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MESSAGE



Hon. Prin. Abhaykumar Salunkhe

I heartily congratulate Internal Quality Assurance Cell, Department of Commerce and Economics, Shikshanmaharshi Dr. Bapuji Salunkhe College, Miraj for organizing One Day National Conference on 'Development of India: Dimensions and Dynamics'.

I appreciate and thanks the principal and organizing committee for selecting an informative topic in current scenario. The topic of the conference has bearing comprehensive understanding and measuring a country's overall progress and well-being. I am assured that the conference will provide platform to discuss and deliberate on upcoming issues to all participants of their study and research.

On this occasion, I convey my best wishes to all the delegates, researchers, participants and organizers of Shikshanmaharshi Dr. Bapuji Salunkhe College, Miraj for success of conference.

Hon. Prin. Abhaykumar Salunkhe

Chairman, Shri Swami Vivekanand
Shikshan Sanstha, Kolhapur.

MESSAGE



Prin. Mrs. Shubhangi Gawade

I express my best wishes to Internal Quality Assurance Cell, Department of Commerce and Economics, Shikshanmaharshi Dr. Bapuji Salunkhe College, Miraj for organizing Self-Funded One Day National Conference on 'Development of India: Dimensions and Dynamics'.

Development is a broader concept than economic growth. It involves social, political economic and environmental dimensions for sustainable development of societies and probably the nation.

I congratulate the organizing committee for selecting this topic and creating the platform to all delegates, participants, resource persons' academicians and students.

My warmest wishes for the grand success of this national conference.

Prin. Mrs. Shubhangi Gawade
Secretary, Shri Swami Vivekanand
Shikshan Sanstha, Kolhapur.

MESSAGE



Mr. Kaustubh Gawade

I would like to express my best wishes to Internal Quality Assurance Cell, Department of Commerce and Economics, Shikshanmaharshi Dr. Bapuji Salunkhe College, Miraj for organizing Self-Funded One Day National Conference on 'Development of India: Dimensions and Dynamics'.

In India development has been a multifaceted pursuit that tries to balance rapid economic growth with social justice, human capabilities, and environmental sustainability. In this view development is about increasing national income, expanding industries, boosting exports, and ensuring that GDP figures were on the rise.

I express my congratulations to the organizing committee for selecting this topic and creating the platform to all delegates, participants, resource persons' academicians and students to provide their research at the conference.

My best wishes for the grand success of this national conference.

Mr. Kaustubh Gawade
CEO, Shri Swami Vivekanand
Shikshan Sanstha, Kolhapur.

MESSAGE



Dr. Anil Patil

It gives me immense pleasure to invite all the delegates in the Miraj city known as Hospital Hub and Home of String Instruments. I cordially welcome to all for this self-funded One Day National Conference on 'Development of India: Dimensions and Dynamics'.

The conference is being organized with the objective of emphasizing the significance of commerce and management in growing economy and to bring together policy makers, academicians and researchers to focus specific topic dimensions and dynamics relate to all issues and identify fruitful solutions.

I express my sincere gratitude to the Executive Chairman of our Sanstha Hon' Prin. Abhaykumar Salunkhe, Secretary Hon' Prin. Mrs. Shubhangi Gawade and Mr. Kaustubh Gawade, CEO, Shri Swami Vivekanand Shikshan Sanstha, Kolhapur for their continuous patronage in organising conference.

I am very happy that we have received large number of research papers from various colleges of the nation. I congratulate all the contributors and the editorial board for bringing out such a knowledgeable Journal of the conference.

Dr. Anil Patil

Principal, Shikshanmaharshi
Dr. Bapuji Salunkhe College, Miraj.

From the Desk of Editors.....



Dr. Swati P. Hake



Dr. Savita M. Raut

It is a matter of great pleasure to present the special issue of Ideal Research Journal on 'Development of India: Dimensions and Dynamics'. Economic development is a broader concept than economic growth. It is characterized by the sustained enhancement of the material well-being of society. Basically, development is nothing but human development which involves social, political, economic and environmental dimensions. It encompasses socially, politically, economically and environmentally sustainable development of the societies and country. There is also close relationship between sustainable development and Commerce and Management which helps to improve the living standard of the people as well as creating new employment opportunities like E – Commerce, manufacturing and marketing digitalization etc. The researchers dealt with many untouched aspects of development and scholarly contribute.

We got huge response and received about 118 papers. All papers were subjected to peer review process and finally 6 volumes were published.

Through this conference we offer a huge platform to the researchers and academicians where a vital topic the dimensions of economic development will be discussed. We are thankful to Hon' Chandrakant (Dada) Patil (Minister of Hire & Technical Education, Government of Maharashtra) President, Hon'. Prin. Abhaykumar Salunkhe, (Executive President), Prin. Mrs. Shubhangi Gawade (Secretary), Hon' Prin. Sitaram Gavali (Joint Secretary-Administration), Hon' Prin. Dr. Milind Hujare (Joint Secretary-Finance), Hon. Mr. Kaustubh Gawade (CEO) of Shri Swami Vivekanand Shikshan Sanstha, Kolhapur.

We are thankful to Prof. R. R. Biradar (Registrar, Central University of Karnataka), Prof. (Dr.) V. B. Jugale, (Former. Head, Department of Economics, Shivaji University, Kolhapur), Prof. (Dr.) M. S. Deshmukh, (Dean, Faculty of Humanities, Shivaji University, Kolhapur), Prof. (Dr.) A. M. Gurav, (Head, Department of Commerce & Management, Shivaji University, Kolhapur), Prof. (Dr.) S. S. Kulkarni, (Head, Department of Commerce, Kanya Mahavidyalay, Miraj) for their scholar contribution. However, the success of conference is attributed to the resource persons.

Dr. Vinay Hatole handled the responsibility to publish all research papers. We are thankful to him that he has executed his responsibility successfully.

We express sincere thanks to Hon' Prin. Dr. Anil Patil, for his inspiration and encouragement to organize and make this conference a success. We are also thankful to Dr. S. A. Jamadar and Dr. Y. D. Hartale and all the members of organizing committee for their cooperation and encouragement. We take this opportunity to thank all teaching and non-teaching staff of the college.

Dr. Swati P. Hake

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1. An Overview on Women Empowerment with MSME and Schemes in India

Dr. Jamadar Shahida Abdulrahim

Department of Commerce, Shikshanmaharshi Dr. Bapuji Salunkhe College, Miraj.

Abstract

The Ministry of Micro, Small & Media Company, known as the country's growth motor and entrepreneurship incubator with the popular engine, has developed on a global platform as someone who carries the goal of enhancing women. The portal has its own company through its own company for learning tools for entrepreneurship, incubation systems, founder gathering, mentoring; training programs for one-on-one meetings Meets the requirements of 8 million Indian women. Provide market research systems and market research and manage technical support. In a nutshell, it can be easily concluded that the Indian government is continuously involved in revolutionizing the role of women outside the four walls of the home. Today, women take risks, trust their vision and are less satisfied.

There is significant enthusiasm surrounding women's empowerment globally. In the 21st century, women have increasingly engaged in various fields that were historically dominated by men. The advancement of technology has facilitated this transition. Furthermore, the Government of India has articulated its vision for women-led development, aiming to transform India into a developed nation by 2047. This blog will explore the current initiatives and schemes focused on women's empowerment in India.

Keywords: Women Entrepreneurship Incubator, founder gathering, mentoring, training programs, Schemes.

I. Introduction

The Ministry of Micro, Small & Media Company, known as the country's growth motor and entrepreneurship incubator with the popular engine, has developed on a global platform as someone who carries the goal of enhancing women. The portal has its own company through its own company for learning tools for entrepreneurship, incubation systems, founder gathering, mentoring; training programs for one-on-one meetings meets the requirements of 8 million Indian women. Provide market research systems and market research and manage technical

support. In a nutshell, it can be easily concluded that the Indian government is continuously involved in revolutionizing the role of women outside the four walls of the home. Today, women take risks, trust their vision and are less satisfied.

Ancient Indian Women Empowerment Transports mixed views into the terrain. In ancient India, women enjoyed the same status as men and were trained in the art of war. The story of Rani Abbakka Chowta is a classic example of enhancing women in the country. The strengthening of women in India will come together after the adoption of the Indian Constitution, which includes several clauses and sections, to remove ambiguity regarding the status of women. As the Oxford dictionary "Narishakti" as Hindi in 2018. Clearly, we can assess the impact women have been born over the years. Industrial MSME's capabilities have recently been able to enhance women in marginalized sections to allow huge applications, but the main phenomenon of female entrepreneurs is It has been proven to be an institution. With the aim of awakening the country on the issue of hidden differences and discussing reach to highlight the developing role of Indian entrepreneurship from women, resulting in several gatherings of influencers from various fields. I went through that session. Conclave proved to have been a huge success at SC/ST. -in dormer. By gradually evacuating ideas among MSME stakeholders, the ministry has given the opportunity of INT'L Women's Day in 2019 a path for women and outstanding women's performance groups in a variety of fields. Ta. Regressive restrictions, society, and the situation is placed on them and continue supervisors who have decided to be financially independent while they make their traditional roles a major.

II. Women- Harbingers of Change

Women, who have erased the change, are now in an age where women reach four walls of their homes. Like male colleagues, women are now writing new stories about unprecedented success, with jokes and hard work. More and more women are expanding the horizon for entrepreneurs, challenging an unprecedented set of business areas. The bigger decision that women are now available to women in the field of employment was the biggest driver of the upheaval as a bureaucrat, professional and manager. You are now beginning to enter the world of violent business - and economic independence. The fact that such a large portion has entered non-traditional areas supports a rather recent phenomenon of women's entrepreneurship, which aims to resume women's approval through programs and programs by the Indian government. It's there. In the long run. "Traditional" women's skills are transformed into a living by

establishing businesses with foundations such as textiles, catering, embroidery, boutiques, crafts and more. See the world around them, where women are empowered, through their presence primarily in cooking, public office, corporate homes, councils and more! Name entrepreneurs, writers, scientists and social activists, actors and directors. You're everywhere!

III. MSME- Transforming Homemaker to Entrepreneur

Women are the pillars of society, and when women are strengthened, the whole world is strengthened! Micro, ministry of small and medium-sized businesses (MSMEs) allows entrepreneurs to help women in triggering talent and build their own identity through various programs. Not only MSME, but the Indian government has taken various measures to promote women and safety. Initiatives such as Beti Bachao, Beti Padhao, Stand Up India, Mission Indradhanush, Mudra Yojana Scheme, Profile (Trade-related Entrepreneur Support Development) Scheme, Mahila Udyam Nidhi Programme, Annapurna Scheme, Street Shakti - Paket and more Mahila Mahila Business Bankon Logue Banien Bankon Logue Banien Bankon Logar Loan Loan Loan Banien Bankendarnu, Dena Shakti Scheme, Udyogini Scheme and Cent Kalyani Scheme have contributed to the Indian women's group.

There is significant enthusiasm surrounding women's empowerment globally. In the 21st century, women have increasingly engaged in various fields that were historically dominated by men. The advancement of technology has facilitated this transition. Furthermore, the Government of India has articulated its vision for women-led development, aiming to transform India into a developed nation by 2047. This blog will explore the current initiatives and schemes focused on women's empowerment in India.

When we have a take a observe historic Indian texts and scriptures, we see empowered women. Moreover, they had been the axis round which the civilizations used to thrive. But, a chain of assaults and invasions posed a chance to the civilization. Women had been uncovered to all kinds of torture and abuse at some stage in this darkish phase.

IV. Important of Women Empowerment

Now they ask themselves what Indian women need. The reasons that cannot be denied are as follows:

GDP increase

Women are 50% of the population. They can give the Indian economy immeasurable value.

Education

Educated women have the know-how and means to nurture society. Remember the popularity of Africans? "If you teach men, I teach people, but if you teach women, I tell countries."

Fighting poverty

More income members are a blessing for poor families. Enhancing family members helps eliminate poverty, especially multidimensional poverty.

Social Justice

The rights promised by our constitution emphasize social justice. The strengthening of women can put an end to the patriarchy, which is deeply rooted in our society.

Improve your health

Remember the Grandma's Magical Home Relief? You'll let it do! Certified women can provide added value to preventive health care, which leads to lower disease and health costs.

V. List of Empowerment Programs

List of Empowerment Programs for Indian Women After understanding why women are important to empowerment, discuss government programs to strengthen Indian women in 2024

1. Sukanya Samriddhi Yojana (SSY)

Launched as part of the maximum popular "Beti Bachao, Beti Padhao" venture, the SSY bills may be opened through the mother and father of a new child female child. The venture ambitions to enhance the Sex Ratio through making sure schooling for girls. Here are a few key factors of the SSY scheme:

1. The scheme is for 15 years
2. It may be prolonged as much as five years at a time.
3. Maximum annual funding - Rs. 1.50 lakhs
4. Deduction for funding to be had u/s 80C (with inside the Old Tax Regime)
5. Tax-Free Interest - 8.2% p.a. (a great deal better than FD)The quantity may be used for the female child's better schooling, marriage, etc.

2. Lakhpati Didi Scheme

This is one of the most important empowerment programs for women in India. As part of the programme, the government will allow two or more women to strengthen themselves in self-help groups (SHGs) to build capital of Rs or more. 1 lakh.

3. Drone Didi Scheme

The Indian Drone Didi Woman Empowerment Scheme aims to train 15,000 workers from Self-Support Group (SHG) to become drone pilots. These trained women can carry out a variety of economic activities. B. Earn drug and food provisions with drones and their livelihoods. It also helps to map agricultural countries and digitize land records across rural India.

4. Mission Indradhanush

Mission Indradhanush is an formidable authorities scheme for ladies`s empowerment in India. Under the scheme, the authorities` guarantees complete immunization of pregnant ladies and children.

5. Mudra Yojana

The PMMY (Pradhan Mantri Mudra Yojana) presents collateral-unfastened loans to small enterprise proprietors as much as Rs. 20 lakhs (restrict improved in finances 24-25). With improved finances allotted for MUDRA loans, the point of interest is on offering extra loans to ladies-led enterprises.

6. TRADE Scheme

One of the lesser-recognized ladies empowerment schemes in India is the Trade Related Entrepreneurship Development Assistance Scheme (TREAD). The goal of this scheme is to expand ladies marketers. For this reason, the authorities present 30% of the full mortgage eligibility of ladies marketers as much as Rs. 30 lakhs. The relaxation of the mortgage is furnished with the aid of using banks, via NGOs that painting for ladies` empowerment and may deal with huge funds.

7. Ujjwala Yojana Pradhan Mantri Ujjwala Yojana (PMUY)

presents unfastened fuel line connections and subsidized fuel line cylinders to BPL families. The scheme immediately blessings ladies with the aid of using offering them with smooth gasoline to prepare dinner dinner food.

8. Standup India Mission

Standup India is looking to provide SC, ST and entrepreneurs with loans between 10 rs.10 lakhs and Rs.1 from 10 lakhs to Rs.1 Corer. The loan includes up to 75% of the total project cost. This is a great empowerment program for Indian women and ensures that entrepreneurs receive the investment they need.

9. PMAY (Pradhan Mantri Awas Yojana)

Many might forget about the PMAY scheme at the same time as speak me approximately ladies empowerment schemes in India. But, it's miles first rate that the allotment of PMAY homes with the possession of ladies is a primary step in empowering them.

10. Women`s Helpline

A 24x7 helpline with a toll-loose variety 181 is operated throughout all states and UTs in India to offer emergency help to ladies stricken by violence or another distress.

11. STEP Initiative

STEP is a central authority scheme for ladies' empowerment in India that offers offers to establishments to run education programmes for ladies. The goal of this system is to make certain employment for ladies thru talent improvement.

12. Mahila E-Haat Scheme

MSSCs are 2-12 months FDs for ladies with inside the Post Offices. They can deposit as much as Rs. 2 lakhs and earn an hobby of 7.5% p.a. on those deposits.

13. Mahila Samman Savings Certificate (MSSC) Scheme

The scheme "Mahila Samman Savings Certificate" was launched by the Department of Economic Affairs, Ministry of Finance to provide financial security to every girl and woman in India. The Department of Economic Affairs, Ministry of Finance, through an e-gazette notification issued on June 27, 2023, permitted all Public Sector Banks and eligible Private Sector Banks to implement and operationalize this scheme. This aims at enabling enhanced access to the scheme for girls/women. With this, 'Mahila Samman Savings Certificate' scheme will now be available for subscription in Post Offices, and eligible Scheduled Banks. The scheme has been in operation since April 1, 2023, through the Department of Post and is valid for a two-year period up to 31st March 2025.

Key Features of the Scheme

- Provides attractive and secured investment options to all girls and women.
- An account can be opened under this scheme on or before March 31, 2025 for a tenure of two years.
- The deposit made under MSSC will bear interest at the rate of 7.5% per annum which will be compounded quarterly.

- Minimum of ₹1,000/- and any sum in multiple of 100 may be deposited within the maximum limit of ₹2,00,000/-.
- The maturity of the investment under this scheme is two years from the date of opening of the account under the scheme.
- It envisions flexibility not only in investment but also in partial withdrawal during the scheme tenor. The account holder is eligible to withdraw a maximum of up to 40% of the eligible balance in the scheme account.

Eligibility

1. The applicants must have Indian citizenship.
2. This scheme is only for women and girl children.
3. Any Individual Woman can apply under the scheme.
4. The minor account can also be opened by the guardian.
5. There is no upper age limit and women of all ages can avail the benefits of this scheme.

14. Mahila Shakti Kendra's

MSKs offer help to ladies for talent improvement, virtual literacy and getting employment. They act as a center of ladies' empowerment which can lay the inspiration of contemporary-day India. Women's empowerment is the want of the hour. There are numerous authorities schemes for ladies' empowerment in India that we've got mentioned on this blog. Hope many aspiring ladies can get the blessings of those schemes and the goal of ladies-led improvement is fulfilled.

VI. Conclusion

In historical Indian texts and scriptures, we discover effective narratives proposing ***ladies who have been critical to the flourishing in their civilizations. Unfortunately, a wave of invasions and assaults added approximately turmoil, subjecting those ladies to impossible struggling and abuse in the course of this sort of darkish length in history.*** Whatever the reason, there is no doubt that we are still fighting to strengthen women around the world. The problems come to the forefront every day. After India, the Indian government launched many women in India. These programs will lead women to the driver's seat to promote a path of development that women lead.

More Power, Less Fear!

Swami Vivekananda, one of the finest sons of India, quoted that, “There isn’t any threat for the welfare of the arena until the situation of girls is improved, it isn’t viable for a chicken to fly on best one wing.” Therefore, the inclusion of ‘Women Empowerment’ as one of the high desires with inside the 8 Millennium Development Goals underscores the relevance of this fact. Countries round the arena have taken the subject matter to their coronary heart and kick-commenced a communication approximately sexual attack with inside the starting of the year, and this lead to Me-too Movement. Surprisingly, this motion became out to be a desk speaks all through the year, and dispatched accusers in the back of the bars for appropriate reasons. Treading the path, so one can obtain the popularity of an evolved country, India too desires to convert its massive girl’s pressure into a powerful human aid and that is viable best through the empowerment of girls.

On a very last note, Happy Women’s Day to all of the beauties, hoping to have a few greater victories this year!

2. Technological and Digital Transformation by using Computer and Library Science Ontologies

Mr. Atul Ramdas Nagarkar

Librarian, Doodhsakhar Mahavidyalaya Bidri, Tal: Kagal, Dist: Kolhapur.

Dr. Shivshankar K. Ghumre

Librarian, MSS Arts, Science and Commerce College, Ambad, Dist. Jalna.

Abstract

India has made significant progress in the fields of computer science and library science by integrating ontologies for knowledge organization, semantic search, and artificial intelligence applications. With the rise of digital transformation initiatives, the country is leveraging ontology-driven systems to enhance information retrieval, digital libraries, and AI-powered knowledge management across various sectors. Additionally, the paper highlights the challenges of ontology development, including standardization, scalability, and maintenance. By examining case studies and real-world applications, this research underscores how ontologies serve as a foundation for digital ecosystems, enabling seamless data exchange and fostering innovation in an interconnected world.

Researcher is made this theoretical paper for the comparison of computer and library science ontologies for technological and digital transformation. The rapid evolution of technology and digital transformation has necessitated structured and intelligent systems for managing complex information. Ontologies play a crucial role in this transformation by providing a formal representation of knowledge, enabling interoperability, automation, and enhanced data integration across domains. This paper explores the significance of ontologies in the digital era, focusing on their role in knowledge representation, semantic search, artificial intelligence (AI), and interoperability between heterogeneous systems.

Keywords: Ontologies, Digital Transformation, Knowledge Representation, Artificial Intelligence, Interoperability, Semantic Web, Intelligent Systems.

Abbreviation: AI - Artificial Intelligence, IoT - Internet of Things

Introduction

India, the world's largest democracy and fifth-largest economy, has undergone remarkable development over the past few decades. The country's transformation has been

fuelled by economic liberalization, technological advancements, infrastructure expansion, and social reforms. With a population of over 1.4 billion, India faces unique challenges and opportunities in its pursuit of inclusive and sustainable development. This paper examines the key dimensions and dynamics of India's progress, analysing the factors driving growth and the obstacles that need to be addressed for long-term prosperity.

In the era of rapid technological advancement and digital transformation, organizations and industries are increasingly relying on intelligent systems to process, manage, and analyse vast amounts of data. The integration of artificial intelligence (AI), big data, cloud computing, and the Internet of Things (IoT) has created complex digital ecosystems where seamless data interoperability and knowledge representation are essential. However, the sheer volume and heterogeneity of data pose significant challenges in terms of standardization, integration, and automated reasoning. To address these challenges, ontologies have emerged as a powerful tool for structuring knowledge, enabling intelligent decision-making, and enhancing machine-to-machine communication.

Ontologies provide a formal and semantically rich framework for representing concepts, relationships, and rules within a given domain. They serve as a foundation for semantic search, AI-driven applications, natural language processing, and automated decision systems, ensuring that digital systems can understand and process information in a meaningful way. By establishing shared vocabularies and structured knowledge models, ontologies facilitate interoperability, data linking, and intelligent automation across various industries, including healthcare, finance, smart cities, education, and cybersecurity. Through this analysis, the study underscores how ontologies serve as the backbone of intelligent digital ecosystems, fostering innovation and efficiency in the modern digital landscape.

Objectives of the Study

1. To understand and compare the concept of computer and library ontology.
2. To suggest remedies on the use of computer and library ontologies in technological and digital transformation.

Ontology in Computer Science

Ontology in computer science refers to a structured framework that defines a set of concepts, relationships, and categories within a specific domain. It provides a formal

representation of knowledge, enabling computers to process, share, and analyze data meaningfully.

Definition

An ontology is a formal specification of a shared conceptualization. It defines the entities (concepts), their attributes, and the relationships between them in a way that is machine-readable and human-understandable.

Key Components

An ontology typically consists of the following elements:

Concepts (Classes)

Represent abstract or concrete things (e.g., "Car", "Person", "Disease").

Instances (Individuals)

Specific occurrences of concepts (e.g., "Toyota Corolla" is an instance of "Car").

Attributes (Properties)

Characteristics of concepts (e.g., "hasColor", "hasAge").

Relations

Define how concepts interact with each other (e.g., "owns", "partOf").

Axioms

Logical statements that define rules and constraints (e.g., "A car must have at least one wheel").

Rules

Additional logic or inference rules that help derive new knowledge (e.g., "If X is a human, then X has a birth date").

Types of ontologies**Upper Ontologies**

General frameworks applicable across domains (e.g., SUMO, DOLCE).

Domain Ontologies

Specific to a subject area (e.g., medical ontology, legal ontology).

Task Ontologies

Describe specific tasks (e.g., diagnosing diseases in medicine).

Application Ontologies

Built for specific software applications (e.g., e-commerce product categorization).

Ontology Languages

Several formal languages are used to create ontologies:

RDF

(Resource Description Framework) – A framework for representing information about resources.

RDFS

(RDF Schema) – Provides basic structure and constraints for RDF.

OWL

(Web Ontology Language) – A more expressive language for defining ontologies.

SPARQL

A query language used to retrieve and manipulate data in ontologies.

Uses of Ontology in Computer Science

Semantic Web: Enhances web data with meaning for better interoperability (e.g., Schema.org, DBpedia).

Artificial Intelligence (AI) & Machine Learning – Helps in knowledge representation and reasoning.

Natural Language Processing (NLP): Improves text understanding and translation.

Biomedical Informatics: Supports medical data structuring (e.g., Gene Ontology).

Data Integration & Interoperability: Enables different systems to communicate meaningfully.

Example: Ontology in Healthcare

A medical ontology might include:

Concepts: "Patient", "Disease", "Doctor".

Relations: "hasDisease", "treats".

Rules: "If a patient has a disease, they should be treated by a doctor."

For instance, SNOMED CT (Systematized Nomenclature of Medicine – Clinical Terms) is a widely used medical ontology.

Tools for Building Ontologies

Protégé

A popular open-source ontology editor.

TopBraid

Composer – A commercial tool for semantic modelling.

OntoStudio

Supports graphical ontology

Ontology in Library and Information Science

Ontology in library science refers to the structured representation of concepts, categories, and relationships within a library's knowledge system. It helps in organizing, classifying, and retrieving information efficiently in digital and physical library systems.

Definition and Purpose

Ontology in library science is a formal representation of knowledge that defines entities (books, authors, subjects, genres) and their relationships. It enhances metadata management, classification, and search capabilities in library catalogs and digital repositories.

Key Goals

- Improve information retrieval and semantic search
- Facilitate knowledge organization
- Enable interoperability across different library systems
- Support automated cataloguing and metadata enrichment

Components of Library Ontology**Core Concepts**

Library: An institution that organizes and provides access to information resources.

Collection: A curated set of books, journals, digital materials, etc.

Book (Document/Resource): A physical or digital item within a collection.

Author: The creator of a document.

Publisher: An entity that produces and distributes books.

User (Patron/Reader): Someone who accesses library materials.

Librarian: A professional who manages library collections and services.

Subject Classification: Categories for organizing books (e.g., Dewey Decimal Classification).

Relationships between Concepts

- A Library contains multiple Collections.
- A Collection consists of multiple Books or Resources.

- A Book is written by an Author and published by a Publisher.
- A Book belongs to a Subject Classification (e.g., Fiction, Science, History).
- A User borrows a Book and interacts with a Librarian.
- A Librarian manages Collections and assists Users.

Types of Ontologies in Library Science

Bibliographic Ontologies

- BIBFRAME (Bibliographic Framework Initiative) – Developed by the Library of Congress to replace MARC standards.
- Dublin Core – A simple metadata schema for digital resources.
- FRBR (Functional Requirements for Bibliographic Records) – Defines relationships among books, authors, and editions.

Subject Ontologies

- Library of Congress Subject Headings (LCSH) – A controlled vocabulary for subject indexing.
- Dewey Decimal Classification (DDC) – A hierarchical system for categorizing books.
- Universal Decimal Classification (UDC) – An international classification system for library materials.

Digital Library Ontologies

- SKOS (Simple Knowledge Organization System) – Used for structuring controlled vocabularies in digital libraries.
- OWL (Web Ontology Language) – Enables machine-readable semantic representation of library data.

Applications of Ontology in Library Science

Information Retrieval and Search

- Improves semantic search by understanding user queries contextually.
- Enables faceted search by filtering books based on subjects, authors, publication dates, etc.

Digital Libraries and Linked Data

- Enhances metadata interoperability across different digital library platforms.
- Connects library resources with external databases (e.g., Wiki data, Open

Library).

Knowledge Organization

- Supports automated cataloguing and classification of new books.
- Helps in detecting duplicates and merging related records.

AI and Machine Learning in Libraries

- Enables recommendation systems for personalized book suggestions.
- Facilitates text mining for research and scholarly analysis.

Summarily we can say ontology in library science plays a crucial role in organizing, classifying, and retrieving information efficiently. By leveraging structured metadata and semantic relationships, it enhances digital libraries, search systems, and knowledge management in the modern era.

Comparison of Computer Ontology and Library Ontology

Feature	Computer Ontology	Library Ontology
Definition	A structured framework for knowledge representation, enabling AI, semantic search, and data integration.	A classification system for organizing, retrieving, and managing library resources efficiently.
Purpose	Helps machines understand, process, and infer knowledge from data.	Facilitates efficient cataloguing, retrieval, and management of bibliographic resources.
Structure	Uses entities, relationships, properties, and rules to define knowledge domains.	Uses hierarchies, taxonomies, metadata, and subject classifications to organize information.
Key Technologies	Web Ontology Language (OWL), Resource Description Framework (RDF), SPARQL.	BIBFRAME, Dublin Core, FRBR, MARC, Dewey Decimal Classification (DDC), Library of Congress Subject Headings (LCSH).
Applications	- AI & Machine Learning (knowledge graphs, chatbots, NLP). - Semantic Web & Linked Data (Google Knowledge Graph, Wikidata). - Data Integration (connecting databases across platforms).	- Bibliographic Management (library catalogs, metadata). - Digital Libraries & Repositories (NDLI, WorldCat, Shodhganga). - Classification & Indexing (subject-based organization, keyword retrieval).
Data Representation	Uses conceptual models to enable intelligent automation and	Uses classification models to systematically organize and retrieve

	reasoning.	information.
Interoperability	Facilitates machine-to-machine communication for data sharing and integration.	Enhances human-centered knowledge organization in physical and digital libraries.
Challenges	- Scalability and standardization of ontologies. - Complexity in knowledge representation. - Integration with diverse AI applications.	- Compatibility with modern digital libraries. - Need for ontology-driven search and discovery. - Standardization of metadata formats across libraries.

Remedies on the use of computer and library ontologies in technological and digital transformation

Key Aspect	Computer Ontology Remedies	Library Ontology Remedies
Standardization	Use OWL, RDF, SPARQL for knowledge representation.	Adopt BIBFRAME, Dublin Core for metadata standardization.
AI and Automation	AI-driven ontology learning and NLP-based extraction.	AI-based semantic search and recommendation systems.
Scalability	Graph databases and cloud-based ontology management.	Digital library integration with linked open data.
User Adoption	Training programs for developers and researchers.	Capacity building for librarians and knowledge professionals.
Interoperability	Unified frameworks for data integration across industries.	Global collaboration for interoperable digital libraries.

Conclusion

To harness the full potential of computer and library ontologies in digital transformation, organizations must focus on standardization, AI-driven automation, scalability, and user adoption. By implementing ontology-based AI solutions, enhancing semantic search, and integrating knowledge graphs, both fields can drive efficiency, innovation, and accessibility in digital knowledge management. Collaboration between technology developers, librarians, and policymakers will be essential in bridging traditional and digital knowledge ecosystems, ensuring a smarter and more connected future.

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3. Application of E-Learning tools for Library and Information Services

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Abstract

E-Learning is a new emerging technique in library science as a solution for delivering online, hybrid, and synchronous learning regardless of physical location, time of day, or choice of digital reception/distribution device. Application of E-Learning is a wide area in progress that continues to evolve with time and further research across the world. In India, E-learning is still in its infancy as result into numerous implementation strategies across a wide e-Learning spectrum. In this paper, it covers meaning of E-Learning, objectives of E-Learning, Advantages of E-Learning, and some of the reasons that institutions and enterprises are turning to e-Learning to help engage learners with ideas and information in revolutionary ways. Finally, it offers practical suggestions for creating digital learning experiences that engage learners by building interest and motivation and providing opportunities for active participation.

Keywords: e-Learning; Mobile Learning, Learning Technology, Information Service.

Introduction

As e-learning has evolved into a global change agent in higher education, it has become more diverse in its form and applications. This increased diversity has complicated our ability to share research findings and best practices, because we lack a shared set of definitions to distinguish among the many variations on e-learning that have arisen. This paper is designed to provide practitioners, researchers, and policy makers with a common set of terms and definitions to guide the ongoing development of the field. Our hope is that it will move us toward a set of shared, commonly understood definitions that will facilitate the sharing of research data and professional standards in our field. In developing the definitions below, we have tried to incorporate existing definitions developed by others and have incorporated comments from colleagues who have reviewed earlier drafts. We do not present these as the ultimate definitions,

but as a step toward more commonly held standards as our field continues to evolve. Additions and revisions will be published periodically, as needed.

Definitions of E-Learning

Over the years, various organizations have attempted to define different aspects of e-learning. Often, these have been focused on the specific needs of an individual institution or organization. In 2012, Frank Mayadas and Gary Miller posted a set of definitions designed to create a more common understanding; these were updated later that year in response to feedback from the professional e-learning community. The following definitions are designed to replace the 2012 document. They are designed to help both faculty and students better understand the different kinds of e-learning that are now practiced in higher education and to provide institutions with some standard models to encourage effective sharing of data about e-learning, at both the individual course and the curriculum level. These definitions have two key characteristics:

- They include definitions at both the course level and the program level.
- They incorporate three key parameters: instructional delivery mode, time, and flexibility.

Meaning of E-Learning

E-learning is a term that covers many approaches, which have in common the use of ICT. E-learning is a technique of delivering educational content through Digital Interactive Television, Video-conferencing, audio-conferencing, Internet/Intranet, Worldwide Web, Video/Audio tapes, Video-on-demand, CD-ROM/DVD-ROM etc. Broadly speaking E-learning is of two types, Synchronous E-Learning and Asynchronous E-learning

Synchronous E-Learning

Synchronous E-Learning establishes contact between instructors and students at the real time. Examples of Synchronous Learning are live radio/live interactive television broadcasting videoconferencing, teleconferencing, chatting, on-line seminar etc.

Asynchronous E-Learning

Asynchronous E-Learning doesn't establish contact between instructor's students at the real time. Examples include extraction of knowledge through CD or DVD or video or audio tapes or through web pages. Correspondence through E-mail falls under this category.

E-learning provides faster learning at reduced costs, increased access to learning and clear accountability for all participants in the learning process. Thus E-learning is the delivery of

knowledge through digital means over the internal, either to replace or to augment face to face teaching with a computer based virtual learning environment.

Learning is facilitated and supported through the use of ICTs;

Learning is accomplished over internet;

E-learning is the delivery of content via electronic media;

E-learning is the delivery of content via electronic media;

Learning activities based on electronic format; and

Software created to teach the user new skills and methods.

Objectives of E-Learning

The following are the objectives of E-learning:

All students and teachers will have access to information technology in their classrooms, schools, communities, and homes;

All teachers will use technology effectively to help students achieve high academic standards;

All students will have technology and information literacy skills;

Research and evaluation will improve the next generation of technology applications for teaching and learning;

Digital content and networked applications will transform teaching and learning; and

Distance education provided the base for E-learning's development.

Advantages of E-Learning

E-learning provides opportunity both formal and informal learning communities;

Learning resources can be relatively easily developed using a variety of standard packages, hence more compact and durable;

In E-Learning, one can make use of and link into, other relevant resources available on the Internet;

E-Learning provides flexible delivery of content material over Internet for 24x7 hours;

Online delivery of reading materials is relatively cheap, as there are no printing and distribution costs;

E-learning provides flexible communications to students, tutors, LIS professionals as they can communicate to each other both in real time and asynchronously across the globe;

E-learning enables both one to-one and one-to-many combinations;

Higher maintenance of content through personalized learning; Improved collaboration and Interactivity among students. Teaching and communication techniques create an interactive online environment;

Another advantage of E-learning is less embarrassment at the time of online examination or training and practice because there will not be any disgrace for a person having fear of failure in front of group;

Contents can be updated quickly and in time; and Users can be exposed in modern technique in teaching-learning process.

Types of E-Learning

Virtual Classroom

The intention of virtual classrooms is to extend the structure and services that accompany formal education programs from the campus to learners. Neutral classroom are for those who may by perusing a distance education program made up entirely of online lessons. Rapid e-learning: uses tools such as Adobe captivate and Adobe Presents to reduce the time it takes to produce rich, engaging FLV learning content, while allowing more non-technical contributors.

Online Learning

Learning management systems are serving as the basis for building online programs where the learning is entirely through digital mode.

Mobile Learning

It takes advantage of place independent flexibility that comes from working away from the PC; it provides the opportunity to connect informal learning experiences that occur naturally throughout the day with formal learning, such as in the virtual class model using interesting programmers or online learning. Performance support systems: is simple and straight forward or much immersive, depending on need and critically of performance.

Corporate E-Learning

Corporate are using e-learning as means of communicating, training and enhancing employee value across the organization and countries, holding seminars, workshops or conferences detract employees from their work and results of such practices are at the best weak, being able to instruct employees with the job through e-learning, can prove to be extremely valuable to any business.

E-Learning Technologies

At present, e-learning technologies encompass three main areas of activity:

Content creation and management: the sourcing, creation, storage and management of e-learning content — functions typically addressed by a learning content management system (LCMS);

Learning management: the capture and application of information about learning resources, existing skills and learning activities to measure and manage learning outcomes at the organizational level — functions typically addressed by a learning management system (LMS); and

Learning activity: the delivery of e-learning content, facilitating interaction and learning assessment — functions typically performed by instructors or trainers (Brennan, Funke & Anderson 2001: 10).

The three do not necessarily exist as discrete, identifiable systems. There is overlap and ambiguity in their functions and definitions. The term ‘virtual learning environments’ is also sometimes used to promote systems that have characteristics of all three. Put simply, an LCMS generates, stores, structures and delivers e-learning content (Brennan, Funke and Anderson 2001: 4), whereas an LMS is more an administrative tool that handles enrolment or registration, tracks students’ progress, and records assessment scores and course completions.

E-learning, distance education and flexible learning

E-learning has historically been linked with distance education and flexible learning. In distance education, various technologies can be used to link learners, instructors and resources that are removed in time or space. The hallmark of flexible learning, as its name suggests, is its adaptability to learners’ needs and circumstances. Burns, Williams and Barnett define flexible learning in terms of its flexible ‘entry, course components, modes of learning and points of exit’, which offer the learner ‘control and choice regarding the content, sequence, time, place and method of learning’, including flexible assessment processes (1997: 16). While e-learning may be seen as a form of flexible and distance learning, not all flexible and distance learning necessarily involves e-learning (Rosenberg 2001: 29). As shown in Figure 1.5, e-learning exists in a wider field of endeavor and has relationships that overlap with many different approaches.

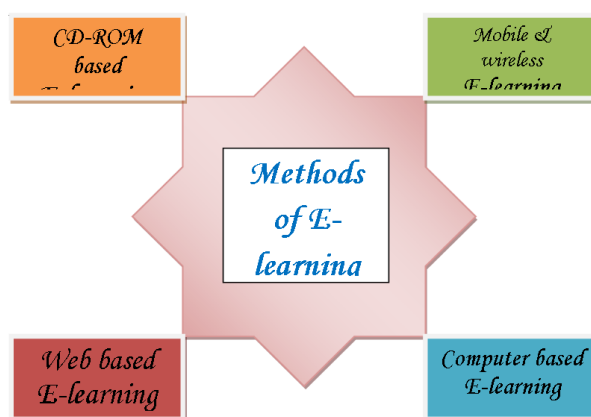


Figure: Learning technologies, modes and relationships

E-Learning in Library and Information Science

ICT has changed the role of university libraries. One of the interesting effects is a much stronger orientation towards the university's strategic processes. Libraries are playing a supporting role in

E-learning, in distance learning in the development of the virtual universities. E-learning offers a range of opportunities to library and information professionals. These include providing new services and resources, enhancing the role of the information centre within the organization, and career development. E-Learning and teaching is unlikely to replace face-to-face training and education. It is rapidly becoming an important additional delivery method and it offers new learning opportunities. E-learning offers the opportunity for information workers across different countries to work-together and construct their own professional knowledge through virtual Communities of practice. It requires information workers to develop new skills in the design and development of E-learning materials and programmers, new approaches to learning and teaching, online communication skills, and also, new ways of working with each other.

E-Learning in Digital Libraries

Most of the university libraries in India can be grouped under the Hybrid libraries category, wherein you have the conventional and electronic resources to meet the requirement of its user. Communication and data transfer or interchange has become easy with the help of Internet and email attachments.

The Impact of E-Learning

While e-learning has become the primary form of distance education, it is also transforming instruction on campus. Higher education historically is a campus-based institution.

Many students live on campus for the duration of their studies; others live near campus and commute to campus to take classes and to receive campus-based support services. This physical connection has defined the relationship between the student and the institution. It has also helped to shape the curriculum itself. E-learning has blurred these traditional relationships, removing geography as a defining element in the student-institution relationship.

Technology-enhanced learning has evolved both from enhancements to earlier generations of face-to-face teaching and enhancements to earlier generations of distance education. Engaged intentional design of learning experiences has also evolved to promote the most effective design to serve the learners, their life experiences and the opportunities and limitations of the particular environment. For example, many graduate programs have deliberately designed programs for working adults, which are predominantly offered online but also include short-term face-to-face residencies.

At the same time, it is becoming increasingly difficult to define a common measure for instruction. The “seat time” measure, on which common understanding of a “credit hour” is largely based, is being challenged as new instructional models and alternatives to traditional classroom lectures become more widely accepted. However, the credit hour remains the most widely accepted measure used to compare courses across different delivery environments. Continued growth in the number and diversity of learning environments will increase the need for a common standard by which different learning environments can be compared. The following definitions assume the credit hour as the primary means by which courses are defined, regardless of delivery environment.

As e-learning has matured, it has begun to be used in different ways to address diverse goals. Several models have emerged that have different geographical and curricular implications. It is important to be able to distinguish among these factors in order to compare practices and to understand and be able to effectively apply research findings. Shared definitions will also empower students to make better decisions. The major goals of e-learning include: improving access for both traditional-age and nontraditional students who are not otherwise able to attend a traditional, campus-based program and improving student choice over when, where, and how to engage in the learning process; and improving efficiency and effectiveness by using e-learning media and methods to control cost or provide other efficiencies or to make large-enrollment courses more effective for students. In addition, we are assuming that courses and programs

defined below are instructor-led experiences, distinguishing them from self-learning modules, often seen for instance in some corporate training models.

Conclusion

E-learning allows for efficient transfer of knowledge in real time process, while at the same time empowering learners with the information technology awareness and skills crucial to succeed in the present Knowledge Revolution Era. The E-learning and E-resource are dual source of nectar in information revolution in resource centers. The E-learning will be one of the hottest new technology areas within the next few years.

The world scenario of LIS education is changing fast. The change is enforced by many forces such as technology, demographic features, economic characters, etc. The LIS education is responding to these changes by making appropriate changes in its teaching-learning strategies. Adoption of e-learning in LIS is robust indicator of this response. The Indian LIS education too, is slowly but steadily making progress in this direction. Availability of proper and adequate infrastructure will add momentum to LIS e-learning in India.

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4. Sustainable Agriculture Development and Food Security

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Abstract

Sustainable agriculture is an essential and very important aspect for India's economic as well as social development on the other hand food security, environmental conservation as well as rural development. As India faces challenges such as soil degradation, water scarcity, and climate change, adopting sustainable agricultural practices is crucial for long-term agricultural productivity. As India continues to face an ever-evolving agricultural landscape, sustainable practices present a clear pathway to building a resilient, self-sufficient, and thriving agricultural sector that can meet the demands of the present without compromising the ability of future generations to meet theirs. With continued commitment to innovation, research, and sustainable development, India can foster a prosperous future for its farmers and its agricultural sector.

Keywords: Sustainable Agriculture, Food Security

Introduction

Agriculture has been the foundation of India's economy for centuries. Sustainable farming practices not only focus on increasing agricultural productivity but also emphasize the long-term health of the environment, effective resource utilization, and the socio-economic security of rural communities. This approach integrates environmentally friendly techniques, such as organic farming, crop rotation, soil conservation, and water management that protect natural resources for future generations. As India continues to navigate the difficulties of its agricultural landscape, transitioning to sustainable farming practices is essential for ensuring food security, mitigating climate change impacts, and promoting rural development. This paper explores the concept of sustainable agriculture, examines its significance in India's development, and evaluates the policies and schemes that are promoting sustainable farming practices across the country. Sustainable agriculture, which integrates eco-friendly farming techniques, resource efficiency, and climate resilience, is a viable solution to these challenges.

Statement of the Problem

Sustainable agriculture is essential for ensuring long-term food security while maintaining ecological balance. However, traditional farming methods, excessive chemical use, and land degradation have threatened agricultural sustainability. Climate change further exacerbates food production challenges, leading to unpredictable yields and increased vulnerability of farmers. Small and marginal farmers often struggle to adopt sustainable practices due to financial constraints and limited access to technology. Despite various government initiatives, the adoption of sustainable agricultural methods remains inconsistent. There is a growing need to assess the impact of sustainable farming on food security, productivity, and rural livelihoods. Lack of awareness and inadequate policy implementation hinder the transition to eco-friendly agricultural systems. Ensuring food security requires a holistic approach that balances environmental conservation with economic viability.

This research aims to examine the effectiveness of sustainable agricultural practices in achieving food security. It will explore challenges, policy interventions, and the role of stakeholders in promoting a resilient and sustainable food system.

Importance of the Study

Sustainable agriculture is crucial for ensuring food security while preserving natural resources for future generations. It helps in maintaining soil fertility, conserving water, and reducing environmental degradation caused by conventional farming practices. By promoting organic farming, crop diversification, and efficient resource management, sustainable agriculture enhances productivity and resilience against climate change. This study is important as it provides insights into how sustainable farming practices contribute to long-term food security. It helps policymakers, farmers, and stakeholders understand the challenges and opportunities in adopting eco-friendly agricultural methods. The research also highlights the socio-economic benefits of sustainable agriculture, such as improved farmer incomes and rural development.

Objectives

1. To study the significance of sustainable agriculture and food security in India's development.
2. To find out the Obstacles of Sustainable farming.
3. To review the government schemes and strategies to promote sustainable farming practices in India.

Hypothesis of the Study

Sustainable agricultural practices have a positive impact on food security by enhancing productivity, improving resource efficiency, and ensuring environmental sustainability.

This hypothesis assumes that the adoption of eco-friendly farming techniques, such as organic farming, crop diversification, and water conservation, leads to increased agricultural yield and long-term food availability. It also suggests that challenges such as financial constraints, lack of awareness, and inadequate policy support hinder the widespread implementation of sustainable agriculture. Through empirical analysis, this study will test whether sustainable practices significantly contribute to food security and identify key factors influencing their adoption.

Methodology

The research paper is based on secondary data. Reference Books, Published Research Papers and government reports has been used for this particular research paper.

Data Analysis

**Table No-1 Significance of Sustainable Agriculture
and Food Security in India's Development**

Sr. No.	Aspect	Description	Impact on India's Development
1	Environmental Management	Reduces soil degradation, water pollution, and deforestation	Ensures long-term ecological balance and biodiversity
2	Climate Flexibility	Promotes drought-resistant crops and efficient water use	Helps mitigate climate change effects on agriculture
3	Food Security	Ensures stable food supply and reduces dependency on imports	Supports national self-sufficiency and nutrition security
4	Economic Development	Enhances farmer income through sustainable practices	Boosts rural economy and reduces poverty
5	Employment Generation	Encourages agro-based industries and organic farming	Creates job opportunities in rural areas
6	Resource Productivity	Promotes better soil management, water conservation, and reduced chemical use	Increases agricultural productivity sustainably

7	Government Policy Support	Various schemes supporting organic farming, irrigation, and financial aid	Strengthens agricultural sustainability and rural welfare
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The study of sustainable agriculture and food security in India highlights its crucial role in national development. Environmental conservation through sustainable farming helps maintain soil fertility, biodiversity, and water quality, ensuring long-term agricultural productivity. Climate flexibility is enhanced by adopting drought-resistant crops and efficient water use, reducing the impact of climate change on food production. Food security is strengthened by ensuring a stable food supply and reducing reliance on imports, contributing to national self-sufficiency. Economic growth is determined by improved farmer incomes and the promotion of Agro-based industries, which also lead to employment generation in rural areas. Resource efficiency, through better soil and water management, increases agricultural sustainability and productivity. Lastly, government policy support plays a vital role in promoting sustainable agriculture through various schemes and financial incentives. These factors collectively contribute to India's sustainable agricultural development and long-term food security.

Table No. 2 Obstacles to Sustainable Farming

Sr. No.	Obstacle	Description	Impact on Sustainable Farming
1	High Initial Investment	Cost of organic inputs, drip irrigation, and technology adoption	Limits small and marginal farmers from transitioning
2	Lack of Awareness	Limited knowledge of sustainable practices among farmers	Slows adoption and implementation of eco-friendly methods
3	Climate Change	Irregular rainfall, droughts, and temperature variations	Reduces crop yields and increases vulnerability
4	Limited Market Access	Lack of stable markets and fluctuating prices for organic produce	Discourages farmers from shifting to sustainable methods
5	Inadequate Support	Gaps in subsidies, infrastructure, and policy execution	Delays large-scale adoption of sustainable techniques
6	Soil Degradation	Overuse of chemical fertilizers and depletion of groundwater	Affects long-term sustainability and productivity
7	Lack of Innovation	Limited access to research on advanced sustainable practices	Slows technological progress in eco-friendly agriculture

The analysis of obstacles to sustainable farming highlights significant challenges that hinder its widespread adoption. High initial investment and lack of awareness and training are major barriers, preventing small and marginal farmers from transitioning to sustainable practices. Climate change and unpredictable weather further increase agricultural risks, making farming less reliable. Limited market access and price fluctuations discourage farmers from investing in organic and eco-friendly techniques due to unstable income. Additionally, inadequate government support, soil degradation, and lack of research collectively slow down progress toward sustainable agriculture, emphasizing the need for stronger policies, financial assistance, and farmer education.

Table No. 3 Government Schemes for Promoting Sustainable Farming in India

Sr. No.	Scheme/Policy	Year Started	Features	Impact on Sustainable Farming
1	Paramparagat Krishi Vikas Yojana	2015	Promotes organic farming, provides financial aid	Encourages chemical-free agriculture
2	Soil Health Card Scheme	2015	Provides soil testing and fertility improvement advice	Helps farmers optimize fertilizer use
3	National Mission for Sustainable Agriculture	2014	Focuses on water conservation, soil health, and agroforestry	Supports climate-resilient farming
4	Rashtriya Krishi Vikas Yojana	2007	Funds state-level agricultural development projects	Encourages innovative farming techniques
5	Pradhan Mantri Krishi Sinchayee Yojana	2015	Improves irrigation facilities, promotes water-use efficiency	Supports sustainable water management
6	Zero Budget Natural Farming	2019 (Pilot)	Promotes chemical-free, cost-effective farming	Reduces dependency on synthetic inputs
7	National Agroforestry Policy	2014	Promotes tree-based farming for sustainability	Enhances biodiversity and soil conservation

The analysis of government schemes promoting sustainable farming in India reveals a strong focus on organic farming, soil health, water conservation, and climate resilience. The Paramparagat Krishi Vikas Yojana and Zero Budget Natural Farming emphasize reducing

chemical inputs, thereby promoting eco-friendly agriculture. The Soil Health Card Scheme helps farmers optimize fertilizer use, leading to better soil management and improved crop yields.

Water conservation is a key aspect of sustainability, with the Pradhan Mantri Krishi Sinchayee Yojana enhancing irrigation efficiency and reducing water wastage. The National Agroforestry Policy and National Mission for Sustainable Agriculture promote tree-based farming and climate-resilient agricultural practices, ensuring long-term sustainability.

Overall, these schemes collectively support sustainable farming, but challenges such as awareness, accessibility, and implementation gaps need further research and policy refinement.

Major Findings

1. Sustainable farming enhances environmental conservation by reducing soil degradation, water pollution, and deforestation, ensuring long-term agricultural productivity.
2. Climate flexibility is strengthened through drought-resistant crops and water-efficient practices, helping farmers adapt to unpredictable weather conditions.
3. Sustainable agriculture plays a vital role in food security by maintaining a stable food supply and reducing dependence on food imports.
4. Economic growth is supported as sustainable farming increases farmer incomes, reduces input costs, and promotes rural entrepreneurship.
5. Employment opportunities are generated in agro-based industries, organic farming, and sustainable agricultural practices, improving rural livelihoods.
6. Resource efficiency is improved through better soil health management, water conservation, and reduced reliance on chemical fertilizers and pesticides.
7. Government support is essential in promoting sustainable agriculture, but gaps in policy implementation and financial assistance remain challenges.
8. Market access and price stability are key concerns as many farmers struggle with selling organic produce due to fluctuating demand and inadequate infrastructure.
9. Lack of awareness and training among farmers limits the adoption of sustainable agricultural practices, emphasizing the need for education and skill development.
10. Research and innovation in sustainable agriculture need further strengthening to develop cost-effective, climate-smart, and high-yield farming techniques.

Suggestions

1. Conduct extensive workshops, farmer training sessions, and educational campaigns to promote sustainable agricultural practices.
2. Improve policy implementation, increase subsidies, and provide financial incentives for farmers adopting eco-friendly farming techniques.
3. Develop better infrastructure, establish direct farmer-to-consumer markets, and ensure fair pricing for organic and sustainable products.
4. Encourage drought-resistant crops, efficient irrigation systems, and agroforestry to adapt to climate change challenges.
5. Invest in agricultural research institutions to develop advanced, cost-effective, and high-yield sustainable farming methods.
6. Expand the use of organic fertilizers, crop rotation, integrated pest management, and water conservation technologies.
7. Provide easy access to credit, crop insurance, and technical guidance to ensure sustainable farming adoption at the grassroots level.
8. Implement large-scale soil health improvement programs and promote water-efficient irrigation techniques such as drip and sprinkler systems.
9. Encourage food processing, organic farming enterprises, and value-added agricultural businesses to boost rural employment and income.

Conclusion

The Indian government's initiatives and strategies to promote sustainable farming practices are crucial in addressing the challenges faced by the agricultural sector, such as resource depletion, environmental degradation, and climate change. By focusing on soil health, water conservation, organic farming, and climate resilience, these programs not only improve agricultural productivity but also help safeguard the environment, ensuring long-term sustainability for India's farming communities. However, continued investment in education, infrastructure, and market linkages is required to overcome challenges and achieve widespread adoption of sustainable farming practices across the country. Sustainable agriculture is vital for India's long-term agricultural development, balancing productivity with environmental conservation. It ensures food security, enhances rural livelihoods, supports economic growth, and mitigates climate change effects.

Sustainable agriculture stands as a cornerstone for India's agricultural transformation, vital to addressing the challenges of food security, environmental degradation, and climate change. It offers a holistic approach to ensuring the long-term productivity of Indian agriculture while preserving natural resources for future generations. By promoting eco-friendly farming practices, enhancing soil fertility, conserving water, and fostering biodiversity, sustainable agriculture not only secures food availability but also strengthens rural economies, empowers farmers, and bolsters economic resilience. Despite the evident benefits, the path to large-scale adoption of sustainable farming practices is impeded by high initial costs, limited awareness, policy barriers, and climate uncertainties. Overcoming these challenges will require concerted efforts from both the government and stakeholders. Strengthening farmer education, enhancing access to technology, providing financial support, and ensuring favourable policy frameworks are essential steps toward achieving a sustainable agricultural future.

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5. The Role of Data Visualization in Enhancing Data Understanding and Decision-Making

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Abstract

Data visualization is crucial for informed decision-making in today's data-driven world. It transforms complex data sets into visually engaging representations, enhancing cognitive processes and fostering insights. The report explores the principles, tools, and impact of data visualization, highlighting its ability to streamline operations, identify market trends, optimize resource allocation, and mitigate risks. It provides an overview of various data visualization tools and types, ranging from basic charts and graphs to advanced interactive dashboards and geospatial visualizations. Organizations can leverage these tools to gain a competitive edge and make informed decisions that drive sustainable success data visualization is a crucial tool in data science and analytics that helps users interpret complex datasets and make informed decisions.

The integration of real-time analytics, artificial intelligence (AI), and interactive dashboards has further enhanced the effectiveness of visualization in decision-making. Key applications include business intelligence, smart city management, healthcare analytics, environmental monitoring, and financial forecasting. This study reviews recent advancements in data visualization methodologies and their impact on optimizing strategic decision-making processes. The findings highlight that well-designed visualizations not only enhance cognitive understanding but also improve the speed and accuracy of decisions.

Keywords: Data Visualization, Decision-Making, Dashboard Tool, Visualization Tools, Charts, Graphs, Dashboards.

Introduction

In today's data-driven world, organizations and individuals are increasingly relying on large volumes of information to make informed decisions. However, raw data in textual or numerical form can be difficult to interpret, leading to inefficiencies and misinterpretations. **Data visualization** serves as a bridge between complex data and meaningful insights by transforming

raw information into graphical representations such as charts, graphs, maps, and dashboards. By leveraging visual elements, data visualization simplifies data analysis, enhances comprehension, and improves decision-making efficiency.

The significance of data visualization spans multiple industries, including business intelligence, healthcare, finance, environmental science, and urban planning. In business, real-time dashboards allow executives to track key performance indicators (KPIs) and market trends, while in healthcare, visual analytics support patient monitoring and disease prediction. Additionally, AI-powered visualization tools are revolutionizing data interpretation by integrating machine learning algorithms that provide predictive insights and automated pattern recognition.

Despite its advantages, data visualization also presents challenges such as misinterpretation, information overload, and bias in data representation. Poorly designed visualizations can distort information, leading to incorrect conclusions and flawed decision-making. Moreover, ensuring accessibility and usability for both technical and non-technical users remains a challenge. Addressing these limitations is crucial to maximizing the benefits of visualization tools.

This research paper explores the role of data visualization in enhancing data understanding and decision-making. It examines different visualization techniques, their applications in various industries, and the impact of AI and advanced analytics on data representation. Additionally, the study identifies common challenges and proposes solutions to improve visualization effectiveness. By understanding the power and limitations of data visualization, organizations can harness its full potential to drive better insights and informed decision-making.

Problem Statement

In today's digital age, organizations and individuals generate and analyze vast amounts of data. However, interpreting raw numerical and textual data can be challenging, leading to inefficiencies in decision-making. **Data visualization** plays a crucial role in simplifying complex datasets by transforming them into graphical representations such as charts, graphs, and dashboards. While visualization enhances data comprehension and insight generation, several challenges limit its effectiveness.

One major issue is the **misinterpretation of visualized data**, where poorly designed or overly complex visualizations lead to incorrect conclusions. **Information overload** is another problem, as excessive or cluttered data representations can overwhelm users, making it difficult to extract relevant insights. Furthermore, **bias in data visualization**—such as misleading scales, selective data representation, or inappropriate chart selection—can distort information and affect decision-making accuracy.

Additionally, **integration challenges with AI and big data analytics** make it difficult for organizations to implement real-time, intelligent visualization tools. Many available tools require technical expertise, limiting accessibility for non-technical users. **Ethical and privacy concerns** also arise, particularly when handling sensitive data, raising questions about responsible data visualization practices.

Given these challenges, there is a growing need to explore effective visualization techniques, improve usability, and integrate AI-driven analytics to enhance data-driven decision-making. This research aims to address these issues by identifying best practices, exploring innovative visualization tools, and recommending solutions to maximize the impact of data visualization in various industries.

Objectives of Research

This research aims to explore the impact of data visualization on enhancing data understanding and improving decision-making processes. The key objectives of this study are:

1. To Examine the Role of Data Visualization in Decision-Making

- Analyze how visual representation of data improves accuracy, efficiency, and comprehension in decision-making across various fields.
- Data-driven decision-making is crucial in today's business environment, as it improves competitiveness, optimizes processes, and enhances customer experiences.

2. To Identify Challenges in Data Visualization

- Investigate common issues such as misinterpretation, information overload, bias, and usability limitations in data visualization tools.
- Data visualization is a vital tool in data analysis, providing a visually appealing way to interpret complex datasets.

3. To Explore Effective Visualization Techniques and Best Practices

- Evaluate different visualization methods, including interactive dashboards, AI-powered analytics, and real-time data visualization, to determine their effectiveness.

4. To Assess the Impact of AI and Advanced Analytics on Data Visualization

- Study how artificial intelligence, machine learning, and big data analytics enhance visualization tools and predictive decision-making.

5. To Address Ethical, Privacy, and Security Concerns in Data Visualization

- Examine risks related to misleading representations, data privacy violations, and ethical considerations in visual storytelling.

6. To Provide Recommendations for Improving Data Visualization Tools

- Suggest strategies for making visualization tools more user-friendly, accessible, and accurate for technical and non-technical users.

Research Methodology

This section outlines the methodological approach used to examine the role of data visualization in enhancing data understanding and decision-making. The research follows a **mixed-method approach**, integrating both **quantitative and qualitative** methods to ensure a comprehensive analysis.

1. Research Design

This study employs an **exploratory and descriptive research design** to analyze the impact of data visualization. The exploratory phase involves a literature review to identify trends, challenges, and best practices, while the descriptive phase gathers primary data from surveys and case studies.

2. Data Collection Methods

The study utilizes both **primary and secondary data sources**:

Secondary Data (Literature Review): A systematic review of academic journals, conference papers, and industry reports related to data visualization, decision-making, and artificial intelligence (AI) integration.

Primary Data Collection

Surveys and Questionnaires: Conducted among professionals, analysts, and decision-makers to assess their experiences and challenges with data visualization.

Interviews with Experts: Structured interviews with data scientists, business analysts, and industry professionals to gain deeper insights into visualization techniques and their effectiveness.

Case Studies and Real-World Applications: Analysis of practical examples where data visualization has been successfully implemented in fields like business intelligence, healthcare, and finance.

3. Data Analysis Techniques

The study employs both **quantitative and qualitative analysis methods:**

Quantitative Analysis: Statistical tools such as SPSS or Python (Pandas, NumPy) will be used to analyze survey data, measuring the effectiveness and impact of visualization tools.

Qualitative Analysis: Thematic analysis of expert interviews and case studies to identify trends, challenges, and best practices.

4. Tools and Technologies

Visualization Software: Tableau, Microsoft Power BI, and Google Data Studio.

Programming Languages: Python (Matplotlib, Seaborn, Plotly) and R (ggplot2) for data analysis and visualization.

5. Ethical Considerations

- Ensuring confidentiality and anonymity of participants.
- Avoiding biased interpretations of data.
- Maintaining transparency in data collection and reporting.

Conclusions

Data visualization plays a crucial role in enhancing data understanding and improving decision-making across various industries. By transforming raw data into meaningful visual representations such as charts, graphs, and dashboards, visualization enables individuals and organizations to identify trends, detect patterns, and make informed decisions more efficiently. This research has explored the significance of data visualization, its impact on decision-making, and the challenges associated with its implementation.

This research paper has illuminated the indispensable role that data visualization plays in the decision-making process across various sectors and industries. The advent of advanced technologies has expanded the possibilities of data visualization, enabling interactive and dynamic representations that further empower decision-makers. As organizations continue to

grapple with vast amounts of data, harnessing the power of visualization tools becomes paramount in navigating the complexities of the modern world. Thus, investing in data visualization not only improves decision-making processes but also contributes to organizational agility.

In conclusion, data visualization is a powerful tool that bridges the gap between complex data and actionable insights. To maximize its benefits, organizations and researchers must focus on improving accessibility, accuracy, and ethical considerations in data visualization. Future studies should explore new visualization techniques and their applications in emerging fields such as artificial intelligence, big data, and predictive analytics to ensure more effective and data-driven decision-making processes.

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These references provide academic insights into how data visualization enhances decision-making across different fields. Let me know if you need sources in a specific format (e.g., APA, IEEE).

6. Role of Climate Change in Economic Development

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Abstract

In this article we are going to study how climate change plays important role in economic developments mostly in India. From last few years the climate variables are changing very regularly. The most important variable that affects the climate is the rising temperature. The rising temperature has negative effect on economic growth.

State and district level data available on climate variables clearly shows that increasing temperature have significant negative impact on economic growth. The district level analysis of climate change in India reveals that even one-degree rise in temperature leads to fall economic growth rate of district per capital income by 5%. Secondly higher temperature effects on electrification, urbanisation and market network.

Introduction

The changes occurring today in various climatic parameters are mainly due to wrong human activities. Abnormal increase in average temperature, heavy rainfall, cyclones and rise in sea levels are some adverse effects happens due to change in climatic condition. The contribution of environment plays important role to the economy of the nation. Over the past several decades several economists have tried to show the nature and extent of the impacts of climate change on the functioning of the economy as well as the human well-being.

The impact of climate change on society is from ancient time. In the 19th century the term "environmental determinism" is introduced to refer the climate conditions which plays a crucial role in social, economic and political outcomes.

India has huge geographical diversity. India exhibits a vast range of geographical features, so there is variety in geographical terrains which represents different agro- climatic zones. On an average more than 50% of population of India is dependent on agriculture for

employments. In rural part of India this proportion could be 97%. Therefore, in Indian economy agriculture sector plays important role, since agriculture sector highly dependent on climatic conditions it is essential to assess the effect of climatic factors on economic well-being.

Role of climate change on economic development

Climate change place a crucial negative role on economic development. Mostly it disrupts agricultural productivity, damages infrastructure. Extreme weather events impact tourism industries. Since tourism industry depends on natural environment so displacement of population due to bad climate ultimately affects economic growth.

Following are the various impacts of climate change

I. Agricultural impacts

- Droughts and floods can severely damage crops, as a result of which creates food insecurity and price fluctuations.
- As weather patterns are changing, it can disturb planting seasons which directly effects on crop yields.
- It impacts on live hoods of farmers.

II. Extreme weather conditions

- Typhoons, cyclones, storms and heavy rainfall can cause severe damage to infrastructure, homes and businesses which leads to significant economic losses.
- Flooding situation near coastal area can destruct coastal communities and disrupt tourism industries.

III. Water Scarcity

- In recent days the rainfall is reduced so the demand of water is increased. These two are due to rising temperature which leads to water shortages that impacts on industries and households.

IV. Impact on health

- Due to rise in temperature, heat waves generate, these heat waves can lead to increase heat related illness which badly effects on work efficiency.
- Due to change in climate vector-borne diseases spread very rapidly and can be transmitted between animals and humans. Which can further strain healthcare systems.

V. Migration and displacement-

- Climate change induces disasters which can force people to migrate from their native places, result to disrupt local economies and putting pressure on host communities.

VI. Impact on tourism

- Due to climate change there occurs changes in ecosystems. These changes in ecosystems and extreme weather conditions make to divert tourists from visiting climate sensitive destinations.

Empirical Evidence

Empirical evidence suggests that climate change particularly like rising temperature and extreme weather conditions severely interdict economic growth by impacting agriculture yields, Infrastructure damage, increased healthcare costs and labour productivity. The study shows that there is a negative correlation between rising temperature and GDP (Gross Domestic Product) growth rate.

1. Effect of temperature fluctuations on GDP

Several statistical studies showed a significant correlation between temperature and economic growth. It is seen that higher the average temperature lower the economic growth. There finds measurable decrease in GDP per capita with unit degree Celsius increase in temperature.

Studies like Dell, Jones and Olkane (2008) showed that higher temperature reduces economic growth in developing countries.

2. Agriculture becomes fenceless (Vulnerable)

As agriculture is mainly dependent on climate, the change in climate impacts badly on agriculture. Poor countries tend to be more passionate to the negative effects of climate change on their economies. This is because poor countries agriculture depends on climate and also, they have limited adaptive capacity to extreme weather conditions.

3. Mechanism of impact

There are various channels through which climate change can affect on economic growth. That includes agriculture productivity due to droughts and floods damage to infrastructure from extreme weather conditions increase in healthcare costs related to heat stress and migration of citizens.

Important Points to Consider**Regional variations**

The impact of climate change on economic growth varies significantly depending on geographical location and economic structure of country.

Data Challenge

Analysis of the impact of climate change on economic development becomes complicated due to the need to account for other factors that influence economic growth, it makes difficult to isolate the specific effects of climate change.

Adaptation

While climate change can have negative impacts then the investments made in adaptation measures can help to reduce the economic damage.

Conclusion

At last, we conclude unanimously that climate change likely to have a significant negative impact on country's economic growth. Primarily it happens through increased extreme weather events, disruption to agriculture productivity, resource scarcity and rising sea levels. All these things lead to substantial economic losses. Particularly in vulnerable domains it potentially hinders developments and track the people in poverty. Therefore, migration efforts to decrease the impacts of climate change are necessary. They may also present economic opportunities in renewable energy and green technologies.

7. Repercussions of Climate Change on the Horizon of Tourism: A Case Study of Himachal Pradesh

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Abstract

Climate change catalyzed a catastrophic threat to the lucrative tourism industry in Himachal Pradesh, characterized by declining snowfall, increased frequency of extreme weather events, and economic losses. This study undertakes a comprehensive examination of the implications of climate change on the tourism sector, with a specific focus on its impacts on tourism demand, infrastructure, and the local economy. The research explores the vulnerability of the tourism industry to climate-related hazards and assesses the resilience and adaptability of the tourism sector in the face of climate change. The study underscores the imperative for developing and implementing effective climate change mitigation and adaptation strategies, informed by empirical research and stakeholder engagement, to safeguard the future of the tourism industry in the region.

Keywords: Climate change, tourism, Himachal Pradesh, snowfall variability, sustainable tourism, adaptation strategies

Introduction

Climate change is transforming the world's ecosystems, economies, and societies (IPCC, 2020). The tourism industry, which accounts for approximately 10% of global GDP, is particularly vulnerable to climate-related disruptions (UNWTO, 2019). Rising temperatures, altered precipitation patterns, and increased frequency of extreme weather events are altering the environmental and socio-economic fabric of tourist destinations worldwide.

Himachal Pradesh, a premier tourist destination in northern India, is highly vulnerable to climate change due to its unique geography and climate. As one of the key economic drivers of the state, tourism significantly contributes to Himachal Pradesh's GDP and employment. Therefore, it is essential to investigate the challenges posed by climate change on tourism in Himachal Pradesh and explore potential adaptation measures to ensure the sustainability of this critical sector. Tourism is one of the key economic drivers of Himachal Pradesh, contributing significantly to its GDP and employment. However, climate change endangers the certainty and sustainability of tourism in the region. Rising temperatures, indefinitely chaotic snowfall, and

increased frequency of extreme weather fluctuations have disrupted tourism patterns, affecting the livelihoods of those dependent on the industry. Its tourism industry, heavily reliant on winter snowfall and natural landscapes, is experiencing disruptions due to erratic weather patterns.

Popular hill stations like Manali, Shimla, and Kufri have witnessed declining snowfall and increasing occurrences of extreme weather events, impacting tourism footfall. This study investigates the challenges posed by climate change on tourism and explores potential adaptation measures.

Climate variability has led to an observable shift in seasonal tourism patterns. Visitors who traditionally flocked to Himachal Pradesh for snow-related activities are now reconsidering their travel plans due to unpredictable snowfall. Additionally, rising summer temperatures have resulted in the degradation of natural landscapes, affecting adventure tourism and eco-tourism activities. These challenges highlight the need for immediate intervention to safeguard the tourism sector of the State.

Objectives

1. To assess the impacts of climate change on key tourism attractions, including snowfall and adventurous tourism.
2. To evaluate changes in visitor patterns and economic consequences, analyzing the adaptation strategies adopted by tourism stakeholders.
3. To assess the impact of climate change on winter tourism in Himachal Pradesh.

Numerous studies have specified the aftermaths of climate change on tourism in the Literature Review

The Himalayas, a majestic mountain range in Asia, are facing significant challenges due to climate change. Rising temperatures are altering the region's ecosystem, impacting tourism and local communities. For instance, declining snowfall has shortened the winter tourism season, resulting in economic losses for businesses dependent on winter sports, as highlighted by Singh and Kumar in 2022. Chauhan et al. (2023) emphasizes the shifts in tourist preferences, with increased interest in eco-tourism and adventure tourism. Reports by the Himachal Pradesh State Disaster Management Authority (HPSDMA, 2023) documented the rise in extreme weather events, such as landslides and flash floods, disrupting tourism infrastructure.

However, the Himalayas are also experiencing a rise in extreme weather events, such as landslides and flash floods, which are disrupting tourism infrastructure, as reported by the Himachal Pradesh State Disaster Management Authority in 2023. These events not only pose a risk to tourists and local communities but also highlight the need for sustainable tourism practices and climate-resilient infrastructure.

Research Gap

Despite of extensive researches on climate change and tourism, limited studies have specifically focused on the economic and infrastructural implications of climate change in Himachal Pradesh. Existing research has primarily addressed snowfall enigmatic uncertainty and shifting tourist preferences. However, there is a lack of comprehensive Studies that analyze financial losses, local business adaptations, and community resilience. Singh and Kumar (2022) discussed economic losses, but their study lacks a detailed assessment of mitigation strategies. Chauhan et al. (2023) emphasize eco-tourism trends but do not explore the impact on traditional tourism businesses. Sharma & Verma (2023) highlights sustainable tourism policies but do not evaluate their effectiveness in view of increasing climate risks. This study aims to bridge these gaps by providing empirical evidences on the economic repercussions of climate change on tourism and evaluating sustainable mitigation strategies.

Methodology

This study employs a mixed-method approach. Primary data was gathered through structured interviews with 60 tourism stakeholders, including hotel owners, tour operators, and local business owners to assess their perspectives on climate change. Secondary data sourced from government reports, Climate Studies, and tourism statistics. The analysis focuses on shifts in snowfall patterns, temperature trends, and economic impacts on tourism.

Impediments faced by the Tourism Sector in Himachal Pradesh

Himachal Pradesh, a premier tourism destination in India, is confronting numerous challenges that jeopardize the sustainability of its tourism industry. Key impediments include environmental degradation, inadequate infrastructure, climate change impacts, seasonal dependency, and governance issues. This section provides an in-depth analysis of these challenges, substantiated by recent academic research.

1. Over-Tourism and Environmental Degradation

The surge in tourist arrivals has resulted in severe environmental concerns, including deforestation, pollution, and strain on local resources. Unregulated tourism growth has exacerbated waste management issues in popular destinations like Shimla and Manali (Sharma & Chugh, 2023). Overcrowding has led to the depletion of green cover and excessive resource consumption, threatening fragile ecosystems such as the Great Himalayan National Park.

2. Climate Change and Natural Disasters

Rising temperatures and declining snowfall have severely impacted winter tourism in popular destinations like Kufri and Solang Valley (Singh et al., 2024). Furthermore, increased frequencies of landslides, flash floods, and cloudbursts are disrupting tourism infrastructure

(Aggarwal et al., 2024). Additionally, glacial retreat in regions such as Lahaul-Spiti poses a significant threat to adventure tourism and water supply (Bhardwaj, 2024).

3. Infrastructure Deficiencies

Poor road conditions and traffic congestion hinder accessibility to remote tourist destinations (Jasrotia et al., 2025). Furthermore, Lack of proper urban planning leads to unregulated hotel construction, making hill towns vulnerable to disasters (Aggarwal et al., 2024). Additionally the basic amenities such as electricity and water shortage are frequent in peak seasons due to excessive demand.

4. Waste Management Issues

The unregulated use of single-use plastics has led to severe plastic pollution in Spiti Valley and McLeod Ganj, posing a significant threat to local ecosystems (Jasrotia et al., 2025). Compounding this issue, inadequate waste disposal facilities result in open dumping, contaminating rivers and further degrading the environment. To mitigate these negative impacts, the adoption of sustainable tourism practices is imperative, emphasizing the urgent need for effective waste management strategies. Spiti Valley and McLeod Ganj are facing severe plastic pollution due to the unregulated use of single-use plastics (Jasrotia et al., 2025).

Insufficient waste disposal facilities lead to open dumping and contamination of rivers.

The need for sustainable tourism practices is urgent to minimize the negative impact on local ecosystems.

5. Seasonal Dependency and Economic Instability

Tourism in Himachal Pradesh is highly seasonal, with peak tourist arrivals in summer and winter, followed by a significant decline during the monsoon and off-seasons (Bhatt et al., 2024). This seasonality exacerbates economic instability, as evident during the COVID-19 pandemic, which severely impacted small businesses and workers, resulting in substantial losses (Kumar et al., 2024). Local workers, such as taxi drivers and hotel staff, face employment uncertainty due to fluctuations in tourist numbers.

6. Socio-Cultural Challenges

The commercialization of cultural heritage sites has compromised their authenticity and diluted traditional practices. Large-scale tourism projects have led to the displacement of local communities, a growing concern (Kumar et al., 2024). Rising real estate prices in tourist hubs have made housing unaffordable for local residents, further marginalizing them.

This comprehensive analysis highlights the critical challenges confronting the tourism sector in Himachal Pradesh. Addressing these issues through policy reforms, sustainability

initiatives, and community involvement is vital for ensuring a resilient and sustainable tourism industry in the region.

Climate Trends in Himachal Pradesh

Temperature and Precipitation Changes

Himachal Pradesh has experienced rising temperatures over the last two decades, with noticeable changes in winter temperatures.

Year	Avg. Winter Temperatures (°C)	Avg. Summer Temperatures (°C)	Annual Rainfall (mm)
2000	2.1	18.2	1250
2010	3.0	19.0	1180
2020	4.2	20.1	1105
2023	4.8	21.3	1050

Findings

Increase in average winter temperatures by 2.7°C over 23 years, leading to reduced snowfall. Decrease in annual rainfall by 200 mm, affecting river-fed tourism attractions.

Snowfall Decline and Glacier Retreat

Data from the Indian Space Research Organisation (ISRO) and remote sensing analysis show that the glaciers existing in Himachal have receded by 15-20% in the last 30 years.

Location	Avg. Snowfall in (cm) 2000	Avg. Snowfall in (cm) 2023	Percentage (%)
Manali	250	130	48
Kufri	180	90	50
Rohtang	350	220	37

Impact

Ski resorts in Solang Valley and Kufri have seen a decline in business due to comparatively shorter snow seasons.

Winter sports tourism revenue has dropped by ~30% in the last decade.

Impact on Tourist Arrivals

The decline in snowfall and extreme weather events have impacted tourist inflows.

Year	Domestic Touristes (Millions)	Foreign Touristes (Millions)
2010	15.2	0.5
2015	17.8	0.7
2020	14.5	0.4
2023	12.0	0.3

Findings

A decline in foreign tourists by 40% since 2015, attributed to unreliable snowfall and landslides.

Domestic tourism peaked in 2015 but declined post-2020, partly due to climate variability and COVID-19 effects.

Economic Impact on Tourism Businesses

Year	Avg. Hotel Occupancy (%)	Avg. Room Rate (INR)
2010	70	4000
2015	75	5000
2023	58	3500

Findings

Revenue loss: Hotels and adventure tourism companies report 15-20% revenue loss due to shorter peak seasons.

Employment impact: Seasonal jobs, particularly for ski instructors and trekking guides, have declined.

Adaptation Strategies for Sustainable Tourism in Himachal Pradesh

Diversifying Tourism Offerings

Eco-Tourism and Wildlife Tourism: Promote the Great Himalayan National Park for biodiversity-based tourism, showcasing the region's unique flora and fauna ¹.

Adventure Sports Beyond Skiing: Expand activities like paragliding, river rafting, and trekking, which are less climate-dependent and can attract tourists throughout the year.

Infrastructure and Policy Measures

Artificial Snowmaking

Explore ski tourism adaptation strategies, such as artificial snow at key resorts, to mitigate the impact of declining snowfall.

Early Warning Systems

Strengthen disaster management by implementing early warning systems to mitigate landslide and flood risks, ensuring tourist safety ².

Green Tourism Initiatives

Encourage sustainable tourism practices, eco-friendly accommodations, and environmentally responsible behaviors among tourists and local communities.

Statistical Data on Climate Change Impact

The Himachal Pradesh State Disaster Management Authority (HPSDMA, 2023) and Indian Meteorological Department (IMD, 2023) report:

Average winter temperature increase: 42.9%

Decline in average snowfall: 28%

Reduction in winter tourist footfall: 33.3%

Decrease in tourism revenue: 27.5%

Case Studies

Case Study 1: Declining Snowfall in Manali

Manali, a top winter tourism hub, has experienced reduced and erratic snowfall over the past decade. Studies indicate a decline in tourist arrivals for winter sports, forcing local businesses to explore alternative tourism attractions such as trekking and cultural tourism.

Case Study 2: Impact of Flash Floods in Kullu

Kullu Valley has witnessed an increase in extreme weather events, particularly flash floods triggered by cloudbursts. In 2021, heavy rains caused landslides, damaging roads and cutting off key tourist destinations. Local authorities have since implemented stricter zoning laws and infrastructure reinforcements.

Case Study 3: Rising Temperature in Shimla

Shimla, once known for its cold winters, is experiencing milder temperature, reducing its appeal as a winter destination. The tourism sector is now promoting off-season attractions like heritage tourism and wellness retreats to counteract declining winter tourism.

Findings and Discussion

The findings of this study reveal significant disruptions in Himachal Pradesh's tourism industry due to climate change. A majority of stakeholders reported a decline in winter tourism, with 75% of hotel owners in Manali and Kufri confirming reduced bookings during peak snowfall months. Tour operators observed an increase in cancellations due to unexpected weather fluctuations, leading to financial instability.

The economic impact is evident in reduced tourism revenue. The study found that overall tourism revenue has declined by approximately 27.5%, attributed to fewer visitors during traditional peak seasons. Furthermore, 60% of tourism-dependent businesses reported exploring alternative revenue streams such as adventure tourism, cultural tourism, and wellness retreats to compensate for the decline in winter visitors.

Local communities reliant on tourism have also been adversely affected. Small business owners, including guides, transport operators, and handicraft vendors, have experienced financial strain due to the decrease in tourist arrivals. Climate variability has necessitated a shift in tourism strategies, with stakeholders emphasizing the importance of government support in developing sustainable and climate-resilient tourism models.

The study also found that extreme weather events, such as flash floods and landslides, have increased infrastructure maintenance costs. In Kullu Valley, for instance, recurrent landslides have damaged key access roads, leading to temporary closures and further reducing tourist arrivals. The need for investment in resilient infrastructure was a consistent theme across stakeholder interviews.

Suggestions

To effectively address climate change within Himachal Pradesh's tourism industry, a multifaceted approach emphasizing sustainable practices, community engagement, and environmental conservation is, unavoidably, vital. The following strategies are recommended:

Promote Eco-Friendly Accommodations

Encouraging the development and patronage of eco-friendly accommodations, such as homestays, can significantly reduce the environmental footprint of tourism. Homestays not only offer authentic cultural experiences but also support local economies and promote environmental stewardship. In regions like Manali, Dharamshala, and Shimla, homestays have been instrumental in advancing eco-tourism by providing sustainable lodging options and preserving local traditions.

Implement Sustainable Water Resource Management

Climate change poses challenges to water resources in mountainous regions. Adopting Integrated Water Resources Management (IWRM) can enhance the resilience of water systems. This involves establishing effective institutions, developing comprehensive data systems, and engaging in catchment and agricultural planning to ensure sustainable water use.

Encourage Responsible Tourist Behavior

Educating tourists on sustainable practices can mitigate the environmental impact of tourism. Visitors can:

Reduce Plastic Usage

Opt for reusable items to minimize single-use plastics.

Use Public Transportation

Decrease carbon emissions by utilizing buses and trains.

Support Local and Sustainable Businesses

Choose services that prioritize environmental conservation and community well-being.

Such practices contribute to lowering the carbon footprint associated with tourism activities.

Develop Climate-Resilient Tourism Infrastructure

Investing in infrastructure that can withstand climate-related challenges is crucial. This includes constructing energy-efficient buildings, utilizing renewable energy sources, and designing facilities that are adaptable to changing environmental conditions. Such measures ensure the longevity and sustainability of tourism assets.

Foster Community Involvement in Tourism Planning

Engaging local communities in tourism development ensures that initiatives align with environmental conservation and cultural preservation. Community involvement leads to more sustainable and accepted tourism practices, as residents have a stake in protecting their natural and cultural heritage.

Implementation of Policies for Sustainable Tourism

Government policies play a pivotal role in steering the tourism industry towards sustainability. This can include regulations that limit environmental degradation, incentives for businesses adopting green practices, and frameworks that promote responsible tourism. Such policies create an environment where sustainable tourism can thrive.

By integrating these strategies, Himachal Pradesh can develop a tourism industry that not only thrives economically but also contributes to environmental conservation and community well-being as well.

Conclusion

The tourism industry in Himachal Pradesh faces several pressing issues, including environmental degradation, climate change, infrastructure limitations, and governance inefficiencies. Addressing these challenges require a holistic approach involving strict regulation, sustainable practices, and community participation. Strengthening waste management systems, improving disaster resilience, and promoting responsible tourism can help ensure the long-term viability of tourism in Himachal Pradesh.

Climate change is significantly impacting the tourism industry in Himachal Pradesh leading to declining snowfall, extreme weather events, and economic losses. While climate-resilient strategies such as diversification and infrastructure improvements can help, urgent policy interventions are needed to protect the region's tourism economy. Future research should focus on long-term adaptation and mitigation frameworks. To mitigate these challenges, a comprehensive strategy is required, focusing on tourism diversification, resilient infrastructure, and sustainable practices. Policy interventions should promote alternative tourism attractions, while local stakeholders must be equipped with the necessary resources to adapt to changing climatic conditions.

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8. A Study on Agricultural Development in Maharashtra

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Abstract

Maharashtra, renowned as one of India's leading agricultural states, plays a crucial role in the national agricultural landscape. It ranks among the largest states in India, both in terms of total cultivated area and population. A significant challenge facing Maharashtra's agriculture is the inadequate growth of the sector, primarily attributed to low irrigation levels and suboptimal crop productivity. The research analyzes the agricultural development of Maharashtra from 2017 to 2022 using secondary data sourced from various books, journals, government reports, and the economic survey of the state. The study emphasizes trends in agricultural area production, productivity and major crops essential to the state's economy. The aim of this paper is to analyze that in 2021-22, the area under key crops such as rice 46.4, wheat 30.5 and maize 10.0 experienced an increase, while crops like jawar, bajara, cotton jute and mesta saw a reduction in sown area. Interestingly, the area designated for perennial crops such as tea, coffee, and rubber remained stable. In terms of production, rice reached 130.3 million tonnes and wheat 106.8 million tonnes, both showing growth compared to previous years. In contrast, the production of jawar and cotton decreased, while the outputs of tur, mesta, tea, coffee and rubber remained stable.

Productivity metrics show enhancement for most crops, with rice achieving 2809 kg per hectare and wheat 2507 kg per hectare in 2021-22. However, certain crops, including tur, groundnut and tea, decreased in productivity. The findings highlight dynamic changes in crop cultivation patterns, influenced by various factors affecting both area and yield, thereby providing insights for policymakers to enhance agricultural strategies and ensure food security.

Key words: Agriculture, Development, Production, Productivity and Crops.

1. Introduction

Maharashtra is a major state in India, both in size and agricultural significance. The total land area of Maharashtra is 30,771,389 hectares, which is equivalent to 76,037,760 acres. The state has 3.114 million hectares of irrigated land and 118,809 acres of non-irrigated land.

Agriculture plays a vital role in the state's economy. The present study was carried out to examine agricultural development in Maharashtra by measuring the areas, production, and productivity of major crops in the state.

The word 'Agriculture' is originally derived from the Latin terms *Ager* and *Cultura* are the roots of the English word *agriculture*. *Cultura* means cultivation, while *Ager* denotes land or field. Thus, the word "agriculture" refers to the cultivation of land. Agriculture is the foundation of the Indian economy. A significant portion of the nation's income comes from the agriculture sector, although its share has been continuously dropping. Since gaining independence, India's agricultural sector has advanced remarkably. The green, white, yellow, and blue revolutions have all occurred in India. India is the world's top producer of tea, cashew nuts, milk, fruits, and coconuts. It ranks third in rice and tobacco production and second in wheat, vegetables, sugar, and fish. The majority of people reside in rural areas and make their living from agriculture. India ranks second in terms of agricultural production. According to the 2011 census, 54.6% of the population works in agriculture. India's total development is greatly influenced by the agriculture industry, which continues to be the largest economic sector. Therefore, the advancement of Indian agriculture is regarded as a prerequisite for "inclusive growth". The adoption of modern technology has an impact on agricultural development and reduces various risks. With the support of the agriculture sector, people can meet their basic needs. As a result, agriculture is the most significant industry in the world. Sheep rearing, dairy production, sericulture, poultry farming, pisciculture (fish rearing), nurseries, and livestock are all considered forms of agriculture. Agriculture provides food, feed, fiber, fuel, furniture, and raw material for industries. Additionally, it helps preserve the ecological balance of the natural world by producing products through the cultivation of plants and the rearing of animals.

2. Objectives of the Study

The main objective of this study is to examine agricultural development in Maharashtra and the specific objectives are as follows:

4. To examine the area under major crops in Maharashtra.
5. To study the production of major crops in Maharashtra.
6. To study the productivity of major crops in Maharashtra.

3. Research Methodology

For this study, the researcher has used secondary data regarding agricultural development. The data has been collected from the years 2017-18 to 2021-22, focusing on the

area, production, and productivity of major crops in Maharashtra. . The researcher has covered food grains, cereals, pulses and oilseeds crops across the state of Maharashtra.

4. Result and Discussion

4.1. Area under Food grains, Cereals, Pulses and Oilseeds in India (In Million Hectares)

Commodity	2017-18	2018-19	2019-20	2020-21	2021-22
Food grains	127.5	124.8	127.0	129.8	130.5
Cereals	97.7	95.6	99.0	101.0	99.5
Pulses	29.8	29.2	28.0	28.8	31.0
Oilseeds	24.5	24.8	27.1	28.8	29.2

Source: Directorate of Economics & Statistics, Department of Agriculture and Farmers Welfare

The above table shows the trends in area under foodgrains, cereals, pulses and oilseeds in India. In 2017-18, the area under foodgrains was 127.5 million hectares, which increased to 130.5 million hectares in 2021-22. In 2017-18, the area under cereals was 97.7 million hectares, which increased to 99.5 million hectares in 2021-22. In 2017-18, the area under pulses was 29.8 million hectares, which increased to 31.0 million hectares in 2021-22. In 2017-18, the area under oilseeds was 24.5 million hectares, which increased to 29.2 million hectares in 2021-22. From the above analysis, it can be observed that the area under foodgrains, cereals, pulses and oilseeds increased in 2021-22 compared to 2017-18.

4.2. Area under Major Crops in India (In Million Hectares)

Commodity	2017-18	2018-19	2019-20	2020-21	2021-22
Rice	43.8	44.2	43.7	45.8	46.4
Wheat	29.7	29.3	31.4	31.1	30.5
Jawar	5.0	4.1	4.8	4.4	3.8
Bajara	7.5	7.1	7.5	7.7	6.7
Maize	9.4	9.0	9.6	9.9	10.0
Tur	4.4	4.6	4.5	4.7	5.0
Gram	10.6	9.6	9.7	10.0	10.9
Groundnut	4.9	4.7	4.8	6.0	5.7
Rapeseed and Mustard	6.0	6.1	6.9	6.7	8.1
Sugarcane	4.7	5.1	4.6	4.9	5.1
Cotton	12.6	12.6	13.5	13.3	11.9
Jute	0.7	0.7	0.6	0.6	0.6
Mesta	0.1	0.0	0.0	0.0	0.0
Tea	0.6	0.6	0.6	0.6	0.6

Coffee	0.4	0.4	0.4	0.4	0.4
Rubber	0.8	0.8	0.8	0.8	0.8
Potato	2.1	2.2	2.1	2.2	2.2

Source: Directorate of Economics & Statistics, Department of Agriculture and Farmers Welfare

The above table illustrates the trends in area under major crops in India. In the year 2017-18, the area under the rice crop was 43.8 million hectares, and it was increased to 46.4 million hectares in the year 2021-22. The area under wheat in the year 2017-18 was 29.7 million hectares, and it was increased to 30.5 million hectares in the year 2021-22. The area under jawar in the year 2017-18 was 5.0 million hectares and it was decreased up to 3.8 million hectares in the year 2021-22. Area under Bajara in the year 2017-18 was 7.5 million hectares and it was decreased up to 6.7 million hectares in the year 2021-22. Area under Maize in the year 2007-18 was 9.4 million hectares, which increased to 10.0 million hectares in 2021-22. The area under Tur in 2017-18 was 4.4 million hectares, which increased to 5.0 million hectares in 2021-22. The area under Gram in the year 2017-18 was 10.6 million hectares, and it was increased up to 10.9 million hectares in the year 2021-22. The area under Groundnut in the year 2017-18 was 4.9 million hectares, and it was increased up to 5.7 million hectares in the year 2021-22. The area under Rapeseed and Mustard in the year 2017-18 was 6.0 million hectares, which increased to 8.1 million hectares in 2021-22. The area under Sugarcane in the year 2017-18 was 4.7 million hectares and it was increased up to 5.1 million hectares in the year 2021-22. The area under Cotton in the year 2017-18 was 12.6 million hectares and it was increased up to 13.3 million hectares in the year 2020-21 and then decreased to 11.9 in the year 2021-22. The area under Jute in the year 2017-18 was 0.7 million hectares and it was decreased up to 0.6 million hectares in the year 2021-22. The area under Mesta in the year 2017-18 was 0.1 million hectares and it was decreased up to 0.0 million hectares in the year 2021-22. The area under Tea in the year 2017-18 was 0.6 million hectares and it was constant to 0.6 million hectares in the year 2021-22. The area under Coffee in the year 2017-18 was 0.4 million hectares and it was constant to 0.4 million hectares in the year 2021-22. The area under rubber in the year 2017-18 was 0.8 million hectares and it was constant to 0.8 million hectares in the year 2021-22. The area under Potato in the year 2017-18 was 2.1 million hectares and it was increased up to 2.2 million hectares in the year 2021-22. So from the above table it was observed that area under rice, wheat, maize, tur, gram, groundnut, rapeseed and mustard, Sugarcane and Potato increased and the area under jawar,

bajara, cotton, jute and mestad increased. The area under Tea, Coffee and Rubber is remained constant.

4.3. Production of Foodgrains, Cereals, Pulses and Oilseeds in India (In Million Tonnes)

Commodity	2017-18	2018-19	2019-20	2020-21	2021-22
Foodgrains	285.0	285.2	297.5	310.7	315.7
Cereals	259.6	263.1	274.5	285.3	288.0
Nutri/Coarse Cereals	47.0	43.1	47.7	51.3	50.9
Pulses	25.4	22.1	23.0	25.5	27.7
Oilseeds	31.5	31.5	33.2	35.9	37.7

Source: Directorate of Economics & Statistics, Department of Agriculture and Farmers Welfare

The above table shows the production of foodgrains, cereals, pulses and oilseeds in India. In the year 2017-18 production of foodgrains was 285.0 million tonnes and it was increased up to 315.7 million tonnes in the year 2021-22. In the year 2017-18 production of Cereals was 259.6 million tonnes and it was increased up to 288.0 million tonnes in the year 2021-22. In the year 2017-18 production of Nutri/coarse cereals was 47.0 million tonnes and it was increased up to 50.9 million tonnes in the year 2021-22. In the year 2017-18 production of Pulses was 25.4 million tonnes and it was increased up to 27.7 million tonnes in the year 2021-22. In the year 2017-18 production of Oilseeds was 31.5 million tonnes and it was increased up to 37.7 million tonnes in the year 2021-22. It can be seen from the above table that production foodgrains, cereals, pulses and oilseeds was increased in 2021-22 compared to 2017-18.

4.4. Production of Major Crops in India (In Million Tonnes)

Commodity	2017-18	2018-19	2019-20	2020-21	2021-22
Rice	112.8	116.5	118.9	124.4	130.3
Wheat	99.9	103.6	107.9	109.6	106.8
Jawar	4.8	3.5	4.8	4.8	4.2
Bajara	9.2	8.7	10.4	10.9	9.6
Maize	28.8	27.7	28.8	31.6	33.6
Tur	4.3	3.3	3.9	4.3	4.3
Gram	11.4	9.9	11.1	11.9	13.8
Groundnut	9.3	6.7	10.0	10.2	10.1
Rapeseed and Mustard	8.4	9.3	9.1	10.2	11.7
Sugarcane	379.9	405.4	370.5	405.4	431.8
Cotton	32.8	28.0	36.1	35.2	31.2
Jute	9.6	9.5	9.4	9.0	9.9

Mesta	0.4	0.3	0.4	0.4	0.4
Tea	1.3	1.4	1.4	1.3	1.3
Coffee	0.3	0.3	0.3	0.3	0.3
Rubber	0.7	0.7	0.7	0.7	0.8
Potato	51.3	50.2	48.6	56.2	53.4

Source: Directorate of Economics & Statistics, Department of Agriculture and Farmers Welfare

The above table shows the production of major crops in India. Production of Rice in the year 2017-18 was 112.8 million tonnes it was increased up to 130.3 million tonnes in the year 2021-22. Production of Wheat in the year 2017-18 was 99.9 million tonnes it was increased up to 106.8 million tonnes in the year 2021-22. Production of Jawar in the year 2017-18 was 4.8 million tonnes it was decreased up to 4.2 million tonnes in the year 2021-22. Production of Bajara in the year 2017-18 was 9.2 million tonnes it was increased up to 9.6 million tonnes in the year 2021-22. Production of maize in the year 2017-18 was 28.8 million tonnes it was increased up to 33.6 million tonnes in the year 2021-22. Production of Tur in the year 2017-18 was 4.3 million tonnes it was constant to 4.3 million tonnes in the year 2021-22. Production of Gram in the year 2017-18 was 11.4 million tonnes it was increased up to 13.8 million tonnes in the year 2021-22. Production of Groundnut in the year 2017-18 was 9.3 million tonnes it was increased up to 10.1 million tonnes in the year 2021-22. Production of Rapeseed and Mustard in the year 2017-18 was 8.4 million tonnes it was increased up to 11.7 million tonnes in the year 2021-22. Production of Sugarcane in the year 2017-18 was 379.9 million tonnes it was increased up to 431.8 million tonnes in the year 2021-22. Production of Cotton in the year 2017-18 was 32.8 million tonnes it was decreased up to 31.2 million tonnes in the year 2021-22. Production of Jute in the year 2017-18 was 9.6 million tonnes it was increased up to 9.9 million tonnes in the year 2021-22. Production of Mesta in the year 2017-18 was 0.4 million tonnes it was constant to 0.4 million tonnes in the year 2021-22. Production of Tea in the year 2017-18 was 1.3 million tonnes it was constant to 1.3 million tonnes in the year 2021-22. Production of Coffee in the year 2017-18 was 0.3 million tonnes it was constant to 0.3 million tonnes in the year 2021-22. Production of Rubber in the year 2017-18 was 0.7 million tonnes it was increased to 0.8 million tonnes in the year 2021-22. Production of Potato in the year 2017-18 was 51.3 million tonnes it was increased to 53.4 million tonnes in the year 2021-22. So from the above table it was found that Production of Rice, wheat, bajara, maize, gram, groundnut, rapeseed and sugarcane, jute, rubber and potato was increased and jawar, cotton, was decreased in the year 2021-22 as compared to 2017-18 and production of Tur, Mesta and tea coffee and rubber was constant.

4.5. Yield / Productivity per hectare of Food grains, Cereals, Pulses and Oilseeds in India (In kg. / Hectare)

Commodity	2017-18	2018-19	2019-20	2020-21	2021-22
Food grains	2235	2286	2343	2394	2419
Cereals	2657	2752	2772	2824	2895
Pulses	853	757	823	885	892
Oilseeds	1284	1271	1224	1247	1292

Source: Directorate of Economics & Statistics, Department of Agriculture and Farmers Welfare

The above table shows the Yield/Productivity per hectare of Foodgrains, Cereals, Pulses and Oilseeds in India. Productivity of Foodgrains in the year 2017-18 was 2235 kg. per hectare it was increased up to 2419 kg. per hectares in the year 2021-22. Productivity of Cereals in the year 2017-18 was 2657 kg. per hectare it was increased up to 2895 kg. per hectare in the year 2021-22. Productivity of Pulses in the year 2017-18 was 853 kg. per hectare it was increased up to 892 kg. per hectare in the year 2021-22. Productivity of Oilseeds in the year 2017-18 was 1284 kg. per hectare it was increased up to 1292 kg. per hectare in the year 2021-22. From the above table, it was found that productivity of foodgrains, cereals, pulses and oilseeds was increased in the year 2021-22 as compared to 2017-18.

4.6. Yield / Productivity per Hectare of Major Crops in India (In Kg./ Hectare)

Commodity	2017-18	2018-19	2019-20	2020-21	2021-22
Rice	2576	2638	2722	2717	2809
Wheat	3368	3533	3440	3521	3507
Jawar	960	849	989	1099	1110
Bajara	1231	1219	1374	1420	1436
Maize	3065	3070	3006	3199	3349
Tur	966	729	859	914	859
Gram	1078	1041	1142	1192	1260
Groundnut	1892	1422	2063	1703	1759
Rapeseed and Mustard	1410	1511	1331	1524	1458
Sugarcane	80	80	80	84	84
Cotton	443	378	455	451	445
Jute	2517	2569	2706	2591	2774
Mesta	1420	1471	1728	1782	1730
Tea	2210	2121	2138	2017	2113
Coffee	765	767	713	790	797
Rubber	845	792	866	869	938
Potato	24	23	24	25	24

Source: Directorate of Economics & Statistics, Department of Agriculture and Farmers Welfare

The above table shows the productivity of major crops in India. Productivity of Rice in the year 2017-18 was 25762 kg per hectare it was increased up to 2809 kg. per hectare in the year 2021-22. Productivity of Wheat in the year 2017-18 was 3368 kg per hectare it was increased up to 3507 kg. per hectare in the year 2021-22. Productivity of Jawar in the year 2017-18 was 960 kg. per hectare it was increased up to 1110 kg. per hectare in the year 2021-22. Productivity of Bajara in the year 2017-18 was 1231 kg per hectare it was increased up to 1436 kg. per hectare in the year 2021-22. Productivity of Maize in the year 2017-18 was 3065 kg per hectare it was increased up to 3349 kg. per hectare in the year 2021-22. Productivity of Tur in the year 2017-18 was 966 kg per hectare it was decreased up to 859 kg. per hectare in the year 2021-22. Productivity of Gram in the year 2017-18 was 1078 kg per hectare it was increased up to 1260 kg. per hectare in the year 2021-22. Productivity of Groundnut in the year 2017-18 was 1892 kg per hectare it was decreased up to 1759 kg. per hectare in the year 2021-22. Productivity of Rapeseed and mustard in the year 2017-18 was 1410 kg per hectare it was increased up to 1458 kg. per hectare in the year 2021-22. Productivity of Sugarcane in the year 2017-18 was 80 tonne per hectare it was increased up to 84 tonne per hectare in the year 2021-22. Productivity of Cotton in the year 2017-18 was 443 tonne per hectare it was increased up to 445 tonne per hectare in the year 2021-22. Productivity of Jute in the year 2017-18 was 2517 kg. per hectare it was increased up to 2774 kg. per hectare in the year 2021-22. Productivity of Mesta in the year 2017-18 was 1420 kg. per hectare it was increased up to 1730 kg. per hectare in the year 2021-22. Productivity of Tea in the year 2017-18 was 2210 kg. per hectare it was decreased up to 2113 kg. per hectare in the year 2021-22. Productivity of Coffee in the year 2017-18 was 765 kg. per hectare it was increased up to 797 kg. per hectare in the year 2021-22. Productivity of Rubber in the year 2017-18 was 845 kg. per hectare it was decreased up to 938 kg. per hectare in the year 2021-22. Productivity of Potato in the year 2017-18 was 24 kg. per hectare it was constant to 24 kg. per hectare in the year 2021-22. So from the above table it was found that per hectare productivity of Rice, wheat, jawar, bajara, maize, gram, rapeseed and mustard, sugarcane, jute, mesta, coffee and rubber was increased and per hectare productivity of Tur, groundnut and tea was decreased in the year 2021-22 as compared to 2017-18. Productivity of potato is constant.

5. Conclusion

The agricultural landscape changed significantly in 2021-22 compared to 2017-18. The areas under foodgrains, cereals, pulses, and oilseeds all experienced a rise. Areas under crops such as rice, wheat, maize, gram, and rapeseed and mustard increased, whereas areas under

jawar, bajara, cotton, and jute decreased. Similarly, production levels were higher in 2021-22 for several crops, including rice, wheat, maize, gram, and potato. Crops such as jawar, cotton, and tur decreased in production, in contrast to the steady production levels of mesta, tea, coffee and rubber.

The yield of foodgrains, cereals, pulses, and oilseeds also increased, indicating greater operational efficiency. In particular, crops like rice, wheat, and gram, along with maize, rapeseed and mustard, achieved improved yields per hectare in the 2021-22 period compared to 2017-18. Productivity for tur, groundnut, and tea decreased slightly, while potato productivity remained stable. During the period of 2021-22, a positive trend emerged in both the area of crops cultivated and their overall yield, marked by significant growth in major crops and enhanced agricultural productivity.

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9. The Role of Modern Agri-Inputs in Sustainable Agriculture of Maharashtra: Special Reference to Solar Pump Set

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Introduction

Agriculture plays an important role in the Indian economy. Agriculture is a way of life, a tradition which for centuries has shaped the thought, the culture and the economics life of people of India. Growth of agriculture is essential not only to achieve self-reliance at income and wealth resulting in reduction in poverty level. India has formed particular steps on the agricultural front during the last three decades. Much of the credit for this success should go to the several million small farming families that form the backbone of Indian agriculture and economy. Agricultural policy support, production strategies, public investment in infrastructure, research and extension for crop, livestock and fisheries have significantly helped to increase food production and its availability.

Sustainable agriculture development is a holistic approach to farming that aims to meet the present and future food demands while ensuring environmental protection, economic viability, and social equity. In India, where agriculture is the backbone of the economy, sustainability is crucial to address challenges like soil degradation, water scarcity, climate change, and declining farm incomes.

The goal of sustainable agriculture is to optimize resource use, reduce environmental impact, and promote long-term productivity. This involves adopting eco-friendly farming techniques, conserving natural resources, using climate-resilient technologies, and ensuring fair economic opportunities for farmers. By integrating traditional knowledge with modern innovations, sustainable agriculture can enhance food security, improve rural livelihoods, and support a resilient agricultural ecosystem.

India is facing rapid population growth and climate uncertainties, sustainable agriculture development is essential for ensuring a balance between productivity and ecological well-being.

Government initiatives, technological advancements, and community participation play a crucial role in driving this transformation toward a greener and more sustainable future.

Solar energy is the energy harnessed from the sun's radiation. It is a renewable and sustainable source of power that can be converted into electricity or heat. Solar energy is widely used for various applications, including electricity generation, water heating, and powering devices like solar pumps.

A solar pump is a type of water pump that operates using electricity generated by solar panels. It is an eco-friendly and cost-effective alternative to traditional pumps that rely on grid electricity or fossil fuels. These pumps are commonly used for agricultural irrigation, livestock watering, and drinking water supply in remote areas.

Types of Solar Pumps

1. Solar Surface Pumps: Used for moving water from lakes, rivers, or shallow wells.
2. Solar Submersible Pumps: Installed deep inside wells and borewell to extract groundwater.
3. DC and AC Solar Pumps: Based on the type of motor used; DC pumps run directly on solar power, while AC pumps require an inverter.

Objectives

1. To study all types of scheme for solar pump set which implementing by Government in Maharashtra.
2. To study benefits of solar pump set to farmers of Maharashtra.
3. To analyze the electricity saving by using solar pump set.
4. To Analyze the role of solar pump set in sustainable development in agriculture of Maharashtra.
5. Maharashtra.

Schemes for Solar Pump Set

A solar pump is a type of water pump that operates using electricity generated by solar panels. In Maharashtra state Government and Central Government launched schemes for solar pump set.

1. Mukhyamantri Saur Krushi Pump Yojana

The Government of Maharashtra has launched the mukhyamantri saur krushi pump yojana on 01 January 2023 to promote solar energy. Under this scheme the Maharashtra

Government will provide a 95 percent subsidy to the farmers for setup of solar pump set. The Maharashtra government's Mukhyamantri Saur Krushi Pump Yojana (MSKPY) aimed to deploy one lakh solar-powered pumps in three phases. 25000 pumps, 50000 pumps and 25000 pumps.

2. Magel tyala Saur Krushi Pump Yojana

The Government of Maharashtra has introduced Magel Tyala Saur Krushi Pump Yojana in February 2025. This scheme helps farmers who have water but no electricity to run pumps.

3. Pradhan Mantri Kisan Urja Suraksha Evam Utthaan Mahabhiyan

PM-KUSUM Scheme for de-dieselisation of farm sector and enhancing the income of farmers. Under the Scheme, central government subsidy upto 30 percent or 50 percent of the total cost is given for the installation of standalone solar pumps and also for the solarization of existing grid-connected agricultural pumps. Further, farmers can also install grid-connected solar power plants up to 2MW under the Scheme on their fallow land and sell electricity to particular area DISCOM at a tariff determined by state regulator. This scheme is being implemented by the designated departments of the State Government. The PM-KUSUM Scheme allows inter transfer of quantities between all components of the scheme aim to add Solar capacity of about 34800 MW by March 2026 with the total Central Financial support of ₹ 34422 crore.

Features of Schemes

All Schemes of solar pump for agriculture have same features in Maharashtra as follows.

1. Saur krushi pump schemes aims to reach out farmers from remote areas where the agricultural feeder is not possible.
2. The Government will provide solar pumps at subsidised rates for the farmers.
3. Under these schemes, 3HP to 7.5HP solar pumps would be installed along with the lighting system comprising of 2 LED bulbs and 1USB port for mobile charging.
4. That Scheme facilitate to farmers for irrigation with sustainable practices.
5. Solar pump set Schemes of agricultural pumps will get by paying only 10 percent amount to General category farmers and Scheduled Caste and Scheduled Tribes farmers is 5 percent.
6. The amount under these schemes subsidized by the Central and State Governments.
7. Pumps ranging from 3 to 7.5 HP capacity determined by area of the land.

8. Day time power supply for irrigation with the help of sun light.
9. No concern of load shedding and electricity bill.
10. Supplier company provides five year repair guarantee, including insurance.

State wise Beneficiaries of Solar Pump Set

State Name	Total Sanction No.	Total Installed No.	State Name	Total Sanction No.	Total Installed No.
Andman & Nikobar	34	0	Madhhya Pradesh	59400	7325
Arunachal Pradesh	700	429	Maharashtra	505000	290444
Assam	4000	0	Manipur	1150	78
Chhattisgarh	10000	0	Meghalaya	3035	98
Goa	900	100	Mizoram	1700	40
Gujrat	18212	8762	Nagaland	265	65
Haryana	197655	145261	Odisha	16441	5640
Himachal Pradesh	1270	764	Punjab	33000	12952
Jammu & Kashmir	5000	2125	Rajsthan	162914	94579
Jharkhand	42985	31305	Tamil Nadu	5200	4187
Karnataka	41360	1846	Tripura	10895	3737
Kerala	8	8	Uttar Pradesh	110948	58926
Ladakh	1400	0	Uttarakhand	5685	813
India	1239157	669484			

Source: WWW.pmkusum.mnre.gov.in

As above chart mentioned all over India Government sanctioned 1239157 Solar Pump set and Installed 669484 Pump Set in India till 31 January 2025. It obeserved that the Maharashtra state go first rank in sanction and installation of solar pump set panel with 505000 sanction and 290444 instalation. Last rank in state Kerala with 8 sanctions solar pump set. Zero instalation in Assam, Chattishgarh and Ladakh.

Benefits of Solar Pump Set

Solar pump sets offer several benefits in agriculture, making them a sustainable and cost-effective solution for irrigation.

1. Cost Savings: Reduces dependency on expensive diesel or grid electricity, lowering long-term operational costs.

2. Renewable Energy Source: Utilizes solar power, reducing carbon emissions and environmental impact.
3. Low Maintenance: Fewer moving parts lead to lower maintenance costs compared to diesel or electric pumps.
4. Reliable in Remote Areas: Ideal for off-grid regions where electricity supply is inconsistent or unavailable..
5. Long Lifespan: Solar panels and pump sets have a long operational life, providing sustainable benefits.
6. Government Incentives: Government offers subsidies and financial aid to promote solar pump adoption.
7. Reduces Fuel Dependency: Eliminates reliance on fossil fuels, shielding farmers from fuel price fluctuations.
8. Easy Installation and Operation: User-friendly and does not require complex infrastructure.
9. Pollution Control: Zero pollution created by using Solar Pump set.

Drawbacks of Solar Pump Set

1. Weather Dependent – Efficiency reduces on cloudy or rainy days, affecting water availability.
2. Limited Operation at Night – Without battery backup, solar pumps do not work after sunset.
3. Battery Replacement Cost – If used with batteries for energy storage, maintenance and replacement costs can be high.
4. Dust and Maintenance Issues – Panels need regular cleaning to maintain efficiency, which can be challenging in dusty areas.

Conclusion

In Maharashtra state approximately 2300 MW electricity is wanted for agricultural use. Economic view of using electrical or oil engine for irrigation for farming is expensive. Calculation of HP and Vats 1HP is equal to 746 vats it means 3HP pump uses 2238 vats in one hour. Approximately farmer runs pumps 8 hours in a day. 3HP pumps use 17904 vats electricity, 17.6 units (1000 vats=1 unit in one hour) for 8 hours.

Production of electricity with help of Thermal power station and Hydropower station. Both practices want a lot of money, land, coal and water. Indian thermal power station prefers imported coal instead of Indian coal because of quality. Imported coal consumes more foreign currency. Hydropower station needs a lot of capital, machinery and land. Thermal power station generates air pollution, water pollution, coal ash disposal, land degradation, noise pollution and radioactive emissions and increases temperature.

Solar pump set is most useful tool as modern agri-inputs in sustainable agriculture. There is a need for greater promotion of use of renewable and solar energy. With the help of solar pump farmers save money and water. Animal, snake can not harm to farmers because maximum solar pump sets work at sunlight time. Solar pump sets are a sustainable and cost-effective solution for agricultural irrigation. It reduces dependency on fossil fuels, lower operational costs, and provides a reliable water supply, especially in remote areas. While they have some limitations, such as high initial costs and weather dependence, their long-term benefits such as environmental sustainability, government subsidies, and minimal maintenance make them a smart investment for modern farming. With advancements in solar technology, solar pumps are becoming more efficient and accessible, helping farmers achieve energy independence and water security.

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10. Sustainable Development in Maharashtra's Poultry Industry: Issues and Future Outlook

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Abstract

The poultry industry in Maharashtra plays a pivotal role in the state's agricultural economy, providing livelihoods to millions and contributing to food security. However, this industry faces several challenges including disease outbreaks, environmental concerns, poor infrastructure, and market volatility. This paper aims to analyze these issues, explore sustainable practices, and provide insights into the future of the poultry sector. Using both primary and secondary data, this study examines the economic, social, and environmental impacts of poultry farming in Maharashtra. The findings suggest that while the industry has substantial growth potential, it requires strategic policy interventions, improved infrastructure, and the adoption of sustainable farming practices to ensure long-term viability. The paper concludes with recommendations for stakeholders to adopt eco-friendly technologies and sustainable practices to overcome existing barriers and enhance future growth prospects.

Keywords: Poultry farming, sustainable development, Maharashtra, environmental impact, market challenges, infrastructure, policy interventions, growth prospects.

Introduction

Poultry farming is one of the most significant segments of the agricultural industry in Maharashtra. The state contributes significantly to India's poultry production, particularly in broiler and egg production. However, the poultry industry in Maharashtra is facing increasing pressure due to various challenges such as disease management, environmental degradation, market fluctuations, and the lack of adequate infrastructure. As the demand for poultry products continues to rise, it is essential to explore sustainable practices to address these challenges and ensure the industry's long-term viability.

This paper explores the key issues and prospects for the sustainable development of the poultry sector in Maharashtra, with a focus on balancing economic growth with environmental and social responsibility

Objectives

1. To identify the primary challenges faced by the poultry industry in Maharashtra.
2. To examine the impact of unsustainable practices in poultry farming on the environment and the economy.
3. To explore potential sustainable farming techniques that can be implemented in the state's poultry sector.
4. To assess the policy environment and propose recommendations for improving the sustainability of the poultry industry in Maharashtra.
5. To evaluate the economic and social prospects for the future of the poultry industry with a focus on sustainability.

Methodology

This research adopts a mixed-methods approach, combining qualitative and quantitative analysis.

1. Data Collection

- **Primary Data:** Surveys and interviews were conducted with poultry farmers, industry experts, and stakeholders in Maharashtra. These interviews provided insights into the challenges faced by farmers and the adoption of sustainable practices.
- **Secondary Data:** Analysis of government reports, industry publications, and academic articles was conducted to gather existing data on the state of poultry farming in Maharashtra.

2. Data Analysis

- Qualitative data from interviews was analyzed using thematic analysis to identify key challenges and opportunities for sustainability.
- Quantitative data, including production statistics and economic data, was analyzed to evaluate the financial viability and market trends in the poultry industry.

3. Case Studies

- Case studies of successful sustainable poultry farms in Maharashtra were examined to identify best practices and successful models for sustainable development.

Findings

1. Disease Management

Impact

- Avian Influenza (AI) and other diseases like Newcastle disease or salmonella can devastate poultry populations, leading to the culling of infected birds. These outbreaks can cause widespread economic loss, reduced supply, and disruptions to both local and international trade.
- Disease outbreaks can also result in stricter regulations, including trade bans, which further reduce market access for poultry farmers.
- Health concerns related to zoonotic diseases (diseases that can transfer from animals to humans) also raise consumer concerns, further complicating the industry's reputation.

Challenges

- Inadequate biosecurity measures at farms and during transportation increase the risk of disease transmission.
- Resistance to vaccinations or ineffective vaccines can also limit disease prevention efforts.
- The high density of poultry farms in certain regions increases the likelihood of rapid disease spread.

Solutions

- Improving farm biosecurity, such as limiting access to farm premises and controlling animal movement, can help reduce disease outbreaks.
- Research into more effective vaccines and treatments for poultry diseases.
- Government support for disease surveillance programs and rapid response mechanisms.

2. Environmental Impact

Impact

- **Waste Management:** Poultry farming generates large amounts of waste, including manure, feathers, and dead birds. If not managed properly, this waste can lead to soil and water pollution, contributing to eutrophication in nearby water bodies.
- **Water Usage:** Poultry farming consumes significant amounts of water for drinking, cleaning, and processing. In regions with water scarcity, this becomes a major environmental concern.
- **Carbon Footprint:** Large-scale poultry farming contributes to greenhouse gas emissions through feed production, poultry transport, and energy usage on farms. This makes it a significant contributor to climate change, particularly through methane emissions from manure and the energy-intensive processes of poultry production.

Challenges

- Inefficient waste management practices, such as improper disposal of manure, can lead to contamination of groundwater and surface water.
- High feed consumption results in increased agricultural land use, which in turn contributes to deforestation and habitat destruction.
- Poultry farming in regions with water scarcity can exacerbate water shortages, especially in arid climates.

Solutions

- Implementing sustainable farming practices like manure composting and using waste as fertilizers for crops can help mitigate waste-related issues.
- Water conservation measures such as water recycling, rainwater harvesting, and more efficient water use in farms can reduce environmental pressure.
- Investing in renewable energy and energy-efficient technologies in poultry farms can help lower the carbon footprint.

3. Market Volatility

Impact

- Poultry markets are highly susceptible to fluctuations in demand and price volatility. This can be driven by factors such as changing consumer preferences, shifts in global trade policies, and supply chain disruptions.
- Events like global pandemics, inflation, or natural disasters can significantly impact demand, leading to sharp declines in prices, reduced consumption, or trade barriers. Similarly, an oversupply can push prices down, hurting farmers' profitability.
- Global supply chains can also lead to volatility due to unforeseen disruptions, such as transportation delays or trade bans following disease outbreaks.

Challenges

- Producers often face difficulty forecasting demand, leading to overproduction or underproduction.
- Price instability makes long-term planning and investment difficult, especially for smallholder farmers.
- Large-scale producers may be more insulated from market volatility, but small farmers often bear the brunt of price fluctuations.

Solutions

- Governments and industry bodies can provide risk management tools like subsidies or price stabilization programs.
- Investment in market intelligence and more sophisticated demand forecasting tools can help farmers plan production better.
- Diversification into other poultry-related products (such as processed goods) may help reduce dependence on fresh poultry prices.

4. Lack of Infrastructure

Impact

- Cold Storage Facilities: The lack of adequate cold storage facilities is one of the key barriers to ensuring the freshness and shelf life of poultry products, especially in rural and developing areas. This can result in spoilage, which impacts the profitability of poultry farmers.

- **Transportation Infrastructure:** Poor roads, limited access to transportation networks, and inadequate logistics systems can delay deliveries and result in losses, especially in regions where farmers rely on distant markets. This leads to increased costs and wastage.

Challenges

- Poor infrastructure increases the cost of getting products to market, reducing profitability.
- Inability to store products properly affects the quality and safety of poultry, which can hurt consumer confidence and demand.
- It makes it difficult for farmers to expand into regional or international markets.

Solutions

- Investment in rural infrastructure, including improved roads, bridges, and cold storage systems, would help to reduce losses and improve efficiency.
- Public-private partnerships could facilitate the construction of adequate cold chains and transportation infrastructure.
- Technology solutions, such as mobile apps for logistics coordination, can help small farmers access better market connections.

5. Regulatory Issues

Impact

- **Lack of effective regulations:** In some countries, the absence of clear and enforceable regulations surrounding animal welfare, environmental sustainability, and disease control can result in unsustainable practices. For instance, there may be inadequate regulations on waste disposal or water usage.
- Inconsistent or poor enforcement of food safety standards can affect the quality of products and lead to contamination risks, which ultimately damage consumer trust.
- Policy gaps also contribute to unfair competition between large industrial producers and small-scale farms, with smaller operations struggling to comply with high standards without the necessary support.

Challenges

- There may be a lack of capacity within regulatory bodies to monitor and enforce rules.
- Inconsistent or conflicting policies between regions or countries can create confusion for farmers.
- The need for regulations that promote sustainability without burdening small-scale farmers with excessive compliance costs.

Solutions

- Governments should work on creating a cohesive regulatory framework that balances economic growth with sustainability. This includes clear regulations on environmental impact, animal welfare, and food safety.
- Incentivizing sustainable practices through grants, subsidies, or tax benefits can encourage farmers to adopt better practices.
- Streamlining regulations to reduce red tape and support smallholder farmers would improve compliance and overall productivity

1. Prospects for Sustainable Development

- Technological Innovations: Adoption of automation, efficient feed management systems, and disease control technologies can improve farm productivity.
- Sustainable Farming Practices: Practices such as organic poultry farming, waste recycling, and renewable energy sources (solar, biogas) can help reduce environmental impacts.
- Government Support: Policy initiatives like subsidies for sustainable farming, better insurance schemes, and infrastructure development can create a conducive environment for growth.
- Market Expansion: There is a growing demand for organic and sustainably produced poultry products, which can open new market opportunities for local farmers.

Conclusion

The poultry industry in Maharashtra has significant potential for growth, but it faces substantial challenges that need to be addressed for sustainable development. The adoption of sustainable practices, coupled with supportive policies, can ensure the industry's future growth while minimizing environmental and economic risks. It is essential for the government, farmers,

and industry stakeholders to collaborate in creating a framework that promotes environmentally friendly farming practices, improved infrastructure, and effective disease control mechanisms. The future of Maharashtra's poultry sector lies in balancing productivity with sustainability.

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11. Environmental vs. Ecological Economics: Two Paths to Sustainability

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Abstract

The pursuit of sustainable development necessitates a critical examination of economic frameworks and their relationship with the environment. This paper contrasts two prominent schools of thought: environmental economics and ecological economics, highlighting their distinct approaches to integrating nature into economic planning. Environmental economics, evolving since the mid-20th century, seeks to incorporate sustainability into existing market-driven systems. It emphasizes valuing nature financially and utilizing market-based mechanisms like carbon trading and environmental taxation to achieve efficient resource allocation. While acknowledging the importance of environmental considerations, it generally maintains a belief in continued economic growth alongside sustainable practices. Ecological economics, a more recent discipline emerging in the late 1980s, fundamentally challenges the concept of unlimited economic growth. It posits that the economy functions within the Earth's finite ecological system, thus advocating for a steady-state economy that respects planetary boundaries. Prioritizing conservation, renewable resources, and ecosystem protection, it promotes policies that limit resource consumption to sustainable levels. The transition to a sustainable future requires a significant shift in economic paradigms. While the challenges are substantial, the relatively recent intensification of environmental problems offers hope for potential reversal. A balanced approach, incorporating insights from both environmental and ecological economics, is crucial. This involves embracing innovation, prioritizing renewable resources, fostering localized sustainability, and ultimately redefining prosperity beyond purely financial metrics. By rethinking economics as a tool for harmonious coexistence with nature, humanity can strive towards a future that meets present needs while safeguarding the planet for generations to come.

Keywords: Environmental Economics, Ecological Economics, Sustainability

As the world strives for sustainable development, two key economic perspectives shape the debate: environmental economics and ecological economics. While both acknowledge the importance of nature in economic planning, their approaches differ significantly.

Environmental Economics

Integrating Markets with Sustainability, market-driven solutions. Environmental economics has been evolving since the mid-20th century. The idea of tracking natural resources was introduced as early as the 1950s, and by the 1960s, rising pollution levels led to regulations and environmental taxes on industries. This field integrates nature into conventional economic models, emphasizing that natural resources and environmental degradation should be accounted for in national budgets.

However, environmental economics still relies on market-driven solutions to allocate resources efficiently. Market-based strategies like carbon trading, environmental taxation, and natural resource accounting are widely adopted worldwide. The core belief remains that economic growth can continue while incorporating sustainability measures—nature is valued in financial terms, but development is not compromised.

Ecological Economics: Rethinking Growth for a Sustainable Future

In contrast, ecological economics emerged in 1987, introduced by researchers Herman Daly, Joan Martinez, Ann Jansen, and Robert Costanza. Their goal was to connect economic systems with environmental sustainability, leading to the establishment of a new discipline and a dedicated journal.

Unlike environmental economics, ecological economics challenges the notion of unlimited economic growth. It argues that the economy operates within the Earth's finite system, meaning resource consumption must align with planetary limits. This approach prioritizes conservation, renewable resources, ecosystem protection, and localization over globalization. Instead of relying solely on markets, it advocates for policies that maintain a steady-state economy—where economic activity respects natural boundaries.

The Road to Sustainable Development

Shifting from current economic systems to sustainable models is no small task, but history offers hope. The environmental challenges we face today have intensified over the past two to three centuries—just a brief moment in geological time. This suggests that, with the right strategies, reversing some of the damage is possible in the coming decades.

Transitioning to sustainability requires a step-by-step approach. While we may not have a perfect blueprint yet, we can shape an economic framework that balances progress with environmental responsibility. The future depends on our ability to rethink economics—not just as a tool for growth, but as a means to coexist harmoniously with nature.

Conclusion

The journey toward sustainability demands a fundamental shift in how we perceive economic growth and environmental responsibility. While environmental economics seeks to integrate sustainability within traditional market systems, ecological economics challenges the very notion of limitless growth, advocating for an economy that respects planetary boundaries. Both perspectives offer valuable insights, but the path forward requires a balanced approach—one that embraces innovation, conservation, and equitable resource distribution.

As history shows, the environmental crises we face today are relatively recent, meaning that solutions are still within our reach. By adopting smarter policies, prioritizing renewable resources, and fostering localized sustainability, humanity can transition toward an economic system that not only meets present needs but also safeguards the future. The key lies in rethinking prosperity—not just in terms of financial wealth, but in our ability to live in harmony with the planet.

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12. Zooplankton Configuration and Seasonal Deviation in density Panchaganga River near Ichalkaranji Area, Kolhapur District Maharashtra India

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Abstract

The present research paper deals with the study of Zooplankton composition and seasonal variations in Panchaganga river near Ichalkaranji area district Kolhapur M. S. India during the period from June 2022 to May 2023. A total of 21 species were found in the river among these 9 species belong to rotifers, 5 belong to copepods, 5 belong to Cladocera's and 2 species belong to Ostracoda. Numerically rotifers were dominant group throughout the study period. This study of season wise zooplankton analysis showed average abundance of species in winter season, lower in monsoon season and maximum occurrence in summer season due to different environmental condition of river water body water.

Keywords: Zooplankton – Configuration– Deviation- Panchaganga River - Ichalkaranji

Introduction

Information on species diversity richness evenness and dominance species evolution on biological physical and chemical component of the ecosystem is essential to understand detrimental changes in Environment and its ecosystem. Among all the other species the zooplanktons are the free floating and microscopic animal found in aquatic ecosystem. The zooplanktons are important for fishes as they are used as source of food. The Zooplanktons are classified in various groups viz. Cladocera, Copepoda, Rotifer and Ostracoda. Many workers have studied the zooplanktons of fresh water bodies both in India and abroad. The biodiversity of phytoplankton and zooplankton are also rich in nature (Kangasabapathi and Rajan, 2010). Zooplanktons are playing important role in biomonitoring of water pollution (Tylor et al., 2014). The availability of food is more due to decomposition of organic matter and the density of zooplankton might be high due to fewer predators (Shivashankar et al. 2013). The study of

zooplankton is necessary to evaluate the fresh water reservoir in respect to their ecological and fishery status (Goswami and Mankodi, 2012).

The Zooplanktons community fluctuates according to physicochemical parameter of the environment, especially Rotifer species change with biotic factors (Karuthapandiet al., 2012). The abundance and assemblage composition of zooplanktons are depending upon the dominance of water birds, fish, macroinvertebrates and their food preference, (Russell et al., 2006). On the similar line Jafari et al. (2011) studied the zooplankton diversity and compositions are correlated to the physicochemical environment of the Haraz River. Zooplanktons are heterotrophic in nature and play important role in food web by link primary producers to higher trophic level. The Zooplankton abundance was declined due to connection with redistribution number of individual in a water body less possibilities to stay in eutrophic zone where photosynthesis occurs (Dhembare, 2011). Zooplanktons are important in nutritive level, temperature, and pollution used to determine the health of an ecosystem (Purushothama et al., 2011). From the earlier work on the zooplanktons, it appears that studies have been done on the seasonal variation and zooplankton diversity in river but negligible work has been carried out on composition and seasonal variation in zooplankton in Panchaganga River near Ichalkaranji area and its villages. The objective of present study is to determine zooplankton composition and seasonal variation of Panchaganga River near Ichalkaranji area.

Materials and Methods

Study area: The Panchaganga river runs along the villages like Ingali, Chandur, Rangoli Shirdone, Abdul, Lat, etc. in Kolhapur district. It is situated at 16°39'05.6"N 74°26'44.9"E.

Collection of samples and biological analysis

The survey of Zooplanktons from Panchaganga River near Ichalkaranji area was carried out from June 2022 to May 2023. Water samples were collected monthly between 9 am to 11 am. The data was articulated seasonally as summer, winter, and Monsoon. Then plankton samples were collected through 50 liters of water by standard plankton net made up bolting silk cloth No. 20 and the collected samples were fixed in 4% formalin. Needham and Needham, (1966). The Zooplankton are identified with the help of standard literature up to generic level by using standard keys of Adoni et al. (1985), Edmondson (1959), Pennak (1978),

Reddy (1994), Dhanapathi (2000), Bhoyain and Asmat (1992). The qualitative and quantitative analysis of the organism is carried out by Sedgwick rafter cell as per the standard methods APHA (1998).

Result and Discussion

The present study reports the zooplankton diversity composition from the Panchaganga river near Ichalkaranji area District Kolhapur (M.S.) India. In total, 21 species of zooplanktons belonging to families and 4 classes viz. Rotifera, Cladocera, Copepoda and Ostracoda were recorded from the Panchaganga river along the villages like Ingali, Chandur, Rangoli Shirdone, and Abdul, Lat, The class Rotifera represents 9species, Cladocera 5species ,Copepoda 5 species and Ostracoda 2 species.The species recorded during the study with their occurrence in summer monsoon and winter presented in table 1. Purushothama et al. (2011) studied the physico chemical profile and zooplankton community composition in Brahmana Kalasi tank, Sagara, Karnataka. Their study reports 18 species of Zooplanktons from the Brahmana Kalasi Tank. Likewise, several records on hand about zooplankton diversity, abundance, composition and seasonal variation from the different fresh water bodies (Jayabhaye, 2010; Jadhav et al., 2012; Watkar and Barbate, 2012; Annalakshmi and Amasth, 2012; Singh et al., 2012; Gaike et al., 2012).

Table.1-Species composition of zooplankton at study area during June 2022 to May 2023

Sr. no	Zooplankton Groups	Family	Name of species	Summer	Winter	Monsoon
1	Rotifera	Brachionidae	<i>Brachionuscaudatus</i>	+	+	+
2			<i>Brachionusfalcatus</i>	+	+	+
3			<i>Brachionusforficula</i>	+	+	+
4			<i>Brachionuscalyciflorus</i>	+	+	+
5			<i>Brachionusdiversicornis</i>	+	+	+
6			<i>Keratellachochlearis</i>	+	+	+
7			<i>Keratellatropica</i>	+	+	+
8			<i>Keratellacrassa</i>	+	+	+
9	Cladocera	Filiniidae	<i>Filiniaopoensis</i>	+	—	—
10		Moinidae	<i>Moina micrura</i>	+	+	+
11			<i>Moina Brachiata</i>	+	+	+
12		Chydoridae	<i>Chydroussphaericus</i>	+	+	+
13			<i>Bosmina longirostris</i>	+	+	+
14		Sididae	<i>Diaphanosomasarsi</i>	+	+	+
15		Diaptomidae	<i>Mesocyclops</i>	+	+	+
16			<i>Undinulavalgaris</i>	+	+	+
17			<i>Thermocyclops</i>	+	+	+
18			<i>Microcyclops</i>	+	+	+
19			<i>Nauplius</i>	+	+	+
20	Ostracoda	Cyprididae				
21			<i>Stenocypris</i>	+	+	+
22			<i>Heterocypris</i>	+	+	+

Table.2 - Seasonal variation of various zooplanktons density from study area

Sr. no	Zooplankton groups	Summer	Winter	Monsoon	Grand Total
1	Rotifera (No/L)	592	389	251	1232
2	Cladocera (No/L)	349	248	149	746
3	Copepoda (No/L)	398	320	198	916
4	Ostracoda (No/L)	147	101	48	296
5	Total. Zooplanktons (No/L)	1486	1058	646	3190

Plate 1

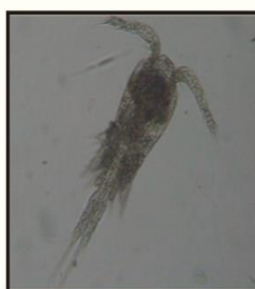
Zooplankton of Panchaganga River Near Ichalkaranji area M.S, INDIA.*Thermocyclops.**Microcyclop**Moina brachiata**Moina micrura**Bosmina longirostris**Chydorus sphaericus**Diaphanosoma sarsi**Stenocypris.*

Plate 2

Zooplankton of Panchaganga River near Ichalkaranji area M.S.India



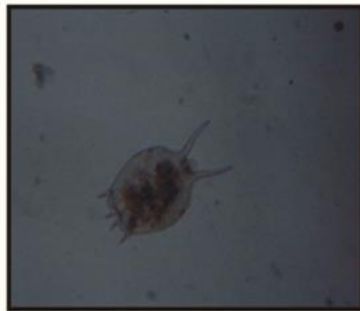
Brachionous forficula



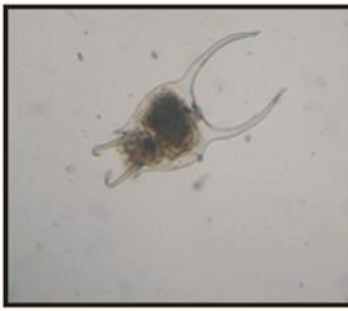
Brachionus diversiconis



Brachionus calyciflorus



Brachionous caudatus



Brachionous falcatus



Keratella crassa



Keratella chochlearis



Keratella tropica



Filinia opoliensis



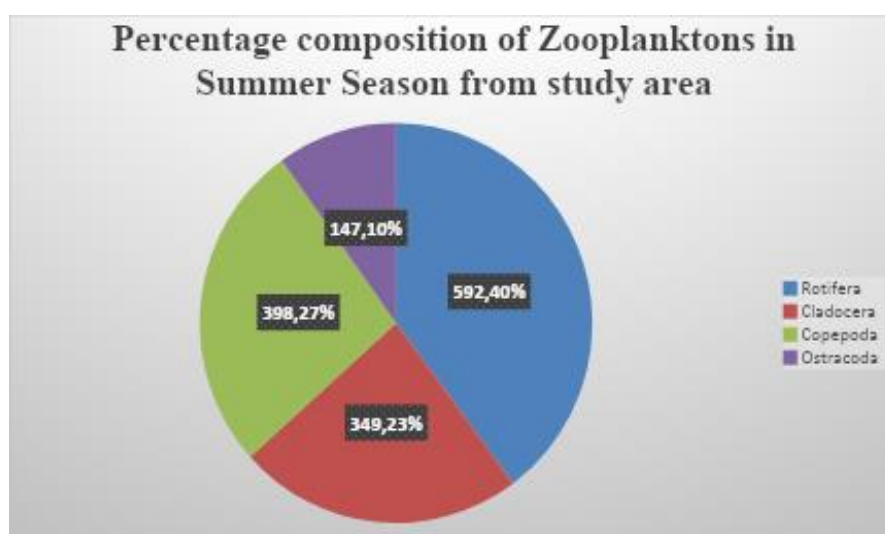
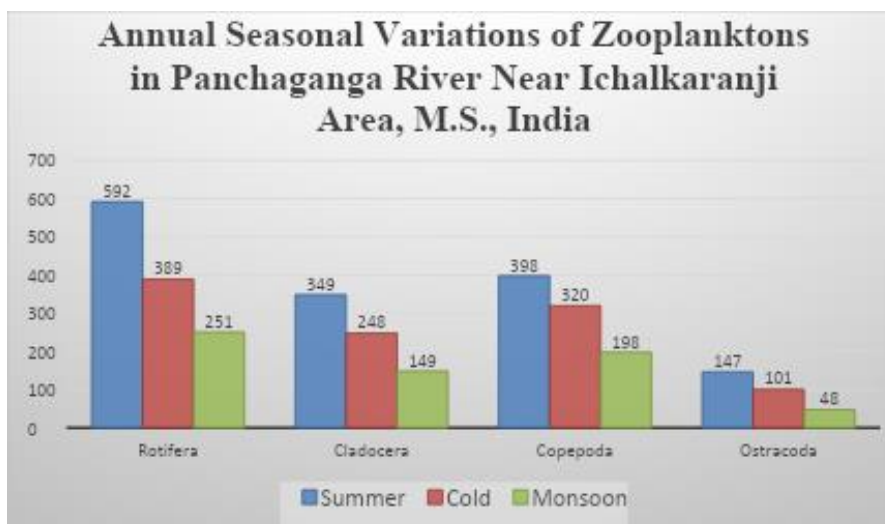
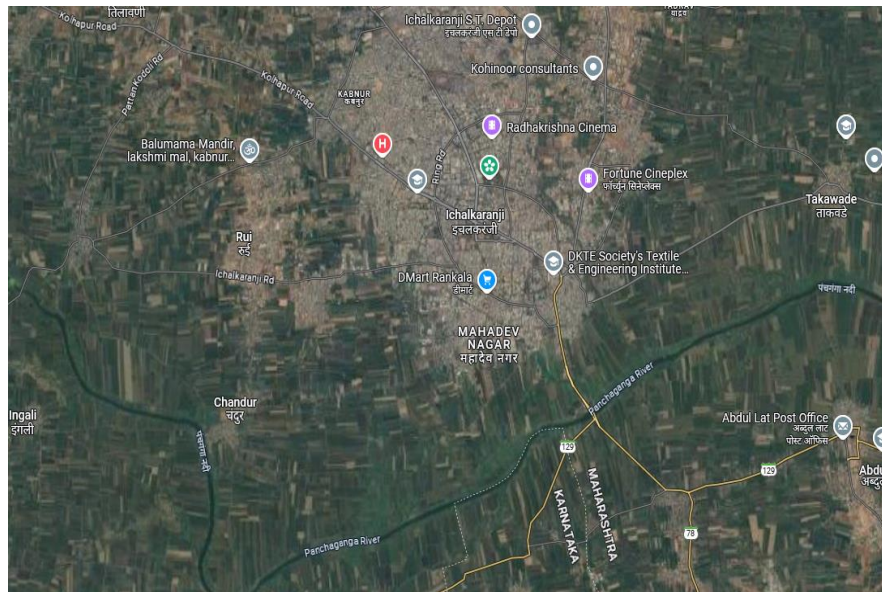
Mesocyclops

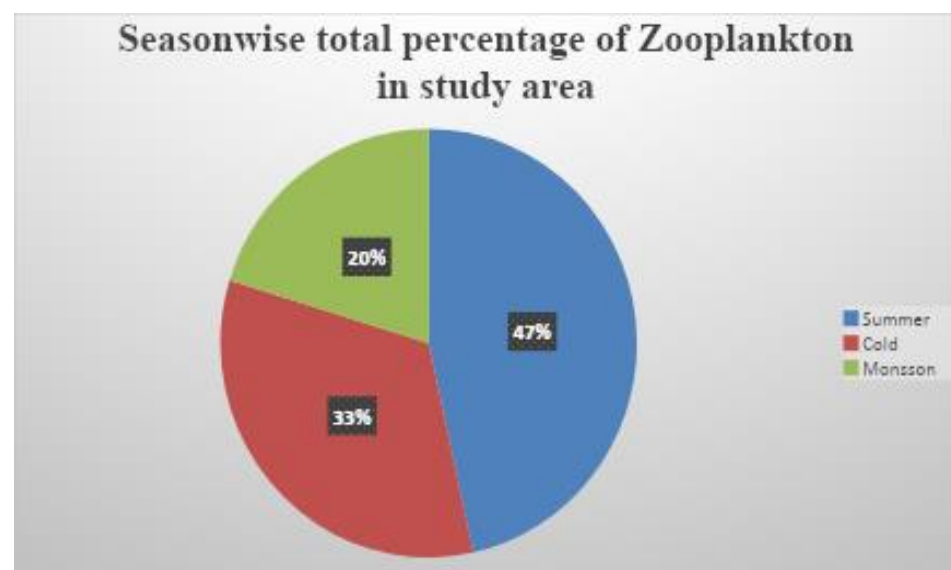
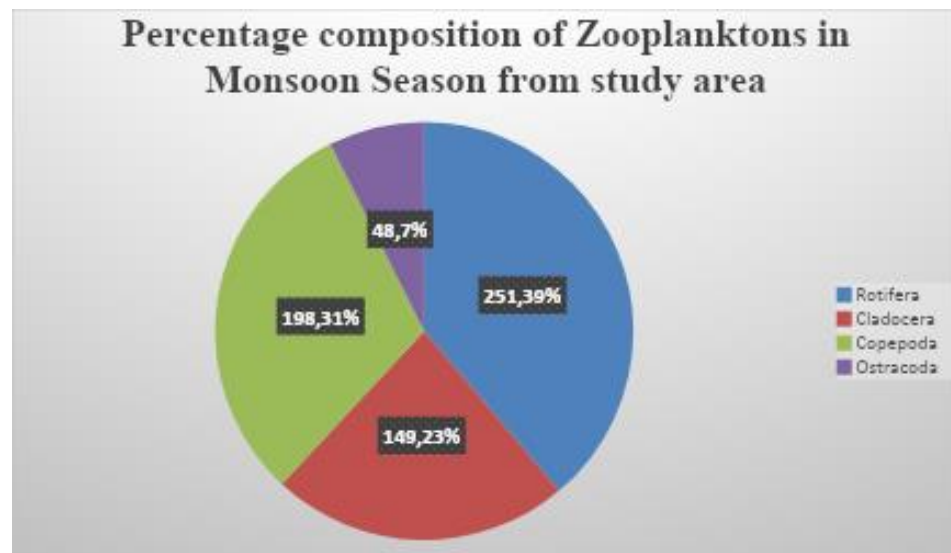
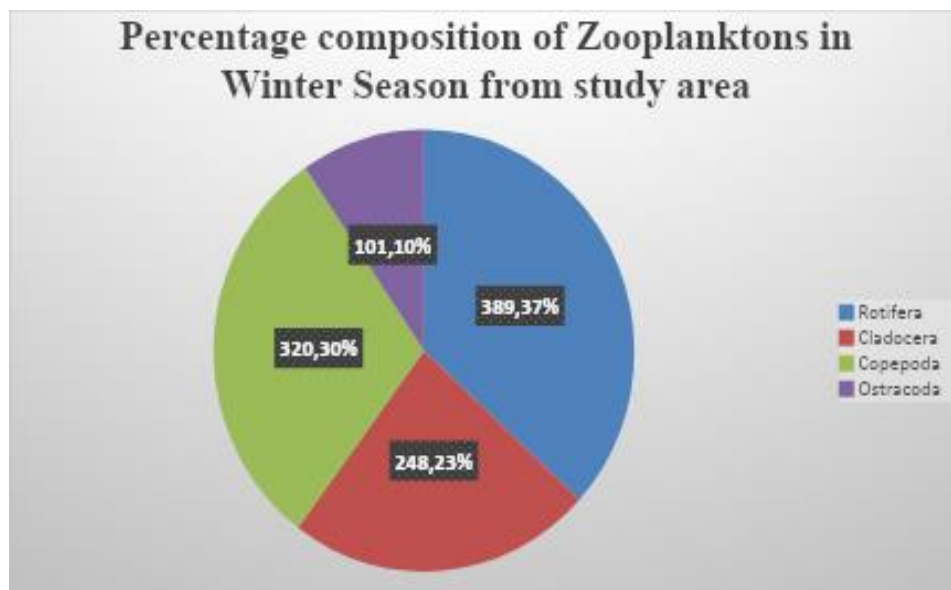


Cyclops nauplis



Undinula Valgaris

Fig.1 Satellite view of Study area



Rotifera were the dominant group among the Zooplankton community with 9 species. The Brachionus, Keratella, and Filinia were showed 39 % population of total zooplankton community. Where as in the Cladocera, the Moina, Chydorus, Bosmina, Diaphanosoma are presented 23% population of total zooplankton community. In the Class Copepoda, the Mesocyclops, Microcyclops, Undinula, Thermocyclops, Nauplius were 29 % and in the class Ostracoda. Heterocypris and Stenocypris were 10% out of total population in Zooplankton community. On the similar line, Jose and Sanal Kumar (2012) carried out a study on seasonal variation in the zooplankton diversity of river Achencovil and reported that in summer, rotifers were dominated (39.36%) followed by copepods (33.53%) and cladocera (27.11%). The cladocera was higher abundance during pre monsoon (41.41%) and monsoon (45%) while copepods formed the dominant group during post monsoon season (42.01%). During the present study, the population density was high in summer (47%) followed by winter (33 %) and monsoon season (20%) (Fig.6). The Filinia genus was observed only in summer season. The total zooplankton density was high in summer season followed by winter and Monsoon (Fig.2). In the summer season percent composition was as follows, Cladocera (23%), Copepoda (27%), Ostracoda (10%), Rotifera (40%) (Fig.4), the winter percent composition of Rotifera was 37%, cladocera (23%), copepod (30%) Ostracoda (10%), (Fig.3). In monsoon season percent composition of Rotifera was (40%), Cladocera (23%), copepod (30%), Ostracoda (7 %), (Fig. 5). Similar observations were reported by Ramakrishna (2014) from Yelahanka lake, Manickam et al. (2014) from Thoppaiyar reservoir Dharampuri district, South India and Gayathri et al. (2014) from Doddavoderhalli lake, Bangalore, Karnataka (Table 2).

The population density, composition and abundance of zooplanktons varies according to the season and type of freshwater body, its physicochemical parameters and biotic components was studied by different workers (Thirupathaiah et al., 2011; Patel et al., 2013). The result of present study indicated that zooplankton were maximum in summer season because of favorable environmental condition. The present information on the zooplankton composition and seasonal variation from the Panchaganga River near Ichalkaranji area (M.S.) India is helpful for further diversity and conservation studies of invertebrates from Panchaganga River. It will be also useful to create awareness of water pollution and maintenance of river aquatic ecosystem in future.

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13. Role of Artificial Intelligence (AI) in development of India

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Abstract

Present review article aimed to summarise the prime role of Artificial Intelligence (AI) in major sectors including Agriculture, education, healthcare, robotics and manufacturing and finances. AI is most ruling technology in overall world as well as in India. In our country this technology proven most useful to overcome challenges due to increasing population like maintenance of health, disease control, food demand and safety, employment and financial growth. The application of AI is now increasing with great advancement, introduction new assistance and protocol. The inclusion of AI becoming easier and more useful too. Whatever else may be a particular sector or field may any situation AI started foot printing in very effective manner.

Keywords: AI, Education, Healthcare, Agriculture, Finance, India.

Introduction

Artificial Intelligence (AI) is a field of computer science which deals with the development of intelligent computer systems, which are capable to perceive, analyse and react accordingly to the inputs. It is well-known fact that humans are considered as the most intelligent and smart species on earth, as they able to think, apply logic, do reasoning, understand the complexity, and make decisions on their own. They can also do planning, innovation, and solve problems to a greater extent. One of most magical innovation by human being is they tried to create a “man-made *Homo sapien*” species, which can be related to the world of computers in the form of AI (which are Artificial, i.e., manmade, and Intelligence, i.e., has thinking power).¹

India has a unique opportunity to apply the technology to solve some of its biggest problems such as shortage of healthcare facility and low quality of education, etc. It is not possible to meet the target of providing good healthcare or quality education using conventional methods. AI technology provides an alternative to achieve the same.

Now India being the fastest growing economy with the second largest population in the world, has a significant stake in the AI revolution. Recognising AI's potential to transform economies and the need for India to strategise its approach, Hon'ble Finance Minister, in his budget speech for 2018 – 2019, mandated NITI Aayog to establish the National Program on AI. Recently the start of this year, NITI Aayog has partnered with several leading AI technology players to implement AI projects in critical areas such as agriculture and health etc.²

Key techniques in AI

AI encompasses several key techniques and technologies that enable machines to exhibit intelligent behaviour and capabilities like Human do. Some of the prominent AI techniques and technologies include:

- **Machine Learning (ML):** ML algorithms enable machines to learn from data and improve their performance over time. Through training on large datasets, machines can identify patterns, make predictions, and classify information. ML techniques, such as supervised learning, unsupervised learning, and reinforcement learning, are widely used in diverse applications.
- **Natural Language Processing (NLP):** NLP focuses on enabling machines to understand, interpret, and generate human language. It involves techniques like text analysis, sentiment analysis, language translation, and speech recognition, which have applications in areas such as customer service, chatbots, and language processing.
- **Computer Vision:** Computer vision techniques allow machines to analyze and interpret visual information from images or videos. This technology finds applications in areas such as image recognition, object detection, facial recognition, and autonomous vehicles.
- **Robotics and Automation:** AI-powered robots and automation systems are capable of performing tasks autonomously or in collaboration with humans. Robotic process automation (RPA) automates repetitive tasks, while robots equipped with AI capabilities can handle complex tasks in industries such as manufacturing, healthcare, and logistics.³

Role of AI in different Sectors

AI technologies now become most popular and rapidly applicable in each and every sector due to its versatile mode of working like human rather more efficiently than that, and now

there is great revolution occurring in the era of AI. The present article aimed to paint fine picture of importance of AI in growth of our Nation. The topic revolves around the Role of AI in development of India with respect to important sectors like Health, Education,

1. AI in Healthcare

The integration of Artificial Intelligence into healthcare has opened new avenues for enhancing patient care, optimizing healthcare operations and advancing public health initiatives. AI proving its potency in wide domains of health sectors.

- **Diagnostic Assistance:** AI algorithms have significantly improved the accuracy and efficiency of disease diagnosis, based on data from medical imaging, genetic testing and biometric sensors. In medical imaging, for example, AI-driven tools analyze X-rays, MRI scans and CT scans to detect anomalies such as tumours, fractures, and signs of neurological disorders with precision, often surpassing human capability.
- **Genetic data analysis:** where AI excels, offering insights into a patient's predisposition to certain diseases and conditions. By analysing genetic markers and variations, AI algorithms can predict the risk of genetic disorders, enabling preventative measures or early treatments tailored to the individual's genetic makeup.
- **Treatment Personalization:** AI's role in personalizing treatment is transformati. AI models analyze vast datasets, including genetic information, environmental factors, and patient history, to predict individual patients' most effective treatment plans. This approach enhances the efficacy of treatments, minimizes side effects, and reduces the trial- and- error process.
- **Patient Monitoring and Care:** AI has revolutionized patient monitoring and care, mainly through wearable technology and remote monitoring systems. These AI-enabled devices continuously collect health data such as heart rate, blood pressure, glucose levels, and sleep patterns, providing real-time insights into the patient's health status.
- **Healthcare Operations:** AI applications streamline healthcare operations, improving efficiency, reducing costs, and enhancing patient satisfaction. AI tools automate administrative tasks such as appointment scheduling, patient triage, and billing, freeing healthcare professionals to focus on patient care. Resource allocation algorithms optimize medical equipment and hospital beds.

- **Public Health and Epidemiology:** AI is crucial in analyzing disease patterns, predicting outbreaks, and informing public health strategies. AI systems process vast amounts of data from various sources, including health records, social media, and environmental sensors, to track and predict the spread of diseases. ⁴

1. AI in Agriculture

Agriculture is Any economy's foundation for sustainability, essential to long-term economic growth and structural transformation. Agriculture used to be restricted to the production of crops and food. Nowadays, agriculture provides the majority of people's income, boosts GDP, contributes to national trade, lowers unemployment, supplies raw materials for other industries' production, and generally advances the economy.

- **Drone imaging:** It can help with thorough field analysis, crop monitoring, and field scanning. Drone data and computer vision technologies will work together to make sure farmers respond quickly. Data fed from drone image could bring forth alerts in real time which would accelerate precision farming.
- **Weather & Price Forecasting:** Many times it is difficult for the farmers to make the right decision for harvesting, sowing seeds, and soil preparing due to climate change. But with the help of AI weather forecasting, farmers can have information on weather analysis, and accordingly, they can plan for the type of crop to grow seeds to sow and harvest the crop. Price forecasting helps farmers maximize their profit by providing them with precise information about crop prices for the upcoming few weeks.
- **Health Monitoring of Crops:** The crop quality widely depends on the soil type and nutrition of the soil. Various factors degrading the soil quality day by day and it is hard to determine it. To resolve this issue, AI based mobile application Plantix was developed to identify deficiencies in soil, including plant pests and diseases.
- **Agriculture Robotics:** Robots are being employed extensively to carry out difficult jobs in a variety of industries, primarily manufacturing. AI robots are also taught to inspect crops for quality identify and manage weeds, and harvest crops more quickly than a human. **Intelligent Spraying:** AI sensors enable the rapid detection of weeds and the identification of areas impacted by weed growth. Herbicides can be accurately sprayed in these locations to minimize the need for herbicides while also saving time and crop damage.

- **Disease Diagnosis:** Plant leaf images are segmented into surface areas such as background, diseased area, and non-diseased area, image sensing and analysis. After that, the unhealthy or infected region is clipped and sent to the lab for additional testing. This provides further support in identifying pests and detecting dietary deficiencies.
- **Water and resource management:** Artificial intelligence (AI) can assist optimize water usage by monitoring soil moisture levels, weather patterns, and crop water requirements.⁵

3. Applications of AI in education

AI is frequently utilized in teaching, learning, and administration. AI applications support social learning, supporting integrated group teaching based on learning models, and facilitating participation in online communities.

- **Intelligent Tutoring Systems** Intelligent tutoring systems leverage artificial intelligence (AI) to deliver individualized learning experiences, making them increasingly powerful educational tools and feedback.
- **Adaptive Courseware:** Using artificial intelligence and machine learning techniques, adaptive learning software allows for real-time “adaptation” of a student’s learning path, making learning more personalized.
- **Students Grading:** The grading, assignments, projects, quizzes, and presentations are assessed and graded using computer algorithms and machine learning. AI grading may give teachers and students rapid feedback, consistent standards, and tailored recommendations.
- **Administrative Tasks** Systems powered by artificial intelligence (AI) can execute tasks like resource and assignment distribution, attendance monitoring, and grade tabulation very quickly.
- **Global Classroom Possibility:** Artificial Intelligence (AI) has the potential to dismantle classroom barriers, facilitating information sharing and worldwide learning opportunities for students.
- **Learning and instruction** With the aid of AI, educators can grade assignments and provide underachieving pupils with the support they require to succeed.

- Administrative Support Artificial intelligence: AI tools are being used by colleges and universities to power a variety of administrative processes, including scheduling, budgeting, maintenance, information technology (IT), transportation, and student record systems.
- The FAQ Chatbot Chabot's are applications that automate a variety of processes with machine learning (ML) and artificial intelligence (AI), leveraging the experience of educators to free up more time for more crucial facets of teaching.⁶

4. Application of AI in financial services

AI has revolutionized various aspects of financial services, offering advanced capabilities for automation, analysis, and decision-making. AI-powered algorithms play a crucial role in algorithmic trading, enabling automated execution of trading strategies based on predefined rules or predictive models. Machine learning techniques analyse historical market data, identify patterns, and make predictions about future price movements, helping traders to capitalize on market opportunities and manage risk more effectively. AI is instrumental in detecting and preventing fraudulent activities in financial transactions, including credit card fraud, identity theft, and money laundering. Machine learning algorithms analyse vast volumes of transaction data, identify suspicious patterns or anomalies, and flag potentially fraudulent transactions for further investigation.

Natural language processing (NLP) techniques analyse textual data from various sources, such as emails, chat transcripts, and social media, to detect signs of fraudulent behaviour or fraudulent attempts to bypass security measures. AI-driven chatbots and virtual assistants are increasingly being deployed by financial institutions to enhance customer service and engagement. Natural language processing (NLP) algorithms enable chatbots to understand and respond to customer inquiries, provide personalized recommendations, and assist with account management tasks. Chatbots can handle routine customer service queries, such as balance inquiries, transaction histories, and account updates, freeing up human agents to focus on more complex issues and interactions.⁷

Conclusion

AI is transforming various sectors in India, promoting economic sustainability and driving innovation. The integration of AI techniques and technologies in these sectors help to optimize resource utilization, improve productivity, and address societal challenges, contributing to the overall economic growth and sustainability of the country. AI plays a fundamental role in revolutionizing various sectors, fostering innovation, and enhancing productivity. AI in India help to overcome challenges due to increasing population, health of citizens and focusing on employment generation and fostering innovation and entrepreneurship.

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14. The Benefits and Challenges of Urban Co-operative Credit Societies in Solapur District: An Overview

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Abstract

Urban Co-operative Credit Societies (UCCS) in Solapur District play a pivotal role in fostering financial inclusion, empowering local communities, and driving economic growth within urban areas. These societies provide affordable and accessible financial services to populations that are often excluded from traditional banking systems, including low-income households, small businesses, and marginalized groups. This paper explores the benefits and challenges of UCCS in Solapur district, with a focus on their impact on financial inclusion, local economic development, and social welfare. The study highlights the positive contributions of UCCS in facilitating access to credit, savings, and investment opportunities, as well as their role in supporting micro, small, and medium enterprises (MSMEs), particularly in sectors such as textiles, which are prominent in Solapur district. Despite these advantages, UCCS face significant challenges, including regulatory pressures, financial mismanagement, limited technology adoption, political interference, and competition from commercial banks.

Recommendations are provided to address the challenges, such as improving governance, increasing technological integration, expanding financial literacy programs, and reducing political influence. Overall, the research underscores the importance of UCCS in Solapur's socio-economic landscape while offering insights into potential solutions to ensure their sustainability and growth. By embracing modernization and strengthening internal operations, UCCS have the potential to further enhance their role in advancing community development and financial empowerment in the district.

Keywords: Urban Co-operative Credit Societies (UCCS), Local economic development, Affordable financial services, financial mismanagement, financial literacy programs, financial empowerment.

1. Introduction

Co-operative societies represent a unique form of business organization established worldwide to safeguard the interests of lower and middle-class individuals, often considered the weaker sections of society, against exploitation by powerful businessmen. Guided by the motto “Each for all, and all for each,” co-operative societies trace their origins to the early stages of human existence when individuals met their needs through self-sustenance. Over time, the barter system emerged, enabling trade through the exchange of goods in the absence of formal currency. As societies evolved, specialization in occupations and the introduction of money facilitated broader economic exchange, emphasizing the need for cooperation in addressing collective challenges.

In India, poverty remains a significant obstacle to development, with a substantial portion of the population living below the poverty line despite advancements in sectors like IT. Eradicating poverty is critical for India’s progress, requiring the collective effort of all societal segments. To this end, the Government of India has implemented various poverty alleviation programs, including the establishment of credit societies aimed at financially empowering the poor and integrating them into the economic mainstream. These societies play a pivotal role in enhancing financial inclusion and reducing economic disparities, although they face challenges due to changing economic and regulatory landscapes.

Urban Co-operative Credit Societies

Urban Co-operative Credit Societies (UCCS) are financial institutions that operate in urban and semi-urban areas in India, primarily providing credit and other financial services to their members. These societies function on the cooperative model, which means they are owned and managed by the members themselves, with each member having an equal vote in decision-making, regardless of their financial contributions.

UCCS are a part of the cooperative banking sector and provide various services, including savings accounts, loans, and other financial products. They aim to cater to individuals and small businesses who may not have access to traditional banking services. Their primary

focus is on promoting financial inclusion, especially for the economically weaker sections of society.

Key Features of UCCS

1.1. Cooperative Structure: UCCS are based on cooperative principles, where members pool their resources for mutual benefit.

1.2. Member-Owned: The members of UCCS are both the contributors and beneficiaries. Each member has an equal say in the management of the society.

1.3. Financial Services: UCCS provide services like savings accounts, fixed deposits, loans, and insurance, mostly targeting low-income and middle-class urban residents.

1.4. Regulation: UCCS in India are regulated by the Reserve Bank of India (RBI) under the Banking Regulation Act, 1949, and are registered under state or multi-state cooperative societies' acts.

1.5. Profit Distribution: Profits made by UCCS are generally reinvested into the society for the benefit of the members or distributed as dividends.

2. The Role of Urban Co-operative Credit Societies in Solapur District

The role of Urban Co-operative Credit Societies (UCCS) in Solapur district is multifaceted, as they contribute significantly to financial inclusion, economic stability, and social empowerment, particularly for urban poor, small businesses, and underserved populations. UCCS play an essential part in promoting equitable economic growth by addressing gaps in financial services left by traditional commercial banks. Below is a detailed exploration of their role in the economy.

2.1 Promoting Financial Inclusion

UCCS provides financial services to individuals and businesses that may otherwise be excluded from the mainstream banking system. They are particularly beneficial to low-income urban residents and the unbanked or underbanked sections of society. These groups may lack access to credit from traditional commercial banks due to factors such as insufficient credit history, lack of collateral, or geographic location. UCCS helps bridge this gap by offering more accessible financial products, such as small loans, savings accounts, and other services tailored to their needs.

2.2 Access to Affordable Credit

One of the primary functions of UCCS is to provide affordable credit to their members. By pooling resources from the members, UCCS can lend at lower interest rates than commercial banks, helping small businesses, low-income households, and self-employed individuals. These loans often come with more flexible repayment terms and are more accessible than traditional banking loans, which tend to favor wealthier and more creditworthy individuals or businesses.

2.3 Encouraging Savings

UCCS play a crucial role in promoting a savings culture among their members. They offer various deposit schemes, including savings accounts, recurring deposits, and fixed deposits, with competitive interest rates. By encouraging members to save regularly, UCCS contribute to enhancing personal financial security. This, in turn, helps stabilize the finances of urban families, promoting economic resilience in the long term.

2.4 Supporting Small and Medium Enterprises (SMEs)

UCCS are critical in providing financial services to small and medium-sized enterprises (SMEs) in urban areas. Many SMEs face difficulties in accessing credit from large banks, either due to the lack of required collateral or the high-interest rates. UCCS, by contrast, offer lower-interest loans and flexible repayment terms, which helps SMEs manage working capital, buy raw materials, or finance new projects. These businesses are a backbone of urban economies, creating employment opportunities and contributing to local economic development.

2.5 Economic Empowerment and Social Welfare

UCCS serve as a tool for economic empowerment, especially for marginalized and disadvantaged groups. By providing access to credit, savings, and insurance, they promote financial literacy, self-reliance, and sustainable livelihoods. Many UCCS target specific demographics, such as women, low-income families, and senior citizens, enabling them to improve their socio-economic conditions and contribute more effectively to society.

3. Statement of Problem

The Urban Co-operative Credit Societies in Solapur district face numerous challenges, including high administrative expenses and a lack of managerial skills among employees. A key issue lies in balancing the principles of the co-operative movement with the business objectives necessary for financial sustainability. This delicate balance underscores the need for a detailed analysis of their operations and financial health.

4. Research Objectives

1. To analyze the benefits and positive impact of UCCS in Solapur district.
2. To identify and examine the key challenges faced by these co-operatives.
3. To suggest solutions and strategies for improving the functioning of UCCS in Solapur.

5. Research Methodology

The research study employs a survey method for data collection. Primary data will be gathered through personal, direct, and virtual visits to various Urban Co-operative Credit Societies (UCCS). During these visits, the researcher will engage with the management team, conducting interviews and consultations to gather necessary information. The survey questionnaires will be distributed to the relevant individuals, ensuring that the responses provide a comprehensive understanding of the operational and financial aspects of UCCS.

The primary data collected will then be processed using statistical tools for analysis. The analyzed data will be interpreted, compared, and evaluated to draw meaningful conclusions and insights. After gathering completed questionnaires from one UCCS, the researcher will proceed to the next UCCS to continue the data collection process, ensuring the study's thoroughness across various locations.

5.1 Sample Size

The determination of an appropriate sample size is a critical element in any research study, as it directly affects the reliability, validity, and generalizability of the findings. For this research, which examines the asset-liability management and risk management practices of Urban Co-operative Credit Societies (UCCS) in Solapur District, the sample size was calculated based on the total number of active UCCS in the district.

5.2 Population Base

The Solapur district comprises a total of 978 UCCS, of which 668 UCCS are considered active and operational. These 668 UCCS form the population base for this study.

5.3 Sampling Approach

To ensure representativeness and manage feasibility, a decision was made to select 50% of the active UCCS from each of the 11 talukas in Solapur District. This approach ensures diversity while maintaining a manageable sample size, a common practice in social science research.

5.4 Usable Sample Size Adjustment

During the data collection process, it was observed that 96% of the selected sample provided complete and valid responses. The usable sample size was calculated as follows:

5.5 Final Sample Size

The final usable sample size for the study is 320 UCCS, ensuring a high level of data reliability and accuracy. This sample is representative of the UCCS in Solapur District, providing a robust foundation for analyzing their asset-liability and risk management practices.

5.6 Sample Size Calculation Formula

The sample size for each taluka was calculated using a proportional sampling formula $n = \frac{N}{2}$

Where: n = Sample Size

N = Total number of active UCCS in each taluka

Table No. 01

Taluka-Wise Sample Size Distribution

Sr No	Taluka	Total No of UCCS	Active UCCS	Sample Size (50%)	Usable Sample Size (96%)
1	Akkalkot	19	13	7	7
2	Barshi	109	73	37	37
3	Karmala	59	50	24	24
4	Madha	136	78	38	36
5	Malshiras	95	66	33	31
6	Mangalwedhe	93	68	34	32
7	Mohol	71	39	19	16
8	Pandharpur	85	58	29	27
9	Sangola	75	51	25	24
10	Solapur – North	172	131	68	66
11	Solapur – South	64	41	20	20
	Total	978	668	334	320

Source: Secondary Data (<https://sahakarayukta.maharashtra.gov.in>)

6. Benefits of Urban Co-operative Credit Societies in Solapur District

1. Affordable and Accessible Credit

- Lower interest rates compared to formal banking institutions.
- Easy access to short-term and long-term credit facilities for local populations, including migrant workers, small traders, and artisans.

2. Savings and Investment Products

- a. Encouraging saving habits among urban residents, especially through fixed deposits, recurring deposits, and other savings schemes.
- b. Providing investment opportunities for community members.

3. Local Economic Growth

- a. Mobilizing local savings and reinvesting them into the community, supporting local development initiatives.
- b. Facilitating the circulation of money within the local economy and stimulating demand for goods and services.

4. Financial Literacy and Inclusion

- a. Promoting financial literacy through awareness programs and workshops.
- b. Enabling previously excluded sections of society to access banking services, contributing to inclusive growth.

5. Strengthening Community Bonds

- a. The cooperative structure of UCCS fosters a sense of ownership and belonging among members, enhancing social cohesion.
- b. Mutual assistance and peer-to-peer support during economic crises or financial difficulties.

7. Challenges Faced by Urban Co-operative Credit Societies in Solapur**1. Regulatory and Compliance Issues**

- a. The pressure of complying with various regulations laid down by the Reserve Bank of India (RBI) and the Maharashtra State Co-operative Bank (MSCB).
- b. Challenges in aligning with the changing legal framework of the co-operative sector, including mandatory audits, financial disclosures, and capital adequacy norms.

2. Financial Management and Sustainability

- a. Weak financial management practices leading to the risk of insolvency and the inability to raise sufficient capital.
- b. Issues with loan recovery, resulting in non-performing assets (NPAs).
- c. Dependence on government subsidies and limited ability to generate funds independently.

3. Fraud and Mismanagement

- a. Instances of fraud, mismanagement, and corruption within some UCCS in Solapur district, which damage the reputation of the sector.
- b. Lack of proper internal controls, transparency, and accountability in many societies.

4. Competition from Commercial Banks and Private Lenders

- a. Increased competition from national and private banks that offer superior products, more advanced technologies, and a wider network.
- b. Customer preference for larger financial institutions due to their perceived reliability and larger product offerings.

5. Technology Gap

- a. Slow adoption of technology, hindering UCCS' ability to provide digital banking services such as mobile apps, online banking, and digital payment systems.
- b. Limited access to technology and infrastructure in smaller co-operatives in rural or semi-urban areas within Solapur.

6. Political Interference

- a. The influence of local politics and political patronage in the management and functioning of UCCS, leading to inefficiency and a lack of focus on business objectives.
- b. Political interference in decision-making and leadership appointments, which can undermine the operational credibility of these societies.

7. Limited Member Growth and Engagement

- a. Difficulty in attracting new members, especially the younger generation, who may prefer modern banking services over traditional co-operatives.
- b. Low awareness about the potential benefits of membership in UCCS among urban populations in Solapur.

8. Suggestions and Recommendations**1. Improved Governance and Management**

Strengthening the governance framework through better internal controls, transparency, and accountability. Encouraging qualified professionals for management roles to ensure sustainable financial practices.

2. Technology Integration and Digitalization

Encouraging UCCS to adopt modern banking technologies, including mobile banking apps, digital loan applications, and online payment systems. Collaboration with fin-tech firms to upgrade infrastructure and improve the delivery of services.

3. Financial Education and Awareness

Expanding financial literacy programs to educate the urban population, especially the marginalized sections, on the benefits of UCCS. Promoting knowledge of loan products, savings schemes, and investment opportunities available through UCCS.

4. Partnerships for Capital Infusion

Exploring partnerships with national banks, government institutions, and microfinance organizations to increase capital availability and expand operations. Access to low-interest loans or credit lines to fund urban development projects and support small businesses.

5. Reducing Political Interference

Ensuring that the functioning of UCCS remains free from undue political influence and is driven by professional management. Implementing a strict code of conduct and governance standards to prevent corruption and ensure transparency.

6. Youth Engagement and Member Expansion

Creating targeted outreach programs to engage younger generations in UCCS membership.

Offering modern banking products and services that appeal to tech-savvy, young urban dwellers in Solapur district.

9. Conclusion

Summary of Key Findings

UCCS in Solapur district provides a vital service to the urban poor, small businesses, and marginalized communities, promoting financial inclusion, local economic development, and social welfare. Despite their benefits, UCCS face significant challenges related to governance, competition, technology gaps, and political interference.

Future Outlook

With reforms in governance, adoption of technology, and increased financial education, UCCS in Solapur district can overcome challenges and play an even more significant role in community development. The potential for UCCS to become a sustainable and vital financial

resource for the urban population in Solapur remains high, given the right mix of modernization and community engagement.

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15. Sustainable Development: A Pathway for India's Growth

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Summary

Sustainable development is India's chosen path for progress. It refers to meeting the needs of the present without compromising the ability of future generations to meet their own needs. Development largely depends on the use of natural resources, which are nature-made and limited in quantity. No particular society holds ownership over these resources they belong to all living beings.

The modern concept of sustainable development was introduced in the 1987 Brundtland Report. Originally proposed for sustainable forest management, this concept has evolved to encompass economic development, social progress, and environmental protection for future generations. In 2015, the United Nations created the 2030 Agenda for Sustainable Development. The primary goal of sustainable development is to use resources to meet human needs without disrupting the integrity of the planet.

Introduction

A long-lasting state is known as sustainable development. Development that meets the needs of future generations is called sustainable development. It is a multi-dimensional concept that focuses on growth that endures over time. Sustainable development is a natural right of humanity. While enjoying this right, there is often an excessive use of natural resources. If natural resources are used without limits, there will be none left for future generations. Recognizing this, the idea of sustainable development was introduced.

This concept is based on the efficient and careful use of natural resources, promoting material development, social justice, and equality through the use of renewable resources. Sustainable development offers a perspective on both growth and human development, aiming to meet the needs of the present without compromising the ability of future generations to meet their own needs.

The roots of sustainable development can be traced back to the 17th and 18th centuries in Europe, particularly in the ideas surrounding sustainable forest management. Every nation aspires for rapid and holistic development. There are two key interests in this pursuit: first, improving and elevating the standard of living and quality of life for its citizens; and second, establishing the country as an economically advanced nation and a global economic superpower.

Definitions

1. According to the Commission on Environment and Development, "Sustainable development is the kind of development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs."
2. According to David Pearce, "Sustainable development is the sum of social objectives, which includes an increase in per capita income, improvements in health and nutrition, educational progress, equitable access to resources, fair distribution of income, and enhanced freedom."

Both these definitions explain the concept of sustainable development from narrow and broad perspectives. In India, the responsibility of coordinating sustainable development goals has been entrusted to NITI Aayog. Accordingly, NITI Aayog has implemented plans related to the goals and objectives of sustainable development.

The Government of India has been running various programs to achieve these sustainable development goals, such as:

- Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA)
- Beti Bachao Beti Padhao (Save the Girl Child, Educate the Girl Child)
- Sagarmala Project
- Swachh Bharat Abhiyan (Clean India Mission)
- Aadhaar Act

Concept of Sustainable Development

The concept of sustainable development emerged from the understanding that the unlimited exploitation of natural resources would leave nothing for future generations. This idea focuses on the careful and efficient use of natural resources, promoting the use of renewable resources, ensuring material development, and upholding social justice and equality.

The concept of sustainable development first emerged about 35 years ago, in 1987, when the World Commission on Environment and Development presented the report titled "Our

Common Future.” This commission was chaired by Dr. Gro Harlem Brundtland, and since she was responsible for the publication of the report, it is widely known as the Brundtland

Report

The United Nations Development Programme (UNDP) has identified the following key objectives of sustainable development:

- Eradicating poverty
- Increasing access to basic resources and services
- Supporting communities affected by conflicts and climate-related disasters

Importance of Sustainable Development

The importance of sustainable development lies in its focus on economic, social, and environmental aspects, serving as a roadmap for balanced growth. The primary goal of sustainable development is to meet the needs of future generations while protecting the environment.

1. Sustainable development helps control issues like environmental degradation, loss of biodiversity, and climate change.
2. It promotes economic growth.
3. It ensures the conservation of natural resources.
4. It balances the needs of the economy, the environment, and social well-being.
5. It reduces carbon footprints and the emission of toxic substances into the environment.
6. It benefits the entire world, enabling people to live cleaner and healthier lives.
7. It leads to the long-term prosperity of economies through sustainable business practices.
8. It strengthens and safeguards resource-based foundations.

Sustainable development is essential to preserve natural resources, maintain environmental balance, and reduce the impact of climate change. Sustainable business practices improve efficiency, lower costs, and enhance customer loyalty. Moreover, sustainable development creates new job opportunities and fosters innovation.

Sustainable Development Goals

1. To promote inclusive and sustainable economic growth that benefits all members of society.

2. To reduce poverty, inequality, and indebtedness in developing nations, thereby bridging the gap between the rich and the poor.
3. To conserve and protect coastal resources.
4. To develop sustainable agriculture.
5. To ensure access to quality education for all children.
6. To promote social equality by reducing disparities and ensuring that all members of society have access to healthcare and education.
7. To provide resilient infrastructure, promote sustainable industrialization, and encourage innovative research.

Conclusion

Sustainable development is an important contemporary topic that has garnered global attention. It represents a close and harmonious integration of social, economic, and environmental development. Sustainable development is also people-centric. It is a process of economic and social transformation based on cultural or environmental factors and their interactions. The modern concept of sustainable development was introduced in the 1987 Brundtland Report. Originally suggested for sustainable forest management, this concept has evolved to focus on economic growth, social progress, and the protection of the environment for future generations.

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16. Viksit Bharat@2047: Initiatives and Challenges in Education

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"Viksit Bharat@2047" is a big vision for India's future. It means making India a developed country by 2047, when India will celebrate 100 years of independence. This goal was introduced by Prime Minister Narendra Modi and covers many areas like economic growth, taking care of the environment, making society better, and having good governance.

Education is a crucial part of this vision. The National Education Policy (NEP) 2020 highlights the challenges India faces, such as not having enough money and lacking infrastructure, which affect the education system. The policy aims to increase education spending to 6% of India's Gross Domestic Product (GDP), which will require careful planning.

The four pillars of Viksit Bharat are Yuva (Youth), Garib (Poor), Mahila (Women), and Kisan (Farmers). The government has launched initiatives like "Viksit Bharat @2047: Voice of Youth" to involve young people in shaping India's future.

India's vision for Viksit Bharat@2047 aims to transform the country into a developed nation by 2047. Education plays a critical role in achieving this vision, as it is the foundation for developing a skilled and knowledgeable workforce. This paper explores the initiatives and challenges in education that can help achieve the vision of Viksit Bharat@2047.

Keywords: Viksit Bharat@2047, Quality Education, Initiatives, NEP 2020 and Challenges

Introduction

Today, as we stand on the threshold of a new era, every individual, every institution, and every organisation must heed the call to contribute to the realisation of a developed India. Similar to how the youth of previous generations devoted themselves to the pursuit of freedom, we must now commit ourselves to the progress and development of our nation. Drawing inspiration from our historic struggle for freedom teaches us a valuable lesson about unity, dedication and collective action. In the same way that our forefathers fought tirelessly with immense zeal to acquire freedom, we now need to concentrate on the construction of a developed

India. On December 11, 2023, the honourable Prime Minister of India, Mr. Narendra Modi, introduced the “Viksit Bharat @2047” campaign for the youth of India. This campaign was initiated to make India a developed nation in the 100th year of its independence. This campaign includes various aspects of development, such as economic growth, environmental sustainability, social progress, and good governance. [1]

Academic engagement is crucial to evaluate and reframe the mechanisms, effects, and results of these development initiatives within the context of "Viksit Bharat@2047," a concept put forth by our esteemed Prime Minister. This vision of a "Developed India" is dynamic and aligns with our dedication to the five fundamental principles, or "Panch Prana," which encapsulate India's developmental philosophy. These five pillars encompass breaking free from colonial influences, taking pride in our cultural heritage, promoting national unity, encouraging advancement, and cultivating a sense of responsibility. Together, they form a comprehensive developmental framework aimed at fostering equality, satisfaction, and collective prosperity throughout the country.

The developmental initiatives, their effects, and results require scholarly examination to reevaluate and reframe them within the context of "Viksit Bharat@2047," a concept put forth by our Honorable Prime Minister. This vision of a "Developed India" is dynamic, aligning with our commitment to the "Panch Prana" or five pillars that encapsulate India's developmental philosophy. These pillars, which include breaking free from colonial influences, embracing our cultural heritage, promoting national unity, encouraging progress, and cultivating a sense of responsibility, collectively form a comprehensive development model. This approach aims to promote equality, satisfaction, and collective welfare throughout the country.

In developing nations, education serves as a fundamental element of advancement and prosperity. Its importance extends beyond individual benefits to encompass societal, economic, and political domains. Educated individuals are better equipped to handle the intricacies of contemporary life, adjust to changing circumstances, and capitalize on opportunities for personal and professional development. Prime Minister Narendra Modi highlighted this crucial role of higher education institutions in realizing the vision of a developed India. He also emphasized the significant contributions of renowned universities such as Kashi Hindu University, Lucknow University, Visva Bharati, Gujarat Vidyapith, Nagpur University, Annamalai University, Andhra University, and University of Kerala to the Indian Freedom Movement.

There is considerable academic interest in reflecting on and discussing national development. The "Amrit Kaal" landscape has been influenced by numerous successful development initiatives conceived and implemented over the past nine years. During this

transformative period, "Sankalp Se Siddhi" emerged as a guiding principle to ensure the effective execution of development schemes, collectively contributing to a narrative of developmental achievement. Over the past nine years, the Indian government has launched numerous groundbreaking initiatives and programs. These efforts have had a significant impact on both social and economic aspects, fundamentally altering the way of life in the country. Various research studies have documented the transformative effects of these governmental development schemes, highlighting their implementation and outcomes. These initiatives have reshaped both tangible and intangible areas of national development, warranting discussion among academics, researchers, young people, and students.

At both national and state levels, a wide array of initiatives have been implemented to improve the education system. These include key programs such as the National Education Policy 2020, the Samagra Shiksha Abhiyan, and Saksham Anganwadi, among others. Furthermore, these efforts are bolstered by partnerships with various stakeholders and organizations, including UNICEF, UNESCO, and the World Bank.

Objectives

- To analyze the key educational initiatives under "Viksit Bharat@2047."
- To evaluate the impact of existing and upcoming policies on the education sector.
- To identify the challenges and propose recommendations for achieving educational excellence by 2047.
- To explore the role of technology and innovation in shaping the future of education in India.

Literature Review

The transformation of India's education sector has been a subject of extensive study, particularly in the context of long-term national development plans. Various researchers have highlighted the importance of education as a fundamental driver of economic growth and social progress. The National Education Policy (NEP) 2020 is frequently cited as a landmark reform that aligns with the objectives of "Viksit Bharat@2047."

Studies have emphasized the role of digital learning and EdTech in democratizing access to education. Research on online and blended learning methods has shown that digital platforms, such as PM e-Vidya and Swayam, are instrumental in addressing learning disparities across urban and rural areas. However, scholars also point out concerns regarding the digital divide and the need for substantial investment in infrastructure to ensure equitable access.

Vocational and skill-based education is another focal area in the literature, with many researchers stressing the significance of industry-aligned curricula. Reports on the Skill India

Mission and National Apprenticeship Promotion Scheme indicate that skill development programs contribute to employment generation and economic growth. Yet, challenges such as the lack of awareness, uneven participation, and the need for stronger employer engagement persist.

Overall, existing studies affirm that while India has made commendable progress in educational reforms, several challenges remain. The literature highlights the need for targeted policy measures, enhanced investment, and stronger collaboration among stakeholders to achieve the ambitious goals of "Viksit Bharat@2047."

Educational Themes, Schemes, Initiatives, and Policies under "Viksit Bharat@2047"

Some educational themes, schemes, initiatives and policies taken by the Indian Government are elaborated as follows-

The growing empowerment of women in India, known as Nari Shakti, reflects the changing social and cultural scene of the country. In recent years, efforts from various groups have pushed women into more influential roles, breaking old ideas about gender and making society more fair and inclusive. Sukanya Samriddhi Yojana, Stand Up India, PM Mudra Yojana, PM Kaushal Vikas Yojana, Beti Bachao Beti Padhao, PM Matru Vandana Yojana, Sarvada Shaktishali: Breaking the Glass Ceiling in Armed Forces, Women Technology Parks and S&T for Women Empowerment, and Encouraging meritorious girls to pursue careers in underrepresented areas of STEM through Vigyan Jyoti are schemes introduced by the Indian Government.

Samagra Shiksha Abhiyan (National Education Mission), Rashtriya Uchchatar Shiksha Abhiyan (RUSA), Saksham Anganwadi and POSHAN 2.0, National Initiatives for School heads and teachers' holistic advancement (NISHTA), PM USHA, Study in India, Maddhyamik and Uchchatar Shiksha kosh (MUSK), Education Quality Upgradation and Inclusion Programme, Study webs of active learning for young aspiring minds (SWAYAM), and SWAYAM Prabha (Educational TV programme) are few instances of such types of programmes.

Divyang Jan's empowerment represents a critical aspect of inclusiveness and societal advancement. The Indian government is always striving to ensure that Divyangjan people have equal rights and are fully integrated into society. The following are some of the steps that the government has taken to make this happen:

UDID (Unique ID for Persons with Disability), Law for Transgender, Restoring Janjatiya Gourav through Heroes, Van Dhan Vikas Kendra, Technology Interventions for

Disabled and Elderly: Assistive Technologies for Divyangjans. The Indian government has successfully launched the following significant initiatives

Aadhar, Digi-Locker, Jeevan Parman Patra, Digital India, Aatmanirbhar India through Unified Payment interface (UPI), UNG Unified Mobile App for new age technology, State Spatial Data infrastructure (SSDI), Digital financial literacy Campaign, Geospatial Technologies for SMART cities, and the National Academic Depository (NAD).

1.1 Key Educational Themes

- **Digital Education & Ed-Tech Integration:** Leveraging technology for accessible and interactive learning through AI, AR/VR, and adaptive learning platforms.
- **Vocational & Skill-Based Education:** Enhancing employability through industry-aligned training and competency-based assessments.
- **Higher Education Reforms:** Strengthening research, innovation, and global partnerships to improve India's standing in global education rankings.
- **Equity and Inclusivity in Education:** Bridging rural-urban gaps and promoting gender parity, especially among marginalized communities.
- **Lifelong Learning and Continuing Education:** Encouraging upskilling and reskilling through flexible learning pathways and modular certification programs.

1.2 Government Schemes and Policies

1. **National Education Policy (NEP) 2020:** A comprehensive framework aimed at transforming education through multidisciplinary learning and skill-based training.
2. **PM e-Vidya:** Digital learning initiatives for students across the country, including DIKSHA, Swayam, and e-pathshala.
3. **Samagra Shiksha Abhiyan:** Holistic education development at all levels, emphasizing infrastructure, teacher training, and student support.
4. **National Digital University:** Bridging higher education gaps through technology-driven flexible learning opportunities.
5. **Skill India & National Apprenticeship Promotion Scheme (NAPS):** Fostering employability through vocational training, apprenticeships, and industry collaboration.
6. **Ek Bharat Shreshtha Bharat:** Promoting cultural and linguistic exchange among students to enhance national unity.

Initiatives in Education

The government of India has launched several initiatives to improve education in the country, including:

- **National Education Policy (NEP) 2020:** The NEP 2020 aims to transform the education system in India by promoting equity, inclusion, and quality.
- **Digital India Initiative:** The Digital India Initiative aims to promote digital literacy and online education in the country.
- **Rashtriya Uchchatar Shiksha Abhiyan (RUSA):** RUSA aims to improve the quality of higher education in the country.

Educational Challenges and “Viksit Bharat@2047”

2.1 Key Challenges

- a. **Digital Divide:** Lack of internet connectivity and digital literacy in rural areas, limiting access to online learning resources.
- b. **Quality of Education:** Need for skilled teachers, updated curricula, and better learning assessment methodologies.
- c. **Equity and Accessibility:** Bridging socio-economic and gender disparities to ensure inclusive education for all.
- d. **Research and Innovation:** Enhancing India’s global educational competitiveness through increased investment in R&D.
- e. **Infrastructure Gaps:** Need for modernized classrooms, laboratories, and libraries, particularly in government schools and colleges.
- f. **Policy Implementation Barriers:** Challenges in executing policies effectively at the grassroots level due to bureaucratic delays and lack of coordination.

2.2 Recommendations

1. **Expanding Digital Infrastructure:** Providing affordable internet access, smart classrooms, and digital resources to bridge the digital divide.
2. **Strengthening Teacher Training:** Introducing competency-based teacher development programs to enhance teaching quality.
3. **Enhancing Public-Private Partnerships:** Encouraging corporate involvement in education through CSR initiatives and industry-academia collaborations.
4. **Policy Interventions for Inclusivity:** Implementing affirmative action programs to support underprivileged and differently-abled students.
5. **Investment in Research & Innovation:** Establishing research hubs and innovation centers in universities to drive academic excellence.

Conclusion

Achieving "Viksit Bharat@2047" requires a well-structured and inclusive education system. While India has launched progressive initiatives, addressing existing challenges is essential to realizing the vision of a self-reliant and globally competitive nation. Investments in technology, policy reforms, and skill-based education will play a crucial role in shaping the future of India's education system. Collaboration between government, private sector, and civil society will be key to ensuring that education remains a driving force behind India's growth and development.

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17. A Comparative Analysis of Institutional vs. Retail Intraday Traders

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Abstract

This research paper examines the key differences between institutional and retail intraday traders. This research, based on a descriptive qualitative approach, examines the structural advantages of institutional trading while exploring the evolving role of retail traders in modern financial markets. The study underscores the importance of regulatory frameworks, financial literacy, and emerging fintech solutions in bridging the gap between these two groups. The findings provide valuable insights for traders, policymakers, and researchers interested in understanding the dynamics of intraday trading and its broader implications for market efficiency.

Keywords: Institutional Traders, Retail Traders, Intraday Trading, Market Efficiency, Trading Strategies, Algorithmic Trading, Behavioral Finance

1. Introduction

Intraday trading involves buying and selling financial instruments within the same trading day, aiming to capitalize on short-term price movements. The evolution of financial markets has brought significant advancements in trading technologies, allowing different types of traders to participate in intraday trading. However, the landscape is highly competitive, with institutional traders enjoying advantages in terms of infrastructure, automation, and access to real-time data, while retail traders often operate with limited resources and face higher risks.

Institutional traders, such as hedge funds, mutual funds, and proprietary trading firms, utilize advanced algorithmic strategies and high-frequency trading (HFT) to gain an edge in the market. Their ability to execute large volumes of trades at high speeds provides liquidity to the market and often influences short-term price movements. On the other hand, retail traders, comprised of individual investors, depend on personal research, technical indicators, and market

trends to make decisions. They are more susceptible to market volatility, emotional trading, and slippage due to their relatively smaller trade sizes and higher transaction costs. The key objectives of this study are to examine the fundamental differences in the trading behaviors of institutional and retail traders, identify the factors contributing to their respective success rates, and explore the limitations faced by retail traders in competing with institutions. By analyzing trading patterns, market impact, and risk management strategies, this research seeks to provide a comprehensive understanding of the challenges and opportunities within the intraday trading ecosystem.

2. Literature Review

Several studies highlight the impact of institutional trading on market efficiency and price discovery. This section reviews previous research on intraday trading behavior and market impact.

1. **Agarwal & Naik (2021)** studied the impact of algorithmic trading on retail investor performance in India. They found that institutional investors using high-frequency trading had a significant advantage over retail traders in terms of trade execution speed and profitability.
2. **Bansal & Choudhary (2020)** examined the intraday trading behavior of retail investors in Indian stock markets. Their research revealed that retail traders often exhibited herd behavior and were influenced by short-term market fluctuations.
3. **Bhattacharya & Mukherjee (2019)** analyzed the role of institutional investors in Indian stock market volatility. Their findings suggested that institutional trades contributed to market stabilization, while retail traders added to price fluctuations.
4. **Chandra (2017)** focused on behavioral biases in intraday trading among Indian retail traders. The study identified cognitive biases such as overconfidence and loss aversion, which negatively affected retail trading decisions.
5. **Gupta & Mehta (2022)** conducted a comparative analysis of institutional and retail investors' impact on stock price movements in India. They found that institutional traders had a more systematic approach, whereas retail traders were more reactive to market events.

6. **Jain & Srivastava (2021)** explored high-frequency trading and its effects on market efficiency in India. Their study demonstrated that institutional traders using HFT had a competitive edge in exploiting short-term arbitrage opportunities.
7. **Kumar & Sharma (2018)** investigated the effectiveness of retail trading strategies in volatile markets. They found that retail traders using momentum-based strategies often experienced higher losses compared to institutional investors.
8. **Patel & Desai (2020)** studied the role of algorithmic trading in enhancing liquidity and efficiency in Indian stock markets. Their research indicated that institutional trading algorithms significantly improved market depth.
9. **Reddy & Prasad (2019)** examined the survival rate of retail traders in Indian equity markets. Their findings showed that a majority of retail traders exited the market within the first year due to continuous losses.
10. **Verma & Joshi (2021)** analyzed market microstructure and the impact of institutional traders in India. Their study highlighted that institutional traders benefited from privileged access to order flow information, giving them a significant advantage over retail traders.

3. Methodology

This research adopts a descriptive approach to analyze the differences between institutional and retail intraday traders. The study is based on a qualitative analysis of secondary data, including academic journals, financial reports, regulatory filings, and market analysis reports. The research focuses on reviewing existing literature, industry insights, and expert opinions to develop a comparative framework. The study does not involve quantitative data collection or empirical testing but instead relies on a structured evaluation of key factors influencing institutional and retail trading.

4. Comparative Analysis

4.1 Trading Strategies

- **Institutional Traders:** Utilize algorithmic trading, high-frequency trading (HFT), and arbitrage strategies.
- **Retail Traders:** Rely on technical analysis, momentum trading, and news-based strategies.

4.2 Capital and Resources

- **Institutional Traders:** Institutional traders have significant capital, enabling them to take large positions and withstand market fluctuations.
- **Retail Traders:** Retail traders operate with limited capital and often use leverage, increasing their risk exposure.

4.3 Market Impact

- **Institutional Traders:** Institutional traders influence market liquidity and price trends due to large trade volumes.
- **Retail Traders:** Retail traders have minimal impact on market movements but often react to institutional trading activity.

4.4 Risk Management

- **Institutional Traders:** Institutional traders use advanced risk management techniques, including hedging and stop-loss automation.
- **Retail Traders:** Retail traders face challenges in managing risk due to emotional biases and limited risk-mitigation tools.

4.5 Technology and Infrastructure

- **Institutional Traders:** Institutional traders have access to state-of-the-art trading platforms, co-location services, and direct market access (DMA).
- **Retail Traders:** Retail traders rely on broker-provided platforms, which may have latency issues and limited functionalities.

4.6 Access to Information

- **Institutional Traders:** Institutional traders have access to premium research, proprietary data analytics, and real-time market news.
- **Retail Traders:** Retail traders depend on publicly available data, delayed market feeds, and social media analysis.

4.7 Order Execution Speed

- **Institutional Traders:** Institutional traders execute trades in microseconds using automated systems.
- **Retail Traders:** Retail traders experience slower execution speeds due to reliance on brokerage platforms.

4.8 Trading Volume and Liquidity

- **Institutional Traders:** Institutional traders execute large trade volumes, influencing bid-ask spreads.
- **Retail Traders:** Retail traders contribute to market liquidity but on a much smaller scale.

4.9 Leverage and Margin Availability

- **Institutional Traders:** Institutional traders receive preferential margin rates and higher leverage limits.
- **Retail Traders:** Retail traders face stricter leverage regulations and higher margin requirements.

4.10 Regulatory Scrutiny

- **Institutional Traders:** Institutional traders must comply with stringent regulatory oversight, including SEBI regulations.
- **Retail Traders:** Retail traders have fewer regulatory obligations but must adhere to brokerage guidelines.

4.11 Holding Period of Trades

- **Institutional Traders:** Institutional traders often employ ultra-short-term strategies, including high-frequency trading.
- **Retail Traders:** Retail traders may hold positions longer, reacting to trends and signals manually.

4.12 Psychological Factors

- **Institutional Traders:** Institutional traders follow systematic, data-driven strategies with minimal emotional involvement.
- **Retail Traders:** Retail traders are more prone to emotional decision-making and cognitive biases.

4.13 Trading Costs and Fees

- **Institutional Traders:** Institutional traders benefit from lower transaction costs and preferential brokerage rates.
- **Retail Traders:** Retail traders face higher trading fees, commissions, and slippage.

4.14 Diversification of Strategies

- **Institutional Traders:** Institutional traders employ diversified trading models, including statistical arbitrage and market-making.
- **Retail Traders:** Retail traders often focus on a single or limited set of strategies due to resource constraints.

4.15 Market Manipulation Risks

- **Institutional Traders:** Institutional traders can influence price movements through large block trades.
- **Retail Traders:** Retail traders are vulnerable to market manipulation schemes like pump-and-dump strategies.

4.16 Impact of News and Events

- **Institutional Traders:** Institutional traders integrate real-time news sentiment analysis into trading algorithms.
- **Retail Traders:** Retail traders react to news manually, often with delayed responses.

4.17 Profitability and Consistency

- **Institutional Traders:** Institutional traders have a structured approach, leading to consistent profits over time.
- **Retail Traders:** Retail traders face inconsistent returns due to market unpredictability and emotional factors.

4.18 Use of Artificial Intelligence and Machine Learning

- **Institutional Traders:** Institutional traders leverage AI and ML for predictive analytics and trading automation.
- **Retail Traders:** Retail traders have limited access to AI-driven insights and rely on traditional methods.

4.19 Survival Rate in the Market

- **Institutional Traders:** Institutional traders have structured risk management and diversified portfolios, ensuring long-term survival.
- **Retail Traders:** Retail traders have a higher failure rate due to capital limitations and lack of professional training.

5. Findings

1. Institutional traders have a technological and informational advantage over retail traders.
2. Retail traders rely on technical indicators and social trading, which can sometimes be misleading.
3. Institutional traders benefit from lower transaction costs and access to superior execution speeds.
4. Retail traders often struggle with emotional biases, leading to inconsistent trading performance.
5. The role of regulatory frameworks and market transparency in levelling the playing field.
6. The increasing use of AI-based trading tools among retail traders to counter institutional advantages.

6. Conclusion

The study concludes that institutional traders possess significant advantages in terms of technology, capital, and access to real-time market data. Retail traders, while gaining ground through improved platforms and social trading networks, still face numerous challenges such as higher transaction costs, emotional biases, and lack of risk diversification. To enhance retail trading success, educational initiatives, regulatory support, and improved trading tools should be encouraged. Future research could explore the impact of evolving fintech solutions on narrowing the gap between institutional and retail traders.

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18. Agricultural Upliftment from Dudhebhavi Reservoir of Sangli District, Maharashtra, India

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Abstract

Water is most stable compound and universal solvent. It is one of the most priceless gifts of nature. Water is utilized for domestic purpose, for industrial applications, agriculture purpose, as well as for inland fishery.

In Maharashtra, 13% agricultural land is under irrigation. There are 14 districts come under drought prone situation, Sangli is one of them.

Agricultural productivity is very complex phenomenon dependent on various physical, edaphic, socio- economical and technological factors. It is expressed in terms of output per unit of input. It is also a measure of agricultural efficiency depending upon the man made framework to exploit the reservoir. The availability and supply of water through different modes of irrigation is key factor in determining the agricultural production in general.

After construction of Dudhebhavi reservoir in Kavathe-Mahankal tahsil, the cropping pattern in the Dudhebhavi and adjoining villages has been changed. Currently, the major cultivated crops at Dudhebhavi are sugarcane, wheat, gram and grapes are dominant once instead of rain fed crops like jawar, bajara, tur, maize and urid

Attempts have been made to know the significant role in social and financial upliftment of local inhabitants with special reference to agricultural productivity.

Key words: *Agricultural productivity, Dudhebhavi reservoir, Sangli district.*

Introduction

Water, the nector of life and one of the most important natural resources for the entire living organism. The quality of water is of vital concern for mankind since it is directly linked with human welfare. Water is utilized for domestic purpose, for industrial applications, agriculture purpose, as well as for inland fishery.

Agriculture is possible when the water resources are available sufficiently in qualitative and quantitative means. Therefore, there is a close relationship of local inhabitants and wetlands of agriculture purpose. Importance of any water resource in relation to agriculture is estimated in terms of area under irrigation, duration of water resource, number of crops can be grown, number of villages benefited, intensity of lifting of water etc. These are the direct benefits of the farmers but, rising in soil water level is one of the important indirect benefits of wetland.

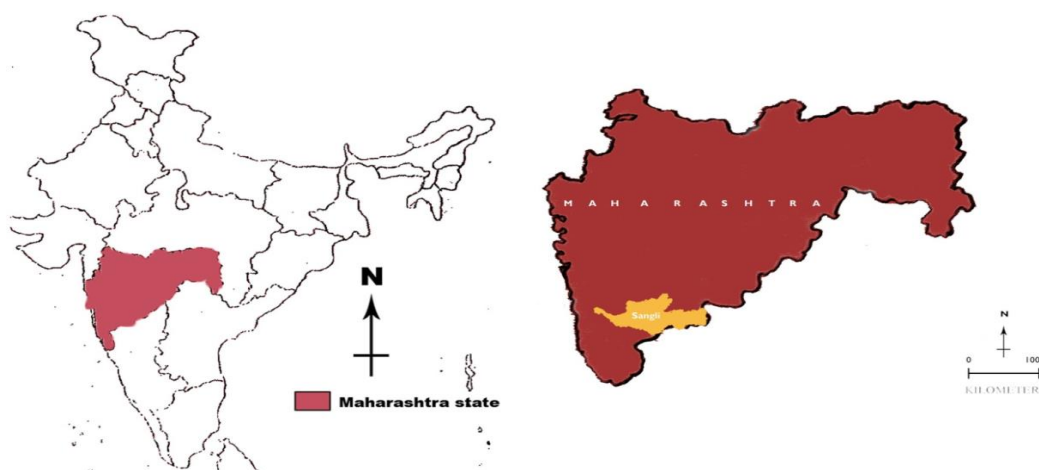
The present work is on Dudhebhavi water reservoir of Kavathe-Mahankal Tahsil with respect to agricultural productivity.

Study Area

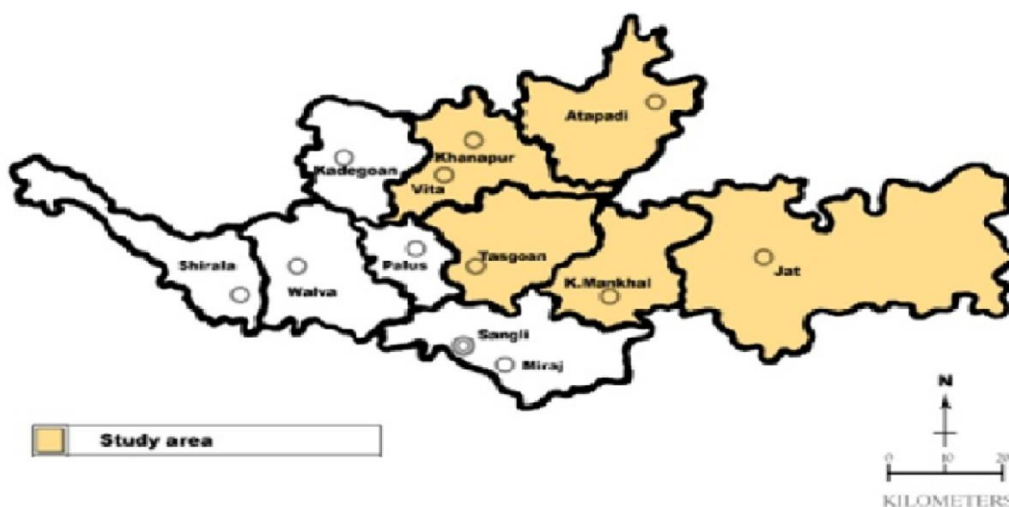
Geographically, Sangli district is divided into two zones. Krishna river basin area and eastern drought prone region of the district which is away from river basin with low rainfall and with typical geographical set up.

Among 10 tahsils of Sangli district Kavathe-Mahankal is one of the tahsil which comes in drought prone region. The tahsil has some minor irrigation reservoirs constructed where rain water is stored from adjoining catchment area. This stored water is being utilized in dry months for many purposes.

The reservoir of Dudhebhavi confines within 80 kilometers distance from Sangli, the head quarter of district.



Map of Sangli District showing Study Area



Map of India, Maharashtra and Sangli District



Satallite images of Dudhebhavi water Reservoir.

Morphometric features of Dudhebhavi reservoir

This is minor reservoir near village Dudhebhavi. The catchment area is approximately 51.76 sq.km. The total storage capacity is 630.90 Mcft and length of dam including slipway is 330 M having 115 M is the length of slipway only, which is clear overflow and earthen type. The height of dam is 19.33 M. The bottom of reservoir is rocky. The total water spread and submergence area is about 152 hectare. In dry months dead storage of reservoir is 18.63 Mcft. The period of construction of reservoir was during 1984 to 1986.

Material and Methods

The socio-economic aspects of these man made reservoir has been studied from Kavathe-Mahankal tahsil. Local people from the Dudhebhavi and adjoining villages were interviewed with the help of questionnaire. The data obtained through questionnaire is analyzed in laboratory and used for discussions and further results. Other visual observations were also made for this reservoir. Secondary data was obtained through survey with respect to agricultural productivity.

The socio-economic survey was conducted adjoining the nearby villages of reservoir randomly. The household head considered as unit of analysis of profile.

Result and Discussions

From human civilization, irrigation is an age old art, to increase the crop production for growing population. The government policies encouraged the farmers to utilize surface water, ground water resources by providing financial support. Doshi and Pujari (1997) reported that in the drought prone districts of Maharashtra, there is changing crop pattern and crop yield. The quantity and quality of human efforts modify the farm practices at farm as well as regional level.

It is necessary to bring more and more land under irrigation and to adopt improved methods of agricultural practices such as use better seeds, high yielding varieties of crops, more fertilizers etc., but the prime necessity would be assured supply of quality water to have high yields.

An efficient cropping pattern may be defined as the sequence of crops to be raised in an area in accordance with the type of soil, quality of water and climatic conditions of the area and other available irrigation resources. It looks quite simple, but needs a comprehensive knowledge of all water management aspects (Sankara 1976, and Yadava 1972).

The factors which affect the water requirement are the soil, plant and environment. The total quantity of water that is essential for raising a successful crop has been given by different scientists, Baier (1962), Zimmerman (1966), Anand and Jain (1978) and Kuppa (1978)

In Maharashtra, there are two main crop growing seasons, Kharip and Rabi. The kharip crops are sown with onset of monsoon and harvested in September – October. The rabbi crops are sown in October- November and harvested in February- March. There are some crops like jowar, cotton, which are grown in both the seasons. Also sugarcane stands in the field for 12 to 14 months spread over both the seasons. Rain fed crops are grown in jirayat or unirrigated land. Here the farmer is entirely dependent on the nature for crop productivity.

Bagayat in contrast is an irrigated land where labour and water intensive farming is practiced. Some crops like sugarcane are entirely dependent on irrigation.

The stored rain water in the reservoir is used for drinking, irrigation as well as for domestic purpose. The fishing activity by the adjoining villagers and farmers is the additional income source.

In the present investigation it has been noticed that constructed reservoir is more beneficial to the marginal land owners and farmers. Land ownership and cropping pattern along these villages are studied.

Singh and Dhillon (1984) emphasized the significance of the use of water resources by irrigation system in regional economic development. Farming in dry lands without irrigation is a suicidal and un-economic venture. Pawar (1989) stated that irrigation is characterized by physiographic variations, which in turn have resulted in the development of the particular source in a particular region. Any future planning of irrigation depends upon the basic and essential aspect of supply of agricultural water from ground and surface resources.

Fig. 1: Cropping pattern of Dudhebhavi after construction of reservoir.

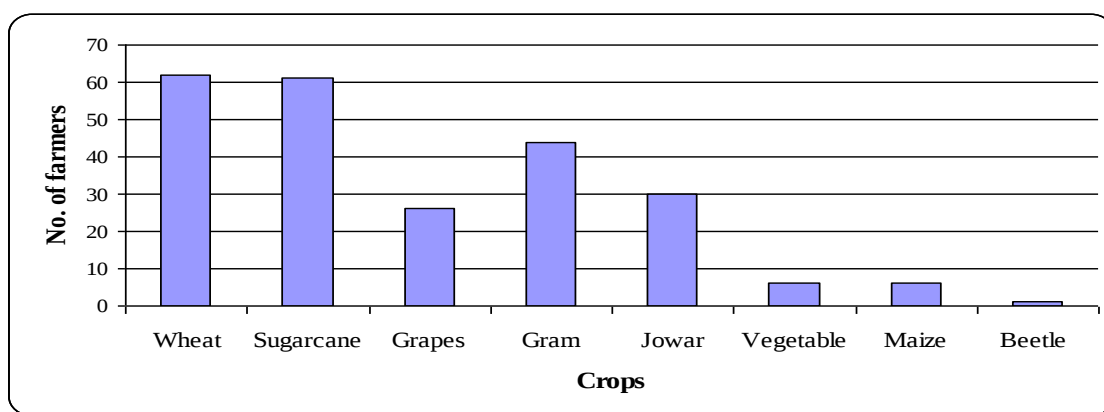


Fig. 1 indicates the cropping pattern of Dudhebhavi. After construction of Dudhebhavi reservoir in Kavathe-Mahankal tahsil, the cropping patterns in the villages have been changed.

Dudhebhavi villagers were earlier growing only the rain fed crops and cereals. But currently, those farmers are cultivating wheat, sugarcane, gram, grapes on a large scale, while vegetables and betel leaf on small scale. The scenario has been changed totally in the studied area.

Datye *et. al.* (1988) have noticed similar type of changes in drought prone region of Sangli district. Patil Alaka (2012) has studied economic valuation of Atpadi, Sidhewadi reservoir in terms of agricultural productivity and Fishery in dry region of Sangli District Doshi and Pujari (1977) have also observed that farmers have shifted to cultivate fruit crops like ber, pomegranate, mango and grapes depending upon the nature of land and water resources. Basically, this reservoir was constructed for irrigation.

Conclusion

The stored water of reservoir is utilized for agricultural irrigation. Cropping pattern is found to be changed in surveyed villages. Majority of farmers have shifted from dry land agriculture to horticulture and commercially important cash crop cultivation.

These reservoir is found more beneficial to improve financial status of marginal land owners by maximum crop yield in the available area but under different seasons of drought prone.

Thus, based on the studies it can be suggested to recharge, to maintain and to increase the water resources in drought prone areas is the need. Further, their management and conservation will lead to sustainability.

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19. Economic Development: Issues and Challenges in India

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Abstract

The Indian economy is one of the largest and fastest-growing economies in the world, marked by a diverse and dynamic structure. With a GDP of approximately \$3.7 trillion in 2024, India ranks as the 5th largest global economy. Its economy is driven by three key sectors: agriculture, industry, and services. While agriculture still employs a large portion of the population, the services sector, particularly information technology (IT), business outsourcing, and finance, plays a dominant role in GDP contribution. Manufacturing and industrial growth have been fostered by initiatives like "Make in India," which aims to boost local production. The economy has witnessed significant reforms in areas such as taxation, financial inclusion, and digital payments. Despite challenges such as unemployment, income inequality, and infrastructure gaps, India continues to expand its global economic footprint through trade agreements, foreign investment, and a focus on self-reliance in key industries. The nation's young population and emerging middle class are expected to remain key drivers of economic growth in the coming decades. Even after developing country it has some issues like income inequality, inadequate infrastructure, unemployment as well as Poverty, these issues requires a holistic approach, combining fair policies, strategic investment in infrastructure, and measures to ensure sustainable growth.

Key words: Development, Growth, Employment, Policy implications etc.

Introduction

The Indian economy is one of the largest and fastest-growing in the world, driven by a diverse range of sectors including agriculture, manufacturing, and services. As a mixed economy, it combines traditional industries with modern, technology-driven sectors. Over the past few decades, India has experienced significant economic growth, with key drivers being information technology, pharmaceuticals, and services like banking and tourism. Despite its progress, India faces challenges such as income inequality, high unemployment rates, inflation,

and inadequate infrastructure. However, the government has implemented reforms aimed at improving ease of doing business, attracting foreign investment, and enhancing the overall business environment.

India's large population and growing middle class make it an attractive market for global companies, though it continues to work towards sustainable development and addressing social disparities. Economic development often faces several challenges that can hinder progress. One major issue is income inequality, where the benefits of growth are not evenly distributed across society. This can lead to social unrest and limit the potential of marginalized communities. Additionally, inadequate infrastructure, such as poor transportation or unreliable energy supplies, can slow down business activity and discourage investment. Corruption and weak governance can also undermine efforts, as resources intended for development may be misappropriated. Furthermore, environmental degradation due to rapid industrialization can harm long-term sustainability, while dependency on external aid or foreign investment can create vulnerabilities in the local economy. Addressing these issues requires a holistic approach, combining fair policies, strategic investment in infrastructure, and measures to ensure sustainable growth.

Objectives and scope of the paper

1. To analyse the key drivers of economic development in India.
2. To evaluate the impact of government policies on economic development.
3. To identify the challenges faced by the agricultural sector in India's economic development
4. To assess the role of technology and innovation in promoting sustainable economic growth in India.

Historical Background and Economic Reforms

Before major reforms, many nations were often primarily agrarian economies with limited industrial infrastructure and technological advancement. For instance, during the colonial era, economies of many countries were structured to serve the interests of colonial powers, often leading to the extraction of resources without significant development of local industries. After independence, many countries in Africa, Asia, and Latin America adopted protectionist policies, focusing on self-sufficiency and gradual industrialization, often through state-led economic planning.

The key drivers of economic development in India: we can break it down into various sectors and factors that contribute to growth. Below is a simple table format outlining the key drivers, along with their descriptions

Key Driver	Description
Human Capital (Education)	Investments in education and skill development contribute to a more productive workforce and innovation.
Infrastructure Development	Development of physical infrastructure such as roads, ports, airports, and utilities that facilitate trade and economic activity.
Industrial Growth	Expansion in key sectors like manufacturing, technology, and services, especially in IT and automotive industries.
Agricultural Productivity	Improvements in agriculture through technology, better irrigation, and government support schemes for farmers.
Foreign Direct Investment (FDI)	Inflow of capital from foreign investors that drives industrial growth, technological transfer, and job creation.
Government Policies & Reforms	Pro-market policies such as GST, labour reforms, and Make in India initiative that encourage entrepreneurship and business growth.
Technological Innovation	Growth in the tech sector, especially the IT and software industries, which boosts productivity and creates global competitive advantage.
Domestic Consumption	Large domestic market driven by a growing middle class, increasing consumer demand for goods and services.
Entrepreneurship & Start-ups	Rise in the number of start-ups, especially in technology, retail, and service sectors, driving innovation and job creation.
Access to Finance & Capital	Improved access to credit and capital for businesses, including microfinance, banking reforms, and venture capital for start-ups.
Trade & Export Growth	Expansion of international trade, especially in IT services, textiles, and pharmaceuticals, promoting economic integration.
Energy Availability	Reliable energy supply from both traditional and renewable sources essential for industrialization and daily life.

India's economic development is driven by a combination of factors that span multiple sectors. Human capital plays a critical role, with investments in education and skill development creating a more productive workforce and fostering innovation. Infrastructure development, including the creation of robust physical assets like roads, ports, and utilities, supports trade and industrial activity. The country's industrial growth, particularly in technology, manufacturing, and services, has become a major driver of economic progress. Agriculture also remains important, with increasing productivity through modern techniques and government initiatives

supporting farmers. Foreign direct investment (FDI) is another key contributor, as it brings in capital, technology, and expertise.

Government policies and reforms, such as the introduction of GST and labour laws, encourage entrepreneurship and business expansion. Technological innovation, especially in IT, positions India as a global leader in software and services. Domestic consumption, driven by a growing middle class, stimulates demand for goods and services. Entrepreneurship and the rise of start-ups are also crucial, fostering innovation and creating jobs. Access to finance and capital, including microfinance and venture funding, supports businesses and entrepreneurs, while the growth of international trade and exports positions India as a key player in the global market. Finally, reliable energy supply from diverse sources is essential for sustaining industrialization and everyday economic activities. Together, these drivers form the backbone of India's ongoing economic development.

The impact of government policies on economic development in India: To evaluate the impact of government policies on economic development in India, we can explore several key policies, their objectives, and the outcomes they have had on the country's economic growth.

The government policies implemented in India over the past few decades have had a profound impact on the country's economic development, contributing significantly to its growth, modernization, and global integration. The **1991 Economic Reforms** marked a turning point, liberalizing the economy and reducing state control, leading to impressive GDP growth, foreign investments, and an expansion of the manufacturing sector. The **Make in India** initiative (2014) aimed to further boost manufacturing, attracting foreign direct investment (FDI), though challenges like inconsistent success across sectors and implementation issues persisted. Meanwhile, the **Goods and Services Tax (GST)** introduced in 2017 streamlined India's tax system, benefiting businesses through a unified tax framework, though initial disruptions, especially among small businesses, posed hurdles. On the social development front, initiatives like **Pradhan Mantri Jan Dhan Yojana** (2014) and **MGNREGA** (2005) have significantly improved financial inclusion and rural employment, respectively, though challenges in utilization and fund mismanagement were encountered. **Swachh Bharat Abhiyan** and **Atal Mission for Rejuvenation and Urban Transformation (AMRUT)** brought significant improvements in urban sanitation and infrastructure, although certain areas, particularly rural regions, struggled with slow implementation. Policies like **Digital India** have played an essential role in expanding internet access and promoting digital literacy, despite the digital divide in rural areas.

Addressing Challenges: Policy Solutions and Recommendations

To address these issues and challenges, governments and international bodies need to implement comprehensive strategies

1. **Inclusive Growth:** Policies should be designed to ensure that economic growth benefits all segments of society. This includes investing in education, healthcare, and infrastructure for marginalized groups. Social protection programs like unemployment insurance and public health can help reduce inequality.
2. **Sustainable Development:** Governments should adopt green technologies and prioritize sustainable development. This includes promoting clean energy, conservation efforts, and urban planning that reduces environmental impact.
3. **Strengthening Institutions:** Effective governance and anti-corruption measures are critical for the success of economic reforms. Transparent policy-making and strong legal frameworks can encourage investment and social trust.
4. **Human Capital Development:** Governments should invest in education and vocational training programs to equip the workforce with the skills needed for modern industries, ensuring that labour markets are adaptive to technological changes.
5. **Diversified Economic Models:** Rather than relying solely on export-led growth or a few industries, diversifying economies through innovation, entrepreneurship, and regional development can create a more resilient economy.
6. **Low Productivity:** Despite employing a large portion of the workforce, the agricultural productivity in India is relatively low compared to other countries. This is due to outdated farming techniques, limited access to advanced technology, and insufficient modern irrigation systems.
7. **Dependence on Monsoon:** A large portion of Indian agriculture is rain-fed, making it highly dependent on the monsoon season. Unpredictable rainfall patterns due to climate change and irregular monsoons severely impact crop yields, leading to frequent droughts and floods.

The role of technology and innovation to promote the sustainable economic growth in India: Technology and innovation play a pivotal role in driving sustainable economic growth in India. As the country continues to navigate challenges such as population growth, environmental sustainability, and economic inequality, technological advancements can help address these issues and enhance long-term prosperity. Below is an assessment of how technology and innovation contribute to promoting sustainable economic growth in India.

1. **Digitalization and Infrastructure Development:** The growth of digital technologies, including the expansion of internet connectivity, mobile broadband, and digital payment systems, has transformed key sectors of the economy. This has improved accessibility to services such as healthcare, education, banking, and government schemes, reducing inequality.
2. **Sustainable Agriculture and Food Security:** India's agricultural sector, which employs a significant portion of the population, faces challenges like low productivity, water scarcity, and soil degradation. Technology and innovation, such as precision agriculture, AI-driven crop management, and blockchain for traceability, offer solutions to these challenges, boosting productivity and ensuring sustainability.
3. **Renewable Energy:** India has set ambitious targets for renewable energy generation to reduce its dependency on fossil fuels and curb carbon emissions. The advancement of solar and wind technologies, energy storage systems, and smart grid solutions can help India transition toward a cleaner energy future.
4. **Skill Development and Employment Opportunities:** The adoption of technology and innovation in various sectors requires skilled workers. By promoting technology-driven education and vocational training, India can equip its workforce with the skills needed to meet the demands of a rapidly changing economy. This creates more job opportunities and fosters inclusivity.
5. **Smart Cities and Urbanization:** As urbanization continues to increase in India, smart city initiatives that use technology to improve urban planning, transportation, waste management, and energy consumption can help create more sustainable, livable, and efficient cities. These innovations contribute to economic growth by fostering more productive and resource-efficient urban environments.
6. **Entrepreneurship and Innovation Ecosystem:** India's burgeoning startup ecosystem is a testament to the role of technology and innovation in driving economic growth. Government initiatives such as the Startup India campaign have provided crucial support to young entrepreneurs, enabling them to scale their businesses and contribute to job creation and economic dynamism.
7. **Green Technologies and Environmental Sustainability:** Innovations in green technologies, such as waste-to-energy solutions, electric vehicles (EVs), and sustainable manufacturing processes, contribute to reducing pollution and conserving natural resources. These technologies align with India's commitment to the United Nations' Sustainable Development Goals (SDGs).

Technology and innovation are crucial drivers of sustainable economic growth in India. By fostering an ecosystem of digital transformation, clean energy adoption, and innovation, India can overcome some of its key development challenges and build a more inclusive, resilient, and sustainable economy. However, careful attention must be given to addressing inequality in access to technology and ensuring that policies support sustainable growth while mitigating potential adverse effects.

Conclusion

The economic development of India has been marked by impressive growth in recent decades, but it continues to face several issues and challenges that hinder its progress. These include widespread poverty, income inequality, unemployment, inadequate infrastructure, and a large informal sector. Despite improvements in education and healthcare, access to quality services remains uneven, particularly in rural areas. The challenges of climate change, environmental degradation, and resource management further complicate sustainable development. Additionally, bureaucratic inefficiencies, corruption, and policy inconsistencies pose barriers to effective governance. To address these challenges, India needs to prioritize inclusive growth, invest in infrastructure, enhance social welfare programs, improve labour market dynamics, and streamline governance systems. Strengthening the education and health sectors, while promoting innovation and technology, will also play a crucial role in shaping India's future economic trajectory. By tackling these issues, India can work towards a more balanced, sustainable, and resilient economic development model that benefits all citizens.

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20. Understanding the Impact of NAAC Accreditation and College Branding on Student College Admission Decisions

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Abstract

This research investigates the factors influencing student decisions regarding college admissions, with a specific focus on the role of NAAC accreditation and college branding. The study aims to determine whether students prioritise quality indicators such as National Assessment and Accreditation Council (NAAC) ratings or rely more on the perceived reputation and brand of colleges. By analysing survey data and conducting interviews with students, parents, and academic counsellors, this paper seeks to offer insights into the decision-making process and propose strategies for colleges to align their priorities with student expectations.

Keywords: Accreditation, NAAC

Introduction

Higher education plays a pivotal role in shaping an individual's career and life opportunities. With a plethora of options available to students, the choice of a college becomes a significant decision influenced by multiple factors. Among these, NAAC accreditation serves as a quality assurance mechanism, providing a credible evaluation of academic and infrastructural excellence. On the other hand, college branding—shaped by historical legacy, alumni success, and market perception—often commands a strong influence on prospective students.

This research explores whether students weigh NAAC accreditation and its grading system as a critical factor or prioritize the overarching brand value of a college. The findings aim to bridge the gap between institutional priorities and student expectations irrespective of accreditation status of college.

Literature Review

The existing body of research identifies a range of factors influencing student preferences for college admissions. Studies highlight that while academic excellence and employability are pivotal, the role of institutional branding cannot be overlooked. NAAC accreditation, introduced to ensure transparency and quality in higher education, provides critical metrics such as curriculum quality, research output, and infrastructural standards. However, branding often leverages subjective elements like historical reputation, campus culture, and extracurricular prominence.

Key studies suggest

1. Institutions with higher NAAC ratings often witness increased enrolment due to their assurance of quality.
2. Branding significantly affects students from urban or affluent backgrounds, where peer and societal perceptions play a more prominent role.
3. Lack of awareness about NAAC ratings in certain regions contributes to an inclination towards branded institutions despite lower accreditation grades.
4. Even having good NAAC ratings, many colleges have poor college admissions.

Research Methodology

The study employs a mixed-method approach:

1. Survey

- A sample size of 100 students who have recently completed college admissions.
- Questions covering awareness and importance of NAAC accreditation and perceptions of college branding.
- Demographic segmentation based on urban/rural backgrounds, income levels, and academic streams.

2. Interviews

- In-depth interviews with 20 students, parents, and academic counsellors to understand qualitative nuances.

3. Secondary Data Analysis

- Review of NAAC reports and student enrolment statistics.
- Analysis of popular rankings and media coverage of college brands.
- Research papers published in similar line

Results and Discussion

Initial findings indicate that

- NAAC Accreditation Awareness: Only 50% of students demonstrated a clear understanding of NAAC accreditation and its implications.
- College Branding Influence: Around 70% of students admitted that brand perception influenced their decision, often overriding accreditation considerations.
- Regional Disparities: Students from urban areas showed higher reliance on NAAC grades, while majority students leaned towards branding.
- Students show their inclination towards facts that may not be in the NAAC accreditation report, such as a availability of a particular course, their friend circle, approachability, college timings, fees structure and payment strategies adopted by the college, scholarships and many others.
- Parental Role: Parents' emphasis on branding correlated strongly with higher income brackets.
- NAAC is based on documentation verification and a peer team visit, which may show something different from what exists in college.

Discussion

The findings reveal a complex interplay between quality indicators and branding. While NAAC accreditation provides a rational, standardized measure that may not match the branding statistics, branding captures emotional and aspirational aspects of decision-making. Institutions with strong branding but lower NAAC grades attract students, potentially misaligning expectations with outcomes. It is also noted that, some other factors like convenience, availability of a particular course, fee payment methods, financial conditions, college environment regarding attendance, fluency in communication, overall culture of the college etc are major factors that affect the college enrolment status.

Conclusion and Recommendations

The study concludes that while NAAC accreditation is vital for maintaining quality benchmarks, its impact on student choices remains limited compared to branding. It is because, majority students have different goals in their education years. The selection of college is based on these goals. To address this imbalance, the following recommendations are proposed:

1. Enhanced Awareness Campaigns

- NAAC must collaborate with schools and colleges to educate students about the significance of accreditation.

2. Accreditation with Students Perspective

- NAAC should focus on the needs of students and its fulfilment by the colleges. Accordingly, the criteria should be different for different institutions.

3. Parental Engagement

- NAAC should focus on the perspective of parents in higher education. Most parents focus on branding with the perspective of getting financial stability.

4. Incentives for High-Grade Institutions

- There should be an incentive system for those institutions having good enrolment and poor NAAC accreditation status.

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21. Role of NGO's in Poverty Eradication

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Abstract

Poverty reduction has been declared as the most important development goal by the government of India. It has been one of the major objectives of India. For achieving goal about poverty reduction India is constructing socio-economic strategies. Non-Government Organisations are non-profit organisations constituted with an aim to uplift the poor, marginalised, underprivileged. NGOs participate actively in various political, economical and social matters and work on their own, in conjunction with individual governments or with international organizations. These groups were expected to show how village and indigenous resources could be used and how human resources, rural skills and local knowledge, grossly underutilized at present could be used for their own development. Over the last two decades NGOs are working basically to eradicate poverty. In the recent years they have designed their programs to address the strategic needs of poor with a view to providing basic social services as well as fulfilling practical needs. They are playing very significant role in uplifting the poor with their innovative programmes. On this backdrop, the present study explores the role and their performance of NGOs in poverty eradication.

Keywords: Poverty, NGOs, Poverty eradication, empowerment.

Introduction

Poverty is widespread in India, with the nation estimated to have a third of the world's poor. The World Bank (2005) estimated that 41.6 percent of the total Indian population lived under the international poverty line. Major determinants of poverty are lack of income and purchasing power attributable to lack of productive employment and considerable underemployment, inadequacy of infrastructure, affecting the quality of life and employability etc. NGOs have a significant role in assisting the rural poor to break out of the vicious circle of poverty. Most NGOs consider empowerment of the poor as their major goal and objective. The empowerment can be as basic as enabling groups to improve their conditions through socio-economic development programmes or projects. "Empowerment is the ownership of the development process by the people themselves.

NGOs are tremendously working, and helping government, institutions, and the rural poor in the fight against poverty. They have played an increasingly prominent role in the

development sector as innovative and Grassroots Driven Organisations with the desire and capacity to pursue participatory and people centred forms of development and to fill gaps left by the failure of the government in meeting the needs of their poorest citizens.

NGOs because of their situation and interaction with local people can be very effective in bringing change since they are able to address issues that governments are often not able to comprehend. That is, because these organizations work at the grass roots level, they are able to sense the urgency of issues and prioritize into the problem-solving mode at a quicker pace. The empowerment of the rural poor and community mobilization are the keys to sustainability, and these processes can take extensive periods of time to be assimilated. In order to reap the distinct advantages of empowerment, the IFAD and NGOs are collaborated. From a practical point of view, NGOs have a number of distinct features that build upon the foundation for effective collaboration:

NGOs are often able to reach segments of rural populations that governments neglect or do not target as priority. They often find their way into remote rural areas to identify the poorest segments of communities, deliberately seeking out those who are normally excluded from development processes because of their isolation, their lack of assets and their vulnerability.

NGOs engage the poor in capacity-building activities as a major component in their programmes and projects. Whether literacy programmes or agricultural extension or handling of credit, these activities lay the foundation for creating local groups and organizations that can then link with other groups having common interests through federations, coalitions, networks, etc.

NGOs are recognized for their role in developing new initiatives, new programmes or components of programmes, new approaches, new mechanisms, etc., to address development problems and issues. Many NGOs, with their generally flexible organizational structure and characteristics, which include organizational independence, and participatory structures are able to experiment on new institutional mechanisms and on different approaches that add value to projects. The criterion of innovativeness of a project is now generally a requirement of most donor agencies in formulating and appraising NGO projects.

NGOs possess extensive knowledge of local conditions. NGOs with long-term experience in the target area can help provide baseline data and information on the local economy and infrastructure, the existence (or absence) of self-help organizations, and the major obstacles to development.

Review of Literature

In India and abroad, several studies have been made on Non-Government organizations working in urban as well as rural areas. Much of the literature on these organizations in Indian settings has come from traditional social work.

According to Sachs (2005), a poverty trap must first be solved in combating poverty. Although the poor have willingness to overcome their ill-being, they are not able to do it by using their own resources. There are so many factors that trap the poor until they are in powerless conditions, such as diseases, climate stress, environmental degradation, physical isolation, and also extreme poverty itself. Essentially, the poor must be helped to exit from the poverty trap. If it can be reached, there will be an opportunity to get a first foothold on the ladder of development. In helping the poor to climb out of poverty, NGOs use two approaches: supply-side and demand-side (Clark, 1995).

Fowler (1997) identifies two types of NGO tasks: micro-tasks and macro-tasks. From the supply-side or micro-tasks approach, NGOs provide various basic public services to the poor. It is argued that especially in countries where government lack public services, NGOs play a significant role in the direct provision of social and economic services. In general, NGOs emerge and play the roles as service providers. NGOs or Voluntary Organizations are not a new phenomenon, and the concept of voluntary action is very ancient.

Shalini Mehta (1980) has found that these organizations working more effectively in the field of education rather than the Government department, whereas in the case of health, both Voluntary and Government Organizations failed. K.A. Suresh's (1990) found that NGOs are not working as participatory organizations to the extent desired. The rates of participation of beneficiaries and institutional arrangements for participation are found to be very low. The beneficiaries are also found to be not keen in getting represented in decision making bodies and planning process.

Mark Robinson (1995) found that NGO projects were successful and effective in improving the social status of the poor; however, not all the projects were successful in reaching the poor. S. Mohanan (2000) points out that NGOs have been playing a very important role in the country over the last quarter of the century in the sphere of social development. D.K. Gosh (2001) opines that attacking poverty and its reduction to an appreciable extent seems to be not manageable only by the Government sector. He considers Government Organizations need collaboration and co-operation from other than Government institutions for creating opportunities, facilitating empowerment and providing security for the poor. He prefers NGOs because they have greater accountability to the poor, as they work among the poor, while the

official system is yet to be totally pro-poor. Desai (2005) has mentioned that NGOs have an important role to play in supporting women, men and households, community groups, civil society groups and expected that they can meet the welfare.

Methodology

The data has been collected from various secondary sources such as journal, articles, books, and government reports.

Objectives of the Study

1. To analyze the magnitude and severity of poverty.
2. To analyze the strategies adopted by the poor in overcoming poverty.
3. To discuss the nature of voluntary organisations.
4. To study the present scenario of NGOs in India
5. To analyze the need of NGOs related to various sectors/ areas or groups. Examining the efforts made by the NGOs in alleviating poverty to analyze the impact of the reforms undertaken by NGOs.

Significance of the Study

The present study is a significant attempt to examine the role of NGOs in poverty reduction which will prove helpful to analyze lacunae in the developing economy like India. Further, it can be helpful to explore some untapped areas where potential for development exists and rectification of the flaws in the present system. The study will also prove helpful in empowering the poor by generating employment avenues and making the country self-reliant.

Analysis

India is a developing economy with 15 percent of the world's poor. Poverty is a global dialog and poverty eradication is considered integral to humanity's mission for sustainable development. Thus, reduction of poverty in India is vital for the attainment of international goals. The philosophy underlying the poverty alleviation programs is to tackle the rural poverty by endowing the poor with productive assets and training for raising their skills so that they are assured of a regular stream of employment and income in raising themselves above the poverty line.

According to the Tendulkar Committee Report, 37 percent of people in India live below the Poverty Line (BPL). Basing on calorific intake, the N.C. Saxena Committee report states that 50 percent of Indians live below the poverty line. A study by the Oxford Poverty and Human Development Initiative using a Multi-Dimensional Poverty Index (MPI) found that there were 650 million people (53.7 percent) living in poverty in India, of which 340 million people (28.6 percent) were living in severe poverty, and that a further 198 million people (16.4 percent)

were vulnerable to poverty. It is also found that 421 million of poor are concentrated in Eight North Indian and East Indian states of Bihar, Chhattisgarh, Jharkhand, Madhya Pradesh, Orissa, Rajasthan, Uttar Pradesh and West Bengal.

Missions of NGO's

Non-Governmental Organizations (NGOs) are launched with various purposes. Based on the region or local demand and problems, divergence in each NGO targets and objectives can be observed. But everywhere the main purpose of NGOs is the much-desired development of poverty strike deprived people. The missions and goals with which the NGOs are established and conducting their operations in India are:

- A. Assisting the poor and suffering people as well as exercising self-control through utilization of own resources.
- B. Identifying native assets, local leadership and ensuring effective utilization of these for welfare and development.
- C. Coordinating the poor and deprived ones through formation of co-operatives and thus facilitate the socio- economic progress. Health and Nutrition development.
- D. Acting as the associate of the government and no as competitor.
- E. Generating alternatives to overcome special social problems and hurdles besides taking necessary steps to aware the general population.
- F. Creating positive attitude of the society, annihilation of superstition and belief against development and bringing in the deprived ones in the mainstream of development.
- G. Giving priority to women in loan scheme by involving them directly in production process and thus creating scope of additional income in the family, which gradually leads to self-sufficiency.
- H. Continuing the assistance towards poor so that they can create own investment by saving at a growing rate from upward income.
- I. Creating awareness and developing leadership for the landless and relatively less facilitated ones. Helping out people in coping with the changing societal environment.

Ngo Activities to Eradicate Poverty

Humanitarian an Structural Development of Organizations for Poor

NGOs are playing essential role for humanitarian development through joint analysis and seeking solution through different seminars and workshop, joint social activities, and application of socio-economic projects. Besides, they have introduced certain essential concepts like developing small groups, credit-based cooperatives, mother welfare society and cooperatives etc.

for homeless/ landless etc. and thus have strengthened the root of organizational structure for rural poverty.

Employment Generation

To encourage the rural poor to participate in different economic activities and to increase their income through employment generation, several policies, methods and strategies of the NGOs have attracted the attention of some foreign development experts. NGOs usually create employment in two ways. First, they provide employment in their own organization and secondly, they provide loans and management assistance to individuals, which create new employment opportunity. Besides, they are providing inputs, technical and skill training and development facilities to poor men and women to get self-employment. Thus, they are significantly contributing in eradication of poverty by providing the above-mentioned essentials.

Organizing Groups and Participation of the Beneficiaries

One very important and effective innovation by NGOs is the strategy of organizing group wise meeting. As a result, participation of the true beneficiaries and direct objective setup is possible to achieve economic target. Besides, It is an effective element in making the loan scheme (to economically empower the poor) successful. This type of meeting keeps up for the poor the trend of empowerment and awareness along with raise in their entitlement.

Micro Credit

Overall economic development is essential for poverty eradication at both urban and rural levels. Besides employment generation, per head income and scheme to increase savings is required so that a sustainable development and poverty reduction can be seen for the poor. Microfinance is another important sector that NGO's has fully utilized in reaching out to the poor. Their roles in this sector, has immensely contributed to alleviating poverty among the poor. The purpose of using microfinance to alleviate poverty is because of what role microfinance can play and what impact it created on the beneficiaries. Microfinance has a very important role to play in development according to proponents of microfinance. Lending methodologies of different NGOs: Different NGOs have adopted different lending methods for their micro-credit schemes such as Group-based lending or Grameen Approach (lending to groups of 5-15 members) individual lending or financial intermediation (lending to individuals)

Initiating Capacity Building

Capacity building is another NGO's strategy and role that helps to bridge a gap between the haves and have not in society. Capacity building is an approach to development that builds independence.

Self-Reliance and Sustainable Community Development

Self-reliance is another strategy that affects sustainable community development. Effective community development sits on the foundation of self-reliance. The concept of self-reliance is strategically situated within the essence of community development and is related to other concepts like mutual-help, self-help, participation of the indigenous people and rural progress. Self-reliance encourages the necessity for people to use local initiatives, their abilities and their own possessions to improve their condition.

Relief Services

The provision of food and non-food items during emergency periods and war time and other disasters periods, often see NGOs functions as important one. The provision of these items is short run but very significance in alleviating poverty.

Peace Building Projects

NGO's roles are extended to peace building in India. The crucial role played by NGO's in the restoration of peace in war affected zones is worth noticeable. The presence of NGO's led to the restoration of fair peace as their propagation of the human rights law, and their involvement in the disarmament, demobilization and reintegration programmes, is fostering cooperation among the warlords. Through the functions of providing microfinance, initiating capacity building and self -reliance, peace building projects, relief services during emergencies, NGOs could bridge the gap of poverty in India.

Conclusion

Non-Governmental Organizations (NGOs) play a crucial role in poverty eradication by complementing government efforts, implementing grassroots programs, and advocating for policy changes. Their ability to work directly with marginalized communities allows them to address poverty through microfinance, education, healthcare, women's empowerment, and livelihood support. By providing financial aid, skills training, and social services, NGOs contribute significantly to sustainable development and economic self-reliance among the poor. However, challenges such as funding constraints, lack of accountability, dependency creation, and coordination issues with government agencies can hinder their effectiveness. To maximize their impact, NGOs must adopt transparent governance, strengthen partnerships with public and private sectors, and promote community participation in development initiatives. In conclusion, while NGOs alone cannot eradicate poverty, they serve as vital partners in the fight against it. Their role in fostering inclusive growth, empowering communities, and advocating for pro-poor policies makes them indispensable in global poverty alleviation efforts. A collaborative approach

involving governments, international organizations, and local communities is essential for achieving long-term poverty reduction.

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