Chapter 3
Precision Agriculture and Resource Optimization Using Artificial Intelligence Techniques

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ABSTRACT

Precision Agriculture (PA) is also called as Satellite Agriculture which connate an epistemological break in irrigation management by augmenting to refine crop profitability, resources- use efficiency and environmental stewardship advanced technology. Farmers are under more pressure than ever to grow more with less. That's where precision agriculture comes in a smarter, more efficient way of farming that uses technology and data to make better decisions on the field. This chapter explores the concept of precision agriculture and its potential to transform the agricultural sector. It discusses the challenges facing in modern farming and

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examines the role of technology and data analytics in addressing these challenges. The benefits of precision agriculture are highlighted, including increased efficiency, reduced environmental impact, and improved food security. The chapter provides a comprehensive overview of the current state of precision agriculture and its potential to shape the future of farming.

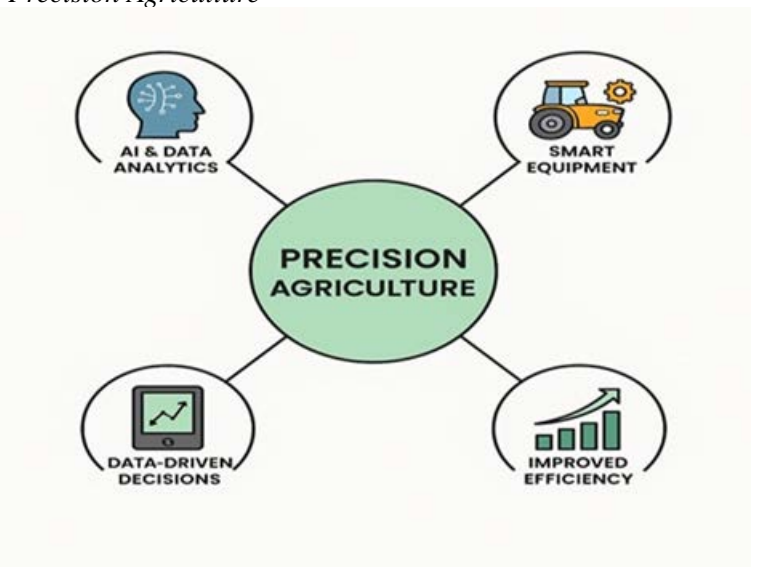
1. PRECISION AGRICULTURE

Precision agriculture is a method of farming that measures variation over various parts of land and strives to tailor the management response into each part. Precision agriculture is time-saving and cost-effective; production and profitability have also been enhanced.

1.1 Introduction to Precision Agriculture

Precision farming, also referred to as smart farming or digital farming, employs cutting-edge technologies to collect, analyse, and interpret huge amounts of data on soil conditions, crop status, climate conditions, and operational process. Such a data-based paradigm enables the farmers to make their practices-ranging from irrigation and fertilization to pest control and harvesting-according to the individual needs of crops and fields. Precision agriculture is shown in Figure 1.

Figure 1. Precision Agriculture



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