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Appraisal of precision farming: A review

Tulasi Tejaswi and Nilesh Talekar

Abstract
Precision farming is the most recent trend in the agribusiness sector, utilising data innovation to incorporate all farming systems, from breaking down soil moisture, climate forecasting, and seed nature to anticipating harvesting constants. Fundamentally, it focuses on the significant role of between-field and intra-field variability in developing harvests. Precision farming could be extremely helpful in India, an agrarian country where agriculture is the cornerstone of the economy. The importance of precision farming was spelled out in the current essay via a systematic writing survey. Similarly, the essay identifies various problems associated with the selection of precision farming in India.

Keywords: Appraisal, farming, Agriculture, precision, global

Introduction
Precision Agriculture is commonly defined as a data and innovation-based homestead the executives' framework to recognise, dissect, and manage inconsistency inside fields for optimal production, maintainability, and insurance of the land asset. In this farming strategy, fresh data developments can be used to make better decisions regarding various aspects of crop production. Precision farming innovation would be a viable option for increasing benefit and output. Ranchers are looking for new ways to increase competency and minimise expenses in light of rising input costs and decreasing item costs. Precision farming innovation would be a good option for increasing benefit and profitability Banu, S. (2015) [2].

Why precision farming is useful?
The global food system is now facing challenges that will only become worse over the next 40 years. A lot can be done quickly with the current developments and knowledge available. However, in order to provide fresh solutions to unique problems in the future, we will need more drastic changes to the food framework and a greater interest in investigation. The decline in total efficiency, diminishing and depreciating natural assets, deteriorating ranch pay, absence of Eco provincial methodology, declining and divided land possessions exchange advancement or agribusiness restricted business openings in non-ranch areas, and global climatic variation have all become major concerns in the ranch industry. Improvements in rural areas. A precision farming system detects site-specific disparities throughout fields and alters the board's operations accordingly, Precision agriculture offers the opportunity to automate and improve on the collection and analysis of data using machinery. Decisions can be taken and instantly implemented on small areas within large field (Kariuki, S. 2015) [9].

Prerequisites for precision farming
The Indian Green Revolt has also been linked to detrimental biological/ecological effects, according to researchers. An estimated 182 million hectare is affected by land depletion, with water disintegration accounting for 140.33 ha, wind disintegration for 11.50 ha, water logging for 12.63 and 13.24 acres, and synthetic disintegration for 12.63 acres. A warning is given to take appropriate measures against existing and future illnesses (Shan wad *et al*. 2004) [12]. The over use of agricultural information may be curbed by growing with precision, which will ensure natural degradation. For example, Accuracy Cultivating aims to streamline economics and enhance field level management. Due to India's dominance in agriculture, it has more leeway to embrace precision farming for the following reasons.

- Information and innovation to enhance quality. The quality of agribusiness products improves when horticultural inputs are properly used. Pesticides and insect sprays were used in a way that minimised the environmental impact of pesticides and bug sprays. Remote sensor and GIS innovation ensures the effectiveness of field the board

Methods for compound application, development, and gathering. Composts and insecticides used in large quantities might have a negative impact on the ecological equilibrium.

- Improving Creation Capability Intelligent agricultural practises are required today to care for the people tomorrow. It necessitates precise optimum dynamic by cultivating local area. During one cultivating cycle, from pre-gathering to post-gathering, ranchers must make around 40 odd decisions. Exactness farming assists the rancher in becoming educated and rational in each of these 40 unusual options (Tech Mahindra) (Brummel 2014).

Tools of precision farming

Every person should be familiar with the creative tools available to them in order to collect and use data effectively Instruments that include equipment, programming, and suggested rehearsals are included in these instruments (Sahu *et al*., 2019) [11].

1. GPS
2. GIS
3. Yield monitering and mapping
4. Rate controller
5. Remote sensing

1. Global positioning system (GPS)

Satellites in the Global Positioning System (GPS) transmit signals that allow GPS users to calculate their location. This data is provided gradually, indicating that constant location data is provided while travelling. Having precise area data wherever possible allows for soil and crop predictions to be prepared. GPS collectors, whether transported to the field or placed on equipment, let clients to return to specific locations to test or treat certain areas. GPS signals with no correction have an accuracy of about 300 feet. To be useful in agriculture, uncorrected GPS signals need be compared with a land-based or satellite-based signal that provides a position adjustment known as a differential correction. (2019, Sahu *et al*.) [11] The ability of DGPS to provide continuous sub meter- or even decimetre-level precision has transformed the agriculture industry (Ahmed, 2019). GPS uses in precision cultivation include soil sample collection, compound application control, and yield screen collecting. When collecting soil samples, GPS is used to precisely locate the example focuses from a predetermined framework. Following the examination of the soil samples, data such as nitrogen and natural material substance may be obtained. This type of data is prepared and used as a source of perspective to manage ranchers in order to efficiently and economically treat soil concerns. When GPS is combined with an ethereal guidance system, the field sprayer may be led through a moving guide show. The system will administer the synthetic chemicals at the proper locations, with little cover, based on the sprayer's area, and will consequently adjust their pace. This, in addition to increasing profitability, ensures that synthetic chemicals and fuel are used properly.

2. Geographic information system (GIS)

Maps are created with the use of geographic information systems (GIS), a set of PC hardware and software that includes property and area information. For example, yields, soil research maps, remotely detected information, crop exploration reports and supplement levels can all be stored in horticulture GIS. GIS can display geographically referenced data, providing a visual perspective for comprehension. It is possible to use the GIS for more than just information storage and display. By combining and manipulating information layers, it is possible to have a better understanding of board circumstances.

3. Yield monitoring and mapping

As a result of the yield monitor, the customer will have a clear understanding of how yields change within a given field. As much as grain harvesters in many regions of the world benefit from yield monitors, they were never intended to replace scales for selling grain. A yield monitor on its own can provide useful information and improve on-ranch research. It is possible to collect yield data on specific loads or fields, allowing for the testing of half and halves, assortments or medications inside test plots. The grain mass and gathered region of all yield monitors, for example, can be measured on a heap-by-burden, or field-by-field basis.

4. Rate controllers

Rate controllers are devices designed to manage the conveyance rate of compound information sources such as manures and insecticides, whether fluid or granular. These rate controllers monitor the speed of the farm vehicle/sprayer bridging the field, as well as the stream rate and pressing factor (if fluid) of the material, causing conveyance modifications to be made gradually in order to apply an objective rate. Rate controllers have been available for quite some time and are frequently used as separate frameworks.

5. Remote sensing

In remote sensing, information is gathered from a variety of sources. Basically, information sensors might be handheld gadgets, placed on aeroplanes, or satellite-based systems Remotely-detected information can be used to determine the health of crops. Overhead images of plants can be used to identify plant stress related to moisture, nutrients, compaction, crop diseases, and other plant health issues. As well as electronic cameras, near-infrared images of sound plant tissue may also be captured. As a result of remote sensing, it is possible to identify in-season variability that affects agricultural production, and to make management decisions that enhance productivity for the flow of the crop.

Challenges of precision agriculture

Due to a high level of illiteracy among Indian ranchers, they do not have access to new farming techniques. Different initiatives undertaken by the public and commercial sectors to promote ICT use in agribusiness have not yielded the desired results in terms of awareness and adoption, but they have proven helpful in terms of boosting efficiency, reducing costs, and obtaining higher yields. Researchers have found that many Indian ranchers have difficulty grasping the additional technical elements of precision farming.

- Agronomic factors are not as well understood, geo-measurements are not well understood, and that there is a limited capacity to combine data from diverse sources with varying goals and power. Because of the following three parameters, ranchers are not able to benefit from accurate agricultural innovation.

Examples of application of precision farming

- **Precision seeds for direct vegetable sowing**

Many vegetable crops are transplanted in India; however studies have shown that direct seeding of vegetable crops improves production and quality. Precision planting is required for mechanised harvesting. Cultivation, granting the capacity to plant seeds in the specified location spacing. Pneumatic precision seeders are one type of precision seeder.The pneumatic precision planter and the precision planter for vegetable crops metering machine for direct planting of tiny seeds of vegetables (Ma *et al*, 1990) [8].

- **In moutain's gis-based pesticide application planning**

Agricultural University of Himachal Pradesh in Shimla and Solan performed a farmer survey in 2004 to track the usage of pesticides in the region. Agricultural crops such as apple and vegetable crops are also grown. A GIS with a As a result of the pesticide transport model, in soil, plants, and surrounding environment. As a consequence of the study, pesticides were shown to be retained in their relevance in the world's media. Use that is logical and specific. In addition, hotspots in spatial analysis were used to identify pesticide abundance. An important piece of knowledge that will affect the future (Sood) pesticide usage planning in mountain agriculture (Bhagat, 2005, and others) [3]

Conclusion

In the context of smallholder farmers in India, the definition of PF should be: "the exact use of agricultural inputs depending on soil, weather, and crop." prerequisites for maximising long-term production quality as well as profitability' This PF idea is not used. Owing to a variety of factors, by Indian farmers on a huge scale. Technology dissemination limitations, input–output Policy and management orientation the function of PF in organic farming, pressured irrigation, and Agriculture might benefit from the use of plasticulture. Boost the agricultural sector, yet these technologies, despite being scientifically proven, they have yet to be widely embraced by farmers.

Precision farming is still a concept in many non-industrialized countries, and critical assistance from individuals in both public and commercial sectors is required to accelerate its adoption. In any instance, effective selection consists of three stages: inquiry, examination, and implementation. Precision agriculture can solve both the financial and environmental concerns that currently plague creation horticulture. Questions regarding cost adequacy and the best ways to use the new tools we now have remain, but the notion of "doing the right thing in the right place at the right time" has a strong instinctual attraction.

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