

Chapter 10

Essentials, Challenges, and Future Directions of Agricultural IoT: A Case Study in the Indian Perspective

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ABSTRACT

Agriculture plays a major role in the socio-economic structure of India. A recent report claimed that population of India is increasing faster than its capability to produce rice, wheat, and vegetables. The challenges in the area of agriculture are farming, watering, weather forecasting, marketing, and transportation. These challenges are to be addressed towards proper solution. If the infrastructure and productivity of the food increases, then India can easily feed its population as well as improve the exports of wheat and rice around the world. Internet of things (IoT) is an emerging technical area of agriculture domain. The advantage of IoT is to implement a smart agriculture management system with the help of analyzing the weather conditions of the field in order to optimize the usage of water, energy, fertilizers so as to maximize the crop yield. The objective of this study is to explore the possible contributions of IoT in Indian agriculture towards the improvements in irrigation infrastructure, agricultural productivity, food security, and rural job opportunities.

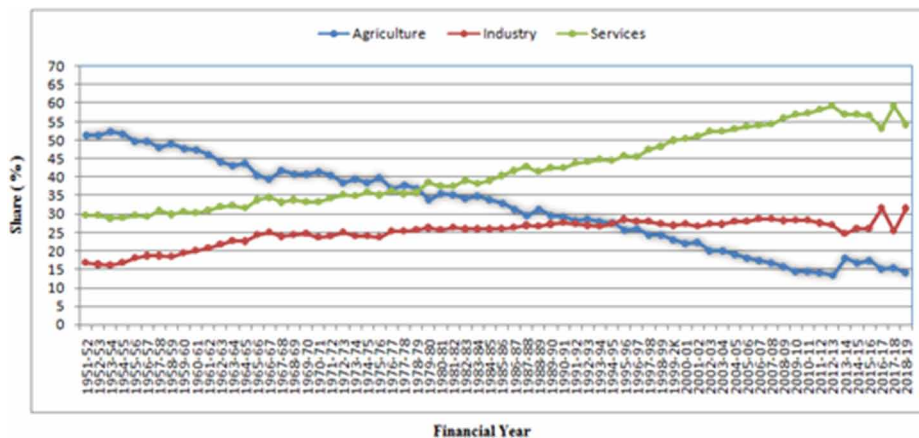
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INTRODUCTION

Agriculture is one of the most important areas of human activity worldwide. India is one of the agriculture background developing nation with more than 70% of its inhabitants depend on agriculture. The escalation in agriculture productivity directly increases the economy of India. As of 2015-16, India has wide-ranging agricultural sector makes about 17% of GDP income. India's 159.7 million hectares (394.6 million acres) of arable land is the second largest in the globe, after the United States. Gross irrigated crop region of 82.6 million hectares is the biggest in the world. India stands in the top three global manufacturers of many crops, such as wheat, rice, cotton, peanuts, vegetables and fruits. India also had the biggest herds of livestock; hence it is the large maker of milk and also has one of the largest poultry industries. As the inhabitants of India increases there is a need to raise the agriculture productivity. But nowadays the Indian farmer's life style and farm practices are swiftly untrustworthy due to the raise in non-agricultural openings. The scientific improvements in farming are not getting closer to the cultivator, because of their illiteracy or due to lack of knowledge. Hence, a greater number of the farmers are failing to gain the expected production profit and business rate. Still the Indian agriculture face the challenges like traditional farming practices, disjointed land farming, dependence on monsoon, poor infrastructure in countryside and less usage of technology applications.

Indian financial system is organized into three sectors: Agriculture sector, Industry sector and Service sector. The Agriculture sector consists of Agriculture, Livestock, Forestry & Logging, Fishing and allied activities. Combination of Agriculture & allied, Industry, and Services sector was 51.45%, 16.69%, and 29.63%, correspondingly at current prices in 1951-52. But now the contribution of Agriculture & allied sector has declined to 17.40% in 2015-16. Meanwhile share of service sector has improved to 56.60% share of industry sector also has raised to 26.00% as shown in fig.1 (Planning Commission department, Government of India). Rural areas in India still faces a greater number of challenges in the agriculture sector, water resources management, environment management, infrastructure administration, cleanliness, access to markets, roads and transport connectivity. The technical contribution and its usability still have to be developed for agriculture sector.

Figure 1. Sector wise contribution of GDP of India (1951 - 2019)



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