

# AN OVERVIEW OF ENHANCING THE IRRIGATION SYSTEM IN AGRICULTURE AND APPLICATIONS OF PESTICIDE AND INSECTICIDE USING AI

## Abstract

Agriculture is one and only the back bone of every country economic sector which implements the automation technologies in agricultural field with fundamentals of subjects across the world and the increased population is massive with increment by intaking the healthy foods. The methods of tradition used by every farmer all over the country will sufficiently fulfill their requirements and it helps to consume the food wanted for the billion of people and the technologies implemented in the agriculture became the great revolution and also it protects the yield based on the climate changes, downside food security and other related issues. The framework of Artificial intelligence will assist the users to develop the quality and accuracy of prediction something based on the requirements of farmers and users. Computer assisted methods and technologies help the users to identify the illness of plants and other issues by simulation of intelligence of sensors. The sensors are identifying the weeds and select the crop suits for which region using AI and machine knowledge makes the interventions of humans are lesser and it will improve the quality of crops. The proposed research paper is about the overview study of irrigation system in agriculture and its applications with using the pesticides and insecticides are studied.

**Keywords:** Agriculture; Artificial Intelligence; Machine knowledge; Pesticides; Automations; Irrigation system.

## Authors

### S. Binny

Associate Professor  
PG Department of Computer Application  
Kristu Jyoti College of Management and  
Technology  
Kottayam, Kerala, India  
binnylatheesh@gmail.com

### Dr. P. Sadar Maran

Professor  
Department Computer Science &  
Engineering  
Sathyabama Institute of Science and  
Technology  
Chennai, India  
sardarmaran@gmail.com

## I. INTRODUCTION

In 2050, the world's population is about to near 10 billion by improving the agriculture for developing the agriculture to 50% with 37.7% of agriculture based on land floor using crop production. The implementation of technology for contribution of higher income to the economy of the nation and the agriculture is critical for contributing the large number of elements inside the prosperity of certain locations with energetic components based on the capita of rural community. It helps to emphasis the agriculture sector with rational development of countries like Indian regions for 18% with 50% of employments of team works. Mostly surprised think is least digitized moments of improvements in technologies using agriculture with the proposed methods of artificial intelligence plays a major role in day-to-day life of farmers to extend the capacity of the environment around us, the techniques used to harvest the crops using machine-based techniques with vehicle routing is provided. Using this kind of technology, the workers has become limited for effective commercial sectors on several sectors and artificial intelligence is based majorly at the domains such as computer science, mathematics, engineering, etc., for effective and accurate result execution. The proposed paper aims to view the gadgets for flower and leaf identifying and watering system on time using Internet of Things (IoT) technology with hybrid botanical farming system. The basics of artificial intelligence will expand to the technologies with sensing method how human mind will think. It will be about studying the thinks like human and make choices and paint it on limited time to fix the hassle-free techniques with upgraded software and systems are enhanced and developed. Machine learning technology will be the center part of artificial intelligence to make decision on time with right execution values using sensible packages. It has the capabilities of researching the matters without any program with deep learning models and neurons. Artificial neural network is processing some set of rules and protocols for functioning the layout by designing the network with remarkable capacity of self-employment and adaptive gaining knowledge of ANN. It has various conventional strategies with various domains like computer science, engineering, physics, etc., using ANN methods. The learning process of machine-based techniques are supervised and unsupervised knowledge with connected relations among the structures of AI of neural networks.

## II. AGRICULTURAL VIEWS USING AI

Increase in population throughout the year will make farming more necessary for day-to-day life for surviving healthier also hike of population will leads to reduction of land cover effectively for farming and it become essential for agriculture needs. People are interested to enhance the innovative technologies in their own places like home, vehicles, etc., but failed to implement in the agriculture sector which will be more necessary for livelihood. An artificial intelligence (AI) technology supports various domains and areas for helping others efficiently by overcoming the difficulties and consistently makes the horticulture areas with simulated intelligence for innovations in a Agri business with different unique ways.

- 1. Improved harvest quality using AI:** Artificial intelligence helps to improve the quality of harvesting the crops with more accurate value which helps to identify the precision of farming. It helps to assist the disease identification and nutrition in poor plants detection

and it also helps the farmers for regular monitoring of the crops and soil for better improving in yielding and to control the quality of harvest. Deep learning method and algorithms helped a lot for decision making on time execution using drones over the farming area with image recognition approach by capturing the real-time images through drones.

- 2. AI for weather data forecasting:** Knowledge based machine assistance helped a lot for monitoring the forecasting and climate changes by AI which detects the rotational moments by sending the signals through satellite to the land and captured as images, it will help the farmers to keep themselves updated with weather conditions. The model will extend the yielding and get more profits with minimal and reduced risk of nature damages made by storms, floods, etc.,
- 3. Reduction of pesticides using AI:** Artificial intelligence will employ and helps to manage and handle the weeds and pests in a control by implementing the machine learning and computer vision techniques with the help of real time data by analyzing the present and past data about the plants and soil affected. The farmers know the current status of the weeds life quality and they process only for particular crops from applying the pesticides and make the crops and soil become healthier for better yielding. Soil and water are regularly contaminated using pesticides we often used for farming and AI helps to reduce the usage of pesticides and helps the farmers to monitor their crops without using chemicals to the agriculture land for hiking the production of yield. It will redefine the traditional farming and makes farming more smarter using artificial intelligence and image processing for drastic transformation using advanced and hybrid artificial intelligence approaches.
- 4. Image processing and perception:** Image processing is the best way by implementing artificial intelligence for detection and controlling the sickness of crop and bugs using advanced learning methods with innovative technologies for improved quality of production. Image processing helps to capture the real time data as image using smart sensors and devices and collects the real status of the crops which makes the sense about the crops and soil history transferred to the farmers using artificial intelligence technology for better care. Pre-processing like classification, segmentation, object detections, etc., will helps to produce the clear results and extract the hidden information from the image.

### III. FARMING ROBOTS

Robots are used for farming purposes and the applications of robots in agriculture is highest harvesting level. The drones and robot with artificial intelligence technologies help to manage the weeds and cloud seeding and planting the seeds, harvesting the crops and tracking the environmental status and analyzing the soil health using sensors designed and developed in robots automatically predicted all these models. Robots are used in a farming land such a way as listed below,

1. Selecting healthy/ diseased fruit,
2. Driverless tractor or sprayers
3. Shearing sheep, etc.,

The robots implemented in agriculture will lead to reduce the presence of human in the farm land and the factors will be considered for using machines and robots for agriculture purpose will be weeding, spraying, monitoring and alerting with computerized technologies, the robots are doing higher production of crops and it will reduce the manufacturing charges for manual exertions. It also used for automatic tasks which used by tractors with different human operated motors is the risk factors for operators. An irrigation is the process of supplying the water to the land for farming and maintain the proper water and soil quality for better yielding of the crops. In the agriculture sector in 5000 years, it has developed with many cultures and this sector has consume the 85% of freshwater resources around the world. Agricultural sector developed rapidly by increasing the food demands. There are several efficient technologies are implemented for using the water sources properly for better irrigation which has support the water measurement and it was replaced by automatic irrigation system with scheduled techniques. Humidity was increased due to the evaporation of plants will make more humidity to the atmosphere and the wind speed are controlled by the proper irrigation factors. There are some irrigation system which permits all the followed things,

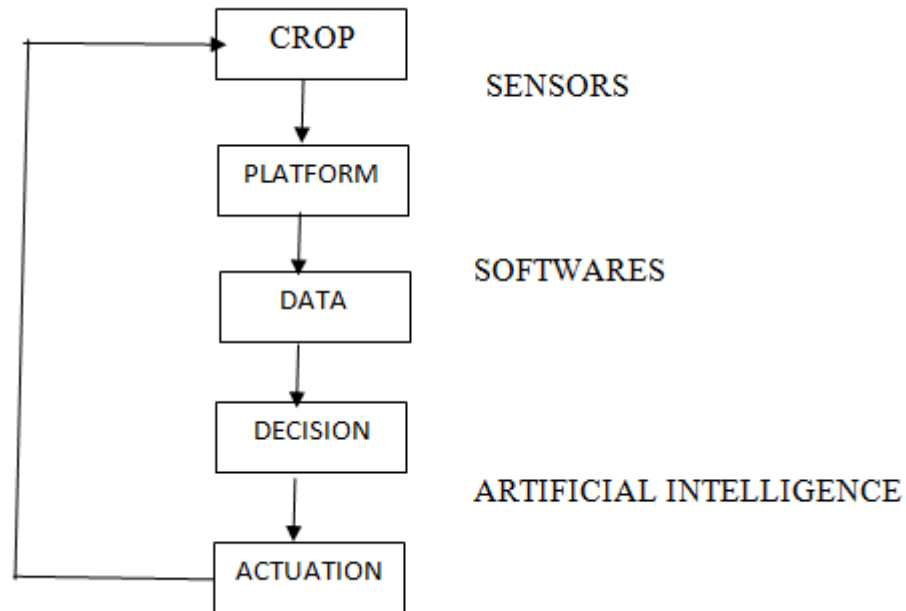
1. Harvest developed higher.
2. Framework and activities are adaptable in high level.
3. Yield higher due to good water resource.
4. Developing seasons were extended naturally.
5. Market creations were exploited.

#### **IV. DRONE IN FARMING**

Drone is the automated flying vehicle used for horticulture process and the yield has improved and it helps to check the creation of harvest and development the farming. These are considered as robot which helps the farmers to develop the agriculture stages by sensing smartly. The sensors are used on the robots for capturing the real time images using electromagnetic radiations with some ranges using infra-red and short-wave infrared rays to capture high clarity images. There are various applications of flying drones in the agriculture fields are listed below,

1. Spraying pesticides
2. Monitor the crops and mapping the lands

**1. Monitoring the crops:** There are some high-level sensors are used for imaging the yields and automated drones or robots are used for pragmatic process to take a peculiar image. Lot of advanced sensors are mounted on UAV with advanced cameras for capturing and sensing the data in the ground and examine the research of farming in detailed.



**Figure 1: Process of Ai in agriculture**

**2. Challenges and scope in future:** Artificial intelligence did not reach the farmers wider and the apply the computerized machines normally to their lands. They won't understand the functions and process of AI which assist them more accurately and they are moderately cared about the technologies. The utilization of artificial intelligence devices is opposition to bought by the farmers due to the absence of awareness about these smart devices. The integration of smart devices with artificial intelligence sense will be more benefits for the following process,

- Market demands are analyzed
- Handling the tasks easily
- Seed breeding
- Soil health monitoring
- Crop protection
- Crop feed
- Harvesting

## V. CONCLUSION

There are lot of difficulties are there in the agriculture field and frameworks of water system weed the checking plant health to predict the level of yielding and patterns of weather are monitored using artificial intelligence. There are several AI performed smart devices are enhanced and assisted with GPS to look the accuracy of weeding process with huge amount of yielding measure with weed system. In addition to the robots the further developments using smart devices are enhanced and the pesticides and herbicides are calculated and

controlled accordingly. There are methodologies to follow for measuring the work for yielding the better-quality crops and plant health and soil health was monitored. There are some different frameworks are followed for potential gain of on demand admittance of data with different objectives.

## REFERENCES

- [1] Awokuse, et.al., “Growth of economy of the country- agriculture supports”, American agri economics in association meeting, newyork, USA, 2009.
- [2] Kimpe, et.al., “Soil management for growing crops”, Soil science, vol. 165, issue.1, pp. 31-40, 2000.
- [3] Z. Zhao, et.al., “Soil texture prediction using AI networking model”, Computers and Electronics in Agriculture, Vol. 65, No. 1, pp. 36-48, 2009.
- [4] Ahir, et al., “Military training education for VR application”, Military training and sports, Augmented Human Research, vol. 5, issue 7, 2020.
- [5] Aitek, et.al., “Train neural network for predicting the time series in environment system”, Ecological Model, vol. 162, 2013.
- [6] Yang, et.al., “Herbicide developments for map application using AI and fuzzy logic”, agriculture system.
- [7] Bak T, et.al., “Agri robot platform using 4-wheel steering to detect the weed”, Biosystem engineering.
- [8] Blasco, et.al., “Controlling weed using robots with compute vision”, Biosystem engineering, vol. 83, issue 2, 2012.

