

Concept and Architecture of Agricultural e-Commerce for Least Developed Countries

Md. Abdur Rahman

American International University Bangladesh (AIUB), Dhaka, Bangladesh

Abstract- Agricultural ICT is the newly emerging concept, which has been already adopted by some developed countries. However, most of them are still far behind the maximum blessings of this modern tool. In spite of being a least developed country, Bangladesh can also adopt agricultural e-Commerce to make a revolutionary change to the agricultural economy. Only ICT can make a bridge between the Marginalized Communities and Advanced communities to eliminate the e-gap. This research has been performed on the prevailing infrastructure of ICT and agricultural business operations for least developed countries like Bangladesh, in addition to a conceptual innovative model of Agricultural e-Commerce for sustainable development.

I. INTRODUCTION

Bangladesh is an agricultural country. Majority of the population are living in rural areas (Villages) and agriculture is their main source of earning. Unfortunately almost all of them are not familiar with the terms “Information Technology”, “e-Commerce” and other related issues that can make a dramatic change to their day to day life. Furthermore rural people do not have any means and modes of communication to interact with people outside their realm. Thus their horizon is enclosed to their own local community. As a least developed country, it is indispensable for the economy of Bangladesh to establish technically developed remote regions. Only the proper utilization of the modern Information and Communication Technologies (ICT) [1], especially agricultural E-Commerce can provide them a global identity that can drastically change the usual life of rural marginalized community.

The agricultural business in Bangladesh is encircled by three types of agents including producers, traders and consumers. The traders are not doing anything special but gaining the super normal profit of the business. This system exploits the producers directly not to give the appropriate portion what the producers deserve really. Agricultural e-Commerce will abolish these traders to optimize the present business structure by providing the normal profit to the producers (farmers) and minimum price for the consumers. Producers and consumers related to agricultural sector should have the privilege to get the perfect information about the agricultural products, crops, market information, weather news etc. Internet with e-commerce facilities can fulfill all these requirements.

II. THE PREVAILING AGRICULTURAL CONDITION OF BANGLADESH

The mechanism to reach agricultural products, inputs and services to target groups, includes producers, consumers and intermediaries (traders). A huge number of people are engaged in the marketing of agricultural products like rice, jute, vegetables, fruits, cattle, milk, poultry, eggs and fish. The history of agricultural marketing is as old as agriculture.

Exchange of commodities had been prevalent in Bengal's agrarian society but the reinforcement of cash economy during British rule made agricultural marketing easier and eliminated many of the problems of conversion. As peasants are very responsive to the fluctuations of market prices of crops, the cropping patterns of an area depend to a great extent on the marketing of crops.

As most farm families in Bangladesh own very limited land, they grow just enough crops to meet their own needs. About 53% households of the country having 0.05-2.49 acres of land produce at the subsistence level. Major contributors in the supply of agricultural produce in the market are the medium (2.5-7.49 acres) and large (7.50 acres and above) farmers, who are only 11.7% and 1.7% of the farming community respectively. The institutional network to deal with marketing of even major commodities such as rice, jute, cotton, sugarcane and tea is not adequate in the country. The Department of Food, Bangladesh Jute Mills Corporation, sugar mills and the Cotton Board maintain their own purchase centers. However, most agricultural products reach consumers through various types of mid-level businessmen. The Department of Agricultural Marketing, a government agency, has the responsibility of ensuring fair prices of agricultural commodities for both buyers and consumers. The department has a total manpower of 375 and advises the government in this regard [2][3]. In its agricultural policy announced in 1999, the government of Bangladesh came up with various strategies for the development of agricultural marketing. Emphasis was laid on establishing a proper marketing network to facilitate timely marketing of farm produce. The policy also identified certain steps to reduce the control of middlemen and to ensure fair prices of crops for both growers and consumers.

III. E-COMMERCE FOR MARGINALIZED COMMUNITY

Although e-commerce has promised to re-shape agricultural production and marketing in profound ways, few promises have come to fruition. To ensure a well structured e-commerce system for the marginalized community the following functions are need to be considered

- A. Information distribution,
- B. Input supply,
- C. Commodity trading floor, and
- D. Logistics/supply chain management.

A. Information Distribution : Internet is one of the major medium to distribute information to some target groups and it simplifies the distribution of data and analysis. Agricultural related e-commerce network must distribute some sort of information, which often includes weather reports, future market quotes, and market analysis. These services are provided for free at many of the e-commerce sites. Obviously Internet has significantly enhanced the level of market

information available (although information overload could become a problem). Even if no future developments occur (which is unlikely), the Internet will have had a major impact on agriculture. There are many examples of the Internet being used for information distribution, not necessarily from for-profit companies. A network shown in Fig 1, should be established by integrating trade associations, government agencies, or universities to provide information to the public, and the Internet enhances this activity.

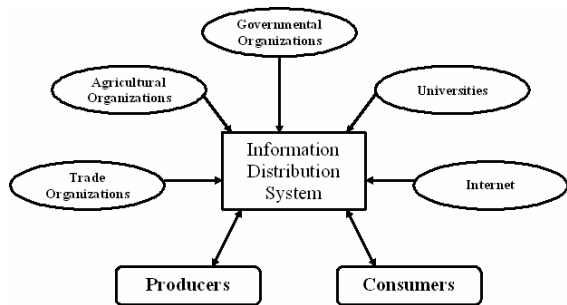


Fig. 1 Information Distribution for the Producers and Consumers

B. Input Supply: Input supply is very important category of B2B agricultural e-commerce. E-commerce input supply firms should provide various inputs to farmers including seed, chemicals, parts, and machinery over the Internet. This operation is little different than traditional input suppliers except that they are not bound to a certain geographic area. All the transactions and negotiations will be done via internet. Farmers will be able to search the Internet for the inputs they need and compare prices between suppliers. Buyers and sellers agree on price, quantity, and transportation of the desired product. This model will facilitate the e-commerce for buyers and sellers of farm inputs including chemicals, seeds, parts and equipment, and animal health products. Users can access the web-site and search for the products they need or display products they wish to sell. A product listing will be offered along with prices. The farmer then selects the best option for his or her needs. There must be a user agreement about the transactions between buyers and sellers. The control over the quality, safety, or legality of the items advertised can be ensured by some responsible authorities.

E-commerce has the potential to increase the level of competition in the input supply business. One important change is that customers will be able to more easily see what different suppliers are charging, and agricultural inputs are generally highly substitutable. The Internet could reduce a supplier's ability to charge higher prices because consumers would know what other firms were charging. Suppliers may differentiate themselves by using a sales force or providing good customer service. This could lead to a highly competitive situation that is good for customers, but harmful to supply companies. It has been argued that input suppliers could use the Internet to reduce or eliminate their sales staff, and that this would increase firm profitability.

C. Commodity Trading Exchange: Electronic commodity trading floors are also an important development in agricultural e-commerce. The main idea with an electronic

trading floor is that the company can host a marketplace and earn a small commission on every transaction. Since volume is large with most agricultural markets, many firms hope commission sales will lead to significant profits. Electronic transactions should be more liquid and efficient than traditional markets because geographic boundaries are eliminated and the potential number of users could increase. This innovation could enhance the information flow through agricultural markets. The key to the success of ecommerce market exchanges (or any market exchange) is a high level of liquidity. This ensures enough buyers and sellers to facilitate the price discovery process.

D. Logistics/Supply Chain Management: Another service that e-commerce firms provide deals with logistics and supply chain management. Supply chain management has become a prominent buzzword throughout the B2B industry, partly because Internet exchanges have not achieved the promise that was expected of them. An important issue with supply chain management is coordinating the movement of products (particularly non-standard products) between buyers and sellers. Developing contracts and identifying producers for different types of commodities. The firm will verify product quality, and tracks product movement through the supply chain. The Internet is used throughout the process to keep close contact between the contracting company and producers. Using the Internet in this way is an improvement in a firm's ability to manage supply chains, but it is not new. Supply chain management has been an important field for some time and there has been significant progress over the past two decades. For example, such tools as EDI have worked to improve the linkages between buyers and sellers and enhance supply chain efficiency. The Internet will clearly be a powerful tool in the management of supply chains because it has improved the ability of managers to create networks. Still, using the Internet for supply chain management should be considered a part of an overall improvement in management science rather than a revolutionary tool that changes everything. It is also not clear what firms will develop and manage these supply chain tools. A third party could be used to coordinate between buyers and sellers. However, it may also be possible for the firms to avoid these middlemen and perform the function themselves.

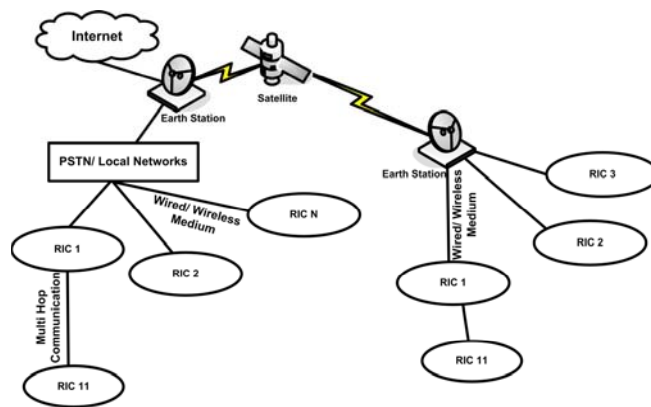


Fig. 2: Possible Connection between Rural Communities to the Internet

IV. ACCESS TO INTERNET FOR THE RURAL COMMUNITY

The ICT infrastructure of Bangladesh is still lacking from the standard needed to provide internet services to the rural marginalized community. A wireless local loop (WLL) [6] or a mixed network model with Radio link (LOS-RRL) and Satellites (V-SAT) may help in this situation. For the remote areas a VSAT will connect the Rural Information Center (RIC) to the internet via satellite. The network architecture of RIC is a similar as the RCP discussed on [7]. Fig 2 illustrates a possible framework for the remote connectivity. If the village is close to the district or subdistrict areas, the RIC shown in Fig 3, will be connected to the existing infrastructure through cable or LOS-RRL. RICs will boost up the village economy through e-commerce, e-business, e-government, e-health, e-learning etc. All RICs will be connected to make a countrywide communication network through satellite (VSAT) or existing cable lines. A base station will be available to serve in each subdistrict and all RICs under the sub-district and the base station will constitute a WAN.

Other Services Provide by RIC

The RIC will provide a number of services to the rural community. Some of them are discussed below.

- 1) Education
- 2) Poverty alleviation (Women)
- 3) E-Health
- 4) E-Government
- 5) Radio Community [9].
- 6) VOIP [10]

V. CONCLUSIONS AND FUTURE WORKS

In this paper, some ways to utilize ICT and agricultural e-commerce through the Rural Information Center (RIC) have

been presented. The RIC will decrease the digital divide between the urban and rural people. The rural poor farmers are the pillar of the economic strength of the country. The RIC with agricultural e-Commerce will open a new world to them, who always contributed to the economy of the country and got nothing in return. The technical matters are not fully discussed here. Initially, it may not be possible to start the services in the whole country. At first about 5/10 centers should be established to check the outcomes.

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