e-Sagu: An IT based Personalized Agricultural Extension System

A Research Project of IIIT, Hyderabad and Media Lab Asia
http://www.esagu.in

Recall the face of the poorest and the weakest man whom you may have seen, and ask yourself, if the step you contemplate is going to be of any use to him. Will he gain anything by it? Will it restore him to a control over his own life and destiny? In other words, will it lead to Swaraj for the hungry and spiritually starving millions?

Mahatma Gandhi

What is eSagu ?

eSagu is a tool for IT-based personalized agricultural extension system. ("Sagu" means cultivation in Telugu language.). It aims to improve farm productivity by delivering high quality personalized (farm-specific) agro-expert advice in a timely manner to each farm at the farmer's door-steps without farmer asking a question.. The advice is provided on regular basis (typically once a week) from sowing to harvesting which reduces the cost of cultivation and increases the farm productivity as well as quality of agri-commodities. In eSagu, the developments in IT such as (database, Internet, and digital photography) are extended to improve the performance of agricultural extension services. eSagu offers next generation agricultural extension tool and supplements and integrates into the existing agricultural extension system.

System architecture and operation.

In e-Sagu, rather than visiting the crop in person, the agricultural scientist delivers the expert advice by getting the crop status in the form of digital photographs and other information. The description eSagu is as follows (Figure 1): The **farmers** are the end users of the system and can be illiterate. A **coordinator** is an educated and experienced farmer who can be found in the village. **Agricultural Experts** possess a university degree in agriculture and are qualified to provide expert advice. **Agricultural Information System** is a computer based information system that contains all the related information. **Communication system** is a mechanism to transmit information between farms to agricultural experts and vice versa. If enough bandwidth is unavailable, information can be transmitted through courier service. However, the advice text can be transmitted through dial-up Internet connection.
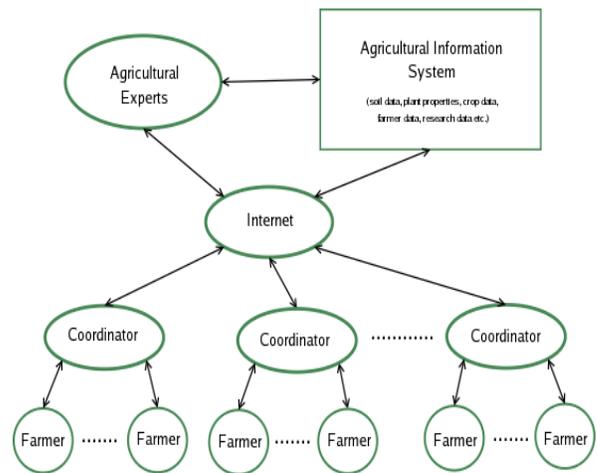

Figure 1: The parts of eSagu System.

The operation of eSagu is as follows. A team of agriculture experts work at the eSagu (main) lab (normally in a city) supported by agricultural information system. One small computer center (few computers and one computer operator) is established for a group of five to six villages. Appropriate number of coordinators were selected from the villages. Depending on the crop, each coordinator is assigned a fixed number of farms. The coordinator collects the registration details of

the farms under him including soil data, water resources, and capital availability and sends the information to the main eSagu system. Every day, the coordinator visits a fixed number of farms and takes four to five photographs for each farm. A CD is prepared with the photographs and other information and transported to the main system by a regular parcel service. The Agri-experts, with diverse background (Entomology, Pathology, Agronomuy…)at the eSagu (main) lab analyse the crop situation with respect to soil, weather and other agronomic practices and prepare a farm specific advice. This advice is downloaded at the village eSagu center electronically through a dial-up Internet connection. The coordinator collects the advice and delivers it to the concerned farmer. Each farm gets the advice at the regular intervals starting from pre-sowing operations to post-harvest precautions.

Progress till March 2006

The development of eSagu was started during Kharif season of 2004 by providing expert advice to 1051 cotton crops in Oorugonda, Gudeppad and Oglapur villages of Atmakur mandal in Warangal district (Andhra Pradesh, India). The eSagu main system was built at IIIT, Hyderabad. The system was very successful. Based on this observation, during Kharif and Rabi 2006, a scaled-up version of eSagu for 5000 farms has been implemented for the crops of Cotton, Chilies, Rice, Groundnut, Castor, Groundnut and Redgram (Table 1).

Table 1: Crops, eSagu local centers, and corresponding villages		
Crop	**eSagu Center name and address**	**Villages attached**
Cotton	Oorugonda (Atmakur mandal; Warangal district)	Oorugonda, Gudeppad, Sitaramapuram, Dammanapeta, Nandigama, Rangapur, Relakunta , Saireddipalli
	Malkapur (Station-Ghanpur mandal, Warangal district)	Malkapur, Venkatadripeta, Chilpur, Peechara, Maddelagudem
Chilies	Banapuram (Mudigonda mandal, Khammam district)	Banapuram, Kamalapuram, Gandhasiri, Mangapuram, Pedamandava
Rice	Jinnuru (Poduru mandal, West-Godavari district)	Jinnuru, Poduru
Groundnut	Nagrireddipalli (Ananthapur-rural mandal, Ananthapur district)	Nagireddipalli, Taticherala, Somaldhoddi
Castor	Gurukunta (Atmakur mandal, Mahabbobnagar district)	Gurukunta, Darpalli, Lingampalli, Kamaram, Karoor
Redgram	Kotabasupalli (Thandur mandal, Ranga Reddy district)	Kotabasupalli, Gengurthi, Inelli, Kothlapur, malkapur, Sankireddypalli
Aqua	Pathepur (Nidamarru mandal, West-godavari district)	Pathepuram

eSagu prototype for 200 aqua farms has started. Further, a revenue model and partnership model is being experimented. An experiment is being conducted to develop an entrepreneur model.

Key Results

- The farmers are happy with the expert advice as it is helping the farmers to improve input efficiency by encouraging integrated pest management (IPM) methods, judicious use of pesticides and fertilizers by avoiding their indiscriminate usage.
- The evaluation study shows that the e-Sagu farmers accumulated benefits worth about Rs. 3,820/- per acre in monitory terms with cost to benefit ratio 1:3..
- The turnaround time for advice delivery is 24-36 hours.
- In some of the centers, the farmers are charged nominally for the services and they are satisfied with the service.

Benefits

- It provides a quality personalized agro-advice to the farmers.
- It is a query-less system and provides expert advice even without the farmer asking a question.
- It provides accountable advice. The advice is comprehensive, complete and regular in terms of diagnosis, analysis, advice delivery, follow-up and feedback.
- It is a cost-effective system. It can be made self-sustainable with a nominal service charge..
- It enables farmers (marginal and poor) to cultivate like an agricultural experts..
- It provides strong database to support decision making and documents success stories and new problems.
- It follows a proactive approach naturally averts problematic situations.
- It enables quick deployment of services during the times of crisis.
- It capacitates rural livelihoods and generates rural employment.
- It helps in validation of agriculture technology.
- It aids in successful implementation of crop insurance scheme by making farm as a unit of insurance..
- It is a scalable system.
- It can be developed on the available infrastructure even without bandwidth.
- It significantly reduces the lag period between research efforts to practice.
- It shows a great promise in the era of globalization, as it can provide the expert advice that is crucial to the Indian farmer to harvest different kinds of crops based on the demand in the world market with quality and assurance.

Future

- Continued experiments to bring down the cost of eSagu services..
- Investigating the development of agri-business model by providing multiple services under one roof. The services include eSagu , input (fertilizer and pesticide), banking, warehousing, insurance and marketing.
- Scaling-up of operations in Andhra Pradesh and extending the concept and services to other States in a phased manner.
- Standardization of eSagu system
- International certification for e-Sagu system
- Certification for the e-Sagu farmers' produces under International Standards to enable them to compete in Export Markets
- Expanding eSagu to Horticulture, Aquaculture and Animal husbandry.

Stakeholders

The eSagu system is being developed by IIIT, Hyderabad and Media Lab Asia. The other stakeholders are Acharya NG Ranga Agricultural University (ANGARU), Byrraju Foundation, M/S JANANI Foods Pvt. Ltd. The organizations such as Central Research Institute of Dryland Agriculture (CRIDA), National Institute of Agricultural Extension Management (MANAGE), and Center for Environmental Studies are associated with the project.

Dr.P.Krishna Reddy, Chief-investigator of eSagu, IIIT, Hyderabad, Gachibowli, PIN: 500032 (India). Phone: +91-40-23001967/9 ext.322; E-mail: pkreddy@iiit.ac.in. Web: http://www.iiit.ac.in/~pkreddy and http://www.esagu.in.

Dr. G.V. Ramaraju, Media Lab Asia C-235, 1st Floor, Defence Colony, New Delhi - 110024. Tel: 011 41553693; email: ramaraju@medialabasia.in.