

# A study on climate change and its accounting implication in agriculture

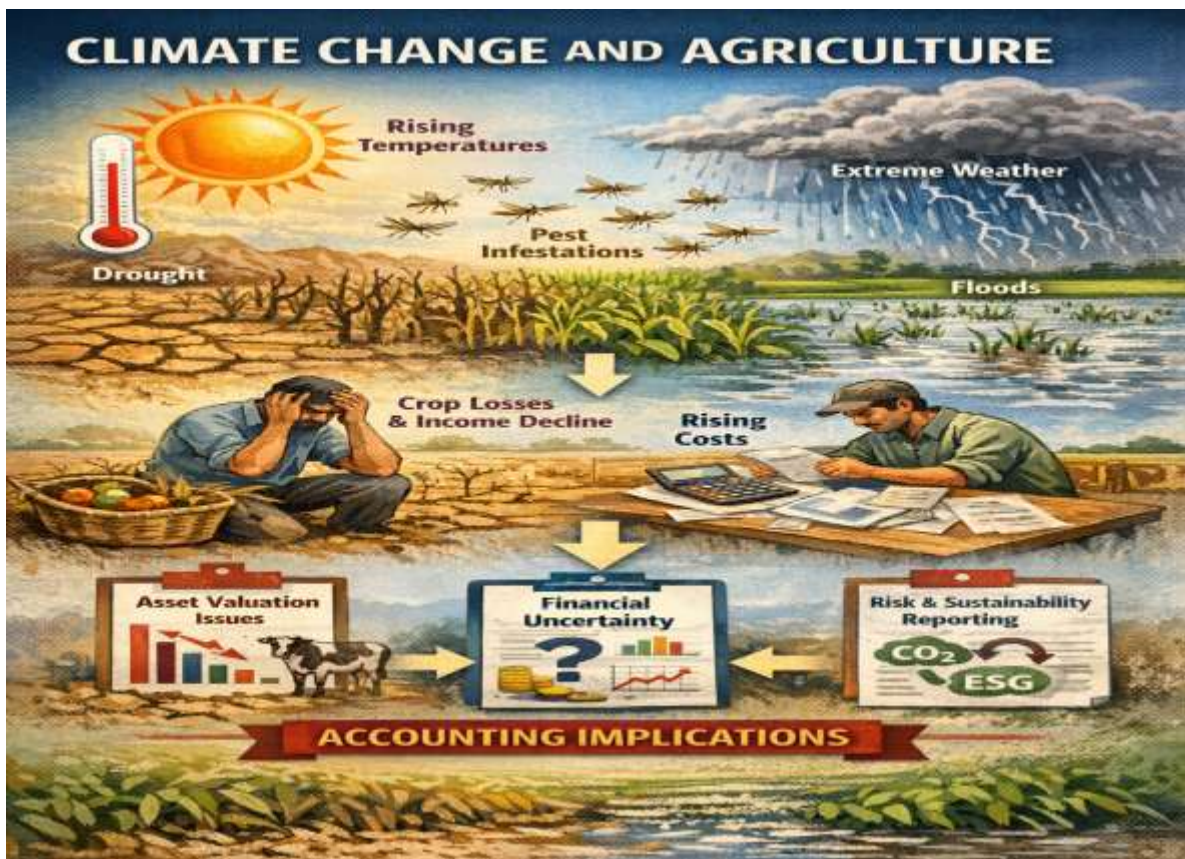
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## Abstract

Climate change significantly affects agricultural productivity through irregular rainfall, temperature raise and extreme whether events. These changes increase production costs, income uncertainty, and asset valuation issues in agriculture.

From an accounting perspective, this climate related changes affects the measurement and reporting of agricultural activities. Traditional agricultural accounting focuses mainly on recording costs, revenues and profits but it often fails to capture climate related risk, losses, and environmental impacts. As climate change intensifies, there is growing need to examine how accounting practices can adapt to reflect these realities. This study highlights the climate change and its accounting implication in agriculture.

**Key words:** Climate change, agriculture, accounting implications.



## Introduction

Climate change has become one of the most serious global challenges of the 21st century, and agriculture is among the most affected sectors. Agriculture is highly dependent on natural factors such as temperature, rainfall, soil moisture, and seasonal patterns. Changes in these climatic conditions such as rising temperatures, erratic rainfall, frequent droughts, floods, and extreme weather led to increased uncertainty and risk in agricultural production. Farmers across the world face challenges such as crop failure, reduced yields, pest infestations, and water scarcity due to climate variability.

Climate change also creates serious accounting challenges for the agricultural sector. Increased production costs for irrigation, fertilizers, pesticides, and climate-resilient technologies must be accurately recorded in financial accounts. Biological assets such as crops, plantations, and livestock lose value due to climate-related damage, creating difficulties in asset valuation.

For instance, crop losses due to floods or droughts must be recognized as losses in financial statements, affecting farm profitability.

Furthermore, uncertain weather conditions make it difficult to estimate future income and recognize revenue accurately. Climate risks also require better disclosure in financial reports to inform investors, lenders, and policymakers. Therefore, traditional agricultural accounting systems need to be adapted to incorporate climate-related risks, environmental costs, and sustainability considerations. Understanding the accounting implications of climate change in agriculture is essential for ensuring transparency, financial stability, and sustainable agricultural development.

*For example, prolonged droughts reduce soil moisture and lead to crop failure in rain-fed areas, while excessive rainfall and floods destroy standing crops and degrade soil quality. Rising temperatures increase pest and disease attacks, forcing farmers to spend more on pesticides and crop protection. In India, irregular monsoons have resulted in reduced yields of crops such as rice, wheat, and pulses, causing financial stress for small and marginal farmers.*

## Objectives of the study

The main objectives of the study are:

- To examine the impact of climate change on the agricultural sector.
- To analyze the accounting implications arising from climate related risks in agriculture.
- To study the effect of climate change on cost measurement, asset valuation, and revenue recognition.
- To suggest measures for improving agricultural accounting practices in the context of climate change.

## **Impact of climate change on Agriculture**

Climate change has a significant impact on agriculture, as farming activities are highly dependent on weather conditions. Changes in temperature and rainfall patterns directly affect crop production, livestock and farmers livelihoods.

### **1. Rising temperatures:**

- Higher temperatures reduce soil moisture and affect crop growth.
- Heat stress lowers crop yields and reduces livestock productivity.

### **2. Irregular rainfall:**

- Erratic and unpredictable rainfall disrupts sowing and harvesting cycles.
- Excess rainfall causes floods, while insufficient rainfall leads to droughts

### **3. Increased frequency of droughts:**

- Droughts reduce water availability for irrigation.
- Crop failures become more frequent, especially in rain fed agriculture.

### **4. Floods and extreme weather events:**

- Floods damage standing crops, soil fertility and farm infrastructure.
- Cyclones and storms destroy crops and increase financial losses.

### **5. Pest and diseases infestation:**

- Warmer temperatures create favorable conditions for pests and plant diseases.
- Farmers spend more on pesticides, increasing production costs.



## Accounting Implication of Climate on Agriculture

Climate change significantly affects agricultural operations and creates several challenges for accounting and financial reporting. The major accounting implications are as follows:

### 1. Cost Measurement:

Climate change increases production costs due to higher expenditure on irrigation, fertilizers, pesticides, crop insurance and climate adaptive technologies. These increased costs must be accurately recorded to determine the true cost of agricultural output.

### 2. Asset Valuation:

Agricultural assets such as crops, plantations, livestock and land are affected by droughts, floods and extreme weather events. Climate-related damages may reduce the value of the biological assets, requiring revaluation or impairment recognition in financial statements.

### 3. Revenue recognition:

Unpredictable climatic conditions lead to fluctuating crop yields and uncertain harvest quantities. This affects the timing and amount of revenue recognized, especially when crops fail or production is delayed.

### 4. Recognition of losses and provisions:

Losses arising from crop failure, livestock mortality and natural disasters must be recognized in accounts. Provisions may also be created for expected losses due to climate-related risks.

### 5. Risk and Sustainability:

Climate change increases financial risk and uncertainty in agriculture. Accounting standards require disclosure of climate risks. There is growing importance of reporting environmental impacts, carbon emissions and sustainable farming practices. Climate change has encouraged the adoption of sustainability reporting and green accounting in agriculture.

## CONCLUSION

Climate change has significantly transformed agricultural activities, creating increased uncertainty, higher production costs, and greater financial risk for farmers. These changes directly affect accounting practices related to cost measurement, asset valuation, revenue recognition, and risk disclosure. Integrating climate-related factors into agricultural accounting improves transparency, supports better decision-making, and promotes long-term sustainability in the agricultural sector.

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