



Information Communication Technologies for Sustainable Agriculture

Pre requisites and Policies for Practice

JIJU P. ALEX

Associate Professor

Kerala Agricultural University




ICTs for Sustainable Agricultural Development




- ICTs have advanced in terms of applicability and sophistication and the use of these technologies has turned out to be universal, touching every facet of life and becoming increasingly affordable
- Information is invariably factored in every human activity more than ever before
- Information intensive sectors such as agriculture need to be ICT enabled effectively


Agriculture is information intensive



Issues and needs of a large number of heterogeneous people and the diverse production systems of innumerable crops, across several agro climatic regions



Large and complex systems of agricultural research, education and extension which are institutionalized and interlinked



Administration of development process, credit, agribusiness and market related activities are complex domains in agriculture which require huge information inputs



Inherent vulnerabilities and instantaneous response to socio economic transformations and shifts in international and domestic policies

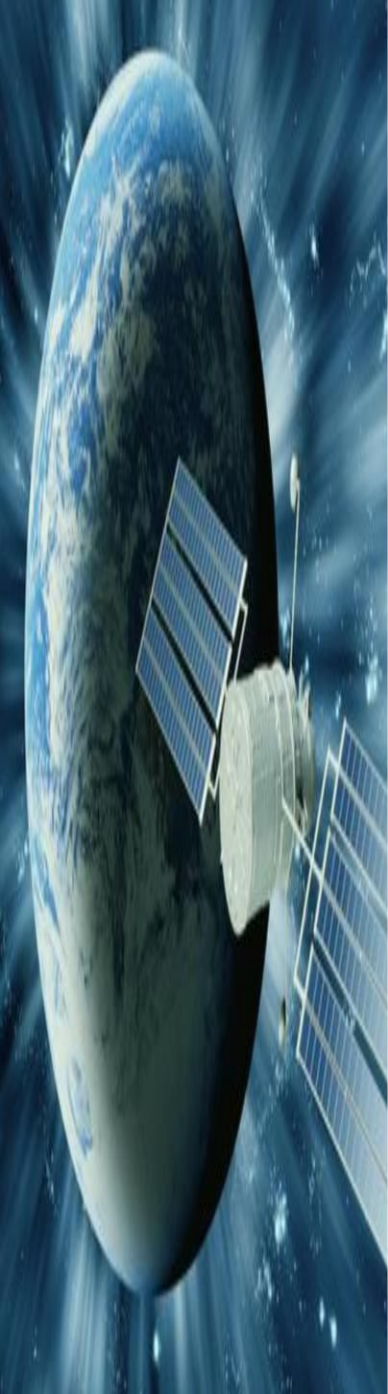
ICTs for Agriculture: Current Status

- There are no comprehensive ICT programmes that address issues of equity and sustainability in agriculture
- Only a few organisations in India have taken up ICT initiatives in any comprehensive manner and have tried to build services which can be scaled up and have a long-term sustainable impact on the society (Jhunjhunwala and Aiyar,2006)
- ICT support to conventional input intensive agriculture itself has been grossly inadequate; and the concern on sustainability has been only rarely addressed

Challenges of information support to sustainable agriculture

- Sustainability in agriculture offers the challenges of tackling the contradictory concerns of optimum resource use and profitability simultaneously
- Any ICT programme with focus on sustainability hence will have to follow a course much different from that of conventional transfer of technology initiatives





ICTs in Agriculture: An Overview

The key concerns in employing ICT in agriculture, particularly for the rural farming communities are

Connectivity, Accessibility, and Content Adequacy

- India- 'ICT access' facts
 - Teledensity has reached 67.67 per cent
 - Internet penetration in India- 10.2 per cent with 12.1 crores
 - overall state of internet connections in India continues to be poor with average speed of just 0.9mbps

ICTs in Agriculture: An Overview



Most of the programmes intend transfer of technology and awareness creation



ICTs are also employed in training, policy advocacy, distance learning and knowledge management



There is a major issue of lack of locally relevant content in majority of the programmes for the farming community



Only a very few initiatives have addressed the real time information requirement of the process of agricultural production at the farmers' level

Typology of the ICT programmes for agricultural development in India

Type	Name of ICT project/programme	Major Objectives
<p>Internet enabled Computer Centres (Kiosks/Knowledge Centres/Common Service Centres/Telecentres)</p>	<p>Akshaya e- learning centres, Warna Wired Village Village Knowledge Centres e- Choupal Knowledge Share Centres Common Service Centres</p>	<p>Dissemination of information on agricultural technologies, climate, prices, government programmes, schemes, e- literacy etc</p>

Typology of the ICT programmes for agricultural development in India

Portals	AGRISNET, Department of Agriculture and Co operation (DACNET), I-Kissan, Agriwatch, Agricultural Marketing Research & Information Network (AGMARKNET), Karshaka Information Systems Services and Networking(KISSAN), India Development Gateway, Agriwatch, AGMARKNET, Agropedia, Rice Knowledge Management Portal (ICAR and partners) e- Krishi (IT Mission Kerala)	Providing users with information on varieties, cultural practices, plant protection practices, prices, advisory services, E-commerce- Linking producers to traders/consumers In few cases, on-line query management etc
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Typology of the ICT programmes for agricultural development in India

<p>Call centres</p>	<p>KISAN Call centres in the country as well as abroad Distress help line (e.g.: Bhumika, Andhra Pradesh)</p>	<p>Providing instantaneous information on technological solutions, problem solving through consultation with experts, legal counselling</p>
<p>Mobile Phones</p>	<p>Reuters Market Light (RML), IFFCO; Tata m-Krishi), Fisherman advisory services by MSSRF</p>	<p>Dissemination of information on technology, weather, prices of commodities in different markets, crop and animal husbandry advisory services, government schemes</p>
<p>Community Radio</p>	<p>Community Radios run by KVKs, NGOs etc (e.g.: Sangham Radio, Kongu FM radio, Mandakini ka awaaz, Krishi</p>	<p>Wide range of information on rural life, agriculture, forests, health, handicrafts etc. Greater scope for issues on sustainability as the ownership</p>

Typology of ICT programmes for agricultural development in India

6	Video	Digital Green, Video SEWA (Self Employed Women's Association)	Information dissemination, advocacy, communication, training, capacity building, mobilisation, distance education
7	Digital Photography	e- Sagu, e-Seva and e- Velanmai in Andhra Pradesh and Tamil Nadu	Information dissemination Training Problem-solving Advisory support

Typology of the ICT programmes for agricultural development in India

Interactive CD ROM/ Touch Screen	Touch screen kiosks, Pondicherry	Problem solving, information dissemination
Video conferencing	Virtual academy for semi-arid tropics, CPCRI Kasargod, IGNOU	Advisory support

Sustainable development : Perspectives and challenges



The goal of sustainable development policy is human well-being for people everywhere, measured in terms of factors such as *security, satisfaction of material needs, health, social relations, freedom of choice and action, and following a principle of equity and fairness.*



To meet this goal, it is necessary to generate and distribute wealth in ways that reduce poverty and provide a decent standard of living to people everywhere (IISD, 2010).

Sustainability of Agriculture: Interventions and Action Points

Converting sustainability concerns into action points require precise interventions at various fronts

- Focus on both genotype improvements through the full range of modern biological approaches
- Improved understanding of the benefits of ecological and agronomic management and manipulation
- Strategies should be devised for better use of existing resources and technologies through ‘sustainable intensification’, rather than employing extensive approaches



Sustainability of Agriculture: Interventions and Action Points

- At the macro level, policies, institutions and technologies need to increase synergies between initiatives on poverty reduction, agricultural production and environmental sustainability
- Information support required include
 - Closing knowledge gaps, including means of measurement and monitoring
 - Information on community level property rights and resource management, yield-increasing and resource-conserving technologies- generation as well as appropriation
 - Information on institutions, people's network, market channels, value chains

ICT programmes for sustainable resource management: An illustrative compilation

Name of the project	Agency and Area	Major Focus	Mode of action
Application of ICTs in land surveys and registration systems Participatory 3D mapping in the Philippines	The Philippine Association For Intercultural Development (PAFID)	Conservation of ancestral domains	Participatory mapping and GIS integration
Logging Off	Malaysia	Conservation of forest	Mapping and modelling to represent land and the associated resources and integrating into GIS maps for community level learning and action

ICT programmes for sustainable resource management: An illustrative compilation

Food Insecurity and Vulnerability Information and Mapping System for Asia (Asia FIVIMS)	Combdia, Philippines, Srilanka By International Telecommunication Union (ITU), UN	Identify the most food insecure and vulnerable populations at sub-national level Capacity building for vulnerability assessment Poverty alleviation	Participatory mapping based on socio economic characteristics and preparation of resource databases
Global Fire Monitoring Centre	Joint FAO/UNECE*/ILO Committee on Forest Technology, Management and Training <i>*United Nations Economic Commission for Europe</i>	Preventing forest fire, giving information on forest fire	Periodic online collection and publication of fire statistics of the member states

ICT programmes for sustainable resource management: An illustrative compilation

Hanoi Land Information Management	Vietnam	Easy access to information on land parcels	Maps and GIS Community training on mapping
Mekong Info - Information System for Natural Resources Management in the Mekong River	Mekong River Commission, South East Asia	Providing access to information about participatory natural resource management	Building information repository and providing access to various stakeholders for formulating action plans
Integrated Water Resource Management	Thailand	Water resource management	Development of a computerized information system on water resources and promoting the linkage of information

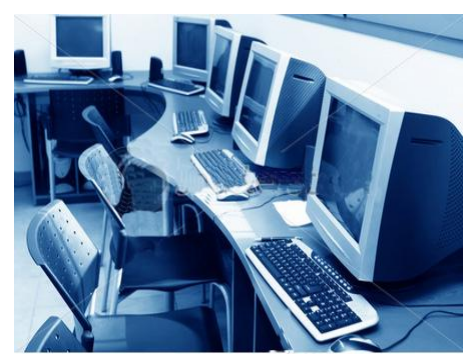


Key components of the ICT programmes for sustainable agriculture

1. Enhancing access to information

Knowledge Kiosks to provide information on:

Credit availability, inputs for cultivation, market opportunities, prices, package of practices, entrepreneurial opportunities, training programmes, certification processes



Key components of the ICT programmes for sustainable agriculture

Online and off line transfer of technology and e-learning

Lack of infrastructure, relevant content in local language and the pedagogical limitation of virtual learning

Interactive multimedia products based on crops, cultural and conservation practices

Call centres, video conferencing, e- learning



Key components of the ICT programmes for sustainable agriculture

- **Grassroots level resource maps and resource data bases**
 - Resource maps
 - Development databases
- **Updating legacy databases**
 - Digitization of legacy databases
 - Generation and integration of legacy databases



Key components of the ICT programmes for sustainable agriculture

- **e- Governance for better coordination of development agencies**
 - MIS for development administration
 - MIS for grass roots level planning
 - Office automation
 - Transaction based database generation
 - Generation and transfer of reports
- **Information systems**
 - Crop Information System



Key components of the ICT programmes for sustainable agriculture

- **Devising ICT enabled participatory tools**
 - Tools for planning
 - Tools for resource
- **Organising local groups and ICT enabled capability building**
 - Local resource groups for technology dissemination-
Eg. Knowledge Centres, Rural Knowledge workers
 - e- Literacy, participatory content development



Conclusion

- ICTs for sustainable agriculture require exclusive interventions guided by the principles of sustainable growth
- Research and development agencies should focus on developing paradigms of information support for sustainable resource use
- ICT enabled transfer of technology models should address information required for sustainable production
- Development administration should be facilitated by robust information systems for improving efficiency

Thank you