

Navigating the Change: Developing Geo-Spatial Information Applications for Agri-food Systems

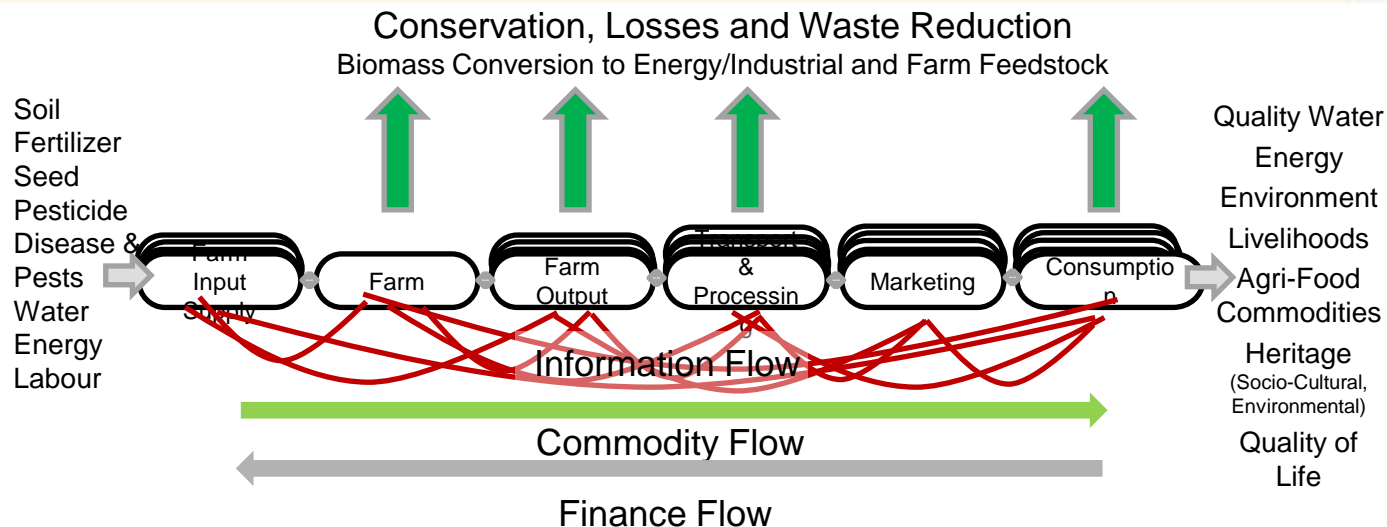
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Discussion Points: The Change

- Shifting Paradigm for Agri-food Systems
- Emergence of More Knowledge Intensive Farming
- Information Needs of Smallholder Farmers
- Geo-spatial applications for Emerging Agri-food Systems
- The Emerging Information Model for Agri-food Systems
- Innovations Needed for Geo-spatial Information Application in Agri-food Systems

Shifting Paradigm



- The development paradigm of agri-food systems of which agriculture and farming are central components, is rapidly undergoing a shift.
- This shift is from production-productivity-profit to improving the efficiency of all resources used in the agricultural production and consumption chain.
- It is affecting all the large to small scale models of intensive, industrial and agro-ecological farming

Emergence of More Knowledge Intensive Farming

This paradigm shift is making farming more knowledge intensive than ever before.

For developing countries such as India, the emergence of increasingly knowledge intensive agriculture is a major challenge that will need to be urgently met through major innovations in the entire ecosystem supporting Agri-food systems.

The innovations required are in its Institutions, inclusion of communities and use of technologies so that not only finance, commodities and products but also information move through value addition in market chains with efficiency and greater equity.



The Need for Information in Agri-food Systems



In addition to efficient commodity movement especially to urban markets and finance, one of the key resources in short supply for the increasingly knowledge intensive smallholder systems is the information needed to make smallholder based Agri-food systems efficient, sustainable and resilient in the face of its many challenges.

Challenges for Agri-systems

- Climate change
- Availability and access to natural resources especially land, soil nutrients and water
- Trans-boundary spread of diseases and pests
- Loss of agro-biodiversity
- Inadequate capacities to participate effectively in globally competitive agricultural commodities markets.

Agri-food systems in developing countries are increasingly being expected and even stressed to:

- Generate livelihoods,
- Supply rapidly growing urban areas with cheaper products,
- Produce energy as a product,
- Serve to manage urban waste and the physical environment,
- Support recreation for urban dwellers
- Maintain cultural legacy.



Roles of Geo-spatial applications

The roles of geo-spatial applications in Agri-food systems include their use for aiding decision making at Global Supra-National, National and Local levels by the public, private and community sectors individually and collectively.

User Organizations and Institutions

Supranational level

- International organizations,

National level

- Government ministries for planning and policy

Local levels

- Administrative units
- Farm advisory organizations
- Chambers of Commerce
- Financial and risk management organizations such as banks and insurance companies
- Welfare, subsidizing and taxation organizations
- Land consolidation units
- Farmer and producer organizations and cooperatives
- Regulatory and certification bodies
- Research and development and education organizations
- Inputs, logistics, transport and infrastructure providers and developers, marketers and consumers

Uses for aiding Decision Making

- Trade regulations and development
- Policy development, planning and monitoring of development projects
- Poverty, hunger and resource mapping
- Investment and Finance
- Taxation and welfare provision, land consolidation and allocation
- Water and irrigation management
- Forest and fallow land, Pasture Management
- Infrastructure planning, development and management
- Providing and managing services such as for extension, disease and pest management, weather, input supply
- Farm, livestock and fisheries related planning and management
- Transport, storage and marketing of farm products
- Mapping consumption and consumer preferences etc.

Farmer-producer perspective

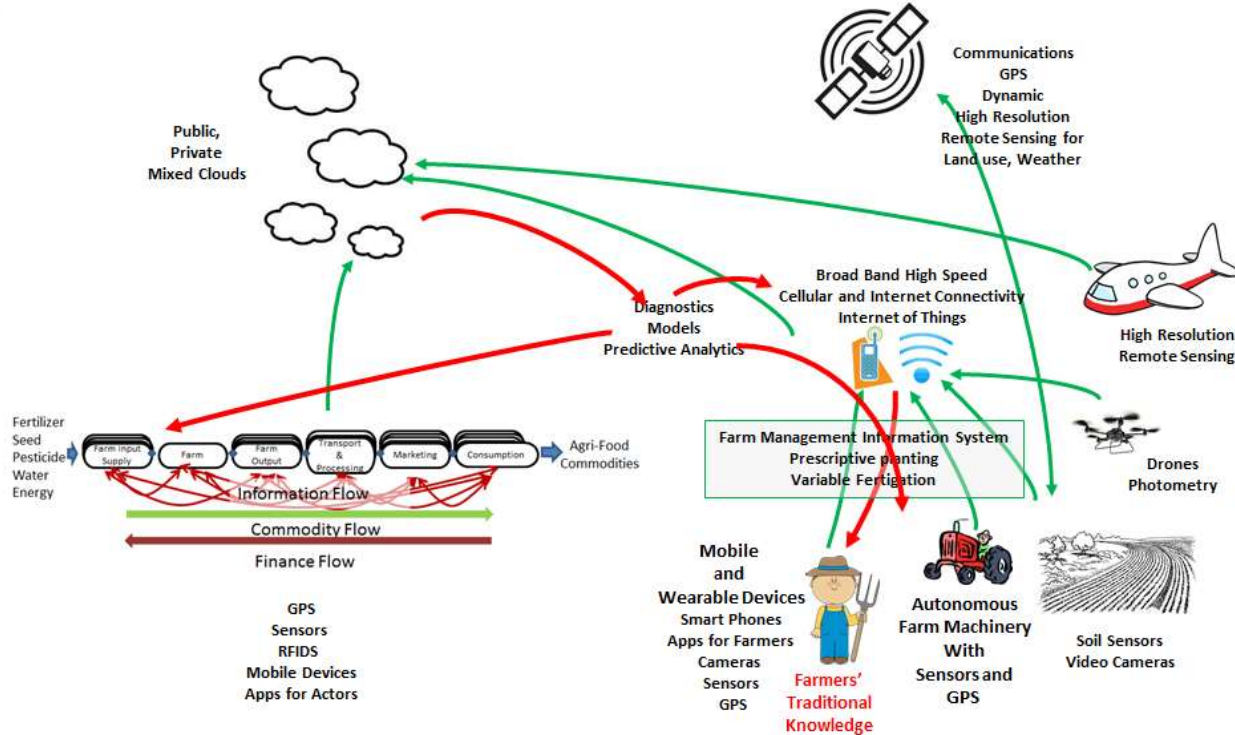
To decide what to grow, where to grow, when to grow, how to grow and where and how to market what will be grown?

- Planning and managing crop and animals production cycles
- Monitoring resource use
- Fulfilling Governance and regulatory requirements
- Market access for inputs and products
- Logistics

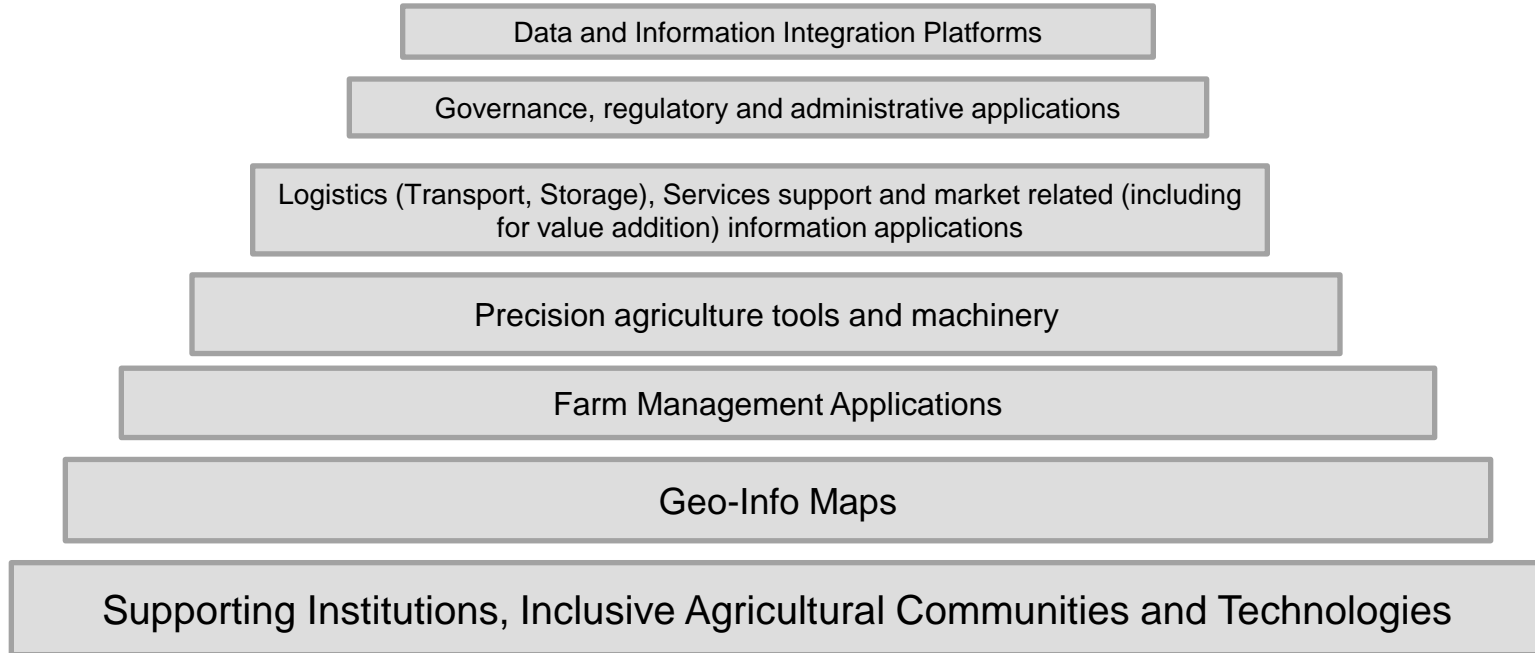
Under this seemingly simple questions underlie a complex web of needed information on:

- Crop and Farming related information on water, land and soil nutrient status, varieties and their agronomy
- Inputs and their supply
- Weather
- Risks Forecasts
- Markets and Market related forecasts
- Finance
- Transport and Storage
- Services availability and support

The Emerging Model of Information Technology Use in Agri-Food Systems



Development of Geo-spatial Applications for Agri-food systems



Institutional Innovations Needed

- Open data and information policies
- Implementation of open data and information policies especially in public Institutions such as for agricultural research and space technology
- Governance and Regulatory Mechanisms for data and information flowing through Agri-food systems at International, National and Local levels
- Enabling learning in users, specially farmers and producers, in sharing, exchange use of data and information from Geo-spatial applications
- Promotion and support to Integrative platforms for data and information from Agri-food systems

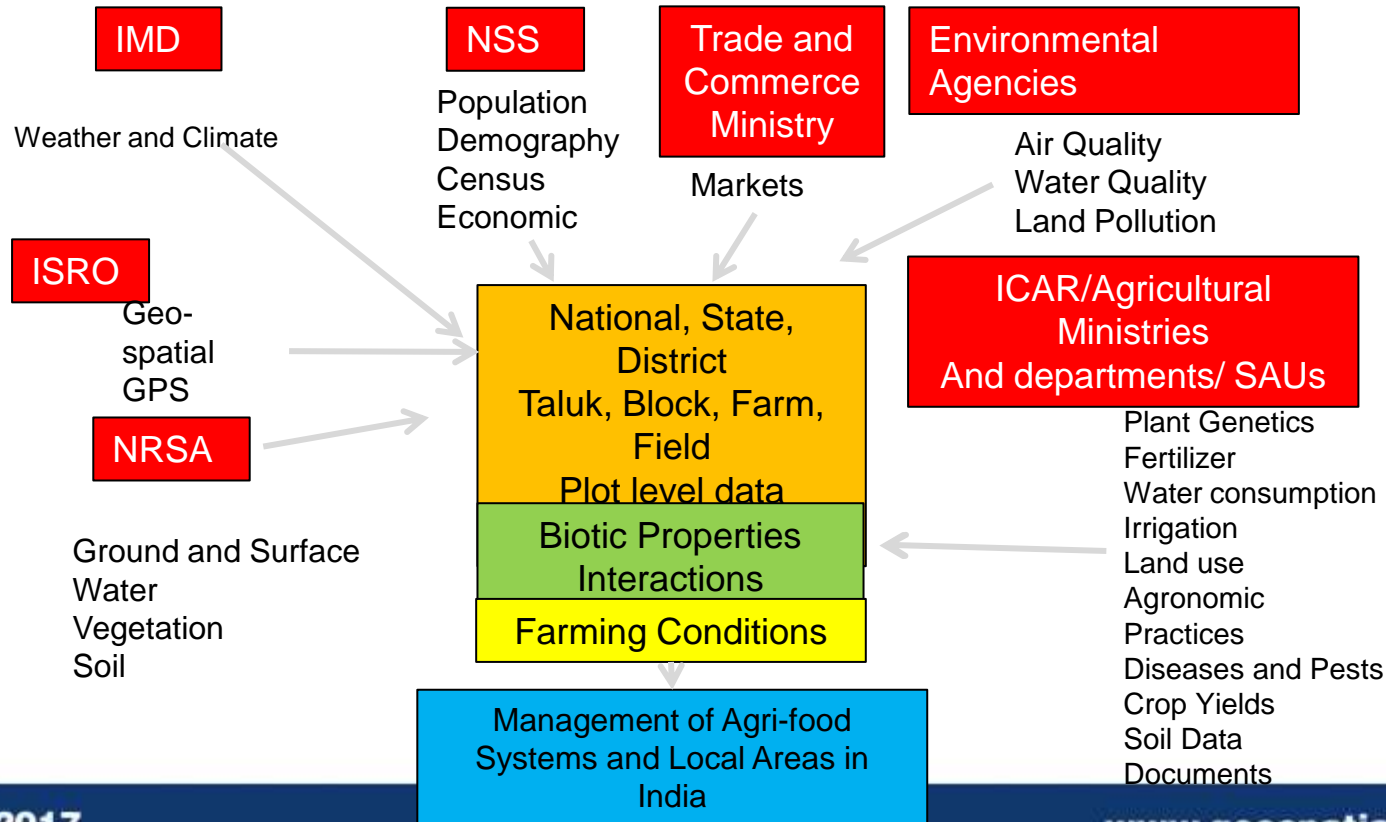


Community Inclusion

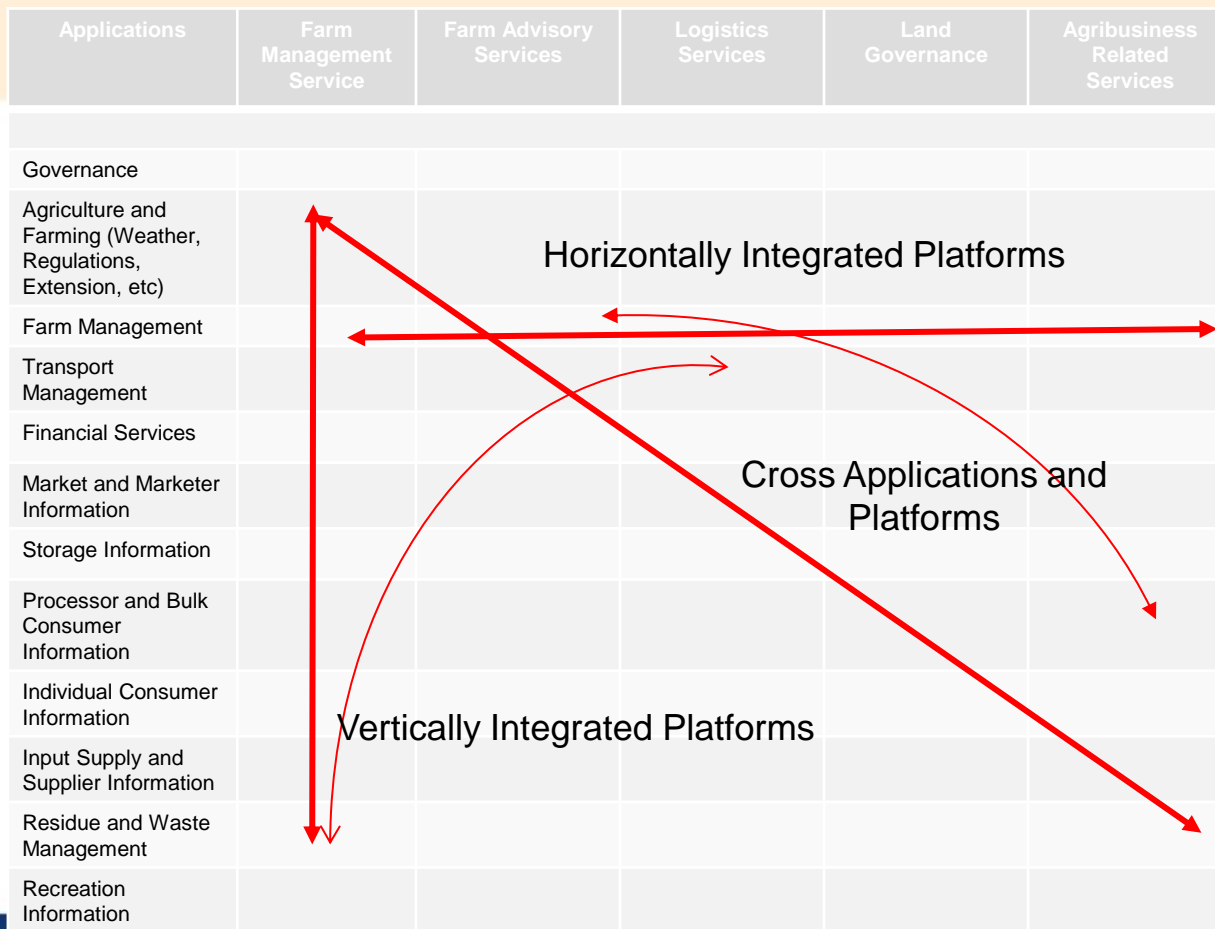
- Innovations needed
 - Farmer-producer virtual aggregation through cooperatives, producer companies, contract farming for crop planning and management, input supply, use of farm resources, tools and machinery, produce marketing, transport, storage, processing etc.
 - Data Cooperative either as adjuncts to existing farmer cooperative and producer organizations or as standalone new organizations
 - Trust organizations for managing, quality control, sharing, exchanging and clearing house for data and information from multiple sources and for a variety of users



Data Integration Platforms



Integration Platforms for Geo-spatial Information Services for Agri-food Systems





GFAR

Thank You

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