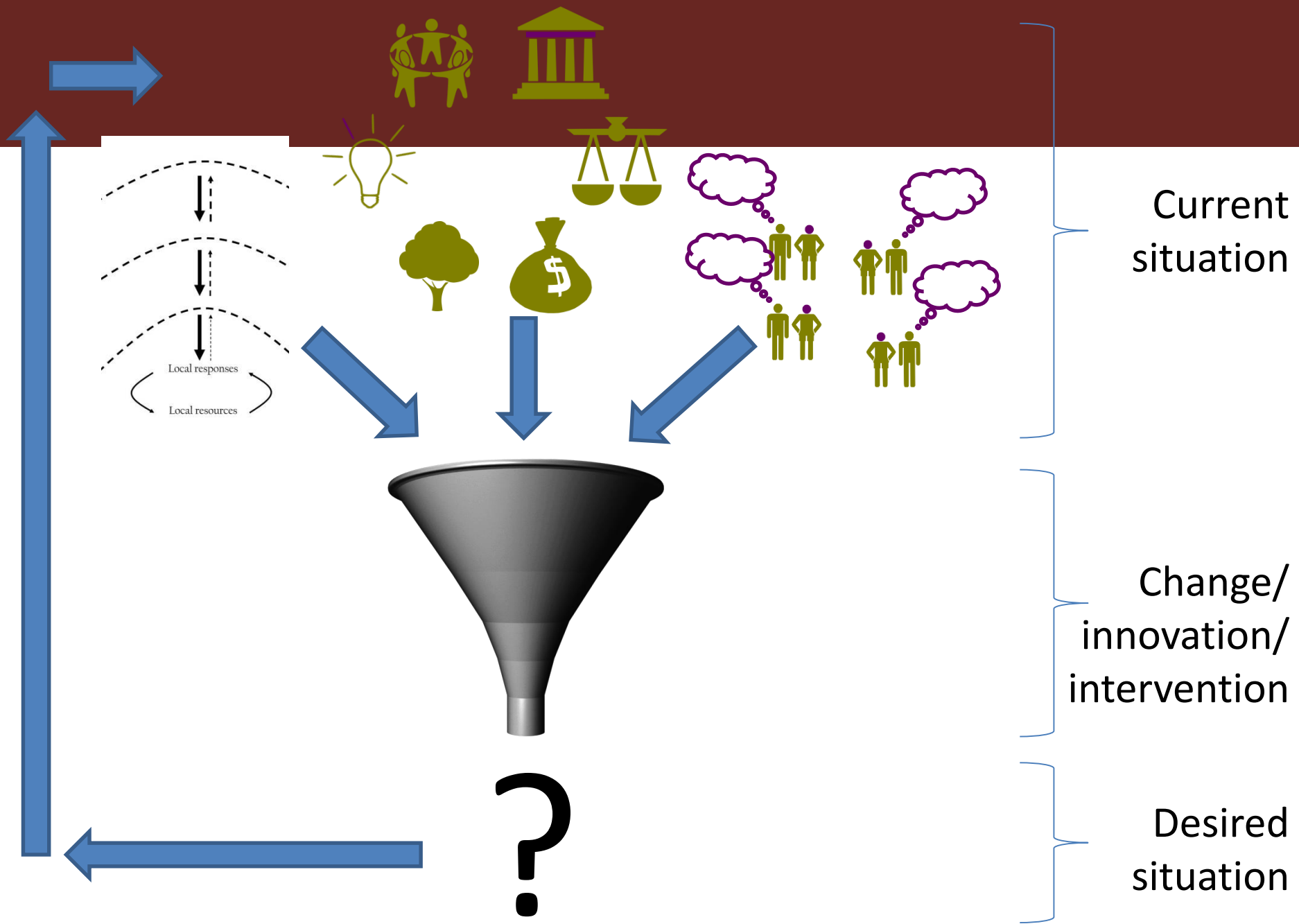
Agricultural Innovation Systems



Source: Adapted from KIT and IIRR (2010)

Analyze Agricultural Innovation Systems

- Analyze complex agricultural problems
 - Complex problem (multiple dimensions/ levels/ stakeholders)
 - System in which the problem is embedded
 - Components/ elements that support or constrain innovation in the agricultural system
- Identify entry points for innovation to address complex agricultural problems
 - Specific entry points for innovation (e.g. *Striga* in maize)
 - Generic entry points for innovation (e.g. crop protection)



Paradigm shift

Attributes	Linear approach	Agricultural innovation systems
Mode	Blueprint, supply, push	Process, demand-driven
Keywords	Planning, transfer, farmers	Participation, empowerment, rural, community
Goals	Pre-set; closed	Evolving; open
Decision-making	Centralized	Decentralized
Methods, rules	Standardized; universal	Diverse; local
Interaction of professionals with people	Instructing, motivating	Enabling, empowering, facilitating
Local people seen as:	Beneficiaries, passive	Partners, actors
		Source (worldbank,2013)

Limitations of the linear approach

- The major failures of the linear technology transfer approach include:
 1. Its failure to transform research outputs into development impacts and inability to meet users needs
 2. Its inability to promote a continuous learning and innovation process capable of helping people and their communities to cope with complex agricultural problems
 3. Its failure to appreciate local and indigenous knowledge
 4. Its inability to create interaction among different sources of knowledge creating a bottleneck to develop user capacity in relation to the innovation
 5. Limitation in developing user capacity in relation to the innovation

(Source: Lundy et al. 2007)

From Technology transfer to Agricultural Innovation systems



- Achieving development and improvement of livelihood will require transforming the traditional top-down, technology-driven approach to a more decentralized and farmer-led system .
- Innovation has become a focus of many development projects and innovation systems are the centerpiece of many development projects.

From Technology transfer to Agricultural Innovation systems

- The systems oriented participatory approaches to technology development and dissemination emerged as a result of the realization that the Technology Transfer (TT) paradigm of industrial and Green Revolution agriculture had not worked well
- Historically, non-adoption of recommendations was attributed to farmers' ignorance, to be overcome through more and better extension, and then to farm level constraints, with the solution in easing the constraints
- However, evidence shows that farmers are far more knowledgeable and better informed than agricultural professionals used to assume; and farming conditions are, and will remain, different from those prevailing at research stations.

(Source: Chambers, 1999)

From Technology transfer to Agricultural Innovation systems

- The salient feature of the new approach is the reversal of learning, where researcher and extension workers are learning from farmers.
- The key elements of the new paradigm are to put emphasis on people rather than ‘things’, to decentralize, empower the participants, to value and work on what matters to participants (subjective perspective), and to learn from the beneficiaries rather than to teach them.
- Location and roles are also reversed, with farms and farmers seen as central instead of research stations, laboratories and scientists.

(Source: World Bank, 2013)

From Technology transfer to Agricultural Innovation systems

- The innovation systems framework sees innovation in a more systematic, interactive and evolutionary way.
- More emphasis is placed on fostering active interaction among diverse stakeholders and enhancing human capacity to continuously innovate to be able to adapt to changing social economic and environmental conditions

(Source: Hall 2005)



An Innovation system

- An innovation system (IS) is a set of all individual and organizational actors that are relevant to innovation in a particular sector or issue, their interactions and governing institutions.
- The goal of an innovation system is to develop, diffuse and implement innovations which occur in a collaborative process and are essential for economic development
- An important part of its creation process is the collaboration of stakeholders with different expertise and their open knowledge exchange.

Innovation systems

- These stakeholder groups contain, amongst others, research institutions, universities, companies, buyers, suppliers as well as certain political actors.
- The influence of already existing formal and informal institutions such as rules, regulations, norms and behavioral attitudes based on local and cultural imprints in combination with social structures can trigger, or hinder the innovation process
- It is therefore necessary that innovation systems are able to constantly evolve and adjust within and towards their changing environment

Agricultural Innovation System (AIS)

- The purpose of an AIS is to strengthen the **capacity to innovate** and create novelty throughout the agricultural production and marketing system
- Potentially all actors in the public and private sectors are involved in the creation, diffusion, adaptation and use of all types of knowledge relevant to agricultural production
- Its organizing principle is new uses of knowledge for social and economic change and it is Innovation driven

(Source: ILRI, 2008)

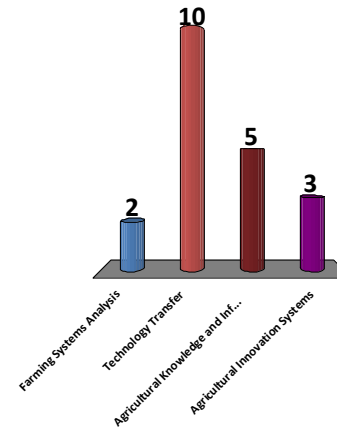


How Agricultural Innovation Occurs

- Agricultural innovation typically arises through dynamic interaction among the multitude of actors involved in growing, processing, packaging, distributing, and consuming or otherwise using agricultural products.
- These actors represent quite disparate perspectives and skills
- For innovation to occur, interactions among these diverse stakeholders need to be open and to draw upon the most appropriate available knowledge
- The ability to innovate is often related to collective action, coordination, the exchange of knowledge among diverse actor.

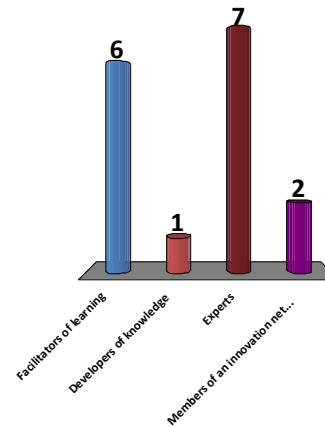
In the linear model of agricultural extension, agricultural research, through technology transfer, leads to technology adoption and increased productivity. What is the name commonly given to this approach?

- A. Farming Systems Analysis
- B. Technology Transfer
- C. Agricultural Knowledge and Information Systems
- D. Agricultural Innovation Systems



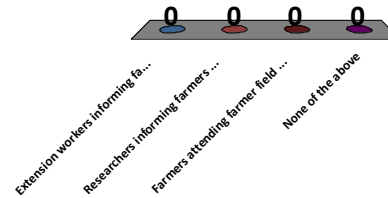
What role did researchers NOT have under Agricultural Knowledge and Information Systems (AKIS)

- A. Facilitators of learning
- B. Developers of knowledge
- C. Experts
- D. Members of an innovation network



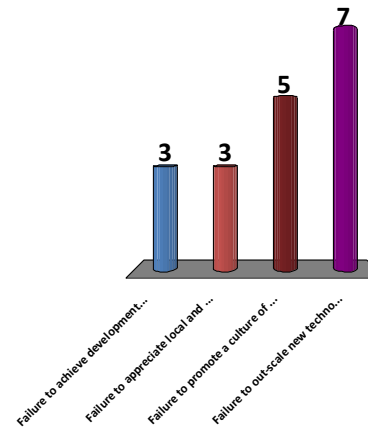
Which of the scenarios below would typify an AIS?

- A. Extension workers informing farmers about current policies and research
- B. Researchers informing farmers about current research
- C. Farmers attending farmer field days
- D. None of the above



Which of the following is NOT considered a failure of the linear technology transfer approach?

- A. Failure to achieve development impacts
- B. Failure to appreciate local and indigenous knowledge
- C. Failure to promote a culture of continuous learning and innovation
- D. Failure to out-scale new technologies



Thank You

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