

FIT5145
INTRODUCTION TO DATA SCIENCE

ANALYSIS ON AGRICULTURE IN INDIA



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Assignment 2 - Business and Data Case Study
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1. PROJECT DESCRIPTION

1.1 Background

Agriculture in India represents an important sector contributing to about 17% of the Indian GDP. As per 2018 reports, agriculture employed around 50% of the Indian workforce¹. Every individual in the nation is directly or indirectly affected by agriculture. Farmers who are looked upon as the backbone of the Indian economy, are still found to worry about their crops, profits, sales, debts and various other problems throughout their lives. There are many problems that a farmer has to face which the urban people do not even realise. Because of the difficulties, it is no surprise, that even the children of the farmers want to migrate to the cities and leave farming. We need to understand the extent of this issue otherwise a day will come where “food surplus” will convert to “food deficiency” in India.

Farmers in India face many problems where education contributes majorly. A huge percentage of Indian farmers do not attend schools and their children are seen to do the same. Due to the lack of education, the farmers are not able to solve their problems and make use of the new-age technology to the best fit.

Climatic conditions is another major difficulty that haunts every farmer day in and day out. For the farmers who want to build up their yields, climate change always acts as a gamble. Agricultural scientist,M S Swaminathan have already pointed out that just a mere 1 degree celsius rise in temperature can yield to a loss of 6 million tonnes per year². Performing analysis and visualisations on the climatic conditions during the different times of the year can help in the betterment of the crop supply.

Another major issue that is often overlooked is the storage management of the crop and the condition of the infrastructure around the agricultural land. Roughly around 15% of the yield is lost between the farm gate and the consumer³. This can be reduced if better roads are constructed. This will also allow a smooth working atmosphere for the farmers and the commuters.This can further augment the agricultural output and income for rural farming community.

1.2 The Project

This project aims to provide solutions and a business model to solve the issues seen in the farming community. Use of technology and data for carrying out analysis can help us to reduce the difficulties and ensure maximum productivity. Analysis can be carried out on the climatic conditions and the type of crop to grow at a period of time to secure the efforts put in by the farmers. Through the data collected over the years we can also find out how lack of education impacts the agriculture and ways in which we can correct it.

2. THE BUSINESS MODEL

Data Science can play an important role in finding the best possible solutions for the problems faced by the farmers in today's world. Abundant amount of data has been collected which tells us how even a single decision while farming can cause a huge impact. What kind of soil to pick, which crop to grow, how much irrigation is required, what pesticides are less harmful, which climatic conditions yield best results and prediction of weather change can all be answered by looking at the history and the previous data. This project aims to provide a business model and solutions to such questions based on analysis and prediction.

Farmers around the country are beginning to adopt precision agriculture and agriculture technology through machines and equipment that use data analytics, Internet of Things and robotics to optimize the inputs and enhance the yields. Precision agriculture involves working on data about the crop type, climate, etc and then carrying out analysis on it to find major insights that will help the farmers. Based on the insights better decisions can be taken to increase the crop produce and the business. The goal of Precision Agriculture remains to optimize the profits while making a minimum use of resources. Precision agriculture can help predicting the climatic conditions and also estimate the potential losses. Accordingly the farmers can make adjustments to ensure minimum loss.

Precision technology is not only applied during pre-harvest but can also be applied to the post-harvest activities. Grading the quality of the produce and supply chain management can ensure a better productivity. It can allow the farmers to enhance the marketing of their products at a particular time of the year to a particular audience.

With the help of precision technology and the insights gathered from it we can assist farmers to make better decisions. The farmers can be educated regarding which crop to grow at what time to get the maximum profit. They can be taught about the climatic conditions and how majorly it impacts the growth of the crop.

The data for precision agriculture can be collected through various means. Sensors can be put into soils to collect and store the nutrient contents of the soil during different times of the year. A record of the pesticides used on different crops during different times can also provide us with good insights. The chlorophyll percentage in a crop can also be determined using a chlorophyll meter. This data can further help the farmers to pay more attention to the crops that have a low chlorophyll level. Climatic conditions can be monitored using tools like weather stations that measure the different variables like temperature, humidity, wind speed, rainfall, etc⁴.

Based on the data we can analyse and find patterns that will help in the better decision making for the farming sector. This will help in better crop productivity and will help farmers use their resources to the best use.

3. REFERENCES

1. https://en.wikipedia.org/wiki/Precision_agriculture
2. <http://imotforum.com/2017/11/biggest-problems-faced-farmers-india/>
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