

Analyzing Agricultural Related Data with Weather Conditions and Labour Demands Using Data Mining Approaches

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Received: August 18, 2021; **Published:** October 01, 2021

Abstract

In the recent times, the area of agriculture one of most essential research and also there has been an increasing demand in future based on weather conditions and agriculture labour demands. In this paper discuss what are the reasons for increasing the growth using weather conditions and labour demands. Numerical illustrations also provide to prove the various government reports.

Introduction to Indian Agriculture

In the recent times, there has been an increasing demand for efficient strategies in the field of data assimilation about agriculture development. Data mining is equipment that utilizes the prediction efficiently by statistical model sensing concept. India is a predominantly agrarian economy with most of its population depending on agriculture for livelihood. As agriculture is the backbone of Indian economy, its income plays a leading role in the national income. India has attained self-sufficiently in food production after 67 years of independence, the credit for this, no doubt goes to agricultural workers who spend most of their time in slush and muck but with unappeasable hunger. As a result, the exodus from agricultural workforce is expected to slow down in the coming years till 2019-20 compared to the earlier periods in consideration. In any farming fields, it for the most part happens that at whatever point the choices regarding different methodologies of arranging is viewed as, for example, season wise rainfall, region, production, and yield rate of principal crops. According to 2001 census, India having more than 68.8 percent of total population depending upon agriculture for their livelihood. This sector continues to support more than half a billion people providing employment to 52.8 percent of the workforce. As per the census of India 2011, 263 million people are engaged in the agriculture sector and over half of them are now agricultural labours.

Literature Review

Big data applications may offer the ability to collect and analyze 'real time' information from across ESCAP's 62 member States for policies that relate to the 2030 Agenda's 17 goals and their 169 targets [1]. The following table highlights the connection between the SDGs and Israel's current strategic goals. Like many other countries, Israel embarked on the SDG process while the institutional arrangements were being developed. Agenda 2030 was presented at the Senior Professional Forum for Strategic Planning [2]. The United Nations' 'No Poverty' goals seeks to eradicate poverty in all its forms through the achievement of seven key targets, each monitored by various indicators, making it imperative for countries to report poverty data that can be compared over time, and are available at relatively frequent intervals [3]. This study investigates, at the country level, the adverse effects of changes in metal inputs on the achievement of sustainable development goals (SDGs). It also highlights the relationships between metals use and various socio-economic consequences that urgently require decoupling in order to achieve the SDGs [4].

Data mining is the process of analyzing hidden patterns for using pre-existing data. Data mining is also known as data discovery and knowledge discovery for handling advanced data analysis [5]. The major steps involved in a data mining process namely locate the data, data collection, data cleaning, integration, data selection, data transformation and discovering the knowledge [6]. The area of weather forecasting is used to collecting huge amount of data as possible to find the current weather state of the atmosphere metrics namely temperature, humidity, and wind conditions [7]. Data mining techniques is easy to understand the atmospheric condition and to determine how to find the future atmosphere conditions using regression analysis [8]. In data mining techniques, normalization is one of the most important concepts for prepare a well suitable dataset with unique format. After using the normalization techniques various scales of information converted into similar scale of information. Various normalization techniques are also used to handling the data analysis, one of the most popular normalization techniques called maxima and minima normalization [9-15].

Growth of the Agricultural Sector

Growth in agricultural GDP has shown high volatility. It has 4.8 % for each annum in the Eighth Five Year Plan (1992-96) to a low of 2.4 percent during the Tenth Plan (2002-06) before rising to 4.1 percent in the Eleventh Plan (2007-12), as shown in table 1 and figure 1. The agriculture GDP growth rate for time series data from 2005 to 2014 as mentioned in the following figure 1. Source: Central Statistics Office (CSO)

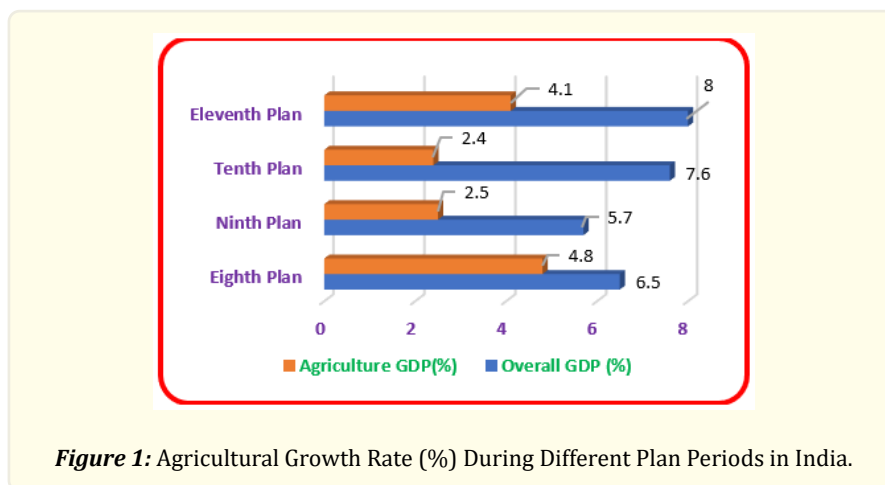


Figure 1: Agricultural Growth Rate (%) During Different Plan Periods in India.

Government of Tamil Nadu is pursuing systematic effort to increase the food grain production by resorting to numerous innovative methods. Relentless efforts taken by the Government for a speedy information dissemination of scientifically proven strategies and schemes, coupled with rapid technology adoption by the farmers led to a prodigious increase in food grain production over 100 L MT in 2010 to 2016 which building on the success. In table 1, the food grain production achieved by the Department of Agriculture, Government of Tamil Nadu.

The following table taken from Department of Economic and Statistics, Department of Agriculture, ENVIS Centre, Tamil Nadu State Council for Science, Ministry of Environment and Forests and Climate Change, India Meteorological Department (IMD), Government of India. The dataset display time series data from 2010 to 2016, which is include food grains (L MT), rainfall (MM), temperature (Celsius), groundwater level (M) and fertilizers (tone.). In table 1, include different measurements of data then these type datasets not possible to apply to the proposed stochastic equations (8).

Year	Rainfall (MM)	Ground Water Level (M)	Temp. (Celsius)	Fertilizers (Tones.)	Agri. Productions (L MT)
2010	937.80	13.20	34.2	32049	126.67
2011	1165.10	11.70	32.6	41799	124.75
2012	937.00	11.50	33.6	57902	120.78
2013	743.10	13.00	32.5	70758	125.04
2014	790.60	23.60	32.3	90974	124.30
2015	987.90	24.35	33.1	116393	123.22
2016	1138.80	21.80	33.4	143104	128.03

Table 1: Actual time series data include Agri. Productions (L MT), rainfall (MM), temperature (Celsius), groundwater level (M) and fertilizers (Tones).

Estimation of Labour Force Reduction in Agriculture by 2019-2020

An analysis across states shows in figure 2, In the period 2004-05 to 2011-12, robust growth in the secondary and tertiary sectors led to significant job creation in these sectors. As a result, a large share of the agricultural labour force moved to these professions which offered better remuneration. Source: NSSO, FICCI Research.

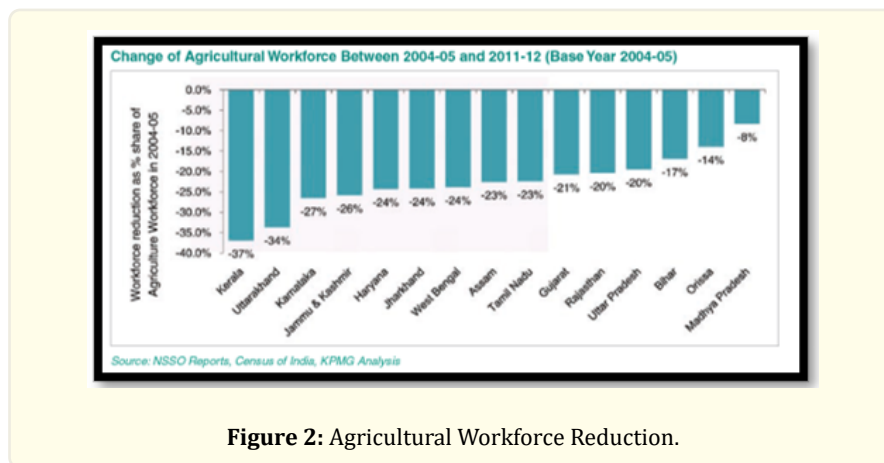


Figure 2: Agricultural Workforce Reduction.

Job creation in the primary and secondary sector is likely to slow down because of lower growth expectations in the sectors. As a result, the exodus from agricultural workforce is expected to slow down in the coming years till 2019-20 compared to the earlier six-year period in consideration. Nevertheless, the size of the workforce in this sector is expected to shrink by another 23 million in the next eight years till 2019-20 and form only 41% of the total workforce and this trend calls for immediate steps to improve labour productivity in the sector (figure 3).

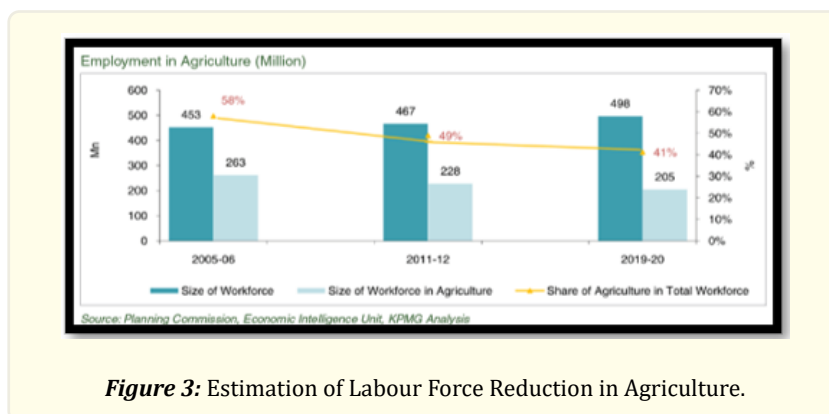


Figure 3: Estimation of Labour Force Reduction in Agriculture.

Conclusions

The increasing factors of agriculture growth are one of the sustainable developments in nations like India. The use of different data mining the primary factors for increase agriculture growth with the help of rainfall, groundwater, temperature and fertilizer. At the same time, in this research clearly explain for the forthcoming years the demand increases in agriculture labours. Further research what are ways to increases the labours involvement in agriculture.

Further studies

In future using linear regression model and normalization techniques to be used and for predict the future percentages.

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Volume 1 Issue 2 October 2021

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