

E-Commerce Framework to Improve Rural Agriculture Sector in Cambodia

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Abstract. This study is aimed to put forward a comprehensive and applicable e-commerce framework that serves as an enabler to the development of rural agriculture sector in Cambodia; which plays an important role towards economic and social growth by promoting rural livelihoods, food security and poverty reduction. The main approach used was to critically review and comprehend the national and sectoral development and reform policies. In general, these policies articulate three-pronged strategy of productivity enhancement, diversification and commercialization to accelerate the agriculture sector to new pace and scale. Next, the challenges and knowledge gaps were identified and translated in the form of agriculture e-commerce framework and subsequently dynamic e-commerce application components.

Keywords: Rural agriculture sector, e-commerce framework, e-commerce application.

1. Introduction

Agriculture sector is a cross-cutting sector which plays important roles in improving the livelihood of rural people amounting to about 90% of Cambodia's population and directly contributes to poverty reduction [1]. Agricultural productivity has increased but is still low (\$170/worker and \$517/ha). As a result, even though declined, poverty is still high at 35% of total households according to the 2006 Cambodia Poverty Assessment (World Bank 2006). Unless agricultural growth increases on a stable path, the goals of meeting the Millennium Development Goals of halving poverty by 2015 will not be reached [2]. The challenges ahead are to increase agricultural growth and generate more income opportunities in rural areas.

Under the Socioeconomic Plans [3], the government looked forward to transform agriculture into a driving force for improved economic growth within a market-oriented policy framework by promoting agriculture commercialization and diversification. The government had established many joint technical working groups with international organizations to actively participate in advance development of agriculture sector focusing in mechanism to mobilize the resources and resolving critical issues restricting the agriculture performance, including:

- regulatory weaknesses limiting access to productive resources and improved agricultural inputs
- uncertainty in the market environment for private, agro-based enterprise growth
- lack of resources for effective agricultural research and extension services to promote commercialized agriculture
- weak capacity and resources at agricultural institutions

This is expected to improve agricultural stakeholders' ability to access, gather, analyze and use information to better respond to market signals. First focus is on improving the information system in all its phases, from commodity price collection in the key markets, to basic analysis of the information and then its dissemination to farmers, including improved extension agents' distribution of market prices. Second focus

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is on applying price information in market development, such as improved production choices and selling during non-peak periods [4].

2. Background

In mature agricultural economies such as the United States, farmers benefit greatly from easy access to market information and vertical market integration. This is possible through intensive use of Information and Communication Technology (ICT) such as timely dissemination of agriculture information, education and training, monitoring and consultation, expert respond, price forecasting, early warning and mitigation measures, marketing information for various commodities, farm business and management, and expansion of the use of e-commerce [5].

However, the agriculture landscapes in less developed countries are characterized by weak infrastructure and the involvement of numerous intermediaries. Although the agricultural productivity improves to extend that the country is self-sufficient and becomes net exporter of agricultural products, majority of farmers remain poor and poverty is imminent. Empowering farmers thru ICT and internet [6] proves to be successful in many countries such as India which provides the ground for:

- greater information exchange; despite many limitations such as poor literacy level and local languages
- creation of an alternative market structure; this trade exchange platform will lessen the rural isolation and create market transparency
- improved farming techniques and best practices; that enhance the yield and reduce cost of inefficiency

One of the most successful initiatives is *e-Choupal* in India, which in 2005, have reached millions of farmers across six states and over 30,000 villages covering a wide range of crops and fisheries. This proves that use of internet can improve the living conditions and increase the economic growth of farmers. However, the common problems of infrastructure limitations, power supply and internet connectivity are the real challenges in remote and inaccessible areas.

Agriculture is identified as one of the great promises of e-commerce [7] due to the facts such as:

- the complexity of its supply chain and large volume traded
- internet technology provides the possibilities of cost reduction and enhancement along the food supply chain
- automation capacity that substantially reduce transaction and procurement costs
- improve efficiency by reducing inventory levels, transportation costs, order and delivery time
- more transparent and competitive than physical market

Agribusiness organizations worldwide have capitalized on many advantages of e-commerce to improve the marketing of their products. The agribusiness industry is regarded as a major contributor to the economy. The high reliance on accurate and timely information and large physical distances between producers (farmers) and buyers (traders and consumers) have made this agriculture sector conducive to the benefits of e-commerce. Developing the e-commerce framework is well accepted and initiated in many organizations but there is no unanimity over the types of model accepted. Meaning that the model could differ from one country to another, and successful model in one country may prove to be failure in another country.

In China, the agricultural information network was started in late 1990s by establishing agriculture information centers and over 2500 agriculture or agriculture-related websites [8, 9]. The application of e-commerce improves the efficiency of agriculture product circulation by:

- strengthening the directness of agriculture products
- regulated by international standards
- limit the price fluctuations
- participation of authorities

3. E-Commerce Framework for Rural Agriculture

3.1. Agriculture E-Commerce Framework

As an overview, the Agriculture E-Commerce Framework [10,11] focuses on two main directions:

Reshape Agriculture Production. This plays an important part in improving the rural agriculture sector. There are two main components here which are:

- Greater Information Exchange
- Promoting Farming Techniques

Restructure Sales & Marketing Ways. This focuses on commodity trade exchange and multiple inputs in the distribution method. The two components are:

- Trade Exchange Platform
- Quality Input Supply

This framework is further supported by two other important success factors [12,13] which have significant contribution to implementation of agriculture e-commerce application. These factors are Rural Intelligent Information Centre (RIIC) and Expert Views. Figure 1 illustrates the e-commerce framework for agriculture sector.

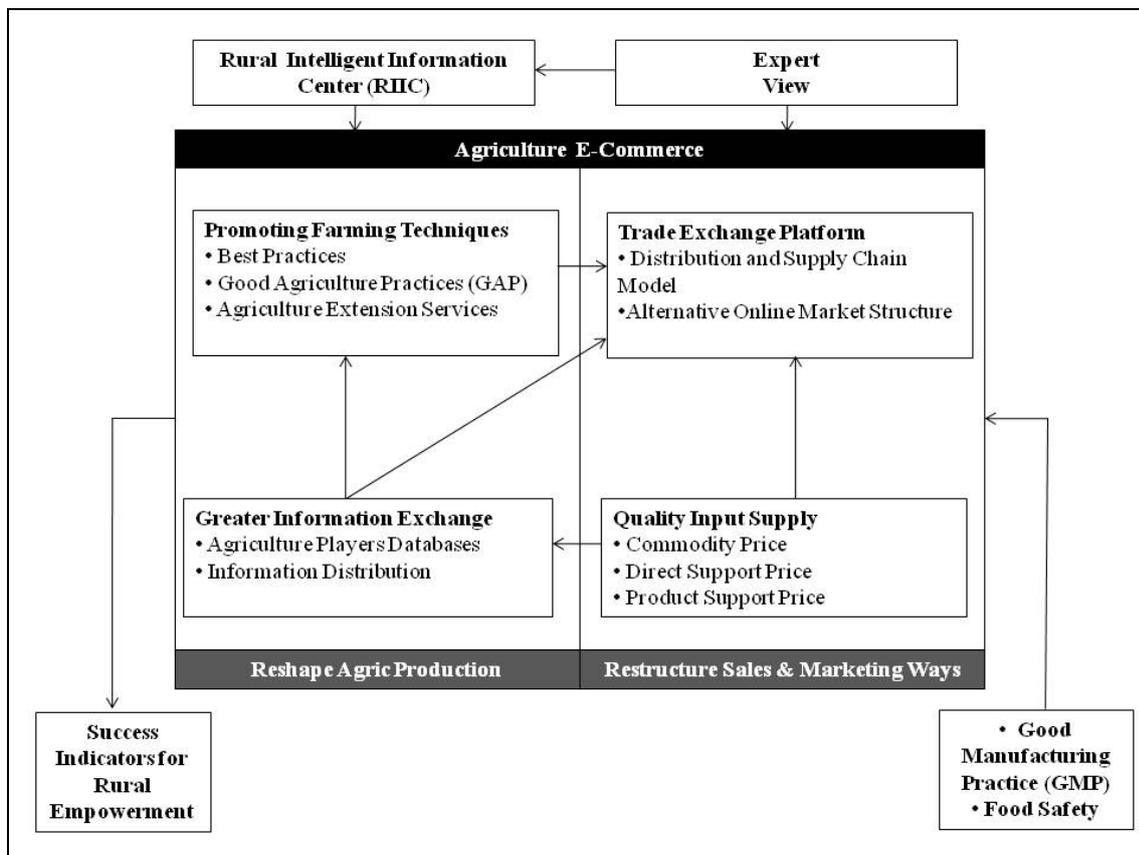


Figure 1: Agriculture E-Commerce Framework

This framework can be further enhanced with the ability to market the agriculture products on international market by adopting Good Manufacturing Practice (GMP) and Food Safety (FS). The access of developing country such as Cambodia to food export market in general and developed world in particular, will depend on their capacity to meet the regulatory requirements of the most lucrative markets. Thus, by incorporating GMP and FS in e-commerce framework will improve market access and building trust of importing countries [14]. Besides, the workable e-commerce framework can be used a tool to identify the indicators for empowering the rural agriculture sector in Cambodia.

3.2. Agriculture E-Commerce Application Components

From Figure 1, we will be able to derive the Agriculture E-Commerce Application components [15] as shown in Figure 2, that meet the requirements and provide an excellent platform for significant improvement

of rural agriculture sector in Cambodia. The agriculture e-commerce application consists of six dynamic features which include:

- Web 2.0 Content
- Real-time Info
- Search Engine
- E-Commerce Gateway
- Infrastructure and Internet Connection
- Knowledge-based Information System

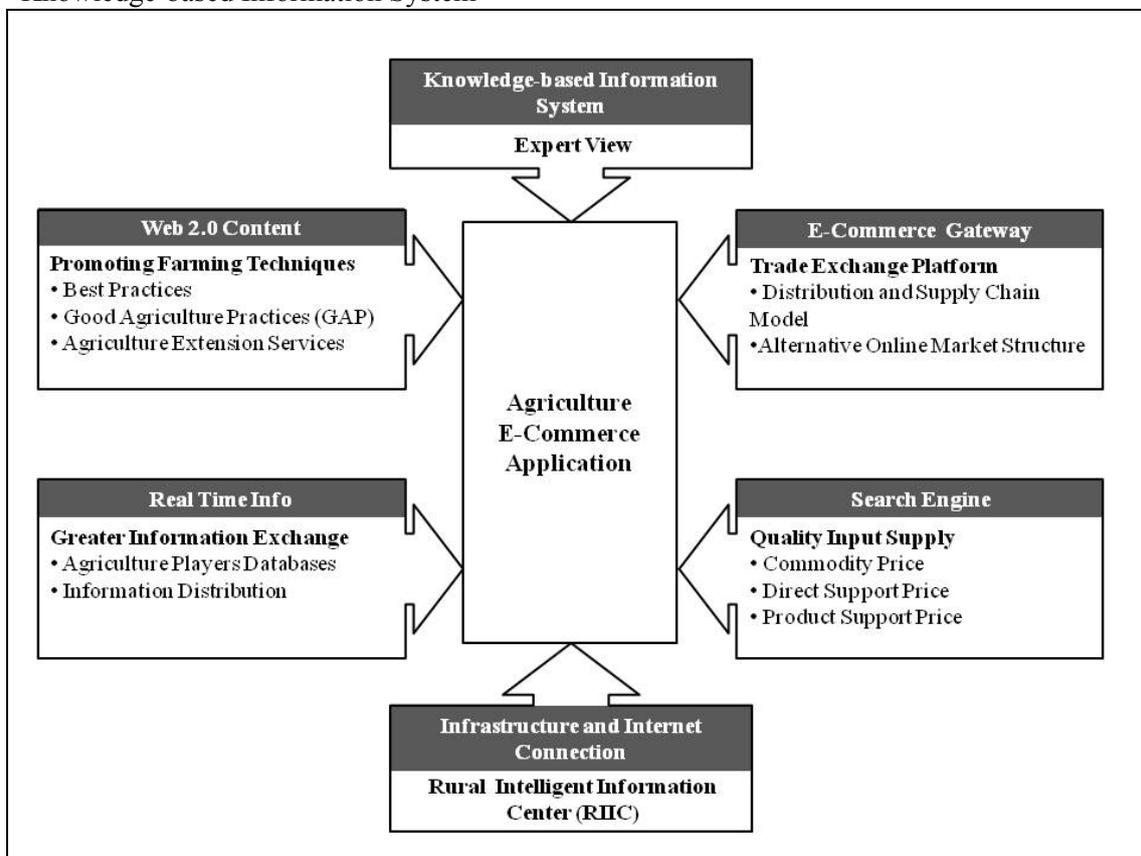


Figure 2: Agriculture E-Commerce Application

4. Conclusion

The agriculture e-commerce framework is intended to improve the rural agriculture sector in Cambodia. In general, two important directions which complements to each other are being used as a basis of developing the appropriate framework. Firstly, by reshaping the agricultural production by promoting farming techniques using web 2.0 contents such as multimedia, animation and social networks, and providing greater information exchange through real-time info from comprehensive agricultural databases and relevant authorities and agencies which are directly or indirectly related to agriculture sector in Cambodia.

Secondly, restructuring the sales and marketing ways for commodities by introducing online trade exchange platform which improves the supply chain and efficiency of agricultural product circulation. It also provides quality input supply that includes commodity price list and comparison analysis, direct support pricing such as logistics, warehouse and cold storage, and product support price which includes seedling, pesticides, machinery, parts, crop health and animal health.

The e-commerce will not be complete without the infrastructure and technology which provides the connectivity between the farmers, businesses, government agencies and other relevant parties. This is possible through RIIC which can be configured uniquely for intended users and content delivery based on the preference of users. The other important aspect is expert view which includes subject matter experts,

market analyst, knowledge-based training providers and researchers. Finally, the comprehensive framework becomes a good basis for development of agriculture e-commerce application with six dynamic features.

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