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An Overview on Precision Agriculture for Sustainable Development

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SUMMARY

Use of technology is proving to be a boon for human in all fields and one such branch is now emerging in the field of agriculture called Precision agriculture is useful and is gaining popularity for the use in the fields. There are many technologies used for different purposes and also there are laws made for the use of these technologies. While it has many benefits this technology also has several barriers which must be overcome for it to flourish and to be accepted by farmers in a large scale. The procedure is to bring about awareness among farmers, to create success stories and spreading the world about technology and agriculture will bring about tremendous change in future.

INTRODUCTION

Necessity is the mother of invention. Let us see the world as it was ages ago, no machineries, no technologies and no developments, nevertheless, sufficient. If we compare that with today's world then we will realise that we are so used to the technology that we will find it very difficult to survive without the means of Machineries and Technologies. Many of us have seen or heard from our fathers or grandfathers the stories about the change of time from Bullock cart to bus. What have resolved many issues in past without technology but may have difficulty at present as it is needed for everything we do. It would definitely be a failure in future to resolve the issues with the use of technology, now a days we see a different world and it is changing very fast, the term world is a global village fits here. If we have a look at various fields then it would be easy to understand that how technology influenced the particular sectors whether it comes to medical stream where it has improved health and recovery rate or in agriculture where it has increased the yield of crops. There are many advantages of introducing new technologies in any field. There is now a new branch in agriculture using the technological advances for crop protection, soil management, irrigation, harvest, etc. It will not be wrong to say that the precision agriculture is a latest version of modern agriculture. In simple words, doing right things at right place on right time with right means is called Precision Agriculture (PA) Kalam, and Singh, 2011. Crop and site-specific conditions can be perfectly managed and it gives better outcomes in the terms of the yield and also is safer to the environment.

Working of Precision Agriculture

The working of Precision Agriculture according to India's Precision Farm, Hyderabad where coco-peat is used instead of soil to minimize the risk of soil-borne diseases and no chemicals are used but use of chemicals in PA depends on the conditions present. Controlled environment is used for the complete cultivation of crops with the help of Artificial Intelligence (AI). Smart machineries, protected condition with weather controlling devices, water purifiers, sensors for measuring the plants need, AI based software and many other productive technologies are being used for high output with optimum inputs in PA. Seedlings are grown under the protected condition under the observation of AI based software, then, they are transferred to the poly-house for further development. There is technical support by high-tech machineries which provides necessary artificial and natural atmosphere to crop. Nutrients are provided with RO and UV treated water. No chemicals are being used during the entire development of crop because every task is performed under the controlled condition.

Benefits of Precision Agriculture

The use of precision agriculture shows a significant reduction in the pesticide resistance and 15-20% higher yield than conventional farming and is almost double the production compared to state and national average yield. Precision agriculture estimates and optimises the level of inputs like Soil, Water, fertilizers, herbicides, insecticides, fungicides, land, labour etc. with high accuracy and improves quality and quantity. It also reduces

cost of production as there is less labour used and also unwanted application of products is avoided. The more efficient use of water is done and is one tenth of the conventionally used, furthermore optimum sowing density is evaluated and crop yields are accurately predicted. It is used for pest monitoring and management, to harvest the crop like strawberry and distribution of natural enemies. PA has proved to be useful for almost every part of agriculture Fakhruddin, (2017) and Mungarwal, & Mehta, (2019).

Achievements of Precision Agriculture

At the time of independence in 1947, India's GDP was a mere Rs 2.7 lakh crore accounting for a trivial 3 per cent of the world's total GDP. According to the TIMESONNEWS's data, while India currently has a real GDP of Rs 147.79 lakh crore, and as of 2018 accounted for 7.74 per cent of global GDP, according to the latest figures from the Ministry of Statistics and Programme Implementation. P.M. Chinnasamy, a farmer, produced 500 MT eggplants from one hectare in fifteen months and became inspiration for many Kalam, A.P.J.A. and Singh, S.P (while average yield of egg-plant varies from 20-30 t/ha). Various people have seen the development of agriculture through the time. At first it is hard to adopt the new environment but with the continue practicing we can overcome the fear, which make the effort to produce productive outcome. If people are told before the invention of tractors that there will be a machine which will help farmer in cultivation of crops then it was like making castles in the air for people, but for now it is really hard for many farmers to imagine farming without the tractors. Same examples we can take as for different machineries of agriculture and again if we look at various technologies like Post-Harvest Technologies (PHT) which really played well in agriculture, like people might never would have thought that they would will ever be able to stored food for such long time but it is possible now. We are living in the age of science and it would be unfair to leave some sectors undeveloped due to the lack of technologies. On an average, 5,480 people die every day due to hunger and FAO estimates that around 435 million people minimum are seriously undernourished worldwide, and we cannot just increase the yield by doubling the seed rate. Before the "Swatantrata" when we were less in numbers of population, with the help of productivity, India was sufficient and then the imbalance occurred and it was found necessary to introduce the hybrid crops and unluckily they have become the most significant problem of poor soil fertility, yet there are many factors which accompanied them.

Barriers while adopting Precision Agriculture

Lack of technological knowledge, mismatched investment schemes, energy depletion risks, technical failures are the major barriers in adopting PA. There are security factors, poor connectivity in rural areas which also become a problem and cause less adoption of this facility. The other problems can also be the rules and not easy to use facility and proper coordination between the working professionals and farmers is not maintained. The benefits in the use of this facility are not apparent along with its high cost adds to barriers Fakhruddin, (2017) and Mungarwal & Mehta, (2019).

CONCLUSION

Precision Agriculture is not only the success of the technology but also a need of present. India's Agricultural Potential is 52 % cultivable land as compared to world average of 11 % with all 6 major climatic regions, 8 soil types and 15 agro climatic regions. The sunshine hours and day lengths are ideal all-round the year. Indian farmer holds the power to translating the any great agricultural visions into action. While interacting with Hon'ble former President of India, one of the successful precision agriculture practicing farmer said, with tears in his eyes, that his family had been able to see one lakh rupees for the first time. We can assume his internal happiness. Only we lack at technology, we have most of the things which the world doesn't and with the Precision Agriculture we would achieve what the world dreams. The use of technology is gaining popularity now in every field especially the use of drones for agriculture, it is soon expected to be adopted for the use by farmers in large numbers.

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