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Agriculture 5.0: Robotics in Agriculture

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INTRODUCTION

There is a continuous transformation in the agricultural sector due to upcoming technologies which will enable the farmers to proceed to a next level of farm productivity and profitability. This can be observed as a new revolution in the field of agriculture. At present, we are at the fourth wave of agricultural revolution *i.e.,* digitalization of agriculture (the first is mechanization, the second wave is the green revolution and the third being precision farming). The digitalization in agriculture mainly is a data driven agriculture comprising of Internet of things (IoT), big data and Agriculture 5.0: Robotics and Artificial Intelligence (AI). Robotics has already been successful in the field of medicine, military, mining, industries, robotic fishes (which are used to detect pollutants in the water bodies) hotels, classrooms, cars *etc.*

Indian agriculture is a gamble on monsoon. More than 70% of the population in our country depends on agriculture as a source of livelihood yet the scarcity of labour is a paramount problem in the country. Robot technology in agriculture called as AgRobots is an up and coming technology to meet the growing demands of labour in our country.

APPLICATIONS OF ROBOTS IN AGRICULTURE:

Robots can be used to perform different farm operations such as sowing of seed, planting of seedlings, irrigation, spraying of chemicals and fertilizers, examining the soil, weeding, checking the incidence of pest and diseases and harvesting of the crop.

Robots have been developed with a sensor to let the plant tell us what it needs. The sensor detects the light (red and infra-red waves) which are reflected from the plant and upon detection, it recognises and determines the amount of fertilizer which is required by the plant and is applied accordingly. Drones are used to spray pesticides, insecticides and herbicides on the crop. With the help of this technology, large areas can be covered in a short time span.

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ADVANTAGES:

1. Elimination of labour: The dependency of the farmers for labour to carry out any agricultural operation is greatly reduced.
2. Self-employment: It provides an opportunity of self-employment to the farmers who are unemployed.
3. One-Time investment: The investment on the AgRobot is done only once thereby the expenditure on farming is reduced drastically.
4. Improves productivity
5. The amount of pesticides/insecticides/herbicides applied is greatly reduced.
6. Soil test results can be obtained in no time and the accuracy of the results is much greater.

DISADVANTAGES:

1. High cost: Since most of the farmers in India are small and marginal farmers, this technology is expensive for them to afford.
2. Requires a skilled labour who has a good knowledge on the operation of these AgRobots.
3. Lack of electricity in the country as these robots are power driven.

CASE STUDY:

TerraSentia, a robot which was developed by Earthsense was introduced to the farmers in Dharwad, Karnataka. The farmers welcomed this new technology as it helped to solve the labour problem as there is a high requirement of labour for cotton crop at different growth stages.

CONCLUSION

Robotics can be an excellent breakthrough in the field of agriculture as it makes every farmer independent and capable of cultivating his crop without any hindrance and thereby helps to earn him more returns.