Simplified e-Agriculture Model Implementation for Developing Countries

Jai Vardhan Singh

1 Saraswati Institute of Technology & Management India, jaivs@rediffmail.com

Abstract

Agriculture is the main source of livelihood in developing countries. Two third population of developing countries is dependent on Agriculture for their bread directly or indirectly. For improving the condition of these people there is a need to develop the agriculture of these regions.

But how we can change the face of agriculture in these countries?

As we know that around sixty years have been passed by getting independence to these nations, lot of efforts and steps have been taken by local governments, NGO’s and international bodies etc. to improve their condition, but no satisfactory improvement had been noticed in yester years.

So how to improve the condition of agriculture in these regions because as we know that agriculture is also dependent on weather and natural calamities like rainfall, storm, flood, hurricane etc. along with technological development & infrastructure in this field.

There is an urgent need to bring all technological development, available information, market sources, government policies & actions, research work, international efforts etc to one place and make it available to each and every farmer of these nations.

As we are aware that all information and efforts are so much scattered that making it available to one central point, by which every farmer can access is not so easy and cost effective but not impossible.

Yes, there is an effective solution of all these complex problems, called e-Agriculture.

We all are aware of royal presence of Internet among us and each of us is beneficiary of its services one or other way.

By taking the help of Internet, e-Agriculture has an ability and capability to solve the problems of farmers very easily and an efficiently.

I can say confidently that e-Agriculture has a potential to solve all the problems related to agriculture, farmer and food effectively and efficiently.

Keywords: e-Commerce, Internet, Satellite imaging, networking, credit card, wireless connection, intermediaries, early warning system

Introduction

Every living being’s most indispensable need of life is food. Any other thing than food is secondary in life. Food is fuel to this machine called our ‘Body’.

If something is so important to human life, then its continuous supply in sufficient quantity is utmost importance to us.
As we know that world population especially in developing countries is increasing at a high growth rate. For feeding huge masses we also have to increase the agricultural production in same proportion. Although a lot have been done for increasing agricultural production in last fifty years but we are far behind the actual requirement. If we see the statistics of developing countries’ agricultural production, it is quite less as compare to developed countries. There is need to adopt strategy which will be less expensive and provide us a fast growth rate in short span of time, plus, it can connect each and every farmer on earth.

**Some Facts**

- According to United Nation Population Division the world population would be somewhere between 8 and 11 billion by 2050, in year 2000 it crossed the 6 billion mark.
- Cultivable land is quite less as compare to total area of earth.
- There are around 826 million people in the world who don’t have more than 100-400 calories per day.
- In developing countries production per hectare area is much less than developed countries.
- Our agriculture is mainly dependent on natural rainfall.
- Ground water is falling day by day.
- Lack of sufficient & proper storage facilities for grains at right place, which leads to wastage of grain.
- Poor information and road network.

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**Table 1 : Food Grain Production Total & Per Person**

<table>
<thead>
<tr>
<th>Year</th>
<th>Production Million Metric Tons</th>
<th>Production per Person Kilograms</th>
</tr>
</thead>
<tbody>
<tr>
<td>1950</td>
<td>631</td>
<td>250</td>
</tr>
<tr>
<td>1960</td>
<td>824</td>
<td>272</td>
</tr>
<tr>
<td>1970</td>
<td>1,079</td>
<td>292</td>
</tr>
<tr>
<td>1980</td>
<td>1,429</td>
<td>322</td>
</tr>
<tr>
<td>1990</td>
<td>1,768</td>
<td>335</td>
</tr>
<tr>
<td>2000</td>
<td>1,842</td>
<td>303</td>
</tr>
<tr>
<td>2006</td>
<td>1,984</td>
<td>303</td>
</tr>
</tbody>
</table>

Source: United States Department of Agriculture (USDA)
Figure 1: Percentage of Population Undernourished in the Developing Regions


Problems faced by Farmers

➢ Farmers don’t have sufficient knowledge to make land highly cultivable.
➢ They are not getting high yielding seeds and the seeds which can resist to common illnesses & which can give good crop in less water
➢ Farmers are not getting soil friendly fertilizers & pesticides.
➢ Farmers are not getting weather information or timely weather information.
➢ They don’t have ‘agricultural experts’ for help, experts consultation or guidance is needed regarding:
  ▪ Which seed to use?
  ▪ Which insecticide to use at the time of problem with crop?
  ▪ How much and when to water the crop for best yield?
  ▪ Any unprecedented problem with crop during growth.
  ▪ Regular check up by experts.
➢ Farmers are not getting good deserving price for their crops.
➢ They are not getting the payment in time for their product.
➢ Lack of good transport facility.
➢ They don’t have proper storage facility near to them.
➢ What other thing they can grow in their land between two main crops.
➢ As we know that developing countries agriculture is laborer dependent means instead of machines mainly humans are doing all jobs related to it, so main farmer always need laborers for his help. Generally they are not getting sufficient and good laborers.
Then what is the remedy of all these problems?

The problems mentioned above require a collective effort from different groups of people, organization, governments and lot of money and time. But if try to solve the problems related to agriculture & farmers with the use of technology then its quite easy, fast and economical. So by using Information & Communication Technology we can deal the problem in a better manner and we have given new name to agriculture called **e-Agriculture**.

**What is e-Agriculture?**

‘Food and Agriculture Organization’ of the United Nations(FAO) proposes the following definition:

“**e-Agriculture**” is an emerging field in the intersection of agricultural informatics, agricultural development and entrepreneurship, referring to agricultural services, technology dissemination and information delivered or enhanced through the Internet and related technologies. More specifically, it involves the conceptualization, design, development, evaluation and application of new (innovative) ways to use existing or emerging information and communication technologies (ICTs).

Another definition:

“**e-Agriculture**” is an emerging field for enhancing sustainable agriculture and food security through improved processes for knowledge access and exchange using information and communication technologies (ICT).

The World Summit on the Information Society(WSIS) Plan of Action includes e-Agriculture as an area of application of information and communication technologies (ICTs) under Action Line 7:

a. Ensure the systematic dissemination of information using ICT’s on agriculture, animal husbandry, fisheries, forestry and food, in order to provide ready access to comprehensive, up-to-date and detailed knowledge and information, particularly in rural areas.

b. Public-private partnerships (PPP) should seek to maximize the use of ICT’s as an instrument to improve production, marketing and food safety standards.

In short I can say that **e-Agriculture** will connect all concerned persons starting from farmers to researchers together. Farmers can get the desired information at any moment of time from any part of world and they can also get the help from experts regarding their problem immediately. ( without moving anywhere)

**Problems in implementing e-Agriculture**

As we know that our agriculture land is spread over large geographical boundaries and especially in developing countries even we don’t have basic necessities of day-to-day life like electricity, road, telephone, proper drinking, schools, banks etc. Then, how we can implement this latest technology concept. One of the biggest problems of developing countries is funds.
Then what is the way out of this situation? If there is a will there is way, after having many problems we still have a solution. Certainly we need a support from government & private sector along with local peoples. Solution of this problem is *Simplified e-Agriculture Model Implementation*.

**Simplified e-Agriculture Model Implementation**

Figure 2: e-Agriculture Model

![Diagram of e-Agriculture Model](image_url)

**a. Components of e-Agriculture Model**

There are basically two parts in this system:

(i) **Client side**

(ii) **Server side**

**Client side**: It consist of mainly farmers and agricultural products purchasers, they need services from the other organizations or agencies.

**Server side**: It consist of number of organizations & agencies across world who are contributing to the development of agriculture and related services, for example...
Research organization involve in development of agriculture related services or products, weather department, geological department, FAO etc. Here there is a main Server which is on Internet. All organizations & agencies are giving the information for storing in it, which will be accessed by farmers and other related people through Internet. As we know that Internet is providing the easy facility to access & submit information form any part of the world in few seconds.

b. Technical feasibility of model

Is this model is technically feasible or not?
• Answer is ‘Yes’. Due to highly developed networking, mobile communication, satellite, computer & software technologies, now-a-days it is very easy to implement this model.
• Client side or farmer side we need a Personal Computer (PC)/Laptop connected with wireless (mobile) modem, which is easily available.
• For power supply problem we can install solar energy to electrical energy converting device or small generator, which is easily available.
• For Internet connection now-a-days mobile service providers are providing the internet facility, and mobile companies are already covering a large number of villages. For covering all villages in country we need private & government partnership.
• As we are aware that most of the people in villages don’t know English language or even they can’t read, then how they can read the information available on internet site. Solution of this problem is very simple we have to develop the internet sites in multi-languages (regional languages) along with English. In addition to this we can load the softwares which can read the text matter in human voice.
• Purchasing of seed, fertilizers, pesticides etc. and selling products through internet is also possible. We are already using e-Commerce facility through internet, by which we are purchasing goods & services from home. We can extend it for agriculture also. We can also pay and get money immediately by use of credit card and internet banking account.

c. Economic feasibility of Model

• Client side equipments are not costly at present due to high production and advancement in technology. In villages farmers can purchase necessary equipments by mutual sharing because there is a no need of PC in each and every house at initial stage, in future when they are in position to afford they can purchase individually.
• Server side investment should be borne by government & private sector, which is also not very high due to technological development. Here investment is common at certain extent for many countries.
• Developing countries that don’t have facilities for weather forecasting, ground water prediction, agricultural research work etc., they can take the help from fellow countries or developed countries & international bodies.
- With Public Private Partnership government should install mobile communication network in every village or government can establish wireless network with the help of communication satellites.

**Discussion**

I can say that e-Agriculture can solve the problems of farmers efficiently, timely and in a cost effective manner. This will increase the financial status of farmers which in turn change the economic condition of country. When our agricultural production will increase with the help of e-Agriculture then the food crisis of the world will be solved and we can ensure food to everyone in sufficient quantity.

**References**

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