P: ISSN NO.: 2321-290X RNI : UPBIL/2013/55327 VOL-4* ISSUE-12* August- 2017
E: ISSN NO.: 2349-980X **Shrinkhla Ek Shodhparak Vaicharik Patrika**

Economic Needs and Effects of E- Revolution in Agriculture

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Abstract

India's population would be 1.6 billion by 2050 requiring 377 million tonnes of food grain as against 272 million tonnes in 2016-17. This shows immense pressure on agriculture and vast opportunities for the farmers in the agricultural market. According to an estimate by GOI it is estimated that per capita land availability which was .32 ha in 2001 will decrease to .23 ha in 2025 and .09 by 2050 due to rapid urbanization. Thus there is an urgency of Evergreen revolution in agriculture. It is said that growing demand for food can be dealt with the introduction of Diversification in agriculture .This will enrich the food basket and create new edible products in the market. Now days we witness brands like e-basket, big- basket where new packaged products are seen. How this has become possible is a miracle of ICT or e- revolution in India, which propogated information at such a high speed to any person

Keywords: Ever Green Revolution, Diversification, ICT, Technology in Agriculture, Optical and Rular Imagery, Geo-Satellites, Apps, Portals, Super Market, Effects

Introduction

With the advent of WTO the important place of agriculture sector can not be ignored in the international market. In a study by FAO (Food and Agriculture Organisation of United States) it is assumed that world population would be 9.1 billion by 2050 out of which 70% of population is expected as urban .To meet the needs of the vast population FAO expected 70% increase in global food productivity by 2050. Such an increase has been assumed on the basis of 10% increase in consumption per person. If talk about India, population would be 1.6 billion by 2050 requiring 377 million tonnes of food grain as against 272 million tonnes in 2016-17.This shows immense pressure on agriculture and vast opportunities for the farmers in the agricultural market. Presently, in India , the net sown area is 46.3% which if includes the fallow land accounts for 54%. According to an estimate by GOI it is estimated that per capita land availability which was .32 ha in 2001 will decrease to .23 ha in 2025 and .09 by 2050 due to rapid urbanization.

On the one hand agricultural land is decreasing due to urbanization and physical infrastructural development , on the other there are studies showing increasing consumption in future due to rise in population and increase in the level of per-capita consumption. Thus there is an urgency of Evergreen revolution in agriculture. It is said that growing demand for food can be dealt with the introduction of Diversification in agriculture .This will enrich the food basket and create new edible products in the market. Now days we witness brands like e-basket, big- basket where new packaged products are seen. How this has become possible is a miracle of ICT or e- revolution in India, which propogated information at such a high speed to any person at any distance. This paper enumerates the economic requirements and effects for ICT to benefit agriculture.

Aim of Study

1. To enumerate need based aspects of e- revolution in agriculture.
2. To ascertain the possible economic effects of e revolution in agriculture.
3. To suggest the measures for effective support of e- revolution in agriculture.

Methodology

This paper is based on the facts supported by the secondary data published by Food and Agriculture Organisation of United Steates ISRO and others as found on various sites related to the title of this paper (as

Shown in the reference part of the paper). Effort is being done to give a new analysis on this topic.

Review of Literature

Francois Quesnay's "tableau economique" (1758) organized a logical explanation of the conversion of land inputs to agricultural outputs and profit, anticipating modern production economics, input-output analysis and general equilibrium theory. His emphasis on surplus production was a touchstone of classical economics and exercised a direct influence over Adam Smith (1776). Ricardo (1821), Von Thünen and Malthus, provided commentary on the difficulties of agricultural specialization, returns to land as a factor

Economic Needs for Agriculture and ICT

We know that 70% of population still live in rural area and 64% of this depend on agriculture .The need and craze of ICT has started generating demand in rural areas . How the Indian government along with private partners fulfilling this demand for ICT and how the demand- supply forces making ICT cheaper to reach the suburb areas is a mind boggling question. We cannot deny the important role of foreign partners in the decreasing the cost of ICT devices. For example we can have a mobile in Rs. 1000 or 500 with some talk time. It has made the technology to reach anybody. The mind blowing integration from international to national and from national to rural for the benefit of farmers and economically backward classes of the society is a miracle of the day. The most important sources of e–revolution are mobiles, laptops, blue-tooth and wi-fi devices made for specific purposes. The use of ICT was introduced in India in the decade of 80' when the computers were used by agricultural scientists. But today it is in the reach of an average farmer. In India though the literacy rate has improved to 74%, the computer literacy is very low 6.37% i.e. even the people living in urban area do not know much about computers. Still it is a fact that people are increasingly making use of computers through informal learning of computer. People are using this device for computation, documentation, animation, simulation in their day- today business.

It is vague to see that where computer literacy is low among general men, India's educated youth are reaching new heights in the IT sector. On the basis of this sector and under the international pressure the GOI has seen the dream of e-revolution to transform India specially rural India. Paper- less work is being promoted in every department to digitalize India. But it is not a joke. GOI has to build a huge physical infrastructure to support. However this is becoming possible day by day with the government efforts and new taxes imposed by the government. .

The Indian government in the budget 2017-18 decided to provide fund upto 60% of the R&D cost for producing indigenous low cost electronic items. The cheap supply of computers and related e-material is urgent. We observe decreasing prices of these items and expansion of the market. The use of multiple Bluetooth devices for various purposes have surged the market. The use of wi-fi devices is also up- surging as a new market. Government is investing highly to convert to wi-fi environment for internet suitability in both urban and rural areas for ensuring good governance through GIS and high speed internet connectivity. At the same time government is increasing broad- band penetration by selling more frequencies to private sector for better services as we see the growth from 2G to 3G and from 3G to 4G . Still as compared to international community it is far below. There are miles to go in the G- services (National Telecom Policy 2012). If we talk about present we use only 4G services, the future prospects when more higher frequencies will be commercialized seems to be immense. These services are impossible without R&D in the field of geo- satellites (GPS) which itself is a beginning like computers at one time.

The increasing of geo- satellites has surpassed all the imaginations of men. The use of ICT has increased multiple folds with the use of geo – satellites for specific purposes viz., land recognition, demarcation, mapping , specific area weather report, forecasting , satellite based optical and rular imagery are widely used for monitoring in agriculture. Institutes observative network allow timely crop production fore-casts and drought assessments which helps government to frame policies for farmers like insurance cover, subsidy. Satellites like RESOURCE SAT 2, RESOURCE SAT 2A, RISAT 1 are specially designed to meet agricultural demands for information. Since we have started preparing and launching satellites indigenously therefore their costs are decreasing day by day. For instance RISAT 1 launched in 2012 costs 375 crores where RESOURCE SAT 2A launched in 2016 costs only 106 crores . Launching of satellites is fetching a big market for India. GOI has allocated $ 1.2 billion for space activities for 2015-16.

The use of smart phones has transformed all these changes into a revolution. People may have distance from computer but by the usage of smart phones they can make the use of internet also .Thus smart phones are also assisting in carrying out e-business in agriculture. First of all it helps in communication through phones and sms . Secondly it is helping in every aspect through wide range of apps and portals. They are e- Krishi, Bighaat, IFFCO e-bazaar, IFFCO Agri portal, Kisan Call centres, Indian Space Research Organisation portal, ITC e-choupal , e-ARIK, e- SAGU , Rice knowledge management portal, RML, VKC (village kisan centres), VRC (village resource centres, e-NAM etc. All these portals provide knowledge, sell inputs and help in handling farmers production by the informations about the prices of various brands in different mandis. The figure1 shows how a portal helps farmer in disseminating information.

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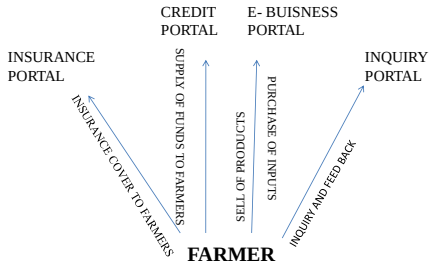

PORTALS BENEFITTING FARMER

Fig 1

Examples of some of the company portals working in the field of e- agri business are given below-

1. Agro Star , Big haat, IFFCO e- bazaar, e- ARIK , E- NAM– they provide door step delivery of seeds, chemicals and accessories.
2. Ninja Cart, Farmer Uncle, Mera Kisan- they provide direct door step delivery of produce to purchasers from the farmers.
3. Flybird – Provide instruments related to Precision farming. Precision farming is a data driven approach using electronic devices to monitor growth in agriculture and other allied activities.
4. Stellaps – sell dairy management tools .

Economic effects of e- revolution on Agriculture

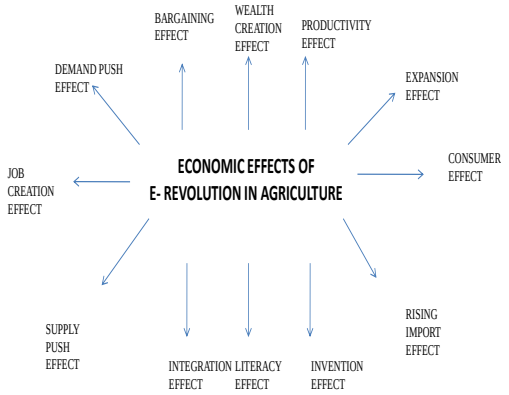

Fig 2

The problems in agriculture, future demand for food and exuberantly high growth of ICT in agri-tech market shows dynamism to change the traditional scenario. What will be the future of agriculture depends upon the reaction of farmer to these changes. But it is certain that their will be multiple effects of these change. If the use of electronic items related to ICT increases depending upon cheaper availability of such devices, there will be a boom of new farm based electronic products. This we may call Expansiom effect. According to Buisness Standard (13 June 2017) manufacturers in India will not be able to cater the growing demand of electronic goods in the country with the imports accounting 75% of the market by 2020. The demand of electronic items will grow at the CAGR of 41% during 2017-2020 to reach $400 billion leaving a huge gap for imports up to $ 300 billion. E- Revoltion is certain but if these facts by Buisness Standard prove true, the revolution will not be an indigenously driven revolution. We may call it as Rising -import effect.

In agriculture the use of electronic items based on GPS (global positioning system), and GIS (global information system) will increase productivity as has been assumed by many researchers. This increase in production will be a backbone for sustenance in the future. It is dreamt that sustainable development can be assured only by fine use of technology for better productivity. We may call it as Productivity effect. The use of technology will decline the need for farm workers but create new skilled jobs to monitor the machines. Thus we will observe more agricultural scientists and technicians in the future. This may also be included under productivity effect. Relating nature and technology in such a deep manner will create new inventions. We may call it as Invention effect. For example at present channel market, apps market has uprise which were not present before. Now government is launching a whole time krishi channel to benefit farmers. In future there will be more krishi channels which will be more specialized. The use of electronic devices will make the people smarter and literate. Their per capita consumption of electronic devices will increase showing a unique human -ICT bondage. This we may call as Literacy effect.

If agricultural productivity increases there are chances that more wealthy people may take up this task this may lead to Wealth – concentration effect. Private holders like TATA, Reliance Green, and Mahindra are already in the agricultural market. Better and fast information to farmers will strengthen the farmers and avoid distress sale.This we may call as bargaining effect. For instance e-NAM portal which is launched to join 200 or more mandis in the country to provide integratred knowledge about agricultural market. There will be a close communication between mobile market, apps market, channel market and IT sector. We may call it as Integration effect. There will be surge of new kinds of courses and jobs which can be called as Job – creation effect. Hi- tech agriculture may change the modes of production, storage and marketing. These changing modes will create new demands in agri-tech market for instance bar- coding of agricultural products have proved a boom for farmers. It can also support on farm purchase by the private players helping farmers. With the help of crop monitoring devices it will be possible to sell the crops before them ripe. Thus various time

lags in agriculture may deplete enhancing farmers' security. We also witness new crop insurance companies are peeping into the market to provide crop insurance at various stages. All this may be called as Supply push effect.

The e- revolution in agricultural production will create new super markets in agricultural products so there will be no storage problems for the farmers. This responsibility will shift to the company who is purchasing the product either before ripening or at the time of ripe. These super markets will make home made deliveries. Thus the private companies may curb a big chunk of the agricultural production leading to privatization of agriculture. Increasing health consciousness and urbanization may shift the demand in favour of agricultural products of the super markets making pressure on farmers to sell their products to private companies. This will bring a marketing revolution in agriculture due to Consumer effect. Brandisation of agricultural products and their publicity will fetch more market and will influence long term demand for agricultural products. This we may call as Demand push effect**.**

Suggestions

There is immense potential of ICT and supportive technologies to revolutionize agriculture. The need of the hour is to think and plan the ways as to how can we make this revolution successful to change the picture of agriculture sector and attain the growth rate of 4% annually.Firstly, government should create the database of all farmers in the country. In this data base details related to his land, assets,type of farming, crops he grow, technology he is using etc, should be clear. Secondly, government should make it compulsory for farmers to link with the Kisan call centres and community service centres. With the help of these agencies farmers should be guided for his farming activities through downloadable audio visual programmes prepared under the expertise of agricultural scientists. Thirdly, the government should support more agriculture supporting apps having downloadble vedio aids for specific problems. Fourthly, there should be a time bound target to attain full literacy which is necessary for ICT to serve rural India. Lastly, government should start special loans to avail higher technologies on the agricultural farm . These loans should be disbursed at subsidized rates so that more farmers can be benefitted.

Conclusion

The up coming changes will harness the nature to its bount. The new electronic devices based on space technology, nano technology, renewable energy technology, bio technology will prove helpful in sharp monitoring. It is of immense importance in the WTO regime where quality is a big constraint in trade . The change of hi- tech agriculrture will certainly help to improve the conditions of rural India through ICT. This integration will generate a new economy which can change the thinking of common man. A huge demand is likely to generate for e- devices and agricultural inputs. How far the private companies take this task depends on the profitability in this sector which further depends on the cost – effectiveness of e- devices and bio- tech instruments.

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