TNAU AGRI TECH PORTAL: An on-line Knowledge Warehouse

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Prelude

In the past, agricultural extension has been seen as an approach for transferring technologies and practices to farmers. A continuous flow of technologies in an appropriate manner is vital to provide quick benefit of the development of the farmers. The technology dissemination system typically involves a top down approach where scientists determine research priorities, generate innovations and provide the results to extension agents which are then passed to individual farmers on the assumption that it will encourage them to adopt the innovation.

In this complex process, the extension workers employed individual communication as one of the tool for disseminating the packages of facilities to the end group. The individual contact method was found to be successful and popular, since the contact is generally at the personal level with focused area of interest. Though the individual contact methods were intense and effective, the speed with which all the farmers were covered is really challenging, as 2.5 billion people in the developing world depend upon agriculture for their livelihood. (World Development Report, World Bank, 2008).

As it has to be respond successfully to these challenges of bridging the gap between the information rich and the information poor, greater attention has to be paid to provide need based information and recommendations of practical utility with the strengthened means of

dissemination. To make information transfer more effective, greater use will need to be made of modern information technology and communication among researchers, extensionists and farmers.

The hallmark characteristics of internet is, its ability to deliver individualized message to an infinite number of people; each people involved shares reciprocal control over that content. In other words, it has the advantages of both interpersonal and mass media, but without its complementary disadvantages.

Extension work continues to face challenges because of the scarcity in human, financial and physical resources. The need 'to do more for less' is a reality and partnering with the ICTs can help enhance extension services. The extension officer to farmer disparity points to challenges in delivering information. In light of the constraints of human and financial resources and geographical distances, the media and ICT are being promoted as valuable tools in the delivery of extension information. Increasingly, ICT is being regarded as a tool for sustainable agricultural development.

ICT tools in Indian Agriculture

There is a need to connect rural communication, research and extension networks and provide access to the much needed knowledge, technology and service (Forno, 1998). Dissemination of the required and recent agricultural information to the farmers in scattered villages at the variegated geographical situation in India is very difficult task. Transfer of technology to farmers is not a onetime exercise because new farm technology is being constantly evolved (Mehta, 2003).In rural India, the Information and Communication Technologies (ICT) are already used to

give an immediate and participatory form of administration. Somehow, the strategy has been successful in several areas. It is well known that radio, telephone, television, computer and print media are available everywhere fortunately in the remote areas also.

Agricultural informatics is a new concept that has arisen following the rapid development in ICT and the internet. Referred to as e-agriculture, agricultural informatics is an emerging field which combines the advances in agricultural informatics, agricultural development and entrepreneurship to provide better agricultural services, enhanced technology dissemination and information delivery through the advances in ICT and the internet. The e-Agriculture concept, however, goes beyond technology, to the integration of knowledge and culture, aimed at improving communication and learning processes among relevant actors in agriculture at different levels i.e. locally, regionally and globally.

The Indian Ministry of Information Technology orchestrated the public and private sector roles and attracted much private-sector investment. ICTs can be seen as useful in improving linkages between the research and the extension sub systems. The experience of rural tele-centers in the developing world shows that ICT can help in enabling rural development workers to gather, store, retrieve, adapt, localize and disseminate a broad range of information needed by rural families (Davison *et al.,* 2005).

India has the second largest number of extension workers in the world providing continuous knowledge support to this number of extension workers requires 24 hours service all the seven days is possible only through e-learning strategies in agriculture. Some successful public ICT initiativeinIndian agriculture are e-choupal, aAQUA which stands for almost All Questions Answered*,* Warana Wired Village, Infosys' ICT

initiatives for empowering Indian farmers, Agropedia, RKMP (Rice Knowledge Management Portal), InDG (India Gateway), Kissan Kerala, Agrisnet, Agmarknet, Dacnet, Agricoop, Intradac, seednet, Metrological Information by Ingen Technologies, Honey-Bee knowledge network.MSSRF, Ikisan portal, Uttamkrishi, Mahindra kisanmitra, Indiaagronet, Krishi world, Agriwatch, Agriculture information were some of the private initiative for agricultural development.

TNAU Agritech Portal

A website is a collection of all the facts and information in different pages that are included or contained under a domain name. A website contains text, images and videos. A portal is defined in the dictionary as a gateway or an entry point to a grand entrance. Thus a web portal, in addition to being a website, also acts as a gateway to the internet. Web portal is a website but it also acts as a portal as it gets to you an array of web services. There are many pages that go into making it a website that is also a web portal. A web portal is not just a great source of information; it allows data retrieval from divergent sources. While a web portal find information for the users, they themselves have to search for it on a particular website. It is possible to search for information on a website but it is limited while a web portal itself searches and presents all the information for the users.

In Tamil Nadu, farm technologies are transmitted to farmers through State Department of Agriculture, Tamil Nadu Agricultural University, Private Dealers and Non-Governmental Organizations. Still, these agencies are following the conventional extension approaches such as mass, group and individual contacts. Due to fast growing economy,

these approaches are not able to deliver the technologies as expected by the farming community. The existing staffs in agricultural department, Government of Tamil Nadu is not matching with the growing rural population in the villages which has resulted in slow transfer of technologies and delivering of untimely information. Again, most of the time they are not giving need based farm advices than general or blanket. Further, following are the problems faced by the end user or farmer

· Lack of instant farm advisory support to the farmers

· Lack of instant technical information support to field extension officials

· Poor weather and disease complex advisory services

· Lack of market information support services

A farm technology portal was designed to overcome these constraints and launched by integrating allied sectors including agriculture, horticulture, sericulture, seed sector, marketing, fisheries, forestry and animal husbandry. The portal (http://agritech.tnau.ac.in) have feature of dynamic and multimedia based content coverage for the benefit of field extension officials and farmers in bi-lingual (Tamil and English) mode covers around 7.5 lakhs web pages. The portal has been launched on 27th October, 2009. It holds all the farming information for decision making at the field level.

Design of TNAU Agritech portal

a. Content need assessment: The project team organized three different brainstorming sessions to understand the information needs of the stakeholders.

i) Farmers: In each district, five progressive farmers were selected through KVKs and invited to participate in the brainstorming session.

The project team explained about the purpose of the meet and what sorts of information have to be added for the benefit of the farmers. The farmers were grouped into various subgroups to discuss the needed information in the portal. Each group outcome was presented and it is concluded that the portal should have information on i) farmer's success stories, ii) farmers association and its function, iv) farmers innovation, v) TNAU scientific publication etc.

ii) Extension officials: All JDAs, DDHs and other line department heads are invited for the content generation and need assessment. They need information on line departments and its activities apart from the technological information. They are,

1. Agriculture

2. Horticulture

3. Agricultural marketing

4. Agricultural engineering

5. Seed certification

6. Organic farming

7. Sericulture

8. Forestry

9. Fisheries

10. Animal husbandry

iii) Scientists and Subject Matter Specialists (SMS): The project coordinators and KVK SMS from all the districts were invited for brainstorming to enumerate the content need and suggestions for content generation. Accordingly the following suggestions were added by the officials.

1. Technologies

2. Special technologies

3. Schemes and services

4. Daily events

5. Agri information

6. Market information

7. Related information

8. Recent updates

b. Software tools used: The portal content is designed and developed with the support of Adobe Photoshop CS as Template Designing Tool, Macromedia Dream Weaver for Web Developing Tool, HTML, XHTML, ASP.net, Flash Scripts as Coding Tool and Open Access Software as platform. The following softwares were used and they are listed as below.

1. Dream weaver – Content alignment and HTML Tag Editing and Hyper linking

2. Photoshop – Template Design and Photo Editing

3. DVD video soft – Video and flash conversion

4. Adobe Acrobat – Document to PDF conversion

c. Content validation: Around 25 man power (10 Research Associates + 10 Senior Research Fellows + 5 Junior Research Fellows) from multidiscipline who scouted the content from various sources like library, books and periodicals, magazines, scientists, web and other sources. Further relevant photographs, audio, video files were collected from different centers and sources. The content were sequenced and segregated according to easy coverage. Based on the subject availability 54 scientists

were identified from TNAU as content validations.

The entire document were taken printout and shown to the concerned subject matter specialists for validation of the content (Annexure I and II). Sufficient time was given to them to go through the whole content including the supporting materials like audio, video, visuals, photographs etc. Once the content validation is certified by the representative subject matter specialists, the contents were designed and developed by using above software.

d. Trial version: The designed content was linked with main home page and trial version was released for internal usage among content validation and content designers. Mac and windows server used to upload the content.

Features of TNAU Agritech portal

Agriculture: The production technologies of all agricultural crops includes cereals, pulses, forage crops, sugar crops, fiber crops, oil seeds, and i. millets; plant nutrition, resource management, stress management, agro meteorology, dry land agriculture, water shed management, integrated farming, organic farming, green manuring, schemes, farmers associations and publications.

ii. **Horticulture:** Production technology of horticulture crops, landscaping, value addition, varieties, sale price, precision farming, supply chain management, green house cultivation, orchard management, cost of cultivation, nursery techniques, deficiencies and disorders, fertilizer schedule, plant protection, schemes and publications are the major topics covered in this topic.

iii. **Agricultural Marketing and Agri Business:** Schemes, organizations, farmers markets, regulated markets, commodity markets, commodity boards, online market data, SFAC and publications are some of the items covered.

iv. **Agricultural Engineering:** Agricultural engineering provides information on tillage implements, sowing, weeding, plant protection, harvesting equipments, processing equipments, energy gadgets, micro irrigation, drainage technology, water lifting, water harvesting, bio energy and soil and water conservation.

v. **Seed Production:** Seed production of cereals, millets, pulses, oilseeds, fibre crops, vegetable crops; seed processing, seed treatments, seed storage, TNAU seed center and seed certification are the wide areas covered in this topic.

vi. **Organic certification:** Organic certification includes links on introduction, principles, steps, pest and disease control in organic farming. It also covers information related to activities such as schemes, trainings, publications, success stories and organic cultivation of agricultural and horticultural crops. It also have information on special technologies, marketing and organic farming.

i. **Forestry:** Forestry technologies like agro-forestry, timber trees, fuel and fodder trees, industrial forestry, biodiversity, eco-tourism, wildlife resources and mangroves were included in this link.

ii. **Fisheries:** All types of fisheries, fishing methods, harvesting, marketing, processing and value addition, export information were

presented in this department.

iii. **Animal Husbandry:** Animal husbandry covers rearing of livestock and poultry, pest and disease management, insurance, equipments, veterinary services in Tamil Nadu and Export-Import details.

Sericulture: Silkworm rearing, mulberry cultivation, pest and disease management, Post cocoon technology, waste management, schemes, and cost of cultivation are covered in this link.

Other links in home page

Technology topic covers crop production, crop protection, crop improvement, sustainable agriculture, organic farming and indigenous farming. Crop production includes production details of cereals, pulses, forage crops, sugar crops, fiber crops, oil seeds, and millets, plant nutrition, resource management, stress management, agro meteorology, dry land agriculture, water shed management, integrated farming, organic farming, green manuring, schemes, farmers associations and publications. Special technologies provide information on system of rice intensification, precision farming, good agricultural and management practices, good laboratory practices, sustainable sugarcane initiation (SSI), canopy management in mango and ultra-high density in mango.

Schemes and services includes government schemes and services, IAMWARM, development blocks, banking and credit, crop insurance, Krishi Vigyan Kendra (KVK), Agricultural Technology Management Agency (ATMA), Non-Government Agencies (NGOs) and Self-Help Groups (SHGs), Kisan Call Centre and Millennium Development Goal (MDG- 2015). Daily events contains dynamic market information, TNAU-DEMIC, human resource development, television programmes,

farm radio programs, farm magazines, water level in dams and TNAU community e-radio. Daily newspaper, farm information are uploaded and archives are maintained in the portal in Tamil and English.Dynamic Market Information (DMI) provides whole sale and retail market price information for 152 perishable commodities like vegetables, fruits, flowers and plantations from 13 major South Indian Markets namely Bangalore, Chennai, Cochin, Coimbatore, Hosur, Kumbakonam, Madurai, Mettupalayam, Ottanchatram, Panruti, Thalaivasal, Tirunelveli and Trichy.

The other links in the homepage are covered under major topics such as agri information, market information, related information and recent updates. It includes sustainable farming, indigenous farming, farm enterprises, nutrition, minimum support price, input source, export and import, NHRDF, MCX, NCDEX, patents, environment and pollution, disaster management, ICT initiatives, important links, inputs source, with streamed audio and video files wherever necessary. Recent updates contains the latest information such as e Governance award, TN season and crop report which is periodically updated.

Usage of TNAU AGRI TECH PORTAL

This dynamic portal holds around Seven and half lakh pages in Tamil and English with multiple media content. The portal (http://agritechportal.tnau.ac.in) has been dedicated to serve for the benefit of field extension officials, farmers and other stakeholders. During the past four years, the portal was used 60.25 lakh times. During the year 2014-15 the daily visitors ranged from 5,200-7,400**.** New visitors numbered between 3,500 and 4,800 a day. The e-mail queries received and answered were 90,000

Sl. No	Particulars	Year I (2011-12)	Year II (2012-13)	Year III (2013-14)	Year IV (2014-15)
1.	Total Viewers of portal	6,52,345	12, 52, 789	45,89,039	60,25,015
2.	Daily Visitors	450-550	740-900	2,900-5,700	5,200-7,400
3.	Average time on site	12-18 minutes	16-22 minutes	18-25 minutes	20-30 minutes
4.	Bounce rate (Repeated hits / day)	55 per cent	58 per cent	63 per cent	75 per cent
5.	e-Mails Queries	1,865	35,000	58,000	90,000
6.	New Visitors / day	125-140	190-320	2,800-4,300	3,500-4,800

The details of usage of TNAU Agri-Tech Portal are given below.

Technology and Market Advisories through Mobile Phone:

· The e-Extension Centre, Directorate of Extension Education is utilizing the govt. of India initiative on m-kisan portal (http://mkisan.gov.in) to reach the farmers through kisan SMS service during 2014-15.

· Number of Technology message includes technology and marketing information: 5,215

· Total number of beneficiaries includes farmers, extension officials and scientist: 64,502,766

Strengthening of TNAU AGRI TECH PORTAL

Sharing Multi Institutional Information: Right now, the portal has more technological information on SAUs and ICAR institutions. Sharing information of private institutions or organisations is required. Hence, the information of leading multinational companies and domestic institutions involved in agriculture such as seeds, fertilizers, pesticides, herbicides, machineries, export and import may be shared.

Outreach and Dissemination: Efforts have to be taken to strengthen the outreach activities by using the media revolution and more advertisements. Exploring the kind of public-private partnership strategy will facilitate to sustain the portal for long run.

Leverage through Social Networks: Multiple social networks should be effectively used for technology dissemination, as single tool will not serve the purpose. Hence multiple tools like blog, you tube, RSS feed, video conferencing and linkage with social networks may be integrated.

Exploring Mobile Phony Dissemination: Mobile based agro advisory services may be introduced. An exclusive toll free number can be assigned and made familiar among the extension officials and farmers. Any mobile service users may call e-extension center for clarification, updation of latest technological information. Similarly, the success stories may also be shared through mobile platform to rest of the farmers.

Interactive Services: Availing all inputs, schemes, online based credit services and benefit sharing may be introduced through online. In each block extension officials may be devoted this task. This will ensure the

speed delivery and transparency in execution of extension system.

ICT mobile vans: State of art of ICT or new media mobile van, one per block may be introduced. A team of scientist including soil science, pathology, entomology and social science with water, soil and petiole testing instruments and ICT tools to help the unreached ICT users.

ICT Capacity Strengthening: All the extension officials may be provided with hands on training on new media tools, its operation and utilization. They have to realize that ICTs are the easy way of dissemination of farm information to the farmers. Similarly the needs of the farmers have to be taken to the research system for quick follow up with ICT tools.

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