



International Journal of Linguistics & Computing Research

Journal Homepage: <http://cphfs.in/research.php>



Artificial Intelligence in Agriculture

Abhishek Trivedi

Department of Computer Science and Application

Dr. Harisingh Gour University

Sagar, India

abhishek007trivedi@gmail.com

Abstract: Expected global population will be around 9 billion by 2050 and feeding this large population will be a biggest challenge. Components on which food production is dependent like agriculture land, water, fertilizer utilization is very limited for use. One way to raise the food production is to best utilization of existing resources. Human has very limited knowledge to use existing resources in optimal way. Artificial intelligence may be one technique to help former in utilization of existing resources and hence improve the food production. This paper presents the use of artificial intelligence in soil testing. Knowing the soil quality former can decide which crop to be cultivated with available resources.

1. INTRODUCTION

It is expected that global population will reached 9 billion in 2050 and it means we require more agricultural production in order to meet food demands to overcome the threat of food security problems. Since the agriculture land is limited so we need to increase per unit area production. On the other hand, it is estimated that nearly one third of the food produced in the world for human consumption every year gets lost or wasted. 40 percent of the fruits and vegetables, and 30 percent of cereals that are produced are lost due to inefficient supply chain management and do not reach the consumer markets. Key facts about hunger in India are following:

- Largest India is home to the largest undernourished population in the world
- 14.5% of our population is undernourished
- 190.7million people go hungry everyday
- 21.0% of children under 5 are underweight
- 38.4% of children under 5 years of age are stunted
- 1 in 4 children malnourished
- 3,000 children in India die every day from poor diet related illness
- 24% of under-five deaths in India
- 30% of neo-natal deaths in India

2. REASON FOR FOOD PROBLEM INDIA

There are several reasons for food problem in India some of them are following:

- i. By Population Bombing: By 2050, India's population is likely to reach 1.7 billion, nearly equal to that of China and the United States combined. Can India feed 1.7 billion people properly? If food availability is stretched now, what is likely to be the situation in 2050 when India will have an additional 430 million mouths to feed? The population of India is increasing at a very high rate. Increasing size of population is responsible for the persisting food problem in the country.
- ii. Limited Cultivated land and water resources: According to Agriculture Census 2001-02, only 58.1 million hectares of land in India was irrigated while the total arable land in India is 160 million hectares. As per the World Bank, only about 35% of the total agricultural land in India was reliably irrigated in 2010. India has nearly 30% of the global annualised irrigated areas, and is the leading country in terms of irrigated area in the world. The Indian agriculture is mostly dependent raining water. The former have less water resource, they also phasing low water level problem, they don't have sufficient tube-wells, they need raining water conservation by the small ponds and stop dams and canals. This will be helpful for water conservation and the former have the water for the irrigation.

Crop production can be improved if we can increase our irrigated land, this problem will be overcome. Use of artificial

intelligence can also help farmers to improve crop production. One use of artificial intelligence is to test the soil quality by which farmers can know the kind of soil they have, which crop is better for this type of soil and which kind of fertilizer it will be needed etc.

3. ARTIFICIAL INTELLIGENCE

According to the father of Artificial Intelligence, John McCarthy, it is "*The science and engineering of making intelligent machines, especially intelligent computer programs*". The theory and development of computer systems able to perform tasks normally requiring human intelligence, such as visual perception, speech recognition, decision-making, and translation between languages. AI is accomplished by studying how human brain thinks, and how humans learn, decide, and work while trying to solve a problem, and then using the outcomes of this study as a basis of developing intelligent software and systems.

It seems like artificial intelligence is everywhere these days. Many industries are interested in how the technology can help businesses become more efficient with both resources and money. Modern agriculture is one of them. Farmers are making informed decisions about how they use resources like soil, water, and energy by using technology. The story of modern agriculture combines sophisticated knowledge, sophisticated technology, and sophisticated decision making. Modern agriculture is making smaller, more frequent adjustments in the field. This emerging, data-driven field known as "precision agriculture¹" is gathering information collected by the interconnected system of sensors on modern-day tractors, combines, and other machinery.

4. AI IN AGRICULTURE

- i. **Soil Testing:** When talking soil, a little knowledge goes a long way. Some soils are naturally fertile and need little altering, but others need an overhaul. Knowing where you stand with your soil helps to determine what fertilizers and amendments you need to add before you get started. Data mining techniques can be used to predict the category of the analyzed soil datasets and provide suggestions of the crops which can be cultivated for better yield.
- ii. **Fertilization:** In recent years, with GIS and computer technology being widely used in the study of fertilization, many fertilization expert systems have been developed. Some fertilization systems have as many as 52 fertilization standards, and some fertilizer software can provide consulting services on 11 nutrients of 140 crops. At present, three fertilization models are widely used, and have good results, and they have their own advantages and disadvantages.
- iii. **Identifying Crop Diseases:** Deep Learning can be used to identify the crop diseases. Precision Technology provides easy solutions for crop disease diagnosis and monitoring, automated disease detection and advanced tools for automated disease detection for precision farming. Using smartphones farmers are able to detect specific crop disease with a very high accuracy.

CONCLUSION

This paper gives an idea to use of artificial intelligence in agriculture sector. By use of artificial intelligence it may be possible to challenge the food security problem.

REFERENCES

1. <https://www.indiafoodbanking.org/hunger>
2. <https://scroll.in/bulletins/104/transforming-patient-care-by-managing-talent-better>
3. <https://modernag.org/modern-agriculture/farming-with-precision/>