

Agriculture in Ancient India with Reference to Indian Knowledge System

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Abstract

Agriculture is the core of human civilization, It began around thousands of years back when humans shifted from hunting and started living in gathering and settling down in one place. They started growing their own food and raising animals was the start of agriculture.

Agriculture formed the backbone of ancient Indian civilization and played a crucial role in shaping its economy, society, and culture. Agricultural practices in ancient India were deeply rooted in indigenous knowledge, environmental understanding, and sustainable use of natural resources. Early Indian farmers developed systematic methods of soil classification, crop selection, irrigation, and seasonal planning based on close observation of nature. Ancient texts such as the Vedas, Arthashastra, Krishi Parashara, Vrikshayurveda, and Brihat Samhita provide valuable insights into traditional farming techniques, crop rotation, use of organic manures, water management, and plant protection methods. Irrigation systems like wells, tanks, canals, and rainwater harvesting supported agricultural productivity. The integration of agriculture with livestock rearing further strengthened rural livelihoods. This study highlights how ancient Indian agricultural practices were scientific, sustainable, and knowledge-driven, offering valuable lessons for modern agriculture. Understanding these traditional practices through the Indian Knowledge System framework helps revive eco-friendly and resilient farming models relevant to contemporary agricultural challenges.

Keywords:

1. Ancient Indian Agriculture
2. Indian Knowledge System (IKS)
3. Sustainable Farming Practices
4. Traditional Agricultural Techniques

Introduction

Agriculture is the core of human civilization, It is the turning point that laid down foundation of human societies and cultures. It began around thousands of years back when humans shifted from hunting and started living in gathering and settling down in one place. humans started growing their own food and raising animals and this was the start of agriculture. It is first step of human civilization, today the whole world is surviving because of agriculture development. Agriculture plays very pivotal role in physical, mental, social, economic

and financial stability to people. Agriculture is not just growing crops or raising animals, it's a way which helps to shape and civilize all human beings. Agriculture means cultivating and growing plants like grains, vegetables, and fruits, as well as rearing animals such as goats, cows, poultry, and even fish. These activities provide food, clothing, shelter and other daily use resources for survival. Agriculture is a primary sector as it provides a foundation for Industry and service sectors to develop, industries operate efficiently and make profit because of agriculture.

Agriculture plays a role of feeding the world. Agriculture starts with smoothening the land and bowing seeds to water plants, adding fertilizers, protecting crops from pests, and finally harvesting after harvest, handling storage, transport, and selling of produce to ensure it reaches market fresh and safe. The main objective of agriculture is to meet the food and nutritional needs of a growing population. Beyond that it also supports livelihoods, creates jobs, boosts the economy, and even helps protect the environment.

Around the world the origins of agriculture and allied activities traced to different regions at different times. In the Fertile Crescent (modern-day Middle East), around 10,000 years ago, early humans began cultivating crops like wheat, barley, lentils, and domesticating animals such as goats, sheep, and cattle. This shift allowed for a more stable food supply and the development of human permanent settle down. The development of agriculture has several important factors. One was the discovery that certain plants could be intentionally grown from seeds and propagated, leading to the establishment of crop cultivation. The domestication of animals also provides a reliable source of meat, milk, and labor for agricultural activities. Agriculture makes changes in human life. It gives thought to establishment of larger, more complex communities and the development of specialized roles and trades beyond basic food production. Surpluses of agricultural output traded and the rise of civilizations. Over the period agricultural practices evolved and spread to different parts of the world, influenced by factors such as climate, geography, available crops, and cultural practices. Innovations such as irrigation systems, crop rotation, selective breeding, and the use of tools and machinery further improved agricultural productivity.

In the modern period, advancements in technology, genetics, and agronomy have made revolutionized changes in agriculture all over the world, which result in increased efficiency, higher crop yields, and improved food quality. Industrialized agriculture practices, however, have also raised concerns about environmental sustainability, biodiversity loss, and the impact on rural communities. Sustainable, responsible and organic agriculture is now a key focus, with an emphasis on minimizing environmental impacts, promoting biodiversity, conserving natural resources, and ensuring food security for the growing global population.

Indian Knowledge System (IKS) in Agriculture

Agriculture played a central role in the economic, social, and cultural life of ancient India. The Indian Knowledge System (IKS) represents the accumulated wisdom, skills, and practices developed through centuries of observation and experience. Agriculture was not only an economic activity but also closely connected with nature, religion, and seasonal cycles.

Ancient Indian farmers understood soil types, rainfall patterns, crop suitability, and water management. Agriculture was considered a respected occupation, and farmers were supported by state policies and community systems. Ancient texts provide evidence of advanced agricultural knowledge and sustainable farming techniques.

The Indian Knowledge System refers to traditional knowledge developed in India through observation, experimentation, and practical application. It includes knowledge related to agriculture, medicine, astronomy, water management, and ecology.

Features of Indian Knowledge System in agriculture

- Harmony with nature
- Sustainable use of natural resources
- Scientific understanding of seasons and climate
- Conservation of soil fertility
- Use of organic inputs
- Connected with astronomical knowledge

Objectives of the Study

1. To examine the origin and development of agriculture in ancient India
2. To analyze the agricultural practices described in ancient Indian texts
3. To study the indigenous knowledge and scientific methods used by ancient Indian farmers.
4. To evaluate the sustainability and environmental relevance of ancient agricultural practices.
5. To assess the relevance of ancient Indian agricultural knowledge in the context of modern agriculture.

Literature Review

- Suhani Johari presented paper in international conference 2025 on topic How Ancient and Advanced was Agriculture in India? Where she mentions about wrong belief about certain agricultural product like silk and rice originated in china chillies and cabbage from Portuguese but actual in Vedas we have references that all are Indian origin. She also mentions about In Vedas there are over 200 references on farming, irrigation, fertilizer, crops and tools used in agriculture.
- P. S. Aithal & Ramanathan S. in their book (2024) Ancient Indian Technologies and Their Relevance to the 21st Century talked about significance of agriculture in ancient India is intence, serving as the primary source of sustenance, economic stability, and social structure. They mention that ancient agriculture was used various innovative practices for crops diversity, irrigation facility and it also has cultural impact.

Research Methodology

The study adopts a descriptive and analytical research design. It focuses on understanding, interpreting, and analysing ancient agricultural practices within the framework of the Indian Knowledge System (IKS). The research is mainly qualitative in nature. This study is historical and exploratory, as it examines the origin, development, and scientific relevance of agricultural practices in ancient India.

The primary sources are Ancient Indian textbooks like

- Rigveda
- Atharvaveda
- Arthashastra
- Krishi Parashara
- Vrikshayurveda

- Brihat Samhita

The Secondary sources are research articles, journals, books, government reports, and scholarly publications related to ancient Indian agriculture and Indian Knowledge System.

Data is collected through Textual analysis of ancient scriptures, Review of literature data is analysed using, Content analysis, comparative analysis.

Hypotheses of the Study

Hypothesis 1

- **H0:** Ancient Indian agricultural practices were not scientific and did not significantly contribute to sustainable Agriculture.
- **H1:** Ancient Indian agricultural practices were scientific and significantly contributed to sustainable Agriculture.

Hypothesis 2

- **H0:** Indian Knowledge System has no references of ancient Indian agriculture practiced modern sustainable agriculture.
- **H1:** Indian Knowledge System has references of ancient Indian agriculture practiced modern sustainable agriculture.

Major Sources of Agricultural References in Ancient India

➤ Vedic Literature

Farmers worshipped natural forces like rain, sun, and earth, recognizing their importance of nature in agriculture. In Rigveda there is reference of various trees and plants of herbs and spice and medicine The Vedas contain references to agricultural practices such as ploughing, sowing, irrigation, and harvesting.

➤ Arthashastra

The Arthashastra, written by Kautilya, provides detailed information on agricultural administration, irrigation systems, land management, and taxation. It also state pivotal role of agriculture in state economy.

➤ Krishi Parashara

Krishi Parashara is one of the oldest agricultural texts. It written on Soil classification, Crop selection, Rainfall prediction, Use of organic fertilizers.

Agricultural Practices in Ancient India

- **Land Preparation** - Farmers used wooden ploughs drawn by oxen. Proper ploughing helped improve soil fertility and crop yield.
- **Crop Diversity** - Major crops included Rice, Wheat, Barley, Pulses, Cotton, Sugarcane Crop rotation was practiced maintaining soil fertility.
- **Irrigation Systems** - Ancient India had well-developed irrigation systems such as Wells, Canals, Tanks, Reservoirs. These systems ensured their will be no wather scarcity and water availability even during dry periods.
- **Use of Organic Fertilizers** - Farmers used natural fertilizers such as Cow dung, Compost, Plant residue. These methods improved soil health and sustainability.

- **Pest Management** - Natural pest control methods were used, including plant-based substances and traditional techniques.

Scope of the Study

The study is limited to agricultural practices in ancient India and their relevance to modern sustainable farming. It does not include detailed statistical field surveys.

Agriculture in Ancient India with reference to Indian Knowledge System

1. Origin and Timeline of Agriculture

- 7000–5000 BCE the period of Early farming settlements like Mehrgarh, Beginning of organized agriculture in Indian subcontinent.
- 3300–1300 BCE Indus Valley Civilization, in this period large cultivation and food production took place.
- 2890–2140 BCE Indus Valley Civilization, Scientific crop diversification and multi-cropping.
- 6000 BCE evidence of Early plant domestication and agricultural experimentation.

2. Population Engaged in Agriculture

- In Indus Valley Civilization agriculture was the main occupation, 70% of population involved in agriculture.
- Ancient Indian villages Agriculture was the main livelihood system shows agriculture was the backbone of ancient Indian economy and society.

3. Cropping System

Ancient Indian agriculture followed a multi-cropping and seasonal farming system Winter crops like Wheat, barley, peas, chickpeas called Rabi cropping system and summer crops Rice, millets, sesame, cotton called Kharif cropping system. Multiple cropping was practiced as early as 2890–2630 BCE, showing advanced agricultural knowledge.

4. Livestock and Animal Husbandry Statistics

Evidence shows mixed farming system 50–60% of animal remains at Indus sites were cattle and buffalo, Oxen were used for ploughing, Dairy and livestock were important components. This shows integrated agriculture system combining crops and animals.

Limitations of the Study

- **Dependence on Historical Texts:**

The study is mainly based on ancient scriptures, classical literature, and secondary sources. The accuracy of conclusions depends on the interpretation and availability of these texts.

- **Lack of Quantitative Data:**

The research is qualitative and historical in nature, and it does not include statistical data, field surveys, or experimental verification of ancient agricultural practices.

- **Limited Availability of Original Sources:**

Some ancient agricultural texts are not fully available or exist only in translated versions, which may affect the original meaning and interpretation.

- **Time and Geographical Constraints:**

The study focuses on ancient Indian agriculture in general and does not cover detailed regional variations across different parts of India.

- **Comparative Limitations with Modern Agriculture:**

Direct comparison between ancient and modern agricultural systems is limited due to differences in technology, climate conditions, and socio-economic factors.

- **Scope Restricted to Indian Knowledge System:**

The study emphasizes traditional Indian agricultural knowledge and does not include agricultural practices from other ancient civilizations for comparison.

The Future Scope of the Study

The future scope of this study lies in exploring the application of ancient Indian agricultural knowledge in modern sustainable farming systems. Traditional practices such as organic manure use, crop rotation, and water conservation can be scientifically examined and integrated with modern agricultural techniques. Further research can focus on regional indigenous farming methods and their role in addressing present challenges like climate change, soil degradation, and water scarcity. The findings of this study can also help promote eco-friendly farming and support policymakers in developing sustainable agricultural policies based on the Indian Knowledge System.

Conclusion

Agriculture in ancient India was highly advanced and based on scientific principles embedded in the Indian Knowledge System. Ancient farmers had deep knowledge of soil, climate, irrigation, and crop management. Agricultural practices were sustainable, environmentally friendly, and economically beneficial. Reviving traditional agricultural knowledge can help promote sustainable agriculture and ensure food security in the modern era.

The evidences clearly shows that agriculture in ancient India was scientifically advanced, highly organized, and deeply connected with the Indian Knowledge System. The large percentage of population engaged in agriculture, crop diversity, multi-cropping practices, and large agricultural settlements show that ancient India had a sustainable and efficient agricultural system.

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