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The Fertile Ground of Agriculture for Digitization

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ABSTRACT: Over the past five decades agriculture remains the most ignored sector by continuously decreasing employment and GDP contribution to the economy. By increased use of technology and digitizing the resources for optimal usage, it will significantly give the much needed boost to the sector which is at a very critical phase. With the humongous population but limited resource base it becomes much eminent to use them in a way which reduces loss and at the same time favors well-being of the people employed in this sector. In surge to make money few Farmers have started moving from staple crops like rice ,wheat towards higher-cost foods like poultry meat and dairy products. Stagnant and traditional practices , financial crunch ,lack of Research & Development and improper leveraging of technology and rain fed cropping are the main issues of Indian farmers which has kept this sector at low despite three decades of unmatched industrial growth. Digitization is necessary for agriculture as it ensures transparency in payments, effective implementation of schemes; curb corrupt practices and most importantly to create a "win-win "opportunity for customers and farmers both. Digitization is necessary so that farmers could have better idea of market and that they can use it to the best possible way. Digitization not only reduces the middle man worries but also provides a chance for farmers to reach out the market directly and get their shares. In order to use the resources optimally, digitization in this age has become the need of hour.

Keywords: Agriculture; digitization; technology

INTRODUCTION

With the policy makers and government aiming to connect the rural and urban parts of India by digitizing it to a large extent and using electronic facilities, one of the most important sectors which are responsible to fulfill the needs of 1.3 billion Indians, The agriculture sector is still lagging behind when it comes to coupling with technology and digitization. In the era where we live in global economy driven by growth and increasing middle class with a larger appetite base by consuming meat, dairy and high caloric foods it becomes more crucial to handle our resources wisely and at the same time ensuring the increased production for future.

The Indian government under strong leadership plans the 12th FYP as inclusive and sustainable growth with buzzwords like digitization in order to achieve the target of doubling the incomes of farmer by 2022. Making agriculture profitable business, introducing new technologies, efficiently and effectively using digital measures to reach out larger consumer base should be the perquisite. The schemes and measures like Digital green, Krishi vani and Krishi gyan sagar – are Information Communication technology initiated to target and make farming cost effective business, sustaining socially, while delivering secure, healthy and economical food for people. Delivering smart suggestions to farmers , digital technology is going to play a vital role then be it increasing agriculture productivity by based on various aspects of crop and crop conditions like planting, weather , market prices and localized suggestions. Latest in house technologies like The Internet of Things and sensors are giving some farmers profitable source of information mostly regarding soil.

Self-driving machineries connects with satellite imagery to apply fertilizer automatically and relay nutrient information to a farmer's mobile computer. Thus the extensive use of big data, while offering attractive opportunities, does come with challenges but if we see it from a better perspective we can say that, overall from a technology viewpoint, agriculture is ready for intense digitization.

Literature Review: Developing effective policies and programs at the city or neighborhood level demands as a first step the accurate mapping of existing urban agriculture sites as suggested by Zhang et al. Jihong et al think that Only 13% of sites reported to be community gardening projects by non government organizations and government agencies were determined, through image analysis, to be sites of food production. The production area of home gardens identified by the study is almost threefold that of community gardens.

A procedure for microcomputer-based digitization of images is proposed using an IBM-PC microcomputer and a TECMAR digitizer board as inferred by Fisher et al.

Yanuka et al believe that Using cross sections of impregnated porous materials such as glass beads, sandstones and soils, procedures are described to determine the porosity, pore (chord) size distribution, and permeability of porous materials.

It has been in the view of Ning G that modern agriculture features industrialization, marketized industrial structure, intensive production pattern and high digitization, farm produce logistics are characterized by

wide range, large quantity, relative independence, consumable as well as value-added processing. According to Tang et al in view of the features of modern agriculture and farm produce logistics, a SCOR model (Supply-Chain Operations Reference-model) of agricultural products based on the Internet of things has been put forward through the improvement of the logistics model of traditional agricultural products.

The agriculture operations is mainly based upon farmer families, and the correlating agricultural products circulating system characterized as "small scale, and big group" finds it more and more difficult to meet the demands of modern agricultural products logistics and agricultural industrialization as said by Chuanfu, C. Bailey et al believe that stepping up the development of modern agriculture has become the important strategy towards the building of agricultural power. Blank et al think that the transport management, which lacks of wholeness and coordination, directly leads to hindered circulation of agricultural products and the increase of cost. Jihong, Z., & Bosheng, L. stress more upon that since traditional agriculture in our country now makes up the greater part, the development of agricultural products logistics is still backward and fails to form standard organization and management.

Objectives of the Study: The main objectives of the study were as follows:

- To study the usage of various digitization technologies in agriculture sector.
- To conduct a analysis about the effect of digitization on agriculture by using different technological tools.

METHODS

This paper uses research method approach to understand the effect of digitization, its recent advancement and examining the advantages and disadvantages for the same. The main components which can be considered to be lifeline of the application of Digital Agriculture is SDI - Spatial Data Infrastructure, and affordable smart phones and other electronic devices to support the two way flow of data and information even to the remotest rural areas and farmers. When talking about digitization of agriculture in US, Europe and Australia SDI has played major role and even in the emerging economies of Brazil, South Africa and China it is used to a large extent. One needs to consider multiple factors in agriculture as it is highly and mainly based on data availability like that of soil variability, harvesting, soil nutrient levels, anticipated rainfall , and market price flexibility. Nowadays advanced agriculture set ups help growers strategically manage and increase their production and decrease market risks through the application of advanced techniques like SDI which are cloud facilitated and unified through APIs. In turn thisis one the critical factor in India which farmers desperately need to get through because it creates a prosperous and effective data system that enables analytics to inform farmers of the best current economic options to available and their future prospects to maximize expediency and minimize risk.

Digital technology will not only give producers a cutting edge in data intense researches but also it will be decisive to expanding agriculture productivity by bringing in change the best possible suggestions to farmers based on crops and plants, variety sown, real time localized observed , weather and expected market prices. Secondly with the help of data analytics particular, larger area of land will be covered and potential pests and other harmful weeds can also be known and evaluated easily. Big data, analytics , user interface and some key resource like remote sensing are important resources to support the development of crops in changing weather conditions ,improved hydro elucidation and basin management, soil and crop life estimates . By the help of data insights as provided by different technologies it can assist producers in carrying out operations that will optimize yield and increase their revenue many folds. Use of NDVI or infrared images from UAVs (Unmanned Aerial Vehicle), user interface and calculation of economic impacts of digital technologies have high potential and can be game changer in future increasing the financial prospects and outcome for every farmer using it. Different firms are entering this section of tailored techniques for farmers as this market is full of scope and ample of opportunities.

Establishing a strong network of digital services can prove to be a game changing technique, allowing access to vast portions of the most intensively used global crop land and managing such a platform to provide contractual maintenance services to producers would enable the industry majors to access and make decisions about comprehensive crop protection, traits, fertilizer, and growth regulator inputs. By summation of all these inputs into one offering comprising products, recommendations, and application services specifically for each acre under service, based on soil quality, weather conditions, pests pressure, digitization helps the industry establish best in house solutions in a way that is much smarter than conventional marketing and sales efforts can offer. Adding to it, such a service platform model would enable the industry to increase salability and to improvise upon their know-how and build customer loyalty instead of only selling products, resulting in more opportunities to capture economic value and building stronger relations.

Around the world's most significant agricultural market markets, digital service techniques can be used to pro to provide service to large portions of land. Large and medium-size farms, in can be maintained with digital offerings by various firms, many large farms are already using automation techniques that is digital farming-enabled. So these large farms have stake for 50 to 70% of crop land in major markets and are generally willing to use technology to escalate yields for greater profits.

RESULTS AND DISCUSSION

The digital penetration in other industries reveals that the patterns and success factors for today's digital world is Being first and fast does. This gives a cutting edge advantage on the first platform itself to give a lead and gaining relevant size is likely to shape the future market.

Thus we can say that in the era of fast pace technological advances the firms which will enter this arena to develop the agriculture sector will have the chance to acquire the maximum market share more like the monopoly case. So this sector caters first come and first serve with high acceptance rate as observed in developed and developing countries.

Instead of just responding to this phenomenal development, aggressive agriculture companies have the opportunity to take charge and lead the way by creating win-win situations in line with a digital strategy and working models. The outcome of all this can bring about evolution in this sector, some probable benefits can be termed as:

Keeping in touch and engaging with customers - by constantly keeping in touch with producers and by giving them access to farm data, including health of the plants, nutrition and pests strain as well as planned field deployment actions like protection for the sown crops and their treatment by accessing from any electronic device. Also the feedback system part of self regulation or self monitoring helps in making decisions and with the help of this the growers can decide what is turning out in their favor and then that suggestion or recommendation can be implemented. This also helps the producer farmer to sit back and relax and not to worry much about the crops.

Getting to know the potential customers and their needs, henceforth linking the best in house products to products such as fertilizer and agro-chemicals, pesticides for optimal efficacy and tank mix feasibility to ensure ideal outcomes for each field and each treatment.

CONCLUSIONS

In the past few years we have observed the decisive change in agriculture field and ample of steps taken at national and state level to benefit the growers with the Direct Benefit of payments system and UID – Unique Identification Number the Aadhaar, to directly transfer the sanctioned government grants to citizens, soil health card to farmers, kisan credit card, Pradhan Mantri Krishi Sinchayi Yojana, national unified economy and climate indexed insurance for crops in defined limitations. When jointly associated with the SDI, subsidies can be granted to increase farm expediency and managing production and bifurcating market risks that directly or indirectly give farmers morale to invest further in their farms to increase productivity.

Digital Agriculture is influencing socially and one of the best examples of this is that originated from India, Digital Green. Now here in this social platform farmers do explain best farm management practices to other farmers hence making it a mutual co-operation and with this

approach there is almost ten times cost reduction than traditional ways and farmers believe other farmers more because they have gained experience through that way

The US being the leader in Digital agriculture the concepts of these are being successfully applied to small farm holders in other countries too. When we talk about India we should know well that without wasting any more time we need to keep our projects on fast track to get these plans on ground and apply the latest and most automatized new tools to [ace the developmental process of taking agricultural to new heights and to make the vision of the Prime Minister of a Digital India, doubling the income of farmers by 2022 and also to expedite the accomplishment of Sustainable Development Goals. The National Food Security Act - NFSA one of the most important act as passed by our parliament will be achieved as an objective of digital initiative.

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