Soil health and sustainability

Building and maintaining soil health are essential to agricultural sustainability and ecosystem function, but erosion, deforestation and intensive agriculture have led to the degradation of many soils. Access to global research is essential for managing soils to support food production for future generations.

CAB Abstracts covers soil health and management in both cultivated and natural environments. The global coverage and extensive backfile enable scientists and researchers to take a long-term perspective while managing soil health for future food security against a background of increasing population and diminishing natural resources.

CAB Abstracts comprehensively covers hot topics that matter

CAB Abstracts sources the world literature to provide the complete picture on the effects of climate change including information on:

- **Soil health assessment**: quantifying the numerous aspects of soil health, and assessing the sustainability of soil quality under different forms of management
  
  Soil health assessment and management: issues and strategies.  
  *Indian Journal of Fertilisers*, 2015  
  
  Assessment of soil health indicators for sustainable production of maize in smallholder farming systems in the highlands of Cameroon.  
  *Geoderma*, 2016

- **Soil health and food security**: soil health is the foundation for production of healthy food, and for sustaining agricultural production for a growing population
  
  Healthy soils: a prerequisite for sustainable food security.  
  *Environmental Earth Sciences*, 2016  
  
  Soil degradation, land scarcity and food security: reviewing a complex challenge.  
  *Sustainability*, 2016

- **Impact of cropping systems on soil health and quality**: understanding how different cropping practices influence soil health and fertility
  
  Long-term impact of tillage and crop rotation on soil health at four temperate agroecosystems.  
  *Soil & Tillage Research*, 2015  
  
  Accounting for soil biotic effects on soil health and crop productivity in the design of crop rotations.  
  *Journal of the Science of Food and Agriculture*, 2015

- **Soil organisms and diversity**: soil microorganisms are vital for maintaining soil fertility and improving plant nutrition. Biological diversity is also an important indicator of soil health
  
  Understanding and enhancing soil biological health: the solution for reversing soil degradation.  
  *Sustainability*, 2015  
  
  Unearthing the role of biological diversity in soil health.  
  *Soil Biology & Biochemistry*, 2015
8.1 Introduction

The Indian economy mostly depends on agriculture, which is the major source of food and employment, accounting for the livelihoods of 12% of the population. In 2014, all agricultural production (1.5% of gross domestic product) farming describes crop production at the district level. Crop production is affected by a range of factors, including weather, soils, diseases, and pests. A series of agricultural production surveys have been conducted in India to understand the impact of these factors on crop yields. This chapter discusses various approaches for crop yield estimation, with a focus on digital data collection and statistical models. The development of crop yield estimation models has been emphasized by the Indian government, and several models have been developed to estimate crop yields. The estimation of crop yields is essential for understanding the impact of factors such as weather and soil on crop productivity.

8.1.1 Historical background of yield estimations

In India, the earliest mention of agricultural statistics is found in ‘Arthashastra’ (Wikipedia, no date), the ancient Indian treatise on statecraft. The first agricultural census in India was conducted in 1901, and since then, several agricultural surveys have been conducted to estimate crop yields. The Agricultural Census, conducted every five years, is the main source of agricultural statistics in India. However, the accuracy of these estimates has been questioned due to issues such as underreporting and non-sampling. Additionally, the reliance on manual data collection has limited the accuracy and timeliness of the estimates. To address these issues, several digital data collection methods have been developed, including remote sensing and geospatial data. These methods have been used to estimate crop yields, and recent studies have shown improved accuracy and timeliness of the estimates.