

AN AGRICULTURAL MANAGERIAL TOOL FOR PRE AND POST PRODUCTION ACTIVITIES

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Abstract: The economic growth of any nation depends on overall development of all sectors with equal priority. Agriculture is one of the sectors which influences the financial and social status of both rural and urban population, there by contributing to nation development. In India, agriculture is an important occupation for majority of rural population with limited resources. The farmers in India are facing a lot of problems in both pre and post agricultural phases which is directly affecting the crop production. Availability of seeds, fertilizers, chemicals, machineries, markets, storage and guidance in right time is the key challenge to agriculture in India. Since, Information and Communication Industry has reached all corners of India, providing necessary information to farmers in right time would definitely help them for the betterment. This paper brings a platform through a tool which merges India's agriculture with ICT. This managerial tool provides different services for pre and post agricultural activities benefiting not only the farmers, but also the different public and private sectors such as Banking, Agricultural Departments and Transportation. This tool is developed using 'Bottom up Approach' of Object Oriented Technology with necessary services with scope to enhance in future.

Keywords: ICT,E-Agriculture, Object Oriented Technology.

Introduction: Agriculture is backbone of India. India is primarily agriculture-based country with 60% of its population being dependent directly or indirectly on agriculture. The Indian agriculture sector has made considerable progress in the last few decades with its large resources of land, water with variety of crops which are region dependent. India produces all major crops to meet the requirement of food, fodder, fiber, fuel and inputs for its agricultural industry. The current rate of Indian food processing market in US is \$22 billion and it is expected to increase to reach \$30 billion in near future. The Agriculture sector is important in any developing economy, where it contributes 30% of Gross Domestic Product (GDP). Currently, India holds second position in agriculture in the world and given more importance since it plays a key role in the social economic growth of the country.

Agriculture sector in India is facing lot of challenges. An interactive discussion with each farmer is unsolvable problem. Nearly 80% of farmers in India are illiterates where they can't read and write. However, they are familiar with usage of mobile phones which is a greater platform to bring changes. Thus, Information and Communication Technology (ICT) plays an essential role in development and economic growth of the country. E-agriculture is an emerging field focusing on the enhancement of agriculture and rural development with evaluation and application of innovative ways in information and communication technologies in rural domain.

A case study of problems on farmers: A case study is done on the problems faced by the farmers at different regions. A check list made independent on

region and crops grown. The commonly addressed problems collected out of survey are as below.

Lack of knowledge: Most of our Indian farmers are either illiterates or semi-literate. The rural farmers lack access to knowledge and information which help them to achieve maximum agricultural yield. Farmers should continuously intimate about the features of their farm such as the soil type, the plants that can be suitably grown in that soil type and so on to the Central information centre. This information can be shared with other farmers so that it is useful for them. Farmers can contact the Central information centre for any further details and enquires. The government of India has initiated various measures and policies for the welfare of the farmers.

- Novel methods for interacting with the farmers, i.e. a person with a sound technical as well as agricultural knowledge should be appointed to interact with the farmers.
- To unfold easier access to information Using latest technology available
- Educating the farmers about the various facilities provided by the government so that they can make the best use of those facilities to solve their routine issues.

Lack of Markets: The government of India established the markets such Agriculture Produce Market Committee (APMC) and HOPCOMS in taluk places. APMC markets are meant for crops and HOPCOMS are meant for fruits and vegetables. If the villages are too far from taluks, the farmers found difficulty to travel from villages to taluks places. This is one of the major problems being faced by farmers. An efficient transport system is expected to reduce the same to favor the farmers in terms of cost & time.

Mediators in and out of the markets: The mediators are the major problems in agriculture for both farmers and consumers. A financial commitment during pre agriculture forces the farmers to sell the crops at lower price. The same crops are sold to consumers at higher market rates which makes market imbalance and de-motivating the farmers.

Lack of communication between stakeholders: The farmers need suggestions and support in time. Lack of communication between the officers and farmers would lead to a greater loss which is irreversible.

Labor Difficulty: Agriculture is a labor intensive work. Lack of labor due to migration to cities caused labor problem which made the farmers to rely on machineries. However, this advancement has not reached all the farmers and also not affordable due to huge financial investment.

Financial Crisis: Agriculture is assumed as a less profitable profession. Since farmers are following traditional farming and marketing strategy, it is less productive and creating financial problems. Through, government is supporting farmers with favorable schemes and financial assistance, it is not being properly used due to various reasons. Credit recovery rate is also very low in the banks which would further create a problem for the government to help the needy farmers. A proper policy and a monitoring system would improve the situation.

Unavailability of Commodities: The prerequisites for agricultural activities are the commodities such as quality seeds, fertilizer, chemicals and machinery. Timely availability is very important and productivity is depending on the quality of commodities and service been extended.

Natural Calamities: Natural calamity is an unavoidable situation, sometimes unpredictable. Guiding principle on such situation is important to retain the faith on agriculture as well as on the government. Delay in execution of support causes the financial imbalance which has ripple effect on the whole scenario.

Lack of Water facility and soil testing: Water is a major crisis faced by farmers in current years as it is more required for major crops/vegetables. Government has to take the measures where there is a lack of water for growing water even yearly once. The guidance and implementation on soil test periodically would reduce the loss in agriculture.

Literature survey:

In this paper author proposed conceptualization, design, development, evaluation and application of innovative ways to use information and communication technologies in the rural domain with primary focus on agriculture. It is difficult to convey the web services to farmers in rural areas.

Providing high speed internet in rural areas is another big challenge in e-agriculture.

This paper tells about the role of mobile phones and information exchange in a place like India where more than 50% of the population is dependent on agriculture and most of them are illiterates. As the number of mobile phones being used by the farmers increases we can devise many ways to educate the farmers about the various agricultural issues and their solutions.

Author focused in his paper on the study of application of cloud computing in agriculture and forestry industry for highreliability, expansibility, virtualization services. This paper also focuses on monitoring the agricultural land to detect and control pest diseases.

Analysis and Proposed Methodology: The typical problem in Indian agriculture is with medium and small scale farmers, right from seeding to marketing phases. Existence of middleman between the farmer and consumer is a major issue. Marketing is another problem with limited markets. Due to the lack of knowledge, information regarding availability of commodities is not available which unnecessarily wastes time and money. Though, most of the farmers are not explored to recent happenings, they are interested in adapting themselves to new system which would change their life style.

A solution to their problem is to localise the information using existing telecommunication facility merging with Information and communication technology. The information and communication technology (ICTs) plays a important role in agriculture scenarios by providing the agriculture information and knowledge such as pre-harvest, post-harvest, fertilization, production, cost of the crops. The proposed tool has five major modules which addresses the problems efficiently in time. They are

1. Administrator
2. Transport
3. Banking
4. Government Policies and Rules
5. Marketing

System Architecture and Design: The system architecture explores the major modules and their interconnectivity. Each module has its own set of responsibility relating to different agricultural activities in both pre and post agricultural phases.

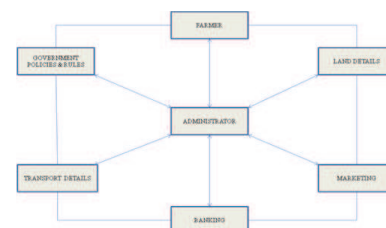


Fig 1 System Architecture

Administrator:The administrator has right to access this application of different users at the different levels. In this module the different levels are from GramaPanchayth to state and then to the nation with various access rights which includes details on agriculture officers, roles and responsibilities like bank loans ,marketing at region wise.Thus the administrator is to make sure that the operation can work with efficiency.

Farmer:This module includes

- ✓ Farmers personal information
- ✓ Crop growing details
- ✓ Land details
- ✓ Loan details

In this module the farmer should be registered with all the personal information and primarily with Adhaar card number along with the bank account details. The farmer has to submit the crops growing information, land details along with the pahani which is given by government and loan details. Thus it provides the complete statistics of farmer, cultivation area and possible yield rate with respect to the specific region.

Transport: Transport providers have to register with administrator with his personal information, vehicle number, vehicle name, capacity of the vehicle, price per kilometre. The route plans need to established and continuously optimized for the optimal utilization of the transport facilities and reducing the cost of the transport. There is some situation where the transportation is required to carry the harvested crops from point of production to the point collection. By this the farmers can reduce the time to reach the crops to market and tax free for the third party holders near APMC yards. **Banking :**They include

- ✓ Crops loans

- ✓ Fertilizers loans
- ✓ Bore well loans
- ✓ Agriculture equipment loans

The crop loans for the farmers are generally given by the many banks through the Kissan Credit card Schemes. The kissan Credit Card scheme was started by the government of India and National bank for agriculture and rural development. These loans are called as the short term loans. Government has advised the banks to convert Kissan Credit Card **into a Smart Card cum Debit Card**. So that we can include other loans like, fertilizer loans, bore well loans and agricultural equipment loans by the same scheme which helps to farmers.By this the farmers can increase the production and helps to increase the GDP of India.The payment for the crops can be done through e-banking system

Government policies and rules:There are certain policies and rules by the government which are benefited to the farmers in terms of the subsidy schemes for crops,agricultural equipments and fertilisers.Due to involvement of middle man between farmers and government it is not reaching the fertilizers properly and in a short time so that by this approach eliminating of middle man government can reach the fertilizers to the farmers in short time. By this application the government can reduce the payment of sushthi loans to the banks.

Marketing: The marketing holders should be registered with all required personal information so that the payment must done to government accordingly after buying the crops .By this approach the customers can get the crops with reasonable price and export facility can be increased according to the demands . There by the middle mans can be eliminated and get benefited to farmers.

Implementation

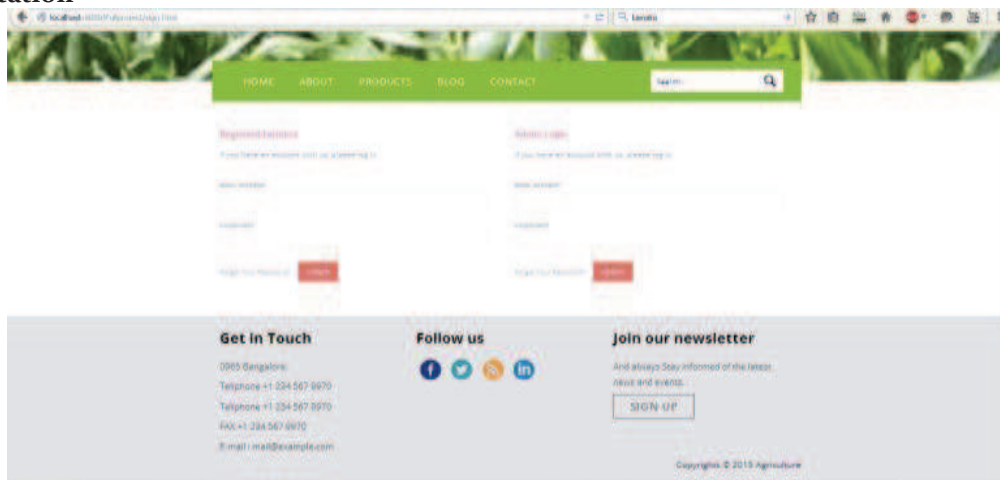


Fig 2 Admin and Farmer login

Fig 2 Entering the personal details

Fig 3 Entering the land details

Result analysis: This below results shows comparison of with and without middle man in agriculture markets with the terms of cost and time.

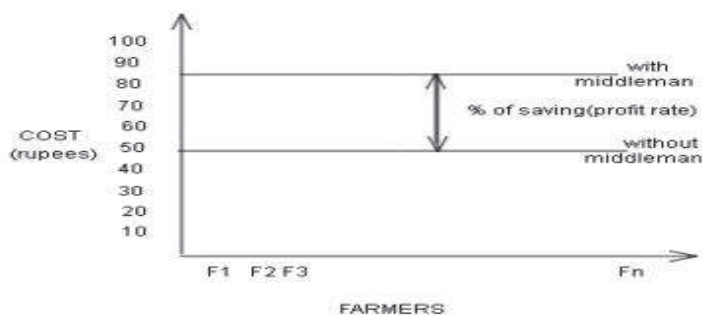


Fig 5 Comparison in terms of cost

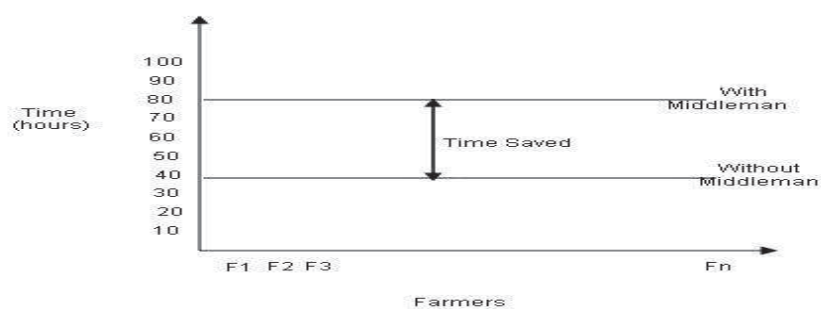


Fig 6 Comparison in terms of time

Conclusion: Agriculture is a back bone of nation economy. Equal importance is expected as given to other industries since major portion of our profession is agriculture at villages. Farmers in India are less privileged community loosing the interest in the field gradually which is a dangerous sign for Indian economy. They are facing the problems in both pre and post agricultural phases not getting expected productivity. There is a necessity to equip the farmers for latest happenings and encouraging them to transit from traditional to modern approach.

Since Communication Technology touched every corner of the village, it would be apt to begin

innovation in agricultural marketing which would be either region or crop specific, helping the farmers online by creating virtual market. This Bottom-Up approach would improve Indian Agricultural marketing as well as opens a common platform to provide other services and suggestions to farmers on Pre-Agricultural problems by respective departments. Never the late, awareness on importance of merging IT in agriculture among IT students and synergic contribution from agricultural departments and universities, Communication departments and other related sectors along with NGOs would initiate a revolutionary changes in Indian Agriculture.

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