Innovation Systems Perspective for sustainable commercialization of smallholder agriculture

Ranjitha Puskur, Tesfaye Lemma, Berhanu Gebremedhin, Dirk Hoekstra

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Overview of the presentation

- Factors influencing smallholder agricultural commercialization
- Some basic concepts of innovation and key issues
- Interventions to support commercialization – some experiences and lessons
- Implications
Generic constraints affecting smallholder market participation

- poorly developed entrepreneurial skills
- limited technical and marketing knowledge and expertise
- lack of Business Development Services (BDS) and extension service organizations
- low levels of formal education and social capital of farmers
- weak and/or non-existent farmer organizations (co-operatives etc)
- low productivity (e.g., access to land, poor agronomic practices, access to planting materials, lack of trained labour)
Generic constraints affecting smallholder market participation

- lack of **vertical co-ordination** within dynamic market structures including exporters and agri-business
- inadequate **infrastructure** including irrigation, cold storage etc
- poor **post-harvest handling** practices and lack of up-to-date handling and grading equipment
- limited and unsuitable **transport infrastructure**
- lack of **credit**, restricting investments in key equipment and technology.
Determinants of smallholder farmers access to markets

- **Asset base (education, land, wealth/income)**
  - significantly lower for female headed households
  - evolution of assets influenced by social capital

- **Technology**
  - low productivity – important determinant of commercialization
  - limited product diversification

- **Access to capital**
  - limited credit availability for entrepreneurial activities, especially for women
  - high risk prevents households from taking interest-based loans
Determinants of smallholder farmers access to markets

Trading opportunities, proximity to markets and quality of infrastructure
- weak market integration
- poorly functioning markets
- poor market access
- inadequate market information
- inadequate rural roads network
Era of Knowledge economies

Knowledge
Technology
Skills

Innovation

Growth
Knowledge and information

- improving productivity
- linking producers to remunerative markets
- improving competitiveness in markets
- enhancing abilities of producers, agro-enterprises, and countries to survive, exploit and compete in fast changing technical, economic, political and institutional conditions
The challenge

- Knowledge about technology and production is not enough
- Institutions (formal and informal) and organizations (including their attitudes, practices, new ways of working), management and, marketing changes among others are important
- Government policies have a critical role to play by providing the enabling environment, to avoid institutional, policy or market failures.
- A complex issue needing multi-pronged strategies to address it – needs a broad systems perspective
What is innovation?

- Successful application of knowledge (new or existing) in any economic or social process

- Change in practices, in the established way of doing things – technological, organisational, institutional
Some insights..

- Knowledge becomes innovation when it is applied.
- Innovations require integration of ideas, knowledge, experiences, and creativity from multiple actors.
- Innovation is not an event, but a process - outcome of conscious effort and continuous processes of experiential learning through network building and interactions with multiple and heterogeneous actors.
Some insights..

- the existence and nature of interactions among actors is shaped by economic and social institutions and, wider policy environment through incentives and norms
- usually successful innovations have technical and socio-organization dimensions
- innovations could lead to improved productivity, income, and welfare gain
What is an Innovation system?

- the networks of organizations or actors, together with the institutions and policies that affect their innovative behavior and performance, bringing new products, new processes and new forms of organizations into economic and social use
AIS in an Agri-food chain/Agri business System

Enabling environment
Political stability, law and order, infrastructure, Governance, favorable micro-macro and sectoral policies, etc.

Facilitating Institutions
Policies, legal framework, market, information, quality control Research, extension, training, credit, etc.

Facilitating Services
Transport, storage, packaging, facilitating, equipment, import and export, communication, promotion, etc.

Agro-industry (Input supply) → Agricultural production (Farm production) → Agro industry (Product marketing)

• Processing
• Value adding
• Marketing

• Processing
• Value adding
• Marketing
Innovation (response) capacity

- capacity to respond to changing internal and external conditions (like production, markets, policy etc) in order to exploit opportunities
- capacity to innovate is as much about the linkages and relationships between farmers and other actors in the innovation system as it is about specific skills and information held by competent, but isolated actors
- a system concept
Key issues..

- Multiple actors and perspectives
- Multiple sources of knowledge and information
- Central role of knowledge sharing and communication
- Building effective linkages and networks for social learning
- Co-ordination of tasks among actors
- Roles of institutions
- Roles of policies
IS Framework..

- The essence of the framework is the proposition that technology and other forms of knowledge can and does bring about the innovations (technical, institutional, market, organisational) needed for development progress.

- However this will only take place when the correct conditions are created for bringing different ideas and bodies of knowledge together and allowing new ideas that emerge from this to be put into productive use.
Emphasis on interdependence and non-linearity in innovation processes

Demand- a determinant of innovation

Bigger issues come into focus- starting at the knowledge application end

- Why farmers innovate or why they don’t?
- What are the constraints that hold them back- prices? Technology? Markets?
- Are farmers passive recipients of technology?
- What are the roles of input suppliers, co-ops, traders, processors, NGOs etc.
IS Framework...

- **Analytical tool**
  - Understand imbalances and distortions
  - Obstacles to well-functioning systems

- **Policy making support**
  - Broad explanation
  - Wider analytical lens
Particularly for policy making...

- Understanding of process
- Shift to focus on enhancing interactions between actors
- From technology generation and dissemination to innovation processes
- Acknowledge behaviours
- Focus of analysis shifts from internal working of an economic system to the way it interacts with outside world
AIS in Ethiopia

- Diversity of actors at both the local and national level
- The most prominent are government administrative, extension, and input services; cooperatives and cooperative unions; nongovernmental organizations; traditional community-based organizations; and smallholders
- Private sector agents, including traders, brokers, input supply companies, or agribusinesses, are far less common
AIS in Ethiopia

- Innovators are typically members of larger networks - greater numbers of ties and shorter walks to other actors => relatively greater access to information, inputs, credit, and markets

- more ties to traditional institutions such as *iquub* or local moneylenders

- Cooperatives common in most local innovation networks, generally accessible to both innovators and non-innovators – greater role in input supply than in marketing crop surpluses for their members

- Private sectors agents - far fewer ties to government organizations, role typically confined to purchasing crop surpluses from smallholders
IPMS approach

- Knowledge management
- Technology
  - Institutional
  - Organizational innovations
- Capacity building
- Enhance market orientation
Some examples of innovations

- **Technological innovations**
  - development and use of new products (new species, varieties, breeds, processing equipment, storage facilities) and management practices/techniques (irrigation, pest and diseases, agronomic practices).

- **Organizational innovations**
  - entities created to support collaborative pursuit of specified goals
Some examples of innovations

**Institutional innovations**
- changes in rules of the game or norms or policies which prohibit, permit, or require certain actions and require changes in habits and practices of actors involved through changes in incentives/rewards
  - new ways of organizing production
  - input management
  - marketing
  - sharing common resources
  - new way of providing extension support.

Institutional innovations are going to be equally or more important in dealing with complex challenges facing agriculture and rural development.
Technical innovations

- New technologies/techniques to improve productivity and, product quality and diversity in response to market opportunities:
  - **new crops** (e.g., fruit trees, improved forage species etc)
  - **new varieties** (e.g., Chickpeas, Haricot beans, fruit varieties, Onion, Sorghum, Pepper etc)
  - **new (small and large ruminant ) livestock breeds** for dairy and fattening (e.g., woshera sheep, Begayit, Dairy Crossbreds, etc)
  - **improved inputs** (e.g., chemically treated improved seed, Urea Molasses Blocks-UMB)
Technical innovations

- improved management practices
  - conservation tillage
  - reclamation of swampy lands
  - crop residue utilization
  - Tryps control
  - ground water utilization
  - improved irrigation systems
  - pasture improvement and grazing land management
Technical innovations

- based on market opportunities identified, appropriate technologies to overcome various constraints scouted for and popularized
- interested farmers engaged to take up enterprises
- always accompanied by need-based, targeted and focused capacity building of both public and private sector actors in technical skills and creation of linkages
- skill building - on farm practical trainings, exposure and exchange visits, provision of demonstration materials etc.
Some lessons

- If new technology is simply delivered, innovation will not necessarily take place.
- Technology needs to be integrated with other sources of knowledge (farmers, market etc) to allow it to be used in locally relevant ways.
- It is important that the training covers all important aspects and not confine to one or two dimensions.
- Need to have quick access points to specialized knowledge by extension agents in the field.
  - Modern communication technologies like mobile phones and internet to a certain extent
  - Development of Farmer Training Centers as knowledge centers.
## Fruit & veg innovation in Ada’a

<table>
<thead>
<tr>
<th></th>
<th>Increase</th>
<th>Decrease</th>
<th>No change</th>
<th>Don’t know</th>
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<tbody>
<tr>
<td>Yield</td>
<td>72.72</td>
<td>13.64</td>
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<tr>
<td>Productivity</td>
<td>72.72</td>
<td>13.64</td>
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<tr>
<td>Profitability</td>
<td>72.72</td>
<td>13.64</td>
<td>13.64</td>
<td>13.64</td>
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<tr>
<td>Market share</td>
<td>59.09</td>
<td>22.73</td>
<td>18.18</td>
<td></td>
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<tr>
<td>Benefit of the poor</td>
<td>50</td>
<td></td>
<td>50</td>
<td></td>
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<td>Gender Equality</td>
<td>54.55</td>
<td></td>
<td>45.45</td>
<td></td>
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<tr>
<td>Diversification</td>
<td>59.09</td>
<td>18.18</td>
<td></td>
<td>13.63</td>
</tr>
<tr>
<td>Employment</td>
<td>59.09</td>
<td></td>
<td>40.91</td>
<td></td>
</tr>
<tr>
<td>Product differentiation</td>
<td>54.55</td>
<td></td>
<td>45.45</td>
<td></td>
</tr>
<tr>
<td>Retention of remunerative markets/buyers</td>
<td>31.81</td>
<td>27.28</td>
<td></td>
<td>40.91</td>
</tr>
</tbody>
</table>
Organizational innovations

Woreda Knowledge Centers

- repositories of information related to various marketable commodities and other cross-cutting issues in electronic and non-electronic forms to serve as a ready access point for service delivery agents like extension agents and subject matter specialists
  - mixed experience with regard to equipping them and managing them.
  - most woredas feel that this is an excellent information source, but limited use due to weak reading habits
  - need to have very locally relevant and practical content, especially user-friendly and in local languages
  - keep them updated on a regular basis and ensure that the pipeline is full - linkages of OoARD with the National Research organizations
Organizational innovations

Co-operatives

- re-orient them from being just service providers to more market/business orientated entities
  - dairy co-operative formation in Alamata and rejuvenation in Fogera
  - diversifying co-operative activities (input supply shops) in Alaba
  - credit fund administration in Alaba, Alamata
Platforms

- public and private sector actors in the value chain of various commodities to engage in dialogue, resulting in collective agendas for market oriented development
  - Dairy platform in Ada’a
  - Cotton platform in Metema
  - Goat marketing platform in Mieso
  - Fattening platform in Alamata and Fogera
  - Onion seed production in Fogera.

- Clearly defined roles and responsibilities and action plans
Organizational innovations

- arrangements allow the use of diverse talents, capacities and strengths of various actors to address the problems
- potentially take up the role of actor coordination
- platforms are not a panacea, but the platform members do agree that such collaborative arrangement helps in ensuring ownership, sustainability and effectiveness
- still learning from various experiences to see whether these would be effective instruments and how they can be more efficient.
Organizational innovations

Farmer groups

- Various groups of producers organized especially to
  - facilitate capacity building activities
  - facilitate input supply and marketing arrangements to reduce transaction costs
  - create adequate volumes for the market
  - enhance bargaining power
  - inculcate the spirit of collective action.
Organizational innovations

- Fisherfolk groups in Fogera - trained and given credit through ACSI to purchase fishing boats and other fishing materials
- In Ada’a – trained bee keeper farmers organized to form four cooperatives - obtained legal status
  - 10 women farmers were organized to produce improved variety of onion
  - 10 milk producers in Denkaka organized and linked with Ada Dairy Cooperative, to facilitate milk marketing.
- Capacity development in group formation and forging linkages with private sector.
Organizational innovations

WALC/RALC/NALC

- learning alliances - series of connected stakeholder platforms, at key institutional levels
  - to break down barriers to both horizontal and vertical information sharing
  - to speed up the process of identification, development and uptake of innovation
- major roles include
  - joint planning
  - facilitate trying of new/innovative approaches
  - facilitate ownership/institutionalization of project activities
  - lead learning from the experiences through monitoring and evaluation
  - facilitate scaling up and out of innovations
Organizational innovations

- Mixed experience
- More critical analysis required
- Explore if the proposed functions of the RALC/WALC can be integrated into existing structures, rather than creating multiple parallel structures
Institutional innovations

Collaborative network arrangements

- Farmers- public sector-private sector
- Research- Development agencies
- OoARD-Universities

- the linkage creation (boundary spanning) function has to be institutionalized and become the mandate of a certain organization/actor
- important implications for the organizational culture (habits and practices) of establishing trust-based relationships with other actors in the system
Institutional innovations

Input supply arrangements

- farmer-farmer banana seedling supply in Metema
- farmer based onion seed production in Fogera
- private fruit nurseries in Ada’a, Mieso, Alaba and Alamata
- private Bull stations in Ada’a and Mieso
- para vet services in Alaba and Alamata
- motor pump maintenance services in Atsbi
- private input supply shops in Alaba (forage seed) and Metema (vegetable seeds, agro-chemicals, farm implements like sprayers, livestock concentrate feeds like Noug cake)
- UMB as supplementary animal feed in Mieso
Institutional innovations

Marketing arrangements

- organizing farmers and linking producer groups to market
  - Banana in Metema
  - Onion in Fogera and Alamata
  - Dairy co-op in Fogera with hotels

- providing market information
  - Mieso and Alaba

- promotion of new processed products
  - Fogera, Mieso
Institutional innovations

Capacity building

- diverse actors involved in providing training
- encouraging gender equality
- for public sector agents - beyond technical skills to include participatory project planning, gender, HIV/AIDS and environment
Institutional innovations

Promoting knowledge sharing

- exposure visits
- technology exhibitions
- Farmer-to-farmer discussion sessions
  - Farmer groups encouraged to meet at certain intervals to share knowledge and discuss specific issues and problems related to their commodities of interest
    - Alaba, apiculture group in two PAs meet fortnightly
    - Sheep and Teff seed multiplication group members meet on a regular basis
- Expert consultation sessions - to learn from the community and share experts’ knowledge with the community
  - Alaba - on haricot bean production, seed supply system, use of bio fertilizer, and pepper production
Credit fund

- administered in various woredas to finance activities (including input supply arrangements) which have traditionally not been financed by formal credit agencies
  - establishing bull stations
  - purchasing water pumps for irrigation
  - etc…
Technical and institutional innovations

- Technical innovation need not have to be the starting point
- Technical and institutional innovation ideally should go hand in hand
- Quite often, institutional innovations are even necessary for generating and promoting technical innovations
- Institutional innovations can flourish only in a situation where sufficient flexibility and freedom to experiment exists
## Obstacles to innovation

<table>
<thead>
<tr>
<th>Obstacles</th>
<th>Proportion of Households</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not Relevant</td>
</tr>
<tr>
<td>A. High cost of the innovation</td>
<td>27.28</td>
</tr>
<tr>
<td>B. Lack of financing</td>
<td>9.09</td>
</tr>
<tr>
<td>C. Lack of skills</td>
<td>9.09</td>
</tr>
<tr>
<td>D. Lack of information on technology itself</td>
<td>0</td>
</tr>
<tr>
<td>E. Legislation/legal restriction/administrative procedures affecting the innovation</td>
<td>18.18</td>
</tr>
<tr>
<td>F. Weak customer demand</td>
<td>22.73</td>
</tr>
</tbody>
</table>
## Importance of government programs

<table>
<thead>
<tr>
<th>Support Programs</th>
<th>Importance (% of households)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not Important</td>
</tr>
<tr>
<td>Finance/Credit</td>
<td>22.73</td>
</tr>
<tr>
<td>Training</td>
<td>0</td>
</tr>
<tr>
<td>Technical support/advice</td>
<td>0</td>
</tr>
<tr>
<td>Market information &amp; support</td>
<td>0</td>
</tr>
<tr>
<td>Infrastructure support</td>
<td>0</td>
</tr>
<tr>
<td>Loans &amp; grants</td>
<td>0</td>
</tr>
<tr>
<td>Farm machinery</td>
<td>0</td>
</tr>
</tbody>
</table>
Implications

- Unambiguous need for new actors and greater diversification of roles and responsibilities
  - networks of actors with Government as an important player, but providing level playing field to private sector and civil society and providing support for its development
- Priority to strengthening interactions among actors along the value chains – both horizontally and vertically.
- Organizational habits and practices to be geared towards collaboration, co-operation and change and, participatory and collective decision making.
Implications

- Investments in building social and human capital are most critical, while promoting rural entrepreneurial spirit and capacity.
- Revamping the formal rural financial systems, while finding ways to effectively engage traditional, community based organizations to transform them into more vibrant outfits to facilitate micro-capital formation.
- Developing appropriate reward and incentive system to promote innovation at all levels and encourage the spirit of flexibility, experimentation, outcome orientation and learning.
Implications

- Re-orienting extension services and building skills to promote market-oriented agricultural development
  - FTCs can be effective nodes for linking farmers and rural entrepreneurs to technical and non-technical services
  - “training” centres – but “knowledge” centres
  - multi-purpose sites where farmers
    - receive training and exposure to new production, processing and marketing technologies and management techniques;
    - are facilitated to directly access available technical knowledge and market information
    - get support to work collectively on marketing issues such as access to inputs and collective marketing of outputs
    - get technical and other support for small scale agro-processing and post-harvest operations by households, farmer groups and co-ops
    - are facilitated to forge linkages with markets and other services
Thank you!!!