

ROLE OF PLATFORM ECONOMY IN AGRICULTURE**Ramalakshmi V* & N. Ravi Shankar****

* Krupanidhi Group of Institutions, Bangalore, Karnataka

** Krupanidhi Degree College, Bangalore, Karnataka



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Abstract:

The major purpose of the study is to describe and understand the current status of agriculture in relation to platform economy. Agriculture and food industry are driving its importance towards the platform economies. Various collaborative platforms are also emerged along with development of platform economies in order to match the demand and supply. Experts in the field of agri-food industry are rehashing and rediscovering more established types of unity. This paper opts conceptual approach and reviews the recent advancements, major challenges and issues in agriculture in the economy era of platform.

Key Words: Platform economy; Agriculture; Food industry

1. Introduction:

Digitized agriculture is "Information and Communication Technology, and Data Ecosystem to Support the Development and delivery of timely, targeted information and services to make farming profitable and sustainable while delivering safe nutritious and affordable food for all". Over the last few years there have been massive technological development and opportunities which have transformed people's lives. But the agricultural sector has been least benefited by such opportunities. Online retailers have a huge market to tap not only in the field of clothing but also in the field of food items as India has a fast growing young population who opt for online marketing. Platform economy is a part of digitized agriculture which refers to online marketplaces. But vastly it also includes social and market place interaction, and a set of digital framework for the same. "Platforms are to the network age what the factory was to the industrial revolution" (Policy Framework For Digital Platforms-Moving from Openness to Inclusion). There is a rise in B2C and B2B marketplace platforms for the procurement of input cultivation practices, harvesting practices and marketing the produces. Fintech companies have also tied up with these platforms for ease of payment through simple online payment schemes. Based on the needs of the farmers there is the greatest need to deliver targeted and timely information to them. It is transformational when it comes to informed option that is provided to farmers and empowerment, especially for women and youth. "HAR KHET KO PANI" is a statement of Pradhan Mantri Krishi Sinchayee Yojana, which also states, "MORE CROP PER DROP". This depicts the government's initiative towards digitized agriculture for a better yield with minimum water wastage. Zonal Business head Dipayan Bhattacharjee says that the company pays off the farmers within 24 hours of procuring the produce.

Objectives:

- To know the transformation of agriculture into digitized agriculture
- To study the various digital technologies which are available in the market for agricultural purposes
- To examine the future opportunities available to both farmers and customers in the field of digitized agriculture
- To determine how the digitized technology connects farmers traders and consumers
- To study how digital platforms transform the physical structure of the economy

Statement of the Problem:

The agricultural sector is facing severe technological drawback especially in the area of agro-product marketing. Also, the farmers are least aware of the technologies available in the market to enhance the agricultural produce. There is a greater need to provide knowledge and skills to farmers in order to transform the picture of agriculture in India. Digital technology helps to overcome this situation and make agriculture wide and efficient.

2. Review of Literature:

During the past decade, the agricultural sector has suffered adversely, inspite of overall high growth rates by the other sectors of the Indian economy. A more equitable use of fertilizers, among others, would be required to increase the growth rates in the farming sector. So far, there has been a trend of uneven usage of fertilizers across states and farms of different sizes. Fertilizer policy reforms should consider taking account of such realities (Birner et al., 2011)

Erande et al. (2014) claimed that there are both positive and negative impact of subsidies in the agricultural sector of India. In the last few years, the percentage of GDP contribution by agricultural sector has decreased. But, the production and productivity of this sector has increased with increase in investment. Rise in inflation rate and rise in population is also a factor to measure the low contribution in India's GDP. But, a significant growth of agricultural sector in India is based on the vital role played by the subsidies of the government.

The development of agriculture is difficult without the help of subsidies. Due to ineffective management and corruption in subsidies in India, the benefits have not reached to the end users, i.e, due to farmer's illiteracy regarding subsidies in agriculture, there is a financial crisis faced by farmers and therefore, least benefit for them. Panagriya (2004) addressed reintroduction of Open General Licensing in 1976 helped farmers to avail benefits of exports. There were large exemptions given on agricultural goods due to quota rents. There was a considerable buoyancy in exports even if there was further slowdown due to world trade decline. The average trade deficit abated due to the robust performance of agricultural exports from an average 2.7% GDP during 1980s to 0.9% GDP in 1992-93. There was further meltdown of exports during 1996-97 to 1998-99 which widened the gap to 1.6% There are three phases which divides the changes in external policy, i.e, closed economy with tighter control during 1950-75;

liberalization in the rigid structure of the economy during the period 1976-91, especially the second half of 1980s; and a series of systematic reforms entailed, commencing from 1992. Fourier Analysis of Historical NOAA Time Series Data to Estimate Bimodal Agriculture (21st Dec, 2007)

Fourier approach was used along with NOAA AVHRR Data from which NDVI time series 10-day composites were derived in order to estimate the Bimodal Agricultural areas (where the cultivation per annum is based on 2 primary seasons). The phase and amplitude of first and second harmonics were used from the NDVI sequence which was earlier transformed into harmonic signals, for the analysis. Decision tree analysis was applied to classify and discriminate different Asian Sub-regions, primarily under which various Bimodal Agricultural areas and types of lands were covered. There was a linear relationship determined when; the FAO-UF developed irrigated area was compared with predominant Bimodal Agricultural area, which had the amplitude of second harmonics in that sample region. To transform the amplitude of second harmonics, the above derived function was applied to Bimodal Agricultural area estimates. This provided an initial encouraging result with large scale irrigation projects that appeared on the map. Thus, one of the main sources of information regarding the global or regional scale of mapping of irrigated area was Bimodal Agricultural area. Temporal resolution and greater spatial was achieved for improved accuracy. Eg: Improved decision tree classification algorithm combined with SPOT vegetation or MODIS time series of NDVI data can be used for greater precision and geographical distribution of ground reality. Automation and repeatability is the principal merit of this approach.

Further studies were attempted in precision agricultural studies with the system of handy imaging, which is an inexpensive approach that can visualize the images on varied height platforms specific to remote sensing studies in precision agricultural areas. The technical attribute of this handy camera is found to possess Electric EDC-1000L monochrome camera, a Canon PHF6 1.4 lens, a set of Andover band pass filters, and an Advantech PCA6751 single board computer, was built up and installed with corresponding self-developed application software. This system were implemented in higher altitude platforms such as mobile lift cranes and drone to secure various narrow-band images. This kind of applications are highly utilized for carrying validation tests on stress-identification index and its related measurements (Lee, et al., 2010)

Beeri (2006) addresses two major purpose on a multi-year study with the application of remote sensing in agriculture. First is to deploy new spectral indices for wheat monitoring and other on producing an interpretation key for mapping vegetation features with spectral indices. Agricultural monitoring with remote sensing utilizes and maps the spectral reflection of specific vegetation features. These are the indicators of plant development and crop condition. Over the years, a number of spectral indices have been developed, but the ultimate combination of information required by the farmer, and the capability of remote sensing to map this information, has not yet been achieved. With the three years of the longitudinal research collected vegetation and remote-sensing data. The study aimed to improve the current abilities of remotely sensed agriculture monitoring. Indices were developed relating to various features of wheat. These indices map the current conditions of the crop, such as nitrogen in the leaves, and predict the yield. Evaluation of these indices, and already known indices, shows that each can be used to map different crop variables.

The recent developments in analytics, similar to large scale data analytics in other sectors the researchers were also involved in analytics initiatives in agriculture in order to meet the production demands. For instance, Rehman et al. (2014) analyzed the utilization of various sensors that solves the issues in agriculture. Lokers et al. (2016), in the research of agro-environmental science highlighted the problems related to variety as well as veracity. That is, it showed that all the business are not alike and thus it is needed to give solutions based on the location specific information which in turn can solve problems of farmers in different locations. Before 2000, the researchers mostly confronted with small data sets for finding solution but after 2000, the concern for agriculture and food industry gains more attention to develop models such as ecological model, crop based model, farming model in agriculture domain with the use of big data. (Janssen et al., 2007; Van Ittersum et al., 2008; Schmolke et al., 2010). In line to this, a survey with search technologies (2010) addressed the data collected of about 30Mb by smart self-driving tractor for analyzing few data driven models. Thus various studies were attempted in highlighted the technological advancement in the field of agriculture and stresses its importance.

3. Research Methodology:

Sources of Data:

This data is collected from official website ministry of agriculture and farmer's welfare and journals which are secondary in nature.

A. The various Digital Platforms by the Government of India are:

- NITI Aayog - NITI Aayog has started a scheme called Startup AgriIndia Scheme to subsidize digital startup in agriculture. It is a National Digital Marketplace for trading agricultural commodities through Digital Platform.
- mKRISHI Platform - It is an agrotech startup which is used for identifying best cultivating practices, for protection against various damages due to weather conditions, for selecting appropriate seeds of a particular form from a variety of seeds. It also provides information regarding market prices of different farm produces and input availability. It also provides information on various plant diseases and curation for the same.
- e-NAM - The electronic national agricultural market was launched in April 2016 to create a unified national market for agricultural commodity by way of connecting existing APMCs through online networking.
- Agmarket - It is the first e-governance project which was set up in the year 2000 in view of strengthening agricultural marketing system in India

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- Agricultural Commodities Exchanges - It is a future trading platform for agricultural commodities in India. It consists of National commodity and derivatives exchange ltd (NCDEX) and Multi commodity exchange of India ltd(MCX).They were introduced in the year 2003 mainly to mitigate the price risk of farmers
- Indian Farmers Fertiliser Cooperative Ltd (IFFCO) - It is the world's largest fertilizers o-operative federation established in India. It has 40000 member cooperatives with a massive cooperative market with the help of creation of e-platform.

B. The Various Digital Platforms by Private Sector in Agricultural are:

Reuters Market Light Free Mobile Application (RML Agtech) - It is an application which connects farmers to various information services through SMS and toll free number. It is highly engaged in content formats such as; Advisory videos, podcasts, imagery, and also contains many innovative features consisting of chats with agri experts and lead farmers so as to create a network of social community on the application. It also engages agri communities and agri stakeholders through its Digital Platform.

The Various Features of This Application are

- 6 day taluk level weather forecast
- Historical updates on 6 crop market combination
- Unpredictable weather protection by warning or alert
- Direct connection with various traders at district level to understand the current and future supply trend
- Inputs from sowing to harvesting on a timely basis
- Suggestions for increase in productivity
- Communication of policies, government schemes, subsidies, health of the crops and other finance related information
- Latest updates regarding key agricultural practices using technology

Stellapps Technologie- This startup is mainly for dairy farmers it aims at optimization and monitoring of services. Its main focus is on small and medium scale farmers. It operates using cloud mobility and data analytics as tools to improve production of milk, procurement as well as cold chain. It also boosts animal insurance and farmer payments.

eKutir Global- It is a digital platform connecting marginal farmers with stakeholders through online and mobile based applications across the value chain. It connects the farmers with soil testing labs, banks, food processing units, suppliers of fertilizers, suppliers of high yield variety seeds, and branded retailers. A part of its service is Agri Suite, which is a one stop solution for all the requirements of farmers such as training to use the applications and information about the field pattern. It also helps the farmers maintain and repair the products used for agricultural production along with advisory on supplementary components and other marketing services.

Ekgoan Technologies- It is IT based network integration. Ekgoan OneVillageOneWorld network is a mobile communication technology which offers a range of services to farmers.

Statistical Data on Platform Economy in the Agricultural Sector:

As per the government estimates, India is one of the top 6 active geographies for investments in agricultural technology after the US, Canada, UK, Israel and France. The investment in this field is over USD 313 million into Indian startups and SMEs. India is the second largest fruits and vegetable producer in the world as per 2015-16 report. It is also the second largest producer of sugar and it is the leading country in coconut production. The global market for precision agriculture is expected to reach a market size of over USD 6.34 billion by 2022 with an expected growth rate of 13.09% annually. India and China are expected to grow annually at the rate of 18.29% until 2022, the fastest growth projection. The mKRISHI Platform has 414 million subscribers of mobile services in rural India alone as per statistics of 2014-2015. The e-NAM Platform has reached from 250 to 585 markets. At current scenario 9.87 million farmers, 109725 traders are registered on the eNAM Platform. There is around 100 million soil health cards distributed in the country as per data of 2015-17 and a mobile app for soil health has been launched to help Indian farmers.

4. Discussions:

a. Transformation of Agricultural Sector due to Platform Economy:

In India, Agricultural Sector contributes 16% to GDP. It is a source of employment for 49% of the population. The fastest growth is projected by India and China with an annual growth rate of 18.29% by 2022. India's expected agricultural income would be doubling by 2022. The Target of Govt. is to increase the avg. Income of farmer household is at current price USD 3420.21 by 2022-23 from USD 1505.27 in 2015-16. India is transforming itself through Digital India by way of direct application of digital technology in Agricultural Sector. Technology such as remote sensing (via Satellites), Geographic Information System, crop and soil health monitoring, and livestock and farm management. Government of India will provide USD 306.29M for computerization of primary Agricultural Credit Society (PACS). Agri-Udaan Program-It is a program to monitor and mentor startup so as to enable them to connect potential investors. Pradhan Mantri Annadata Aay Sanrakshan Abhiyan (PM-AASHA) is a compensation scheme by the Government of India along with private agencies which ensures that farmers get fair prices for their produce in the country.

b. Platform Economy in Connecting Farmers, Traders and Consumers:

As per the statistics Indian online grocery market is expected to reach USD 40 million by the end of 2018 and is expected to increase to 141% by the end of 2020 as it is growing at a compound annual rate of 62%. Due to growing concern for food safety, there is an adoption of food safety and quality mechanism such as Total Quality Management which includes ISO 9000, ISO 22000, Hazard Analysis and Critical Control Points (HACCP), Goods Manufacturing Practices (GMP), Good Hygienic Practices (GHP) by food processing industries.

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The various platforms which offer marketing of agricultural produces, connecting farmers and traders for mutual benefit and also with the customers are:

Ninja Cart- Ninja cart is one of the most popular online platforms for B2B and B2C businesses. It tackles the toughest supply chain problem in India. Since India is the second largest fruit and vegetable producer in the world, this platform connects these farmers directly with retailers or business for the benefit of both farmers and consumers. Farmers get better prices along with consistent demand for agro products as well as retailers can procure fresh fruits and vegetables at competitive prices directly from farmers. It is launched in 7 cities connecting 12000 farmers with traders and retailers by employing 1200 people. The delivery is within 12 hours from farm to store. Ninja cart is among the 42 most innovative startups in India as per INC42 media. It has an opportunity of USD 50 billion (BAIN, Google and OMIDYAR Report, 2018).

Custom Hiring Centers- It is the model for rental of tractors and other farm equipment with the objective of encouraging rural entrepreneurship as well as fast tracking mechanism of Indian agriculture

Destamart and Destatalk- Destamart is an E-Commerce platform for agri input supplies, fertilizers, pesticides and seeds to the rural market. Destatalk is a platform which provides agri inputs to agri store owners and also provides information related to agricultural sector.

Big-Haat- It is also one of the agri commerce startups in E-Commerce with the objective of saving money of farmers. It was started in January 2015 for providing quality agro inputs and accessories through online platform.

E-Chaupal- This business platform consists of a set of various organizational subsistence and interfaces connecting Indian farmers to International market. It is initiated by ITC. It has 3 different layers with different level of geographical aggregation which are characterized by 3 key elements;

- Infrastructure –is a place where transaction takes place (physical/organization)
- Entity (person or organization) this is where mounting of the transaction takes place.
- Geographical coverage

Village level Kiosks with e-chaupals. Here, the local farmers who are trained by ITC manage each target farmer within the reach of 15 km. There are Brick and Mortar infrastructure called hubs which reach targeted farmers within the reach of 25 to 30 km. they are managed by traditional intermediary who have local skills and knowledge.

“I Say Organic” (ISO)- It is a Delhi based online portal setup in 2012 for food retailing. Organic products are marketed through ISO website on a daily basis where orders are taken over by mobile or through online and the deliveries are within a few hours. The website accepts cash on delivery, card or online banking.

Amazon has entered into food retail sector due to the liberalization of FDI policy in 2016 which allows for 100% FDI as long as local sourcing requirements have been met. Similarly Ask-Me-Grocery.com, Snap deal, Freshfalsabzi, Peppertap, Local Banya and Bigbasket have also started grocery. Orders on Freshfalsabzi websites can be through online or by calling any time of the day for delivery of products on the following day in 3 time slots.

Bigbasket - There are three sources from which Bigbasket procures its products- farmers, vendors, and national sourcing. The oldest distribution centre of big basket is in Mahadevapura which spreads across 72000sq.ft. The major national source for Bigbasket is for onion and potato. These sources majorly constitute

- 70% collection from farmers (stock keeping units).
- 20% from vendors
- 10% from national sourcing
- International Crops Research Institute for the Semi-Arid Topics (ICRISAT)

T-Hub and ICRISAT are working together in Telangana state startup incubators to combine both extensive and vibrant network of entrepreneurs through value chain technology and agricultural expertise of farmers. The impact of this collaboration on a large scale spans multiple programs which covers technology innovation and agriculture as a core domain.

National Agricultural Cooperative Marketing Federation of India Limited (NAFED):

This institution is registered under the Multi State Cooperative Society Act. its objective is to promote operative marketing of agricultural produce so as to benefit the farmers. It is the online platform not only for internal trade but also international trade, consumer marketing, counselling for organic farming, procurement of seeds, fertilizers and other raw materials. The website of NAFED also provides information regarding tender, procurement of pulses, farmers grievance redressal, information of brokers or surveyors in various parts of India, viewing of e-bulletins as well as annual reports (both in english and hindi) for an overall agricultural information. Farmers and other members can login once they have registered with the institution and operate accordingly. It also provides updates regarding upcoming national and international trade fairs for the benefit of its members. The website also provides updated news and other agricultural related important links and government schemes. NAFED is also available in the form of mobile application for ease of access by users. Some of the links provided are: Agmarknet (NIC); Agriwatch; APEDA (Agricultural and Processed Food Products Export Development Authority); Farmer portal; Agri commodities in India; India agro net; Forward market commission

Some of the agricultural government schemes provided by NAFED are Agricoop; Crop insurance; mKisan; State agricultural departments

The statistics have been proved that a large number of farmers have been included with the digital platform due to various initiatives taken by the government and private sector. Although many farmers are still reluctant to use digital platform due to traditional agricultural practices, lack of knowledge and lack of awareness, India is evolving itself for the big change in agricultural infrastructure. Indian farmers still depend on physical APMCs and middlemen due to warehousing facilities, credit facilities and other services provided by them. India will witness a huge growth in this field in the coming years. Farmers are

gradually turning towards digital economy for information regarding agriculture, supply chain, market availability and technological advancements in this sector. The estimates have shown substantial increase in investments into technology-driven innovations for increasing the productivity of agricultural yield, providing fair prices to the farm produces, availability of global market by way of exporting the products, recognition of farmers and traders through online registration, and providing solutions for problems faced by small and medium farmers.

The areas to be explored are: Establishment of an accelerator hub for agricultural activities, synergies and partnership across all the innovative spectrum and sponsoring programs related to agriculture.

Indian Agricultural sector has a lot of scope in development of digital application for a common digital platform with common price scheme for similar agro products and this area is yet to be explored. There is a need for in depth research and development to be initiated by both government and the private sector in order to establish a fair value to benefit farmers and also to reduce intense price fluctuations in the market.

Private sectors need show curiosity in agricultural sector and invest so that there is an inclusion and contribution from this field along with industrial and service sector contributions to the economy.

More and more online services and mobile applications need to be provided to the local farmers in remote areas along with training on usage of technologies to improve the quality of living of every Indian farmer. This is possible only when there is affordability by way of inexpensive and ease of availability of such technologies.

6. Conclusion:

The study has thus informed about the innumerable technology driven agricultural digital platforms and opportunities available in this field. Therefore, more steps taken can unburden the farmers of their day-to-day problems. This can bring about a huge transformation in Indian society and economy.

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