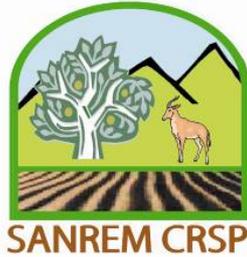


Developing Approaches for Smallholder Adaptation of Conservation Agriculture



KEITH M. MOORE
ADJUNCT PROFESSOR OF SOCIOLOGY AND
ASSOCIATE PROGRAM DIRECTOR

SUSTAINABLE AGRICULTURE AND NATURAL RESOURCE MANAGEMENT
COLLABORATIVE RESEARCH SUPPORT PROGRAM



Principles and procedures



- In working with our partners in the farming communities we have targeted for conducting research for the development of adapted Conservation Agriculture Production Systems (CAPS) we need to keep upper most in our minds two concerns:
 - ✦ the value of our activities for community members, and
 - ✦ how they perceive the value of these contributions.

Principles and procedures



- The SANREM CRSP is a research project. Our objective is to develop new knowledge that can be used by local partners to improve their production systems, and consequently their livelihoods and well-being.
- We are not a development agency and cannot deliver the inputs and means for achieving development.
- We are in the community to learn from community members and about their production systems. In the process, we should be helping the community learn more about their own resources and potentials.

Principles and procedures



- SANREM CRSP conducts research with individuals and communities is on a voluntary basis. No one should be forced to participate in SANREM activities.
- Successful learning occurs when individuals choose of their own accord to think and act in new ways.
- Our job is to present and test new ideas and technologies with those communities and community members who are interested in actively learning about new ways to manage their resources.

Equity of Participation



- **Participation is a two-way street requiring effective communication.**
 - Clearly explain about activities and researcher expectations, provide adequate time and opportunity for community members to respond and give their full advice.
 - All community members need to be encouraged to participate – men and women, old and young, marginal groups – in proportion to their presence in the population.
 - During dialog sessions be sure that everyone has an adequate and realistic (recognizing deference and power issues) opportunity to speak.
 - Preference in dialog should always be given to those who have not spoken, encouraging input from all members of the community.

Technology Transfer to Adaptive Management



Two paradigms:

- ✦ Technology Transfer
- ✦ Adaptive Management

In reality we can see these along a continuum

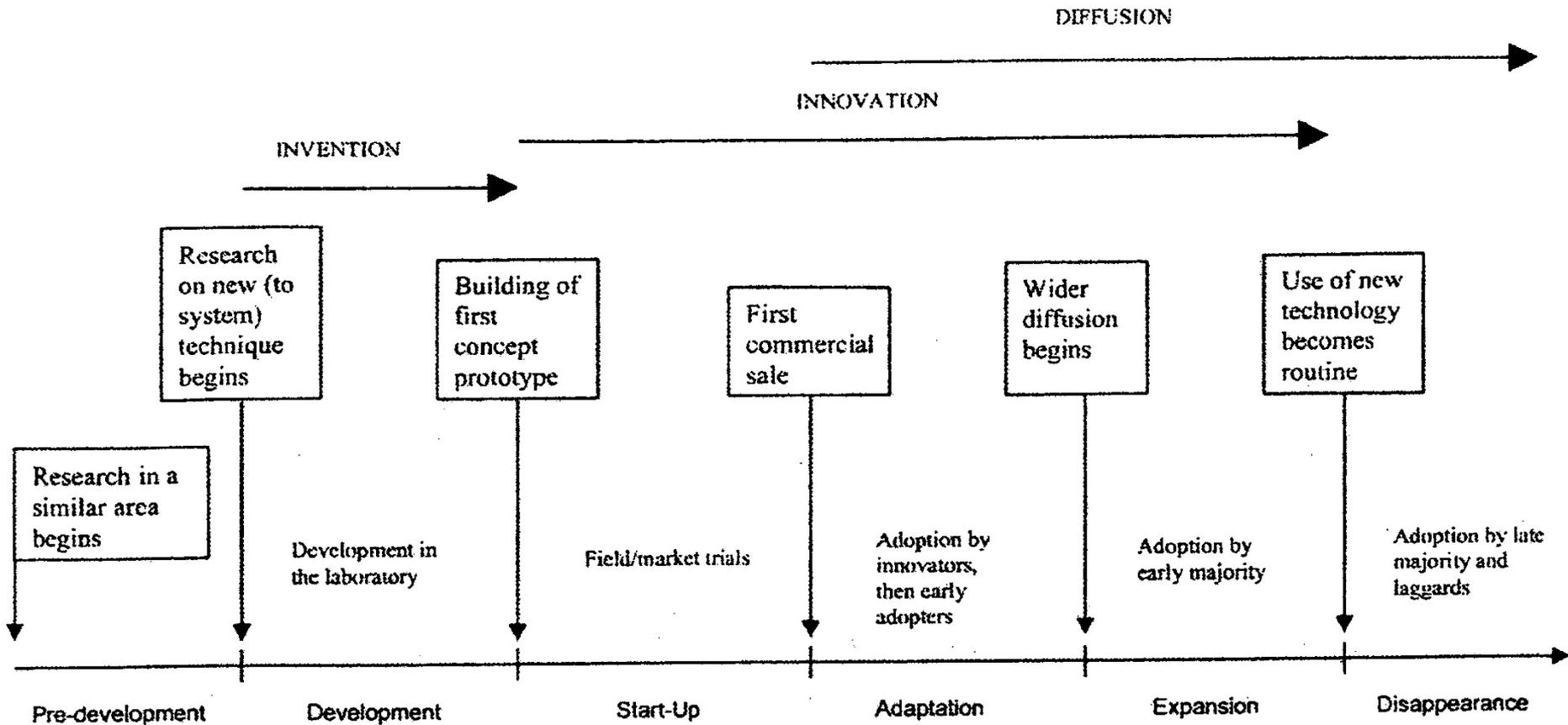
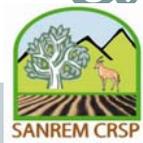


Figure 2.2 Stages and milestones in the invention, innovation and diffusion process³

Knowledge Network Characteristics of Technology Transfer



Technology Transfer operates well under conditions where:

- Technological change is a matter of component replacement
- Shared knowledge systems extend from conception to execution
- Ecological and market conditions are stable and relatively homogeneous
- Linking investments with outputs allows for quantitative priority setting

Social Learning for Adaptive Management



Learning by doing

Local stakeholders innovate management techniques adapted to local conditions

- **Negotiation**
- **Resistance**
- **Accommodation**

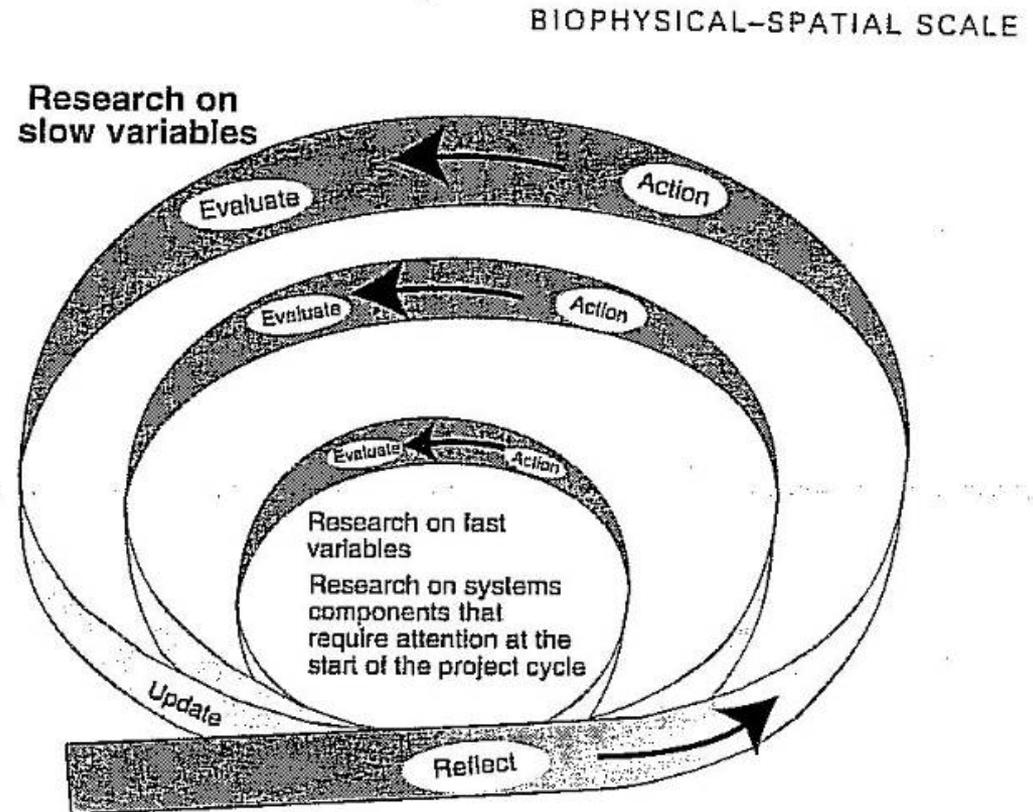
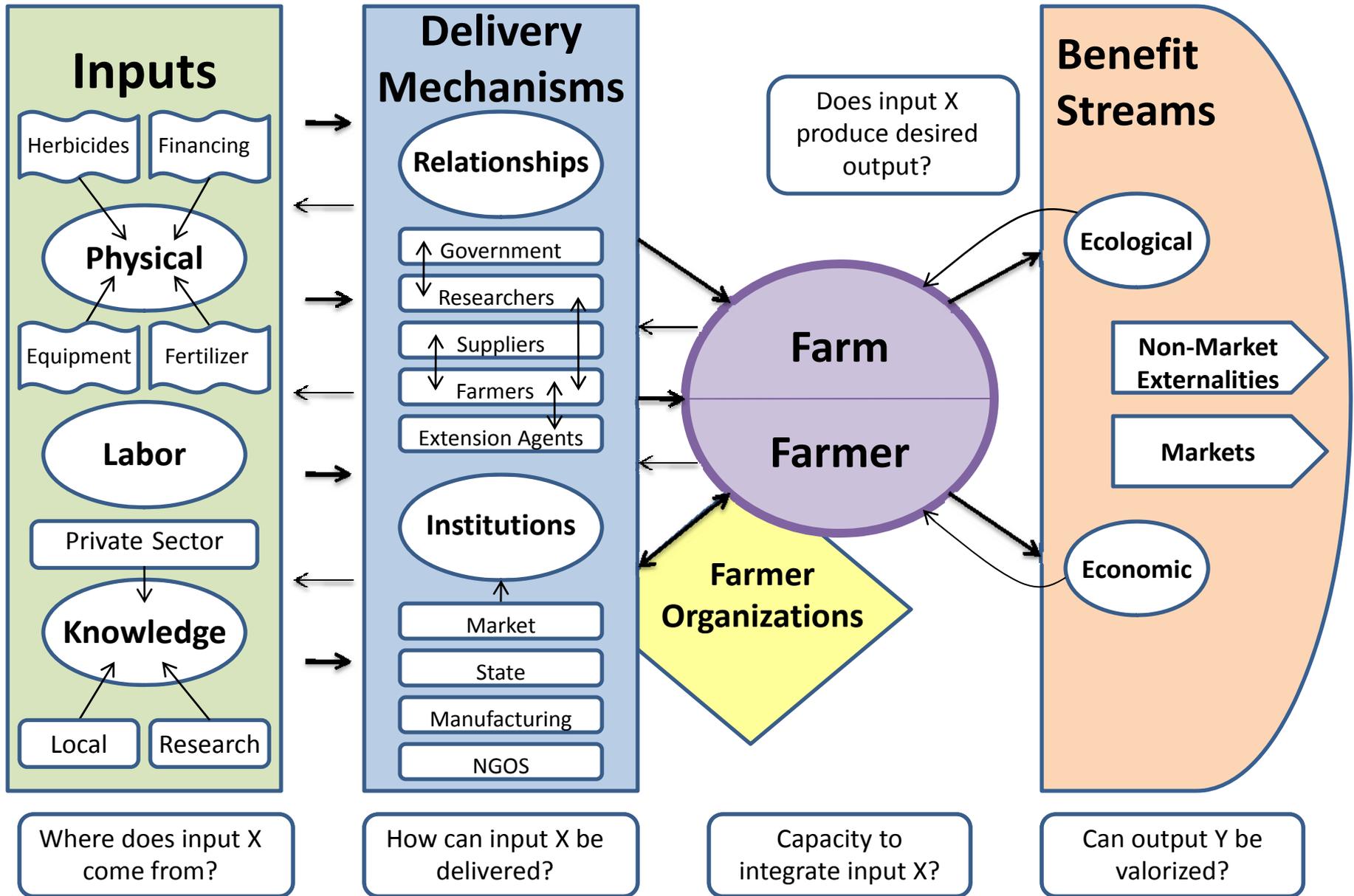


Fig. 4.1. Overlapping learning cycles for processes with different temporal characteristics.

From: Sayer and Campbell, 2004

Generic Conservation Agriculture System



Frames of Reference and CA Pathways

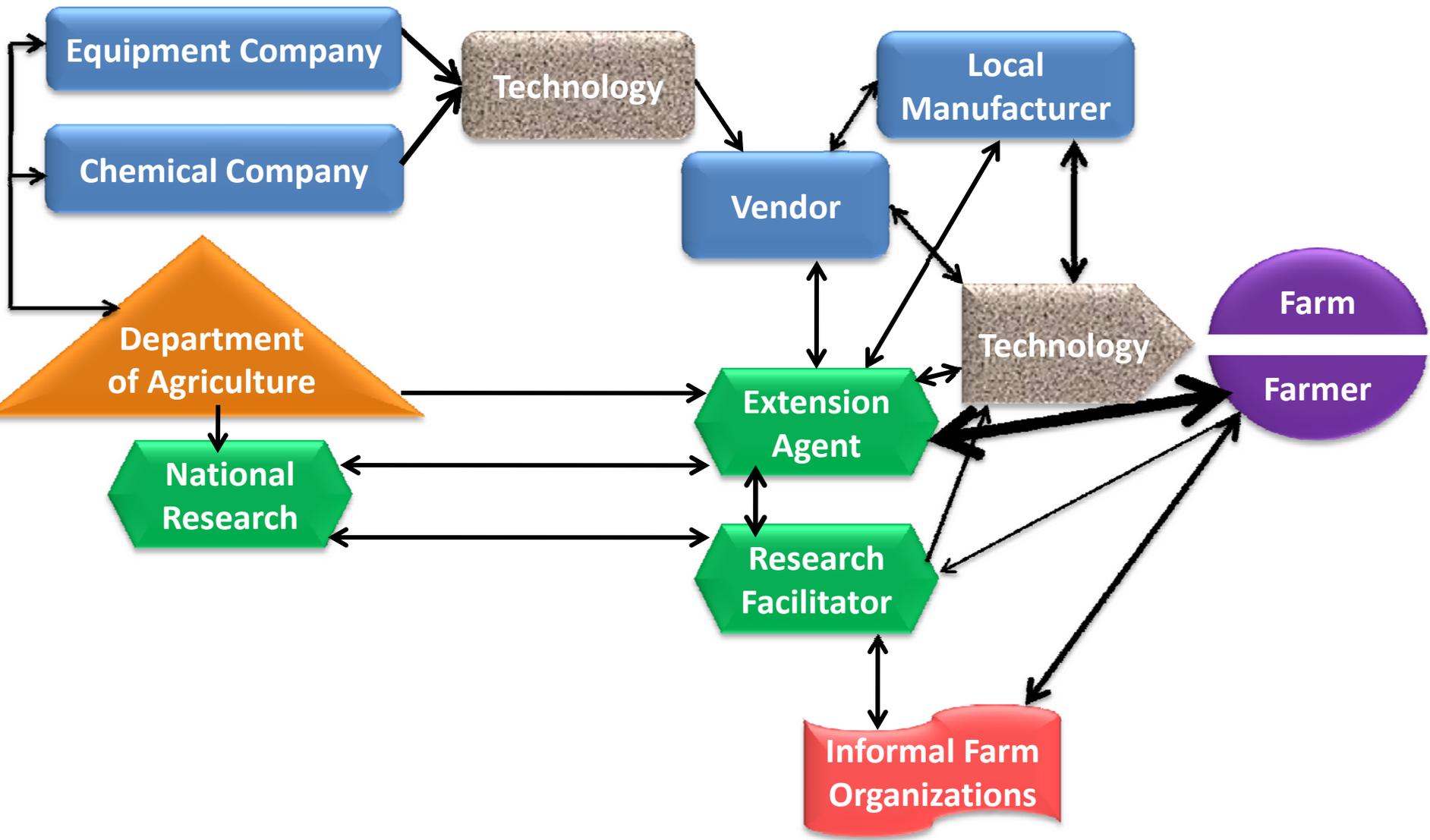


Diagnosing the existing production system requires that we consider a wide variety of material, social, and technical elements, a few are listed here:

- **What is the problem?**
 - (erosion, moisture conservation, management of labor, lack of income)
- **Who is involved in defining the problem?**
 - (farmers, researchers, government officials, commercial interests)
- **How is the problem approached?**
 - (technological fix, adaptive management, farmer problem solving)
- **Why are CA practices adopted?**
 - (increased income, resolves production constraint: weeds, double cropping, timeliness)

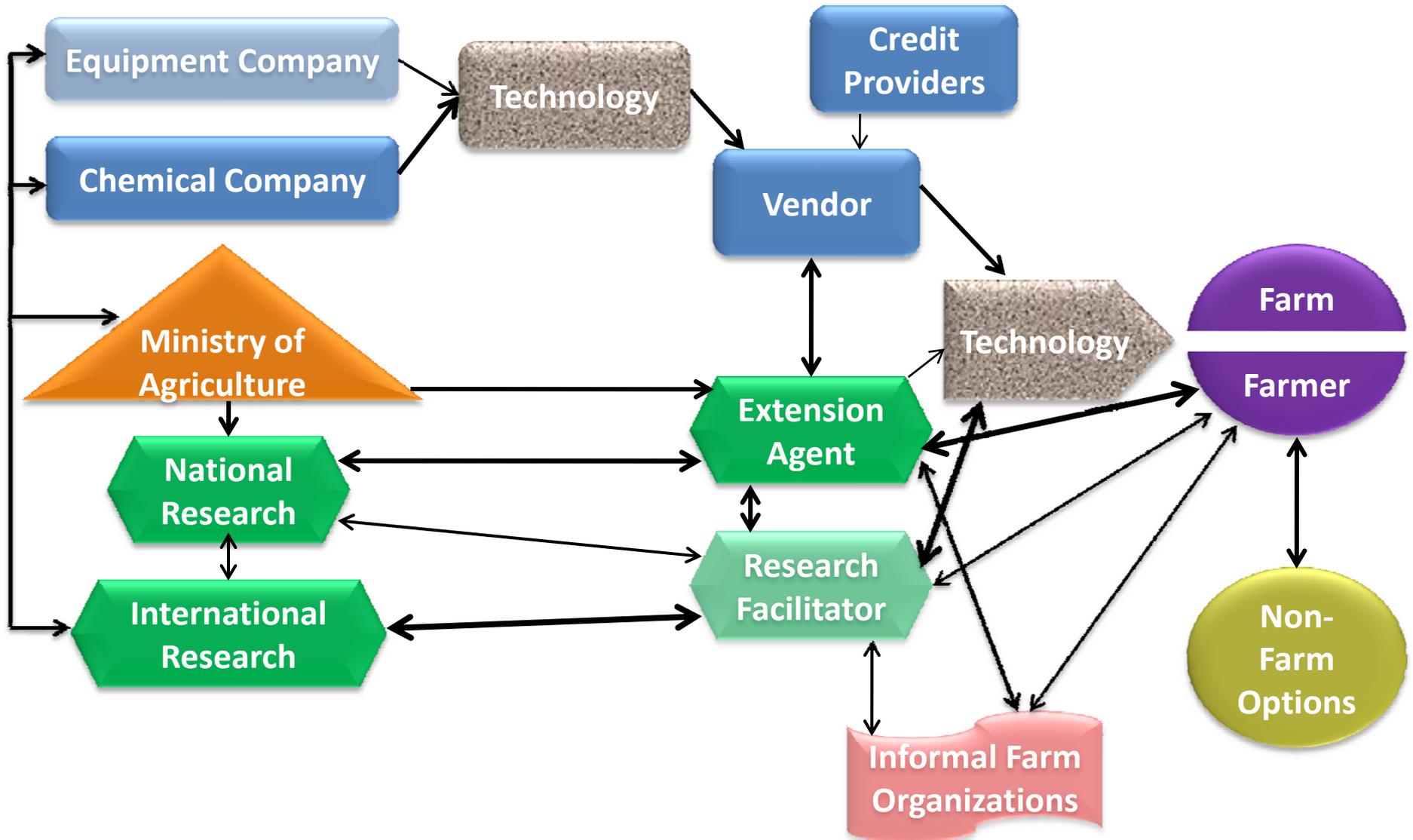
Non-Local

Local



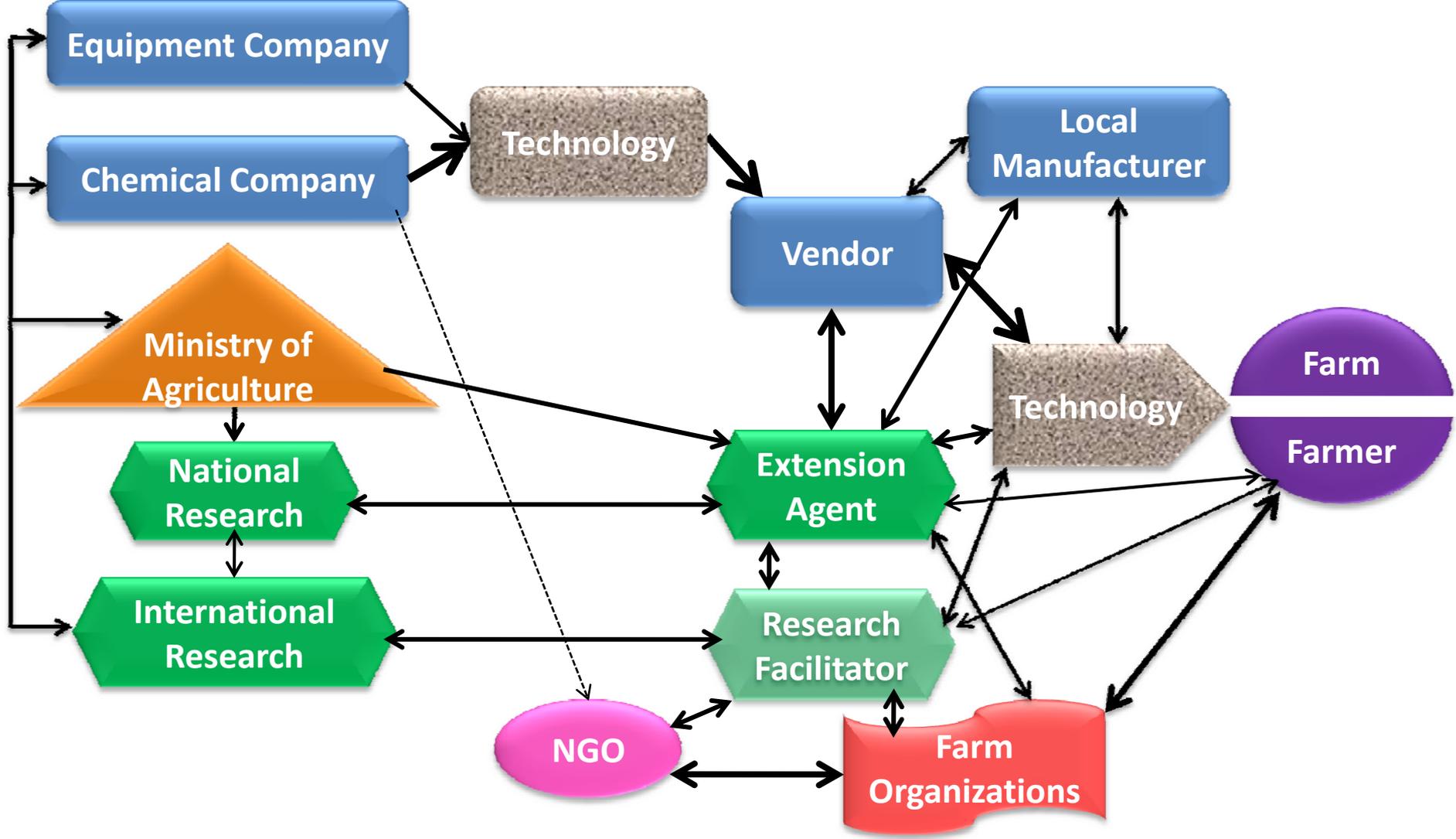
Non-Local

Local



Non-Local

Local



Formulating the right research questions



- **IF** the network supporting conservation agricultural systems is critical to technological change in agriculture,
- **THEN** we need to review all the component elements of that system in a new light.

Not as hypotheses in search of the universal variable, but as meaningful components of local knowledge systems

– as suggested by Knowler and Bradshaw (2007)

Input Questions: Herbicides / Fertilizers / Seeds



- Available at local market?
- Appropriately packaged?
- Local substitutes?
- Sufficient labor for weeding?
- Crop rotations to decrease weeds?
- Possible livestock nutrient management?

Input Questions: Equipment



- Forms of power available to farmer?
- Access to appropriate power?
- Appropriately scaled equipment?
- Appropriate implement / tool?
- Local manufacturers and maintenance available?
- Use or modify existing equipment?

Input Questions: Knowledge



- Use and safety of herbicides and equipment?
- Maintenance of seedbed and equipment?
- Knowledge adapted for local implementation?
- Training / education for extension agents?
- Local knowledge sufficient for innovation and adaptive learning?

Input Questions: Financing



- **Is local credit available?**
- **Input supplied in kind?**
- **Self-financing?**

Delivery Mechanism Questions: State / NGO / Market



- Vendors present for input supplies?
- Is there a market demand?
- Chemical / equipment companies aware of demand?
- Affordable bank credit?
- Government support or guarantees?

Delivery Mechanism Questions: Farmer Organization



- **Group purchases?**
- **Can inputs be purchased and transported from elsewhere?**
- **Environment conducive to knowledge sharing?**
- **Network to consult concerning problems?**
- **Network supporting a change in mindset?**

Farmer Questions



- Problem to be solved by implementing CA?
- Alternative income generation possibilities?
- Sufficient resources and willing to take a risk?
- Adaptive capacity to solve problems?
- Ability to adjust for labor requirements?
- Knowledge regarding use of new inputs?

Farm Questions



- CA appropriate for soil type?
- CA impact on pests and diseases?
- CA adapted to livestock?
- CA compensates for other crop residues uses?
- Necessary to integrate all aspects of CA?

Benefit Stream Questions: Ecological



- Soil health (structure, quality, moisture) improvement?
- Increasing biodiversity?
- Leading to long term carbon sequestration?
- Otherwise sustainable?

Benefit Stream Questions: Economic



- **Definite short term income increase?**
- **Allow for double cropped grain / soybean systems?**
- **Accessible markets for selling crops?**
- **Market for more than one crop?**
- **Economic incentives for ecological benefits?**

Questions - Comments



Thank you