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Multidisciplinary Approaches to Research in Higher Education : Embracing Adaptation, Innovation and Change



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Multidisciplinary Approaches to Research in Higher Education : Embracing Adaptation, Innovation and Change

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Message from the Hon. Sarchitnis



Maratha Vidya Prasarak Samaj believes in the motto 'Well-being of the Masses'. Being at the helm of the second largest educational society of Maharashtra, it is my onus to pass on the values and ideas bequeathed from the torchbearers of the institute to the stakeholders, teachers and students. I would like to congratulate the principal, Prof. Dr. Suresh V. Jadhav for this initiative and the editorial board for the tremendous efforts put in for the launch of the special edition titled "Multidisciplinary Approaches to Research in Higher Education : Embracing Adaptation, Innovation and Change"

Research has become the backbone of Higher Education. Scientific temper and inquisitiveness accelerate inventions and creation. The scenario has witnessed drastic changes in the field of Higher Education. AI tools and trends is an oft discussed topic. However, it is a well-established fact that despite the birth of AI teachers, learners always imitate human teachers. They cannot be replaced but assisted by technology. Therefore, they must not restrict themselves to disseminating book knowledge on the other hand they must instil desire for research and newer terrains in the learners. I believe this special edition titled "Interdisciplinary Perspectives: Exploring Innovations, Adaptation and changes in Research" provides a vast plethora of knowledge to quench the thirst of knowledge of both academicians and students. This is a platform dedicated to showcase the remarkable intellectual pursuits of our academicians. Each research paper unveils countless hours of inquiry, critical thinking and passion of the researcher.

I congratulate all the contributors for their utmost efforts and wish that their research pursuits will bring significant changes in the times to come.

Happy reading..!

Hon. Adv. Nitin B. Thakare

Sarchitnis

Maratha Vidya Prasarak Samaj, Nashik

From the Principal's Desk.....



Karmaveer Ganpat Dada More Arts, Commerce & Science College pitched amidst the greeneries of Niphad is one of the priced institutions of Maratha Vidya Prasarak Samaj. Established in 1973, with the motto to create a centre of education for the common people in and around Niphad, the college has always strived to soar in various fields. It gives me immense pleasure to pen the message for the research compendium of our college.

National Education policy pinpoints on the overall development of students. Hence teachers are not just sources of knowledge but mentors, motivators and felicitators. Their service is no more curtailed to providing bookish knowledge but to lead the budding citizens of our nation to the limitless panorama of information, wisdom vision, research and innovation. Hence the editorial board of our college has decided to launch a special edition, a conglomeration of the novel ideas and research findings of our teacher in variegated fields of Arts, Science, Commerce & Computer Science. It is with immense pride and enthusiasm that I put forth these findings for our readers. Forty three papers from different fields are included in this edition. It covers research papers on National Education Policy to new thoughts and perspectives in language and literature to the depths of advancements in Science and the trends in market and what more. The publication of the special edition titled "Multidisciplinary Approaches to Research in Higher Education: Embracing Adaptation, Innovation and Change". It is a proof of the dedication, perseverance, and intellect of our research scholars and academicians. The papers presented in this magazine reflect the innovations, adaptations and changes in research beyond the boundaries of conventional wisdom in fostering a research-oriented culture that encourages curiosity and nurtures creativity.

I commend all contributors for their commitment to research and innovation. I also extend my gratitude to the editorial team for their dedication in curating and presenting these remarkable contributions. My Heartiest greetings to all readers of this esteemed research magazine. As you advance through the pages of this magazine, I hope you find inspiration, knowledge, and a renewed passion for the pursuit of truth and discovery. I hope this will be the beginning of a research journey that will witness ground breaking research and innovation in the future.

Prof. Dr. Suresh V. Jadhav

**Principal,
K.G.D.M. College, Niphad**

Messages from the Executive Editors of the issue



Research Journey's special edition of our college titled "Multidisciplinary Approaches to Research in Higher Education: Embracing Adaptation, Innovation and Change" is a dream come through for me. Being a connoisseur of art and literature, it has always been a dream for me to launch a special edition of our college encompassing the research ideas of our talented research scholars and academicians.

Higher Education has entered a new phase after the implementation of National Education Policy. It encourages research, inquiry and innovation of teachers and students like. It has boosted the production and creation of new levels of knowledge and wisdom.

The new divide is between those who have skills and lack skills. Consequently, the duty of the teacher is not just to explain the definitions in the text book but to lead the learners to the untrodden path of quest and inquiry. Therefore, research inquiry has become an integral part of today's academic curriculum.

The publication has become a platform for teachers to share their ideas and transfer knowledge across various streams. I hope this interchange of knowledge leads to further developments in the future. I extend my sincere thanks to the management of Maratha Vidya Prasarak Samaj, Principal, Prof. Dr.Suresh V.Jadhav, Mr.P.P.Shardul, my co-editor Dr. Swati Lawange and her team who have worked day in and day out for the realisation of this dream. So also, I extend my deepest gratitude to all the authors who have shared their insightful work and the entire editorial team for their tireless efforts in bringing this issue to life.

As you leaf through each page of this publication, I hope that it takes you through the mesmerizing journey of language and arts, innovative revelations of science, insightful world of Social Science, amazing highlands of technology, the vast expanse of human psychology along the terrains of e-commerce and virtual markets.

So get your grip and enjoy!!!

Dr. Susan Lawrencia

Head, Dept.of English

K.G.D.M. Arts, Com. & Science College, Niphad

I am particularly happy to publish this research journal because the 21st century is known as the age of science and technology. So naturally research and exploration in this era has a special significance, so research work is important in this field of education. And with this purpose in mind, we are publishing this journal. The article has been published in this journal. It is a matter of pride and happiness for our college. I would like to thank Prof. Dr.Suresh V. Jadhav, honorary principal of our college, for his valuable guidance to inspire this commendable initiative and research work. I would also like to thank Dr. L.J. Susan, co-editor of this journal, who edited the journal. I hope that this journal will be definitely useful for researchers and scholars and also students.

Happy Reading to all readers.

Mr. P.P. Shardul

Head, Dept.of Geography,

K.G.D.M. Arts, Com. & Science College, Niphad

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Effect of Modern Electronic Technology on the Management of Business Enterprises

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Abstract:

As electronic technology continues to advance, it has progressively emerged as a key technological component of the automotive, engineering, and industrial sectors and has created favorable development circumstances for India's industrial revolution. Electronic commerce draws on technologies such as mobile commerce, electronic funds transfer, supply chain management, Internet marketing, online transaction processing, electronic data interchange (EDI), inventory management systems, and automated data collection systems. Modern electronic commerce typically uses the World Wide Web for at least one part of the transaction's life cycle although it may also use other technologies such as e-mail. There are three areas of Modern Electronic Technology: online retail, electric markets, and online auctions. Modern electronics technology is supported by electronic business.

There are several effects from this technology. This change of business practices will fundamentally change our views of how business is to be conducted and change management attitudes. Finally, I believe that a final effect of this system would be on the management of business enterprises. Modern electronic technology is a phenomena that is emerging rapidly between businesses all over the world, and it has affected the businesses in many aspects especially at management. This research is looking at the effects of modern electronic technology on the management of business enterprises.

Keywords: Modern Electronic Technology, online market, electric market, business organization, management, functions of management

Introduction:

Modern Electronic Technology is a phenomena that is emerging rapidly between businesses all over the world, Electronic commerce is the use of the internet or a network to transfer and use data. It can also be defined as the use of the internet to buy and sell products and services. This can be either through business to business or business to customer or customer to customer. With the use of the internet more and more business' have to find more ways to interact and supply things for their customers. The introduction of Modern Electronic Technology over the past 15 to 20 years has had a major effects on society and the way business is done on a global scale. This has had many positive effects on the business and on management. Additionally there are risks that have had a negative effects on both the management of businesses. This research paper discusses the effects and risks associated with Modern Electronic Technology to an organization and to global business and society in general. To help and understand the effects of Modern Electronic Technology on management of business the present study has been chosen. Use of this article to help you understand different effects of E commerce on business management so that you can research this topic further.

Objectives:

The most commonly cited objectives of the effects of electronic commerce on business are:

1. To study the concept of Modern Electronic Technology.
2. To study the implementation of Modern Electronic Technology Models of Business.
3. To study the effects of Modern Electronic Technology on Business.
4. To study the benefits and barriers of Modern Electronic Technology to management of business enterprises.

Scope and Limitations:

Present study is based on the secondary source of data. All secondary data obtained from the Economic Survey of Maharashtra State, research papers, related websites research articles, books, newspapers, use of internet, research papers, etc

Hypothesis :

- 1) There is significant impact of modern electronic technology on business enterprises
- 2) Use of technology in business enhance planning and decision making process.

Research Methodology:

Present study is based on the secondary source of data. All secondary data obtained from the various reference books on Modern Electronic Technology, E-Business, Mobile Commerce, Internet Marketing, Electronic Advertising, Commerce, and Management. For the said research study the secondary data is also collected from the various National and International Research Books and Journals which are related to Modern Electronic Technology, Internet, Commerce, and Management.

Results and Discussion:**Concept of Modern Electronic Technology:**

Modern Electronic Technology (electronic commerce or EC) is the buying and selling of goods and services, or the transmitting of funds or data, over an electronic network, primarily the internet. These business transactions occur either as business-to-business, business-to-consumer, consumer-to-consumer or consumer-to-business

Electronic commerce or Modern Electronic Technology refers to a wide range of online business activities for products and services. It also pertains to "any form of business transaction in which the parties interact electronically rather than by physical exchanges or direct physical contact." Modern Electronic Technology is usually associated with buying and selling over the Internet, or conducting any transaction involving the transfer of ownership or rights to use goods or services through a computer-mediated network. Though popular, this definition is not comprehensive enough to capture recent developments in this new and revolutionary business phenomenon. A more complete definition is: Modern Electronic Technology is the use of electronic communications and digital information processing technology in business transactions to create, transform, and redefine relationships for value creation between or among organizations, and between organizations and individuals.

Modern Electronic Technology Models of Business:

Modern Electronic Technology or Electronics Commerce business models can generally categorized in following categories.

- Business - to - Business (B2B)
- Business - to - Consumer (B2C)

- Consumer - to - Consumer (C2C)
- Consumer - to - Business (C2B)
- Business - to - Government (B2G)
- Government - to - Business (G2B)

Effects of Modern Electronic Technology on Business Enterprises:

The Effects of Electronic Commerce on Business is about a new business concept that incorporates all previous business management and economic concepts. As Modern Electronic Technology effects on many areas of business and disciplines of business management studies as follow.

- 1) Effects of Modern Electronic Technology on Marketing
- 2) Effects of Modern Electronic Technology on Management Information Systems
- 3) Effects of Modern Electronic Technology on Production and Operations Management
- 4) Effects of Modern Electronic Technology on Human Resource Management
- 5) Effects of Modern Electronic Technology on Operations
- 6) Effects of Modern Electronic Technology on Finance
- 7) Effects of Modern Electronic Technology on Economics

Benefits of Modern Electronic Technology to management of business enterprises

The Effects of Modern Electronic Technology on Business management results into various benefits as follows

1) Reduces Costs for Inventory Management

With Modern Electronic Technology, the suppliers can reduce costs to manage their inventory of goods because they can automate the inventory management using web-based management systems. This method indirectly can save their operational costs.

2) Reduce Labor Costs

The labor costs can be reduced with Modern Electronic Technology because the sellers can automate their online store fronts.

3) Reduce Advertising Costs

Modern Electronic Technology can reduce advertising costs because it is easier to update the advertisement using software technology.

4) Personnel management:

A complete automation of check-out, billing, inventory management, payments and other type of operational costs lower the total number of employees that you require to run your ecommerce business.

5) New markets

Whether geographical, industry or niche, the clever use of email and a website can increase customer numbers, purchasing volumes and frequency of return (loyalty). It will improve your ability to capture and leverage customer intelligence to direct your marketing, purchasing, warehousing, delivery and pricing strategies and will ultimately result in increased revenues.

- 6) More fruitful customer/supplier relationships
- 7) Faster provision of products and services to the marketplace through streamlined and thus cheaper production
- 8) Market leadership
- 9) Intellectual and human capital

10) Across the board cost savings

The Barriers of Modern Electronic Technology:

The drivers of Modern Electronic Technology were identified and summarized there are barriers to the growth and development of Modern Electronic Technology. Numerous reports and surveys identify the different kinds of barriers, and many of them focus on security as being one of the largest inhibitors to and problems for Modern Electronic Technology. Different Businesses are at different stages of development of ecommerce and as such the issues that are relevant to one business may not be relevant to another. Similarly, the issues that are relevant to the type of organization also differ. Overall, all kinds of organizations have similar barriers but with different emphases for discuss as follows:

1. Commercial Infrastructure - Relates to issues such as international trade agreements, taxation laws and other legal agreements that facilitate all kinds of on-line trading and so is a barrier relevant to all types of businesses.

2. Technology Infrastructure - Deals with issues of standardization of systems and applications, which is a particular concern for larger organizations who want to implement solutions such as value chain integration and e-supply chain management.

3. Internet Infrastructure - Deals with issues such as availability and quality of the Internet in terms of speed and reliability. This barrier is of particular concern to Business to Consumer organizations, since their business relies more on general consumers, and so the ease with which the general public can connect to the Internet has a direct effects on their Web-based business.

4. Security -In its broadest term is one of the most significant barriers to Modern Electronic Technology both within the organization and external to it. Identified as Security and Encryption; Trust and Risk; User Authentication and Lack of Public Key Infrastructure; Fraud and Risk of Loss it relates to the development of a broader security infrastructure and it also relates to the kinds of measures barriers to Modern Electronic Technology businesses can take to improve security.

5. Interoperability of systems– This is identified as one of the major barriers for large US based Business to Business corporations. This refers specifically to implementation and compatibility problems of integrating new Modern Electronic Technology applications with existing legacy systems and resources within organizations. This problem also extends to interacting with systems of business partners and stakeholders.

6. Lack of Qualified Personnel- This is a particularly strong concern because internally they do not have sufficient resources to attract and maintain their own support staff to develop a sophisticated technology infrastructure. With regards to third parties, the qualified personnel tended to work for larger organizations.

Conclusions and Suggestions:

Modern Electronic Technology is becoming immensely popular and is in a nascent stage. Information technology has played a vital role in the advancement of business functions. With the time, the concept of online commerce has got attention in business world. All these developments in business enterprises show that, the businesses are marching towards modern business and changing their traditional look. It is a grate change in business organization because of information technology development. They are trying to utilize the information technology for trade, commerce and provide technology based business products and services to their customers. On the basis of the analysis most of the business have already implemented the

Modern Electronic Technology modules, as these facilities are beneficial to both i.e. business as well as consumers. But the adoption of Modern Electronic Technology by the business is still at the early stage due to various challenges to the management of business enterprises.

The challenges such as lack of electronic Commercial Infrastructure, Interoperability of systems, Lack of Qualified Personnel, security risk, privacy risk, trust factor and less awareness about Modern Electronic Technology are acting as hurdle in the adoption of Modern Electronic Technology facilities. Considering the challenges and risk related to Modern Electronic Technology, the Government of India along with various government agencies is making an effort to make Modern Electronic Technology more safe, secure and reliable. The paper only presents the overview of Modern Electronic Technology in Indian context. Studies in the past have shown that with the time Indian businesses are opting Modern Electronic Technology services with the time. Modern Electronic Technology will not only be acceptable mode of business but will be preferred mode of business. Considering this in mind, the future studies may be conducted to analyze the various factors which influence the management intention to adopt E commerce services.

References:

- Computer economics (2001) internet and e-business strategies, internet trends, volume :4, page :3-5.
- P. Timmers, 'Electronic Commerce – Strategies and Models for Business-to-Business Trading', John Wiley & Sons, 2000.
- David Whitley, 'Modern Electronic Technology', Tata Mcgraw Hill Publication, New Delhi (2004).
- Nair, k.G.K (2002) & quot; development through information technology in developing countries: experience from an Indian state & quot;, The electronic journal on information systems in developing countries, volume: 8, page :1-13.
- Business Today Special Millennium Edition, Jan. 7, 2000.
- Computer economics (2001) internet and e-business strategies, internet trends, volume :4, page :3-5.
- J.Suresh Reddy, 'Effects of Modern Electronic Technology on Marketing' Indian Journal of Marketing. Vol. - XXXIII No. 5 May 2003.
- Atif,Y (2002) & quot; building trust in e-commerce & quot;, IEEE internet computing, volume:6,page:18-24.
- Chaffey. Dave. (2007) e- business and e- commerce management: strategy implementation.
- www.ibm.com/e-business
- www.whatis.com/ecommerce
- http://www.straight-on.com/ecommerce_definition.htm

The Power of Mathematical Tools in Modern Agricultural Practices

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Abstract:

Mathematics plays a critical role in modern agriculture by providing tools and methodologies to optimize farming practices, enhance productivity, and ensure sustainable resource use. From crop growth modeling and yield prediction to optimizing irrigation, fertilization, and pest management, mathematical models are integral in addressing key challenges in the sector. Optimization techniques such as linear programming and dynamic modeling are applied to improve decision-making regarding resource allocation, reducing costs while increasing efficiency. Climate models and risk assessment tools, powered by mathematical analysis, help farmers adapt to changing environmental conditions and manage uncertainties related to weather patterns and market dynamics. Additionally, mathematical algorithms, including machine learning and genetic algorithms, are transforming precision agriculture by enabling data-driven decisions based on large-scale data from sensors, drones, and satellites. Mathematical approaches also assist in managing soil fertility, predicting the spread of pests and diseases, and improving livestock production through optimization of breeding and health management. This paper explores the diverse applications of mathematics in agriculture, highlighting its importance in achieving higher yields, reduced environmental impact, and more resilient farming systems. As agriculture continues to face global challenges such as climate change, population growth, and resource depletion, mathematical innovation will remain essential in shaping the future of sustainable and efficient farming practices.

Keywords: mathematical models, optimize farming practices, linear programming, sensors, drones, satellites and efficient farming practices

Introduction:

Agriculture, as the cornerstone of global food production, faces numerous challenges, including increasing demand due to population growth, environmental degradation, and climate change. As the world shifts toward more sustainable and efficient farming practices, mathematics has emerged as a powerful tool to address these challenges. The application of mathematical techniques in agriculture allows for the optimization of resources, improved decision-making, and better predictions, which in turn enhance productivity, minimize waste, and reduce environmental impact.

Mathematics provides a framework for modeling complex agricultural systems, enabling the simulation of crop growth, pest dynamics, and nutrient cycles, as well as optimizing irrigation, fertilization, and harvesting schedules. From simple calculations for cost-benefit analysis to advanced algorithms for precision farming, mathematical approaches are transforming traditional agricultural practices. Techniques such as optimization, statistical modeling, and machine learning are used to analyze vast amounts of data from various sources, including satellite imagery, sensors, and climate models, to create precise recommendations for farm management.

Additionally, mathematics supports agricultural economics by informing market predictions, resource allocation, and risk management strategies. Mathematical models also play a pivotal role in addressing critical environmental concerns, such as soil degradation and water scarcity, by suggesting sustainable solutions to mitigate these issues. As agricultural systems become more integrated with technology, the role of mathematics continues to expand, offering innovative ways to improve crop yields, safeguard natural resources, and ensure food security.

Methodology:

The use of mathematics in agriculture is critical for optimizing various agricultural processes and improving productivity, sustainability, and efficiency. By applying mathematical techniques, agricultural practices can be more precise, resource-efficient, and environmentally friendly. Here are some key areas where mathematics is applied in agriculture:

1. Crop Growth and Yield Prediction:

Mathematical models are used to predict the growth and yield of crops under different environmental conditions. These models take into account factors like soil properties, weather, irrigation, and pest control.

i) **Growth models** (e.g., **CROPGRO**, **DSSAT**): These simulate crop development, from planting to harvest, based on factors such as soil moisture, temperature, and nutrient availability.

ii) **Yield prediction models**: Use past data (historical yields, weather patterns) and current conditions to predict future yields, helping farmers plan their production and marketing strategies.

iii) **Differential equations**: Used to model the biological growth processes of crops.

iv) **Statistical analysis**: Helps correlate various factors (e.g., climate variables, soil conditions) with crop yield to predict performance.

2. Optimization of Agricultural Practices:

Mathematics, particularly optimization techniques, is used to enhance the efficiency of agricultural operations such as irrigation, fertilization, planting schedules, and pest management.

i) **Linear programming** and **dynamic programming** are used to optimize water use in agriculture, minimizing waste while ensuring that crops receive the required amount of water.

ii) **Nutrient optimization models** help determine the exact amount of fertilizer needed at different stages of crop growth. This reduces costs and environmental impact.

iii) **Scheduling models** determine the optimal time for harvesting to ensure maximum yield and quality while considering labor availability and market demand.

3. Agricultural Economics and Decision-Making:

Mathematics is widely used in agricultural economics to make decisions about pricing, production strategies, and resource allocation. Mathematical models help farmers, policymakers, and agricultural economists understand and forecast market trends, input costs, and farm profitability.

i) **Game theory**: Can model competition in markets for agricultural products, helping farmers make pricing decisions.

ii) **Stochastic models**: Used to account for uncertainty in factors such as market prices, yield prediction, and demand for agricultural products.

iii) **Linear programming** is applied to maximize farm profits by optimizing the allocation of land, labor, and capital resources across different crops or livestock.

4. Climate Change and Environmental Modeling:

Mathematics is vital in studying the impact of climate change on agriculture and developing strategies to mitigate adverse effects, such as droughts, floods, and temperature fluctuations.

i) **Dynamical models** of the atmosphere and soil can predict how changes in temperature, precipitation, and CO₂ levels will affect crop production.

ii) **Stochastic modeling** helps predict the likelihood of extreme weather events and their impact on crop yields, guiding farmers on risk management strategies like crop insurance and drought-resistant crops.

iii) **Ecosystem modeling** (e.g., using **system dynamics**) helps understand how agricultural practices (e.g., pesticide use, irrigation) affect the environment and biodiversity.

5. Pest and Disease Management:

Mathematical models can predict and control the spread of pests and diseases in crops, thus improving plant health and reducing the need for excessive pesticide use.

i) **Differential equations** are used to model the growth and spread of pest populations and plant diseases.

ii) **Agent-based models** simulate how individual pests interact with their environment, helping to predict outbreaks and optimize control measures.

iii) **Optimization models** can help decide the best time and amount of pesticide to apply, balancing effectiveness with environmental and financial costs.

6. Precision Agriculture and Big Data:

Mathematics plays a key role in precision agriculture, where technologies like sensors, drones, and satellites collect massive amounts of data about soil, crops, and weather. This data is then analyzed to make precise decisions for crop management.

i) **Machine learning** algorithms (e.g., neural networks, decision trees) are used to analyze data from sensors, drones, and satellites for things like early pest detection, soil nutrient levels, and weather predictions.

ii) **Big data** and **statistical models** can help create detailed, location-specific recommendations for irrigation, fertilization, and pest management.

iii) **Geostatistics** and **spatial analysis** help analyze variations in soil fertility, moisture, and other factors across different areas of a field, allowing farmers to apply resources only where needed, thus improving efficiency and reducing waste.

7. Soil Fertility and Nutrient Management:

Mathematics is used to model the interaction of nutrients in the soil and how they affect crop growth. Mathematical techniques can optimize the use of fertilizers, improving crop yields while minimizing environmental damage.

i) **Kinetics models** describe how nutrients move and transform in the soil, helping farmers understand nutrient cycles.

ii) **Nonlinear programming** is used to balance nutrient application rates across multiple crops in a sustainable and cost-effective manner.

8. Genetic Algorithms and Plant Breeding:

Mathematical models, particularly **genetic algorithms** (GAs), are used in plant breeding to select for desirable traits such as drought resistance, pest resistance, and high yield. GAs are

used to simulate the process of natural selection, optimizing the selection of parent plants to produce offspring with desirable traits. These algorithms can be used to improve breeding programs for both crops and livestock. Mathematical models help ensure genetic diversity in crops, which is crucial for ensuring long-term resilience against pests, diseases, and climate change.

9. Mathematical Modelling of Livestock Production: Mathematics is also applied to the management of livestock farms, optimizing factors like breeding, feed intake, and disease control.

i) **Linear programming** models can help optimize breeding decisions, feed allocation, and health interventions to maximize milk or meat production.

ii) **Compartmental models** (SIR models) are used to model the spread of diseases among livestock populations, helping to design effective vaccination and quarantine strategies.

10. Supply Chain and Logistics in Agriculture

Mathematics is crucial for managing the agricultural supply chain, ensuring that products get from farms to markets in the most efficient way possible.

iii) **Linear and integer programming** models are used to minimize transportation costs, reduce spoilage, and optimize inventory levels for agricultural products.

Mathematical models help balance agricultural production with market demand, reducing wastage and ensuring that farmers receive fair compensation for their products.

Objectives:

1. **Optimizing Resource Allocation:** One of the primary objectives of using mathematics in agriculture is to optimize the use of resources such as water, land, fertilizers, and labor. Mathematical models and optimization techniques help farmers determine the most efficient ways to allocate these resources, reducing waste and improving profitability.
2. **Enhancing Crop Yield Predictions:** Mathematical models play a crucial role in predicting crop yields by simulating various growth conditions. This allows for better forecasting of harvest sizes, enabling farmers to make informed decisions about resource use, marketing strategies, and risk management.
3. **Optimizing Agricultural Economics:** Mathematics is used to analyze economic variables such as crop prices, labor costs, and market demand. By applying economic models, farmers can make better decisions regarding crop selection, production timing, and market strategies to maximize profit while minimizing financial risk.
4. **Promoting Sustainable Agricultural Practices:** Through mathematical modeling, agriculture can become more sustainable by promoting efficient land use, minimizing chemical inputs, and ensuring long-term soil health. Mathematical tools help design farming systems that balance productivity with environmental stewardship, contributing to sustainable agricultural practices.
5. **Advancing Precision Agriculture:** The integration of mathematics with emerging technologies like GPS, sensors, and drones enables precision agriculture. By analyzing vast amounts of data, mathematics helps create targeted farming practices that increase productivity, reduce resource waste, and enhance environmental protection.
6. **Facilitating Farm Management Decision-Making:** Mathematical models provide farmers with data-driven insights, helping them make better decisions regarding crop management, input purchases, labor scheduling, and market sales. This leads to more

informed and effective decision-making, ultimately improving farm profitability and efficiency.

Conclusion:

In conclusion, mathematics has become an indispensable tool in modern agriculture, offering innovative solutions to address the sector's pressing challenges. From optimizing resource allocation and improving crop yield predictions to mitigating environmental impacts and enhancing pest management, mathematical models provide valuable insights that drive efficiency, sustainability, and resilience in farming systems. Through techniques such as optimization, statistical analysis, and machine learning, farmers can make data-driven decisions that enhance productivity while minimizing waste and environmental harm.

As the agricultural sector continues to face increasing pressures from climate change, resource scarcity, and global population growth, the role of mathematics in shaping sustainable agricultural practices will only grow in importance. By integrating mathematical approaches with emerging technologies like precision agriculture, sensors, and big data, farmers and policymakers can better predict outcomes, manage risks, and make informed decisions that ensure food security for future generations.

Ultimately, the use of mathematics in agriculture is crucial for fostering more efficient, adaptive, and resilient farming systems, helping to create a sustainable future for agriculture worldwide. As we continue to develop and apply new mathematical models and technologies, the potential for improving global agricultural practices is vast, paving the way for a more productive and sustainable agricultural landscape.

References:

1. **Nina Mitchell.** Mathematical applications in agriculture: October 2016
2. **Lavanya Kumari. P, Reddy GK, Krishna TG.** Computational experiences of assignment problems in agriculture sector, International journal of advanced computer and mathematical sciences, 6: 18-29,2015.
3. **D. Subhasri.** Mathematics on agriculture: IJSR, 2018.
4. **Dr. Kavita Jain,** ROLE OF MATHEMATICS IN AGRICULTURE, , October- December, 2022. <https://inspirajournals.com/uploads/Issues/492164977.pdf>
5. **Dr.T.Jagathesan,** Application of Mathematical Models in Agriculture- A Review, July-September, 2020. <https://www.cdes.org.in/wp-content/uploads/2022/04/Application-of-Mathematical-Models-in-Agriculture-A-Review5.pdf>
6. **Cross, M. and Moscardini, A.O.** (1985). Learning the art of mathematical modelling. Ellis Horwood Ltd. Chichester.
7. **France, J. and Thornley, J.H.M.** (1984). Mathematical models in agriculture. Betterworths, London.
8. **J. H. M. Thornley and J.France** (2007). (2007). Mathematical models in agriculture: quantitative methods for the plant, animal and ecological sciences, Centre for Ecology and Hydrology, Edinburgh, EH26 0QB, UK, 2007, 10.1079/9780851990101.0000
9. **G.Marion and Lawson** (2015). An Introduction to Mathematical Modelling, DOI:10.5860/choice.32.5134, https://people.maths.bris.ac.uk/~madjl/course_text.pdf
10. **O.D. Sirotenko and V.A. Romanenkov** (2012). Mathematical Models of Life Support Systems – Vol. II - Mathematical Models of Agricultural Supply - O.D., ©Encyclopedia of Life Support Systems (EOLSS), <http://www.eolss.net/sample-chapters/c02/e6-03a-05-05.pdf>

11. **France J., Thornley J.Y.M.** (1984). *Mathematical Models in Agriculture. A Quantitative Approach to Problems in Agriculture and Related Sciences*, 335 pp., Butterworths Co (Publishers) LTD.
12. **R. Beneke and R. Winterboer** (1973). *Linear programming. Application to agriculture* – Ames: Iowa State University Press.
13. **Bender, E.A.** (1978). *An introduction to mathematical modelling*. Wiley, New York.
14. **M.J.McPhee** (2009). *Mathematical modelling in agricultural systems: A case study of modelling fat deposition in beef cattle for research and industry*, 18th World IMACS / MODSIM Congress, Cairns, Australia 13-17 July 2009, <http://mssanz.org.au/modsim09>.
15. **D.S. Riggs**, (1963), *The mathematical approach to physiological problems*, MIT Press, Cambridge, MA.
16. **Johnson DA, Rising GR.** *Guidelines for teaching mathematics*. (2nd ed). Belmont, Wardsworth Publishing Company; 1972.



The Power of Mathematics : Its Impact on Various Fields

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Abstract:

Basic mathematics serves as a foundational tool across various disciplines, including arts, commerce, and science, enhancing analytical skills and fostering a deeper understanding of complex concepts. In arts, mathematics aids in the analysis of language and literature through statistical methods, enabling linguists and literary scholars to explore patterns in text, dialect variations, and narrative structures. Concepts such as geometry and proportions influence design and composition in visual arts, facilitating harmony and aesthetic appeal. In commerce, mathematics is integral to financial analysis, market research, and operational efficiency. Essential calculations—including interest rates, pricing strategies, and statistical data analysis—enable businesses to assess profitability, optimize inventory management, and make informed decisions based on consumer behavior and market trends. In science, mathematics is the language of scientific inquiry, underpinning experimental design, data analysis, and theoretical modeling. It allows scientists to quantify observations, establish relationships between variables, and communicate findings effectively through statistical evidence. Overall, the application of basic mathematics in arts, commerce, and science not only enhances critical thinking and problem-solving skills but also bridges the gap between disciplines, fostering a comprehensive understanding of the world. This integration illustrates the universality of mathematics as a vital tool that transcends subject boundaries, enriching both academic and practical pursuits.

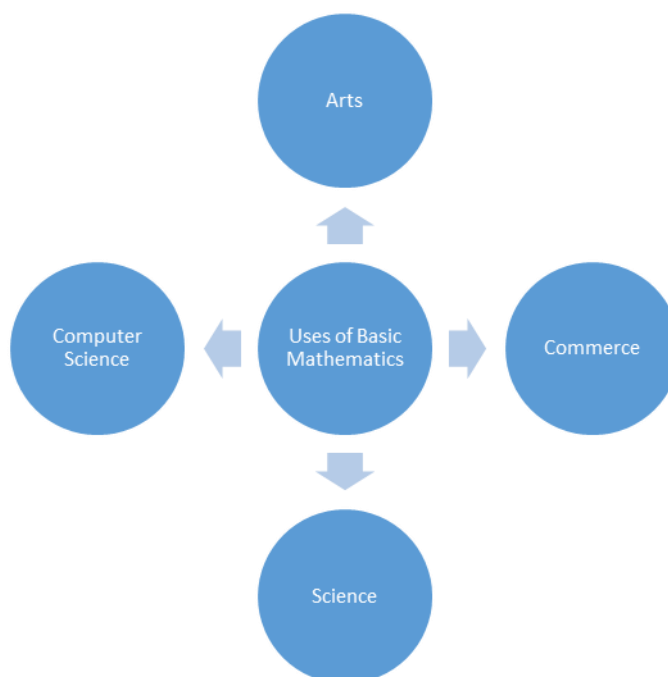
Keywords: Scientific inquiry, Underpinning experimental design, Data analysis, and Theoretical modelling, Quantify observations

Introduction :

Basic mathematics is an essential foundation that permeates various fields, including arts, commerce, and science. In the realm of arts, it facilitates analytical and critical thinking through the study of patterns, structures, and proportions, enriching disciplines such as music, visual arts, and linguistics. In commerce, mathematics is vital for financial literacy, enabling effective budgeting, financial forecasting, and market analysis, which are crucial for informed decision-making in business. Meanwhile, in science, mathematics serves as a core tool for experimentation and analysis, allowing researchers to quantify results, formulate hypotheses, and interpret data. By providing a universal language for analysis and precision, basic mathematics not only enhances understanding and creativity across these disciplines but also demonstrates its integral role in comprehending and navigating our complex world.

Methodology:

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Chemistry: Mathematics plays a vital role in chemistry, allowing chemists to quantify, analyze, and predict chemical behaviors and reactions. Chemists use stoichiometric calculations to determine the quantities of reactants and products in a chemical reaction. Understanding mole ratios from balanced equations is crucial for these calculations. Use mathematics to calculate molarity (concentration), moles, and masses to determine how much of a reactant is needed or how much product can be produced. Use mathematical calculations to determine enthalpy changes in reactions, often calculated using Hess's Law or enthalpy of formation. Differential and Integrated Rate Laws: Use calculus and algebra to derive and manipulate equations that describe concentration changes over time. Use geometry to predict molecular shapes and calculate bond angles. Use linear combinations of atomic orbitals (LCAO) for calculating hybrid orbitals, relating math to the geometry of molecular bonding. Use mathematical tools to analyze data from techniques like spectroscopy, where the area under a curve might represent concentration (in quantitative analysis). Use linear regression and other statistical techniques to create calibration curves for quantifying concentrations of unknown substances.

Physics: Basic mathematics is fundamental to understanding and applying concepts in physics. It enables students and professionals to analyze physical phenomena, derive formulas, and solve problems systematically. Basic arithmetic (addition, subtraction, multiplication, division) is used to convert between different units of measurement (e.g., converting kilometers to meters, hours to seconds). Managing significant figures in calculations to ensure precision in measurements and results. Applying Newton's second law, to calculate forces, masses, or accelerations. Using vector addition to determine net forces acting on an object, requiring basic trigonometry for angle measurements and direction. Apply algebra to calculate kinetic energy and potential energy. Basic mathematics is used to convert temperatures between Celsius, Kelvin, and Fahrenheit.

Botany: Mathematics is integral to various aspects of botany, providing tools and techniques for quantifying observations, analyzing data, and modeling biological processes. Use arithmetic to calculate growth rates by measuring height, leaf number, or biomass over time. Use geometry for calculating the surface area of leaves (important for gas exchange calculations) or the volume of

plant structures .Use statistics for designing experiments and analyzing data, such as using t-tests or ANOVA to compare differences in plant growth under different conditions .Compute means, medians, modes, and standard deviations to summarize data collected from experiments (like leaf size, number of seeds, etc.).Use regression analysis to explore relationships between variables, such as the effect of light intensity on the rate of photosynthesis. Apply mathematical techniques to study spatial distributions of plant species, using statistics and coordinate geometry .Use mathematical modeling to describe photosynthesis rates and optimize conditions affecting these rates, such as light intensity, temperature, and carbon dioxide concentration .Analyze the relationship between various factors (temperature, humidity, wind speed) affecting transpiration, potentially using empirical formulas or regression models .Use basic arithmetic and probabilities to predict the genotypic ratios of offspring in genetic crosses .Use the Hardy-Weinberg principle to calculate allele and genotype frequencies in populations.

Use statistical tools to determine heritability and identify quantitative trait loci (QTLs).Use geometric and statistical methods to analyze the shape of leaves and flowers, which can involve landmark-based approaches for quantifying variations. Use mathematics with Geographic Information Systems (GIS) to analyze plant distribution across landscapes and model habitat suitability based on environmental variables .Use statistical models to predict where certain plant species are likely to grow based on climate, soil, and other ecological factors .Use mathematical models to describe the timing of biological events in plants (like flowering and leafing out) based on environmental changes (temperature, photoperiod).Analyze data on plant lifecycle events over time to identify patterns or impacts of climate change.

Zoology: Mathematics plays a vital role in zoology by providing tools and methods for analyzing biological data, modeling animal populations, studying animal behavior, and understanding evolutionary processes. Analyze age structure, birth and death rates, and population projections using matrix population models and Leslie matrices .Use statistical tests, such as t-tests, chi-square tests, and ANOVA, to compare groups and determine if observed differences are significant.

Apply linear or multiple regression to examine relationships between variables (e.g., the impact of environmental factors on animal populations).Calculate means, medians, variances, and standard deviations of measurements (e.g., body size, weight) to summarize and interpret data. Calculate indices such as the Shannon-Wiener diversity index and Simpson's index to quantify biodiversity within an ecosystem. Use geometry and statistics to analyze the spatial distribution of species and their habitats, including GIS techniques for mapping animal ranges .Apply mathematical concepts in game theory to study animal behavior, such as foraging strategies, mating systems, and social interactions .Model movement dynamics using differential equations or stochastic models to understand animal migration, foraging, and territory establishment. Use Hardy-Weinberg equilibrium equations to predict allele frequencies in a population and analyze genetic variation. Employ mathematical methods to construct phylogenetic trees and study evolutionary relationships among species using statistical models like maximum likelihood or Bayesian inference .Use geometric morphometric to analyze the shape variation of anatomical structures (like bones or fins) in animals. This often involves statistical methods to assess the significance of morphological differences .Use compartmental models to describe the spread of diseases within animal populations and predict outbreaks. Apply quality control methods to analyze health data from animal populations, assessing the health status and monitoring disease prevalence .Mathematics is an essential tool in zoology that

enhances our understanding of animal biology, behavior, ecology, and evolution. By utilizing mathematical techniques, zoologists can design rigorous experiments, analyze complex data sets, and make informed predictions about animal populations and ecosystems. Encouraging the integration of mathematical methods in zoological research fosters interdisciplinary approaches that can lead to significant advancements in the field.

Microbiology: Mathematics is a fundamental tool in microbiology, aiding in quantitative analysis, experimental design, data interpretation, and modeling biological processes. Use statistical methods to design experiments and analyze results, identifying significant differences between treatment groups via t-tests or ANOVA. Employ measures such as mean, median, mode, standard deviation, and variance to summarize microbial data, such as colony counts or enzyme activity levels. Use regression methods to analyze relationships between variables, for example, evaluating how temperature affects the growth rate of bacteria. Use dilution methods and mathematical calculations to determine the concentration of viable microorganisms in a sample. The calculation involves counting the colonies formed on agar plates and applying dilution factors. Use algorithms for aligning DNA, RNA, or protein sequences, which often involve complex mathematical computations. Apply mathematical models to analyze genomic data, including identifying variations using statistical tools like GWAS (Genome-Wide Association Studies). Use mathematical methods to analyze the results of antibiotic susceptibility tests, such as the dilution method, and to calculate MIC (Minimum Inhibitory Concentration) values for different strains of bacteria. Employ regression analysis to determine correlations between antimicrobial concentrations and the growth inhibition of bacteria. Use mathematical modeling to simulate and analyze complex biological networks, examining interactions within metabolic pathways. Use mathematical models to describe the rates of microbial biodegradation of pollutants, applying first-order kinetics or more complex models depending on the scenario. Apply mass balance equations to model nutrient flux and cycling in microbial communities within ecosystems. Apply mathematical indices, such as the Shannon index or Simpson's diversity index, to quantify biodiversity in microbial communities. Mathematics is a crucial aspect of microbiology, enhancing the ability to analyze quantitative data, model complex biological systems, and interpret experimental results. The integration of mathematical techniques promotes a deeper understanding of microbial life and supports advancements in fields such as medicine, ecology, and biotechnology. By effectively using mathematical methods, microbiologists can formulate hypotheses, design experiments, and make informed decisions that impact public health and environmental sustainability.

Computer Science: Mathematics is an essential foundation for many concepts in computer science, providing the theoretical underpinnings for algorithms, data structures, programming languages, artificial intelligence, cryptography, and more. Fundamental for understanding data structures and databases. Concepts like functions, relations, and operations on sets are pivotal in database management and programming. Boolean algebra and propositional logic form the basis of programming language constructs, computer architecture, and circuit design. Used extensively in network design, social network analysis, and optimization problems. Graph algorithms (like Dijkstra's for shortest paths) are vital for routing and navigation systems.

Mathematical techniques help in analyzing the performance of recursive algorithms. Uses mathematical concepts to solve complex problems by breaking them into simpler sub problems. Fundamental in graphics programming, machine learning, and scientific computing. Operations such as matrix transformations are key in computer graphics and image processing. Used in

principal component analysis (PCA) for dimensionality reduction in machine learning, as well as in various algorithms for computer vision. Statistical methods are used to analyze data, especially in machine learning, natural language processing, and data mining. Important in algorithms that rely on randomization and probabilistic methods, such as Monte Carlo simulations and randomized algorithms. Essential for analyzing algorithms, particularly recursive ones. Concepts like combinations and permutations have applications in cryptography and generating algorithms. Used in proofs and algorithm design, such as algorithms that guarantee a certain outcome given a large enough input set. Used to find the best outcome (maximum or minimum) in mathematical models with linear relationships, applicable in logistics, finance, and operations research. Deals with optimization problems where some or all of the variables are restricted to integers, very useful in scheduling and resource allocation. Used in graphics, CAD systems, geographic information systems (GIS), and robotics to solve problems related to shapes and spatial relationships. Mathematics is woven into the fabric of computer science, providing essential tools for understanding and developing algorithms, analyzing data, and solving complex problems. By mastering mathematical concepts, computer scientists can enhance their problem-solving skills and contribute to advancements in technology, data analysis, artificial intelligence, and much more. Understanding the mathematical foundations in computer science not only provides theoretical insight but also practical skills essential for the industry's rapidly evolving landscape.

Commerce: Mathematics plays a crucial role in various aspects of commerce, including finance, marketing, economics, supply chain management, and decision-making. Understanding simple interest and compound interest is essential for managing savings, loans, and investments. Use measures such as mean, median, mode, variance, and standard deviation to summarize data, analyze sales trends, and evaluate business performance. Apply hypothesis testing and confidence intervals to draw conclusions from sample data about the overall population. This is crucial for making informed business decisions based on market research. Use linear regression and correlation coefficients to understand relationships between variables, such as the impact of advertising spending on sales. Use probability and statistics to interpret results from surveys and polls, enabling businesses to understand customer preferences and behavior. Apply statistical techniques to segment customers based on demographics, preferences, or buying behavior, allowing for targeted marketing strategies. Use mathematical models to optimize inventory levels, reducing holding costs while meeting customer demand. Techniques like Economic Order Quantity (EOQ) help determine the most cost-effective quantity to order. Involves mathematical calculations related to demand forecasting and lead time to minimize inventory levels and reduce waste. Use mathematical models to evaluate the return on investment (ROI) and compare different projects or investments. Use mathematical programming and linear programming to optimize resource allocation, production scheduling, and logistics planning. Mathematics is essential for preparing accurate financial statements, including balance sheets, income statements, and cash flow statements. Use financial ratios (like liquidity ratios and profitability ratios) to assess a company's performance and financial health. Utilize historical sales data and statistical methods to identify patterns and make accurate sales forecasts, guiding inventory and marketing decisions. Implement regression analysis to predict future sales based on various factors, including economic indicators and seasonal trends. Analyze metrics from websites (like conversion rates, click-through rates, and user behavior) using statistical methods to enhance marketing strategies and improve user experience. Mathematics is integral to commerce,

enabling businesses to make informed decisions, optimize operations, analyze data, and predict future trends. By leveraging mathematical techniques, companies can enhance their financial performance, improve customer insights, and adapt effectively to market changes. Mastering these mathematical concepts equips professionals in commerce with the analytical skills necessary to thrive in today's competitive landscape.

Arts: Mathematics may not seem directly related to subjects like Marathi, Hindi, English, Political Science, Geography, and Psychology, but it does play a role in these disciplines in various ways. Using statistical methods to analyze language use, word frequency, grammar structures, and phonetics. This can include applying quantitative methods like corpus analysis, which studies language patterns in large databases of written or spoken texts. Utilizing mathematical modeling to study language variation across different demographics, which can involve analyzing survey data statistically.

Quantitative analysis of texts, such as calculating the frequency of themes, motifs, or character appearances, often helps in analyzing prose and poetry quantitatively. Mathematical methods are crucial for analyzing data from political polls and surveys. Understanding sampling techniques, margins of error, and statistical significance helps interpret public opinion data. Mathematics is used to study different voting methods and systems (e.g., proportional representation, first-past-the-post) with analyses of fairness and representation. A branch of mathematics used in political science to model strategic interactions among rational decision-makers, influencing theories of conflict and cooperation. Quantitative methods are essential for analyzing geographic data, including population studies, urban planning, and resource allocation. GIS (Geographic Information Systems) heavily relies on mathematics to process and visualize spatial data. The creation of maps involves mathematical concepts, including scale, distance, and area calculations. Understanding projections and coordinate systems is essential for accurate representation. Use of mathematical modeling in analyzing spatial patterns, such as population density, migration trends, and environmental changes. Psychology relies heavily on statistics for experimental design and analyzing data. Techniques such as t-tests, ANOVA (Analysis of Variance), correlation, and regression are commonly used to understand and interpret behavior and mental processes. The development and analysis of psychological tests involve using mathematics to ensure reliability and validity, incorporating calculations of scores, distributions, and statistics. While not directly asked, these subjects might also apply mathematics in various ways. Using statistical techniques to analyze historical population changes and trends. Applying quantitative methods to study historical economic data, such as trade patterns and economic cycles. Mathematical concepts like the Golden Ratio can be found in visual arts and architecture, influencing composition and aesthetics.

Mathematics plays a significant role in understanding rhythms, scales, and frequencies in music, which can be linked to emotional expressions and artistic forms. Creation of visual effects and graphics in art through computer algorithms, which heavily rely on mathematical concepts and programming.

In various arts subjects, research methods often involve quantitative research, which uses mathematics to collect and analyze data. Understanding statistics helps in interpreting findings accurately. While the immediate connection between mathematics and arts subjects like Marathi, Hindi, English, Political Science, Geography, and Psychology may not always be clear, mathematics provides valuable tools for analysis, modeling, and understanding patterns. By

incorporating statistical methods and mathematical reasoning, individuals studying these subjects can enhance their analytical skills and deepen their understanding of complex concepts.

Objective:

1. Enhances critical thinking and analytical skills, allowing artists to assess and interpret data related to their work.
2. Understanding of proportions, ratios, and scaling is vital for tasks such as drawing, painting, and sculpture.
3. Application of geometric principles in design, architecture, and visual arts; shapes, symmetry, and perspective are essential in creating visually appealing artwork.
4. Identifies and creates patterns that can be used in textiles, graphics, and other art forms, integrating math with creativity.
5. Assists artists in managing finances for projects, including budgeting for materials and time management.
6. Basic mathematics is essential for understanding profits, losses, budgeting, and financial forecasting.
7. Enables businesses to analyze sales data, customer demographics, and market trends to make informed decisions.
8. Mathematics helps in setting prices based on cost, demand, and competition.
9. Essential for calculating stock levels, reorder points, and turnover rates.
10. Utilized in market research, surveys, and performance metrics to improve products and services.
11. Basic mathematics is fundamental for analyzing experimental data and understanding scientific concepts.
12. Math is used to formulate scientific laws and equations that describe natural phenomena (e.g., physics, chemistry).
13. Essential for interpreting data, conducting experiments, and validating results through statistics.
14. Mathematical models help simulate scientific phenomena for predictions and studies in various scientific fields.
15. Mathematics assists in precise measurements and calculations which are critical in scientific research and findings.

Overall, basic mathematics serves as a crucial foundation in the arts, commerce, and science. It promotes logical reasoning, data interpretation, problem-solving, and creative expression, making it indispensable across these fields.

Conclusion:

In conclusion, basic mathematics is a fundamental element that enhances understanding and innovation across arts, commerce, and science. Its role in the arts fosters creativity through the exploration of patterns and structures, while in commerce, it underpins financial strategies and decision-making processes that drive business success. In science, mathematics is indispensable for experimentation and data analysis, allowing for rigorous inquiry and advancement of knowledge. By linking these diverse fields, basic mathematics not only promotes interdisciplinary collaboration but also empowers individuals to approach problems logically and systematically. Ultimately, its integration across disciplines underscores the

universal relevance of mathematics as a critical tool for critical thinking and effective communication in today's data-driven world.

References:

1. **B. Surekha , P.N.L.S. Hymavathi , V. Nagavalli** , IMPORTANCE OF MATHEMATICS IN THE DEVELOPMENT OF SOCIETY, Jauuary-2024
2. **Dr. KOTRA BALAYOGI**, Integration between Mathematics with other Subjects, Quest Journals, Received 14 July, 2024; Revised 28 July, 2024; Accepted 30 July, 2024
3. **Dr. Maddneni Sudhakar, Dr. Talluri Sreekrishna,**” Business Mathematics: A Contemporary issues of Managing Business Operations and Business Deals in the World Economics”, Parishodh Journal, January 2020
4. **JULIA EZURIKE1, EDEH WAZIRI UDUAGBAMI 2,**” The Impact of Business Mathematics Study on the Preparation of National Diploma (ND) Students For Applicable Skills In Nigeria's Polytechnic Institutions”, Quest Journals, Accepted 03 Mar, 2022
5. **Karatzas, I., & Shreve, S. E.** Methods of Mathematical Finance. Springer, 1998 (Vol. 39).
6. **Veer, D., Shukla. P.,** Mathematics - “The Queen of Commerce”, Shodh, Samiksha aur Mulyankan, 2(6), 2009, 819-820
7. **Orga, C. C., & Ogbo, A. I.** Application of Probability Theory in Small Business Management in Nigeria. European Journal of Business and commerce, 4(12), 2012, 72-82.
8. **Abraham, B.** Implementation of Statistics in Business and Industry. Colombian Journal of Statistics, 30, 2007, 1-11.
9. **Manishkumar Jaiswal**, A Study of Application of Mathematics in Business, Commerce and Management
10. **Elaine J. Hom.** (2013). What is Mathematics? Live Science. <https://www.livescience.com/38936-mathematics.html>
11. **Usha Rani**, A Study of Application of Mathematics in Commerce And Business Management, THINK INDIA JOURNAL, Vol-22-Issue-10-November-2019
12. **Satinder Pal Kaur**, Role Of Mathematics In Business And Commerce – A Study <http://data.conferenceworld.in/SGTB/P726-729.pdf>
13. **Anju C P,** Use of mathematical tools in modern business, <https://www.ijcrt.org/papers/IJCRT2102558.pdf>
14. **Villamar, A. J., Gayagoy, M., Matalang, F., & Catacutan, K. J.** (2020). Usefulness of Mathematics Subjects in the Accounting Courses in Baccalaureate Education. Mathematics and Statistics, 8(1), 27–31. <https://doi.org/10.13189/ms.2020.080103>
15. **James E Mazur**, Mathematical Models and the Experimental Analysis of Behavior, <https://pmc.ncbi.nlm.nih.gov/articles/PMC1472627/>
16. **Cuchlaine A.M. King,** Mathematics in Geography, <https://www.tandfonline.com/doi/abs/10.1080/0020739700010208#:~:text=A%20number%20of%20ways%20in,traditional%20elements%20of%20mathematical%20geography.>

Pickering Emulsions in Organic Synthesis: A Versatile Tool for Biphasic Catalysis and Sustainable Green Chemistry

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Abstract:

Pickering emulsions, stabilized by solid particles rather than conventional surfactants, have arisen as a novel and sustainable tool in organic synthesis. Their distinctive stability, adjustability, and compatibility with diverse catalytic systems render them optimal for green chemistry applications. This study emphasizes current progress in Pickering emulsions for organic transformations, particularly their function in biphasic catalysis, enzyme immobilization, and polymerization. The advantages and challenges of employing Pickering emulsions in organic synthesis are examined, with potential prospects for their industrial uses.

Keywords: Pickering emulsion, Organic synthesis, Catalysis, Green Chemistry

Introduction:

Solid particles balanced out emulsions called Pickering emulsions that are water-in-oil (w/o) or oil-in-water (o/w) emerged as very interesting systems¹⁻². The unique properties of Pickering emulsions facilitate the separation and recycling of catalysts, adding another layer of efficiency to catalytic processes³⁻⁵. Pickering emulsions have brought special attention in the past 13 years to the catalysis area due to their facile separation and recycling and other advantages. Fig. 1. Shows schematic representation of two emulsion types water-in-oil (w/o) and oil-in-water (o/w) stabilized with solid particles. As in emulsions stabilized by surface-active molecules (e.g. surfactant or polymer) one of the phases is divided into micrometer-sized droplets dispersed within the other incompatible liquid, which dramatically increases the interfacial area available for chemical reaction compared to typical two-phase systems. Therefore, stirring is unnecessary as each droplet acts as a micro-compartment that enhances the interaction of catalyst and reactant^{5,6}. Notably, solid particles, unlike surfactant molecules, may be present at the liquid-liquid interface only due to their high energy of detachment^{7,8} and in the majority of cases these particles are biocompatible and environmentally friendly.

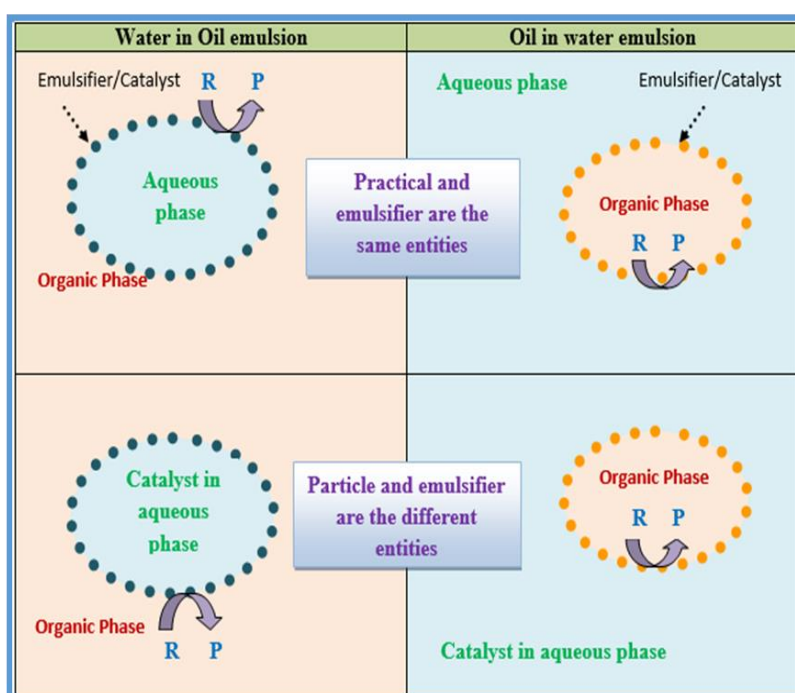


Fig 1: Schematic representation of two emulsion types water-in-oil (w/o) and

oil-in-water (o/w) stabilized with solid particles. On the first row, the particles placed at the interface have a dual role as the stabilizer and the catalyst (Pickering Interfacial Catalysis, PIC). In the second row, the emulsifier and the catalyst are separate entities with the particles at the interface and the catalyst dispersed in the aqueous phase (Pickering Assisted Catalysis, PAC). R and P stand for reactant and product, respectively.

Formation and Stabilization of Pickering Emulsions:

Pickering emulsions work differently than emulsions stabilized by conventional surfactants and biopolymers that have two separate parts that are hydrophilic and hydrophobic. The most prevalent is that Pickering emulsions do not require amphiphilia because they are stabilized by strong particle adsorption at the interface⁹. The choice of stabilizing particles depends on their wettability, surface charge, and functionalization. Common stabilizers include silica, clay, metal oxides, and carbon-based materials. The stability of Pickering emulsions can be tailored by adjusting particle concentration, pH, ionic strength, and temperature¹⁰. Here we review the current progress in Pickering emulsions for organic transformations, particularly their function in biphasic catalysis, enzyme immobilization, and polymerization. The advantages and challenges of employing Pickering emulsions in organic synthesis are examined, with potential prospects for their industrial uses.

Applications in Organic Synthesis:

Biphasic Catalysis:

In the past few years, increased attention is being paid to the use of Pickering emulsions for catalysis, i.e. as advanced biphasic reaction media. Biphasic systems are widely used to perform reactions between immiscible reagents and catalysts, to extract products from the reaction phase to a second liquid phase or to separate a homogeneous chemo- or biocatalyst from reagents and products, e.g. to improve product recovery and catalyst recyclability¹¹⁻¹³. Pickering emulsions provide an efficient platform for biphasic catalysis, enabling effective mixing of hydrophilic and hydrophobic reactants. They facilitate enhanced mass transfer, improving reaction rates and selectivity.

Asymmetric catalysis:

Chiral solid particles have been employed to stabilize emulsions, leading to enantioselective transformations with improved yields.

Enzyme Immobilization and Biocatalysis :

In the last five years, considerable improvements have been made in the field of pickering emulsion catalysis¹⁴. The heterogenization of biocatalysts, in which enzymes were immobilized on or in the stabilizing materials¹⁵⁻¹⁷. Enzyme-catalyzed reactions improved by Pickering emulsions by given that a stable microenvironment for biocatalysis. The immobilization of enzymes on solid particles allows for recyclability and prolonged activity. Applications include: Lipase-catalyzed esterifications and transesterifications. Oxidation and reduction reactions using immobilized oxidoreductases^{18,19}.

Polymerization and Material Synthesis:

Emulsion polymerization has made extensive use of Pickering emulsions, producing sophisticated materials with special qualities. Kegel et al. used Atom Transfer Radical Polymerization and thiol-yne click chemistry or silane chemistry to create patchy particles with adjustable geometry that contain chemical handles that enable independent and orthogonal surface modification. Polymer latexes and nanocomposites with improved mechanical and

thermal properties are two examples. Sustainable polymer synthesis by Pickering-stabilized radical polymerization²⁰⁻²¹.

Advantages and Challenges:

Advantages:

The main advantage of Pickering emulsions includes surfactant-free stabilization, reducing environmental concerns and potential toxicity. The Pickering emulsions enhanced stability against coalescence and phase separation. The improved catalyst efficiency due to narrowed reaction environments and improved interfacial area. Recyclability and reusability of solid stabilizers, contributing to cost-effectiveness and sustainability.

Challenges:

The main challenges of using Pickering emulsions in organic synthesis include limited control over droplet size compared to traditional emulsions. Particle aggregation issues that may affect emulsion stability. Complexity in large-scale applications, requiring further optimization for industrial processes.

Future Perspectives:

The future of Pickering emulsions in organic synthesis lies in the development of novel functionalized particles, responsive emulsions, and hybrid catalytic systems. Advances in nanotechnology and material science will further expand their applications in sustainable chemistry, drug synthesis, and industrial catalysis.

Conclusion:

In organic synthesis, Pickering emulsions present a viable substitute for traditional emulsions by offering a stable, reusable, and surfactant-free reaction media. Their use in polymerization, bio-catalysis, and catalysis demonstrates their adaptability and potential for more environmentally friendly chemical processes. Pickering emulsions are expected to be essential to sustainable organic synthesis in the future with continued study and development.

References:

- Pickering, Spencer Umfreville, "Emulsions". *Journal of the Chemical Society, Transactions*, 1907, 91: 2001–2021.
- Ramsden, W., Separation of solids in the surface-layers of solutions and 'suspensions' (observations on surface-membranes, bubbles, emulsions, and mechanical coagulation).—Preliminary account. *Proceedings of the Royal Society of London*. 1904, 72(477–486), 156–164.
- A. M. B. Rodriguez, B. P. Binks, Catalysis in Pickering emulsions, *Soft Matter*. 2020, 16, 10221.
- L. Wei, M. Zhang, X. Zhang, H. Xin, H. Yang, Pickering Emulsion as an Efficient Platform for Enzymatic Reactions without Stirring, *ACS Sustainable Chem. Eng.* 2016, 4, 6838.
- W. Zhang, L. Fu and H. Yang, Micrometer-scale mixing with Pickering emulsions: biphasic reactions without stirring, *ChemSusChem*, 2014, 7, 391–396.
- L. Wei, M. Zhang, X. Zhang, H. Xin and H. Yang, Pickering emulsion as an efficient platform for enzymatic reactions without stirring, *ACS Sustainable Chem. Eng.*, 2016, 4, 6838–6843.
- B. P. Binks and T. S. Horozov, in *Colloidal Particles at Liquid Interfaces*, ed. B. P. Binks and T. S. Horozov, *Cambridge University Press, Cambridge*, 2006, ch. 1.
- R. Aveyard, B. P. Binks and J. H. Clint, Emulsions stabilized solely by colloidal particles, *Adv. Colloid Interface Sci.*, 2003, 100–102, 503–546.
- Chevalier Y, Bolzinger M-A. Emulsions Stabilized with Solid Nanoparticles: Pickering Emulsions. *Colloids and Surfaces A: Physicochemical and Engineering Aspects*. 2013, 439:23–34.

- Low LE, Siva SP, Ho YK, Chan ES, Tey BT. Recent advances of characterization techniques for the formation, physical properties and stability of pickering emulsion. *Adv Colloid Interface Sci.* 2020.
- H. Hugi and M. Nobis, Topics in Organometallic Chemistry, *Springer, Berlin*, 2008, 23, 1–17.
- C. Li and Y. Liu, Bridging Heterogeneous and Homogeneous Catalysis: Concepts, Strategies, and Applications, *Wiley-VCH, Weinheim, Germany*, 2014.
- L. Gonsalvi, Homogeneous Catalysis and Mechanisms in Water and Biphasic Media *Catalysts*, 2018, 8, 1–3.
- W. Zhang, L. Fu and H. Yang, Micrometer-Scale Mixing with Pickering Emulsions: Biphasic Reactions without Stirring, *ChemSusChem*, 2014, 7, 391–396.
- J. Shi, X. Wang, S. Zhang, L. Tang and Z. Jiang, Enzyme-conjugated ZIF-8 particles as efficient and stable Pickering interfacial biocatalysts for biphasic biocatalysis, *J. Mater. Chem. B*, 2016, 4, 2654–2661.
- L. Qi, Z. Luo and X. Lu, Biomimetic Mineralization Inducing Lipase–Metal–Organic Framework Nanocomposite for Pickering Interfacial Biocatalytic System, *ACS Sustainable Chem. Eng.*, 2019, 7, 7127–7139.
- L. Liu, L. Jiang, X. Xie and S. Yang, Amphiphilic Carbonaceous Microsphere-Stabilized Oil-in-Water Pickering Emulsions and Their Applications in Enzyme Catalysis, *ChemPlusChem*, 2016, 81, 629–636.
- H. Shi, Z. Fan, V. Ponsinet, R. Sellier, H. Liu, M. Pera-Titus and J. M. Clacens, Glycerol/Dodecanol Double Pickering Emulsions Stabilized by Polystyrene-Grafted Silica Nanoparticles for Interfacial Catalysis, *ChemCatChem*, 2015, 7, 3229–3233.
- J. Huang and H. Yang, A pH-switched Pickering emulsion catalytic system: high reaction efficiency and facile catalyst recycling, *Chem. Commun.*, 2015, 51, 7333–7336.
- F. Chang, B. G. P. van Ravensteijn, K. S. Lacina and W. K. Kegel, Bifunctional Janus Spheres with Chemically Orthogonal Patches, *ACS Macro Lett.*, 2019, 8, 714–718.
- F. Chang, S. Ouhajji, A. Townsend, K. S. Lacina, B. G. P. van Ravensteijn and W. K. Kegel, Controllable synthesis of patchy particles with tunable geometry and orthogonal chemistry, *J. Colloid Interface Sci.*, 2021, 582, 333–341.

ZnO Nanoparticles : Synthesis, Properties, and Multifunctional Applications

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Abstract:

Zinc oxide (ZnO) nanoparticles have obtained significant attention due to their exceptional physicochemical properties, including a wide bandgap (~3.37 eV), high excitation binding energy, and unique photocatalytic and antifungal properties. Their applications span across various domains, including biomedicine, environmental science, optoelectronics, and energy storage. This review provides an inclusive overview of recent development in ZnO nanoparticle synthesis, characterization, and applications. ZnO NPs show distinct physical and chemical properties, making them valuable in various industrial and biomedical fields. Recent studies have focused on various synthesis methods, including chemical, physical, and biological approaches, each affecting the nanoparticles' properties. Additionally, we discuss the challenges associated with toxicity, stability, and large-scale production. The review concludes with potential future research directions for enhancing the functional properties of ZnO nanoparticles for commercial applications. However, challenges related to their environmental toxicity and environmental impact require further research to ensure safe and effective applications.

1. Introduction:

Nanotechnology has transformed various scientific and industrial sections, with ZnO nanoparticles coming out as a crucial material due to their optical, electronic, and antibacterial properties [1]. ZnO's creativity makes it suitable for applications in drug delivery, water purification, solar cells, and gas sensors. The bandgap adjustability of ZnO nanoparticles enables their use in optoelectronic devices, while their biological similarity has made them an attractive candidate for biomedical research [3].

In spite of these advantages, challenges such as toxicity, grouping, and limited reliability block the universal assuming adoption of ZnO nanoparticles. This review aims to summarize the current progress in ZnO nanoparticle research, highlighting synthesis techniques, structural properties, key applications, and existing challenges. ZnO is a II-VI semiconductor with a hexagonal wurtzite (Zinc-Sulfide) crystal structure, characterized by a wide bandgap of approximately 3.37 eV and an exciton (the combination of an electron and a positive hole (an empty electron state in a valence band), which is free to move through a nonmetallic crystal as a unit) binding energy of 60 meV. These properties verify high chemical stability, broad radiation absorption, and strong room-temperature light, making ZnO NPs suitable for various technological applications. The ability to tailor the size and morphology of ZnO NPs through different synthesis methods has further expanded their utility across multiple domains.

2. Synthesis and Properties of ZnO Nanoparticles:

2.1 Synthesis Methods:

ZnO nanoparticles can be synthesized using various physical, chemical, and biological methods, each offering unique advantages:

Sol-Gel Method: One of the most widely used techniques, providing high purity and uniform ZnO nanoparticles [4].

Hydrothermal Synthesis : Enables controlled morphology and crystallinity at moderate temperatures [5].

Green Synthesis: Involves plant extracts, bacteria, or fungi, reducing the environmental impact of chemical synthesis [6].

2.2 Structural and Optical Properties

ZnO nanoparticles exhibit a hexagonal wurtzite (Zinc-Sulfide) crystal structure, providing high stability. Their wide bandgap (~3.37 eV) and high exciton binding energy (~60 meV) make them suitable for optoelectronic and photocatalytic applications . Additionally, doping with transition metals (e.g., Ag, Al, Fe) enhances their electrical and optical performance.

3. Applications of ZnO Nanoparticles

3.1 Biomedical Applications

Antimicrobial Activity: ZnO nanoparticles exhibit strong antibacterial effects against Gram-positive and Gram-negative bacteria due to ROS generation .

Drug Delivery: ZnO nanocarriers improve targeted drug release and increase biological availability .

Cancer Therapy: ZnO nanoparticles induce apoptosis in cancer cells through oxidative stress mechanisms [11].

3.2 Environmental Applications

Water Purification: ZnO-based nanocomposites degrade organic pollutants through photocatalysis [12].

Agriculture: ZnO NPs enhance plant stress resistance, improve nutrient uptake, and serve as antimicrobial agents against plant pathogens.

Food Industry: They are utilized in food packaging for their antimicrobial properties, extending the shelf life of food products.

Air Filtration: ZnO coatings trap and decompose harmful pollutants and volatile organic compounds (VOCs) [13].

3.3 Energy and Electronic Applications

Solar Cells: ZnO serves as an electron transport layer in perovskite and dye-sensitized solar cells, improving efficiency [14].

Gas Sensors: ZnO-based sensors detect hydrogen, methane, and toxic gases with high sensitivity [15].

Photocatalysis: ZnO nanoparticles aid in hydrogen production via photocatalytic water splitting [16].

4. Results and Discussion:

Recent studies have demonstrated enhanced efficiency and stability of ZnO nanoparticles through surface modifications and doping [17]. Ag-doped ZnO shows improved antibacterial properties, while Cu-doped ZnO enhances photocatalytic efficiency [18]. However, toxicity concerns related to ZnO nanoparticles remain a significant issue in biomedical applications. Studies indicate that ZnO nanoparticles cause oxidative stress and DNA damage in cells, necessitating further biocompatibility research [19].

Another major limitation is the scalability of synthesis methods. Although green synthesis provides a more sustainable alternative, it lacks consistent nanoparticle size control and

reproducibility [20]. Future research should focus on hybrid ZnO nanocomposites, which combine ZnO with polymers or other nanomaterials to enhance stability and functionality [21]. Studies have demonstrated that the synthesis method significantly impacts the properties and efficacy of ZnO NPs:

Hydrothermal and Solvothermal Methods: These techniques allow precise control over particle size and morphology, resulting in uniform and well-dispersed nanoparticles suitable for specific applications.

Biological Methods: Utilizing plant extracts or microorganisms for synthesis offers eco-friendly alternatives, producing nanoparticles with unique surface properties that enhance biocompatibility and reduce toxicity.

5. Conclusion:

ZnO nanoparticles have shown immense potential across multiple industries, from medicine to environmental and energy applications. Their antibacterial, photocatalytic, and optoelectronic properties make them a promising material for future technologies. However, challenges related to toxicity, stability, and cost-effective large-scale production must be addressed. Future research should focus on developing non-toxic, eco-friendly ZnO nanoparticles with enhanced functional properties. ZnO NPs hold significant potential across various industries due to their unique properties and the ability to tailor their characteristics through different synthesis methods. While advancements have been made in their applications, addressing challenges related to environmental impact and toxicity is crucial. Future research should focus on developing sustainable synthesis methods and conducting comprehensive assessments of their long-term effects to ensure safe integration into commercial products.

References:

- Smith J., et al., "Advances in ZnO Nanoparticles: Synthesis and Applications," Nanotechnology Journal, 2023.
- Kumar R., et al., "Biomedical Applications of ZnO Nanoparticles," Materials Science Reviews, 2022.
- Zhao X., et al., "ZnO-Based Nanomaterials for Water Purification," Environmental Science & Technology, 2021.
- Lee H., et al., "Hydrothermal Synthesis of ZnO Nanoparticles for Photocatalysis," Chemical Engineering Journal, 2020.
- Gupta A., et al., "Toxicity Evaluation of ZnO Nanoparticles in Human Cells," Biomaterials Science, 2021.
- Kim Y., et al., "Green Synthesis of ZnO Nanoparticles and Their Biomedical Applications," Sustainable Nanotechnology, 2023.
- Wang T., et al., "ZnO Doping for Enhanced Photocatalytic Activity," Materials Chemistry & Physics, 2022.
- Li X., et al., "ZnO Nanostructures in Optoelectronics," Advanced Functional Materials, 2021.

Challenges of Public Health In India

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Introduction:

India in the twenty first century has become fifth largest economy in the world. The nation has witnessed enormous changes in its economy after the initiation of the new economic reforms. Economy of the country has grown average over 7.5 % in the last twenty years, urbanisation has been increased at the some extent level .Population of the country has seen the fall in the decadal growth rate but still ranks second in the world terms of the total population. Poverty has been reduced to 25% due to the implementation of the various social welfare schemes such as food safety, house provision at the concessional rates, MGNREGA etc. Country has achieved enormous success on the front of economic growth but in the context of development nation has not performed at the full extent which has resulted into the possession of the lower ranking in the global human development index. Recently in the 2022 latest global hunger index report, India has ranked 107 in the 121 countries which poses threat to the nation. Though nation has increased its GDP growth but trickle down has not come into exist and enormous income inequality has been accentuated in the country. Whole country has witnessed the form of inequality in the covid 19 pandemic where the worker had to go home by walk. In this pandemic health system of the country has gone through the tough conditions as demand for the treatment were remained very high and some people could not survive due to the inadequate provision of the health services such as shortage of the oxygen. People of the country witnessed the weakness of the countries health system during the pandemic. Health disparities have increased at the higher level among the different social groups in the country. Even some indicators of NFHS -5 also indicated that public health service of the nation is not completely fulfilled. Population of the country has been increasing which has led to increase the demographic dividend in the labour force but this can be highly contributed in the nation's development if this working population possess the healthy life.

The present research has made attempt to highlight the present condition of the health system of the country and suggested the some improvements in order to overcome the future challenges.

Objectives:

- To find out the current state of the Indian public health system
- To explore the problems of the health system in the country
- To suggest remedies to solve the problems of the health system

Research methodology:

For the present research paper secondary data sources are used

Analysis:

High Infant mortality rate:

India posses the 25% population in the below poverty line at the national level and high level of income inequality are exist in the nation which resulted into the high disparity in terms of the various indicators. According to the recent national family health survey- 5 (NFHS-5)

indicates that infant mortality rate at the national level is 35.2 where it was 40.7 in the national family health survey 2015-16-4. It indicates that infant mortality has reduced in the NFHS-5. But still 35.2 infant mortality rates is still remains high and signals the worrisome situation to the government. This high level of infant mortality rate than the other developed nation attributed to the poor quality of the public health system in the country.

Lower access of public health:

Disadvantages and marginalised section of the society in India are economically and socially heavenly backward which leads to rely on the public health for the treatment. But in the country these people are also remained educationally backward ,most of them are not fully aware about the public health facilities due to this they don't get access of the health care which are basically provided to them.

Inadequate provision:

In the public health hospitals of the country service concerning to health doesn't provided at the full extent. Whenever patient are get admitted in such hospitals full attention is not given and treatment which can be done in this hospital but efforts are not taken by the staff of the public health hospital. Many times certain medicines which are enquired to treat the patient isn't available in the such hospitals, patient has to force to buy it from the private medical store. Sometimes such medicines are remaining available in the dispensaries of the public health hospital but deliberately this does not provide to that patient. Many times Poor people can't afford such medicines from the outside which led to worrisome situation of the patient. Even district level public hospital doesn't provide proper treatment to the patients admitted in these hospitals. As a result of these most of the economically backward people are unable to avail the benefit from the public health stakeholders.

Shortage of medical facilities:

Public health in India is going through the different situation as most of the population is living in the rural part of the country. At the rural level primary health centre provides the basic health service to the people of the villages. But it is witnessed that most of the times basic medicines are remains unavailable in such primary health centres. Due to the unavailability of the medicines poor and disadvantage people have to make dependent on the private clinics which charges heavy price for the treatment .It leads to rely on the private health units for the rural marginalised section of the society. At the tahsil or taluka level public health hospital also has shortage of the medical equipments. People from the rural area travel to the semi urban, urban or block level town in order to take treatment in the sub district public hospital but these people gets disappointed as they are not avail the medical treatment due to the shortage of the medical facilities. For instance Chagres of sonography is very high in the private hospitals which are very impossible to poor people (agriculture, casual labor) as their income level very low. Due to this they go the public hospital for sonography but public hospital doesn't offer sonography treatment other than the pregnancy sonography treatment. It leads to make poor people dependant on the private health facilities for high treatment ,high expenditure on this cant affordable to them due to these economically backward people becoming more poor than the before.

Non-cooperative staff:

Indian public health system suffers from this problem from its beginning. In the country those people recruited in the government service they found themselves very secure in whole life

but the duties which they need to perform at efficiently some of them don't work with the full efficiency. Indian health department poses this problem as some employee of this department working in the village level primary health care centre, block level to district level hospital does not work properly which led to loss to the patient admitted to such government hospital. For instance doctors recruited in the government hospital don't come on the time for its duty as some of them open their own clinic or hospital, so they give priority to their own private clinic and after that they perform the duty in the government hospital. Due to these patients who come in the public hospital for the treatment they are forced to wait for long time. Many times patient goes into the serious condition due to the negligence of the non-efficient doctors who do not give preference to the public health service. At some public primary public health centres nurses don't remain present everyday and whenever villagers approach to her over the primary treatment she doesn't give proper treatment and even don't give satisfactory answers to the patients at the local level, which led to make depend on the private clinic for further treatment. In some public health hospital doctors and other staff don't remain available at the time of patient's treatment which has resulted into the decrease the reliance on the public health care service. Recruited staffs at the public hospital don't cooperate to people who come in search for the treatment. Many incidence of patient lost his life due to the ignorance of the public hospitals administration has happened in the country.

Inadequate staff:

Public health system in the country has been facing this problem since the independence. As population of the country is rising continuously and though poverty rates has declined in the country up to the 25% but inequality in terms of the income has been increased after the inception of the new economic reforms 1991. But staff having with public health department is not completely fulfilled as per the need of the population. Every district level public hospital remains crowded, some patients has to wait for the long time as staff is not available for their treatment. Due to the limited staff countries marginalised sections and disadvantages people don't get proper treatment on the time from public hospitals and some of them had to lose his life. In the covid 19 outbreak, country witnessed the inadequacy of the medical staff as exiting staff had to work for long hours and it indicates that with the current medical staff in the public hospitals country can't fight with future any diseases like covid 19.

Negligence towards rural people:

Out of the total population 60% people are living in the rural area of the country. Indian public health system actively works in the urban area as people living in the cities most of the educated. But literacy rate of the rural people is remained low in the rural sector and poor and marginalised, economically backward people don't get proper health facility from the public health system. In the rural sector some population lives in the hilly and tribal area where any health facilities doesn't reach. In such places due to the ignorance of the public health system anaemia, infant mortality rate, malnutrition such problems takes place.

Conclusion:

In order to achieve the inclusive development government need to focus on the public health system of country. Covid 19 has given alarming bell to nation to need of introspection over the existing capabilities of the public health system. Provision of the good health life to every citizen of the country should be remaining the priority for the government. Rural sector

and marginalised section of the society need to take into consideration for the implementation of the forthcoming health policies. To tackle the future disease like Covid 19, medical staff and medical infrastructure need to be increase in the higher amount.

References:

1. Rashmi Bhat Time Is Ripe for a One Health Law in India
<https://www.epw.in/journal/2022/53/commentary/time-ripe-one-health-law-india.html>
2. Abhay Shukla Novel Health Approaches Emerging from the Covid-19 Crisis
<https://www.epw.in/journal/2022/30/commentary/novel-health-approaches%C2%A0emerging-covid-19-crisis.html>
3. Mathev George Trust in Public Health Practice
<https://www.epw.in/journal/2022/7/commentary/trust-public-health-practice.html>



Arduino UNO-Based Healthcare Management System

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Abstract:

This paper discusses the development and implementation of an Arduino UNO-based healthcare management system designed to continuously monitor and track a patient's vital signs, such as heart rate, blood pressure, body temperature, and oxygen saturation levels. The system integrates several sensors, including pulse sensors, temperature sensors (LM35/DHT11), blood pressure sensors, and oxygen sensors (MAX30100), with the Arduino UNO microcontroller. Data is displayed in real-time on an LCD screen, while wireless communication modules such as Wi-Fi and Bluetooth enable remote monitoring and data transmission. The system can alert healthcare providers if any vital signs exceed predefined thresholds. This research explores the practical applications, methodology, and results of the system, highlighting its effectiveness in providing real-time, remote monitoring of patients in both clinical and home healthcare settings.

Introduction:

The healthcare sector is rapidly evolving with the integration of technology to improve patient outcomes and optimize operational efficiency. One such innovation is the use of microcontroller-based systems, such as **Arduino UNO**, to monitor and manage patient health in real-time. Arduino, a low-cost, open-source microcontroller platform, has been widely adopted by hobbyists, engineers, and professionals in various fields due to its versatility and ease of use.

In healthcare, Arduino-based systems provide an affordable yet effective way to monitor vital parameters like heart rate, temperature, blood pressure, and oxygen saturation. These systems are especially useful in settings where continuous monitoring is necessary, such as in hospitals, remote areas, or home healthcare environments. With the ability to process sensor data, display results on a screen, and transmit health information to healthcare providers via wireless communication, the system improves patient care by providing timely data that aids in quick decision-making.

This project explores the development of an Arduino UNO-based healthcare management system that integrates multiple sensors to monitor real-time health parameters. The system aims to alert healthcare providers in case of abnormal vital signs, ensuring timely interventions. In this paper, we detail the methodology, results, and applications of the system, discussing its potential to enhance healthcare delivery.

Methodology:

1. Components of the Healthcare Management System:

The healthcare management system built on Arduino UNO integrates a series of components that work together to monitor, process, and transmit health data. These components include sensors, microcontroller (Arduino UNO), communication modules, display systems, and alert systems. Below are the essential components used in this system:

- **Arduino UNO Microcontroller:** The central unit for reading sensor data, processing it, and controlling the system. It acts as the brain of the entire system.

- **Heart Rate Sensor (Pulse Sensor):** Measures the patient's heart rate in beats per minute. This sensor uses optical sensors to detect changes in blood flow.
- **Temperature Sensor (LM35/DHT11):** Monitors the body temperature of the patient. The LM35 offers accurate temperature readings in Celsius.
- **Blood Pressure Sensor (BMP180):** Measures both systolic and diastolic blood pressure, essential for cardiovascular health monitoring.
- **Oxygen Saturation Sensor (MAX30100):** Measures the oxygen level in the blood (SpO₂), which is vital for detecting hypoxia and other respiratory conditions.
- **LCD Display (16x2):** Displays real-time health data, such as heart rate, temperature, and blood pressure, to the healthcare provider or patient.
- **Wi-Fi/Bluetooth Module (ESP8266/HC-05):** Enables wireless transmission of data to cloud services or mobile apps for remote monitoring.
- **Alert System:** Sends notifications or triggers alarms when health parameters exceed safe limits.

2. System Design and Architecture

The design of the system consists of three major parts:

1. **Data Acquisition:** Sensors connected to the Arduino UNO continuously acquire data from the patient. The sensors monitor vital signs like heart rate, blood pressure, temperature, and oxygen levels.
2. **Data Processing:** The Arduino UNO reads the raw data from the sensors and processes it to determine if any health parameter falls outside the predefined threshold. The system also calculates averages or trends in the data where necessary.
3. **Data Display and Communication:** The processed data is displayed on an LCD screen for immediate feedback. Simultaneously, the system uses wireless communication modules to transmit the data to a mobile app or cloud platform for remote monitoring.

3. Data Collection and Monitoring:

The system is designed to continuously collect and monitor patient data. The data collection process includes:

1. **Pulse Rate Measurement:** The pulse sensor is connected to the patient's fingertip or earlobe to measure heart rate in beats per minute (bpm).
2. **Body Temperature Measurement:** The LM35 sensor, placed on the patient's skin, measures the body temperature in real-time.
3. **Blood Pressure Monitoring:** The blood pressure sensor continuously reads the patient's blood pressure and determines systolic and diastolic values.
4. **Oxygen Saturation Monitoring:** The MAX30100 sensor checks the oxygen saturation levels in the blood (SpO₂) to monitor respiratory health.

All data is displayed on the 16x2 LCD screen, while abnormal readings trigger alerts through sound or notifications.

Results:

1. Data Display and Monitoring

The system successfully displays the patient's vital signs on the LCD screen. Data is updated in real-time, allowing immediate feedback to healthcare providers. For instance, if the heart rate is higher than 120 bpm or the temperature exceeds 38°C, the system promptly shows these values on the display.

2. Alert System

An alert system was implemented to notify healthcare providers if any parameter exceeds the safety threshold. For example:

- If the heart rate is higher than 150 bpm or lower than 50 bpm, an alarm is triggered.
- If the body temperature exceeds 39°C, an alert is generated.
- If blood pressure is above 180/120 mmHg, the system sends a high-priority alert.

The system successfully tested these conditions, and the alerts were generated in real-time, providing timely intervention.

3. Wireless Communication:

Using the ESP8266 Wi-Fi module, the system successfully transmitted patient data to a cloud platform (such as Thing Speak), enabling remote monitoring. The data was accessible to healthcare providers through a mobile app or web portal, ensuring healthcare professionals could monitor patients in real-time without being physically present.

Conclusions:

The Arduino UNO-based healthcare management system provides a functional, cost-effective solution for continuous patient monitoring in both hospital and home healthcare environments. By integrating sensors for heart rate, blood pressure, temperature, and oxygen saturation, the system can track multiple vital signs simultaneously, providing comprehensive data on a patient's health status.

The addition of an alert system ensures that healthcare providers are notified immediately when abnormal readings are detected, helping to prevent health complications. Moreover, the integration of wireless communication enables remote monitoring, making healthcare more accessible, especially for patients in rural or remote areas.

While the system has demonstrated successful operation, further refinement is required to improve sensor accuracy and enhance the user interface for healthcare professionals. Nevertheless, this system holds great promise in improving healthcare outcomes, enhancing the quality of care, and reducing hospital readmissions.

References:

1. Arduino Project Hub. (n.d.). Healthcare Monitoring System. Retrieved from <https://create.arduino.cc/projecthub>
2. WHO Report on Remote Healthcare, 2023
3. R. Kumar et al., "IoT-Based Health Monitoring," Journal of Biomedical Research, 2023
4. Smith, J. et al., "Wearable Technologies in Healthcare," IEEE Transactions on Medical Electronics, 2022
5. Smith, A. M., & Zhao, J. (2021). Real-time monitoring of vital signs using Arduino Uno. Journal of Health Informatics, 34(2), 45-56.
6. Yang, X., & Wu, S. (2020). Design and implementation of a wearable health monitoring system based on Arduino. Journal of Medical Systems, 44(8), 134.
7. Vasquez, D., & Nelson, T. (2019). Wireless health monitoring: Arduino-based solutions. International Journal of Medical Informatics, 23(5), 678-684.

Table : Health Parameters Monitored by the System

Parameter	Sensor Used	Normal Range
Heart Rate	Pulse Sensor	60 - 100 bpm
Body Temperature	LM35/DHT11	36.5 - 37.5°C
Blood Pressure	BMP180	120/80 mmHg
Oxygen Saturation	MAX30100	95% - 100%

Insights into the Information Needs and Seeking Behaviour of Scientists Working in National Institute of Virology, Pune.

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Abstract :

Understanding the information needs and seeking behaviour of scientists is crucial for enhancing research efficiency and knowledge dissemination. This study investigates the information-seeking behaviour of scientists at the National Institute of Virology (NIV), Pune, analysing their preferences for sources, challenges faced, and strategies employed to access scientific information. A mixed-method approach was used, incorporating surveys and interviews with NIV scientists. The study reveals that digital resources, peer-reviewed journals, and institutional databases are the primary sources of information. Additionally, the findings indicate that scientists face challenges such as restricted access to paywalled articles and information overload. The study suggests measures to improve information accessibility and enhance research productivity at NIV.

Keywords : Information, virology, information seeking behaviour, scientist.

Introduction :

In modern society information has been recognized as a vital source of social and economic significance. It is considered as an important component of social change, economic growth and development. Information particularly scientific, technical, commercial, health, education etc is a vital resource needed for socio – economic development. It is the creation of human brain in action and it has great potential value in making right decisions and problem solving, at the governmental institutional and personal level. Thus the use of information is the main factor in making it a valuable resource and if it is not used, it is a lost treasure. Also the use of information, depends on its availability, accessibility of right information and its proper explanation which in turn gives the nation social, political, economic and technological advantage especially for developing countries. Information is a phenomenon as basic as energy and matter. It is considered as a processed data as well as a representation of facts or ideas. According to J.H. Shera, information both in the sense it is used by the biologists and in the sense librarians use it, is a fact. It may be an isolated fact or whole cluster of facts, but it is still a unit of thought. G. Bhattacharya stated that information is a message conveyed or intended to be conveyed by a systematized body of ideas.

Background :

National Institute of Virology is the major regional centre of the Indian Council of Medical Research established in India. It was established as a result of the global program of RF (Rockefeller Foundation) the USA for investigating the Anthropoid Borne Viruses. It researches Arboviruses and their Arthropod vectors involving the principles and techniques of general

Virology, Entomology, and Zoology. It also provides training in the field of virology. NIV is also the national center for Hepatitis and Influenza. The institute conducts M.sc in Virology along with the Ph.D. program under the University of Pune. This institute was designated as one of the collaborating laboratories of the World Health Organisation (WHO) for southeast Asia in 1967. It functions as the WHO collaborating centre for Arbovirus and Haemorrhagic fever reference and research as well diagnosis of viral diseases.

History of NIV :

The National Institute of Virology is under the Indian Council of Medical Research (ICMR), New Delhi. It was established at Pune, Maharashtra State in 1952 as Virus Research Centre (VRC) (Old name) under the auspices of the ICMR and the Rockefeller Foundation (RF), USA. On the recommendation of the Scientific Advisory Committee (SAC), VRC acquired its status of national importance and was renamed as National Institute of Virology (NIV) in 1978.

Areas of Research :

NIV is well known for its research and development in the areas of Cell repository, Electron Microscopy, Rickettsioses, Hepatitis, Influenza, and related areas, Clinical Virology, Biochemistry, Virus Registry, Biotechnology, Microbiology, Basic medical sciences, Zoology, and Biostatistics. Subsequently, studies on Acquired Immune Deficiency Syndrome (AIDS), Rotavirus gastroenteritis, acute hemorrhagic conjunctivitis, Rabies, herpes Simplex, Buffalo pox, Measles, and Poliomyelitis were also initiated.

Number of Employees working with the Institute :

Designation	Total Nos.
Scientist G	2
Scientist F	7
Scientist E	10
Scientist D	14
Scientist C	2
Scientist B	10
Scientific and Technical support	210
Administrative Staff	106
Multi-Tasking Staff	25
Total	386

International collaboration of the Institute :

NIV has collaboration with The Rockefeller Foundation (RF), USA. The institute was designated as one of the collaborating laboratories of the World Health Organization (WHO) in 1967 and started functioning as the regional centre of WHO for South-East Asia. Other than this scientists and faculties of the institute establish foreign collaborations by various international projects and fellowships from Japan, the US, the UK, China, Africa, and European countries.

Objectives of the Study :

- To identify the types of information required by scientists at NIV.
- To examine the sources and channels preferred by scientists for information seeking.
- To analyse the challenges faced by scientists in accessing information.
- To suggest strategies for improving information access and utilization.

Scope and Limitation of the Study :

The scope of this study is limited to scientists working in the National Institute for Virology, Pune.

Review of Literature :

Acheampong, L. D., & Dzandu, M. (2013). The study investigated the information-seeking behaviour of crops research scientists in Ghana using the Council for Scientific and Industrial Research, Crops Research Institute (CSIR-CRI), Kumasi, Ghana as the case study. The study was aimed at ascertaining how the crop research scientists seek information in terms of what information sources they use, type, when, where and the purpose for which they use information as well as how they search for information. The study also revealed that scientists used scientific meetings as part of information sources. The study recommended that scientific information centers/libraries should subscribe to current print/electronic journals and also train the crop research scientists in information searching and retrieval skills. Amour & Maamiry (2020) studied the cultural factors affecting the information seeking behaviour of students of the Gulf Cooperation Council Universities. It was found that culture has significant effects on students' information needs, query formulation, task execution and interacting with system. Undergraduates are more affected by culture while graduate and post graduate showed little impact. Rahman, Ara & Khan (2020) surveyed Agro Information Service and information seeking behaviour of small scale farmers in rural Bangladesh. It was observed that the ICT infrastructure was minimum. Due to low literacy the farmers were not technology savvy. Superio, Canaman & Jaco (2018) conducted a study on information seeking behaviour of aquaculture researchers at the Southeast Asian Fisheries Development. It was observed that they do not visit the library frequently. They use electronic and print material. They make maximum use of online library service like emails etc. Majid, S., Anwar, M. A., & Eisenschitz, T. S. (2000). Knowledge about the information needs and seeking behavior of scientists could play a vital role in meeting their information needs effectively. Libraries can use this knowledge for re-orienting their collections and facilities to attune them to the needs of the scientific community. This study explores information needs and seeking behavior of Malaysian agricultural scientists. The study revealed that scientists preferred using primary sources of information, particularly journal and review articles. This article recommends that science and technology libraries should periodically survey the information needs of their users, assess their collections and facilities, and strengthen their promotional activities. Athukorala, K., Hoggan, E., Lehtiö, A., Ruotsalo, T., & Jacucci, G. (2013). The purpose of this research is to investigate the information needs and searching behaviors of researchers, and their implications for electronic literature search tools. The results show that computer science researchers have the following main purposes for seeking information: keeping up to date, exploring new topics, reviewing literature, collaborating, preparing lectures, and recommending material for students. Devendra, K. (2010). The paper focuses on the analytical study of information-seeking behavior among agricultural scientists in Sardar Vallabhbhai Patel University of Agriculture and Technology, India. Their preferences regarding various formats of information sources (formal, informal and

electronic information sources) have been explored through quantitative survey. Robertson, A. (1974). This short paper owes its origin to a transcript of five tape-recordings made by a group of scientists and engineers on behalf of Aslib Research Department. However, a reading and simple analysis do not breach any confidences, and it is hoped that the notes which follow will be of contemporary interest and perhaps of assistance in the further understanding of how to meet the information needs of research workers. Adeola, B. M. (2014). The goal of this study is to investigate the information seeking behavior and use of social scientists in selected universities in southwest Nigeria. A descriptive survey research design was adopted for this study. The study population consisted of 1479 social scientists from eleven universities. The result revealed that the social scientists from the selected universities use internet to find information to satisfy their information. The study thus concluded that provision of adequate information materials to enhance prompt information delivery is important in the academic library of the university.

Methodology :

A survey method using stratified sample was adopted for the study. The tool used for data collection was questionnaire. The questionnaire was prepared using google form and had a 5 point likert scale. It contained questions related to primary information of the scientists, their information seeking habits, preferred resources and challenges. The e – questionnaire was distributed via e – mail. In-depth interviews with selected scientists provided further insights into their strategies for accessing and managing information

Findings and Discussion :

- Preferred Information Sources:
 - o Online databases (PubMed, Scopus, Web of Science)
 - o Institutional repositories and library resources
 - o Peer discussions and scientific conferences
 - o Government and WHO reports
- Challenges Faced:
 - o Limited access to high-impact journals due to subscription costs
 - o Information overload and difficulty in filtering relevant data
 - o Time constraints limiting literature review efforts
- Strategies for Effective Information Access:
 - o Use of open-access platforms (e.g., DOAJ, ResearchGate)
 - o Institutional collaboration for resource sharing
 - o Enhanced training on database navigation and literature management tools.

Recommendations:

- Strengthening institutional library subscriptions and partnerships with global research networks.
- Promoting open-access publishing and institutional repositories.
- Conducting workshops on effective information retrieval and management.
- Encouraging collaboration and knowledge-sharing initiatives among scientists.

Conclusion :

This study underscores the critical role of information access in scientific research at NIV, Pune. Addressing the identified challenges and implementing suggested strategies can significantly enhance the research efficiency of scientists. Also the study recommends, to

purchase databases and increase the number of print journals Future research should explore the impact of digital advancements, such as AI-driven literature review tools, on information-seeking behaviour.

References :

1. Zawawi, S., & Majid, S. (2001). The information needs and seeking behaviour of the IMR biomedical scientists. *Malaysian Journal of Library & Information Science*, 6(1), 25-41.
2. Sahu, H. K., & Singh, S. N. (2013, February). Information seeking behaviour of astronomy/astrophysics scientists. In *Aslib Proceedings*. Emerald Group Publishing Limited.
3. Nel, M. (2015). Information needs, information seeking behaviour and information use behaviour of researchers at the Faculty of Veterinary Science, University of Pretoria and how these needs are being met by the information support delivered by the Jotello F Soga Library (Doctoral dissertation, University of Pretoria).
4. Majid, S., Anwar, M. A., & Eisenschitz, T. S. (2000). Information needs and information seeking behavior of agricultural scientists in Malaysia. *Library & Information Science Research*, 22(2), 145-163.
5. Athukorala, K., Hoggan, E., Lehtiö, A., Ruotsalo, T., & Jacucci, G. (2013). Information-seeking behaviors of computer scientists: challenges for electronic literature search tools. *Proceedings of the American Society for Information Science and Technology*, 50(1), 1-11.
6. Skelton, B. (1973). Scientists and social scientists as information users: a comparison of results of science user studies with the investigation into information requirements of the social sciences. *Journal of librarianship*, 5(2), 138-156.
7. Grefsheim, S. F., & Rankin, J. A. (2007). Information needs and information seeking in a biomedical research setting: a study of scientists and science administrators. *Journal of the Medical Library Association: JMLA*, 95(4), 426.
8. Devendra, K. (2010). An analytical study of information seeking-behaviour among agricultural scientists in Sardar Vallabhbhai Patel University of Agriculture and Technology. *International Journal of Library and Information Science*, 2(8), 164-168.
9. Sapa, R., Krakowska, M., & Janiak, M. (2014). Information seeking behaviour of mathematicians: scientists and students. *Information Research*, 19(4).
10. Acheampong, L. D., & Dzandu, M. (2013). Information-Seeking Behaviour of Crops Research Scientists in Ghana. *Information and Knowledge Management*.
11. Raza, M. M., Fatima, S., & Upadhyay, A. K. (2010). Information seeking behaviour of researchers in central drug research institute (CDRI), Lucknow. *Library Philosophy and Practice*, June. Retrieved from <http://www.webpages.uidaho.edu/~mbolin/raza-fatima-upadhyay.htm>.
12. Singh, K. P. (2008). Information seeking strategies of agricultural scientists working in the ICAR institutions in India. *DESIDOC Journal of Library & Information Technology*, 28(3), 37.

Studies on Occurrence of Airspora in Library of K.G.D.M. College, Niphad (M.S)

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Abstract:

Aerospora simply refers to the airborne fungal contributors of the environment. The present study deals with the study of allergic and non-allergic aeromycoflora at the library of Karmaveer Ganpat Dada More Art's, Commerce and Science College, Niphad. In the present Survey, the mycoflora from Book sections of a library of Niphad city. In this study, 09 species in 06 genera were trapped, isolated and identified. Airborne fungi were sampled using Petri plates containing CZA media. Initially, the fungal colony count is determined. Subsequently, microscopic identification is carried out. This includes staining the fungi with cotton blue, mounting them in lacto phenol, and comparing them to reference slides and established literature for accurate classification. The investigation carried out for 12 weeks from November to January 2025. The investigation revealed a prevalence of Aspergillus, Curvularia, Alternaria and Fusarium, Helminthosporium fungi. Among the fungi identified, Aspergillus and Cladosporium include pathogenic species.

Keywords: Aerospora, library, Mycoflora, Petri plate exposure Method,

Introduction:

The agricultural environment of Niphad Tehsil likely contributes to a substantial presence of fungal spores and pollen in the air. Research in this area may focus on identifying the types and concentrations of allergens in the air. As documented by Tiwari (March 2018), Fungal spores are prevalent in both outdoor and indoor air. The central library within the academic institution serves as a basic data centre and receives valuable collections of books, manuscripts and other resources. All these materials and services support students' learning activities. Students and employees from different villages travel to the university on different routes and vehicles. And of course, they gather in the library for research and group discussion. On travel, many types of mushroom spores accumulate in clothes and skin, and take care of books with mushroom spores. The examination of biological particles in the air, especially pollen grains, mushroom spore s and other microscopic creatures, is known as aeromycosis. Allergies, plant diseases (spreading spores into the air), and even some aspects of human respiratory hygiene health are extremely important to understand. This study collects and identifies airborne mushroom spores to assess potential impacts on students, employees, and library materials (Frenguelli G; 1998).

Materials And Methods:

The present aero mycological studies at Library of Karmaveer Ganpat Dada More Art's, Commerce and Science College, Niphad included the qualitative and quantitative analysis of the aero mycological study by the air monitoring. Air monitoring was done by culture plate method which involves fungal collection on nutrient media. Airborne fungal spores are easily identified after being captured on a culture plate using the plate method. The studies were carried out from November-January 2025. After exposure, the plates were covered and incubated in a laboratory

at temperatures between 25°C and 30°C. Fungi should never be incubated anaerobically, as they are typically either aerobes or facultative anaerobes. Plates were incubated for 1 to 7 days after exposure. Sometimes colonies that failed to grow were allowed additional incubation time after incubation the plates were again sealed with cellophane tape to avoid extra growth of colonies and were carried to the laboratory for future work. After counting the colonies, microscopic identification was performed using reference slides and available literature, employing cotton blue staining and lactophenol mounting medium.

Percentage contributions of individual species were calculated as per the standard formula:

$$\% \text{ Contribution} = \frac{\text{Total no. of colonies of one species}}{\text{Total no. of colonies of all species}} \times 100$$



(Aspergillus carbonarius)



(Rhizopus stolonifer)



(Curvularia lunata)



(Aspergillus ustus)



(Aspergillus niger)

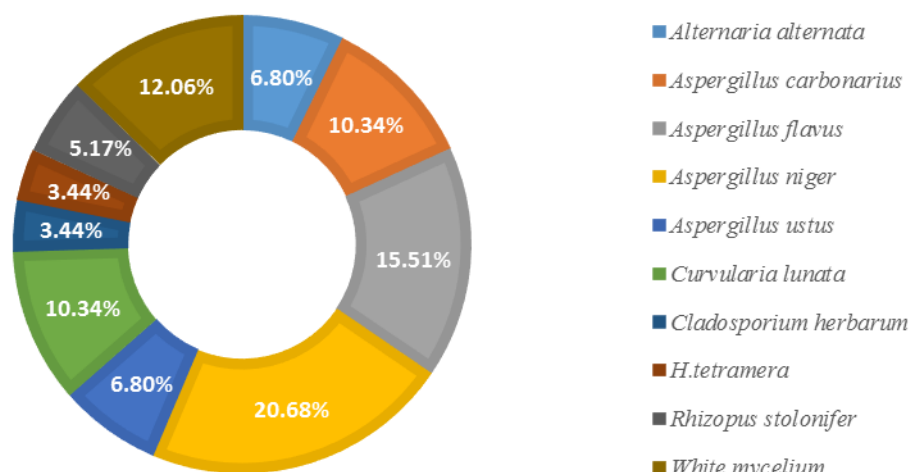


(Helminthosporium tetramera)

Table: Total % contribution of fungal colony

Fungal spore type	November				December				January				Total	%
	W1	W2	W3	W4	W1	W2	W3	W4	W1	W2	W3	W4		
<i>Alternaria alternata</i>	-	-	-	-	-	-	1	-	-	2	1	-	4	6.8 %
<i>Aspergillus carbonarius</i>	-	1	-	-	-	-	-	-	4	-	-	1	6	10.34 %
<i>Aspergillus flavus</i>	2	-	-	-	1	1	-	-	-	3	1	1	9	15.51 %
<i>Aspergillus niger</i>	2	1	1	3	2	-	-	1	-	-	1	1	12	20.68 %
<i>Aspergillus ustus</i>	1	-	-	-	1	-	1	-	-	-	1	-	4	6.8 %
<i>Curvularia lunata</i>	-	1	-	1	-	-	1	1	-	2	-	-	6	10.34 %
<i>Cladosporium herbarum</i>	-	-	-	1	-	-	-	-	-	1	-	-	2	3.44 %
<i>H. tetramera</i>	-	-	-	-	-	1	-	-	-	1	-	-	2	3.44 %
<i>Rhizopus stolonifer</i>	-	-	-	-	-	1	-	-	1	1	-	-	3	5.17 %
White mycelium	-	-	1	1	1	-	1	-	1	-	1	1	7	12.06 %
Total	6	4	2	5	8	3	4	2	6	8	6	4	58	

CONTRIBUTION OF FUNGAL COLONIES %



Result And Discussion:

- The investigation carried out for 12 weeks from November to January 2025.
- Among the above fungal types *Aspergillus*, *Cladosporium*, are pathogenic.
- Some of the fungal types like *Alternaria*, *Cladosporium* are allergic to human being they cause some allergic disorders like Rhinitis, Skin irritation, Itching of eyes etc. to native peoples and visitors.

Conclusion:

Present investigation of air monitoring by petri plates exposure method is to highlight pathogenic and Non-pathogenic fungal spore types from the data obtained. It is concluded that the occurrence of fungal spores is more as compared to previous years study. It may be because of many people visited to Library during College time and may contaminate the air and increases the spore load in air captured air sampling. The present investigation are useful for-

- 1) Forecasting of diseases.
- 2) Such investigation are open for interdisciplinary scope of research in aero biology, Veterinary science, Human health and Medicine.

References:

- **Abid Hussain.**, Role of libraries in Academic Resources of Higher Education Institutions
 ○ (February 13, 2023)
- **Agashe, Shripad N.**, "Recent Trends in Aerobiology, Allergy and immunology": A collection of plenary lectures and Contributory articles. Oxford and IBH publishing Company (1994).
- **Agrawal M.K, K. Singh and D.N. Shivpuri** (1974) studies on the atmospheric fungal spores and pollen grain. *Ind. J. Chest. Dis.* 16:1-20.
- **Ahire, Y.R. and Sangale, M. K.** (2012). Survey of aeromycoflora present in vegetable and fruit market. *Elixir Appl. Botany* 52:11381-11383
- **B.K. Nayak and Anima Nayak**-Studies on air borne fungal spores of a college library in an industrial city of Tamilnadu.
- **Buge, H.P., J.R. Sikimon. W.R. and Bandea. E.** (1978). Fungi in libraries; an aerometric survey. *Mycopathologia* 64: 67-72.

- **Chanda, S. And S. Mandal.(1971).**the role of pollen as Environmental pollutant with refernces to respirstory allergy.
- **Cunningham D.D.(1873).**Microscopic examination of air. Government printers, Caccutta pp.58.
- **Deepa A. Dhaware.,** Aero Mycological Investigation in the Ambient Air Over Some Edible Fruit Plant Fields in Context to Pathogenic Diseases, International Journal of Emerging Technologies and Innovative Research (IJETIR) Volume 2, Issue 1, January 2022
- **Gregory, P. H.** "Airborne microbes: their significance and distribution." Proc. R. Soc. Lona'. B. Vol. 177. (1971).
- **Gregory, P.H.,** "Microbiology of the Atmosphere" Inter science publishers, Inc. New York (1969).
- **Gregory, P.H.,** "Microbiology of the Atmosphere" Inter science publishers, Inc. New York (1969) Gregory, P.H., "Microbiology of the Atmosphere" Inter science publishers, Inc. New York (1969) Atmosphere" Inter science publishers, Inc.
- **Kotwal S.G.(1992).**Aerospora of cattle shed.
- **N Joshi, L Singh, P Rawat and P Chaudhary,** International Journal of Plant Sciences, 2006, 1 (1), 107-110.
- **Shinde H.P, Goswami D.B. and P.P. Ahire.,** "Studies on occurrence of allergic airspora in college libraries"Journal of Basic Sciences, 2015, Vol. 3, 7-11
- **Soji, A.A. and Giri.S.K.(1977).** Concentration of aero allergenic fungal spores in Intramural environments of Nagpur city-Hospital ward and Library.Aero biology, proceeding volume of 5th ICA, 211-218.
- **Tewari, U(March 2018)**Studies of aeromycoflora in library environment of govt. E. Raghvendra rao p.g. Science College, bilaspur (c.g.), Global Journal Engineering Science and researches
- **Swapna Kalbende, Lalchand Dalal,** Mousumi Bhowal., 'the monitoring of airborne mycoflora in the indoor air quality of library'J. Nat. Prod. Plant Resour., 2012, 2 (6):675-679
- **Tewari, U (March 2018),** global journal of engineering science and researches
- **Tilak S.T., Shanta G. Pillai and M. Saibaba(1982).**components of air spore inside the library and it relevance to book deterioration Poc,I.Nat.Conf.Env.Biopull.173-177.
- **Tripathi, S.N.(1987).**Fungal airspors insid the central library of Gorakhpur Universiy. Water, air soil pollution, 34:125-134.
- **Verma, K.S. and Paned. (1987).** Fungi- agents which damage paper materials in library. Atmospheric Bio pollution, Ed N. CHANDRA:193-197.
- **VF Marchisio and D Airarudi,** Mycologia, 2001, 93(5), 831-840.

The Third Space : An Application of Liminality and Entropy in Monica Ali's *Brick Lane*

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Abstract:

Brick Lane is one of the most acclaimed novels written by a South East Asian Post Colonial female writer, Monica Ali. It tries to analyse the uncertainties, apprehensions, juxtapositions and adaptations of a Bangladeshi rural uneducated Muslim woman, Nazneen forcefully transposed from a familiar context to a strange land inhabited by the white population and caught up in a home made by coloured male characters like Chanu, her husband and Karim, her Paramour. The novel portrays the discrimination and exclusiveness of an external world marked by gender, race and religion on one level and the protagonist's inner world of discrimination punctuated by the likes and dislikes of her family, society and friends. It is Nazneen's attempt to deconstruct the brick lane of demarcations as to create a new world accommodating her own self is the crux of the paper. The paper is an attempt to explore the ambiguity, non-belongingness and alterity of Nazneen as she passes through different phases of Liminality.

Key terms- Liminality, Ambiguity, Non-belongingness, Alterity

Cultural Studies is a widely acclaimed branch of Literary Criticism that plunges into the hidden layers of breakages and new linkages created through cultural assimilation, shock and amalgamation. The researcher focusses on the cultural shock, ambiguity, resignation and acceptance of major characters in Monica Ali's *Brick Lane*.

The objective of the paper is to project *Brick Lane* as a representative novel of the genre that unravels the ambiguity, mimicry, non-belongingness, and alterity of the South East Asian diaspora. These attributes of the third world caught up in a willing subjugation in lieu of a new haven can be deciphered only in the backdrop of liminality.

Cultural studies is a wider term which has broader repercussion. The researcher has narrowed down the scope to the application of Liminality and Entropy to Monica Ali's *Brick Lane*. Impactful research has to demarcate research into water tight compartments so it leads to fruitful findings.

Liminality is a concept introduced by Arnold Van Gennep, the Anthropologist in his book 'The Rites of Passage'. The term gained popularity in the literary realm after the Bhabian Post colonial theory. His work *In Location of Culture* (1994), focused on the interstitial space created by the merging of multiple cultures and habits. According to Arnold Van Gennep, Human being passes through three different phases during the rites of passage. He has divided into three phases separation, transition and Incorporation. However, Anthropology linked it with rituals followed by a period of transition. It was the dormant phase where the individual tries to accommodate the change and finally it leads to incorporation where the individual becomes a creative member. The changed system leading to acceptance and establishing a new equilibrium. The period between upsetting one equilibrium and establishing a new equilibrium is called the transition phase. This interstitial phase is an unproductive period allowing the individual to adapt to the new phase. It varies from individual to individual. If an individual fails to adapt to the new equilibrium, then it leads to an unbalanced state leading to entropy. Liminality is directly

proportional to entropy and if the external factors are unfavourable, the period of liminality cannot be curtailed, therefore it leads to increased entropy. Sometimes the individual tends to go back to the original state but though it is not possible. During the ancient times, mankind was solely depended on nature for their existence. They were an agrarian society and leisure was a sin. Hence, days of rest were spent pleasing nature. Hence their celebrations had three phases. Separation where they divorced themselves from their routine life, The paper investigates the transformation of Nazneen, Hasina, Karim and Chanu with special reference to Liminality as they form part of the middle east diaspora shifted from Bangladesh to London.

Brick Lane published in 2003 is set in the back drop of London and Bangladesh unwinds the story of the new generation colonized who shifted to the coloniser's haven in search of wealth and respect. The tables have turned now. Flashback method is employed in the beginning of the novel as it is narrated through the reminiscences of Nasneen, the protagonist of the novel who has been forced to uproot herself from Gowri pur, a rural patch in Bangladesh interspersed with stereotypical brown population entangled in the murky waters of tradition, religion, culture superstitions and desire to submerge into the colonized haven of power, affluence and influence. Nasneen is married to Chanu who is twenty years older than her. He is superior to her in terms of age, education and experience. The mere fact that he is a man itself deprives her the right to express and react to things around her. The only living saint she has met in her life is her mother and the only solace for a woman is religion and God. As Nazneen puts it, 'If God wanted us to ask questions, she would have made us men (BL, 82)'. Her life at the East London, suburbs of London crowded by the Asian populace and its Brick Lane stirs in her memories of her nation. During the first part of the novel, Nazneen's conversations with Chanu, her husband is at a one up level. They are minimal like beautifully ironed and folded clothes and tidied toys in her house. She is full of awe for the skater who balances on her delicate limbs. It is symbolical of Nazneen trying to balance herself in her new found space.

Separation:

The three phases are Separation, transition and incorporation. During the separation phase the individual is separated from the social practices followed by the individual. It is a phase of anxiety, tension and apprehension of the subject if he/she is entering a new phase like marriage, initiation or any other ritual. However, in the context of the Bhabian Post Colonial theory, the colonized experiences non belongingness and identity crisis. However, it was a shared reality of a majority during colonization as the number of orients outnumbered the number of the orient. But during the second part of the Twentieth century, there is mass immigration of the once colonized to the haven of the colonizer in search of greener pastures. The Asian diaspora experienced non-belongingness and identity crisis in the terrain of the White man. It is their hope that they can dissolve into the sea of the white habits and tradition seamlessly that has instilled in the Asian diaspora to leave back the mother land. The researcher puts forth the angst of the Asian diaspora through Chanu and Nazneen of Monica Ali's 'Brick Lane' in the paper

Separation:

Nazneen was just eighteen years old, when she was forced to leave Gowripur from Bangladesh to the murky quarters of London after her marriage. She is portrayed as the stereotypical religious Muslim wife who is submissive and looks up to her husband with awe and fear. He is the sacred sanctum and her life pivots around him. She did not have a say in anything and she has started to love her husband after she has become a mother. The bond between her and her husband is solemnized by the birth of a son. Her thoughts, likes and dislikes are revealed

through her letters to her sister Hasina, the bold and beautiful. Hasina dared to elope with a young man, Maleck. According to the concept of Liminality, Nazneen is a misfit in terms of language, existence and survival skills in the new country. She experiences alienation in terms of culture, tradition, race, religion and gender. The only space where she seems to cope up is her 'home'. Hence she has decided to merge in his territory marked out by her husband, Chanu. At this point of the novel, Nazneen feels that she fails to adapt because of her fault as she is unable to realise that she is forcing herself to a space chipped out by her husband. Although, she tries to befriend Ms. Islam, the money lender a strong willed persona, Chanu discourages Nazneen. He even nips off her desire to learn English thereby snatching her off from the external terrain completely. She lives in the pretext of a queen in the territory ordained by Chanu which was actually a mask to eclipse the reality.

Transition:

Nazneen's inner self is revealed through her letters to Haseena, her beautiful sister. She considers herself inferior to the beautiful Haseena who once eloped from her village bringing disgrace to the family. The writer has employed epistolary method for the free flow of Hasina's thoughts. If uprooting and planting in a new terrain and culture leads to separation and alienation, feelings of non-belongingness and depression for Nazneen, her haphazard state is revealed through her thoughts. However, she does not dare to question unless she meets Karim. Chanu on the other hand tries to imitate the ways of the colonizer. His dressing sense, articulations and superficial manners reveal his inclinations. When Chanu tries to be like the white man, on the contradictory Karim in his Kurta and typical Bangladeshi coiffure and apparels presents before Nazneen a familiar picture. Her acclimatisation to the new terrain has been stimulated through her bonding with Karim. Nazneen decides to be part of the Bengal Tigers Movement is the beginning of her assertion of a new space alienated from the trappings of Chanu. Her transition to a new space is accentuated by her relationship with Karim hence she wants to disclose about her relationship with Karim to Chanu. Separation led to mimicry in the case of Chanu while it has led to liminality for Nazneen. Hence, Nazneen becomes aware of her non-belongingness and accepts it. She believed that one has to suffer in silence as there is no way out of it.

On the other hand, Chanu is unaware of his non-belongingness. He fails to admit the fact that he is a Bangladeshi who tends to mimic the authority. His inability to realise his alienation and isolation from the white community leads to his inability to understand that he is a misfit in the estranged White society. He believed that he will be accepted by the White society hence his Liminality has taken a backfoot in the beginning. Liminality leads to entropy as exemplified through Nazneen. She is in a continuous restless state because of her disorderly condition as she puts it "Sometimes she wanted to get up and run, Most of the time she didn't want to run, But neither did she want to sit still (BL.104)". However, her ability to understand her situation helps her to pass on to the third phase, Incorporation.

Incorporation:

It is the stage in which the individual becomes a productive contributor in the established system. The person stops imitating and rather blends the old and the new world so that a new productive/creative space is created where he experiences happiness and calls for self-esteem and respect. Nazneen reaches this phase hence she practices Hybridity rather than mere mimicry unlike Chanu who fails to reach the stage. She confronts Mr. Islam despite her husband's disparagement. She befriends Raziya, the progressive friend, learns from her daughter Shahana

and Bibi and snaps off her relationship with Karim at her own will. She establishes a third space in London incorporating the progressive ideas of the new terrain and merging with the terrains of like-minded people. He attends Bengal Tigers Movement, deconstructs the territory marked by her husband and plots a new one. Ofcourse, it is Chanu who encourages her to start stitching as a source of financial aid for the family. The novel unravels that economic productivity turns out to be one of the key factors that helps to carve a niche of one's own in a foreign land; However, she earns money through stitching which is not expected from an expatriate as a source of income settled in London. It shows that she has created a third space incorporating the new and the old. It has helped her to dispel the non-belongingness and nullify the 'go back home' syndrome.

Chanu on the other hand turns out to be a failure because he tries to fit himself into the white man's space. He intends to create a seamless space dissolving the boundaries of the colonizer and the colonized and it rebuts. One of the major reasons of the rebuttal is that he believed in a make-believe world that erased non-belongness and alienation. Hence, he never tried to create a third space. He repelled himself from the browns of his class instead tried to reach out to the successful Bangladeshi who are imitating the West. It is his realization that he is trading on thin shells destroyed his dreams. Hence, he ends up to be car driver. His exclusion even from the immigrants of his own nation coaxes him to go back to Gowripur. He is bitten by 'Go back home syndrome' as he is unable to find a third space of his own. Nazneen convinces her husband that she wants to stay back in London while he moves back to his country. He is stuck in the second phase of Liminality forcing him to come back as he is unable to Passover to the third phase. The novel ends with a beautiful depiction of Nazneen skating in a saree wearing her snow boots is symbolical of her incorporation into her third space that recognizes her identity, a terrain demarcated by herself.

Conclusion:

The novel is a classic example of Nazneen's growth from subservience to assertiveness, restriction to freedom, dependency to financial independence, religiosity to spirituality and Liminality to Incorporation. It juxtaposes Nazneen and Chanu. She has carved out a third space of her own as she moved from the interstitial space of liminality to productive period of luminosity while Chanu ends to be stranded in the realm of liminality unable to demarcate a terrain of his own. Hence, she successfully overcomes as 'Go back Home Syndrome' while he gives in to it. The novelist explores the deconstruction of the Brick lane that demarcates the boundaries of the occident and the orient and the establishment of a third space by Nazneen in the novel.

Bibliography:

- Ali, Monica. *Brick Lane*. DoubleDay: BlackSwan, 2003, Print.
- Mortada, Syeda Samara. *The Notion of Women as Bearers of Culture in Monica Ali's Brick Lane*. 2010, Print.
- Perfect, M. "The Multicultural Bildungsroman: Stereotypes in Monica Ali's Brick Lane". *The Journal of Commonwealth Literature*, 43(3), 2008 109-120.
- <https://doi.org/10.1177/0021989408095241> ,2008
- Yousef, Tawfiq. "Cultural identity in Monica Ali's Brick lane: A Bhabhian perspective." *International Journal of Arabic-English Studies* 19.1 (2019): 54-86, Print.

Factors Influencing Academic Motivation among College Students

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Abstract:

Academic motivation plays a critical role in determining a student's success and academic performance in higher education. This study explores the various elements that contribute to academic motivation among college students. Motivation is divided into intrinsic and extrinsic categories, each influencing students' academic journeys in different ways. Intrinsic motivation is driven by personal interest, passion for learning, and a sense of fulfilment through academic success, while extrinsic motivation stems from external rewards such as grades, parental pressure, social approval, and future career opportunities. Additionally, academic self-efficacy, which refers to a student's belief in their own ability to succeed, is an essential factor influencing motivation levels. The academic environment, including teaching styles, student-teacher relationships, classroom climate, and access to academic resources, also plays a significant role in shaping motivation. Furthermore, socio-cultural influences such as socioeconomic status, family expectations, cultural norms, and peer pressure are key drivers of motivation. By exploring the interplay of these internal, external, and environmental factors, this research aims to provide a comprehensive understanding of academic motivation, offering valuable insights for educators and institutions to enhance student engagement and performance through targeted strategies.

Keywords: Intrinsic and Extrinsic Motivation, Academic Self-Efficacy, Academic Engagement

Introduction:

The transition to college life brings a blend of excitement and challenges that requires students to adapt to a new academic setting. Motivation plays a pivotal role in helping students navigate these challenges. Theories such as Self-Determination Theory (SDT), Expectancy-Value Theory, and Goal-Setting Theory examine the complex relationship between various factors that drive or hinder students' academic motivation. This paper explores key factors influencing academic motivation and proposes methods to improve it for better academic outcomes.

Current Study:

National Level:

At the national level, psychological research benefits from larger sample sizes, diverse populations, and more standardized methodologies. National studies often inform policy-making decisions, contributing to mental health frameworks and educational policies.

For instance, national surveys on mental health trends indicate that urban populations experience higher stress and anxiety levels, whereas rural populations report higher resilience but limited mental health access. Studies have shown that the integration of digital mental health services has significantly improved access to psychological support across different socio-economic groups.

Research on workplace psychology at the national level has examined the impact of job burnout, work-life balance, and employee well-being. A study found that organizations that

implemented psychological well-being programs saw an increase in productivity and employee satisfaction rates.

Despite the broader scope of national research, there are limitations in regional specificity, making it difficult to apply findings uniformly across all communities. Studies often emphasize generalized models, which may not fully capture localized cultural dynamics that influence behaviour and mental health.

Local Level:

Local literature in psychology often focuses on region-specific mental health issues, cultural influences on behaviour, and localized intervention strategies. Several studies highlight the importance of indigenous psychological perspectives, reflecting the unique socio-economic and cultural dynamics of the region.

For example, research conducted in Nashik has emphasized community-based mental health interventions, particularly addressing the impact of socio-economic disparities on mental well-being. A study explored how traditional healing practices influence cognitive behavioural therapy (CBT) acceptance in the local population. Findings suggested that integrating traditional and modern psychological approaches resulted in higher engagement and treatment adherence. Additionally, studies on educational psychology in local institutions have explored the relationship between learning behaviours and family structures. Research found that students from collectivist family systems showed greater academic resilience, in contrast to findings in individualistic cultures.

However, there is a significant research gap in longitudinal studies, limiting the understanding of evolving psychological patterns within the region. The need for standardized assessment tools adapted for local dialects and cultural nuances has been a recurring recommendation in many studies.

Definitions:

1. Motivation

Motivation is the internal or external force that drives behaviours. It originates from the Latin word *movere*, meaning "to move," emphasizing the activating properties of motivation.

2. Intrinsic Motivation

Intrinsic motivation refers to engaging in an activity because it is inherently interesting or enjoyable, not for external rewards. College students who are intrinsically motivated are driven by a genuine interest in their subjects, not by grades or external pressures.

3. Extrinsic Motivation

Extrinsic motivation is driven by external rewards such as grades, money, or social recognition. Many students pursue academic achievement primarily to gain these rewards.

4. Self-Efficacy

Self-efficacy, as defined by Bandura (1997), is the belief in one's ability to succeed in specific tasks. Students with high self-efficacy are more likely to set and achieve academic goals.

Methodology:

This research will utilize a mixed-methods approach, combining quantitative and qualitative techniques to explore the factors influencing academic motivation among college students.

1. **Quantitative Data:** A survey will be administered to undergraduate students across various institutions, measuring intrinsic and extrinsic motivation, self-efficacy, and academic self-concept. The survey will include Likert-scale questions assessing factors like subject interest, parental expectations, and campus climate.
2. **Qualitative Data:** In-depth interviews will be conducted with students from diverse academic disciplines and socio-economic backgrounds to explore their personal experiences and perceptions of motivation. Topics will include cultural influences, peer expectations, and individual academic challenges.

Hypotheses:

1. **Primary Hypothesis:** Students with higher levels of intrinsic motivation will exhibit better academic performance and persistence than those who are more extrinsically motivated.
2. **Secondary Hypothesis:** A supportive campus environment, positive peer relationships, and autonomy in learning will positively correlate with increased intrinsic motivation.
3. **Tertiary Hypothesis:** Socio-economic background and cultural values will influence the types of motivation students experience, with students from higher SES backgrounds displaying more extrinsic motivation and those from collectivist cultures being more influenced by family and community expectations.

Conclusion:

Academic motivation is influenced by a complex interplay of intrinsic and extrinsic factors, psychological characteristics, social support, and environmental conditions. Recognizing these influences is essential for developing effective strategies to enhance motivation in college students. Future research should focus on how these factors evolve throughout a student's academic career and how institutions can best support students in maintaining high motivation levels.

References:

- Bandura, A. (1997). *Self-efficacy: The exercise of control*. W.H. Freeman.
- Deci, E. L., & Ryan, R. M. (1985). *Intrinsic motivation and self-determination in human behaviour*. Springer Science & Business Media.
- Eccles, J. S., & Wigfield, A. (2002). Motivational beliefs, values, and goals. *Annual Review of Psychology*, 53(1), 109-132.
- Garcia, M. (2020). Factors influencing academic motivation among Filipino college students. *Journal of Philippine Higher Education Studies*, 15(3), 45-62.
- Reyes, A., & Sanchez, M. (2018). Socioeconomic influences on academic motivation in Filipino college students. *Philippine Journal of Educational Psychology*, 10(2), 23-34.
- Schunk, D. H., Pintrich, P. R., & Meece, J. L. (2008). *Motivation and learning: Theory, research, and applications*. Pearson Education.
- Zimmerman, B. J. (2002). Becoming a self-regulated learner: An overview. *Theory into Practice*, 41(2), 64-70.

Blockchain and Cyber security : A New Frontier for Protecting Online Banking

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Abstract:

The integration of Blockchain technology into online banking systems represents a transformative advancement in enhancing cyber security. Blockchain, with its decentralized, immutable, and cryptographically secure structure, offers robust solutions to combat cyber threats in the financial sector, such as fraud, data breaches, and identity theft. By leveraging features like transaction immutability, distributed ledgers, and encrypted authentication, Blockchain ensures data integrity, secure transactions, and transparent auditing. This paper explores the intersection of Blockchain technology and cyber security in online banking, highlighting its potential to address current vulnerabilities, enhance operational efficiency, and safeguard sensitive financial data. It also examines challenges such as scalability, regulatory compliance, and integration costs that must be overcome to fully realize Blockchain's benefits in securing online banking systems. The technology also enables secure authentication mechanisms through cryptographic techniques, reducing vulnerabilities associated with traditional password-based systems. Additionally, Blockchain-based smart contracts offer automated and tamper-proof execution of banking processes, improving operational efficiency and reducing human error. Blockchain is an amazing new technology that will shake up multiple sectors by introducing better ways of doing things. It may be used in various settings since it is public, unchangeable, and decentralized.

Keywords: Blockchain Technology, Online Banking, Cyber security ,Fraud Prevention ,Data Breaches ,Secure Transactions, Encrypted Authentication, Cryptographic Techniques, Tamper-Proof Execution.

Introduction:

The digitization of banking services has fundamentally transformed the financial landscape, making online banking an integral part of modern life. Offering unmatched convenience and accessibility, these systems cater to millions of users worldwide. However, the rapid adoption of digital banking has also exposed institutions to an escalating wave of cyber threats, including data breaches, phishing attacks, and sophisticated fraud schemes. These challenges underscore the urgent need for advanced cybersecurity solutions to protect sensitive financial data and maintain customer trust. Blockchain technology, known for its decentralized, immutable, and transparent nature, has emerged as a potential game-changer in addressing these cybersecurity challenges. Unlike traditional centralized systems that are prone to single points of failure, blockchain's distributed ledger ensures that transaction records remain secure, traceable, and tamper-proof. This attribute is particularly valuable in the banking sector, where data integrity and operational resilience are paramount. One of blockchain's key contributions to online banking lies in its ability to provide robust authentication mechanisms. By leveraging cryptographic techniques, blockchain eliminates the reliance on vulnerable password-based systems, significantly reducing the risk of unauthorized access. Additionally, blockchain-enabled

smart contracts automate banking processes with precision and reliability, minimizing human error and enhancing operational efficiency. This paper explores the intersection of blockchain technology and cybersecurity in the context of online banking systems. However, despite its potential, the integration of Blockchain technology into online banking systems is not without challenges. Issues such as scalability, regulatory uncertainty, and the cost of implementation must be addressed for Blockchain to be fully adopted in mainstream banking. Blockchain networks, especially those with complex consensus mechanisms, can face scalability issues when handling high transaction volumes, which is a crucial requirement for the fast-paced nature of banking transactions. Additionally, regulatory bodies must work to create frameworks that align with the decentralized nature of Blockchain technology while ensuring that it meets compliance standards for data security and financial transactions. Lastly, the adoption of Blockchain technology comes with significant initial investment costs for infrastructure, training, and system integration, which may pose a barrier to some financial institutions.

Cryptographic Authentication:

Cryptographic authentication in blockchain utilizes public-key cryptography to provide a secure and decentralized way to verify users' identities. Each user is given a pair of keys: a private key, which is kept confidential by the user, and a public key, which is stored on the blockchain. This system allows for secure identification without relying on a centralized authority. Even if a hacker intercepts the public key, they cannot access the user's account because they would still need the private key to authenticate themselves. This approach significantly reduces the risk of attacks like credential theft, as the private key is never exposed or stored in a central location.

Secure Authentication Mechanisms:

Authentication is a critical element of online banking security, as it ensures that only authorized users can access sensitive financial data and perform transactions. Traditional authentication methods, like passwords and PINs, are becoming more susceptible to cyberattacks, including phishing, credential stuffing, and brute-force attacks. Blockchain technology, with its strong cryptographic principles, offers a modern solution to strengthen the security of authentication processes in online banking systems, making it more resilient to these types of threats.

Consensus Algorithms:

In a blockchain system, there are rules that determine how transactions are recorded. New transactions can only be added to the system when most participants in the network agree that they are valid. This agreement is called **consensus**. Essentially, for a transaction to be officially recorded, the majority of people or computers in the network must give their approval. This helps keep the system secure and ensures that everyone is on the same page.

Different blockchain networks use various methods to agree on which transactions are valid and can be added to the blockchain. These methods are called **consensus algorithms**. Here are some common ones:

1. **Proof of Work (PoW):** In this system, participants (called miners) compete to solve complex math problems. The first to solve the problem gets to validate the transaction and add it to the blockchain. Bitcoin uses this method.

2. **Proof of Stake (PoS):** This method allows participants to validate transactions based on how much cryptocurrency they hold and are willing to "stake" or lock up as collateral. PoS is considered more energy-efficient than PoW.
3. **Delegated Proof of Stake (DPoS):** This is a variation of PoS, where participants vote for a few representatives, called delegates, to validate transactions on their behalf.
4. **Practical Byzantine Fault Tolerance (PBFT):** Used in permissioned blockchains, this method relies on a selected group of trusted nodes to validate transactions, ensuring security and reliability.

Each of these methods has its own way of ensuring that transactions are valid and securely added to the blockchain.

Blockchain-Based Identity and Access Control:

Blockchain allows for decentralized management of user identities, meaning that personal information is stored directly on the blockchain instead of a centralized database. This decentralization removes the risk of data breaches typically associated with centralized systems, as there is no single vulnerable point. With blockchain, users maintain full control over their identity and credentials, granting access to their data only when needed. This enhances privacy, strengthens security, and ensures that only authorized users can access their accounts and carry out transactions.

Enhanced Security with Blockchain-Driven Multi-Factor Authentication:

Blockchain can strengthen traditional login systems by incorporating multi-factor authentication (MFA), adding an additional layer of protection. Blockchain-based MFA can utilize biometric data, transaction histories, or other unique identifiers, all securely stored on the blockchain. For instance, a banking system could require a user to verify their identity with a fingerprint or facial recognition alongside their private key. This ensures that only authorized individuals can access their financial accounts. By combining cryptographic authentication, decentralized identity management, and multi-factor authentication, blockchain offers a robust and scalable security solution to protect user accounts from unauthorized access, improving overall system integrity.

Blockchain for Proactive Fraud Prevention and Detection in Online Banking:

Fraud prevention and detection are critical aspects of cybersecurity in digital banking systems. As online banking continues to grow, so do the complexity and variety of fraud schemes, such as identity theft, account takeovers, and transaction manipulation. While traditional security methods can offer some protection, they are often reactive, identifying fraud only after it occurs. Blockchain technology, with its decentralized and transparent ledger, provides a more proactive approach. It enables real-time detection and prevention of fraud, helping to stop fraudulent activities before they can cause significant harm.

Tamper-Proof Ledger for Ensuring Data Integrity:

One of the fundamental features of blockchain is its immutable nature. Once data is recorded on a blockchain, it cannot be altered, deleted, or tampered with without the consensus of the network. Blockchain guarantees that all transactions are securely recorded and can be verified, offering an irreversible record that can be traced to its source. This makes it much harder for malicious parties to alter or manipulate critical banking information, ensuring the reliability and trustworthiness of all records.

How Blockchain Revolutionizes the Banking Sector:

Online banking services enable customers to conduct financial transactions conveniently and reduce the operating costs for banks. In addition to providing a fast and efficient method for online banking, banks must adopt cheap, flexible, and secure countermeasures against cyber threats to protect their customers' accounts. Blockchain technology enables innovative digital collaboration between financial services and customers and has begun to be used by financial institutions to address the security challenges associated with online banking. Blockchain-based online banking applications are becoming increasingly appealing to customers and banks.

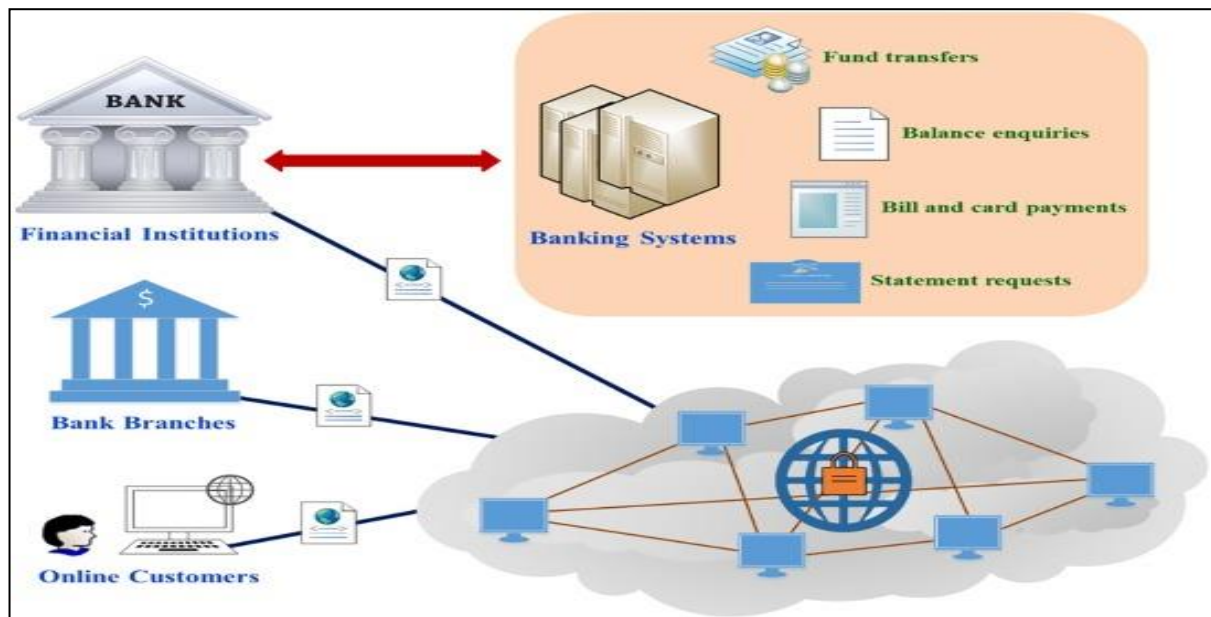


Fig : Illustration of an online banking application based on blockchain technology.

In blockchain technology, distributed ledgers are used for securely storing transaction records, continuously tracking financial assets, and immediately authenticating critical information to ensure efficiency, trust, and transparency. Other core tools used in blockchain technology for confidently sharing access to immutable transaction data through P2P networks include digital signature algorithms, hashing techniques, encryption-decryption methods, decentralized applications, and smart contracts. When using blockchain technology, each business transaction is cryptographically linked to the chained blocks that it depends on, and transaction information such as the bank account number, amount transferred, and personal information is validated and protected from forgery, falsification, and fraud.

Decentralized Applications in Banking through Blockchain Technology:

Blockchain technology empowers participants to conduct business transactions in a peer-to-peer (P2P) environment, allowing them to define which transaction data is shared using decentralized applications (dApps) and smart contracts. This integration of decentralized applications and smart contracts has transformed the way financial transactions and processes operate, offering enhanced decentralization with greater security, efficiency, and transparency.

In the banking context, decentralized applications operate autonomously on P2P networks, enabling direct interactions between participants within the blockchain without the need for a trusted central authority to process or validate transactions. For instance, **Ethereum**, a popular blockchain platform, facilitates decentralized applications in banking by allowing users to communicate with the blockchain network and manage the state of participants executing

transactions. These blockchain-based applications are similar to traditional web applications but rely on the blockchain's underlying technology to ensure that all financial transactions are encrypted and securely recorded on an immutable ledger.

Unlike regular web applications, which typically use centralized systems with secure connections (e.g., HTTPS), blockchain-based decentralized applications utilize wallets as encrypted digital keychains. These wallets manage blockchain addresses with paired public and private keys, enabling P2P communication on the blockchain network. Each participant in the blockchain must agree on any updates made to the distributed ledger and the validity of transactions, ensuring consensus across untrusted parties involved in the transaction.

To facilitate this decentralized agreement, blockchain networks typically employ consensus algorithms like **Proof of Work (PoW)** and **Proof of Stake (PoS)**. These algorithms ensure that all participants in the network reach a mutual understanding of the state of the ledger. PoW, for instance, requires significant computing power to solve complex mathematical problems, like using cryptographic hash functions (e.g., SHA-256), to authenticate transactions. In contrast, PoS (as seen in Ethereum's **Casper**) consumes far less computational power. It validates transactions by selecting a participant as a validator based on the number of tokens (stakes) they hold, thus reducing the energy and resources needed for transaction validation.

In banking, these blockchain protocols provide a secure and efficient method for handling financial transactions, ensuring that all participants can verify the integrity of the transaction without the need for a centralized authority.

Smart contracts in blockchain technology:

According to Szabo, smart contracts are computer protocols comprising program codes embedded in blockchain networks, where these contracts are used to generate transaction agreements. In an Ethereum blockchain, smart contracts enable transaction records to be maintained by all the participants without being tampered with when predetermined conditions are fulfilled. Essentially, the state of smart contracts with relevant transaction details (i.e., state transitions) is verified and recorded on a blockchain-based platform. Once a smart contract is executed, corresponding business processes can perform particular services in causal links among participants. For example, two online customers can transfer money to or receive money from each other as per the relevant smart contract stored in the Ethereum blockchain. The agreement between the sender and the recipient is prewritten in lines of computer code to enforce the automatic confirmation of money transfers. When the predefined rule of the smart contract is met, the state of the remittance transaction that has occurred in the causal relationship since the two parties involved have been simultaneously alerted is stored securely in the Ethereum blockchain and remains traceable and unalterable. Smart contracts running on the Ethereum Virtual Machine are triggered by decentralized applications to execute the core business logic for communicating with the blockchain and conducting transactions. Therefore, in the case of financial institutions, smart contracts act as intermediaries crucial for business process automation, and they facilitate business transactions and the establishment of trust and security between participants on the basis of certain prerequisites. The underlying principle of smart contracts is to increase the transparency of financial services while eliminating the possibility of transaction records being compromised. In simple terms, decentralized applications provide an interface layer with associated cryptographic keys related to a unique identifier or address, enabling interaction with the blockchain for the frontend operation of a blockchain-based

platform; by contrast, smart contracts provide a layer of all business logic, such as a transaction performed in the blockchain to trigger specific events when predetermined rules are attained, for the backend operation of a blockchain-based platform. detection or transaction monitoring systems to flag unusual activities after the fact. These methods, while useful, can only respond to fraud after it has occurred, leaving the system vulnerable until the issue is detected and resolved. Blockchain, by contrast, offers a more proactive approach because it verifies the integrity of transactions before they are added to the ledger. The decentralized consensus mechanisms used in blockchain (like Proof of Work and Proof of Stake) ensure that transactions are validated by multiple parties before being accepted. For example, in the case of a double-spend attempt (where a user tries to send the same funds to two different parties), blockchain's consensus mechanism prevents this from happening because the network collectively agrees on the transaction's validity before it's finalized.

Comparison with Traditional Security Measures:

In traditional systems, fraud detection relies heavily on centralized authorities and post-event investigations. Even with advanced technologies like AI and machine learning, which can detect unusual patterns after a fraud attempt, these systems still operate on a reactive basis. They flag transactions or account activities after a suspicious event occurs, allowing fraud to potentially affect the system before detection.

Blockchain's proactive nature solves this problem by using decentralized consensus and cryptographic validation. Fraudulent transactions are prevented before they are added to the blockchain, ensuring that only legitimate transactions are recorded. This reduces the window of opportunity for malicious actors and provides greater security for both institutions and customers.

For example, with traditional online banking, a user might notice fraudulent activity on their account after the fact, but the financial damage has already been done. With blockchain, the transparency and real-time nature of the technology ensure that such activities can be stopped early, preserving both financial integrity and customer trust.

In summary, blockchain's ability to provide real-time transaction validation and its proactive fraud detection mechanisms offer a significant improvement over traditional banking security systems, making it a highly effective tool for fraud prevention and detection in the financial industry.

Fraud Prevention and Detection in Online Banking:

Real-Time Fraud Prevention: In online banking, fraud is a major concern due to the increasing sophistication of cybercriminals. Traditional banking systems often rely on centralized fraud detection tools that monitor transactions after they have been processed. For example, a bank might flag an unusual transaction only after it has been completed, allowing the fraud to occur before the issue is detected.

Blockchain, however, introduces a real-time fraud prevention system in online banking. Due to the decentralized and transparent nature of blockchain, each transaction is recorded across multiple nodes (or participants) in the network, providing visibility and traceability. As a result, when a user initiates a transaction—whether it's a fund transfer, a loan request, or a withdrawal—the transaction is validated and immediately visible to other participants on the network. This transparency makes it incredibly difficult for malicious actors to alter or falsify transaction details, as any attempt to manipulate data would be detected and rejected in real time.

For example, if a fraudster attempts to withdraw funds exceeding an account holder's balance, the system would instantly recognize that the transaction doesn't align with the available funds recorded on the blockchain. It would either block the transaction or flag it for further review before any damage is done. This real-time detection and validation allow financial institutions to prevent fraudulent transactions before they can be completed, safeguarding both the bank and its customers from financial loss.

Proactive Approach: Traditional online banking security measures, such as those used by centralized institutions, tend to be reactive. They often rely on after-the-fact detection mechanisms, like transaction monitoring systems or anomaly detection software, to spot fraud once it's already in progress or after a breach has occurred. For example, banks might monitor for unusual transaction patterns, such as a sudden large transfer or a login from an unfamiliar location, and flag these as suspicious. However, these systems do not stop fraud from happening in real-time—they only raise alerts after the suspicious transaction has been completed.

Blockchain, on the other hand, offers a proactive approach to fraud prevention. Rather than waiting for an incident to occur, blockchain's decentralized nature ensures that transactions are validated before they are recorded on the blockchain. Every participant in the network validates and reaches a consensus on the legitimacy of a transaction. If an attempt is made to manipulate the transaction (e.g., double-spending, altering funds, or falsifying the sender's identity), the system will immediately detect the discrepancy and prevent the transaction from being added to the blockchain.

In practical terms, this means that fraudulent actions are blocked in real time, not after they've caused harm. For example, in a blockchain-based online banking system, if a user attempts to execute a fraudulent transfer or access an account without proper credentials, the blockchain network will prevent it before it is finalized. This proactive fraud prevention ensures that only legitimate transactions are recorded, providing an added layer of security that traditional centralized systems cannot match.

Comparison with Traditional Security Measures: Traditional online banking systems primarily rely on centralized control and after-the-fact fraud detection. For example, a customer may receive an alert or a notification after suspicious activity occurs, like an unauthorized withdrawal or a fraudulent login attempt. While this can help mitigate damage, it does not prevent fraud before it happens, and the customer may have already lost money by the time the fraud is detected.

Blockchain offers a distinct advantage by making fraud prevention proactive. Since blockchain transactions are verified and consensus is reached before they are added to the ledger, fraud cannot occur without being immediately detected and prevented. The system itself ensures that only validated, legitimate transactions are recorded, which minimizes the chances of unauthorized access or transaction manipulation. This real-time and proactive verification is particularly important for high-stakes financial operations like cross-border payments or loan approvals in online banking, where the risks of fraud are high.

In conclusion, blockchain's transparent, decentralized, and real-time nature makes it a powerful tool for preventing fraud before it happens, as compared to traditional banking systems, which often detect fraud only after it occurs. By integrating blockchain into online banking, institutions can significantly enhance their fraud prevention efforts and provide customers with a more secure, trustworthy platform for managing their finances.

Real-World examples for banks or financial institutions that have implemented Blockchain Mastercard:

Blockchain-based Payment System: While not a bank, Mastercard has made significant strides in blockchain payments. They have integrated blockchain technology into their payments system for cross-border payments, reducing the time it takes for international transactions to be processed and providing additional security and transparency. Mastercard's blockchain solutions are particularly focused on creating faster, more efficient cross-border transactions.

Challenges and Considerations:

Scalability: Address the potential scalability issues of blockchain networks, especially in handling high volumes of banking transactions.

Regulatory Compliance: Discuss the need for regulatory frameworks to align with blockchain's decentralized nature while ensuring compliance with financial laws.

Integration Costs: Mention the potential costs and complexity involved in integrating blockchain technology into legacy banking systems.

Conclusion:

In conclusion, blockchain technology presents a promising future for the banking sector, offering enhanced **security**, **efficiency**, and **transparency**. As blockchain networks mature and overcome their current challenges, it is likely that we will see further widespread adoption across the financial industry, reshaping how banks and their customers interact with financial systems. By embracing blockchain, banks can build more resilient systems that are better equipped to handle the complexities and risks of the digital age, ultimately providing safer, faster, and more efficient services for their customers.

References:

- Bagrecha, N. R., Polishwala, I. M., Mehrotra, P. A., Sharma, R., & Thakare, B. S. (2020). Decentralised blockchain technology: Application in banking sector. *2020 International Conference for Emerging Technology (INCET)*, 1-5.
- Barnum, S. (2014). Standardizing Cyber Threat Intelligence Information with the Structured Threat Information eXpression (STIX). [online] Available: <https://www.mitre.org/publications/technical-papers/standardizing-cyber-threat-intelligence-information-with-thee>.
- Bhivgade, T., Bhusari, M., Kuthe, A., Jiddewar, B., & Dubey, P. (2014). Multi-factor authentication in banking sector. *Int J Comput Sci Informat Technol*, 5(2), 1185-1189.
- Chowdhury, M. U., Suchana, K., Alam, S. M. E., & Khan, M. M. (2021). Blockchain application in banking system. *Journal of Software Engineering and Applications*, 14(7), 298-311.
- Daluwathumullagamage, D. J., & Sims, A. (2021). Fantastic beasts: Blockchain based banking. *Journal of Risk and Financial Management*, 14(4), 1-43.
- Jena, R. K. (2022). Examining the factors affecting the adoption of blockchain technology in the banking sector: An extended UTAUT model. *Int. J. Financ. Stud.*, 10(4).
- Karamitsos, I., Papadaki, M., & Al Barghuthi, N. B. (2018). Design of the Blockchain Smart Contract: A Use Case for Real Estate. *J. Inf. Secur.*, 09(03), 177-190.
- Kumari, S., Sarkar, B., & Singh, G. (2023). Blockchain-based CRM solutions: Securing customer data in the digital transformation era. *International Journal of Computer Trends and Technology*, 71(4), 27-36.
- Mukhtar, M. (2015). Perceptions of UK based customers toward Internet banking in the United Kingdom. *J Internet Bank Commer*, 20(1), 1-38.
- Nayanajith, D. A. G., Weerasiri, R. A. S., & Damunupola, A. (2019). A review on e-banking adoption in the context of e-service quality, Sri Lanka. *J Mark*, 5(2), 25-52. <https://doi.org/10.4038/sljmuok.v5i2.28>

- Natarajan, H., Krause, S., & Gradstein, H. (2017). Distributed Ledger Technology and Blockchain. *Distrib. Ledger Technol. Blockchain*, no. 1.
- Rijanto, A. (2024). Blockchain technology roles to overcome accounting, accountability and assurance barriers in supply chain finance. *Asian Review of Accounting*.
- Wang, H., Zheng, Z., Xie, S., Dai, H. N., & Chen, X. (2018). Blockchain challenges and opportunities: A survey. *Int. J. Web Grid Serv.*, 14(4), 352.
- Jimmy, F. N. U. (2024). Cybersecurity Threats and Vulnerabilities in Online Banking Systems. *Valley International Journal Digital Library*, 1631-1646.
- "Comparative analysis of blockchain consensus algorithms" (2018). 41st Int. Conv. Inf. Commun. Technol. Electron. Microelectron. MIPRO 2018 - Proc., 1545-1550.



Sessional Distribution of Epiphytic Algae in Nandurmadhymeshwar Dam

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Abstract-

The Godavari River is the main source of water for the dam, and it plays a crucial role in maintaining the regional hydrology. The dam helps regulate water flow, reducing the risk of floods during the monsoon and ensuring a steady supply of water during dry periods. This dam plays a significant role in supporting local agriculture, wildlife conservation, and tourism. Its location near the Nandurmadhyameshwar Bird Sanctuary makes it a valuable asset for both nature preservation and regional development. Algal distribution in the Nashik district of Maharashtra is influenced by a variety of environmental factors such as water temperature, light availability, nutrients, and the type of water bodies (e.g., rivers, lakes, reservoirs, ponds). The region is home to a wide variety of freshwater and marine algae, both microscopic and macroscopic. Algae play an important role in the aquatic ecosystems, contributing to primary production and supporting food webs. Here's an overview of algal distribution in Nashik.

Key words – biodiversity ,irrigation,ponds,conservation,hydrology.

Introduction –

The Nandurmadhyameshwar Dam is located in the Nashik District of Maharashtra, India, and it serves as a key water supply and irrigation resource for the region. Here are some key details about the dam The area around the Nandurmadhyameshwar Dam is known for its biodiversity, as it is home to many species of birds and wildlife. The dam and its surroundings are part of the Nandurmadhyameshwar Bird Sanctuary, a significant site for bird watchers, particularly during migratory seasons. The sanctuary has become a popular destination for birdwatching enthusiasts, as it attracts several migratory birds during the winter months. The Godavari River is the main source of water for the dam, and it plays a crucial role in maintaining the regional hydrology. The dam helps regulate water flow, reducing the risk of floods during the monsoon and ensuring a steady supply of water during dry periods. This dam plays a significant role in supporting local agriculture, wildlife conservation, and tourism. Its location near the Nandurmadhyameshwar Bird Sanctuary makes it a valuable asset for both nature preservation and regional development. Algal distribution in the Nashik district of Maharashtra is influenced by a variety of environmental factors such as water temperature, light availability, nutrients, and the type of water bodies (e.g., rivers, lakes, reservoirs, ponds). The region is home to a wide variety of freshwater and marine algae, both microscopic and macroscopic. Algae play an important role in the aquatic ecosystems, contributing to primary production and supporting food webs. Here's an overview of algal distribution in Nashik The dam is an essential source of irrigation for the surrounding agricultural lands, particularly for crops like pulses, sugarcane, and vegetables. The water from the dam is also used for drinking water supply in nearby towns and villages

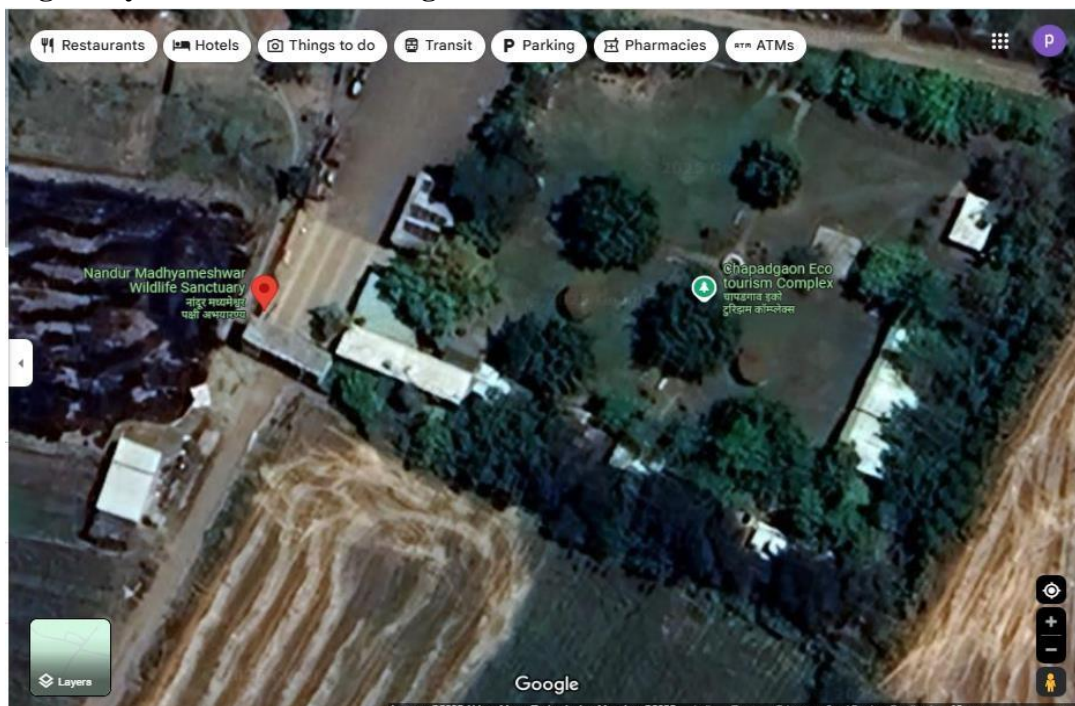
1. Location:

- The dam is situated near the village of Nandurmadhyameshwar, in the northern part of Nashik district. It is approximately 35 km from the district headquarters, Nashik city. The

primary function of the Nandurmadhyameshwar Dam is to irrigate the agricultural lands in the surrounding areas, contributing to the development of farming activities.

- The dam is also important for water conservation and the sustaining of local water resources.
- It is a medium-sized earth fill dam constructed on the Godavari River, which is one of the major rivers in Maharashtra.
- The Nandurmadhyameshwar Bird Sanctuary, encompassing the dam, is a popular spot for nature lovers and tourists. The best time to visit the dam and the sanctuary is during the winter season

when migratory birds are seen in large numbers.



8. Geographical and Climatic Features:

The region experiences a tropical climate with hot summers, moderate monsoons, and mild winters. The dam helps regulate water supply during the dry seasons, especially during summer when water scarcity can affect local farming.

9. Hydrological Features:

The Godavari River is the main source of water for the dam, and it plays a crucial role in maintaining the regional hydrology. The dam helps regulate water flow, reducing the risk of floods during the monsoon and ensuring a steady supply of water during dry periods.

This dam plays a significant role in supporting local agriculture, wildlife conservation, and tourism. Its location near the Nandurmadhyameshwar Bird Sanctuary makes it a valuable asset for both nature preservation and regional development.

Algal distribution in the Nashik district of Maharashtra is influenced by a variety of environmental factors such as water temperature, light availability, nutrients, and the type of water bodies (e.g., rivers, lakes, reservoirs, ponds). The region is home to a wide variety of freshwater and marine algae, both microscopic and macroscopic. Algae play an important role in the aquatic ecosystems, contributing to primary production and supporting food webs. Here's an overview of algal distribution in Nashik

Types of Algae in Nashik:

Algae found in the Nashik area can be generally classified into several groups:

Green Algae (Chlorophyta)	Blue-Green Algae (Cyanobacteria)	Brown Algae (Phaeophyta)	Red Algae (Rhodophyta):	Diatoms (Bacillariophyta):	Chrysophytes (Golden Algae):
<p>1) These algae thrive in freshwater environments such as ponds, lakes, and rivers.</p> <p>2) Species include Chlorella, Spirogyra, Ulothrix, and Cladophora.</p> <p>3) They are often observed in nutrient-rich (eutrophic) habitats and can grow on submerged surfaces.</p>	<p>1) Common in freshwater sources, they frequently create algal blooms during warmer temperatures.</p> <p>2) Species such as Microcystis and Anabaena are typically found in waters with high nutrient levels, which may result from agricultural runoff or untreated sewage.</p> <p>3) Cyanobacteria can sometimes release toxins, leading to concerns about water quality.</p>	<p>1) Common in freshwater sources, they frequently create algal blooms during warmer temperature</p> <p>3) Species such as Microcystis and Anabaena are typically found in waters with high nutrient levels, which may result from agricultural runoff or untreated sewage.</p> <p>Cyanobacteria can sometimes release toxins, leading to concerns about water quality.</p>	<p>1) Common in freshwater sources, they frequently create algal blooms during warmer temperatures.</p> <p>2) Species such as Microcystis and Anabaena are typically found in waters with high nutrient levels, which may result from agricultural runoff or untreated sewage.</p> <p>3) Cyanobacteria can sometimes release toxins, leading to concerns about water quality.</p>	<p>1) Diatoms play a crucial role in primary productivity in both freshwater and marine habitats, being especially abundant in clean, nutrient-rich rivers and lakes.</p> <p>2) Examples of diatom species in the area include Fragilaria and Navicula</p>	<p>1) These algae, found in freshwater lakes and reservoirs, have the potential to form blooms under specific circumstances, particularly in nutrient-poor (oligotrophic) or slightly nutrient-rich (eutrophic) conditions</p>

1. Environmental Conditions Affecting Algal Distribution:

Water Quality and Eutrophication	Water Temperature	Water Flow and Depth	Human Impact
<p>1) Algae, especially green algae and blue-green algae, thrive in waters with high nutrient levels (particularly nitrogen and phosphorus).</p> <p>2) Areas with agricultural runoff, untreated sewage</p>	<p>1) The warm climate of Nashik supports the growth of a wide variety of algae, especially during the monsoon and post-monsoon</p>	<p>1) The warm climate of Nashik supports the growth of a wide variety of algae, especially during the monsoon and post-monsoon seasons.</p>	<p>1) Rivers and streams with fast-moving water tend to have lower algal concentrations due to the constant flow, which doesn't allow for algae to settle.</p>

discharge, and	seasons.	2) Summer temperatures can cause algal growth to peak in shallow water bodies like ponds and lakes.	2) Lakes, reservoirs, and ponds provide more stable environments for algal growth, especially during stagnant water periods.
3) excessive use of fertilizers lead to nutrient enrichment and the occurrence of algal blooms. These blooms can impact water quality, reduce oxygen levels, and harm aquatic life.	2) Summer temperatures can cause algal growth to peak in shallow water bodies like ponds and lakes.		

3. Algal Distribution in Key Water Bodies in Nashik:

• Godavari River:

- The Godavari River, which flows through the Nashik district, is home to various freshwater algae. The river's flow rate and seasonal changes in water levels influence the algal distribution, with greater blooms observed in stagnant areas during low flow seasons.
- Diatoms and green algae are common in the river's slower-moving stretches.

• Nandurmadhyameshwar Reservoir and Bird Sanctuary:

- o The Nandurmadhyameshwar dam and surrounding wetlands, being nutrient-rich, support abundant algal life, particularly green algae and cyanobacteria.
- o These areas also experience seasonal algal blooms, especially in the warmer months.

• Ponds and Lakes:

- Small ponds and lakes in the Nashik district, such as Kalaram Lake and Pandav Leni Ponds, also support algae, including green algae (e.g., Chlorella, Spirogyra) and diatoms. These areas may experience periodic algal blooms due to nutrient runoff and seasonal changes.

• Urban Water Bodies:

- o Water bodies within or near the urbanized areas of Nashik can also face nutrient loading from waste and untreated sewage, leading to the proliferation of algae, especially blue-green algae (cyanobacteria), which thrive in nutrient-rich, stagnant conditions.

Algal Blooms and Environmental Concerns:

- In recent years, excessive nutrient input into water bodies, such as agricultural runoff, has contributed to eutrophication, leading to the growth of algal blooms.
- Blue-green algal blooms in particular, such as those caused by Microcystis and Anabaena, can cause water quality degradation, deplete oxygen levels, and produce harmful toxins that impact aquatic life and human health.

5. Research and Monitoring:

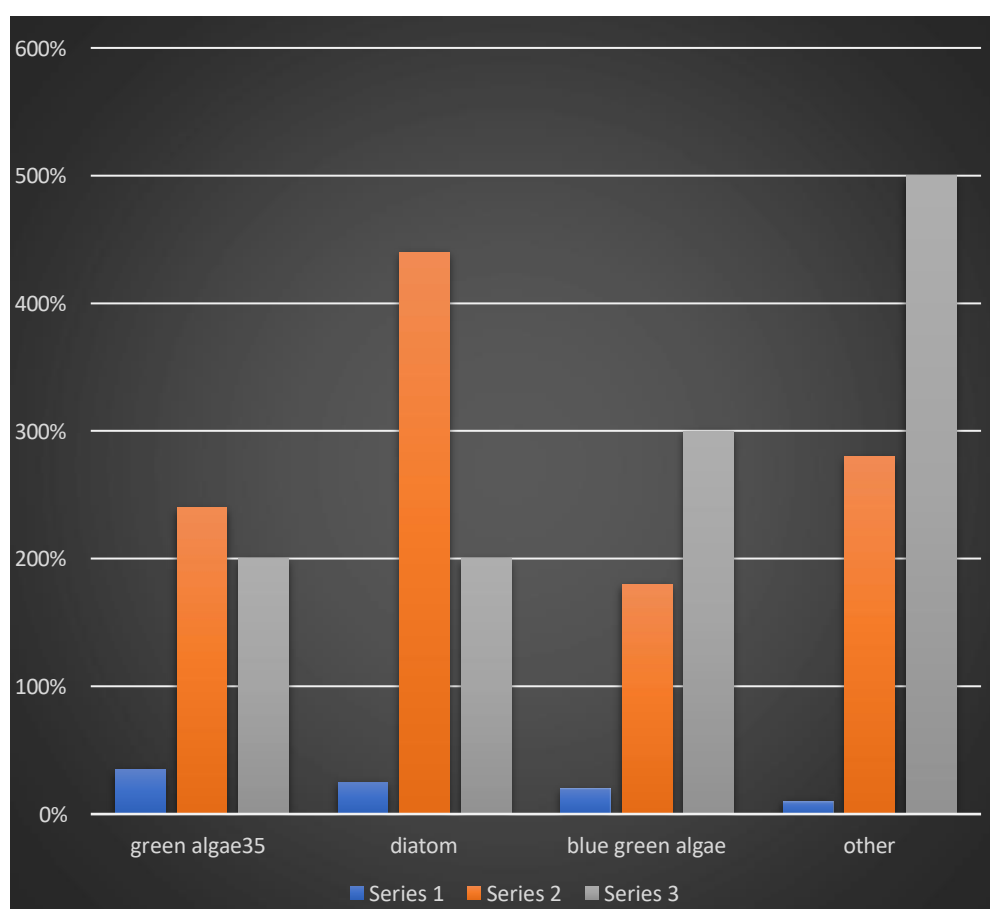
- Various research studies are being conducted to monitor and manage the health of aquatic ecosystems in Nashik, including studies on algal blooms, water quality, and the impact of pollution.
- Environmental agencies and local authorities are focused on maintaining water quality and managing algal growth in the region's water bodies.

Conclusion:

The distribution of algae in the Nashik district is diverse and strongly influenced by factors like water quality, nutrient availability, water flow, and temperature. While algae are an

integral part of aquatic ecosystems, excessive nutrient enrichment can lead to harmful algal blooms that pose a threat to water quality, aquatic life, and public health. The dam is situated near the village of Nandurmadhyameshwar in Nashik district, Maharashtra. It is approximately 35 km from the city of Nashik, which is the district headquarters. The Nandurmadhyameshwar Dam is a significant infrastructure project in the Nashik district, playing a vital role in irrigation, water supply, and environmental conservation. Its contribution to agriculture, the local ecosystem, and tourism makes it an important asset to the region. The surrounding bird sanctuary also adds to its ecological importance.

Chart of sessional distribution:



List of collected sample

- 1) Amphora-ovalis-diatom
- 2) Amphora -ovalis -diatom
- 3) Cellaphora-americana-diatome
- 4) Cimbella-diatom
- 5) Cocconeis-sp-diatom
- 6) Colonies-de-aulacoseira-granulata-diatome
- 7) Closterium sp.
- 8) Cosmarium botrytis menegh
- 9) Pediatum simplex
- 10) Scenedesmus arcutus lemmermann
- 11) Coelastrum proboscideum Bohlin
- 12) Cosmarium tumidum

References:-

- Patel, R.J. and I. George (1978) Chlorococcales of Gujarat, India-Genus Tetraedron Kuetzing. Bangladesh J. Bot. 7 (1):33-43.
- Patel, R.J. and I. George (1980) Algae of fish ponds in Gujarat, India-I-Chlorococcales. Phytos 19 (1): 83-88.
- Misra, P.K. and A.K. Srivastava (2005) Fresh Water Cyanophyceae algae from North-Eastern Uttar Pradesh, India. J. Ind. bot. Soc. 84: 67-75.
- Misra, P.K. and A.K. Srivastava (2003) Some Desmids (Chlorophyceae) from North-Eastern Uttar Pradesh, India. J. Ind. bot. Soc. 82: 85-92.
- Prasad, B.N. and P.K. Misra (1985) Some taxa of Cosmarium Link-New to Indian desmid flora. J. Indian bot. Soc. 64: 343-347.
- Prasad, B.N. and P.K. Misra (1992) Fresh water algal flora of Andman and Nicobar Islands, Vol. II, Bishen Singh Mahendra Pal Singh, Dehra Dun.
- Misra, P.K., R.K. Mehrotra, Jai Prakash and A.K. Srivastava (2001) Fresh water green algae from Basti district, Uttar Pradesh. Geophytology 31 (1 & 2):1-7.
- Scott, A.M. and G.W. Prescott (1961) Indonesia Desmids. Hydrobiologia 17 (1-2): 1-132.
- Kouwets, A.C. (1987) Desmids from the Auvergne (France). Hydrobiologia 146: 193-263.
- West, W. and G.S. West (1905) A monograph of the British Desmidiaceae, Ray Society, London, Vol.2, p 180.



A Systematic Review of Helminth Infections in the Freshwater Catfish Wallago Attu

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Abstract:

Wallago attu, a commercially valuable freshwater catfish, has a broad geographic distribution in South and Southeast Asia. Although the species is of ecological and economic value, it is extremely prone to helminth infection, which affects the health of the fish, aquaculture yields, and food safety. The present systematic review collates and synthesizes published literature on diversity, prevalence, pathological impact, and zoonotic potential of helminth parasites infecting *W. attu*. An extensive literature review was carried out on scientific databases, which found studies from geographically diverse locales with reports on nematodes, cestodes, trematodes, and acanthocephalans infesting the host. Commonly reported genera are *Procamallanus*, *Acanthostomum*, and *Senga*, among others, that vary in infectivity rates dependent on habitat type, season of the year, and host body size. Infection has had pathological effects described as intestinal tissue damage, inflammatory reactions, and stunted growth, with conservation and farmed populations being considered at risk. Furthermore, certain helminths (*Eustrongylides* spp.) are zoonotic, and this raises public health concerns. The review points to knowledge gaps such as limited molecular characterization of parasites, uneven regional distribution of research effort, and the requirement for sustainable control measures. Through integration of existing data, this study emphasizes the necessity of integrated methods in parasitological surveillance, host-parasite ecology, and fishery management to reduce the threat of helminth infections in *W. attu*.

Keywords: *Wallago attu*, helminth parasites, zoonosis, pathology, freshwater fish

1. Introduction:

The preface to the systematic review of *Wallago attu* and helminth infection in fish covers the economic and ecological significance of *Wallago attu*, the importance of helminth infection in fish, and the reason and aim of the review. *Wallago attu*, a freshwater catfish (Fig. 1), is of great economic and ecological significance, especially in areas where it forms a component of the local diet and source of income. Helminth infections in fish such as *Wallago attu* pose significant challenges to the health and growth of fish[1]. They have zoonotic potential and therefore impact aquaculture sustainability as well as public health. This systematic review seeks to summarize present information on these infections, determine their impacts, and suggest ways to effectively manage them. *Wallago attu* is an important species in freshwater fisheries, earning local economies income from fishing and aquaculture. It is an important protein source in most areas, securing food and offering employment in the fishery industry. *Wallago attu*, as a predator, has an important role in the balancing of aquatic ecosystems by keeping the population of minor fish and other aquatic fauna in check. Helminth infection is known to cause decreased growth rates, poor health, and enhanced mortality among fish populations[1], [2]. Physical injury to fish tissues by these infections results in lower market values and financial losses in aquaculture. Some of the helminths in fish are zoonotic, with health implications for humans

who eat raw or undercooked fish. These include species like *Anisakis* and *Opisthorchiidae*, which have been known to infect humans[3].

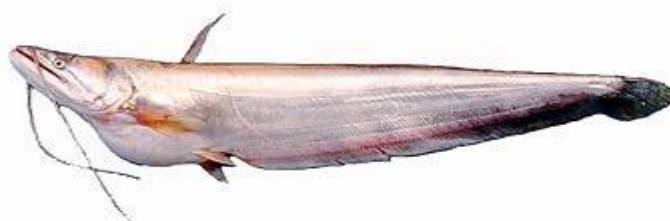


Figure 1: *Wallago attu*

Helminth infections in fish can act as bio-indicators for environmental health, indicating levels of pollution and ecosystem imbalance. They also bring into focus the necessity for enhanced public health regulation to impede zoonotic transmission. The review seeks to compile and consolidate available research on helminth infections among *Wallago attu* and other fish species, giving an up-to-date overview of their prevalence, distribution, and effects. By considering the impacts of helminth infections on the health and growth of fish, the review attempts to determine the key areas that need intervention and management in aquaculture operations. The review aims to guide public health policy and strategy development, promoting a One-Health strategy to address the interrelatedness of human, animal, and environmental health in the control of helminth infections. Whereas attention is given to the problems presented by helminth infections, it is also necessary to take into account the possible advantages of these parasites[4], [5]. Certain research indicates that helminth infections can confer protective benefits against non-communicable diseases, including cardiometabolic diseases, by regulating immune responses. This view emphasizes the complexity of helminth-host relationships and calls for well-balanced strategies in controlling helminth infection in fish and its implications in human health.

2. Methods:

The systematic review of helminth infestations in the freshwater catfish *Wallago attu* needs a thorough methodology to make sure relevant studies are included and pertinent data are extracted. This includes an effective search strategy, data extraction and synthesis approaches, and quality assessment of included studies. The following sections present the methodology for the conduct of such a review. The review must employ more than one electronic database to achieve comprehensive search. Suggested databases are Scopus, Web of Science, and PubMed since they have worked well in comparable systematic reviews of helminth infection among freshwater fish. The studies must be included if they are about helminth infections in *Wallago attu*, report data on prevalence, diversity, or effect of the infections, and are published in peer-reviewed journals. The search period must be between 1990 and the current year to include the latest and most relevant data. Exclude studies not focused on *Wallago attu*, not peer-reviewed or not providing primary data regarding helminth infections. Furthermore, studies dedicated to other fish species solely or insufficient methodological details provided should be excluded[6], [7].

2.1. Data Extraction and Synthesis Methods

Pull out information on types of helminths detected, their prevalence rate, and described effects on *Wallago attu*. This entails information on locality of the study, sample, and

identification methodology for parasites used. Adopt a narrative synthesis strategy to present the overall findings across studies. This will entail a common theme, pattern, and disagreement within the data. If there is adequate quantitative data, this can be used to perform a meta-analysis that will yield combined estimates for helminth prevalence and diversity. Use a standardized quality assessment tool, e.g., the Critical Appraisal Skills Programme (CASP) checklist, to assess the methodological quality of the included studies. The tool is used to determine the validity, reliability, and applicability of the study findings. Assess studies in terms of quality criteria like study design, sample size, methodology of data collection, and robustness of the statistical analysis. Studies need to be rated in terms of their quality as high, medium, or low, depending on the above criteria. Though the interest lies mostly with helminth infections of *Wallago attu*, keeping an eye on the general trend in helminth infections in freshwater fish is of relevance. Introduction of exotic species of fish and climate change might have a bearing on the dynamic of helminth infection and impact *Wallago attu* accordingly. Second, the One Health philosophy puts heavy stress on human-animal-environment health connections, and such understanding and control are necessary in helminth infections of aquatic environments[8].

3. Results and discussion:

The systematic literature review of the helminth infections of freshwater catfish *Wallago attu* presents a diverse picture of the prevalence, diversity, and spatial distribution of the parasites. Synthesizing different studies, the review provides a comprehensive understanding of the prevalence and diversity of helminth parasites, geographical range, host-dependent factors controlling the infection, and seasonal changes in the infection[9], [10].

3.1. Prevalence and Diversity of Helminth Parasites:

Wallago attu, as with most freshwater fish, is infested with a range of helminth parasites. Research has revealed a number of helminth taxa, such as nematodes, cestodes, and trematodes, as typical parasites in freshwater. In Nalganga Dam, cestodes like *Circumoncobothrium spp.* and nematodes like *Eustrongylides spp.* were found to be common in *Wallago attu*, reflecting high helminth parasite diversity in this species. Helminth parasite diversity in *Wallago attu* is consistent with findings in other siluriform fishes that are also host to a diversified array of helminth taxa, including digeneans and monogeneans[1], [11].

3.2. Geographical Distribution of Reported Infections:

Helminth infestations of *Wallago attu* have been documented in many geographical regions, such as India and Nigeria. For example, in the River Penna, Andhra Pradesh, India, ectoparasites like monogeneans and copepods were common among *Wallago attu*. In Nigeria, it has been indicated in studies that fish from various water bodies like the Kaduna River and backyard ponds have a varied helminth infection with higher rates in riverine fish as compared to pond fish. The geographic distribution of helminth infections is determined by environmental conditions and the availability of intermediate hosts, which differ among regions[12].

3.3. Host-Related Factors Affecting Infection:

Host-related characteristics including size, age, and sex determine to a great extent the prevalence and severity of helminth infections in *Wallago attu*. For instance, large fish tend to carry more parasites since they have more exposure and greater surface area. Male fish have been reported to have higher infection levels than females in certain studies, and this could be explained by differences in behavior that expose them to parasites. The host condition factor, as an indication of general health and nutritional status, also happens to be associated with parasite

load, with more healthy fish at times having greater parasite burdens through more successful survival of both host and parasite[13], [14].

3.4. Seasonal Variation in Infection Rates:

Seasonal variations in helminth infection rates have been found, and some studies reported that infection rates were higher in certain seasons. For example, parasite infection in the Nalganga Dam occurred more frequently in winter, but intensity was more during the monsoon season (Fig. 2). These seasonal trends are probably associated with alterations in environmental conditions, including water temperature and intermediate host availability, which influence the life cycles of helminth parasites. While the review identifies the high prevalence and diversity of helminth parasites in *Wallago attu*, it is worthwhile to note the larger ecological and environmental setting. Water quality, habitat destruction, and climate change can have impacts on parasite ecology and fish health. Furthermore, the function of parasites as indicators of environmental quality highlights the need for integrated management strategies that address both fish health and ecosystem integrity[9], [10].

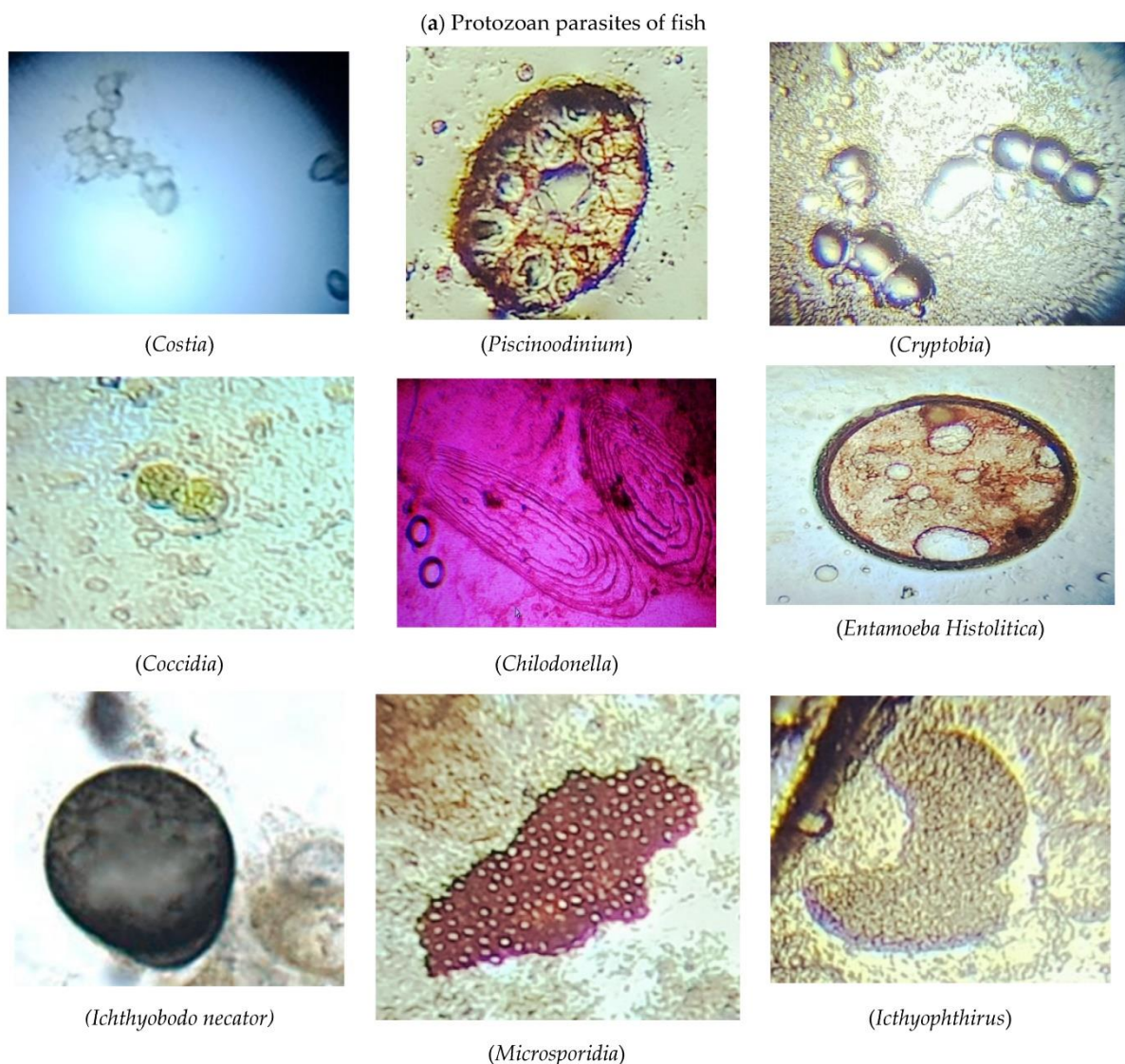


Figure 2: Photographs of protozoan parasites along with their names, which were identified in the freshwater[8].

Aspect	Details
Comparison of Findings with Other Studies on Freshwater Fish Parasites	<ul style="list-style-type: none"> • Helminth infections in <i>Wallago attu</i> are comparable to those found in other freshwater fish species, such as those in River Anambra, Nigeria, where a variety of helminth species were identified, including cestodes, nematodes, and trematodes. • In Malaysia, a study found a high prevalence of various fish parasites, including monogeneans and nematodes, which are also common in other freshwater environments. • The presence of zoonotic helminths in European freshwater fish highlights the global nature of these infections and the need for a unified approach to managing them.
Potential Implications of Helminth Infections for Aquaculture and Wild Populations of <i>Wallago attu</i>	<ul style="list-style-type: none"> • Helminth infections can lead to decreased fish populations and financial losses in aquaculture due to reduced fish health and products. • Infections can also impact wild fish populations by facilitating the transmission of parasites from farmed to wild fish, potentially leading to declines in wild populations. • The presence of zoonotic parasites poses public health risks, necessitating improved biosecurity and parasite control measures in aquaculture.
Identification of Knowledge Gaps and Areas for Future Research	<ul style="list-style-type: none"> • There is a lack of comprehensive data on the parasite fauna of many freshwater fish species, including <i>Wallago attu</i>, which hinders effective management and control strategies. • More research is needed to understand the dynamics of parasite transmission between farmed and wild fish, as well as the environmental factors influencing parasite prevalence. • The role of fish parasites as bioindicators of environmental quality and pollution needs further exploration to enhance monitoring and management practices.

While the current research provides valuable insights into the prevalence and impact of helminth infections in freshwater fish, including *Wallago attu*, there are still significant gaps in understanding the full extent of these infections and their implications. The studies highlight the need for a multidisciplinary approach, combining parasitology, aquaculture management, and environmental science, to address these challenges effectively. Additionally, the potential for parasites to serve as bioindicators of environmental health offers a promising avenue for future research and application in both aquaculture and conservation efforts[1], [3], [4], [5].

4. Conclusion:

This systematic review offers a detailed summary of the helminth parasites described to infect the freshwater catfish *Wallago attu*. Our investigation discloses a wide variety of helminth species infesting this valuable fish with varying frequencies among the different geographic areas and possibly modulated by host-specific and environmental conditions. The infections can have potential bearings on both the wild and cultivated *W. attu* populations' health and productivity. Although this review consolidates current knowledge, it also emphasizes the major

gaps in our current knowledge, especially with regards to the long-term ecological and economic consequences of these parasites. Additional research is essential in an attempt to bridge the gaps, including comprehensive epidemiological investigations, the establishment of effective control measures, and the possible zoonotic implications of these infections. Finally, a deeper insight into helminth infection in *Wallago attu* is critical for the maintenance of its sustainability and the alleviation of any adverse effects.

References:

- J. Ojha and G. M. Hughes, "Effect of branchial parasites on the efficiency of the gills of a freshwater catfish, *Wallago attu*," *J Zool*, vol. 255, no. 1, pp. 125–129, Sep. 2001, doi: 10.1017/S0952836901001170.
- A. prasanna Vankara, C. Thummala, R. Khateef, and R. A. Peddinti, "Histopathological evaluation of *Wallago attu* (Bloch & Schneider, 1801) infested by ectoparasites," *The Journal of Basic and Applied Zoology*, vol. 83, no. 1, p. 32, Dec. 2022, doi: 10.1186/s41936-022-00294-7.
- L. Wangchu, D. Narba, C. Matey, and A. Tripathi, "First report on the diversity and distribution of parasitic monogenoids (Platyhelminthes) from catfishes (Siluriformes) in Arunachal Pradesh, India," *Journal of Parasitic Diseases*, vol. 46, no. 1, pp. 285–295, Mar. 2022, doi: 10.1007/s12639-021-01445-3.
- K. Rana and H. Kaur, "Morphological and molecular description of *Pallisentisroparensis* n. sp. (Acanthocephala: Quadrigyridae) infecting the freshwater cat fish *Wallago attu* from Ropar Wetland, Punjab, India," *Int J Parasitol Parasites Wildl*, vol. 16, pp. 244–254, Dec. 2021, doi: 10.1016/j.ijppaw.2021.10.011.
- D. Jasrotia and H. Kaur, "Molecular analysis of a novel species, *Gangesiapunjabensis* (Family: Proteocephalidae, Subfamily: Gangesiinae) infecting an Indian freshwater cat fish, *Wallago attu* evidencing species complex," *Journal of Parasitic Diseases*, vol. 41, no. 3, pp. 888–898, Sep. 2017, doi: 10.1007/s12639-017-0912-8.
- A. Sahreen and M. K. Saifullah, "Epidemiological studies of *Isoparorchishypselobagri* (Digenea: Trematoda) infecting freshwater catfish *Wallago attu* in the Aligarh region of Uttar Pradesh," *Journal of Parasitic Diseases*, vol. 48, no. 3, pp. 642–653, Sep. 2024, doi: 10.1007/s12639-024-01702-1.
- A. Sahreen, K. Fatima, T. Zainab, and M. K. Saifullah, "Changes in the level of oxidative stress markers in Indian catfish (*Wallago attu*) infected with *Isoparorchishypselobagri*," *BeniSuef Univ J Basic Appl Sci*, vol. 10, no. 1, p. 85, Nov. 2021, doi: 10.1186/s43088-021-00174-z.
- A. Shafiq *et al.*, "Parasite Diversity in a Freshwater Ecosystem," *Microorganisms*, vol. 11, no. 8, p. 1940, Jul. 2023, doi: 10.3390/microorganisms11081940.
- V. D. Athokpam and V. Tandon, "A survey of metacercarial infections in commonly edible fish and crab hosts prevailing in Manipur, Northeast India," *Journal of Parasitic Diseases*, vol. 39, no. 3, pp. 429–440, Sep. 2015, doi: 10.1007/s12639-013-0360-z.
- H. Soofi, A. R. Abbasi, and A. Bhutto, "New Species of the Genus *Contracaecum* (Railliet and Henry, 1912) from Catfish *Wallago attu* of Indus River, Sindh, Pakistan," *Pakistan Journal of Nematology*, vol. 39, no. 1, 2021, doi: 10.17582/journal.pjn/2021/39.1.8.16.
- P. Tripathi, N. Agrawal, R. Pant, and G. G. Agrawal, "Microhabitat distribution of some monogenoideans, parasitizing the gills of *Wallago attu* (Bl. and Sch., 1801) and their seasonal variation," *Journal of Parasitic Diseases*, vol. 34, no. 1, pp. 24–28, Apr. 2010, doi: 10.1007/s12639-010-0008-1.
- A. K. Hazarika and B. Bordoloi, "Ichthyo-parasitological studies in northeastern India," *J Threat Taxa*, vol. 14, no. 5, pp. 21019–21024, May 2022, doi: 10.11609/jott.7583.14.5.21019-21024.
- J. Mondal and C. Dey, "Lipid and fatty acid compositions of a trematode, *Isoparorchishypselobagri* Billet, 1898 (Digenea: Isoparorchidae) infecting swim bladder of *Wallago attu* in the district North 24-Parganas of West Bengal," *Journal of Parasitic Diseases*, vol. 39, no. 1, pp. 67–72, Mar. 2015, doi: 10.1007/s12639-013-0283-8.
- N. Agrawal, S. Rajvanshi, and A. Asthana, "Intraguild interactions between five congeneric species of *Thaparocleidus* (Monogenoidea) from the freshwater shark *Wallago attu*, Lucknow, India," *J Helminthol*, vol. 91, no. 6, pp. 718–725, Nov. 2017, doi: 10.1017/S0022149X17000049.

Use of Digital Marketing and Social Media

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Abstract:

This research paper "Use of Digital Marketing and Social Media" focuses on the use of digital marketing and social media. There were so many social media apps in use digital marketing in business and consumer relationship. Nowadays social media is 'one of the best options available' to connect with customers. Community social networking websites are a means of interacting socially. These new media gain trust by connecting deeply with customers. This is the era of modernity and in this modern era, everything has become modern. In this order, the Internet is also a part of this modernity which is spreading everywhere like wildfire. Digital marketing is able to work through the Internet. Today's society is facing a shortage of time, so digital marketing has become essential. Every person is connected to the internet, they can easily use it everywhere. The use of internet in digital marketing and social media has changed consumer behavior and the way companies do business. Social and digital marketing offer organizations significant opportunities through reduced costs, improved brand awareness, and increased sales. The use of the digital marketing and social media has changed consumer behavior and the way companies do business.

India is undergoing a transformation, with digital marketing emerging as a major player in the economy. By leveraging strategies across social media, search engines, and email, companies can effectively communicate with a large audience. The launch of the government's Digital India initiative, coupled with increasing internet usage in recent times, saw the country's digital population grow to 806 million active users by February 2025. More than half of these were active social media users. At this point, the traffic in the world's second-largest internet market was largely dominated by mobile internet users. This allows companies to connect with a larger audience and enhance relationships with their customers. With over 800 million internet users in the country, the use of social media and digital marketing is essential and beneficial for business and customer satisfaction.

Keywords:

Digital marketing, SocialMedia, Business, Internet users, Commercial activity, Brand, etc.

Introduction:

Today Digital Marketing and social media is important commercial activity in business. It has also played important role in business. Digital marketing began in India in 1995 with the launch of internet services by CSNL due to increasing internet penetration and smartphone usage, and has grown rapidly since then, with the digital advertising industry expected to exceed 500 billion Indian rupees in 2025. Digital marketing, also known as online marketing, is the use of the internet and other digital channels to promote brands and connect with customers. It includes creating and sharing content through digital mediums such as websites, social media, email, and mobile app. The use of the Internet and social media has changed consumer behavior and the way companies do business. Social media and digital marketing offer organizations significant opportunities through reduced costs, improved brand awareness, and increased sales. Digital marketing platforms allow users to communicate, share information, and create web content to help the social media. Blogs, micro-blogs, wikis, social networking sites, photo-sharing sites, instant messaging, video-sharing sites, podcasts, widgets, virtual worlds, and more. Digital marketing is a powerful way for businesses of all sizes to reach potential customers.

People discover brands on social media, learn about them, follow them, and make purchases, So if you're not on platforms like Facebook, Instagram, and LinkedIn, you're missing out! Great digital marketing on social media can bring your business remarkable success, build dedicated brand advocates, and even increase leads and sales. Increasing technological developments bring about many innovations. This situation changes the communication, processes and distribution channels between individuals and organizations. Technology-enriched communication systems have removed the limitations of time and space between individuals. With the widespread use of the internet, digital marketing has increasingly entered human life. The spread of social media platforms across the world has made it possible for the free transfer of emotions and thoughts. As a result, social media has brought about various innovations and changes in digital marketing. Digital marketing uses these platforms to connect with customers, build brand awareness, increase engagement, and increase sales. The interactive nature of social media allows for direct interaction between brands and consumers, facilitating personalized marketing and real-time feedback. In India, digital marketing has evolved rapidly, Businesses of all sizes and across a variety of sectors are increasingly incorporating it into their overall digital marketing strategies use of social media. Digital marketing encompasses a variety of techniques and media that companies can use to promote their products and services to potential customers and improve their market share. To be successful, a combination of advertising and sales savvy is required.

Objectives of the research paper:

Following are the objectives of this research paper:

1. To study the concept of Digital Marketing and social media.
2. To study the use and benefits of Digital Marketing and social media in business.
3. To highlight the present scenario of Digital Marketing and social media.
4. To examine the opportunities for Digital Marketing and social media in business.
5. To study challenges problems of Digital Marketing and social media in business.

Hypothesis of Research Paper:

There are some assumptions for this research paper.

1. The concept of Digital Marketing and social media is useful in business.
2. There are benefits and losses of Digital Marketing and social media in business. But though it is essential in modern age.

Scope of Research Paper:

This research paper is based on secondary data. In this paper concept, benefits, uses, present scenario, opportunities and analysis the problem of Digital Marketing and social media in business are studied only.

Research Methodology:

This research paper is completed with the secondary data which is collected from website, periodical and journals, etc.

Digital Marketing:

Concept:

Internet plays an important role in digital marketing. The internet has brought the whole world close, it has become difficult to meet anyone due to lack of time, but it has become easier to connect through social sites. As social media, Search Engines, Mobile apps have developed,

the popularity of digital marketing has increased. Advertising your products and services through electronic devices such as computers or mobile phones is called digital marketing.

A few years ago, people used to sell their goods through various methods like posters, templates, advertisements, newspapers to sell their goods and reach the customers. But all these activities could attract very few customers, so traders changed the way they market their goods and nowadays everyone can shop online on their phone, send or receive money, take various types of education related courses etc. The term digital marketing became more popular after 2000. When the internet developed things like search engine marketing, social media, apps, etc., the term became popular among the people. Digital marketing is where we can advertise our products globally through digital devices like our mobiles and computers. Any type of marketing can help your business thrive. However, digital marketing has become increasingly important due to how accessible digital channels are. In fact, as of July 2024, there were 5.45 billion internet users worldwide. From social media to text messages, there are many ways to use digital marketing tactics to communicate with your target audience. Additionally, digital marketing has minimal upfront costs, making it a cost-effective marketing technique for small businesses.

Social media:

Social media is an interactive technology that facilitates the creation and sharing of information, ideas, interests, and other forms of expression through virtual communities and networks. Social media platforms allow digital users to communicate with each other, share information. Social media refers to websites and applications that focus on communication, community-based input, interaction, content-sharing, and collaboration. Over the past decade, social media has evolved beyond being just a means of connecting with friends and family. It now serves as a platform for news broadcasting, entertainment, and even commerce, becoming an important part of personal life and professional functioning. People use social media to stay connected and interact with different communities, follow trends, and gain information. In the business world, social media serves as a major tool for marketing, product promotion, customer service, and engagement. Businesses use these platforms to interact with customers and gather feedback. In 2025, India will have a vibrant social media landscape with 444 million users aged 18 years and above, which is 43.1% of the total population in that age group, and 60.9% of the total internet user base will use at least one social media platform.

Use and benefits of Digital Marketing and social media in business:

1 Global Reach:

The first advantage of digital marketing is its global reach. Traditional marketing is limited by geography, and creating an international marketing campaign can be difficult, expensive, and labor-intensive. However, digital marketing takes place over the internet, which means you can reach people all over the world. This online accessibility has opened up many growth opportunities for businesses. The combination of global reach and visibility is a great opportunity for any business.

2. Local Reach:

While global reach is a key benefit of digital marketing, it also improves local visibility, which is especially important if your business relies on nearby customers. Local SEO and locally targeted advertising can be beneficial for businesses trying to bring more customers to their

doorstep. Think about how much you can reach across an entire area through digital marketing, while printing flyers and distributing them everywhere and distribute them around.

3. Cost-effective:

The next advantage of digital marketing is cost-effectiveness. Whether you want to promote your business locally or internationally, digital marketing provides you with cost-effective solutions. It allows even small companies to grow to large scale using highly targeted strategies. This allows even small businesses to compete with larger companies using highly targeted strategies. Most of these strategies will cost nothing initially (such as SEO, social media, and content marketing). However, every form of digital marketing is different for every business.

4. Brand Awareness:

Digital marketing can help businesses build brand awareness and recognition. This is important for businesses that want to attract new customers and grow their business.

5. Effective Targeting:

Even if you don't have a clear idea of your target audience, digital marketing allows you to mine data to see which audiences will work best for you and optimize your campaigns around them. There are many different targeting options, such as keywords for search engine optimization (SEO), pay-per-click (PPC), or demographic information on social media. This huge number of targeting factors at your disposal ensures that each campaign reaches the right audience.

The present scenario of Digital Marketing and social:

Social media has become an integral part of our daily lives, with over 3.6 billion people using social media worldwide. Social media is no longer just a platform for personal communication; it has become a powerful tool for businesses to reach and interact with their target audience. In today's digital landscape, social media marketing has become an essential component of any successful marketing strategy. As of April 19, 56.1% of the world's population has access to the internet, meaning that globally, the way we access information, communicate with each other, and conduct our daily activities is increasingly online. The demand for the digital marketing industry is growing at a 40% growth rate, While other industries are still struggling with only 5 to 10% growth. Have you heard that more than 200,000 digital jobs are likely to be created by 2023, so "Digital Marketing" is the need of the hour. In India and around the world, the term 'digital marketing' is at the top of the list not only on the internet but also in print and TV media, this is because the 'Digital India' campaign launched by the Government of India aims to provide government services to citizens electronically. And to provide the country with digitally empowered technology. Digital marketing is expected to reach \$1.3 trillion globally by 2033, with over 50% of marketing budgets allocated to paid media and new technologies. Mobile advertising is predicted to account for 70% of total ad spending by 2028. The digital advertising market is forecasted to reach \$843 billion by 2025. Content marketing is the most popular form, with blogs being the most popular. Short-form interactive videos can boost sales and conversions by up to 80%. Influencer recommendations are preferred by nearly half of millennial. Generative AI is transforming operational improvements for 51% of businesses.

Digital marketing is predicted to reach \$472.5 billion in 2025, with a compound annual growth rate of 13.6% until 2033. Companies in North America and Europe allocated 7.7% of

their total revenue to marketing in 2024, the lowest percentage since 2021. Paid media and marketing technology make up 51% of marketing budgets, with marketing technology taking second place at 25.4%. The remaining portions go to labour (24.6%) and agencies (23.3%).

Marketing leaders are forced to adjust their strategies to optimize growth and return on investment (ROI), with 82% choosing to reprioritize investments in digital channels. Data-driven strategies mostly benefit email marketing projects, with 47% of marketers stating that data-driven marketing is the most useful area for effective marketing strategies. Improved marketing data leads to better customer experience, engagement, lead generation, personalization, and overall decision-making process.

The global digital advertising market is forecasted to reach \$843 billion in 2025, with businesses of all sizes relying on digital advertising tactics to reach new users. The Digital Advertising Market Report predicts that this segment of the marketing industry will grow at 14% annually and peak at \$1,426 in 2029. Mobile advertising will comprise 70% of total ad spending by 2028, as most consumers use their phones as their primary device to browse the internet.

Opportunities for Digital Marketing and social media in business:

The opportunities and challenges of digital marketing in India have increased recently. Businesses are using digital platforms to reach Indian consumers. Digital marketing helps expand reach, boost online sales, and build brand loyalty, but challenges include constant change, information overload, competition, privacy concerns, ad fraud, and ROI measurement.

E-commerce Growth and Digital Marketing

1. Digital marketing is crucial in online retail, allowing companies to target and retarget potential customers.
2. Paid advertising, social media engagement, email marketing, and content-driven SEO strategies are key strategies.
3. The demand for marketers who can generate revenue from digital platforms is increasing.

Social Media and Influencer Marketing:

- Social media platforms like Instagram, Facebook, YouTube, and Twitter allow brands to communicate directly with their audience.
- Influencer marketing is a booming sector in India, offering access to measurable brand growth.

Content Marketing and SEO:

- Content marketing attracts target customers and maximizes brands' presence on search engine.
- Experts in content creation, keyword research, and SEO tactics are in high demand.

Mobile Marketing:

- Mobile marketing is crucial due to India's high smartphone penetration rate.
- Marketers are devising mobile-centric strategies to effectively target this mass audience.

Growth Potential for Marketers in India

- The booming digital economy and increasing internet penetration are expanding the growth potential for marketers in India.

- Digital marketing offers measurable deliverables and is in demand by businesses. New marketers can benefit from the industry's explosive growth by understanding the latest digital marketing trends for 2024 in India.
- India's large population and rapidly growing economy make it a prime market for digital marketing businesses.
- The middle class, spending more on discretionary items like travel and entertainment, presents a significant opportunity for businesses.
- Over 60% of Indian internet users access the internet daily, spending an average of 9 hours per week online.
- India's leading technology companies are driving the country's digital transformation, providing valuable insights into trends and developments in the digital landscape. Overall, India presents a significant opportunity for businesses looking to tap into the growing trend of digital marketing.

Challenges in Digital Marketing and social media

Digital marketing and social media present numerous challenges for businesses, including constant algorithm changes, content saturation, rising competition, measuring ROI, navigating data privacy regulations, staying updated with technology, targeting the right audience, managing multichannel strategies, and dealing with rising digital ad costs. These challenges require businesses to differentiate themselves, attract customers effectively, measure ROI, navigate data privacy regulations, stay updated with technology, effectively target the right audience, manage multichannel strategies, and handle negative feedback, which can be amplified on social media.

Here are some challenges in Digital Marketing and social media –

- Changing Customer Trends: The constant evolution of digital platforms makes it challenging for businesses to adapt their marketing strategies.
- New Technology: Rapid technological advancements present opportunities but also present challenges in keeping up with relevant tools and platforms.
- Managing a Large Data Set: The abundance of data can hinder marketers from finding useful marketing ideas.
- Competition: The competitive online environment necessitates innovative strategies and targeted customer engagement.
- Managing Multiple Marketing Teams: Effective coordination of various online marketing strategies requires strategic planning and effective team coordination.

Conclusion-

In conclusion, this research paper has successfully achieved its objectives by thoroughly studying the concept of Digital Marketing and social media, as well as their use, benefits, present scenario, opportunities, and challenges in business. The hypothesis has been supported by the findings, confirming the usefulness of Digital Marketing and social media in modern age business, while acknowledging both their benefits and potential losses. Overall, this paper provides valuable insights into the significant role of Digital Marketing and social media in the contemporary business landscape.

The significant impact of digital marketing and social media on modern business and consumer relationships. The global reach of digital marketing has opened up growth opportunities for businesses, allowing for both international and local visibility at a cost-effective

rate. Furthermore, the present scenario indicates a rapid growth rate and increasing demand in the digital marketing industry, with mobile advertising predicted to dominate total ad spending by 2028. The opportunities for digital marketing and social media in India are substantial, driven by the booming digital economy, increasing internet penetration, and the potential for measurable deliverables. However, along with these opportunities come challenges, including the need to adapt to changing customer trends and keep pace with rapid technological advancements. Businesses are faced with the task of effectively targeting the right audience, managing multichannel strategies, and navigating data privacy regulations, all while dealing with rising digital ad costs and content saturation. Despite these challenges, the research paper highlights the immense potential for businesses to leverage digital marketing and social media, especially in a market like India with its large population, growing economy, and significant online presence. The evolving landscape of digital marketing presents both opportunities and challenges, and it is crucial for businesses to strategically navigate this dynamic environment to maximize their impact and success.

References-

- <https://www.iifl.com>
- <https://www.linkedin.com>
- <https://www.nihtdigitalmarketing.com>
- <https://www.linkedin.com>
- <https://huroorkee.ac.in>
- <https://www.nihtdigitalmarketing.com>
- <https://inmarathi.co.in>



Modern Digital Payment Trends

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Abstract:

Like everything in the world, payment system is also change rapidly. Manual system of payment shifting it's face into digitalization. Due to the innovations and changes in technologies, digital payments modes have taken the place of manual payment process not wholly but more extended. Now a day we can make payment by phone to a person who is away from us. Digital payment has undergone a remarkable evolution over the years.

This research paper highlights on Modern Payment Trends, its process, Advantages and Disadvantages.

Digital payments refer to electronic financial transactions conducted over the Internet or other electronics devices, allowing individuals and businesses to receive and send money without the need for physical currency. Due to safe and secure more than other instruments people using the digital payments mode than before. Digital payments are facilitated through various online platforms, electronic payment system and mobile apps.

The core or key participants in Digital Payments system are Customers, Merchant or Businessman, The Issuer Bank (consumer's bank) and the Acquirer Bank (merchant's bank). The main point for payment is gateways which are important and responsible for verification the balance or credit limit of customer's which is linked to their bank account during the digital payment while processing a payment request. Initiation, Process for Authorization, Processing for Payment and Settlement is the process for making the Digital payment.

There are so many systems for digital payments in modern age.

Biometric Verification/Authentication, Unstructured Supplementary Service Data (USSD), Credit Card, Debit Card, QR Code Scanner, Mobile Point- of -Sale (mPOS), NEFT and RTGS, NFC Technology, Unified Payment Interfaces (UPI), Account-to-Account Payments (A2A) etc. Each payments trend have their own advantages and disadvantages.

Instant payment, Easy and Safe, Improved Efficiency, Transactions records in Digital mode, Cost Minimize, Low Fees, Savings and Discount, Low Risk for Theft are some advantages of Digital payments modes,

There are some limitations also while uses the digital payment modes. As online transactions increase, the opportunities for fraudulent misuse of payment networks and data theft grow right alongside. Cyber security is more challenging matter. If there is slow speed of internet, the message sending may be slow and late. In the remote area, the range for phones may be weak or nothing. At that time, we cannot use the digital payment modes. There are so many apps in our smart phones which can stole the customer's secret or confidential data. The customer must literate in general norms and language for using the digital payment system. If he is illiterate, then he can't use this system.

Keywords: Modern Digital Payments, Internet, Online payment, Debit Card, Credit Card, transfer funds, Modern Digital Modes etc.

Introduction:

Now a day payment system is changed in rapidly. Its growth comes fast after Corona. Due to safe and secure more than other instruments people using the digital payments mode than before. Due to the changes and innovations in technologies many new digital payments have appeared and old disappeared.

Digital payments can be fully or partially digital. It depends on how the transactions are processed. Digital payments offered a convenient, secure and efficient way for transferring the money. Its alternation with cash transactions is due to its features as faster, safer and more cost effectiveness. Due to the financial literacy and accessibility every one can try to pay online and so digital payment becoming the strong wave in India than other countries. Due to the significant features of UPI (Digital payments) the Indian online market will be reach to Rs. 220 million by 2025.

Objects of the Research paper:

There are some objects of this research paper.

- 1) To study the concept of Digital Payment.
- 2) To know the process or Steps for making a Digital Payment.
- 3) To understand the Modern Digital Payment methods/trends.
- 4) To know the advantages of Digital Payment method.
- 5) To study the disadvantages of Digital Payment method.

Hypothesis of Research paper:

There are some assumptions for the research paper.

- 1) The concept is easy to understand.
- 2) There are many digital payments modes used by different individuals.
- 3) There are more advantages than disadvantages to use of digital payment modes.
- 4) It is safe and secure while taking precautions.

Scope and Limitations of the Research paper:

This research paper is based on secondary data. In this paper, I have studied the concept, modes of digital payments, advantages and disadvantages of digital payments only.

Research Methodology:

The present research paper is based on the secondary data which is collected from Websites, Text books, Reference books, Periodicals and Journals etc.

Digital Payment: Meaning:

Digital payments refer to electronic financial transactions on a secure website or virtual bank conducted with internet or other electronics devices. It allowed individuals and businesses to send and receive money without the physical currency. Digital payments are facilitated through various online platforms, electronic payment system and mobile apps. In simple words, Digital payments mean the transfer of funds between the payee and payer using the digital platforms. For this both the parties using a digital device or channel for funds transfer.

The core or key participants in Digital Payments system:

For completing the transactions in digital payments core parties are-

1. The Consumer
2. The Merchant
3. The Issuer bank (consumer's bank)
4. The Acquirer bank (merchant's bank)

The process or Steps for making a Digital Payment:

The main point for payment is gateways which are important and responsible for verification the balance or credit limit of customer's which is linked to their bank account during

the digital payment while processing a payment request. The process for making the Digital Payment is as follows.

- 1) **Initiation:** This is the first step of making the Digital payment. It begins when a customer initiates a transaction. Whether the transaction of purchasing goods or services through online or selecting a digital payment method with a credit card or a mobile device with wallets.
- 2) **Process for Authorization:** This is second step in making digital payment. Once the transaction is initiated or completed, the payment information is securely transmitted to the payment processor or acquiring bank for authorization.
- 3) **Processing for Payment:** Once the authorization complete, the first payment network or gateways or processor processes the transaction by debiting the client's payment account. In this step may include communication between various parties as banks, payment networks and merchant service provider.
- 4) **Settlement:** This is second last step in making digital payment. In this step payment has done. The funds transferred from the issuer bank to the merchant's bank. It is considered as settlement.
- 5) **Make Confirmation:** Once the payment or settlement is completed, both the parties receive the message for confirmation of the transaction. This is the last step of digital payment.

Modern Digital Payment Trends/Methods:

Today there are many digital payments aids or sources used for payments compared to traditional payments mode. Some modern payments modes are studied here.

- 1) **Biometric Verification/Authentication:** Biometric Authentication is one of the modern digital payment methods used in various types of digital payments to identify and verify customers when they try to access the solution on their mobile, tablet or desktop devices. This authentication is made via fingerprints, facial scans, vein mapping or iris scan to ensure the legitimacy of the users accessing the payment system.
- 2) **Unstructured Supplementary Service Data (USSD):** In India, this service was launched for those and for remote areas where do not have the access of proper banking and internet facilities. Under the USSD, mobile banking transactions are possible without an internet connection. For this customer can do their financial transactions by dialing *99# on any essential feature phones. This number is operational across all telecom service providers. It allows customers to avail the banking services like fund transfer, balance enquiry, mini statement and so. In India, around 51 leading banks offer USSD services in 12 languages including Hindi and English.
- 3) **Credit Card:** A Credit card having a magnetic number and code on it is a thin rectangular piece of plastic or metal card. This card is introduced by the bank for their customers with the development of information technology. This card is enabled for credit purchases and cash withdrawals for the customers as pre-approved loan. It allows cardholder to borrow funds with which to pay for goods and services to the merchant who accept card for payment. This is an instrument issued by banks for their customers. The credit card payment or processing is simple and easy. It is also easy and safe to carrying than hard cash. One more thing must be considered that the rate of interest on credit card is highest than other loan.
- 4) **Debit Card:** This card is similar to Credit card. It is also called as "Check Card" or "Bank Card". It looks same as credit card. But the functions are different than credit card. The main difference is that there is no credit facility available to this cardholder means bank account holder. Therefore, there is no interest charge on withdrawal of cash or purchase making. With the help of Debit Card, the cardholder can withdraw cash or purchase goods and services and can

pay money to the merchant online instantly. One more condition is that there should be credit balance in his account. This card can be used at ATM for cash withdrawals and merchant sites to pay online. This card can be used when and where required in 24/7. For safety there is required Personal Identification Number (PIN) or OTP for validation or verification the transaction.

5) QR Code Scanner: QR Code Scanner is also another modern digital payment tool. QR code is short for quick response. This code may be static or dynamic as requirement. In QR code, there are all information related to account holder. QR code scanner may be inbuilt in mobile phone or some time we have to download from Google Play or Apple App Store. This scanner scans the QR code and read the related contents to pay online. If you accept the request then online payment can be made by putting the amount easily. It is also a safe and secure payment mode. Customer can verify the merchant's name also.

6) Mobile Point- of -Sale (mPOS): The ability to accept payment anywhere, anytime will be driving massive growth in mobile Point-of-Sale adoption in 2025. mPOS helps business to process customer payments via mobile devices like tablets and smartphones. With offline mode capacity and integration with software, mPOS enables business to operate credit card transactions from any location for home and repair services and market vendors.

7) NEFT and RTGS: In India, NEFT facility was introduced in November, 2005 by the RBI. It is an instrument for digital payment making. The long form is National Electronic Funds Transfer (NEFT) which is applicable for funds transferred from same bank or one bank account to another bank account by computerized network.

In India, Real Time Gross Settlement (RTGS) system was launched on 26th March, 2004 under the guidance of RBI. Under this payment system, the settlement of payment is continuous throughout the day. It means payment made on real time and since the same; it is not at the end of the day.

8) NFC Technology: Near Field Communication (NFC) technology allows users to make secure payments, exchange digital content and connect electronic devices with touch. NFC is a contactless technology that's designed to work only across short distances and required the devices to be in close distance. This technology is also easy and safe to transfer and received payment. It is based on a radio frequency field using a base frequency of 13.56 MHz's

9) Unified Payment Interfaces (UPI): National Payments Corporation of India (NPCI) developed the instant payment system i. e. UPI. Used of UPI increased at Corona disease and after then applications increased very fast. Now, we see everyone at individual level and each businessman also used this source of payment in his daily transactions. This system of payment allows users to link more than one bank account in a single smart phone app and make fund transfers without having to provide IFSC code or account number. For example- BHIM App, Phone Pay, Paytm, Google Pay etc.

10) Account-to-Account Payments (A2A): In 2024, the expected increase in A2A payments is due to its integration with open banking. It is open banking enabled, coupled with advances in instant payments and growing merchant adaption, is catapulting these transactions into a new era. In a result, A2A payments are not only becoming faster and cheaper, but also much more resistant to fraud.

Advantages of Modern Digital Payments Trends:

There are much more benefits of modern digital payments mode than some lacunas. Following are some advantages of Modern Digital Payment Modes.

- 1) **Instant payment:** Due to modern digital payment modes we can easily transfer funds from one account to another person account. Within some seconds we can transfer money to our relatives or merchant without any obstacles.
- 2) **Easy and Safe:** If we take some precautions the use of digital payment modes is safe and secure. Digital payment system made sure about the authentication protocols which minimize the risk of unauthorized access and effectively prevent fraud.
- 3) **Improved Efficiency:** Digitization and Automation in payment methods, efficiency have enhanced significantly. The manual intervention has minimized, errors reduced and financial workflows are streamlined and so the payment process made more efficient and error-free system.
- 4) **Transactions records in Digital mode:** Due to the digital records, the accounts of business have been kept up to date. It is easy to monitor the payment history and can be referred to when required. It is also easy to maintain the records in digitally.
- 5) **Cost Minimize:** The digital payment system minimized the requirements of infrastructure, manual handling and paper works. So, it reduced the cost for the above mention factors. So, the charges levied on customers are also low.
- 6) **Easy to Use:** The Modern payment system facilitates customer comfort. These payment systems are easy to operate and will not take additional efforts to understand how it works.
- 7) **Low Fees:** The digital payment modes typically entail lower transaction fees compared to banking methods contributing to overall cost efficiency.
- 8) **Savings and Discount:** Many digital payment platforms provide discount, cashback or loyalty to their customer which saves money and provides several benefits.
- 9) **Low Risk for Theft:** The digital payments minimized the possibility of the actual loss or theft of money since it's not physical. All the financial transactions made in digital. So, there is no need or necessity of holding big amounts of currency in physical manner. Therefore, there is no question of stolen the money.
- 10) **Help for future:** The digital records saved efficiently in your mail or smartphones. So, we can use it for refer in future as a proof in dispute matters.

Disadvantages of Modern Digital Payments Trends:

As there are more benefits from modern digital payments trends, there are some challenges before this. These challenges are considered as disadvantages of digital payments. These are as follows.

- 1) As online transactions increase, the opportunities for fraudulent misuse of payment networks and data theft grow right alongside.
- 2) Cyber security is more challenging matter.
- 3) **Slow Speed:** If there is slow speed of internet, the message sending may be slow and late. So, the receipt of payment will get late to the merchant and customer. For that both the parties have to wait for some more time. This is not easy for the both parties.
- 4) **Requirement of Internet:** To use of modern digital payment modes, most of the phones requires internet. In the remote area, the range for phones may be weak or nothing. At that time, we cannot use the digital payment modes.

- 5) **Identity can be disclosed:** There are so many apps in our smartphones which can steal the customers' secret or confidential data. If it happened, then the PIN or some Password can be disclosed and then can be fraud or misleading.
- 6) **Literacy Required:** To use the digital payment modes, customer must know the knowledge about the use of that system. The customer must be literate in general norms and language for using the digital payment system. If he is illiterate, then he can't use this system.

Conclusions: From this research paper, I have come to conclusions that-

- 1) At present, use of modern digital payment mode becomes necessary.
- 2) Use of Digital Payment modes is safe and secure.
- 3) Modern Digital payment system is faster than manual process of payment.
- 4) We can pay the amount to a person who is far away from us by digital payment modes.
- 5) We should take care or precaution while making payment on digital modes.
- 6) Modern Digital payment system is time saving aids.
- 7) The process for digital payment system is easy than manual.

References:

- Dr. Gautam S. Bapat- "E-Commerce", Nirali Prakashan, September, 2023
- <https://sdk.finance>
- <https://www.digipay.guru>
- <https://razorpay.com>
- <https://www.nic.in>
- <https://digipay.gov.in/>
- <https://www.bbc.com/news/world-asia-india-37974423>
- <https://www.npci.org.in/what-we-do/upi/product->

Migratory Bird in Nandur Madhmeshwar Wildlife Bird Sanctuary : A Study of Their Diversity and Habitat

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Abstract:

A bird sanctuary located on the Nandur Madhmeshwar in Niphad taluka of Nashik district in the state of Maharashtra is also known as the 'Bharatpur' of India. Nandur Madhmeshwar Bird Sanctuary located at the confluence of the South Ganges and Kadwa rivers, it is very famous for migratory birds. In winter, birds from other countries come to this bird sanctuary to breed after staying in the country. This sanctuary is 40 km from Nashik and 18 km from Niphad. It is located at a distance of 14 km. Many birds from the country travel a long distance between September and February and come here. The Nandur Mahasyaishwar comes here, where there is a large amount of food, as well as the climate is favorable, and since it is a very favorable time for breeding, they come here from the country. Studying migratory birds is a way to change the environment, provide adequate food, and provide a suitable environment for breeding, species conservation. We will study this. Nandur Madhmeshwar is a critical stopover site for migratory birds and it is important to study and inform conservation efforts to protect habitat for local and migratory birds in our responsibility.

Keywords: Bird Sanctuary, Bharatpur, Nandur madhmeshwar, Ramsar site, Niphad, Migratory bird, Wetland

Introduction:

Nandur Madhmeshwar Bird Sanctuary, located in the state of Maharashtra. It is declared as Ramsar site on 26 June 2019. It is located in Niphad Taluka. India is a vital wintering ground for numerous migratory bird species. Every year, thousands of birds from diverse taxonomic groups migrate to this sanctuary, seeking refuge from harsh weather conditions and exploiting the abundant food resources available. The sanctuary's unique location, nestled in the Indo-Gangetic Plain, makes it an critical stopover site for birds migrating along the Central Asian-South East Asian Flyway. During the winter season, Nandur Madhmeshwar Bird Sanctuary provides a haven for migratory birds to feed, breed, and roost. The sanctuary's wetland ecosystems, including shallow wetlands, mudflats, and reed beds, offer a diverse range of food sources, including fish, crustaceans, and insects. Additionally, the sanctuary's habitat diversity provides suitable breeding and roosting sites for various bird species.

In Nandur madhmeshwar birds sanctuary birds come from various countries like Russia, Pakistan, China, Europe, Africa presence of marshy land, abundance of food, forest and big wetland area favourable conditions for feeding, breeding and nesting in this bird sanctuary.

This study aims to investigate the wintering patterns, feeding ecology, and breeding behavior of migratory birds in Nandur Madhmeshwar Bird Sanctuary, providing valuable insights into the ecological significance of this sanctuary and informing conservation efforts to protect this critical habitat.

Material and Method:

Nandur Madhmeshwar (Niphad) wildlife bird sanctuary is located in Chapadgaon near Godavari dam of Nandur madhmeshwar Tal – Niphad, Dist-Nashik. For study birds and collect

the data we visit in December month in morning 6.00am and spent 1-2 hours in each point. Olympus binocular was used to observe activity of bird .we spent 4 hours in morning 6.00am to 11.00am and 2 hours in evening at 4.00 pm to 6.00pm . To record the activity of birds were four observation towers located southern region of wetlands where water birds are observed and five points at 100 meter distance in downstream rocky area to observe avian birds. this regions are help us to count bird activity and various types of birds.



Indian spot-bill



Indian purple moorhen



Peacock



Euracian Spoonbill



Kingfisher



Imperial Eagle



Common quill

Dissscussion:

In winter season number of migratory birds come to from other countries to this place for feeding, breeding and shelter. In this wildlife sanctuary natural grassland, various types of trees, shrubs are present and for water bird wetland is also present. In nandur madhmeshwar bird sanctuary abundant food is available. Little Greb, vulture, owl, Heron, spotted dove, Spot Beel pelican, Eagle, Quail, Hornbill, Swift, White breasted kingfisher, Parrot, Peacock this resident birds are observed.

- White Stork: A large wading bird with a distinctive white plumage and black wings.
- Glossy Ibis: A medium-sized wading bird with a glossy blue-black plumage and a curved bill.
- Spoonbill: A large wading bird with a distinctive spoon-shaped bill.
- Flamingo: A large wading bird with a bright pink plumage and a distinctive beak.
- Goose Brahminy Duck: A medium-sized duck with a distinctive Brahminy duck plumage.
- Pintail: A large duck with a distinctive long tail.
- Mallard: A medium-sized duck with a distinctive green head.

- Wigeon: A medium-sized duck with a distinctive white forehead patch.
- Garganey: A medium-sized duck with a distinctive white eye patch

Raptors: Eastern Imperial Eagle and Osprey these birds are drawn to the sanctuary's wetland ecosystems, which provide abundant food sources, including fish, crustaceans, and insects. The sanctuary's diverse habitats, including shallow wetlands, mudflats, reed beds, and agricultural fields

Migratory birds travel from other countries to Nandur Madhmeshwar

1. Siberia (Russia): Many bird species, such as the Siberian Crane, migrate from Siberia to Nandur Madhmeshwar.
2. Central Asia: Countries like Kazakhstan, Uzbekistan, and Turkmenistan are home to migratory birds that visit Nandur Madhmeshwar.
3. Mongolia: Some bird species, like the Demoiselle Crane, migrate from Mongolia to Nandur Madhmeshwar.
4. China: Birds like the Red-crested Pochard and the Common Pochard migrate from China to Nandur Madhmeshwar.
5. Europe: Some bird species, like the Common Crane and the White Stork, migrate from European countries like Poland, Germany, and France to Nandur Madhmeshwar.
6. Afghanistan: Birds like the Imperial Eagle and the Saker Falcon migrate from Afghanistan to Nandur Madhmeshwar.
7. Pakistan: Some bird species, like the Dalmatian Pelican and the Spot-billed Pelican, migrate from Pakistan to Nandur Madhmeshwar.
8. Flamingo (*Phoenicopterus roseus*): Migrates from Iran, Pakistan, and Afghanistan.

Result:

The top 5 migratory bird species recorded in the sanctuary during the winter season were:

1. Siberian Crane (*Grus leucogeranus*)
2. Flamingo (*Phoenicopterus roseus*)
3. Mallard (*Anas platyrhynchos*)
4. Goose Brahminy Duck
5. Imperial Eagle (*Aquila heliaca*)

Habitat: The most common food sources consumed by migratory birds in the sanctuary were fish, insect, crustaceans for Water bird.

Conclusion:

As per study and observations number of migratory birds are visit in nandur madhmeswar wildlife bird sanctuary in winter season In the study during winter season december-february were observed residential and migratory birds. These concludes highlight the importance of Nandur Madhmeshwar Bird Sanctuary as a wintering ground for migratory birds and emphasize the need for conservation efforts to protect this critical habitat.

Reference:

- Birds and their conservation status at Nandur Madhmeshwar bird Sanctuary near Nasik, India Shivaji Prabhakar Chavan, Arvind N Kulkarni and Pavan L Jadhav.
- Abdulali H. Checklist of Birds of Maharashtra, BNHS, Mumbai, 1981, 1-35. 2. Ali S. The Book of Indian Birds. BNHS, Mumbai, 1996, 1-354. 3. Ali S, Repley SD. A Practical Gui

- Birds from Godavari River Basin in Nanded District of Maharashtra State, India: Annotated status and new reports Shivaji P. Chavan*, Dilip Dudhmal, Shrikrishna Hambarde and A. N. Kulkarni
- Ali S. (1996). The Book of Indian Birds. BNHS, Mumbai. PP: 1-354.
- Chavan Shivaji Prabhakar, Dilip Dudhmal. Population status, shift in food chain and behavioural ecology from isolated ponds of Godavari River basin in Nanded district, India. Science Research Reporter. 2016a; 6(1):50-57.
- Chavan Shivaji, Dilip Dudhmal, Deepak Walke. Mud nests Wire-tailed Swallow (*Hirundo filifera*): Biomarkers of ecological Niche in Godavari River Ecosystem, Nanded, Maharashtra State. Advances in Bioresarches. 2016b; 7(2):170-175.
- Islam ZU, Rahmani AR. Important Bird areas in India, Priority sites for conservation Network: Bombay Natural History Society and Bird Life International (UK), 2004.
- Prasad KK, Bagari RC, Bhargavi S. Avifaunal Diversity of Manjeera Wild Life Sanctuary, Andhra Pradesh, India, Jour of Threatened Taxa. 2014; 6(2):5464-5477.
- IUCN Red List of Birds. BirdLife International, 2018. ([http:// www.birdlife.org](http://www.birdlife.org)).
- Birdlife International. IUCN Red List for birds, 2017. ([http:// www.birdlife.org](http://www.birdlife.org)).
- AVIAN DIVERSITY (LOCAL AND MIGRATORY BIRDS) AND HABITAT USE OF NANDUR MADHYAMESHWAR BIRD SANCTUARY, NASHIK DISTRICT, MAHARASHTRA (INDIA)
- Shivaji P. C., Arvind N. K. and Pavan L. J., (2018). Birds and their conservation status at Nandur Madhmeshwar bird Sanctuary near Nasik, India. International Journal of Fauna and Biological Studies. 5(4): 109-119. 8) Yonezawa, T, et al. (2017). Phylogenomics and Morphology of Extinct Paleognaths Reveal the Origin and Evolution of the Ratites. Current Biology. 27 (1):68–77.
- Chatterjee, A., et. al., (2015). Diversity of early winter migrant and resident birds in an important Ramsar site: Nal Sarovar, Gujarat, India. Int. jou, of Evs, scie, volume 6, No 2. 3) Darekar, P. V. Chougule, S. H. Kumbhar, A. C., (2016). Piscivorous Birds Around Ekrukha Water Reservoir of North Solapur Tahsil Dist. Solapur (M.S.). I JRBAT, Vol. IV, Issue (3), ISSN 2347 –517X. 4) https://rsis.ramsar.org/RISapp/files/4026954/documents/IN2410_mgt181223_1.pdf. 5) Kovacs, Christopher E. Meyers R, (2000).
- Anatomy and histochemistry of flight muscles in a wing-propelled diving bird, the Atlantic Puffin, *Fregata aethiopica*. Journal of Morphology. 244 (2):109–125. 6) Puri S. D. and Virani R. S., (2016).
- Avifaunal diversity from Khairbandha Lake in Gondia district, Maharashtra State, India. Bioscience Discovery, 7(2):140- 146.
- Burt, C.S., Kelly, J.F., Trankina, G.E., Silva, C.L., Khalighifar, A., Jenkins-Smith, H.C., Fox, A.S., Fristrup, K.M. and Horton, K.G. 2023. Effects of light pollution on migratory animal behavior. Trends in Ecology & Evolution, 38: 355-368

Agricultural Problems and Prospects of Yeola Taluka in Nashik District

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Abstract:

In this research paper importance is given to the agricultural problem of Yeola Taluka. Yeola taluka is located in Nashik district of Maharashtra state. Yeola the one of Taluka in Nashik district which experience seasonal rainfall by Southwest monsoon, and most probably it is drought prone area of Nashik district because of uneven distribution of rainfall. Drought is one of the prominent problems in front of the agriculture in the study area. Topography, soil, scarcity of the water and absence of the main river is responsible to agriculture problem the population of this region population is engaged in agriculture activity

Keywords: Climate, soils, land use, irrigation. Agriculture, drought

Introduction:

Origin of the research problem: -

Yeola Taluka is the drought prone area of the Nashik District located at the South-eastern part of District. It is one of the parts of Deccan plateau, Yeola Taluka occupied the total area of 1064.47 square Kilometre which is 6.85% of Nashik. According to the census of 2011 the population of Yeolataluka is 271146 while the rural population percentage is 48.31% and urban population percentage 51.34%. 80% populations are engaged in agriculture. The total area of Yeola is 1059.01 sq.km with population density of 256 per sq.km. This population is depending on directly or indirectly on agriculture. The topography of Yeola is uneven. The North-Eastern part is the hilly region of 'Satmala - Ajantha Mountain Ridge,' very few rivers are blowing from this area. The natures of these rivers are seasonal. The average rainfall occurs Yeola only 45 to 52 cms. Yeolataluka is the rain shadow area of Maharashtra Only 5.57% land area under the forest, while

cultivated area is near to 68%. The agriculture of taluka is highly depending of rain. So Kharif and Rabbi These are two hangams in this area. The eastern part of Taluka is famous for Cotton and Jawar while western part is famous for Bajra and Onion. Now a day people turn towards plantation agriculture. Yeola Urban & Rural Population Out of total population, 50% of population lives in Urban area and 60% lives in Rural area

Aims And Objectives:

1. To study the impact of droughts on agricultural pattern of study area.
2. To suggest measures to minimize the adverse effects of drought on the
3. production of agriculture and animal rearing and productivity of land.
4. Assessment of the impact of the change in cropping pattern on the socioeconomic conditions of the rural community.
5. To study the agricultural problems and prospects of the study region

Hypothesis:

Education, topography, climate, soil, water and technological development play an important role in making the changes in the agriculture.

Study Area –

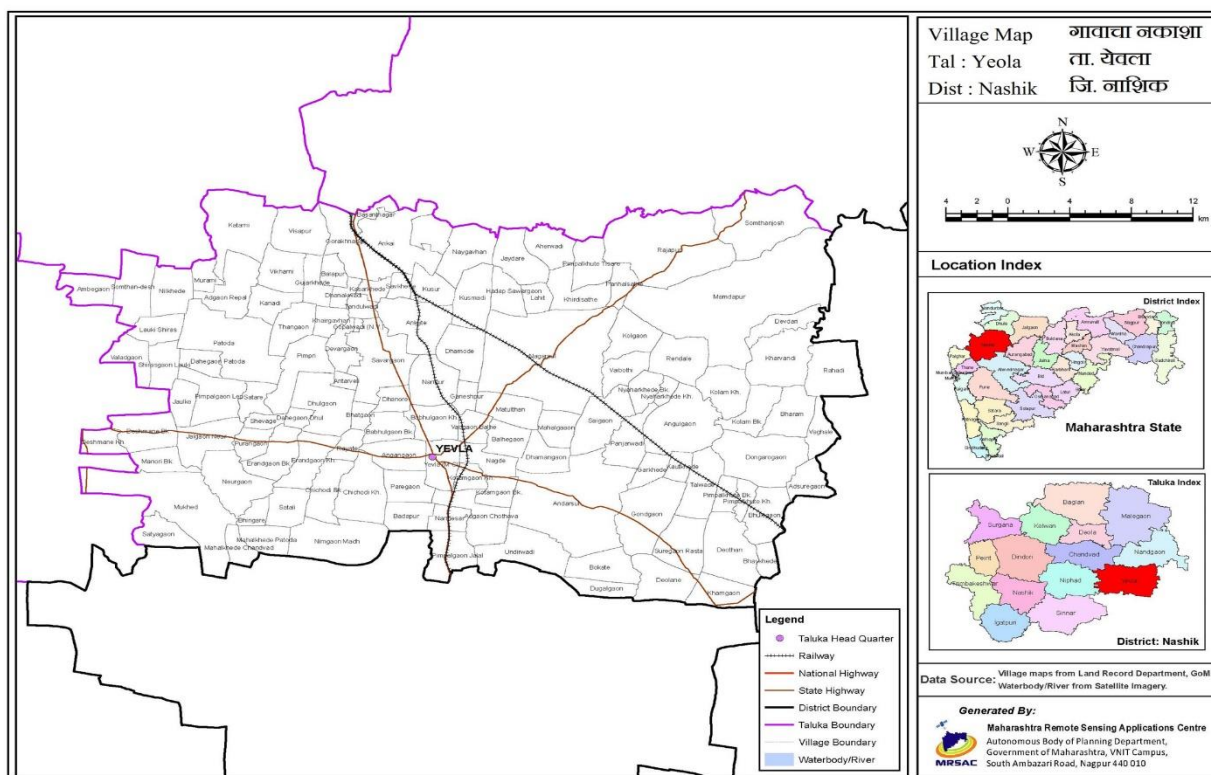


Figure 1 Source By Nashik District Gazette

Data And Methodology:

The present study realizes upon primary and secondary data, concerning rainfall, land use and cropping pattern. The primary data collected from different sources for which special questionnaires were designed. Information was collected through various Talathi office, farmers and agricultural officers. The secondary data obtained from official statistic such as socio-economic review and district statistical abstract of Nashik district, Rainfall data from District Collector office, Epitome of agriculture part-I, District- wise general statistical information of agriculture department (Part-III epitome of agriculture in Maharashtra) commissioner of agriculture Pune, Seasonal and crop reports, Statistical abstract of state. report on agriculture census Maharashtra State part-I and II Gazetteer of Nashik District. Data regarding population obtained from district census hand book of Nashik district. Data concerning surface water will obtain from irrigation department, commission report Vol. II and III. Data regarding ground water obtained from MERI, Nashik. Data regarding soil is obtained from district survey and soil testing laboratory, Data about climatic elements has been extracted from the publication of the meteorological department of Pune, Data regarding irrigation schemes will obtained Z.P. Office at Nashik and various irrigation departments of Maharashtra.

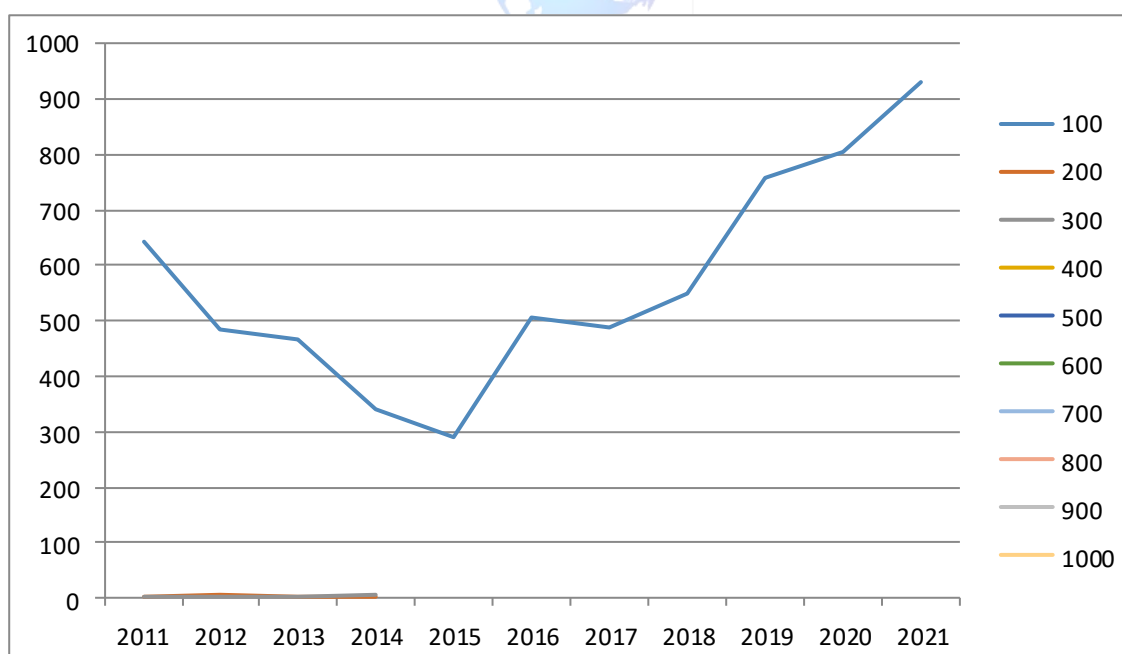
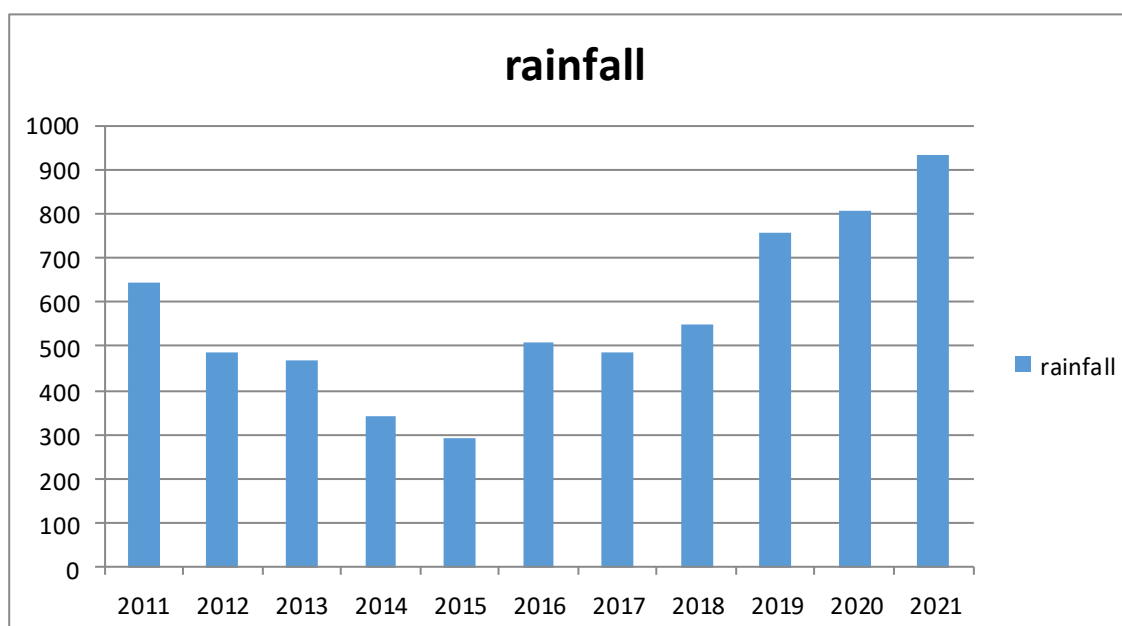
Scope And Limitations:

The agricultural problems of Yeolataluka would be the universal problems for the agricultural drought areas of Maharashtra. The total geographical area of the study area is 111581 hectares. From this only 78100 hectares area is useful to cultivation while only 4925 hectares of land is cultivated under irrigation for twelve months. Kharip crops are taken in 59500 hectares area and rabbi crops area is near to 23300 hectares. (Taluka agriculture office) In this investigation we find the low productivity of land, scarcity of water, traditional methods of farming, uneven climatic changes, economically backwardness of farmers, fragmentation of farm

and enormous low market prices for agricultural products. These are the basic problems of this region. Low and uneven rainfalls as well as physical factors are the broad limit to the development of study area.

Table I: Fluctuation in rainfall from 2011 B.C. To 2021 B.C. (nashik.nic.in and Collector office Nashik)

Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Rainfall (in mm)	643	486	465.5	342	290.8	507	487	551	756.7	805.6	930.6



(Calculated and Tabulated by author)

Above table shows that the rainfall in study area is sparsely distributed in 10 years reporting. In the year 2015 the rainfall is so low that it is only 290.8 mm only. The same situation found in 2014 that the rainfall only 342 mm. The average rainfall of the region is only 569.56mm.

Problems And Prospects:

The study region is presently faced with several problems of which being common to the rest of Maharashtra as well as the country. The problem may be considered in two broad groups. The first one is the physical difficulties arising from Yeola's peculiar natural environment setting and the second is the social problem stemming from the cultural background of the people. In the study region out of total annual rainfall 80% rainfall receive from south-west monsoon. But the monsoon rains in the study region are often marked by some important variations from the normal, like climate uncertainly, uneven distribution often expressed in the commonly held view that 'agriculture' in India is a gamble against the monsoon is the most outstanding problem in this category. The monsoon rains through generally scanty in study region, show considerable variation in their time of annual amount and duration. There has been lack of systematic long run planning of the needed production, processing and distribution of many of the agriculture commodities other than food grains, fruits and vegetable are receiving only little attention. The planning for agriculture development continues to be highly subsistence oriented with emphasis on producing for some minimum level of per capital food grain consumption (Abel, 1970). Soil erosion is the removal of soil from its original location, specifically; soil erosion is a process of detachment and transportation of soil materials by erosion agents like water and wind. Study region has been settled and farmed for so long that soil over has been subjected to modification. Deficiency of vegetable cover has agricultural implication. In many parts, the lack of forest cover has reduced the infiltration of moisture leading to increasing run-off to soil erosion. Low level of literacy in the rural area also inhabit agricultural programme by rural area also agriculture programme by restricting the use of written material and necessity direct contact between the number of agriculture extension worker and famer living in remote and isolated rural area. Other problem of a cultural nature are some religious beliefs, the ingrained conservation of majority of the peasant farmers the lack of capital, but these are sufficient to give some idea of the enormous task facing study region in its attempts to removes and reorganize its traditional banjara growing economy.

Recommendations:

In this way we can say that the majority people in the study region are mainly depended on agriculture. The economic development of the study area is mainly based on agriculture. The problem of agriculture land-use planning is envisaged in following aspects. The proper planning of watershed management is needed to study area. Here is highly importance of water conservation. Number of methods should be apply for conservation of water such as well and tube well recharge, nalbinding, construction of dams, CCT's in hilly region, built check dams, Top to Bottom (Anna Hazare) etc. There should be making more effective use of water resources in study region. Which involve bringing the benefits of irrigation to hundreds of small farms, improving the efficiency of water use through reduction of losses in storage and distribution system and drainage system to allow controlled water application which is so important in case of new varieties and also soil conservation crop management practices which enable more effective utilization of water in rain-fed area. Applying new methods of irrigation is very useful for the better development of agriculture in study area i.e. sprinkler, perforated pipe, drip irrigation etc. The soil of this area is so fertile but still it is needed to development of canal irrigation. There are a number of fallow lands in the study area, we can think of this land seriously and can change it in to productive one limited land can be brought under agriculture

with intensive effort. Increase in the gross cropped area can be achieved by a reduction of fallows cultivable waste and by increasing multiple cropping. The study region is observed surplus of population in rural area many of the young male working people from this region prefer to work in agriculture, who along can take lead in the modernization of agriculture. The study areas topography and climatic condition have put limit on the source of income of farmer. The study area has to depend only one and rarely have two crops in a year. There are little possibilities of positive change in the status of farmers unless subsidiary supplement activity like milk, poultry etc. will be development through proper manner. In addition to the development of water resources a large amount of rural infrastructure will have to be created to extent the geographic impact of agricultural modernization. Among other thing, this will include an adequate system of rural roads, development improved marketing and storage facilities for both inputs and agriculture products. In this study area agro-based processing industries should be start on co-operative basis, these industries not only increase employment potential but also raise the socio-economic status of the study area. Plant protection measure is implemented in the irrigated area little progress has been made in adopting improved agricultural implements, in the study area. Small and marginal farms should be provided modern agriculture implement on concession rate. The most important thing is to increase the area of forest. There also be needed to start the planting of fruit vegetation in study area. The subsidies should be given to farmers for the innovative ideas in farming.

References: -

- Dayalp. (1996) Text Book of Geography Shukla Book bepo, patna.
- Bergwan, Edward E. (1995), Human Geography culture, connections and Landscape, prentice-Hall, New Jersey.
- Singh, I and Dhillon S., (1994) Agricultural Geograpy. M. Grow Hill EducutionsndidPvt.Lit, New Delhi
- AnandSukhush (2013), Dynamics of Rural Development. Delhi, Indi a Research India Press.
- Ellis, F. (1992). Agricultural policy in developing countries cambridge University prees.
- Narton R-D, Agricultural Development policy. concepts and Experiences.
- khang, A (Ed) (2023), Handbook of Research on AI-equipped tot Application in HightechAgricultural.IGI Global.

Synthesis, Characterization and Antimicrobial Activity of CoCr₂O₄ Nanoparticles

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Abstract:

Using the straightforward sol-gel technique, pure cobalt chromite (CoCr₂O₄) nanostructures were prepared. The synthesis of cobalt chromite spinel (CoCr₂O₄) by the aqueous sol-gel technique is examined in the current work. The phase purity of the synthesized cobalt chromite (CoCr₂O₄) nanostructures was characterized by powder X-ray diffraction analysis (XRD) and infrared spectroscopy (FTIR). To determine optical characteristics, UV-vis reflectance spectra of cobalt chromite nanostructure were used. Scanning electron microscopy (FE-SEM) was used to analyse the morphological characteristics and microstructural evolution of the produced product. This study examined the antimicrobial activity of Cobalt Chromite (CoCr₂O₄) nanoparticles against Staphylococcus aureus and Klebsiella pneumoniae, two common pathogens associated with hospital-acquired illnesses. Our results indicate that CoCr₂O₄ has high antibacterial effectiveness, making it a promising option for developing new antimicrobial medicines.

Keywords: cobalt chromite, sol-gel, FTIR, XRD, SEM. Antimicrobial action, Staphylococcus aureus, Klebsiella pneumonia and nanoparticles.

1. Introduction:

Metal Chromite MCr₂O₄, has a spinel structure and is extremely popular for use in a variety of technological applications. CoCr₂O₄ spinel is of the M²⁺M³⁺O₄ type and has stimulated the interest of researchers due to its unique properties and wide range of applications, such as supercapacitor [1], catalyst [2-4], and ceramics [5-7]. Sol-gel processing techniques have also been widely employed. Colloidal particles are significantly larger than molecules or nanoparticles. However, when colloids are mixed with liquid, they appear bulky, whereas nanosized molecules always appear clear. It involves the formation of networks via colloidal suspension (sol) and gelatin to form a network in continuous liquid phase (gel). Initially, a homogeneous solution of one or more selected alkoxides is used in the sol gel process. These are organic precursors to silica, alumina, titania, and zirconia, among other materials. [8-11].

The sol-gel method has the benefits of a low processing temperature, molecular level homogeneity and is effective in the production of complicated metal oxides, temperature sensitive organic inorganic hybrid materials, and thermodynamically unfavorable or metastable materials. This work has established an easy, economical, predictable, ecofriendly and reliable method for producing pure cobalt chromite (CoCr₂O₄) on a large scale. In this present study CoCr₂O₄ successfully prepared by sol-gel method, were characterized by XRD, FT-IR and SEM method.

The global spread of antibiotic-resistant microorganisms has created an urgent demand for novel antimicrobial medicines. Staphylococcus aureus and Klebsiella pneumoniae are two important pathogens that are resistant to various medicines, causing significant infections in both clinical and community settings [12]. The tiny size, high surface area, and capacity to produce

reactive oxygen species (ROS) of nanomaterials, especially metal oxides, have demonstrated potential antibacterial capabilities [13]. Cobalt Chromite (CoCr_2O_4) is a spinel-type metal oxide characterized by chemical stability and magnetic characteristics. While much is known about its uses in catalysis and electronics, its antibacterial potential has yet to be explored. This study evaluates the antibacterial efficacy of CoCr_2O_4 nanoparticles against *Staphylococcus aureus* and *Klebsiella pneumoniae*, investigating their efficiency of inhibiting bacterial growth.

2. Experimental:

2.1 Materials:

Chemicals were used to synthesize the CoCr_2O_4 nanoparticle without additional purification. The chemicals included are chromium nitrate $\text{Cr}(\text{NO}_3)_3 \cdot 9\text{H}_2\text{O}$, cobaltous nitrate $\text{Co}(\text{NO}_3)_2 \cdot 6\text{H}_2\text{O}$, and laboratory grade Triton X-100.

2.2. Synthesis of Cobalt (II) Chromite nanoparticles:

The nanoparticle CoCr_2O_4 was prepared by the sol-gel method using Cobaltous nitrate ($\text{Co}(\text{NO}_3)_2 \cdot 6\text{H}_2\text{O}$), (1M) and Chromium nitrate ($\text{Cr}(\text{NO}_3)_3 \cdot 9\text{H}_2\text{O}$), (2M) as Precursor and Triton X-100 as surfactant was dissolved in 100 ml double distilled water sodium hydroxide (2M) solution was slowly drop by dropped under vigorous stirring to obtained a precipitate solution with the pH 11 the precipitate was filter and wash repeatedly with a double distilled water precipitate dried at 110°C for a period 4 h. The dry product was crushed into a fine powder using a mortar-pestle and it is calcined at 900°C for 4 h to remove surfactant and contamination.

2.3 Bacterial Strains:

Gram-positive *Staphylococcus aureus* and Gram-negative *Klebsiella pneumoniae* were utilized as representative organisms for these groups. After a specific amount of time, the bacterial strains were maintained by transferring them to fresh medium. They were cultivated in nutrient agar slant and kept at refrigerator temperature.

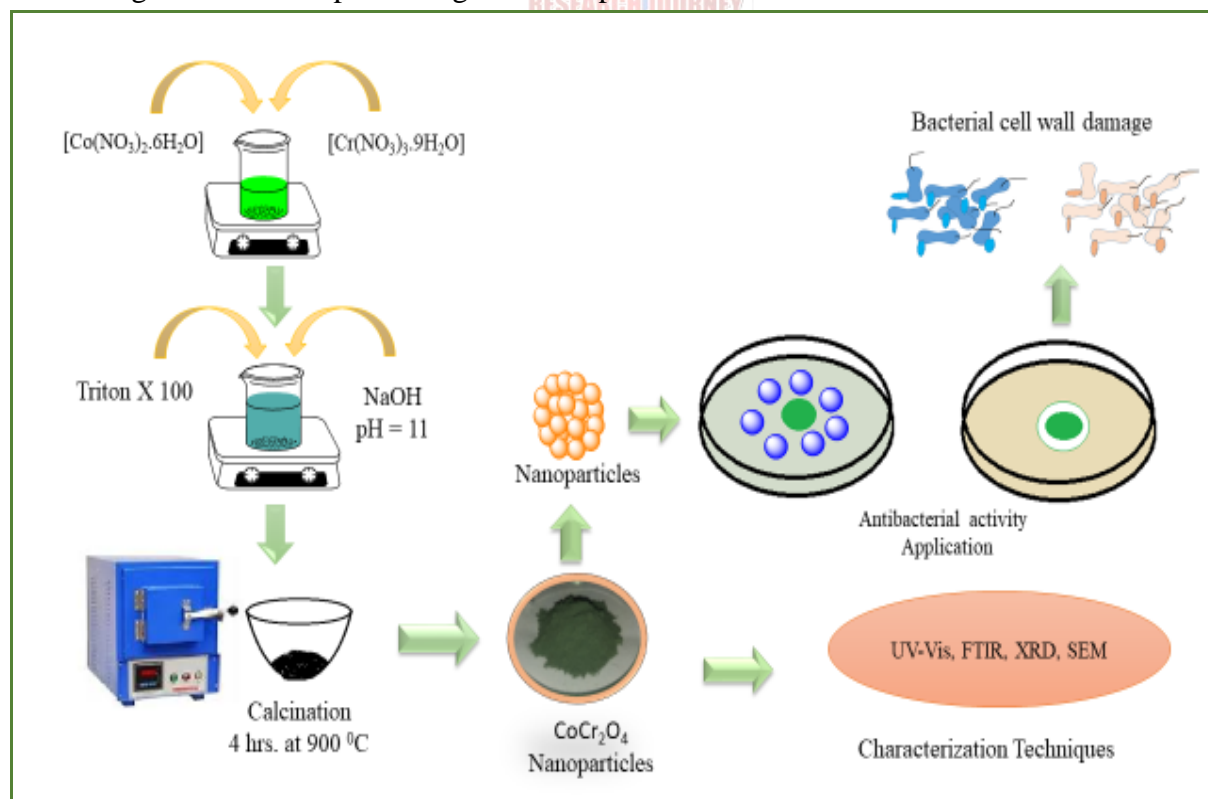


Figure 1. Antibacterial Activity Of Cocr2o4 Synthesis By Sol-Gel Method

3. Characterization

The analytical techniques were used to characterize cobalt chromite. Crystal phase of prepared product was identifying by the X-ray power diffraction pattern. Bruker D8 advanced instrument at 40 kV and 35 mA with Cu Ka radiation at 0.154 nm wavelength (λ) = 0.154 nm. Bragg's scanning angle changing from 10° - 80° was used to establish the phase purity of the product. The Fourier transform infrared (FTIR) spectra observed in the range of 4000 cm^{-1} to 100 cm^{-1} were recorded on a Thermo Nicolet iS50 spectrometer. UV Visible absorption spectra were recorded using a Perkin Elmer Lambda 365 UV Vis spectrophotometer in the range 200 nm to 1000 nm. The morphology of Cobalt chromite was observed by SEM.

4. Result and discussion:

4.1 X- ray diffraction: The different peak of these CoCr_2O_4 sample are strong and broad, indicating small particle size diffraction peaks of these chromate nanoparticles were well consistent with those standard JCPDS cards of CoCr_2O_4 (no. 22-1084) [14-15]. Fig. 2 XRD patterns were showed peaks at 2θ angles 18.28, 30.23, 35.49, 43.70, 57.57 and 63.46 particle size can be calculated by Scherrer's formula $D = k\lambda/\beta\cos\theta$, where D is the mean crystallite size, k is Scherrer constant ($k = 0.9$), λ is the X-ray wavelength ($\lambda = 0.154\text{ nm}$). β is full width at half maximum (FWHM) of the diffraction peak, θ is the angle of diffraction. The average nanoparticles size determines as 10.1 nm.

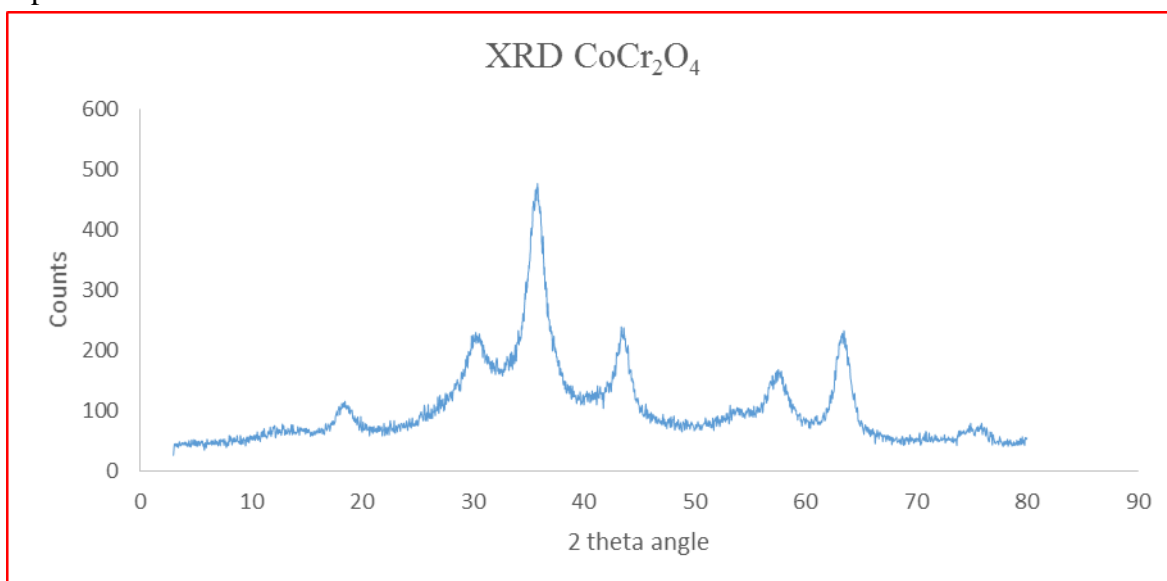


Figure 2. Xrd Pattern Of Cocr2o4 Nanoparticles

4.2 FT-IR Spectra: The prepared chemical sample was examined using FTIR absorption spectra of CoCr_2O_4 nano-particles are shown in Fig. 3 there are two peaks in the region between $700\text{--}530\text{ cm}^{-1}$ could be attributed to the typical metal–oxygen vibrations [16, 17]. The small band at around 944 cm^{-1} due to Co (II)-O bond and two sharp vibrational frequency bands at 616 cm^{-1} and 480 cm^{-1} confirm CoCr_2O_4 nano-particles which arise due to Cr (III)-O bond. This prominent band shows spinel structure. These bonds proved that chromium and cobalt were located in the oxygen surrounds of the spinel structure, which develop as a result of the starching vibration of tetrahedral and octahedral sites. The IR spectra of sol-gel produced CoCr_2O_4 nanomaterial displays large absorption bands resulting from O-H stretching and bending vibration of water caused by sample exposure to the atmosphere at 3500 cm^{-1} to 3300 cm^{-1} and 1600 cm^{-1} , respectively.

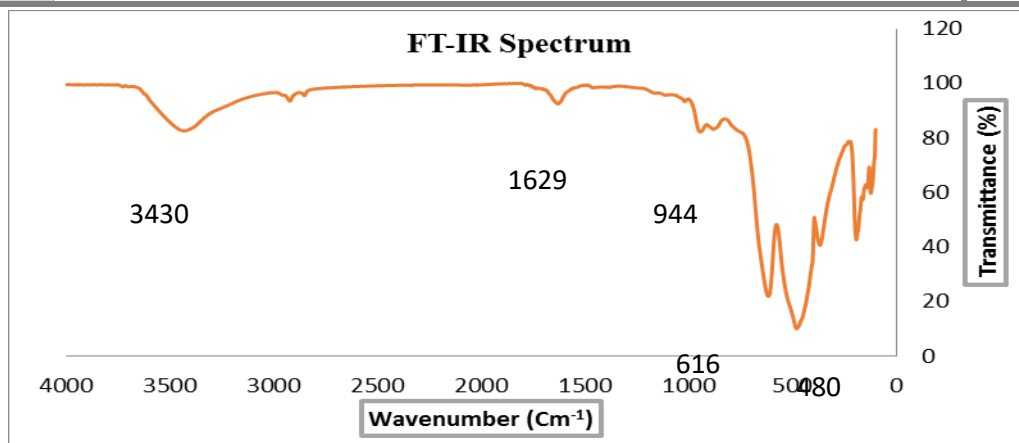


Figure 3. Ft-Ir Spectrum Of Cocr2o4 Nanoparticles

4.3 UV Spectra: Fig.4 shows UV-Visible absorption spectra of CoCr₂O₄ nano-particles. The optical absorption spectra of chromite spinel clearly show the characteristic band between 345 and 365 nm. This band is caused by the presence of Cr³⁺ ions in the octahedral coordination; the higher band corresponds to the dark green region of the visible spectrum at 654-694 nm. [18]. Band gap is calculated from the wavelength (λ_{max}) of the sample. CoCr₂O₄ nano-particles show 1.78 eV band gap.

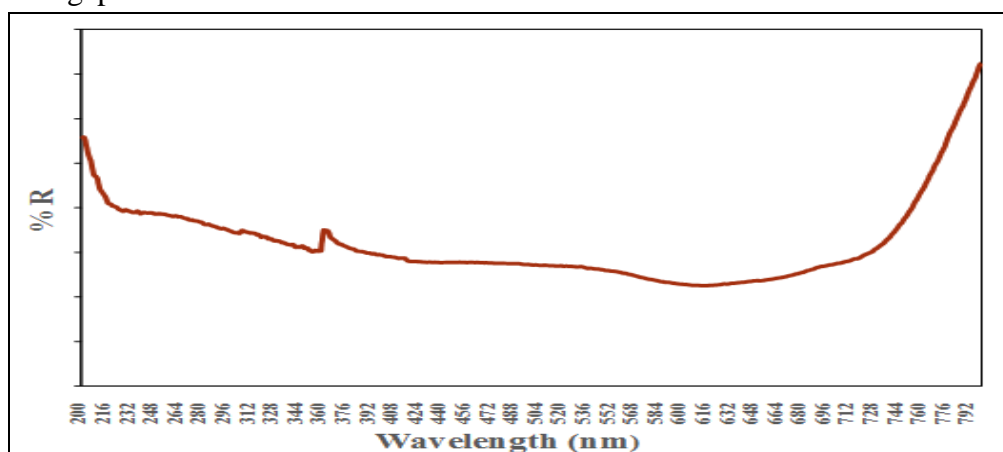


Figure 4. Uv Visible Spectra

4.4 SEM Analysis: The morphology of CoCr₂O₄ powder dried at 110 °C is shown in Figure 5 and was determined by SEM at various magnifications. With an average particle size of around 26.2 nm the CoCr₂O₄ powder largely consists of aggregated microcrystals. Particle size of CoCr₂O₄ is measured by Scherrer's formula using XRD data. SEM micrograph of cobalt chromite particles obtained by sol-gel method observed cubic and octahedral morphologies.

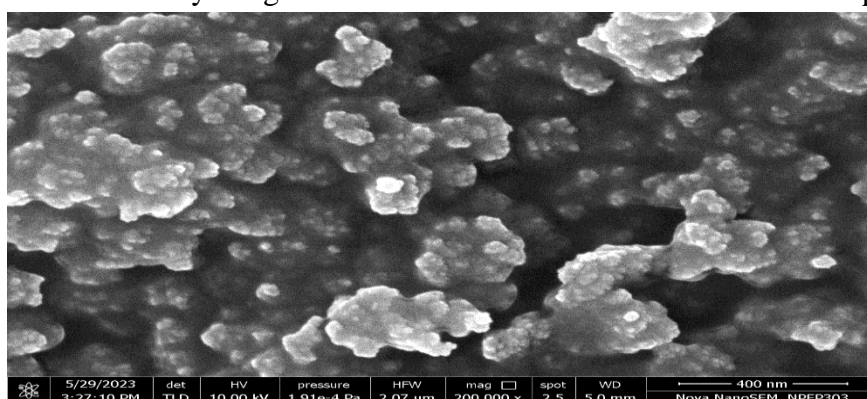


Figure 5. Sem Analysis

5. Antimicrobial activity of CoCr_2O_4

Using the disk diffusion technique, the antibacterial activity of CoCr_2O_4 nanoparticles was assessed. Different amounts of CoCr_2O_4 nanoparticles (50, 100, and 200 $\mu\text{g/mL}$) were impregnated into sterile Petri dishes, which were then put on agar plates that had been infected with bacterial cultures. After 10 minutes of diffusion at refrigerator temperature, the plates were incubated for 24 hours at 37°C . To evaluate antibacterial activity, the zone of inhibition surrounding the discs was evaluated.

This study demonstrated that CoCr_2O_4 nanoparticles have considerable antibacterial action against *Staphylococcus aureus* and *Klebsiella pneumoniae*. The observed inhibition can be due to the nanoparticles' small size and vast surface area, which allow for greater contact with bacterial cell membranes [19]. Additionally, CoCr_2O_4 nanoparticles may generate reactive oxygen species (ROS), causing oxidative stress and bacterial cell damage [20]. CoCr_2O_4 nanoparticles show comparable antimicrobial activity to other metal oxides as ZnO and CuO, which have been extensively researched for their antibacterial capabilities [21]. CoCr_2O_4 unique magnetic and structural features may offer significant benefits in biological applications like drug transport and imaging.

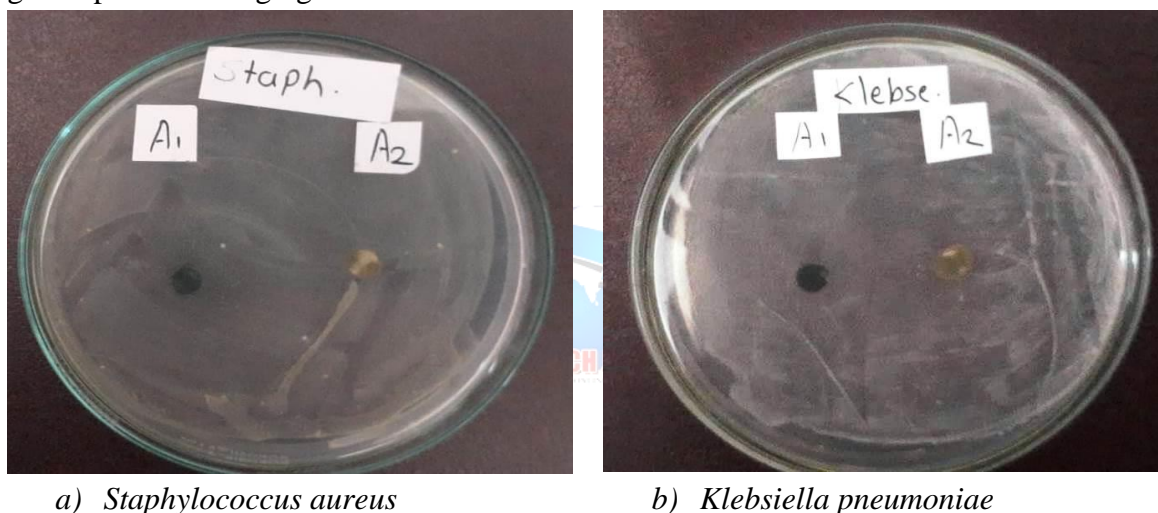


Figure 6. Antibacterial Action Against *Staphylococcus Aureus* And *Klebsiella Pneumoniae*.

Conclusion:

The sol gel method was successfully employed for the synthesis of the cobalt- chromium spinel CoCr_2O_4 . The XRD investigation revealed that a fully crystallized single-phase oxide of CoCr_2O_4 with a clearly discernible spinel crystal structure had developed. The chromite CoCr_2O_4 appeared as a green color nano-crystals. Green color appeared due to Co^{2+}O_4 and Cr^{3+}O_6 transitions. This study also shows that CoCr_2O_4 nanoparticles may effectively treat *Staphylococcus aureus* and *Klebsiella pneumoniae*. Their high antibacterial activity, along with their stability and simplicity of synthesis, make them a promising choice for future use in the development of new antimicrobial drugs.

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References:

- Zhou Q, Wang J, Zheng R, Gong Y, Lin J. "One-step mild synthesis of Mn-based spinel $\text{MnII}(\text{CrIII}_2\text{O}_4/\text{MnIIMnIII}_2\text{O}_4)/\text{C}$ and Co-based spinel $\text{CoCr}_2\text{O}_4/\text{C}$ nanoparticles as battery-type electrodes for high-performance super capacitor application." *Electrochim Acta* 2018; **283**: 197–211.
- Zhang T-T, Song J-D, Chen J-X, Jia A-P, Luo M-F, Lu J-Q. "Catalytic combustion of dichloromethane over supported $\text{CoCr}_2\text{O}_4/\text{TUD-1}$ catalysts: the effect of CoCr_2O_4 particle size on the modification of surface properties and the catalytic performance." *Appl Surf Sci* 2017; **425**: 1074–81.
- Wang Z, Deng J, Liu Y, Yang H, Xie S, Wu Z, Dai H. "Three-dimensionally ordered macroporous CoCr_2O_4 supported Au–Pd alloy nanoparticles: highly active catalysts for methane combustion." *Catal Today* 2017; **281**: 467–76.
- Al-Mamun M, Su X, Zhang H, Yin H, Liu P, Yang H, Wang D, Tang Z, Wang Y, Zhao H. "Strongly coupled CoCr_2O_4 /carbon nanosheets as high performance electrocatalysts for oxygen evolution reaction." *Small* 2016; **12(21)**: 2866–71.
- Mejía AM, Pech-Canul M, Hernández M, García-Villarreal S, Rodríguez CG, Aguilar-Martínez J. "Grain refinement and non-ohmic properties in (Co, Ta)-doped SnO_2 ceramics by Cr_2O_3 additions and the in situ formation of CoCr_2O_4 ." *Appl Phys A* 2018; **124(7)**: 474.
- Chamyani S, Salehirad A, Oroujzadeh N, Fateh DS. "Effect of fuel type on structural and physicochemical properties of solution combustion synthesized CoCr_2O_4 ceramic pigment nanoparticles." *Ceram Int* 2018; **44(7)**: 7754–60.
- Betancur-Granados N, Restrepo-Baena OJ. "Flame sprays pyrolysis synthesis of ceramic nanopigments CoCr_2O_4 : the effect of key variables." *J Eur Ceram Soc.* 2017; **37(15)**: 5051–5056.
- Bhargava, R.N., Gallagher, D., Hong, X. and Nurmikko, A., "Optical properties of manganese-doped nanocrystals of ZnS ." *Physical Review Letters*, 1994; **72**: 416-419.
- Yu, Z.Q., Chang, D., Li, C., Zhang, N., Feng, Y.Y. and Dai, Y.Y., "Blue photoluminescent properties of pure nanostructured $\gamma\text{-Al}_2\text{O}_3$." *Material Research Society*, 2001; **16(7)**: 1890-1893.
- Lu, C.H. and Jagannathan, J., "Cerium-ion-doped yttrium aluminum garnet nano-phosphors prepared through sol-gel pyrolysis for luminescent lighting," *Applied Physics Letters*, 2002; **80(19)**: 3608-3610.
- Morita, M., Rau, D., Kajiya, S., Sakurai, T., Baba, M. and Iwamura, M., "Luminescence properties of nano-phosphors: metal-ion doped sol-gel silica glasses." *Materials Science-Poland*, 2004; **22(1)**: 5-15.
- Livermore, D. M. *The need for new antibiotics. Clinical Microbiology and Infection*, 2009; **15(9)**: 206-208.
- Singh, R., et al. *Nanomaterials as antimicrobial agents: An overview. Science Progress*, 2018; **101(3)**: 235-248.
- Wang, Z.; Deng, J.; Liu, Y.; Yang, H.; Xie, S.; Wu, Z.; Dai, H. "Three-dimensionally ordered macroporous CoCr_2O_4 -supported Au–Pd alloy nanoparticles: Highly active catalysts for methane combustion." *Catal. Today* 2017; **281**: 467–476.
- Huang, J.-Y.; Liu, W.-R. "Synthesis and characterizations of $\text{CoCr}_2\text{O}_4/\text{C}$ composite using high energy ball-milling technique as novel anode materials for Li-ion batteries." *J. Taiwan Inst. Chem. E.* 2019; **96**: 205–213.
- Garskaite E., Dubnikova N., Katelnikova A., Pinkas J., Kareiva A., "Syntheses and Characterisation of $\text{Gd}_3\text{Al}_5\text{O}_{12}$ and $\text{La}_3\text{Al}_5\text{O}_{12}$ Garnets." *Collect. Czech. Chem. Commun.*, 2007; **72**: 321.
- Izauskaite S. C., A. Kareiva, "Sol-Gel Preparation and Characterization of Non-Substituted and Sr-Substituted Lanthanum Cobaltates." *Cent. Eur. J. Chem.*, 2008; **6**: 456.
- Pirogova, G. N.; Panich, N. M.; Korosteleva, R. I.; Voronin, Y. V.; Popova, N. N. "Catalytic properties of chromites with a spinel structure in the oxidation of CO and hydrocarbons and reduction of nitrogen oxides." *Russian Chem. Bull.* 2001; **50**: 2377-2380.
- Zhang, L., et al. *Nanomaterials as potential antimicrobial agents: Recent developments and future prospects. Nature Nanotechnology*, 2017; **12(1)**: 10-14.
- Sharma, V. K., et al. *Antibacterial activity of nanoparticles. Environmental Toxicology and Chemistry*, 2012; **31(5)**: 1181-1187.
- Li, X., et al. *Antimicrobial activity of copper oxide nanoparticles. Science of the Total Environment*, 2011; **409(8)**: 1282-1288

Use of Artificial Intelligence in Healthcare

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Abstract:

This paper provides a comprehensive review of the role of Artificial Intelligence (AI) in healthcare, focusing on its applications and associated challenges. AI-driven technologies, such as machine learning, natural language processing, and predictive analytics, are reshaping the healthcare industry by improving diagnostic accuracy, enabling personalized treatment, facilitating patient monitoring, optimizing healthcare management, and advancing public health initiatives. However, despite these advantages, the integration of AI into healthcare systems presents several challenges. These include concerns related to data security and privacy, ethical and legal implications, difficulties in system interoperability and integration, limitations in scalability and accessibility, and complexities in human-AI collaboration. This review highlights the necessity of implementing strong cybersecurity protocols, establishing ethical guidelines, developing clear legal frameworks, setting standardized interoperability measures, and ensuring fair access to AI-driven healthcare solutions. To overcome these barriers, it is essential to encourage interdisciplinary cooperation, enhance the education and training of healthcare professionals, and invest in ongoing research and development. By addressing these challenges, AI can fully harness its potential to improve healthcare services and enhance patient outcomes.

Keywords: Artificial Intelligence, Healthcare, Diagnostic Assistance, Treatment Personalization, Data Privacy, Ethical Considerations.

Introduction:

Artificial Intelligence (AI) is a specialized branch of computer science that focuses on developing intelligent systems capable of performing tasks that typically require human cognition. An intelligent agent is a system designed to take actions that maximize its likelihood of achieving success. AI enables machines to replicate human-like intelligence by incorporating key principles such as reasoning, knowledge representation, planning, learning, communication, perception, and the ability to interact with and manipulate physical objects. It is both a science and an engineering discipline dedicated to creating intelligent machines, particularly computer programs that can process information and make informed decisions.

The integration of AI into healthcare is no longer a distant concept but a rapidly evolving reality. The increasing availability of vast healthcare datasets, advancements in computational power, and groundbreaking developments in machine learning algorithms have accelerated AI adoption in medical applications (Dwivedi et al., 2021; Leone, Schiavone, Appio, & Chiao, 2021). AI technologies are being utilized in diagnostic assistance, personalized treatment planning, patient monitoring, hospital workflow optimization, and public health initiatives. However, despite its immense potential, the incorporation of AI in healthcare comes with challenges, including data privacy and security concerns, ethical and legal considerations, interoperability issues, scalability limitations, and the complexities of human-AI interaction. This paper explores the transformative role of AI in healthcare, examining its applications, benefits, and challenges. It also highlights the need for robust cybersecurity frameworks, ethical guidelines, legal regulations, universal interoperability standards, and equitable access to AI-

powered healthcare solutions. Furthermore, recommendations such as fostering interdisciplinary collaboration, enhancing the education and training of healthcare professionals, and promoting continued research and development are discussed as essential steps toward maximizing AI's impact on healthcare delivery and patient outcomes.

Applications Of Ai In Healthcare:

The incorporation of Artificial Intelligence (AI) into healthcare has introduced innovative opportunities to improve patient care, streamline healthcare management, and support public health efforts. AI-driven solutions are transforming the medical field by enhancing diagnostic accuracy, enabling personalized treatment, automating administrative tasks, and improving overall healthcare efficiency. Additionally, AI plays a crucial role in predictive analytics, assisting in early disease detection and outbreak monitoring. This section provides an in-depth analysis of the key applications of AI across multiple areas within the healthcare industry, highlighting its transformative impact and potential for future advancements.

Diagnostic Assistance:

AI algorithms have greatly enhanced the precision and efficiency of disease diagnosis by utilizing data from medical imaging, genetic testing, and biometric sensors. In the field of medical imaging, AI-powered systems analyze X-rays, MRI scans, and CT scans to identify abnormalities such as tumors, fractures, and neurological conditions with exceptional accuracy, often exceeding human performance. These advanced technologies employ deep learning models to detect patterns and irregularities that may indicate the early stages of diseases like cancer, allowing for timely medical intervention.

Another crucial application of AI is in genetic data analysis, where it examines genetic markers and variations to assess an individual's likelihood of developing specific diseases or conditions. By predicting the risk of genetic disorders, AI enables proactive healthcare strategies, including preventive measures and early treatment plans tailored to the patient's genetic profile. Additionally, in the area of biometric data analysis, AI-driven applications leverage data from wearable devices to continuously track vital signs. By detecting subtle changes that may indicate potential health concerns, these systems facilitate early diagnosis and prompt medical intervention, ultimately improving patient care and outcomes (Abdallah et al., 2023; Alrefaei et al., 2022).

Treatment Personalization:

AI plays a transformative role in advancing personalized treatment, driving the shift toward precision medicine, where therapies are customized based on the unique characteristics of each patient. By analyzing extensive datasets—including genetic profiles, environmental influences, and medical histories—AI models can predict the most effective treatment plans for individual patients. This personalized approach enhances treatment outcomes, reduces adverse effects, and minimizes the traditional trial-and-error process in selecting appropriate medications or therapies.

In the field of drug development, AI significantly accelerates the discovery and testing of new pharmaceutical compounds by predicting their interactions with biological targets. This not only streamlines the drug discovery process but also improves the chances of identifying promising drug candidates. As a result, AI helps reduce both the time and financial investment

required to develop and introduce new treatments to the market (Gupta et al., 2021; Paul et al., 2021; Vatansever et al., 2021).

Patient Monitoring and Care:

AI has transformed patient monitoring and healthcare management, primarily through the use of wearable devices and remote monitoring systems. These AI-powered technologies continuously track key health indicators such as heart rate, blood pressure, blood sugar levels, and sleep patterns, providing real-time insights into a patient's well-being.

Sophisticated AI algorithms process this data to identify irregularities that could signal potential health concerns, allowing for early detection and timely medical intervention.

Additionally, AI-driven platforms provide personalized health alerts and recommendations, helping patients manage chronic conditions more effectively while encouraging active participation in their healthcare. This proactive approach improves overall care quality, reduces hospital readmissions, and empowers individuals to take greater control of their health and well-being (Ahmadi; B. Wang, Asan, & Zhang, 2024).

Robotic Surgery:

AI-powered robotic surgical systems, such as the Da Vinci robot, have significantly improved the accuracy and efficiency of complex medical procedures. These advanced robotic assistants enhance surgical precision, allowing for minimally invasive operations with greater control and flexibility. By reducing the risk of human error, AI-driven surgical robots help minimize complications, lower the likelihood of post-operative issues, and promote faster patient recovery. The integration of AI in surgery not only enhances outcomes but also contributes to shorter hospital stays and improved overall patient care.

Healthcare Operations:

AI plays a vital role in optimizing healthcare operations by increasing efficiency, cutting costs, and improving patient experiences. By automating administrative processes like scheduling appointments, managing patient intake, and handling billing, AI enables healthcare staff to dedicate more time to direct patient care. Intelligent resource management systems help allocate hospital beds and medical equipment effectively, ensuring optimal utilization. Additionally, AI-powered patient flow management tools streamline care delivery, reducing wait times and enhancing service quality. These innovations contribute to a more seamless healthcare system, improving both operational performance and patient satisfaction.

Challenges Of Ai In Healthcare:

AI can greatly improve healthcare, but it also comes with some challenges. These challenges include technical issues, ethical concerns, legal rules, and social impacts. It is important to use AI carefully to protect patient safety, keep data accurate, and follow ethical guidelines. With proper planning and responsible use, AI can benefit healthcare without causing harm.

Data Privacy and Security:

AI relies on vast amounts of patient data, making it essential to protect sensitive information from cyber threats and unauthorized access. Ensuring data confidentiality is crucial to maintaining patient trust and preventing misuse. Healthcare data is a prime target for hackers, so AI systems must have strong cybersecurity measures to prevent breaches. Additionally, secure data storage and controlled sharing are necessary to ensure that patient information is only

accessed by authorized personnel, following legal regulations like HIPAA and GDPR. By implementing strict security protocols and encryption methods, AI can help safeguard patient data while enhancing healthcare services.

Ethical and Legal Considerations:

The use of AI in healthcare also raises important ethical and legal concerns. One major issue is algorithmic bias, where AI systems may show favoritism or unfairness based on the data they were trained on. This can result in different treatment outcomes for various demographic groups, potentially leading to healthcare disparities. To prevent this, AI models need to be designed transparently and continuously monitored to ensure fairness and equality in patient care. Furthermore, legal issues related to responsibility and accountability become significant, especially in cases where AI contributes to misdiagnosis or treatment mistakes.

Human-AI Interaction:

The interaction between humans and AI in healthcare is a crucial factor in its success. Trust from both medical professionals and patients is essential, but challenges like over-reliance on AI, reduced skill development among healthcare workers, and the need for proper oversight must be addressed. AI should enhance, not replace, human judgment to maintain the quality of care and professional standards. This requires continuous training and education to help healthcare workers effectively collaborate with AI while understanding its strengths and limitations. Ultimately, while AI has the potential to revolutionize healthcare, overcoming challenges related to privacy, ethics, integration, and accessibility is key to maximizing its benefits.

Integration with Existing Systems:

Integrating AI into healthcare is challenging due to the reliance on outdated technology in many hospitals and clinics. Legacy systems often lack the flexibility to support AI-driven tools, making implementation complex and costly. For AI to be effective, it must seamlessly connect with electronic health records (EHRs) and other medical systems without disrupting workflows. Additionally, differences in data formats, software compatibility, and interoperability issues can create barriers to smooth integration. Upgrading infrastructure, standardizing data formats, and ensuring proper staff training are essential steps to successfully incorporating AI into healthcare settings.

Conclusion:

Recent advancements in AI have demonstrated its transformative potential in healthcare, improving diagnostics, treatment planning, patient care, and operational workflows. AI-driven innovations, such as enhanced medical imaging, predictive analytics, and automated administrative tasks, have significantly increased efficiency, accuracy, and cost-effectiveness in healthcare delivery. Additionally, AI-powered tools enable personalized treatment plans and remote patient monitoring, leading to early disease detection and improved patient management. However, despite its benefits, challenges such as data privacy, ethical concerns, system integration, human AI- Integration, and the need for human oversight remain critical considerations. Ensuring AI functions as a supportive tool rather than a replacement for human expertise is essential to maintaining quality care and patient safety. Moving forward, responsible AI implementation, continuous monitoring, and proper training for healthcare professionals will be crucial in maximizing AI's potential while addressing its limitations. With strategic adoption

and regulatory frameworks in place, AI can significantly enhance healthcare accessibility, reduce medical errors, and optimize resource allocation, ultimately leading to improved patient outcomes and a more sustainable healthcare system.

References:

- Abdallah, S., Sharifa, M., Almadhoun, M. K. I. K., Khawar Sr, M. M., Shaikh, U., Balabel, K. M., . . . Ekomwereren, O. (2023). The impact of artificial intelligence on optimizing diagnosis and treatment plans for rare genetic disorders. *Cureus*, 15(10).
- Gupta, R., Srivastava, D., Sahu, M., Tiwari, S., Ambasta, R. K., & Kumar, P. (2021). Artificial intelligence to deep learning: machine intelligence approach for drug discovery. *Molecular Diversity*, 25, 1315-1360.
- Krones, F. H., & Walker, B. (2023). From theoretical models to practical deployment: A perspective and case study of opportunities and challenges in AI-driven healthcare research for low-income settings. *Medrxiv*, 2023.2012. 2026.23300539.
- Lee, D., & Yoon, S. N. (2021). Application of artificial intelligence-based technologies in the healthcare industry: Opportunities and challenges. *International Journal of Environmental Research and Public Health*, 18(1), 271.
- Naik, N., Hameed, B., Shetty, D. K., Swain, D., Shah, M., Paul, R., . . . Smriti, K. (2022). Legal and ethical consideration in artificial intelligence in healthcare: who takes responsibility? *Frontiers in Surgery*, 9, 266.
- Prof. Neha Saini. Artificial Intelligence, Application of AI in Healthcare. *International Journal for Research Trends and Innovation* (www.ijrti.org), Volume 8, Issue 4, ISSN: 2456-3315.
- Taj, I., & Zaman, N. (2022). Towards industrial revolution 5.0 and explainable artificial intelligence: Challenges and opportunities. *International Journal of Computing and Digital Systems*, 12(1), 295-320.
- Udegbe, Ebulue, Ebulue, & Ekesiobi. Diagnostic Assistance, Treatment Personalization, Healthcare Operations, Data Privacy. *International Medical Science Research Journal*, Volume 4, Issue 4, April 2024.
- Wang, B., Asan, O., & Zhang, Y. (2024). Shaping the future of chronic disease management: Insights into patient needs for AI-based homecare systems. *International Journal of Medical Informatics*, 181, 105301.
- Wang, Q., Su, M., Zhang, M., & Li, R. (2021). Integrating digital technologies and public health to fight Covid-19 pandemic: key technologies, applications, challenges and outlook of digital healthcare. *International Journal of Environmental Research and Public Health*, 18(11), 6053.
- Zeng, D., Cao, Z., & Neill, D. B. (2021). Artificial intelligence-enabled public health surveillance—from local detection to global epidemic monitoring and control. In *Artificial intelligence in medicine* (pp. 437-453): Elsevier.
- <https://www.google.com/>
- <https://www.educba.com/artificial-intelligence-techniques/>
- <https://www.howstuffworks.com/artificialintelligence>

Cooperative Sector : Development and Working in Maharashtra

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Abstract:

The Cooperative Movement in India began in 1904 and progressed through various stages, including the introduction of cooperative societies in 1947. These institutions were based on agriculture, were free from political interference, and were not a movement of the people. They were credit-oriented, uniform in their patterns, and transitioned from single to multipurpose.

The first Act to officially launch the Cooperative Movement in India was passed in 1904, simplifying registration procedures and laying down a simple procedure for functioning. The MacLagan Committee reviewed the progress of the Cooperative Movement in India, making valuable suggestions. The government nourished the co-operative institutions with financial, managerial, and technical assistance, making it a state-aided movement. In Maharashtra, the government sponsored the movement to relieve the public from moneylenders who exploited farmers and agricultural labourers. The Deccan Agriculturists Relief Act was passed in 1875, and the movement developed in Bombay Province. Eminent cooperative leaders like Dr. D.R. Gadgil, Vaikunthbhai Mehata, Tatyasaheb Kore, Padmashri Dr. Vikhe Patil, and Ratnappa Kumbhar contributed to the development of the movement. On May 1, 1960, Maharashtra State and Gujarat State were bifurcated on a bilingual basis, revealing the progress of the cooperative movement in Maharashtra. Cooperative spinning mills, cotton growers, and cooperative dairy, fishery, poultry, and sheep breeding societies were organized to help agriculturists earn additional income during off-seasons.

Keywords: Cooperation, Cooperative Movement, Cooperative Institutions, Cooperative Society, Cooperative Year, Financial Performance etc.

Introduction:

Indian society has been following cooperative principles and living in cooperation for a very long time. Our joint Family Systems which cherish the principle of mutual help and assistance and collective cultivation, is the example of living in cooperation. Here, the members live and cooperate with each other and appreciate as well as tolerate each other's viewpoint. They share the profits as well as losses.

While tracing the history of cooperation in ancient India, Srivastav G.P. says, "Historically, speaking "Kula" was the first form of cooperative activity that emerged in Indian Society". According to him it was this Kula which became the basis of ancient Indian Joint Family System.

Grama Sabhas in ancient India were nothing else but cooperative organizations which looked after social, economic and moral development of the village wells, lights and streets. Some of these sabhas worked as guild and purchased, stored and sold items of production, tools, seeds and equipments needed for day-to-day use in the village.

In 1919; Montague Chelmsford Reforms recommended that, as the problems differ from state to state, the subject cooperation should be transferred to State Government. The Government of India directed all the State Governments to pass cooperative Acts for their state on the lines of "Cooperative Societies Act, 1912", with relevant changes to suit their needs.

Cooperative movement in India started in 1904 and by the time in 1947, when whole movement had made some good progress. It has following characteristics of its own.

Objectives of Research Paper:

1. To understand Concept of Cooperative Sector.
2. To get knowledge about development of Cooperative Sector.
3. To understand the Cooperative Development in Maharashtra.
4. To learn working and progress of Three Tire Cooperative Credit Structure.

Hypothesis of Research Paper:

A Hypothesis is a statement of a tentative supposition or a possible solution to a problem based on judgment and/or documentary evidence. As these tests are conducted based on evidence thrown up by a sample, errors cannot be totally eliminated.

Scope of Research Paper:

1. The present study intends to examine the working and growth of the cooperative sector.
2. It is an empirical work at micro level based on secondary data relating to working of the cooperative sector.
3. The findings of the study would help to the policy makers, administration, and other officials in formulating the better policies and their implementation.

Research Methodology:

The present research paper is completed with the help of secondary data. For this purpose, data is collected from website, text books, reference books, periodicals, journals etc.

Development of Cooperative Movement in Pre-Independence Period (1919-1946)

In 1919; Montague Chelmsford Reforms recommended that, as the problems differ from state to state, the subject cooperation should be transferred to State Government. The Government of India directed all the State Governments to pass cooperative Acts for their state on the lines of "Cooperative Societies Act, 1912", with relevant changes to suit their needs.

Cooperative movement in India started in 1904 and by the time in 1947, when whole movement had made some good progress. It has following characteristics of its own.

Characteristics of Cooperative Movement:

- Agriculture based Movement
- Free from Political Interference
- Not a Movement of the People
- Lack of planned Growth
- A Credit Oriented Movement
- Uniform Pattern of Societies
- From single to Multipurpose

Evolution of Cooperative Institutions in India

Prior to the emergence of the co-operative institutions in India, the landlords and the moneylenders in the rural and semi-urban areas used to exploit the farmers and the agricultural labourers. The only ray of hope for these masses appeared to be the adoption of the principle of co-operations. The co-operative organization, as well known, is democratic in spirit and is based on the principles of self-help and equality of opportunities. Significant headway was made by these co-operative organizations in the European countries.

A co-operative organization is a voluntary organization of persons who associate each other, equal terms, to achieve certain common ends. The basic principle of co-operation is the feeling of self – help and a desire to achieve pre-planned common ends through joint efforts. A beginning in this direction was made in 1904, by passing the first Act in this regard, which officially launched the Co-operative Movement in India.

The act simplified the procedure of registering Co-operative Societies and laid down a simple procedure for functioning. This act was amended in 1912 to remove the defects in the earlier Act. The MacLagan Committee appointed for reviewing the progress of the Co-operative Movement in India. It made several valuable suggestions. Throughout this period, the government was looking after the development of the co-operative movement in India.

In India even today, unlike the other countries, the government nourishes the co-operative institutions. They are provided with financial assistance, with managerial and technical assistance etc. Thus, it is seen the entire Co-operative Movement is, by and large, a state-aided Movement.

Cooperative Development in Maharashtra:

The cooperative movement was government sponsored movement to relieve the public from the clutches of moneylenders, who were taking undue advantage of the financial needs of the masses and their ignorance and illiteracy. The moneylenders getting the lands of debtors transfer in their names by posing that the dues by way of principal, interest on principal and interest accrued cannot be cleared by the debtors. Due to this the status of the debtors was being reduced from land owners to landless labourers. The agriculturist from Pune District and Ahilya Nagar which is former Ahmednagar district from Maharashtra came together and started fighting against the moneylenders. It was known as “Deccan Riots”. The Government passed Deccan Agriculturists Relief Act in 1875.

Due to eminent cooperative leaders like Dr. D.R. Gadgil, Vaikunthbhai Mehata, Tatyasaheb Kore, Padmashri Dr. Vikhe Patil, Ratnappa Kumbhar, etc. the cooperative movement had much developed in Bombay Province. On 1st May 1960 Maharashtra State and Gujarat State were bifurcated on bilingual basis and the progress of cooperative movement in Maharashtra came to light.

Cooperative spinning mills cotton growers, Monopoly Procurement of cotton, cooperative Dairy, Fishery, Poultry and Sheep Breeding societies have been organized to help the agriculturist to get additional income in their off season when agricultural work is finished.

The Maharashtra State Cooperative Union Ltd. Pune, is managing to import cooperative education to the public and is doing the work of publicity and propaganda of cooperative movement. It is giving cooperative training to lower level office bearers to cooperative societies through 13 Corporate Training Centres in the State.

Institutes of Cooperative Management at Pune and Nagpur are conducting Diploma Courses and short-term courses for intermediate land officers in Cooperative Department and cooperative Societies. Vaikunth Mehta National Institute of cooperative management at Pune is empowered to impart training to higher level officers in Cooperative Department and cooperative Institution in the whole country.

Thus, the cooperative movement in Maharashtra is more advanced as compared to other state.

Working And Progress of Three Tier Cooperative Credit Structure

1. Primary Agricultural Credit Societies (PACs):

This is the credit society which is at the village level. It can be started with ten or more person belonging to the same village. The management of the PACs consist of a President, secretary and Treasurer. Loans are given for duration of one year for carrying out agricultural operations and the rate of interest is low. Profits are used for the betterment of the village and are not shared among the members. In 1950-51, it advanced loans worth Rs. 23 crores, this rose to Rs. 2,200 crores in 1960-61 and to Rs. 14,000 crores in 1997-98. In order to recognize or revitalize the primary agricultural credit societies the government and the RBI launched programmes.

The National Commission on agriculture had recommended the Farmers Service Societies should provide agricultural inputs and technical guidance as well as credit for the betterment of the farmers. According to the estimates, there are nearly 1 Lac PACs with membership of 10 Crores farmers. As at the end of March 2002 the loan outstanding for PACs were over Rs. 32,520 crores. The number of PACs has come down from 2,12,000 in 1960-61 to 1,61,000 in 1970-71 and 1,06,380 at the end of March 2006. The loans and advances outstanding for PACs up to March 2006 were about Rs. 51,780 crores.

2. District Central Cooperative Banks (DCCB):

These are federation of the PACs in specified areas i.e. in one district. There are about 360 DCCBs which lends about Rs. 14,000 crores annually. These banks have a few private individuals as shareholders who provide both finance and management. Their main objective is to lend to village primary societies but the objective of attracting deposits has not been fulfilled and they are just intermediary between PACs and State Cooperative Bank, NABARD is providing assistance for the rehabilitation of weak internal Cooperative Banks. The loan outstanding came to Rs. 56,650 crores in 2001-02. These are at the end of March 2006, nearly 369 DCCBs. The loans outstanding came to Rs. 79,200 crores. The total deposits of DCCB up to March 2008 were Rs. 94,529 crores, whereas the total loans and advances was Rs. 89,038 crores.

3. State Cooperative Banks (SCB):

The SCBs form the apex of the cooperative credit structure in each state. There are about 28 state Cooperative Banks. The SCBs control the working of the Central Cooperative Banks in the state. It is link between NABARD and DCCBs and PACs. The SCBs obtain its working funds from its own share capital and reserves, deposits from the general public and loans and advances from NABARD. The NABARD provides nearly 50 to 90 % of working capital of state Cooperative banks had lent about Rs. 34,220 crores to Central Cooperative banks and Primary Cooperative societies. There are now 31 State Cooperative Banks. During 2005-06 the 31 state cooperative banks had lent about Rs. 48, 260 crores in DCCBs.

Conclusion:

Ultimately, it may be concluded that the cooperative movement in India, which began in 1904, made significant progress by 1947, with distinctive characteristics such as an agriculture-based focus, independence from political interference, and an emphasis on credit. Cooperative institutions emerged as a ray of hope for farmers and agricultural laborers, aiming to combat exploitation by landlords and moneylenders. The government's involvement in nurturing cooperative institutions in India sets it apart from other countries, with financial, managerial, and

technical support provided. In Maharashtra, the cooperative movement flourished with the establishment of various cooperative societies and institutions, surpassing other states in its advancement. The three-tier cooperative credit structure, comprising Primary Agricultural Credit Societies, District Central Cooperative Banks, and State Cooperative Banks, played a vital role in providing financial assistance and support to farmers, contributing to the overall development of the cooperative movement.

References:

- Gupta. M.C. (2000) "Profitability analysis: An Empirical Approach" Pointer Publisher. Jaipur.
- Maheshwari S.N. and Paul R.R. (2000) Banking Theory Law and Practice" Kalyani Publishers. New Delhi.
- Gordan. E, Natarajan. K (2003) "Banking Theory and Practice". Himalaya Publishing House Mumbai.
- Kothari. C.R. (2014) "Research Methods & Techniques" New Age International Publishers, New Delhi.
- Krishnaswami O R and Ranganathan M (2008) "Methodology of Research in Social Sciences". Himalaya Publishing, Mumbai.
- "Audit of cooperative societies" (1998), published by Jayant Gokhale chairman of Western India Regional Council of ICAI.

Webliography:

- www.rbi.org.in
- www.banknetindia.com
- www.capitalline.com
- www.slideshare.net



Health Significance of Probiotics and Prebiotics

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Abstract:

Probiotics are known since ancient time as the health beneficial microorganism. Now a day's food is not only for the consumption but customers are looking for the health benefits along with nutrition. That concept can fulfill when together use of probiotic and prebiotic is practically applied. Organisms with nondigestible prebiotic content have certain properties which gave health benefits without any adverse effect that can be known as functional food. In this review properties of organism that can be considered as probiotics, types of probiotics, food used as probiotic as well as brief concept of prebiotic its types and functional food were reviewed.

Key Words: Probiotic, Prebiotic, Functional food, functional food, food confectionary.

Introduction:

Functional food provides the nutritional value along with reduction in disease risk and promotes health. Since consumer's awareness towards the functional food increases, production of such functional food along with probiotic and prebiotic content is dominant area of research now days. As together effect of probiotic and prebiotic provides the nutrition along with health benefits.

Increasing the microbiota of gut gives benefit to health by reducing risk of disease so it is beneficial to have such food (Islam *et al.*, 2022). Actually there are two strategies to increase the microbiota of gut first is to consume probiotics and second is to increase the resident gut flora by consumption of prebiotic (Aragon-Alegro *et al.*, 2007). consumption of food containing probiotic as well as prebiotic containing food able to achieve such effect .

In the circumstances food factories are seeking for novel product to stuck in global market. Confectionary sector specially chocolate industries are influenced by such changing demand of consumer. Probiotic and prebiotic together called as synbiotic that maintains gut flora if consume sufficiently due to positive physiological effect on gut flora (Hossain *et al.*, 2022). Synbiotic generally consider the prebiotic which favors growth of probiotic. Fractionated galacto-oligosachharides, monosaccharides, disaccharides, trisaccharide, tetrasaccharide are prebiotic which used by probiotic bacteria for growth Such as *Bacillus lactis*, *L. rhamnosus*, *L. rhamnosus*, *B. lactis* etc. (Kumar *et al.*, 2015).

Probiotic:

Eli Metchnikoff proposed the idea of consumption of live microorganism for health benefit. (Sharma *et al.*, 2017) Probiotic are live microbes used for consumption to get health benefit. probiotic is a Greek word which means "For Life" and can be defined by Food and Agriculture Organization of the United Nations-World Health Organization (FAO-WHO) officially as "live microorganisms which when administered in adequate amounts confer a health benefit to the host"(Hill *et al.*, 2014)() in other word probiotics are live microbes which benefits to the host by increasing microbial balance when ingest in required amount. LAB are generally recognized as safe (GRAS) for consumption as they are human origin and

nonpathogenic. Several well-characterized strains of Lactobacilli and Bifidobacteria are available for human use as probiotic, generally found in the gastrointestinal track of human. (Thantsha *et al.*, 2014) Besides to that other organisms can also act as probiotic which includes fungi *Aspergillus spp.* Yeast, *Bacillus spp.*, *Enterococcus spp.*, *Leuconostoc*, *Pediococcus etc.*

Organisms used as probiotic mainly includes strains of Lactobacilli and Bifidobacteria (Thantsha *et al.*, 2014), (Sharma *et al.*, 2017)

Lactobacillus species	Bifidobacterium species	Others
L. acidophilus	B. adolescentis	Bacillus cereus
L. amylovorus	B. animalis	Clostridium botyricum
L. brevis	B. breve	Enterococcus faecalisa
L. casei	B. bifidum	Enterococcus faeciuma
L. rhamnosus	B. infantis	Escherichia coli
L. crispatus	B. lactis	Lactococcus lactis subsp. cremoriss
L. delbrueckii subsp. bulgaricus	B. longum	Lactococcus lactis subsp. lactis
L. fermentum		Leuconostoc mesenteroides subsp. dextranicum
L. gasseri		Pediococcus acidilactici
L. helveticus		Propionibacterium freudenreichii
L. johnsonii		Saccharomyces boulardii
L. curvatus		Saccharomyces cerevisiae
L. lactis		Streptococcus salivarius subsp. thermophilus
L. paracasei		Sporolactobacillus inulinus a
L. plantarum		Bacillus indicus
L. reuteri		
L. salivarius		Bacillus coagulans
L. gallinaruma		Bacillus clausii
L. cellobiosus		Aspergillus cerevisiae
		Aspergillus niger
		Aspergillus oryzae

Ideal Characteristics of probiotic:

Microbial strain should have specific characteristics to become recognized as probiotic. Generally this criterion includes safety for engulfment, performance of the ingested probiotic and technological aspect. Related to safety the first and most important criteria is that it should be human origin, should be non pathogenic should not be associated with any previous infection they should immune tolerance i.e. They should not responsible to induce any kind of immune response. Any product produced by the probiotic should not cause harm or any toxic effect to the host. it should not produce inflammation, or should not be carcinogenic to the host. The strain should not cause any infection even in immunocompromised individuals. The strain should be nonmutagenic it should possess genetic stability.

Characteristics related to the performance probiotic should be acid tolerance since human digestive systems have various gastric juices and bile so that they can survive in the digestive

track with adherence property to the intestine so that they can survive by peristaltic movement. They should have antimicrobial activity against the pathogenic organism of digestive system. Probiotic strain should have property to survive and multiply in specific conditions particularly harsh conditions in colon and stomach of human body and should possess positive influence on immune system.

If technological aspect is considered the probiotic should not cause any adverse effect on the food it should have good stability and viability in the carrier food without disturbing the texture colour, odour and taste of the carrier food. (Thathansha *et al.*, 2012)

Food containing probiotic: Dairy product generally having the presence of probiotic microorganisms but along with that certain nondairy product also includes probiotic.

Dairy product	Dairy based products	Nondairy product
Drinkable fresh milk and fermented milks	Quark	Vegetable based drinks
Yogurt	Chocolate Mousse	Fruit based beverages
Cheese	Frozen Fermented Dairy Desserts	Fermented Green coconut water
Kefir	Sour Cream,	Soy based frozen desert
	Ice Cream	Cereal-based puddings
		Oat-based drink and products
		Maize-based beverage
		Starch-saccharified probiotic drink
		Probiotic cassava-flour product
		Meat products(meat sausages, freeze dried meat preparations etc.)
		Dosa and idali batter (rice and Bengal gram)

Health benefits of probiotic:

Probiotics gives various health benefits few of that includes Lactose metabolism & food digestion (microbes complete the digestion in large intestine of food that were undigested in the small intestine, such as lactose in lactose intolerant people or some fibers resistant to the enzymes in the small intestine), Cholesterol normalization, B vitamins, Diabetes Antioxidative activity Antibiotic associated diarrhea, maintain oral health, improves Immune response & resist to Parasitic infections, Reduction in blood pressure, relief from Constipation & ulcers, Relief of irritable bowel syndrome, Coronary heart disease, Urogenital tract infection, upper respiratory tract infection, Inhibitory effect against *Helicobacter pylori*, Exclusion of pathogenic *E. coli*, Prevention of rotavirus diarrhea etc. (Nagpal *et al.*, 2012) (Saad *et al.*, 2012)

- **Use of probiotic in lactose intolerance:** Lactose intolerance considered as three basic types that includes 1) Primary lactose intolerance .2) Secondary lactose intolerance. 3) Congenital lactose intolerance
- **Primary lactose intolerance:** This is also referred as adult-type hypolactasia, lactase nonpersistence, or hereditary lactase deficiency as it is genetically determined. in this type production of lactase starts decrease since childhood and continuously goes on decrease through life. Reduction in lactase activity may occur because of reduction in synthesis of precursor protein in epithelial cell.
- **Secondary lactose intolerance:** It occurs when intestinal mucosa were damaged by medication, surgery and or any other reason such as disease. This kind of intolerance is not

persist but can occur for short period of time and can occur at any age group. It may cause mucosal diseases such as in celiac disease and Crohn's disease.

- **Congenital lactose intolerance:** This kind of intolerance occurs when lactase enzyme is completely absent and it is rare and remains lifelong. Generally occurs in infants born with inability to produce lactase enzyme (Morelli *et al.*, 2019). Abnormal absorption of lactose causes lactosuria followed by renal tubular acidosis, aminoaciduria, vomiting, and failure to thrive. This type is considered as life threatening because of considerable dehydration. (Korpela *et al.*, 2001)

Symptoms of lactose intolerance includes non-specific abdominal pain, intestinal bloating, excessive flatulence, distention in abdomen sometimes vomiting may occur because of excessive production of methane and hydrogen in the intestine. Excessive lactose may produce diarrhea in some patient. Decrease in gastrointestinal activity lead to cause constipation. Many patients do not show symptoms of lactose intolerance but this depends on lactose content present in ingested food, fermentation capacity of gut, activity of lactase (Morelli *et al.*, 2019).

As purified lactase is more active in small intestine but purified lactase is costly and method for purification is challenging so use of probiotic considered as better alternative for that enzyme as probiotic bacteria are source of this enzymes. With reference to previous studies it is found that fermented food containing probiotics and prebiotics improves the symptoms of lactose intolerance by proper metabolism of lactose. Probiotics help to modify gut pH, it express. β -gal i.e. lactase enzyme and exerts positive effect on intestinal activity. Lactic acid bacteria produces lactase enzyme which breakdown lactose present in unabsorbed form in the body and converts into glucose and galactose which is redy and easy for absorption into body. Lactose intolerance level is different in individuals depending on the kind of microflora, so it is considered to provide probiotic containing useful microflora for the digestion of unabsorbed lactose, generally administration of probiotic containing Lactobacillus strain *Lactobacillus planatarum* shows better improvement in lactose intolerance patient. In case of lactose intolerance the activity of probiotic is depends on the tolerance of the strain to acid i.e. pH of the colon, as well as bile tolerance of the strain.

(Korpela *et al.*, 2001).

Cholesterol normalization:

Cardiovascular disease are associated with cholesterol, Coronary artery disease are most common generally occur because of increasing cholesterol level. Therapeutic measures are use to reduce the cholesterol level but now a day's use of probiotic is consider as useful to maintain the cholesterol level . as probiotic is having ability to reduce the lipid and cholesterol level by bile salt hydrolase activity, assimilation of cholesterol (Tomaro-Duchesneau *et al.*, 2014)

Cancer:

Abnormal cell development is a cancer. One of the reason to cause cancer is use of chemicals in food which are carcinogenic. Continuous exposure and metabolism of such carcinogenic chemicals by our body may cause cancer. Probiotic are consider to reduce the risk of cancer by detoxification of carcinogenic chemicals, by improving the apoptosis of cell as a proper metabolism, by production of such compound which inhibit the growth of tumor, may proliferate there immune system to defend against cancerous cell. (Sharma *et al.*, 2012)

Urogenital tract infection:

Generally vaginal infection cause by microorganisms that originated in bowl exception for that is sexually transmitted infections. In urogenital patients normal commensal especially lactobacillus are found to be absent which may allow the growth of pathogenic organism to

cause disease. Evidence shows that probiotic microbes can prevent urogenital infection by colonizing ability of probiotic bacteria in urogenital track reduces the pathogenic bacteria count by competitive exclusion (Sharma *et al.*, 2012).

Upper respiratory tract infection:

Lactobacillus rhamnosus found in human gut and effective action on GI infection shows the similar effect on the upper respiratory track disease. Although very less information is present about the colonization of probiotic in upper respiratory track where lymphatic system present and also little is known about the colonization of same probiotic in mucosal tissues. Still probiotic bacteria are found to be effective against upper respiratory disease, the possible mechanism of action may be stimulation of immune system by production of interleukins, IgA production. Another possible mechanism is by production of antiviral agent and may be by direct interaction with the pathogenic agent. (Tapiovaara *et al.*, 2016)

Inhibitory effect against Helicobacter pylori:

Inflammation of gastric mucosa with associated lymphatic's that lead to cause erosion or developed into cancer, vitamin B12 deficiency, idiopathic thrombocytopenic purpura, iron deficiency are the symptoms of chronic infection that can be cure by chemotherapy. Alternative to the use of standard antibiotic against such chronic infection may be the use of probiotic since probiotic bacteria are able to complete inhibition of *Helicobacter pylori* by acting as bacteriostatic with improvement of gut microflora. Use of probiotic bacteria like *Lactobacilli*, *Bifidobacterium*, *Bacilluslicheniformis*, and *saccharomyces* helps to reduce adverse effect of antibiotic associated to the infection. As probiotic bacteria having the ability to produce antimicrobial substances such as hydrogen peroxide, lactic acid, and bacteriocins that can suppress urease activity of *H. pylori*. Along with this bacterial cell wall and its membrane were destructed by the reactive oxygen produced by probiotic. (Mestre *et al.*, 2022).

Exclusion of pathogenic E. coli:

Diarrhea is one of the cause of mortality in children from developing country. Intestinal *E. coli* which is pathogenic is responsible to cause 8-10% cases of diarrhea in children. As probiotic produces inhibitory compound that inhibits the growth of pathogenic organism are consider to be effective for the treatment now a days. As probiotic not only competes with pathogen by producing inhibitory compound but also by stimulating immune response of host (Karimi *et al.*, 2018).

Irritable bowel syndrome:

It is a chronic disorder gastrointestinal (GI) symptomatology; the symptoms may include abdominal pain, indigestion, distention, bloating, and symptoms of defecation. Probiotic consider being effective in irritable bowel syndrome as it enhances microbial flora and alters the immune response. However specific organism and the exact count of organism used for therapeutic gain is not known very well yet (Kumar *et al.*, 2022).

Constipation:

Constipation is functional gastrointestinal disorder probiotics helps to relief from constipation by promoting peristalsis, also By lowering the pH of the colon, increasing the generation of short-chain fatty acids, and enhancing bile salt metabolism. Generally, *Bifidobacterium animalis* subsp. *Lactis*, *Lactobacillus* consider as effective probiotic for constipation (Ananya *et al.*, 2023)

Prebiotics:

These are nondigestible food content that gives beneficial physiological effect to the host by initiating the activity or growth of useful organisms (Sharma *et al.*, 2017). They naturally exist in different dietary food products, including sugar beet, asparagus, chicory, garlic, honey, onion, wheat, tomato, banana, barley, beans, soybean, rye, peas, human's and cow's milk, etc. (Davani-Davari *et al.*, 2019). Prebiotics able to initiate the growth of some Gram positive bacteria and *Bifidobacterium*. Some common examples of prebiotic includes fructooligosaccharides (FOS), galactooligosaccharides (GOS), Lactulose, inulin, maltooligosaccharides, xylo-oligosaccharides (Sharma *et al.*, 2017).

Health benefits of prebiotics:

Prebiotics provides health benefits such improve colonic integrity, regulation of allergic response improve digestion and excretion, enhancement of immune function. (Sharma *et al.*, 2012).

Types Of Prebiotic:**Galactooligosaccharides:**

These are product of lactose extension having two subgroups first is the galactooligosaccharides with excess galactose at C3, C4 or C6 and second are those obtained from lactose by enzymatic transglycosylation with end product as a mixture of trisaccharides to pentasaccharides with β -(1 \rightarrow 6), β -(1 \rightarrow 3), β -(1 \rightarrow 4)galactose linkage. These galactooligosaccharides are also termed as trans galactose oligosaccharides or TOS. *Bifidobacteria* and *Lactobacilli* stimulates GOSs. GOSs which derived from lactulose are isomers of lactose and those consider as prebiotic. Besides to this other types of GOSs derived from sucrose extension called as raffinose family oligosaccharides (RFOs) (Mitmesser *et al.*, 2017).

Fructooligosaccharides (FOS):

FOS are water soluble with the sweetness 0.3-0.6 times greater than sucrose depending on degree of polymerization and chemical structure. These are highly hygroscopic with water holding capacity greater than sucrose and same to sorbitol while viscosity higher than sucrose at the same concentration because of greater molecular weight. Thermal stability of FOS are also greater than sucrose and can withstand normal range of food pH (4.0-7.0). FOS can be used as alternative for sucrose because of its properties such as caloric value (1.5 to 2.0 kcal/g), solubility, freezing and fusion point, crystalline properties etc.

Fructooligosaccharides have Low sweetness intensity makes them useful for foods where the use of sucrose is restricted due to its high sweetness also Calorie free make it safe for diabetics and people on slimming diets. Non-carcinogenic, They behave as soluble food fiber from a physiological point of view. They are non-digestible carbohydrates of a vegetable origin that reach to the large intestine, where they can be fermented by the colonic flora to promote the growth of *Bifidobacteria* Which prevent the growth of potentially pathogenic microorganisms. In bacterial degradation of FOS first monomer hydrolysis by beta oxidases and the monomers released ferment anaerobically to produce volatile fat acids (SCFA) such as acetate, propionate and butyrate, and gases (H₂, CO₂, CH₄). These properties, together with their other beneficial physiological effects defend the addition of FOS to foods as infant formulas which, in any case, have only very low quantities of these nutrients (Molina *et al.*, 2009). These are major class of bifidogenic oligosaccharides that are indigestible. Generally these are the compound of originate

from vegetables and also found in garlic, wheat banana tomatoes honey etc. with varying concentration. Chemically fructooligosaccharide made up with chain of fructose about 2- 60 unit long which ends with glucose unit by β -(2-1) glycosidic bonds which can't be digested by human digestive enzymes since that are specific for alpha glycosidic bond.

Inulin, oligofructose, scFOS (short chain fructooligosaccharides) are three categories of FOS inuline composed of monomers of fructose with an average of 12 units. On enzymatic hydrolysis of inuline it produces oligofructose consist of fructosyl chains with different length that ends with glucose and fructose and can be defined as fraction of oligosaccharides with degree of polymerization lower than 20. scFOS (short chain fructooligosaccharides) are the mixed chains of fructosyl with a glucose terminal unit . they contains maximum 5 units that obtained from natural fermentation process which produces nistose (GF 3), 1-kestose (GF 2), 1-fructosyl - nistose (GF 4) in it fructosyl units (F) are linked at β -(2-1) position of sucrose

Fructans:

These are group of oligo and polysaccharides having fructose unit with β -(2 \rightarrow 1) linkages generally ends with glucosyl moiety. Oligofructose or FOS, which consist of 2–9 units Fructans are the shortest member of this family. Fructan with more than 10 monomeric units are classified as inulin. Inulin stored in the form of carbohydrates in plant. Onion garlic, banana oats wheat contains inulin. FOS are produced by hydrolysis of long chain fructans by endoglycosidase enzyme and also synthesize from sucrose by transfructosylation process. Fructans are indigestible factors since there is absence of enzyme necessary for its digestion in human. Bifidobacteria and lactobacillus species able to produce 2,1- β -d-fructan-fructanohydrolase enzyme for the hydrolysis of fructans therefore presence of this probiotics can be convert nondigestible fibers into digestible by the hydrolysis of fructans.(Hoebregs, 1997)

Inulin and its hydrolysates:

These are fructans used by many food factories for various applications both can metabolize like as dietary. Many fruits and vegetables contain inulin in significant amount.

Transgalacto-oligosaccharides:

It is a mixture of oligosaccharides containing glucose and galactose and are not digested in small intestine of human. It also consist mixture of indigestible oligosides derived from lactose biosynthesis by enzyme galactosidase. In vitro transgalactooligosaccharides converted to short chain fatty acid and are consumed by *Bifidobacterial* species and some strains of *Enterobacteria*. Bifidobacterial cell produces enzymes necessary for galactose metabolism that is optimum substrate for the cell. As Bifidobacteria and other enterococci has property of digestion of galactooligosaccharides it can be used for the food preparation for consumption (Bouhnik, 1997).

Xylooligosaccharides:

XOS are utilized by members of the Bifidobacterium genus. Furthermore, the consumption of XOS results in increased indigenous Bifidobacterium spp. levels in the gastrointestinal tract and fecal short-chain fatty acids in rats. Effects of XOS on gastrointestinal microbiota in human populations have been limited (Lin *et al.*, 2016).

Functional Food:

Food which provides health benefits other than nutritional aspects can be consider as functional food. This kind of food may include natural food or food that can be modified by using certain techniques. The concept of medicinal food was not new. Father of medicine Hippocrates approximately 2500 years back put forth a concept that "Let food be thy medicine

and medicine thy food," today this concept can be met by production of functional food. Since ancient time peoples are aware about the fermented food which are generally microbial formulations. Extra benefits to this microbial preparation can be added by using Prebiotics. Such food preparations are includes commercial food confectionary. Food confectionary is the making confections by using sugar and a carbohydrate based binding medium. Confections can be categorized as flour confection, milk confection, sugar confection, chocolate confection. Flour confection are confections mainly prepared by using flour for example cake , tarts, donoughts, cookies , sweet pastries etc. sugar confections are sugar and flavor based preparations. Coca powder based confections are chocolate confections. Such food confectionary can be make more beneficial to the health by the use of probiotics, this can be the future area of research when synbiotic food confectionary for health benefit is consider.

Conclusion:

As probiotics and prebiotics are having significant health effect it helps to prevent and treat diseases as nutraceuticals or functional food if it included into diet proves to be the effective way to improve health.

References:

- Akter, B., & Rabeta, M. S. (2021). Synbiotic and antioxidant activity of fruit by-products and their effect on human health. *Food Res*, 5(1), 24-35.
- Aragon-Alegro, L. C., Alegro, J. H. A., Cardarelli, H. R., Chiu, M. C., & Saad, S. M. I. (2007). Potentially probiotic and synbiotic chocolate mousse. *LWT-Food Science and technology*, 40(4), 669-675.
- Ananya, P., Avijit, M., Saumya, D., Piyush, V., Sapna, K., & Anmol, K. Probiotics & Prebiotics' Role in Treating Constipation and Hemorrhoid Pain. *Am J Pharmacol*. 2023; 6 (1), 1036.
- Ejtahed, H. S., Ardeshtarijani, E., Tabatabaei-Malazy, O., Hoseini-Tavassol, Z., Hasani-Ranjbar, S., Soroush, A. R., & Larijani, B. (2020). Effect of probiotic foods and supplements on blood pressure: a systematic review of meta-analyses studies of controlled trials. *Journal of Diabetes & Metabolic Disorders*, 19, 617-623..
- Arena, M. P., Spano, G., & Fiocco, D. (2017). β -Glucans and Probiotics. *American Journal of Immunology*, 13(1), 34-44.
- Bouhnik, Y., Flourié, B., D'Agay-Abensour, L., Pochart, P., Gramet, G., Durand, M., & Rambaud, J. C. (1997). Administration of transgalacto-oligosaccharides increases fecal bifidobacteria and modifies colonic fermentation metabolism in healthy humans. *The Journal of nutrition*, 127(3), 444-448.
- Doron, S., & Snyderman, D. R. (2015). Risk and safety of probiotics. *Clinical Infectious Diseases*, 60(suppl_2), S129-S134.
- Davani-Davari, D., Negahdaripour, M., Karimzadeh, I., Seifan, M., Mohkam, M., Masoumi, S. J., ... & Ghasemi, Y. (2019). Prebiotics: definition, types, sources, mechanisms, and clinical applications. *Foods*, 8(3), 92.
- Davani-Davari, D., Negahdaripour, M., Karimzadeh, I., Seifan, M., Mohkam, M., Masoumi, S. J., ... & Ghasemi, Y. (2019). Prebiotics: definition, types, sources, mechanisms, and clinical applications. *Foods*, 8(3), 92.
- Granato, D., Branco, G. F., Nazzaro, F., Cruz, A. G., & Faria, J. A. (2010). Functional foods and nondairy probiotic food development: trends, concepts, and products. *Comprehensive reviews in food science and food safety*, 9(3), 292-302.
- Hoebregs, H., & Collaborators: Balis P De Vries J Eekelen J v Farnell P Gray K Goedhuys B Hermans M Heroff J van Leeuwen M Li BW Martin D Pieters M Quemener B Roomans H Slaghek T Thibault JF van der Waal W de Wit D. (1997). Fructans in foods and food products, ion-exchange chromatographic method: collaborative study. *Journal of AOAC International*, 80(5), 1029-1039

- Hossain M.N., Chaminda S. R., Zhongxiang F., Masum A.K.M., Said A.,(2022). Viability of *Lactobacillus delbrueckii* in chocolates during storage and *in-vitro* bioaccessibility of polyphenols and SCFAs. *Current Research in Food Science* 5 (1266–1275).
- Hill, C., Guarner, F., Reid, G., Gibson, G. R., Merenstein, D. J., Pot, B., ... & Sanders, M. E. (2014). Activity of cecropin P1 and FA-LL-37 against urogenital microflora. *Nature Reviews Gastroenterology and Hepatology*, 11(8), 506.
- Ibrahim, S. F., Dalek, N. E. M., Raffie, Q. F. M., & Ain, M. F. (2020). Quantification of physicochemical and microstructure properties of dark chocolate incorporated with palm sugar and dates as alternative sweetener. *Materials Today: Proceedings*, 31, 366-371.
- Ibrahim, S. A., Gyawali, R., Awaishah, S. S., Ayivi, R. D., Silva, R. C., Subedi, K., ... & Krastanov, A. (2021). Fermented foods and probiotics: An approach to lactose intolerance. *Journal of Dairy Research*, 88(3), 357-365.
- Islam, M. Z., Masum, A. K. M., & Harun-ur-Rashid, M. D. (2022). Milk chocolate matrix as a carrier of novel *Lactobacillus acidophilus* LDMB-01: Physicochemical analysis, probiotic storage stability and *in vitro* gastrointestinal digestion. *Journal of Agriculture and Food Research*, 7, 100263
- James, A., & Wang, Y. (2019). Characterization, health benefits and applications of fruits and vegetable probiotics. *CyTA-Journal of Food*, 17(1), 770-780.
- Kumar, L. S., Pugalenth, L. S., Ahmad, M., Reddy, S., Barkhane, Z., & Elmadi, J. (2022). Probiotics in irritable bowel syndrome: a review of their therapeutic role. *Cureus*, 14(4).
- Karimi, S., Rashidian, E., Birjandi, M., & Mahmoodnia, L. (2018). Antagonistic effect of isolated probiotic bacteria from natural sources against intestinal *Escherichia coli* pathotypes. *Electronic physician*, 10(3), 6534.
- . Kumar, A., Tomer, V., Kaur, A., & Joshi, V. K. (2015). Synbiotics: A culinary art to creative health foods. *Int. J. Food Ferment. Technol*, 5, 1-14.
- Korpela, R. (2001). Symptoms of 'lactose intolerance'. *Näringsforskning*, 45(1), 171-173.
- Lin, S. H., Chou, L. M., Chien, Y. W., Chang, J. S., & Lin, C. I. (2016). Prebiotic effects of xylooligosaccharides on the improvement of microbiota balance in human subjects. *Gastroenterology research and practice*, 2016(1), 5789232.
- Mestre, A., Narayanan, R. S., Rivas, D., John, J., Abdulqader, M. A., Khanna, T., ... & Gupta, S. (2022). Role of Probiotics in the Management of *Helicobacter pylori*. *Cureus*, 14(6).
- Mitmesser, S., & Combs, M. (2017). Prebiotics: Inulin and other oligosaccharides. In *The microbiota in gastrointestinal pathophysiology* (pp. 201-208). Academic Press.
- Morelli, L., Amrani, N., Goulet, O., & Lukito, W. (2019). Lactose intolerance: clinical symptoms, diagnosis and treatment. *Global Diabetes Open Access Journal*, 1(1), 1-10.
- Miremedi, F., & Shah, N. P. (2012). Applications of inulin and probiotics in health and nutrition. *International Food Research Journal*, 19(4).
- Mugambi, M. N., Young, T., & Blaauw, R. (2014). Application of evidence on probiotics, prebiotics and synbiotics by food industry: a descriptive study. *BMC research notes*, 7, 1-8.
- Nagpal, R., Kumar, A., Kumar, M., Behare, P. V., Jain, S., & Yadav, H. (2012). Probiotics, their health benefits and applications for developing health foods: a review. *FEMS microbiology letters*, 334(1), 1-15.
- Nishantha, M. D., Diddugoda, J., Nie, X., & Weining, S. (2018). Beta-glucan: An overview of its properties, health benefits, genetic background and practical applications. *Sch. J. Agric. Vet. Sci*, 5, 130-140.
- Prabhu, S., Molath, A., Choksi, H., Kumar, S., & Mehra, R. (2021). Classifications of polyphenols and their potential application in human health and diseases. *Int. J. Physiol. Nutr. Phys. Educ*, 6(1), 293-301.
- Roberfroid, M. B. (1999). Concepts in functional foods: the case of inulin and oligofructose. *The Journal of nutrition*, 129(7), 1398S-1401S.
- Roberfroid, M. (2007). Prebiotics: The concept revisited1. *The Journal of nutrition*, 137(3), 830S-837S.
- Roberfroid, M. B. (1996). Functional effects of food components and the gastrointestinal system: chicory fructooligosaccharides. *Nutrition reviews*, 54(11), S38.
- Sharma, P., Singh, A., & Mathur, N. (2017). Review Synbiotics "Combination of Probiotics and Prebiotics". *IOSR-JBB*, 3, 19-24.

- Subhashree Sridharan, S. S., & Das, K. M. S. (2019). A study on suitable non dairy food matrix for probiotic bacteria-a systematic review.
- Sangita Bansal, S. B., Manisha Mangal, M. M., Sharma, S. K., & Gupta, R. K. (2016). Non-dairy based probiotics: a healthy treat for intestine
- Sharma, S., Agarwal, N., & Verma, P. (2012). Probiotics: the emissaries of health from microbial world. *Journal of Applied Pharmaceutical Science*, (Issue), 138-143.
- Sabater-Molina, M., Larqué, E., Torrella, F., & Zamora, S. (2009). Dietary fructooligosaccharides and potential benefits on health. *Journal of physiology and biochemistry*, 65, 315-328.
- Shoukat, M., & Sorrentino, A. (2021). Cereal β -glucan: A promising prebiotic polysaccharide and its impact on the gut health. *International Journal of Food Science and Technology*, 56(5), 2088-2097.
- Tomaro-Duchesneau, C., Jones, M. L., Shah, D., Jain, P., Saha, S., & Prakash, S. (2014). Cholesterol assimilation by *Lactobacillus* probiotic bacteria: an in vitro investigation. *BioMed research international*, 2014(1), 380316.
- Thantsha, M. S., Mamvura, C. I., & Booyens, J. (2012). Probiotics—what they are, their benefits and challenges. *New advances in the basic and clinical gastroenterology*, 21.
- Tewari, S., David, J., & Gautam, A. (2019). A review on probiotic dairy products and digestive health. *J. Pharmacogn. Phytochem*, 8(3), 368-372.
- Tapiovaara, L., Pitkäranta, A. I., & Korpela, R. (2016). Probiotics and upper respiratory tract-a review. *Pediatric Infectious Disease Journal*, 1(3), 19.
- Thilagavathi, T. (2020). Probiotics, prebiotics, synbiotics and its health benefits. *International Journal of Current Microbiology and Applied Sciences*, 9(11), 497-511.



Raising the Right Wing Politics in the World

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Abstract:-

The balance of power is shifting towards right wing. Around the world right wing parties or conservative groups are trying to influence the people by Nationalism and identity politics. In the recent election in Austria the far right freedom party has got 28.9% of vote and became the dominant party in Austria. The first time far right freedom party got the strongest position. After that shocking result came out In 2024 European Union election were far right party of France got large number of votes. It is the first time that people of European Union has elected huge number of members from right wing. Giorgia Meloni's right wing party Brother of Italy and its alliance got victory in general election. Donald Trump is known for his conservative and nationalist ideas. In the USA election campaign Republican Party candidate Donald Trump gave a slogan "Make America Great Again" this slogan went viral on social media. The well known businessman Elan Musk has supported Donald Trump in the election campaign. Trump won the election When he took the charge of office he has signed a number of orders. He denies the right to citizenship to the childrens of migrants. He pushed the idea of Americans first. He signed an executive order that there are only two genders Male and Female. He is against LGBTQ community. He said that this is a common sense revolution¹. This type of right wing, conservative and nationalist government are rising in Hungary, Poland, Siberia, and Czechoslovakia. The right wing politics is also rising in India. We have different religion, castes and culture in India. People are spreading fake news and political narrative which is divide and spreading hatred among the community. Politicians use the tools like us vs them and majority vs minority to create a polarisation.

Introduction:-

Racial Antisemitism is somewhere exists in the western society. Far right wing politicians are trying to Influence the people that we are superior then others. Right and left wing are opposite ideologies right wing is known for its hyper nationalism. Jingoism is the extreme form of patriotism and it is harmful for any country. Patriotism or nationalism these words needs to be redefine because violence is a form of nationalism in todays politics. Right wing and far right wing politicians are successfully established there government. In the recent example of Germany, Italy, Austria, USA have the powerful leaders from right wing. Donald Trump is known for his racial statements. He believes in white supremacy. In India we are facing many problems like unemployment, Increasing inflation rate, high petrol price, farmers suicide, women security, healthcare system. Instead all these issues should be raised by the politicians they are polarising the issues. Religion and caste plays a major role in Indian politics. Politicians use social media as a tool to spread hatred. As a citizen of the country we have a right to ask the question and government should answerable to the citizen. Some extremist groups are trying to portray the people who asked a question as anti national.

Objectives:-

- To study the role of right wing politics.
- The impact of raising right wing in the world.

Impact of right wing politics:-

Right wing is surging in the western countries. In Germany the rise of far right wing in politics can be seen. The country is divided in to two groups. Nationalism is on a peak. Germany has a multi party system. The alliance culture is very common in German politics. Central leftist coalition of FDP, SPD, and BDG has ruled in Germany for the last 4 years but after some issues the alliance broke down. After that election took place and far right wing party AFD got historical voting percentage. Alternative for Germany AFD party established in 2013 got a second biggest party Position in the 2025 general election. AFD got 20.8% of vote which represent the far right wing politics in Germany. The famous businessman Elon Musk has participated in the election campaign to promote right wing ideology. He supported Alice Weidel's far right wing party AFD leader. He connected her campaign through online meet. Elon Musk said that, "only the AFD can save Germany"². And he also said that, "We should proud our ancestors and "move beyond Nazi guilt"³. People criticised his statements for promoting right wing agenda. Immigration policy is the major issue in Germany. People have more concern about migration and economical recession. That's why this radical wave of right wing is increasing day by day. Right wing people want unlimited power to solve the issue. This kind of radical move will threat to democracy.

The centre right CDU leader Friedrich Merz Has promised for permanent border controls at Germany's 3800 kilometres border. Friedrich Merz promised people to save Germany from economic recession if he won the election. They will reduced income tax and corporate tax so that economy will boost. His Conservative party got 27% in the election. At the age of 69 he got the opportunity to run the country. After the election Mrtz made an alliance with AFD to form a government. Angela Markel condemned Mrtz's decision of alliance with AFD.

One of the far right German politicians has found guilty to knowingly using a Nazi slogan in his speech. Bjorn Hocke the leader of the AFD party he said in his speech "Everything for our homeland, Everything for Saxony – Anhalt, everything for Germany"⁴. This shows that AFD embracing extremist far right agenda of Nazi. These Nazi and extremist thoughts are rising because of extremist leaders. However the Modern Fascism is emerging in a politics.

Recently the AFD party had a meeting with extremist group to discuss the deportation. After this news gone viral there was more than 100000 people came out across Germany against AFD party³. People were carrying the posters of "Nazi Out", "Defend The Democracy", "Stop The AFD" slogan. In Germany people are divided in to two groups far right and left. Left wing people are more concern about Democracy however right wing people follow nationalism.

In 1991 under the Maastricht Treaty 12 EU countries has been committed for common production, security policy, single European currency, common EU citizenship, uniform tax rate, common security foreign policy. In 1993 the treaty was ratified by 12 countries and officially EU was announced. Europe recovered from world war two and united the European countries. They established there European Central Bank. They have their own Parliament. In recent EU election Marine Le Pan's far right National Rally party got majority votes. After the EU election Emmanuel Macron took a decision to dissolve the French parliament and conducted the re-election in France. The result of the election has created the situation of hung parliament. New Popular Front NFP left wing party got 32.6% votes, followed by Ensemble centrist got 27.9%, National Rally got 24.6% of votes. Economic condition and issues of farmers are the major issues of Germany. Farmers protest played a major role in the EU election. The farmer's protests were happened in Paris they are not able to produce sugar beets because of the rules and

regulations and they don't want to interference of anyone. They are against the globalization, free trade, EU rules and regulations, environmental rules. RN National Rally party raised this issue successfully and shifted the voters towards right wing RN party. Unemployment, migration these are the main issues has been raised by the far right parties.

Religion and race plays the biggest role in the politics. We can see the rise of right and far right wing in developed countries like USA, Italy, Poland, Serbia, Czechoslovakia, and Hungary. The idea of Secularism is being challenged in global politics. People are getting conscious about their identity, race as well as language and culture. This right wing wave is not just growing in developed countries but it is also shifting in to the developing countries. This type of identity politics can cause the world war. Right wing and far right wing are mostly against the rights of LGBTQ community, against the abortion and against the migration policy.

In Italy the right wing alliance got majority and successfully formed the government. Giorgia Meloni is the new prime minister of Italy. The new government is against the LGBTQ Community rights. Giorgia Meloni said that, "Yes to the natural family and No to the LGBTQ"⁵. She is also against the immigration she said that, "No to the immigration Yes to job for our people"⁶. The far right wing party Brothers of Italy trying to create a new Fascism somewhere they believe in Mussolini. Right wing people with no hesitation praise or admire Mussolini. The new debate is started that Fascism also did some good things. Giorgia Meloni one's said that Mussolini was a good politician everything he did he did for Italy ⁷.

Conclusion: -

Racial Antisemitism is rising again in this modern world. Right wing people are glorifying the ideology of Mussolini. Youngsters are blindly following Nazi thought without knowing its consequences. They want rebirth of authoritarian government. Far right wing is rising in European countries like Italy, Germany, France, Hungary, Poland, and Serbia. The racism is also increasing. Identity politics are changing the narrative in politics. The right-wing people are against the right to abortion. The right-wing policies are against the LGBTQ Community they don't believe in 3rd gender. USA president Donald Trump has announced that the only two genders will exist male and female. He also applies the strict rules for anti immigration policy. The economic slowdown or Recession is also the reason behind the rising right wing. People are getting tired of unemployment, Inflation rate, immigration policy they want to form new government. This right-wing wave is also emerging in Indian politics after the 2014 election.

References:-

- Yash Singh Sisodiya, Bankura University Journal of Political Science –“Analytical Study of Rising Political Right Nationalism”.
- Cas Mudde, Manchester University press “The ideology of the extreme right” 2000
- Kristen Ghodsee “Left wing right wing everything”, Problems of Post-Communism, no.3 vol. 55, May/June 2008.
- Peter Davies and Derek Lynch, “The Routledge Companion to Fascism and The Far Right”, Routledge 2002.

Isolation and Screening of Antibiotic-Producing Microorganisms from Rhizosphere Soil

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Abstract:

Rhizosphere soil sample were selected for their potential to harbor antibiotic -producing micro-organisms. Rhizobium Species was isolated from rhizosphere soil & Identified as a potent antibiotic producer. The antibiotic produced by this species was found to be effective against both gram positive, and gram negative. Organism, Antibiotics are commercially valuable secondary metabolites produced by bacteria, widely employed, to combat infectious diseases The study aim to screen & isolate soil bacteria, with antibiotic activity - Soil samples were collected from the rhizosphere of plants such as wheat, rice, and maize. Microorganisms were isolated using serial dilution. Soil Samples were suspended, in sterile water, Inoculated, on nutrient agar plate & incubated, at 37°C for 24 hours, After which colonies with a clear Zone of inhibition were observed.

Keywords:- rhizosphere soil, antibiotic-producing microorganisms.

Introduction:-

Antibiotics play a crucial role in plant health, suppressing plant pathogens and promoting plant growth. The rhizosphere, a dynamic ecosystem surrounding plant roots, is a rich source of antibiotic-producing microorganisms. These microorganisms have evolved to produce antibiotics as a means of competing with other microorganisms for resources and niche space.

The rhizosphere soil, in particular, harbors a diverse array of microorganisms with potential antibiotic-producing capabilities. Screening of antibiotic-producing microorganisms from rhizosphere soil is essential for discovering novel antimicrobial agents. The aim of this research paper is to screen and identify antibiotic-producing microorganisms from the rhizosphere soil of various plants, with a focus on exploring their potential as a source of novel antibiotics.

• Materials and methods :-

• Collection of Rhizosphere Soil Samples:-

Rhizosphere soil samples were collected from the roots of wheat (*Triticum aestivum*) Plants. The soil samples were carefully removed from the roots, taking care to minimize disturbance to the surrounding soil. The samples were stored in sterile polythene bags and transported to the laboratory for analysis.

• Isolation of microorganisms :-

The rhizosphere soil samples were serially diluted and plated on Nutrient Agar (NA) medium. The Plates were incubated at 37°C for 24 to 48 hours. The resulting colonies were isolated and purified using the streak plate method.

• Screening for Antibiotic Production :-

The isolated microorganisms were screened for antibiotic production using the agar well diffusion method. The microorganisms were grown in Nutrient Broth (NB) medium and the culture supernatants were collected and tested. For antimicrobial activity against *Escherichia Coli* (E.coli) and *Staphylococcus aureus* (S.aureus).

•Screening for Antibiotic Production:-

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•Identification of Antibiotic-Producing Microorganisms:-

The antibiotic-producing microorganisms were identified using 16S rRNA gene sequencing. The sequences were compared with those in the GenBank database to determine the closest match.

• Statistical Analysis:-

The data were analyzed using SPSS software. The results were expressed as mean \pm standard deviation. The differences between the means were analyzed using ANOVA.

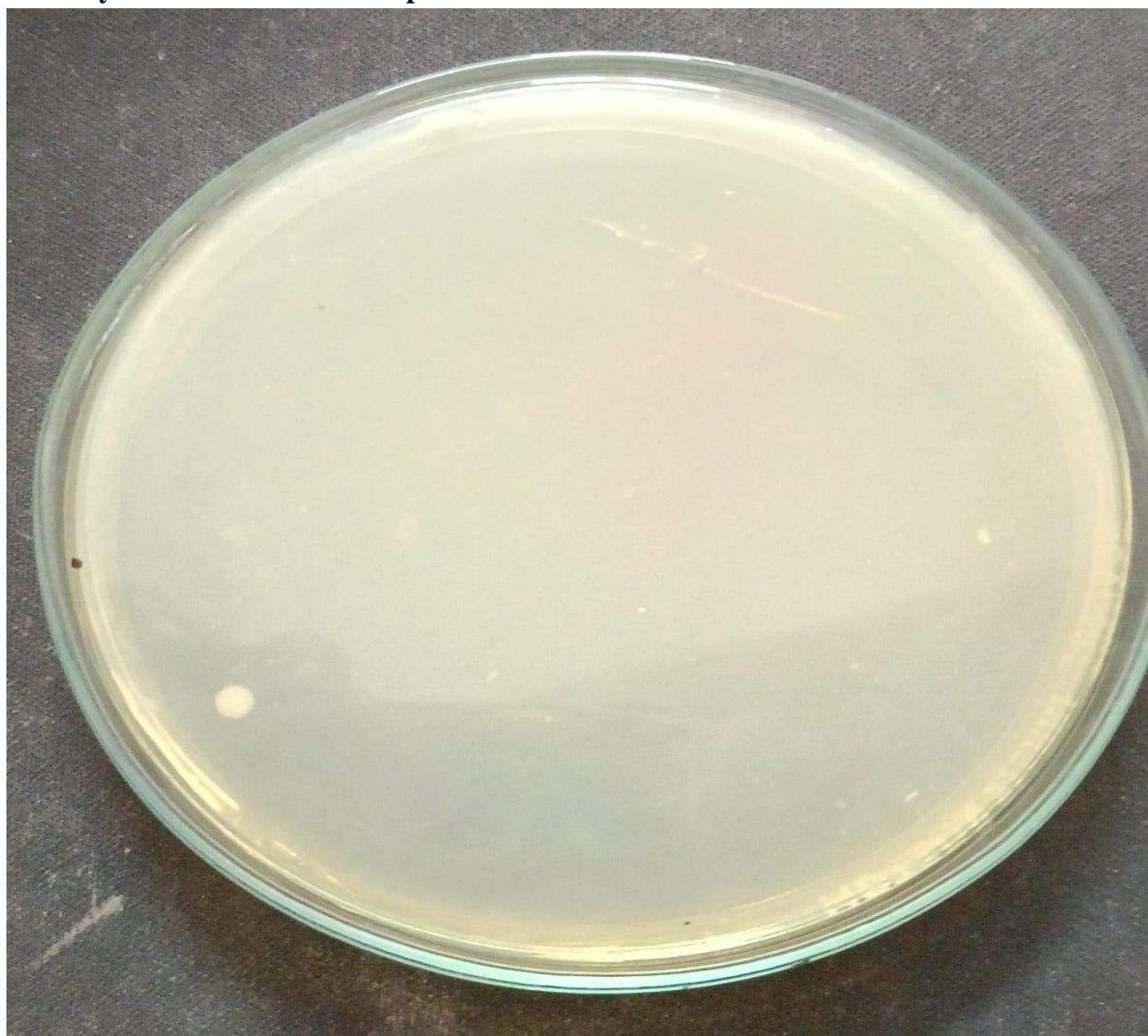
• Identification of Antibiotic - producing microorganisms :-

The antibiotic - producing microorganisms were identified using 16S rRNA gene sequencing. The sequences were compared with those in the GenBank database to determine the closest match.

• Test Organisms :-

Organism	Gram nature	Zone of inhibition (Typical)	Motility	Role in Rhizosphere
• Bacteria				
1) Escherichia Coli (E.coli)	gram - negative	Small zone (various based on antimicrobial sensitivity)	Mobile(flagellated)	Can be pathogenic often present as an indicator organism.
2) Staphylococcus aureus(S.aureus)	gram - positive	Small to moderate rate (depending on antimicrobial resistance)	Non - motile	Opportunistic pathogen rare in the Rhizosphere.
3) Pseudomonas aeruginosa (P.aeruginosa)	gram - negative	Moderate to large zone (depending on strain and antimicrobial)	Motile (flagellated)	Known for antibiotic production and plant growth promotion.
• Fungi				
1) Candida albicans (C.albicans)	gram - positive	Small to moderate rate (various with strain and resistance)	Non - motile	Fungal pathogen can be opportunistic.
2) Aspergillus niger (A.niger)	gram - positive	Small zone (depending on antimicrobial resistance)	Non - motile	Saprophytic fungus contributes to organic matter decomposition.

• Colony Characteristics Rhizosphere:-



Size	Shape	Margin	Elevation	Opacity	Consistency	Colour
1 - 5 mm	Circular	Entire or lobate	Raised or Convex	Opaque or Translucent	Moist or Smooth	White or Cream

. Biochemical tests

Primary biochemical tests:-

Test	Observation
Gram staining	Negative (-)
Catalase test	Positive (+)
Oxidase test	Positive (+)
Motility test	Positive (+)

Secondary biochemical tests:-

Test	Observation
Carbohydrate utilisation	
1) Glucose	Positive (+)
2) Lactose	Negative (-)
3) Sucrose	Positive (+)

Nitrate reduction	Positive (+)
Indole production	Negative (-)
Methyl red test	Positive (+)
Voges - proskauer test	Positive (+)

• Identification:-

• Bergeys Manual of systematic bacteriology

This observation were told with results given in the Bergeys Manual of systematic bacteriology the isolated colony from the soil sample belongs to Rhizobium sps.

• Inoculum Preparation :-

- Use 24-hr old actively growing cultures
- Standardize inoculum to 10^6 cells/ml

• Medium Composition :-

- Tryptone: 5.0 g
- K₂HPO₄: 2.0 g
- NaCl: 2.0 g
- FeSO₄·7H₂O: 0.5 g (not 5.0 g, assuming typo)
- Glucose: 10.0 g
- dH₂O: 1000 ml

• Culture Conditions :-

- Inoculum: 5% (5 ml) added to 100 ml culture media
- Flask size: 500 ml
- Incubation: Orbital incubator shaker
- Temperature: Room temperature
- Agitation: 100 rpm
- Duration: 3-5 days
- pH maintenance: 6.9-7.1



Conclusion:

- The results demonstrated that the rhizosphere soil is a rich source of antibiotic-producing microorganisms.
- In this study, we successfully isolated and screened antibiotic-producing microorganisms from rhizosphere soil, which is a promising and rich source of bioactive compounds.
- The isolation process led to the identification of several microbial strains with antibiotic-producing potential.
- These strains were subjected to preliminary screening methods, such as the agar well diffusion method, to assess their antimicrobial activity against common pathogenic bacteria.

• Future Perspectives:

Future studies should focus on:

1. Characterizing the antibiotics produced by the isolated microorganisms.
2. Evaluating the efficacy and safety of the antibiotics in vivo.
3. Exploring the potential of rhizosphere microorganisms in the production of other bioactive compounds.

Overall, this study demonstrates the potential of rhizosphere microorganisms as a source of novel antibiotics and highlights the need for further research in this area.

• **Reference :**

- ANTIBIOTIC PRODUCTION AND CHARACTERIZATION - Vishwambhar Vishnu Bhandare and Sandip Mahadev Chavre Center for Bioinformatics, Pondicherry University, Pondicherry, India 605014
- Department of Biotechnology, KIT's College of engineering, Shivaji University, Kolhapur
- Waksman, S. A., and Woodruff, H. B., Proc. Sot. Exp. Biol. and Med., 49, 207 (1942).
- Foster, J. W., and Woodruff, H. B., Arch. Biochem., 3,241 (1943).
- Schatz, A., Bugie, E., and Waksman, S. A., Proc. Sot. Exp. Biol. and Med., 66, 66 (1944).
- Schatz, A., and Waksman, S. A., Proc. Sot. Exp. Biol. and Med., 67,244 (1944).



Preparation of Ecofriendly Algae Control Agent from Jamun Tree Bark

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Abstract:

The environment suffers when the algal population grows too quickly. Controlling algal proliferation is therefore a crucial issue, and there are efficient methods for reducing and controlling algal blooms. In this study, the bark of the Syzygium cumini L. (Jamun plant) is used to create a novel, environmentally friendly algae control agent. It is prized for its water-resistant qualities, such as phytochemicals that can help purify water and lessen algae blooms.

Keywords: jamun bark powder, Antioxident, Antibacterial, Antidiabetic

Introduction:

The plant known as jamun (*Syzygium cumini* L.) is always green. The bark of plants contains a variety of compounds. The growth of algae has decreased. Friedol, kaempferol, B-tosterol, D-Cilucoside, gallic acid, lagic acid, gallotannin, ellagitannin, and myricetine are among the phytochemicals found in stem and bark. An algal population grows quickly and under control as a result of climate change and water cutrophication. Native to the Indian subcontinent and Southeast Asia, *Syzygium cumini* (family Myrtaceae) is also known by the popular names jambolan, duhat jambu, Indian black berry, Portuguese plum, chota jamb, etc. Because of the special qualities of its bark, the jamun tree (*Syzygium cumini*) has a wide range of uses in both practical and traditional medicine. A detailed description of its features may be found here.

1. Appearance and Properties of the Bark:

- **Color:** The bark is dark grey near the base of the tree, gradually becoming a lighter grey as you move higher. The color transformation adds to the tree's aesthetic appeal.
- **Texture:** The texture is rough near the base of the tree, providing a grippy surface, while it becomes smoother as you ascend the tree. This change in texture might make the bark look quite distinct depending on where it's harvested.

2. Water Resistance:

Kiln-Dried Wood: When the wood, including the bark, is kiln-dried, it takes on impressive water-resistant properties. This characteristic makes it especially valuable in construction and other applications that require resistance to moisture.

- **Uses in Construction:** The water-resistant nature of the Jamun tree's bark and wood has made it valuable in the construction industry. It's notably used for making railway sleepers (the beams that support railway tracks) and for motor installation in wells, where exposure to water is frequent.

3. Other Uses of Jamun Bark: Village dwellings. The durability and water resistance, along with

Focusing on the Integration of Uses:

- Medicine, exemplifies the practical application of traditional knowledge."
- "From building materials to medicinal remedies, the Jamun tree's diverse applications underscore the integrated nature of traditional knowledge."

Method:

The bark of the Jamun tree (*Syzygium cumini*), commonly used in Ayurvedic medicine, has a variety of medicinal properties. Here's a bit more detail on its uses:

Jamun bark, rich in tannins and other compounds, is traditionally used to treat various ailments. A decoction or powder can manage diarrhea and dysentery by toning the digestive system, alleviate mouth ulcers due to its antimicrobial properties, and reduce inflammation, offering relief from conditions like arthritis. Additionally, while the bark itself isn't directly used for blood sugar regulation, Jamun fruits and seeds are known for this benefit. The bark's antioxidant properties further contribute to cellular protection. Typically prepared as a decoction or powder, its use should be guided by a healthcare professional, especially in Ayurvedic applications

Methodology:

1. Plant material-Collection of Jamun plant bark.
2. Removed the barks and well dry.
3. Grinding the dry barks smooth powder form.
4. Weight of 100gms of powder well mixed with 250 ml of water.
5. Preparation of 5gms of pellets.
6. Ready for Use as Algal control agent.
7. Jamun plant bark. 8. Bark Powder

Result:

This algal powder controls and inhibits the algal growth (10%). This powder purifies the water and formation of nutrients, phytochemicals

It sounds like you're discussing the phytochemical profile of *Jatropha* leaf extract (JLE). The compounds you've mentioned are known for their various biological activities and potential therapeutic properties. Here's a brief overview of each group:

1. **Flavonoids:** These are potent antioxidants that help protect cells from oxidative stress and have anti-inflammatory, anticancer, and antiviral properties. They also support cardiovascular health and improve circulation.
2. **Tannins:** Known for their astringent properties, tannins are also antimicrobial and antioxidant. They have been used traditionally to treat wounds and manage diarrhea.
3. **Terpenoid Phenols:** These compounds have antimicrobial, anti-inflammatory, and anticancer effects. Terpenoids are often found in essential oils and can contribute to the medicinal properties of the plant.
4. **Anthraquinones:** These compounds are known for their laxative effects but also possess anticancer and antimicrobial properties. They have been studied for their role in fighting various diseases.
5. **Cardiac Glycosides:** These are compounds that influence the heart's function, often used to treat heart failure and arrhythmias. They increase the force of heart contractions and have a positive inotropic effect.

Conclusion:

"Research indicates that Jamun bark's phytochemicals may inhibit algal growth, and its tannins promote skin cell regeneration, potentially slowing aging. Exploring Jamun's nutrigenetic and nutrigenomic properties could revolutionize health and disease prevention, integrating traditional knowledge with personalized, modern therapies."

References:

- **Khot D.S.** Ayurveda Internal Medicine for the Management of Common Metabolic Disorders W.S.R. to Madhumeha and Sthoulya. J. Drug Deliv. Ther. 2019;9:167–169. doi: 10.22270/jddt.v9i5-s.3637. [DOI] [Google Scholar]
- **Anwar R., Rabail R., Rakha A., Bryla M., Roszko M., Muhammad Aadil R., Kieliszek M.** Delving the role of Caralluma fimbriata: An edible wild plant to mitigate the biomarkers of metabolic syndrome. Oxidative Med. Cell. Longev. 2022;2022:5720372. doi: 10.1155/2022/5720372. [DOI] [PMC free article] [PubMed] [Google Scholar]
- **Rasheed H., Shehzad M., Rabail R., Kowalczewski P.L., Kidoń M., Jeżowski P., Ranjha M.M.A.N., Rakha A., Din A., Aadil R.M.** Delving into the Nutraceutical Benefits of Purple Carrot against Metabolic Syndrome and Cancer: A Review. Appl. Sci. 2022;12:3170. doi: 10.3390/app12063170. [DOI] [Google Scholar]
- **Oluwafemi Omoniyi Oguntibeju** Type 2 diabetes mellitus, oxidative stress and inflammation: Examining the links. Int. J. Physiol. Pathophysiol. Pharmacol. 2019;11:45–63. [PMC free article] [PubMed] [Google Scholar]
- **Mulkalwar S., Kulkarni V., Deshpande T., Bhide H., Patel A., Tilak A.V.** Antihyperglycemic Activity of Syzygium cumini (Jamun) in Diabetic Rats. J. Pharm. Res. Int. 2021;33:12–19. doi: 10.9734/jpri/2021/v33i35A31868. [DOI] [Google Scholar]
- **Venkateswarlu E., Bhava B.S.S., Kumar R.S., Venkateshwar R.J., Gouthami E., Umasankar K.** Evaluation of diuretic activity of Syzygium cumini and its effect on prostaglandin system. Orient. Pharm. Exp. Med. 2015;15:45–51. doi: 10.1007/s13596-015-0179-5. [DOI] [Google Scholar]
- **Wulandari S., Winarsih S., Baktiyani S.** Syzygium cumini reduces Vcam-1 and Icam-1 expression in endothelial cells induced by plasma from preeclamptic patients. Med. Sci. | Int. Med. J. 2016;5:363. doi: 10.5455/medscience.2015.04.8385. [DOI] [Google Scholar]
- **Mercado C.J.G., Atienza L.M., Sunico D.J.A., Maniwang J.R.C., Gapasin R.P., Gaban P.J.V., Castillo-israel K.A.T., Cena-navarro R., Estacio M.A.C.** Antioxidant, Anti-obesity, and Lipid-lowering Properties of Philippine “Duhāt” (Syzygium cumini L. Skeel) Freeze-dried Fruit Flesh. Philipp. J. Sci. 2021;150:793–808. [Google Scholar]
- **Rabail R., Sultan M.T., Khalid A.R., Sahar A.T., Zia S., Kowalczewski P.L., Jeżowski P., Shabbir M.A., Aadil R.M.** Clinical, Nutritional, and Functional Evaluation of Chia Seed-Fortified Muffins. Molecules. 2022;27:5907. doi: 10.3390/molecules27185907. [DOI] [PMC free article] [PubMed] [Google Scholar]
- **Tahreem A., Rakha A., Rabail R., Nazir A., Socol C.T.** Fad Diets: Facts and Fiction. Front. Nutr. 2022;9:1–14. doi: 10.3389/fnut.2022.960922. [DOI] [PMC free article] [PubMed] [Google Scholar]
- **Parikh N., Brahmbhatt R., Shah K., Engineer S., Chauhan B.** Herbal Approach for the Management of Obesity—A Review. Indo Am. J. Pharm. Sci. 2018;5:1694–1703. doi: 10.18782/2320-7051.6169. [DOI] [Google Scholar]
- **Lorenzo D., Transl J., De Lorenzo A., Gratterer S., Gualtieri P., Cammarano A., Bertucci P., Di Renzo L.** Why primary obesity is a disease? J. Transl. Med. 2019;17:169. doi: 10.1186/s12967-019-1919-y. [DOI] [PMC free article] [PubMed] [Google Scholar]
- **Khan M.I., Maqsood M., Saeed R.A., Alam A., Sahar A., Kieliszek M., Miecznikowski A., Muzammil H.S., Aadil R.M.** Phytochemistry, food application, and therapeutic potential of the medicinal plant (Withania coagulans): A review. Molecules. 2021;26:6881. doi: 10.3390/molecules26226881. [DOI] [PMC free article] [PubMed] [Google Scholar]
- **Buddhi P., Thapa A., Sigdel K.R., Adhikari S., Basnyat B.** Adverse events with ayurvedic medicines-possible adulteration and some inherent toxicities. Wellcome Open Res. 2019;4:23. doi: 10.12688/wellcomeopenres.15096.1. [DOI] [PMC free article] [PubMed] [Google Scholar]
- **Ahmed R., Tariq M., Hussain M., Andleeb A., Masoud M.S., Ali I., Mraiche F., Hasan A.** Phenolic contents-based assessment of therapeutic potential of Syzygium cumini leaves extract. PLoS One. 2019;14:1–16. doi: 10.1371/journal.pone.0221318. [DOI] [PMC free article] [PubMed] [Google Scholar]
- **Sagar A., Dubey A.** Post-harvest value addition of Syzygium cumini L. (Jamun) Int. J. Chem. Stud. 2019;7:590–593. [Google Scholar]

- **Rb K., Gb D., Ar S., Nm D.** Physico-chemical and nutritional properties of jamun (*Syzygium cumini*) seed. *J. Pharmacogn. Phytochem.* 2019;8:211–213. [[Google Scholar](#)]
- **Rather G.J., Hamidudin, Naquibuddin M., Mohd I., Zaman R.** Antidiabetic potential and related activity of Jamun (*Syzygium cumini* Linn.) and its utilization in Unani medicine: An overview. *Int. J. Herb. Med.* 2019;7:7–11. [[Google Scholar](#)]
- **Kumar S., Singh B.** *Syzygium cumini* (jamun) its medicinal uses. *Int. J. Pharmacogn.* 2021;8:361–372. doi: 10.13040/IJPSR.0975-8232.IJP.8(9).361-72. [[DOI](#)] [[Google Scholar](#)]
- **Joshi M., Paudel M., Upreti S.** Therapeutic influence of Jamun (*Syzygium cumini*): A review. *J. Pharmacogn. Phytochem.* 2019;8:1056–1059. [[Google Scholar](#)]
- **Parveen S., Khan A.A., Khan Q.A.** Antihyperlipidemic effect of seeds of Jamun (*Eugenia jambolana*) in subjects of intermediate hyperglycemia: A pilot study. *Tradit. Integr. Med.* 2020;5:191–197. doi: 10.18502/tim.v5i4.5164. [[DOI](#)] [[Google Scholar](#)]
- **Sood M., Bandral J.D., Kaur M.** Development and quality evaluation of jamun seed powder supplemented noodles. *J. Pharmacogn. Phytochem.* 2018;7:1411–1416. [[Google Scholar](#)]



Social Media Integration in Education

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Abstract:

The Social media has brought significant transformations in how organizations, communities, educational institutions, and individuals communicate. This paper focuses on use of social media in education. The use of social media has been drastically increased in education field as it enhances the student's abilities such as classroom engagement, learning involvement and learning outcomes. With the help of social media the student involvement has been increased as they can collaborate, exchange the knowledge and develop the real life problem solving capabilities. This research states the impacts of the social media on student's development, academic success and challenges faced in its implementation. The social media integration in education can integrate the theoretical knowledge with real life practical experiences and also helps to develop the skilled workplace for the students. Students can flourish in such digital and social environment and can meet the future economic needs. Today students need the online and offline learning environment which can be easily adapted by them. To fulfill the technical integration of social media in education, the educators also has to be equally adaptive to this new social media platforms globally. It's highly essential for the educators to incorporate latest social media tools and platforms into their teaching - learning, classrooms such as Blogs, WhatsApp, Facebook, Instagram, and Twitter etc. The educators must be updated about new emerging technologies and trends in the field of education so they can adapt this advancements and provide the optimal environment for the students, which is necessary for the students to acquire theoretical and practical knowledge.

Keywords: Education, Technology, Engagement, Integration, Communications, Social Learning, and Social Networks, Web 2.0,

Introduction:

In today's world, Social Media is very crucial in everyday life. Day to day everyone is sharing their daily updates with their friends and family. Social media can be used in various ways in education sector. Through the social media, it's easy for them to access study material very easily. On the other hand it's also very useful for the educators to communicate with the students through single platform. Using the different social media sites in education it enhances the learning experience for the students by collaborating, discussion forums, and information sharing and offering real life case studies. However students use social media for other distractions and improper online behavior can be seen by the students. Social media tools can provide multiple opportunities for students and colleges for enhanced learning experience. Through these tools we can integrate social media features for the students for online tutorials on you tube, attend online international conferences and a variety of resources shared through social network.

Nowadays for the Educational institutes and colleges it's essential to use and inculcate the social media for the active participation of students. Through the social media it's easy to

learn specific topics and subjects from the experts very quickly and easily. The India Today report highlights how the digital revolution has changed the way students in India communicate, learn, and connect with each other. Platforms like Instagram, WhatsApp, and Facebook have become a part of everyday life for millions of students. Currently, there are 398 million young social media users in India. A 2023 study by the Internet and Mobile Association of India (IAMAI) reveals that teenagers spend over 2-3 hours daily on sites like Instagram and YouTube. While social media serves as a valuable tool for learning and social interaction, excessive and unregulated use can negatively affect mental health, academic success, and emotional well-being. It is crucial to balance these issues for the benefit of India's youth.

One of the most alarming issues among Indian youth is that of addiction to social media. A new report from the National Institute of Mental Health and Neurosciences (NIMHANS) reveals that 27% of teenagers in India show signs of social media addiction. This addiction negatively impacts their focus, school performance, and increases the risk of mental health issues. The constant urge to check notifications, share updates, and scroll through social media feeds leads to a cycle of instant gratification, which reduces productivity and fosters feelings of isolation. Many students are also struggling with sleep, as 40% report not getting enough rest due to late-night social media use. This temporary sense of connection from social media can harm their self-esteem and diminish their sense of identity, affecting them beyond just their studies and physical well-being.

According to the 2022 Indian Council of Social Science Research (ICSSR) study, 65% of Indian teens are measured against social media influencers and peers, leaving them feeling somewhat inferior. With increasing images of looks and fashion, such students revert into an impossible endeavor of sustaining impossible standards about self-worth and mental state. Schools and parents, among them, have been left with real countermeasures that negate the effect. Healthy usage of social media must be taught through the colleges. Digital detox days and device-free time will be far healthier online habits. Creating healthy boundaries digitally will result in a 30% reduction in dependence on social media when stringent restrictions are imposed on screen time.

Trends In Education:

1. Artificial Intelligence and Machine Learning:

Artificial Intelligence and Machine Learning are becoming important tools in education. AI can help with various tasks like managing administrative work, grading assignments, and handling student enrollments. Some teachers utilize AI to track how students are doing and to notify them about any potential problems in performance. Machine learning can evaluate what students know, pinpoint areas where they struggle, and suggest extra resources for improvement. As AI continues to develop, it is anticipated to play a major role in education by making teaching more personalized and easier to manage.

2. Gamification:

Gamification includes utilizing components of video games in their learning environment. Amusement components offer assistance in making a positive environment for students, pointing to extend inspiration and results. Appropriation of gamification is most well known at the rudimentary level, but higher instruction or corporate training are not safe to engaging components that can upgrade understudy or representative engagement.

3. Inverted Learning with AR and VR

The combination of Inverted Learning with advancements in Virtual Reality (VR) and Augmented Reality (AR) is set to revolutionize education in the coming years. As costs decrease, educational institutions are likely to invest heavily in these effective training tools. Virtual environments provide students with valuable hands-on experiences that they might not otherwise have access to. Traditionally, teachers have been the focal point of education, but new technologies are shifting this paradigm. In Inverted Learning, the focus moves from the teacher to the student, making the learning process more engaging and visually stimulating.

4. Using of Social Media in Learning

As Teachers have noticed that students spend a lot of time on social media, and they are finding ways to turn this trend into a useful tool for enhancing education. They are starting to use social media as a way for students to easily connect and communicate with one another. Students can share study materials, engage in discussions in groups, or provide feedback on each other's posts. A well-known example of this approach is TedEd, which creates lessons and shares them on YouTube, allowing users to easily access educational videos and share them with their friends.

Benefits Of Using Social Media In Education:

1. **Enhanced communication and collaboration:-** Through the social media tools like Facebook, WhatsApp, Instagram etc students and teachers can collaborate and communicate with each other beyond the classrooms and share their knowledge and experiences with each other. Students can share their assignments and problems with their mentors and teachers through such social media accounts and get more connected with them.
2. **Access to Educational Resources:-** Students and well as teachers can get the open access to the numerous educational resources such as YouTube free lecture videos, educational Facebook pages and etc. Such free resources can be more beneficial for the students and as well as teachers to enhance their subjective knowledge. Various sites like Quora can offer forums through which people from worldwide can share their problems and get the solutions through such interactive forums.
3. **Interactive Learning:-** Some of the social media platforms share Interactive learning materials such as Facebook live and Instagram live through which students can learn and experience Virtual trips. Also there are many interactive games and sessions such as quizzes, multimedia based learning and engaging videos through which students can study many things.
4. **Global Learning opportunities:-** Social media tools can eliminate the geographical distances between learners, which allow them to learn from the experts, different institutions over the world. There are various websites such as LinkedIn, Coursera, Udemy etc offers certificate courses online from various top Universities and experts. Also students can join internationally through some discussion forums with their peer and discuss on particular problem or subject topics. Also some institutes which are globally distributed can virtually exchange the programs and students can participate in such virtual collaborative activities.
5. **Skill Development:-** Social media tools are not just used for the academics but also can be utilized from the skill development of the students such as writing skills, research paper writing etc. Video tutorials on YouTube can be helpful for the students to learn many skills that can be helpful for their carrier.

6. **Improved student Engagement:** - Students engagement is the biggest challenge for the teachers, for which the social media tools can be helpful to engage the students through fun activities using such social media tools; teachers can give them any engaging puzzles or tasks so the students can learn the things with fun activities.
7. **Carrier Guidance and Networking:** - Students can connect with different company profiles on social media, apply for their internships and build the relations for their recruitments. They can connect to various professionals and job recruiters and plan their carrier accordingly by their own. Many professionals and companies share their requirements and guidance on social media accounts through which students and job seekers can get advices and get job.
8. **Parent Teacher Interaction:** - Nowadays parents are more concern about their child's growth at schools and colleges also. So they tries to keep in touch with their teachers through different social media accounts of the schools and institutions, so that they can interact with the teachers and get informed about different events held at institutes, results of students and many more. Some institutes can arrange virtual live meeting of parent-teachers via Zoom or Google meet.
9. **Awareness and Social responsibility:** - Along with academics, students must focus on social responsibilities such as global issues, climate changes, sustainability and conservation efforts. Many institutes and schools organize the fundraising activities and donation activities through social media accounts.

Negative Impacts Of Social Media On Students

1. **Mental health challenges:** Social media can increase feelings of anxiety, depression, and isolation among students. Being constantly exposed to curated and idealized images can result in unhealthy comparisons with others, which may lower self-esteem.
2. **Cyber bullying and online abuse:-** Social media platforms can facilitate cyber bullying, leading to significant emotional and psychological harm for students. The anonymity and vast reach of these platforms can intensify the impact of bullying, making it hard for victims to find relief.
3. **Distractions from study:-** Excessive time spent on social media can hinder focus, attention, and academic success. The endless flow of notifications and engaging content can distract students, making it challenging for them to complete their assignments effectively. Constant messages and news feeds from the Social Medias can diverse the concentration of the students from the lectures and overall studies
4. **Sleep issues:** - Engaging with social media, particularly before sleeping, can interfere with students' rest. The blue light from screens and the stimulating nature of online content can negatively impact both the quality and length of sleep, resulting in tiredness and reduced cognitive abilities.
5. **Poor social skills:** - Due to the virtual connections and communication over the social media ,face to face communication has been reduced that affects the in person communication and social skills of students. As Online chats and conversations are more preferable by students, they lack in the body language and tone in face to face communications.
6. **Decrease in creativity and critical thinking:** - As social media tools provide everything and every information so easily and fast, students lack their originality and critical

thinking. Students mostly copy the contents from the online sources rather than making it independently. Students lack the capacity to think originally and writing their own research.

- 7. Obsession of virtual world:-** Many students has developed the habit of seeking approval from others from the social media sites. Many students feel pressurized about looks and behaviors' online. If their posts may not get enough engagement then the students feels rejected and demotivated.

Educators:

In engineering education in India, educators utilize social media platforms to enhance student engagement, facilitate collaboration, provide access to a wide range of learning resources, share industry updates, connect with experts globally, and promote active learning through discussion forums, project sharing, and online quizzes, primarily using platforms like Facebook, LinkedIn, YouTube, and WhatsApp groups to foster a more interactive and accessible learning environment.

The Educators uses different ways for integrating social media in educations:-

- 1. Creating Class Social media groups for students:-** Educators can create private groups as per their convenience on various platforms like Facebook, Whats App and Telegram for the discussion and sharing study materials , assignments etc.
- 2. Using You Tube for educational videos:-** Teachers can create their own YouTube Channels or use existing educational content for the students to make the topic easy to understand for them. Educators can record, Upload and create tutorials and series of the lessons for a particular subject so that they can share it with their students and make them study those topics visually available on You Tube.
- 3. Conducting Live sessions and Webinars:-** Educators can Live Stream on Facebook and Instagram also can conduct a live sessions on specific subject and topics to clear the doubts of the students. We can Invite Guest speakers for virtual lectures and conduct revision sessions before exams.
- 4. Blogging and online writing:-** Teachers can encourage students to create and maintain the blogs to enhance writing and critical skills. Teachers can also create their own blogs and write their own notes and researches on the blog and share it with their students for the review and writing the comments on their posts.
- 5. Assigning Social media based research projects:-** Students can use social media for the research and presentation projects, students can analyze the social media trends and related posts and info graphics can be used to create research projects.

Challenges:

- 1. Privacy and security issues:-** Social Media involves sharing personal data, which raises concerns about privacy and online security, there is a risk of exposing students personal information to the strangers, cyber bullying may be happen as there are no strict privacy settings.
- 2. Time Consuming:-** Managing social media accounts and posts for educational purpose requires more time and efforts on regular basis which can be very time consuming for the educators, monitoring students online interactions constantly is not possible and responding to their online queries and constant discussions can be very hard to achieve.

3. **Ethical and professional boundaries:-** There is a challenge in maintaining the boundaries between personal and professional interactions , maintaining teacher-student relationships on social media , avoiding favoritism and unprofessional interactions in online space etc.
4. **Inappropriate content on sites:-** Social media platforms contain contents that can be inappropriate for the students sometimes. Filtering such violent, misleading content is difficult task and preventing the students from accessing such distracting material is necessary.
5. **Copyright and Intellectual Property Rights:-** Sharing the contents on Social media can raise concerns about copyright violations. Ensuring that all the shared content is legally sourced and credited is difficult, avoiding plagiarism and guiding the students about intellectual property rights is very important nowadays.

Conclusion:

Social media platforms have emerged as a significant influence in the lives of students, fundamentally altering their experiences and interactions. While these platforms offer both advantages and challenges, it is crucial to promote responsible and thoughtful engagement with social media among students. By recognizing the adverse effects, capitalizing on the positive features, and implementing effective strategies to navigate the digital environment, students can effectively utilize social media while protecting their mental and emotional health. Ultimately, equipping students to be informed and responsible digital citizens will empower them to optimize the benefits of social media while mitigating its potential risks. Furthermore, educational institutions should be encouraged to leverage technology to enhance communication with students and parents, which could serve as a compelling topic for an argumentative essay in a college setting.

References:

- Al-Rahmi, W. M., Othman, M. S., & Yusuf, L. M. (2015). The effect of social media on researchers' academic performance through collaborative learning in Malaysian higher education. *Mediterranean Journal of Social Sciences*, 6(4), 193–193.
- M. Sadri, "Enhancing peer influence in STEM learning and engagement through social media interactions using network science principles ," in 2020 ASEE Virtual Annual Conference Content Access, 2020.
- Au, M., Lam, J., & Chan, R. (2015). Social media education: Barriers and critical issues. In *Technology in Education. Transforming Educational Practices with Technology: First International Conference, ICTE 2014, Hong Kong, China, July 2-4, 2014. Revised Selected Papers* (pp. 199-205). Springer Berlin Heidelberg.
- Basitere, M., & Mapatagane, N. (2018). Effects of a Social Media Network Site on Student's Engagement and Collaboration: A case study of WhatsApp at a University of Technology. In *ECSM 2018 5th European conference on social media*.
- Greenhow and E. Askari, "Learning and teaching with social network sites: A decade of research in K-12 related education," *Education and information technologies*, vol. 22, pp. 623-645, 2017.
- Chugh, R., & Ruhi, U. (2018). Social media in higher education: A literature review of Facebook. *Education and Information Technologies*, 23, 605-616.
- Boboc, A.T.(2021).Gamification in Higher Education: A Systematic Mapping Study," *Computers & Education*,, vol. 159, article 104014, .

- H. Cheng, S. Z. (2020). Review of Artificial Intelligence Applications in Education,". Journal of Educational Technology & Society, vol. 23, no. 6, , pp. 274-284, .
- C. Drivas, D. Kouis, D. Kyriaki-Manessi, and F. Giannakopoulou, "Social Media Analytics and Metrics for Improving Users Engagement," Knowledge, vol. 2, no. 2, pp. 225-242, 2022.
- M. Riccardi and F. Goyenvallé. (2021). Augmented Reality and Virtual Reality in Education: A Bibliometric Study,". Computers & Education, , vol. 168, article 104181,.
- N. Gambo, I. Musonda, and A. N. Zadawa, "Effects of Social Media Learning Environments on AEC Learning Process among University Students in Nigeria," International Journal of Construction Education and Research, pp. 1-29, 2021.
- P. Pradhananga, M. Elzomor, A. M. Sadri, and N. Pradhananga, "Integrating social media platforms in construction education to increase student engagement," EPiC Series in Built Environment, vol. 1, pp. 53-62, 2020.
- S. Y. Yoon, Y. H. (2020). A Systematic Review of STEAM Education Research. Sustainability, vol. 12, no. 21, article 8898, .
- S. Panand S. Liu.(2020.).The Roles of Social Media in Education :A Systematic Review. Computers in Human Behavior, vol. 113, article 106511, .
- S. J. Hwang, Y. C. (2021). Blockchain Technology in Education: A Systematic Literature Review,. Smart Learning Environments, vol. 8, no. 1, article 14, .
- S. Sulaiman, N. A. (vol. 57, article 102287,). Cybersecurity in Education: A Systematic Literature Review. International Journal of Information Management, , 2021.
- S. Eneje, S. O. Sanni, and C. F. Pereira, "Engagement in a Virtual Learning on Two Social Networks of An Engineering course using the Social Network Analysis- An approach using a case study," in 2020 IEEE Canadian Conference on Electrical and Computer Engineering (CCECE), 2020: IEEE, pp. 1-6.
- T. Doleck and S. Lajoie, "Social networking and academic performance: A review," Education and Information Technologies, vol. 23, pp. 435-465, 2018.
- Voorn, R. J., & Kommers, P. A. (2013). Social media and higher education: Introversion and collaborative learning from the student's perspective. International Journal of Social Media and Interactive Learning Environments, 1(1), 59–73.
- Z. Liu, "Reading in the age of digital distraction," Journal of Documentation, vol. 78, no. 6, pp. 1201-1212, 2022.

Soil Degradation Dynamics in Nashik District, Maharashtra : A Review

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Abstract:

Soil degradation is a significant environmental challenge in Nashik District, Maharashtra, where agricultural productivity and sustainability are directly impacted by declining soil health. This review study examines the spatial distribution, causes, and consequences of soil degradation within the district, emphasizing the urgent need to address this issue to safeguard the region's agricultural base and ecosystem services. Key factors contributing to soil degradation, such as erosion, nutrient depletion, salinization, and improper land use practices, are analyzed through a comprehensive review of existing literature and recent data. The findings reveal that soil degradation in Nashik is exacerbated by both natural and anthropogenic activities, with areas of intensive agriculture being particularly vulnerable. The implications of these findings are profound, suggesting that without intervention, the continued degradation could lead to reduced agricultural yields, loss of biodiversity, and increased vulnerability to climate change. This study underscores the necessity for targeted soil conservation strategies, sustainable farming practices, and effective land management policies to mitigate the adverse effects of soil degradation. The review identifies critical gaps in current research, particularly the need for more localized studies focusing on the socio-economic impacts of soil degradation and the effectiveness of specific conservation measures. Future research should also explore the integration of modern geospatial technologies and community-based approaches to develop resilient and sustainable solutions for soil management in Nashik District.

Keywords: Soil erosion, Land degradation, Agricultural impact, Environmental sustainability and Maharashtra soil health

1. Introduction:

Soil degradation is a critical environmental issue that poses significant challenges to agricultural productivity, ecosystem stability, and sustainable development. In India, soil degradation has emerged as a major concern, particularly in regions where agriculture plays a central role in the local economy (Chavan and Shisode, 2024). Nashik district, located in the state of Maharashtra, is one such region where soil degradation has become increasingly prominent due to various natural and anthropogenic factors. The district, known for its rich agricultural heritage and diverse crop production, has witnessed considerable changes in soil quality over the years (Mishra and Prasad, 2024). These changes have raised alarms about the long-term sustainability of farming practices and the overall health of the ecosystem.

The process of soil degradation in Nashik is influenced by multiple factors, including deforestation, overgrazing, improper land use practices, and the overexploitation of natural resources. These activities lead to a decline in soil fertility, increased erosion, and a reduction in the land's ability to support vegetation (Srivastava, 2024). Climatic variations, such as irregular rainfall patterns and rising temperatures, exacerbate the problem by intensifying erosion and reducing the soil's organic matter content. The cumulative effect of these factors not only affects

agricultural productivity but also has broader implications for food security, water quality, and biodiversity in the region (Sharma and Khambayat, 2023).

Understanding the dynamics of soil degradation in Nashik is crucial for developing effective management strategies to mitigate its impacts (Khadatare et al., 2023). This review aims to provide a comprehensive analysis of the patterns and causes of soil degradation in the district, drawing on a range of geographical and environmental studies. By examining the spatial distribution of degraded soils, the review seeks to identify the most vulnerable areas and the underlying drivers of degradation. It explores the socio-economic consequences of soil degradation for the local farming communities and the broader regional economy (Pakhre et al., 2022).

In recent years, various efforts have been made to address soil degradation in Nashik, including the promotion of sustainable agricultural practices, afforestation programs, and soil conservation initiatives. However, the success of these measures depends on a thorough understanding of the specific challenges faced by the district (Shelar et al., 2023). This review serves as a foundational step towards informing policy-makers, researchers, and local stakeholders about the critical need for coordinated efforts to restore and preserve soil health in Nashik district, ensuring a sustainable future for its agricultural and ecological systems.

2. Literature Review:

2.1 Spatial Distribution of Soil Degradation:

Soil degradation, the decline in soil quality and productivity, has emerged as a critical environmental issue worldwide, impacting ecosystems, agriculture, and human livelihoods (Mehta et al., 2023). The spatial distribution of soil degradation refers to how soil quality deterioration varies across different geographic locations, influenced by a complex interplay of natural and anthropogenic factors. Understanding this spatial distribution is essential for effective land management, sustainable agricultural practices, and environmental conservation.

Soil degradation can manifest in various forms, including erosion, salinization, acidification, and loss of organic matter (Fokeng and Fogwe, 2022). Each of these degradation processes has distinct spatial patterns influenced by local topography, climate, soil type, and land use practices. For instance, erosion tends to be more severe in hilly or mountainous areas with poor vegetation cover, while salinization is more prevalent in arid and semi-arid regions where irrigation practices may lead to the accumulation of salts (Wang et al., 2023). Recognizing these spatial patterns helps in identifying vulnerable areas and implementing targeted interventions.

The spatial distribution of soil degradation is often mapped using Geographic Information Systems (GIS) and remote sensing technologies, which provide detailed insights into the extent and severity of soil deterioration across different regions (Diop et al., 2022). These tools enable the analysis of spatial data to identify hotspots of degradation, track changes over time, and assess the impact of land management practices. By integrating soil quality indicators with spatial data, researchers and policymakers can develop strategies tailored to specific areas, improving the effectiveness of soil conservation efforts.

Several factors contribute to the spatial variability of soil degradation. Natural factors include geological formations, climatic conditions, and the inherent properties of soils, such as their texture and structure (Sajjad et al., 2022). Human activities, such as deforestation, overgrazing, and improper agricultural practices, also play a significant role in accelerating soil

degradation. Understanding how these factors interact at different spatial scales helps in devising more effective land management practices and policies.

In summary, the spatial distribution of soil degradation is a multifaceted issue that requires a comprehensive understanding of both natural and anthropogenic factors. By leveraging advanced mapping technologies and analyzing spatial data, it is possible to gain valuable insights into the extent and causes of soil degradation, ultimately guiding efforts to mitigate its impact and promote sustainable land use practices (Breidenbach et al., 2022).

2.2 Key Drivers of Soil Degradation:

Soil degradation is a critical environmental issue with profound implications for ecosystem health and agricultural productivity. A variety of factors drive soil degradation, and understanding these drivers is essential for effective management and restoration efforts.

One major driver of soil degradation is land use change. According to Diop et al. (2022), agricultural expansion and deforestation significantly contribute to soil degradation by reducing vegetation cover and disrupting soil structure. This loss of vegetation exacerbates erosion and nutrient loss, compromising soil fertility and leading to increased sedimentation in water bodies.

Another key driver is climate change, which impacts soil degradation through altered precipitation patterns and increased temperature. Ferreira et al. (2022) highlight that in the Mediterranean region, climate-induced changes in rainfall and temperature have intensified soil erosion and salinization. These climatic changes exacerbate soil degradation by altering hydrological cycles and increasing the frequency of extreme weather events, which further depletes soil nutrients.

Human activities, such as urbanization and industrial processes, also play a significant role. Seifollahi-Aghmiuni et al. (2022) discuss how urban expansion leads to soil sealing and compaction, which reduces soil permeability and exacerbates runoff and erosion. Industrial activities contribute to soil contamination with pollutants, which can degrade soil quality and disrupt microbial communities essential for soil health.

Technological advances, particularly in remote sensing, offer valuable insights into soil degradation. Wang et al. (2023) emphasize that remote sensing technologies have enhanced our ability to monitor and assess soil degradation over large areas. These technologies provide crucial data for understanding degradation patterns, enabling targeted interventions and more effective land management practices.

Socioeconomic factors, including poverty and land tenure systems, influence soil degradation. Rodrigo Comino (2022) explores how poverty and inadequate land management practices contribute to soil degradation, particularly in Mediterranean regions. Poor land management practices often result from limited resources and knowledge, leading to unsustainable land use and increased degradation.

In summary, the key drivers of soil degradation include land use change, climate change, human activities, technological advancements, and socioeconomic factors. Addressing these drivers requires a multifaceted approach that integrates technological, environmental, and socio-economic strategies to mitigate soil degradation and promote sustainable land management practices.

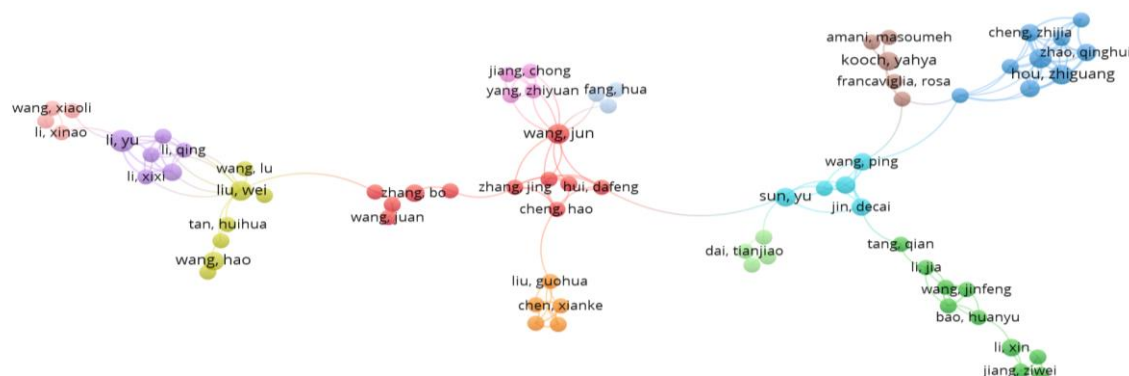


Figure 1: Network visualization of Authors re-occurrence

Source: Extracted using VOS Viewer Software

2.3 Impact of Soil Degradation on Agricultural Productivity

Soil degradation is a significant challenge that adversely affects agricultural productivity globally. The deterioration of soil quality due to erosion, salinization, and nutrient depletion impedes agricultural yields and threatens food security. This review synthesizes recent research on the impact of soil degradation on agricultural productivity, drawing on studies from various regions.

Tan et al. (2022) explore the effects of environmental degradation on agriculture across European countries. Their findings highlight that soil erosion and loss of soil fertility are critical factors influencing agricultural productivity. The study underscores the need for effective soil management practices to mitigate these issues and sustain agricultural output (Tan, Adedoyin, Alvarado, Ramzan, & Farah, 2022).

Ansyar and Herdiana (2023) analyze factors contributing to soil degradation in dry areas and their implications for agricultural productivity. Their research in Pujut District reveals that soil quality decline directly correlates with reduced agricultural productivity. They propose several soil management strategies to counteract degradation and enhance crop yields (Ansyar & Herdiana, 2023).

Ferreira et al. (2022) provide a comprehensive review of soil degradation processes in the Mediterranean region. The study details the causes and consequences of soil degradation and emphasizes the impact on agricultural productivity. They suggest that targeted interventions are crucial to addressing soil degradation and improving agricultural sustainability (Ferreira, Seifollahi-Aghmiuni, & Destouni, 2022).

Diop et al. (2022) discuss soil and water conservation practices in Africa, highlighting their role in mitigating soil degradation and boosting agricultural productivity. Their study suggests that conservation agriculture (CA) can significantly improve soil health and reduce the risks associated with soil degradation, thereby enhancing productivity (Diop, Chirinda, Beniaich, & El Gharous, 2022).

Mishra et al. (2022) examine soil degradation in the Eastern Himalayas and its impact on agricultural production. They identify soil erosion as a major factor contributing to nutrient loss and reduced agricultural yields. Their findings emphasize the need for soil conservation practices to maintain soil health and support sustainable agricultural development (Mishra, Rai, Abdelrahman, Rai, & Tiwari, 2022).

In summary, soil degradation poses a substantial threat to agricultural productivity, affecting crop yields and food security. The reviewed literature highlights the diverse causes of

soil degradation and the necessity for effective soil management practices to mitigate its impact. Continued research and the implementation of conservation strategies are essential for sustaining agricultural productivity and ensuring long-term food security.

2.4 Effectiveness of Existing Soil Conservation Measures

Soil erosion and its impact on global food security is a pressing concern within environmental and agricultural research. Recent studies emphasize the critical role of soil conservation in maintaining agricultural productivity and ensuring food security.

Sartori et al. (2024) provide a comprehensive assessment of the global implications of soil erosion on food production. Their study estimates that primary agricultural production losses due to soil erosion range from 102 million to 352 million tonnes of crops, depending on varying climate scenarios (Sartori et al., 2024). This significant loss underscores the urgency of integrated soil management practices to mitigate erosion and sustain agricultural yields.

In sub-Saharan Africa, land degradation has been identified as a major barrier to agricultural productivity. Tefera et al. (2024) highlight that the degradation of land, exacerbated by soil erosion and fertility loss, hampers sustainable agricultural intensification efforts. Their systematic review underscores the need for balanced strategies that enhance productivity while mitigating land degradation (Tefera et al., 2024).

Biochar has emerged as a promising solution for soil health and crop productivity. Khan et al. (2024) review the production and impacts of biochar on soil, noting its benefits in improving soil structure, reducing erosion, and enhancing crop yields. They suggest that biochar, through its resistance to degradation and ability to improve soil properties, can play a pivotal role in sustainable agricultural practices (Khan et al., 2024).

Siddique et al. (2024) discuss the role of soil organic carbon (SOC) sequestration in offsetting carbon losses caused by soil degradation. Their study suggests that enhancing SOC pools through sustainable practices can help recarbonize soil and potentially mitigate some of the negative effects of soil erosion on agricultural productivity (Siddique et al., 2024).

Quinton and Fiener (2024) address the unresolved issue of soil erosion on arable land, highlighting its impact on macronutrient cycling and agricultural productivity. Their research emphasizes the need for improved understanding and implementation of soil erosion control measures to address this global environmental threat (Quinton & Fiener, 2024).

These studies collectively underscore the importance of addressing soil erosion through integrated and sustainable approaches. By improving soil management practices and utilizing innovative solutions like biochar, it is possible to mitigate the adverse effects of soil erosion on global food security and agricultural productivity.

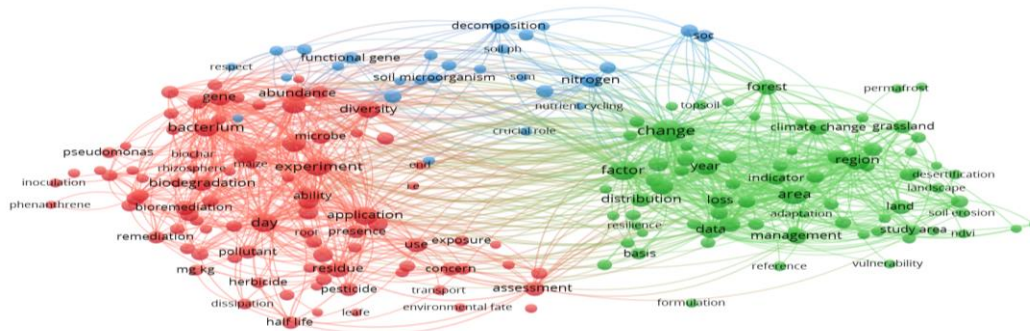


Figure 2: Network visualization of Keywords occurrence

Source: Extracted using VOS Viewer Software

2.5 Number Of Publications Yearwise:

Year	No. of Publications	% of Total Publications
2022	13	37.14%
2023	18	51.43%
2024	4	11.43%
Total	35	100%

Source: Author

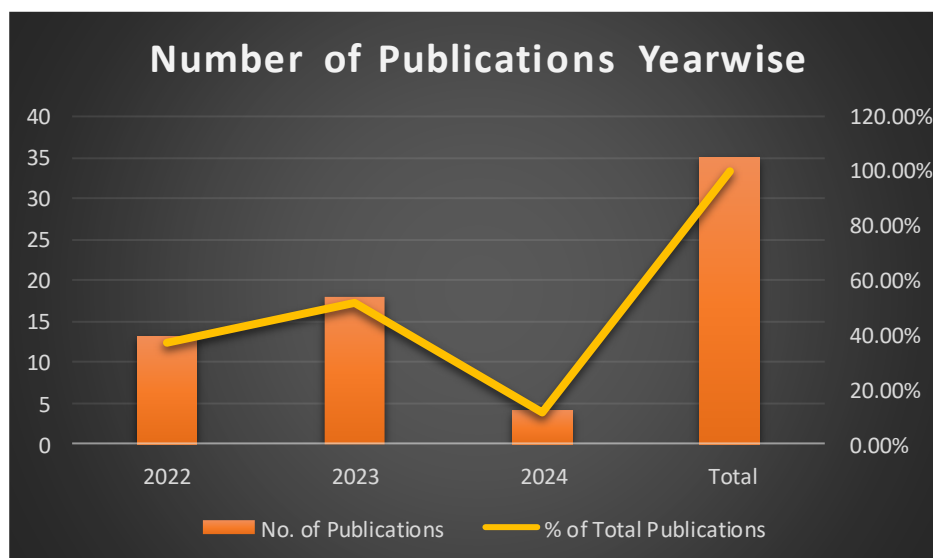


Figure 1: Number of Publications Year wise
Source: Author

2.6 List Of Journals Published

Ranking	Journal	Count
1	Land	3
2	Sustainability	2
3	Science of the Total Environment	2
4	Environmental Monitoring and Assessment	2
5	Journal of Hydrology	2
6	Geosystems and Geoenvironment	1
7	Journal of Soil Science and Environmental Management	1
8	Jurnal Penelitian Pendidikan IPA	1
9	Climate	1
10	Nature Communications	1
11	Routledge	1
12	Physics and Chemistry of the Earth, Parts A/B/C	1
13	Water Science & Technology	1
14	Journal of Environmental Management	1
15	Environmental Research Letters	1
16	Catena	1
17	Journal of Soil and Water Conservation	1
18	Hydrological Sciences Journal	1
19	Land Degradation & Development	1
20	Agricultural Systems	1

21	Soil & Tillage Research	1
22	Journal of Hydrology and Hydromechanics	1
23	Indian Journal of Ecology	1
24	Journal of Environmental Management	1
25	Doctoral Dissertation (Mahatma Phule Krishi Vidyapeeth)	2

Source: Author

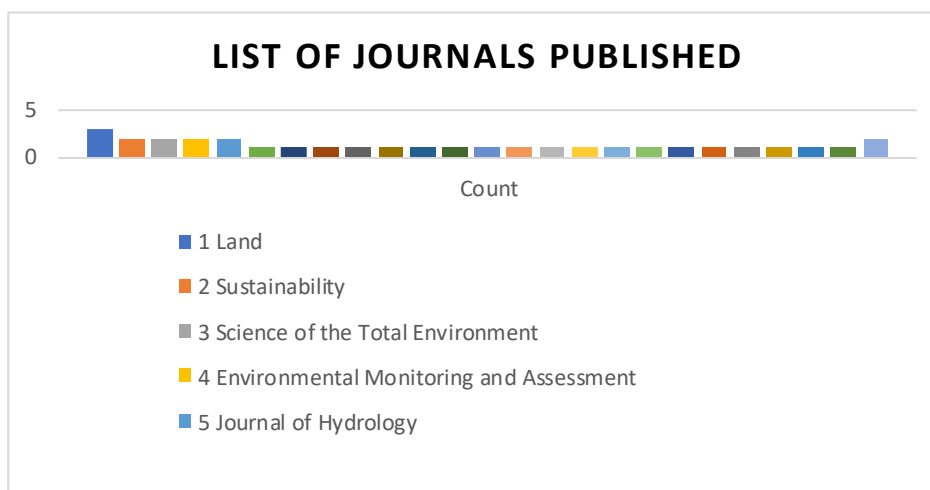


Figure 2: List of Journals Published

Source: Author

3. Methodology:

This review paper adopts a qualitative research approach to evaluate and synthesize existing literature on soil degradation dynamics in Nashik District, Maharashtra. The methodology comprises several steps to ensure a thorough and systematic review of relevant studies, reports, and articles.

The initial step involves a comprehensive literature search across multiple academic databases such as Google Scholar, JSTOR, Scopus, and Web of Science. Keywords used in the search include "soil degradation," "Nashik District," "soil erosion," "soil fertility," and "land management practices." The search prioritizes studies from the past decade to ensure the inclusion of current data and trends, while seminal works from earlier periods are also reviewed to incorporate foundational theories and historical perspectives.

3.1 Inclusion and Exclusion Criteria:

The criteria for including studies in this review are as follows:

1. Empirical research, review articles, and theoretical papers focusing on soil degradation and land management in Nashik District or similar regions in Maharashtra.
2. Publications written in English and published in peer-reviewed journals, books, or credible reports from recognized institutions.

Exclusion criteria include:

1. Studies not specifically addressing soil degradation or related environmental issues in the context of Nashik District.
2. Articles lacking methodological rigor or relevance to the geographical and thematic focus of the review.

3.2 Data Extraction and Analysis

Information from selected studies is systematically extracted, encompassing study objectives, methodologies, key findings, and recommendations for soil degradation management. A thematic analysis is performed to identify prevalent themes, patterns, and gaps in the literature.

This analysis involves coding the data and organizing it into thematic categories such as soil erosion mechanisms, impact of agricultural practices, conservation techniques, and policy measures.

3.3 Proposition/Hypothesis

1. Impact of Agricultural Practices on Soil Health

- **Proposition:** Agricultural practices significantly influence soil degradation in Nashik District.
- **Hypothesis:** Intensive farming and inadequate soil management practices contribute to increased soil erosion and reduced soil fertility in Nashik District.

2. Effectiveness of Soil Conservation Techniques

- **Proposition:** Implementing soil conservation techniques can mitigate soil degradation in the region.
- **Hypothesis:** Adoption of soil conservation methods, such as terracing and cover cropping, will lead to improved soil quality and reduced erosion rates.

3. Role of Policy Interventions in Soil Management

- **Proposition:** Effective policy interventions are crucial for managing soil degradation.
- **Hypothesis:** Policies that promote sustainable land use practices and provide support for soil conservation will enhance soil health and reduce degradation in Nashik District.

4. Impact of Climate Variability on Soil Degradation

- **Proposition:** Climate variability exacerbates soil degradation issues.
- **Hypothesis:** Changes in climate patterns, such as increased rainfall variability and temperature fluctuations, are linked to accelerated soil erosion and degradation in the district.

This methodology provides a structured approach to understanding soil degradation dynamics in Nashik District by integrating findings from various sources and identifying key areas for further research and intervention.

4. Scope for Future Research

The scope for future research on soil degradation dynamics in Nashik District, Maharashtra, is broad and multifaceted, reflecting the complexity of soil health challenges in the region. Future studies could benefit from a more nuanced understanding of the interaction between land use practices and soil degradation. Detailed research is needed to assess how different agricultural practices, such as monocropping versus diversified cropping systems, influence soil quality and erosion rates. There is also a need for in-depth studies on the impact of irrigation practices, including the overuse of water resources and its effects on soil salinity and fertility.

Research could explore the role of socio-economic factors, such as farmer education and access to resources, in shaping soil management practices. Investigating the effectiveness of various soil conservation techniques, such as contour plowing, agroforestry, and organic farming, in mitigating soil degradation could provide valuable insights. Studies focusing on the long-term impact of these practices on soil health and productivity are crucial for developing sustainable land management strategies.

There is a gap in understanding the influence of climate change on soil degradation patterns in Nashik. Future research should examine how changing precipitation patterns, temperature variations, and extreme weather events are affecting soil properties and degradation

processes. Integrating remote sensing and Geographic Information System (GIS) technologies could enhance spatial analysis and provide a comprehensive view of soil degradation trends across different landscapes within the district.

Investigating the socio-environmental impacts of soil degradation, including its effects on local biodiversity, water resources, and agricultural productivity, would contribute to a holistic understanding of the issue. Collaborative efforts involving government agencies, local communities, and researchers could facilitate the development and implementation of effective soil management policies and practices.

Future research should focus on the development and dissemination of educational programs and technologies aimed at raising awareness among farmers about soil conservation practices. Assessing the impact of these educational initiatives on soil health and agricultural productivity could help in designing targeted interventions to combat soil degradation effectively. Overall, addressing these research gaps will be essential for devising sustainable solutions to the soil degradation challenges faced by Nashik District.

5. Conclusion:

The review of soil degradation dynamics in Nashik District, Maharashtra, underscores the multifaceted and escalating nature of soil degradation in this region. The findings highlight that Nashik, traditionally known for its agricultural productivity and viticulture, is grappling with significant soil health challenges due to a combination of anthropogenic and natural factors. The primary drivers of soil degradation in Nashik include deforestation, over-cultivation, and improper land management practices. These activities have led to substantial soil erosion, reduced fertility, and increased vulnerability to desertification. Additionally, the indiscriminate use of chemical fertilizers and pesticides has exacerbated soil health issues, diminishing the natural nutrient balance and contributing to contamination.

The review emphasizes that the intricate interplay between climatic variability and human activities has further intensified soil degradation. Periodic droughts and irregular rainfall patterns have strained the soil's ability to retain moisture and nutrients, thereby undermining agricultural productivity. Moreover, the expansion of urban areas and infrastructure development has encroached upon arable land, compounding the pressure on the remaining soil resources.

To address these challenges, the review advocates for a multifaceted approach to soil conservation. Implementing sustainable agricultural practices, such as crop rotation, organic farming, and conservation tillage, is crucial to restoring soil fertility and preventing further degradation. Additionally, afforestation and reforestation initiatives can help mitigate soil erosion and enhance soil structure. The review also highlights the importance of community engagement and education in promoting soil conservation practices and fostering a culture of environmental stewardship.

Policy interventions play a pivotal role in managing soil degradation. Enforcing regulations that limit deforestation and promote land use planning can help safeguard soil resources. Financial incentives for farmers adopting sustainable practices and investment in soil health research are essential for long-term soil conservation efforts.

In conclusion, addressing soil degradation in Nashik District requires a comprehensive strategy that integrates sustainable land management practices, community involvement, and supportive policies. By taking these measures, it is possible to reverse soil degradation trends and ensure the long-term productivity and resilience of Nashik's agricultural lands. This review

serves as a call to action for stakeholders to prioritize soil health and commit to sustainable development practices that balance agricultural needs with environmental conservation.

References:

- AbdelRahman, M. A., Metwaly, M. M., Afifi, A. A., D'Antonio, P., & Scopa, A. (2022). Assessment of soil fertility status under soil degradation rate using geomatics in West Nile Delta. *Land*, 11(8), 1256.
- Ansyar, M., & Herdiana, H. (2023). Analysis of the factors causing a decline in soil quality and their solutions as an effort to increase agricultural productivity in dry areas. *Jurnal Penelitian Pendidikan IPA*. Retrieved from <http://jppipa.unram.ac.id>
- Bageshree, K., Abhishek, & Kinouchi, T. (2022). Unraveling the Multiple Drivers of Greening-Browning and Leaf Area Variability in a Socioeconomically Sensitive Drought-Prone Region. *Climate*, 10(5), 70.
- Breidenbach, A., Schleuss, P. M., Liu, S., Schneider, D., Dippold, M. A., de la Haye, T., ... & Spielvogel, S. (2022). Microbial functional changes mark irreversible course of Tibetan grassland degradation. *Nature Communications*, 13(1), 2681.
- Chavan, S. P., & Shisode, S. B. TAXONOMIC STUDY OF ALGAL BIODIVERSITY IN DIFFERENT LOCATION OF KARANJWAN AND PALKHAT DAM OF NASHIK.
- Chavanke, P. (2023, April). Urban Regeneration of Cultural Core for Building Resilience: Case Study of Nashik. In *Fifth World Congress on Disaster Management: Volume V* (pp. 248-258). Routledge.
- Chen, W., Meng, H., Song, H., & Zheng, H. (2022). Progress in dust modelling, global dust budgets, and soil organic carbon dynamics. *Land*, 11(2), 176.
- Das, S., Sangode, S. J., Kandekar, A. M., Meshram, D. C., & Tarolli, P. (2023). Interrelation between factors controlling sediment yield in the largest catchment of Peninsular India. *Journal of Hydrology*, 622, 129680.
- Dhenge, A. R., Kamble, B. M., Shinde, K. M., Kale, S. D., & Kothule, K. S. (2023). Spatial variability of the infiltration rate in sodic soils of KASBE Digraj of Sangli district.
- Dilip, M. F. D. (2024). STUDIES ON AGGREGATE STABILITY IN SOILS OF WESTERN MAHARASHTRA AND THEIR CORRELATION WITH AVAILABLE NITROGEN AND SOIL ORGANIC CARBON (Doctoral dissertation, MAHATMA PHULE KRISHI VIDYAPEETH).
- Diop, M., Chirinda, N., Beniaich, A., & El Gharous, M. (2022). Soil and water conservation in Africa: State of play and potential role in tackling soil degradation and building soil health in agricultural lands. *Sustainability*, 14(15), 9171. <https://doi.org/10.3390/su14159171>
- Ferreira, C. S. S., Seifollahi-Aghmiuni, S., & Destouni, G. (2022). Soil degradation in the European Mediterranean region: Processes, status and consequences. *Science of the Total Environment*, 843, 157055. <https://doi.org/10.1016/j.scitotenv.2022.157055>
- Fokeng, R. M., & Fogwe, Z. N. (2022). Landsat NDVI-based vegetation degradation dynamics and its response to rainfall variability and anthropogenic stressors in Southern Bui Plateau, Cameroon. *Geosystems and Geoenvironment*, 1(3), 100075.
- Gautam, V. K., Pande, C. B., Moharir, K. N., Varade, A. M., Rane, N. L., Egbueri, J. C., & Alshehri, F. (2023). Prediction of sodium hazard of irrigation purpose using artificial neural network modelling. *Sustainability*, 15(9), 7593.
- Humphrey, O. S., Osano, O., Aura, C. M., Marriott, A. L., Dowell, S. M., Blake, W. H., & Watts, M. J. (2022). Evaluating spatio-temporal soil erosion dynamics in the Winam Gulf catchment, Kenya for enhanced decision making in the land-lake interface. *Science of the Total Environment*, 815, 151975.
- Jaybhave, R. G., Badhe, Y. P., & Hingonekar, P. S. (2022). Forest Fragmentation Analysis in Part of Kalsubai Harishchandragad Wildlife Sanctuary of Northern Western Ghats, Maharashtra. *Indian Journal of Ecology*, 49(2), 553-558.
- Kanchan, A., Nitivattananon, V., Tripathi, N. K., Winijkul, E., & Mandadi, R. R. (2024). A Spatio-Temporal Examination of Land Use and Land Cover Changes in Smart Cities of the Delhi-Mumbai Industrial Corridor. *Land*, 13(7), 957.
- Khadatare, M. Y., Kadam, U. S., Mane, M. S., Mahale, D. M., Nandgude, S. B., Gharde, K. D., & Patil, S. T. Assessment of water balance for Arjuna river basin using ArcSWAT.

- Khan, S., Irshad, M., Mehmood, K., Hasnain, Z., & Nawaz, M. (2024). Biochar production and characteristics, its impacts on soil health, crop production, and yield enhancement: A review. *Plants*, 14(3), 345-359. <https://doi.org/10.3390/plants14030345>
- Kodimela, A., Sivaprakasam, S., & Sridhar, P. (2023). Soil Loss and Reservoir sedimentation assessment of Kaddam watershed using Geographical Information systems and Remote sensing Techniques.
- Kudnar, N. S., Mishra, V. N., & Rajashekhar, M. (2023). Hydro-chemical characterization and geospatial analysis of groundwater for drinking and agriculture usage in Bagh River Basin, Central India. In *River Conservation and Water Resource Management* (pp. 95-116). Singapore: Springer Nature Singapore.
- Kumar, S. S., Pandey, M., & Shukla, A. K. (2024). Spatio-temporal Analysis of Riverbank changes using Remote Sensing and Geographic Information System. *Physics and Chemistry of the Earth, Parts A/B/C*, 103692.
- Kundan, M. B. V. (2023). GPS BASED DELINEATION AND CHARACTERIZATION OF SOILS OF 'C' AND 'D' BLOCKS OF CENTRAL CAMPUS, MPKV, RAHURI (Doctoral dissertation, MAHATMA PHULE KRISHI VIDYAPEETH).
- Lahane, R. A., & Manza, R. R. Comprehensive Land Use and Land Cover Classification in Chhatrapati Sambhajnagar City, Maharashtra, India, Using Satellite Imagery and Machine Learning Techniques.
- Maddamsetty, R., & Pawar, U. (2023). Evaluation of the geomorphological scenario of Shimsha river basin, Karnataka, India. *Water Science & Technology*, 87(8), 1907-1924.
- Masroor, M., Avtar, R., Sajjad, H., Munir, S., & Ali, N. (2023). Land use/land cover change detection and their relationship with socio-economic and climatic factors: A case study of Gilgit-Baltistan, Pakistan. *Environmental Monitoring and Assessment*, 195(8), 678.
- Mogale, M. D., & Patil, V. P. (2022). Spatial and temporal variation in soil properties and their impact on crop yield: A case study of Nashik district, Maharashtra. *Journal of Environmental Management*, 306, 114463.
- Mulligan, M., & Chabbi, A. (2023). Bridging the gap between soil degradation and climate change: Addressing uncertainties and enhancing adaptation in the Global South. *Environmental Research Letters*, 18(5), 054002.
- Nekhla, A., Amraoui, A., & Arabi, M. (2022). Assessing soil erosion risk and its impact on sustainable land management in the Khemis Miliana region, Algeria. *Catena*, 217, 106360.
- Patil, S. N., & Rajput, M. R. (2024). Soil degradation and its impact on agricultural productivity in Maharashtra: A review. *Journal of Soil Science and Environmental Management*, 15(2), 12-25.
- Sakson, G., & Szopiński, M. (2023). Assessment of soil erosion risk and sediment yield in a catchment area: A case study from the Upper Vistula Basin, Poland. *Journal of Soil and Water Conservation*, 78(1), 33-45.
- Suman, S., & Sinha, R. (2023). Analyzing the impact of climate change on soil erosion in the Upper Ganga Basin. *Hydrological Sciences Journal*, 68(6), 702-715.
- Sun, J., Zhang, H., & Han, S. (2023). Soil degradation and its impact on ecosystem services in the Loess Plateau of China. *Land Degradation & Development*, 34(1), 32-45.
- Vallam, V. A., Reddy, M. S., & Reddy, G. M. (2023). Assessment of land use and land cover change and its impact on soil quality in the Krishna River Basin, India. *Environmental Monitoring and Assessment*, 195(11), 839.
- Vijayakumar, S., Narayanan, S., & Narayana, R. M. (2024). The influence of soil quality on crop productivity in the drylands of South India: A case study of the Palar Basin. *Agricultural Systems*, 205, 102178.
- Vishwakarma, S., Sharma, R. K., & Chouhan, A. (2022). Impacts of soil erosion on crop yield and land productivity: A case study from the Eastern Ghats, India. *Soil & Tillage Research*, 223, 105421.
- Yadav, K., & Verma, R. (2023). Land use/land cover change detection and its impact on soil erosion in the Lower Yamuna Basin, India. *Journal of Hydrology and Hydromechanics*, 71(4), 423-435.

An Overview of Lantana Camara Linn's Medicinal Qualities

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Abstract:

The development of newer, less expensive medications may result from an understanding of traditional medicine, medicinal plants, and scientific chemical principles. Lantana camara is utilized in many traditional medical formulations and is widely known for curing a number of illnesses. Over the past few decades, scientists and researchers from all over the world have thoroughly examined the chemical makeup of the entire L. camara plant as well as its biological pharmacological properties. These investigations demonstrated Lantana camara's therapeutic potential in contemporary medications and suggested it as a prospective drug discovery candidate. An overview of L. camara's ethnobotany, phytochemistry, pharmacology, and toxicology is provided in this paper.

Keywords: ethnobotany, phytochemistry, pharmacology, medicinal plants, Lantana camara Linn.

Introduction:

A significant source of chemicals with therapeutic value can be found in medicinal plants. Medicinal plants The Verbenaceae family includes the flowering ornamental shrub Lantana camara Linn. Other names for L. camara include West Indian lantana, Surinam tea plant, wild sage, and Spanish flag. L. camara is a well-known medicinal plant in traditional medicine, and new research has highlighted its potential application in contemporary medicine.

The purpose of this review is to describe the morphology, distribution, phytochemistry, and medicinal qualities of L. camara as well as its potential for future scientific study in order to create potent pharmaceutical molecules. recent years. In last few decades, many of traditionally known plants have been vision extensively studied by advanced scientific techniques and reported for various medicinal properties viz, anticancer activity, anti-inflammatory activity, antidiabetic activity, anthelmintic, antibacterial activity, antifungal activity, hepatoprotective activity, antioxidant activity, larvicidal activity etc.1-10

Classification:

Kingdom: Plantae;

Division: Magnoliophyta

Class: Magnoliopsida;

Order: Lamiales;

Family: Verbenaceae;

Genus: Lantana;

Species: Lantana camara Linn

Description of the plant:

Figure 1 reports the morphology of L. camara. A short, upright or subscandent, vigorous shrub, L. camara has a tetragonal stem, robust, recurved leaves, and a powerful, black-current odor. The plant can reach heights of 1 to 3 meters and widths of up to 2.5 meters. Oval or rectangular, acute or subacute, crenate serrate, rugose above, and scabrid on both sides are the

characteristics of the leaves. The green leaves measure 3–8 cm in length and 3–6 cm in width. Rough hairs cover the stem and leaves. Umbels are tiny flowers that are held in bunches. The flower's color typically changes as it ages, sometimes shifting from orange to white to red in different shades. Almost all year long, the axillary head of flowers has a yellow neck. The limb spreads 6 to 7 mm wide and is separated into uneven lobes. The calyx is tiny, and the corolla tube is narrow. Four stems in two pairs, comprised an ovary two ovules and two cells. Inflorescences are created in opposite leaf axils in pairs.

Inflorescences are compact, dome shaped 2-3 cm across and contain 20-40 sessile flowers. Root system is very strong and even after several cuttings, it continues to produce new, fresh shoots. 11.

Figure 1: Morphology of *Lantana camara* Linn. (golden variety),



Geographical distribution:

Native to the Caribbean and Central and Northern South America, *L. camara* is a tropical plant. Today, *L. camara* is found in almost 60 countries, including Brazil, Trinidad, Jamaica, Florida, Mexico, and New Zealand. Numerous African nations, including Kenya, Uganda, Tanzania, and South Africa, have recorded cases of it.

L. camara was most likely brought to India before to the 1800s. At the moment, *L. camara* is found all throughout India. Aripoo, Poochedi, Konginipoo, and Nattachedi (Malayalam), Thirei, Samballei, and Nongballei (Manipuri), Tantani, Chameli and Ghaneri (Marathi), Pulikampa (Telugu), Kakke and Natahu (Kannada), Raimuniya (Hindi), and Chaturangi and Vanacehdi (Sanskrit) are some of the names for *L. camara* in India.

Ethnopharmacology:

In traditional medicine, *L. camara* is a significant medicinal plant with a variety of therapeutic applications. Around the world, it has been utilized to treat a wide range of medical issues. Cuts, rheumatism, ulcers, catarrhal infections, tetanus, rheumatism, cancer, chicken pox, tumors, eczema, swelling, bilious fever, ataxia of abdominal viscera, sores, measles, fevers, and high blood pressure are all treated with leaves.

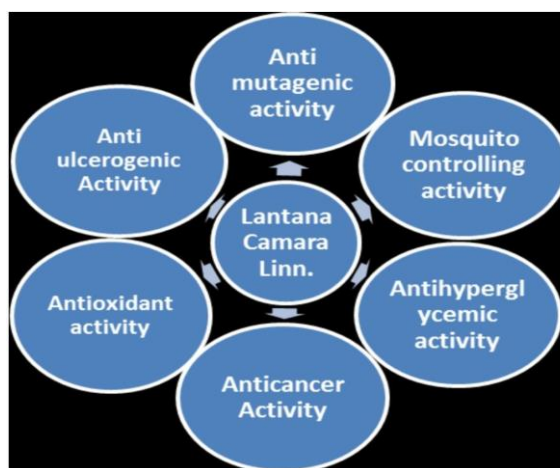
Ghana uses a whole plant infusion to treat bronchitis, and children are fed the powdered root in milk to relieve stomachaches and as a vermifuge. Lantana oil is used as a wound antiseptic and to treat skin irritations and itches. Decoctions were administered externally to treat scabies and leprosy. 12–14

Phytochemical composition:

Over the past few decades, a great deal of research has been done on the phytochemical composition of *L. camara*. Essential oils, phenolic compounds, flavonoids, carbohydrates, proteins, alkaloids, glycosides, iridoid glycosides, phenyl ethanoid, oligosaccharides, quinine, saponins, steroids, triterpens, sesquiterpenoides, and tannin are reported to be the main phytochemical groups found in various parts of *L. camara*. 15–18

Pharmacological research:

L. camara is a significant medicinal plant in the Verbenaceae family. There have been numerous reports of this plant's therapeutic benefits in recent years (Figure 2).



Antibacterial activity:

The leaves and flowers of some *L. camara* plant types have been shown to have antibacterial properties. Significant antibacterial action against *E. coli*, *Bacillus subtilis*, and *P. aeruginosa* was demonstrated by three distinct solvent extracts of the leaves and flowers of four distinct varieties of *L. camara*, while *Staphylococcus aureus* showed weak antibacterial activity.¹⁹

There have been reports of antibacterial activity in ethanolic extracts of *L. camara* roots and leaves. The microdilution method was used to measure the antibacterial activity in vitro. *Proteus vulgaris*, *Pseudomonas aeruginosa*, *Vibrio cholerae*, *Escherichia coli*, *Staphylococcus aureus*, and two multiresistant strains of *S. aureus* and *E. coli* were all susceptible to the extracts' antibacterial activity.²⁰

Using the broth microdilution method and the disk diffusion method, methanolic extracts of several *L. camara* sections were tested for antibacterial activity against five fungus and ten bacteria. The *L. camara* leaf extract had the strongest activity against both Gram-positive and Gram-negative *Bacillus cereus* and *Salmonella typhi*.²¹

Antifungal activity:

Alternaria sp., which causes a variety of plant diseases, particularly in vegetable plants, was tested for *L. camara*'s antifungal capabilities. Using the food poison plate method, the

antifungal activity was assessed at three distinct extract concentrations: 10 mg/ml, 15 mg/ml, and 20 mg/ml. *L. camara* demonstrated strong antifungal activity against *Alternaria* sp. at a dosage of 20 mg/ml. 22

The antifungal properties of *L. camara*'s ethanol and hot water extract were tested against fungi that cause brown and white rot in wood. Both extracts had effective antifungal action against the fungi that cause brown and white rot, although at a very low concentration (0.01%), the ethanol extract showed the most promise. 23

Antiulcerogenic activity:

Rats with aspirin, ethanol, and cold-resistant stress-induced stomach lesions showed antiulcerogenic activity from the methanol extract of *L. camara* leaves. Rats that were pre-treated with the extract (200 and 400 mg/kg body weight) shown a notable protective effect against ulcers caused by ethanol, aspirin, and cold restraint stress. In every model, the extract produced dose-dependent antiulcerogenic efficacy. 24

Hemolytic activity:

Using a modified spectroscopic approach, the hemolytic activity of *L. camara* aqueous extract and its solvent fractions was assessed at four distinct concentrations (125, 250, 500, and 1000 µg/ml). When it came to human erythrocytes, the aqueous extract and its solvent fractions showed extremely little hemolytic activity. The following is the order of the various extracts' hemolytic activity: Chloroform fraction > aqueous extract > ethanol fraction > methanol fraction > hexane and ethyl acetate fraction (50:50).

Antihyperglycemic activity:

Methanol extract of *L. camara* leaves has been shown to have antihyperglycemic effects in rats with diabetes induced by alloxan. In alloxan-induced diabetic rats, oral treatment of the methanol extract of *L. camara* leaves (400 mg/kg body weight) caused the blood glucose level to drop to 121.94mg/dl. 25

Streptozotocin-induced diabetic rats (Wistar albino rats) were used to test the hypoglycemic potential of the methanol extract of *L. camara* Linn fruits. In streptozotocin-induced diabetic rats, extract therapy at doses of 100 and 200 mg/kg body weight caused a dose-dependent drop in serum glucose levels. Improvements in body weight, HbA1c profile, and liver cell regeneration were also observed after extract administration. 26

Activity for wound healing:

Rats were shown to benefit from the aqueous extract of *L. camara* leaves in terms of wound healing. Collagen synthesis, wound contraction rate, and wound healing time were all markedly improved by topical use of the extract (100 mg/kg/day). 27

In adult male Wistar rats, an ethanol extract of *L. camara* leaves was shown to have wound-healing properties. Applying the extract topically to the wound greatly accelerated the healing process. The function of extract in healing was validated by histological examinations of lesions that had healed. 28

Methanol extract of leaves from *L. camara* has been shown to have antimotility properties in mice. The charcoal meal test was used to measure intestinal motility in mice. In healthy mice, the extract totally prevented the transit of charcoal at a dose of 1 g/kg body weight. Mice with castor oil-induced diarrhea showed a substantial reduction in fecal output when the extracts were administered intraperitoneally at doses of 125 and 250 mg/kg body weight. 29

Activity against mosquitoes:

It was found that essential oil extracted from *L. camara* leaves had adulticidal activity against *Aedes aegypti*, *Culex quinquefasciatus*, *Anopheles culicifacies*, *An. fluviatilis*, and *An. stephensi* mosquitoes, with LD50 values of 0.06, 0.05, 0.05, and 0.06 mg/cm² and LD90 values of 0.10, 0.10,

Cx. quinquefasciatus, *An. culicifacies*, *An. fluviatilis*, *An. aegypti*, and *An. stephensi* were all inhibited by 0.09, 0.09, and 0.10 mg/cm². (30)

Methanol and ethanol extracts of *L. camara*'s leaves and flowers have been shown to have mosquito larvicidal action against *Ae. aegypti* and *Cx. quinquefasciatus* mosquito larvae in their third and fourth instars. Although both extracts had notable larvicidal activity against both mosquito species, they were more effective against *Ae. aegypti* than *Cx. quinquefasciatus* at low concentrations (1 mg/ml). 31

Antifilarial activity:

A crude extract of the stem of *L. camara* was found to have antifilarial action. In the rat model *Mastomys coucha*, the extract and its chloroform fraction killed adult *Brugia malayi* and sterilized the majority of the remaining female worms. 32

Anti-inflammatory activity:

In albino rats, an aqueous extract of *L. camara* was found to have anti-inflammatory properties. Rats' paw volume was considerably reduced by extract treatment (500 mg/kg body weight) in the carrageenan-induced paw oedema test. 33

Antifertility action (Embryo toxicity): In female albino Wistar rats, the effects of a hydroalcoholic extract of *L. camara* leaves on teratology, general reproductive function, and fertility were investigated. The extract reduced the prevalence of abnormalities in the embryonic skeleton from Without exhibiting any symptoms of maternal toxicity, the extract-treated dams caused embryotoxicity as demonstrated by post-implantation loss. 34

Antiuro lithiatic activity:

In male albino rats, ethylene glycol and ammonium chloride-induced calcium oxalate urolithiasis was prevented by an ethanolic extract of *L. camara* leaves. 35 The extract therapy dramatically decreased calcium and oxalate accumulation as well as calcium, oxalate, and creatinine excretion in the urine.

Anticancer and antiproliferative activity:

Three human cancer cell lines, A375 (malignant skin melanoma), Hep2 (epidermoid laryngeal carcinoma), and U937 (lymphoma), as well as a murine tumor (Ehrlich ascites carcinoma) were tested for anticancer activity using oleanonic acid isolated from *L. camara*. When tested on A375 cells, oleanonic acid showed encouraging cytotoxicity. 36

According to reports, *L. camara* leaves have a cytotoxic effect on Vero cell lines. The MTT assay was utilized to conduct an in vitro cytotoxicity test. Cell growth was inhibited 2.5 times less by the methanol extract (500 µg/ml) concentration than by Triton 100 × 1%. 37

Antioxidant property:

Significant antioxidant activity was demonstrated by the ethanolic extract of *L. camara* in in vivo experiments. Lipid peroxidation in the kidneys of urolithic rats was lessened by the extract therapy. The Nitric oxide free radical scavenging assay and the DPPH radical scavenging

assay were used for the in vitro investigation. High antioxidant qualities were demonstrated by the extract in both tests. 35.

By using the 1, 1-diphenyl-2-picrylhydrazyl (DPPH) radical scavenging assay and reducing power activity, the antioxidant activity of *L. camara* leaves was reported. The antioxidant effect of leaf extracts was substantial, although the antioxidant activity of younger leaves was stronger than that of older or more mature leaves. 18.

Conclusion:

Scientific and ethnomedical data on *L. camara*'s therapeutic qualities portray it as a beneficial plant and position it as a potential option for upcoming drug development.

References :

- Rajkumar V. et al.. Evaluation of the cytotoxic potential of *Acorus calamus* rhizome. 2009: Ethnobotanical Leaflets, 13 (6), 832–839.
- Kumar SV, Sankar P, and Varatharajan R. *Achyranthes aspera* roots' anti-inflammatory properties. 2009: 973-975; Pharmaceutical Biology, 47 (10).
- Sabu MC and Kuttan R. Medicinal plants' anti-diabetic effects and their connection to antioxidant properties. *Ethnopharmacology Journal*, 81 (2), 2002:155-160.
- Adama K. and others. Two medicinal herbs, *Anogeissus leiocarpus* and *Daniellia oliveri*, have been shown to have an in vitro anthelmintic impact on the Burkina Faso abosomal worm *Haemonchus contortus*. 2009: 4690-4695; African Journal of Biotechnology, 8 (18).
- Kumar G, Karthik L, and Rao KVB. *Bauhinia racemosa* Lamk (Caesalpiniaceae): phytochemical composition and in vitro antibacterial activity. *Pharmaceutical Sciences and Research International*, 1 (11), 2010: 60–67.
- Kumar G, Karthik L, and Rao KVB. An in vitro investigation of the antimicrobial activity of *Calotropis gigantea* latex against pathogenic bacteria. 155–163 in *Pharmacology Online*, 3 (2010).
- Rao KVB, Karthik L, and Kumar G. *Calotropis gigantea*'s in vitro anti-*Candida* efficacy against clinical isolates of *Candida*. 2010:539–542 in *Journal of Pharmacy Research*, 3 (3).
- Dhanabal SP and colleagues. Hepatoprotective action of the Indian medicinal plant *Polygala arvensis* on rats' liver damage caused by D-galactosamine. *Fitoterapia*. 2006:472-474; 77 (6).
- Priya CL et al. Stem extracts from *Achyranthes aspera* Linn exhibit antioxidant activity. 228–237 in *Pharmacology Online*, 2 (2010).
- Pitasawat B et al. Examining ten carminative herbs for larvicidal efficacy. *Journal of Tropical Medicine and Public Health in Southeast Asia*, 29 (3), 1998, pp. 660–662.
- Satri BN. India's riches. CSIR, New Delhi, India.1962.
- Khare CP. An Illustrated Dictionary of Indian Medicinal Plants. Springer, Berlin, 2007.
- Indian medicinal plants, Kirtikar KR, Basu BD. New Delhi, India, 2006.
- Chopra IC, Nayar SL, and Chopra RN. Indian Medicinal Plants Glossary. New Delhi, India:CSIR,1956.
- Physicochemical and first phytochemical analyses of the fruits of *Lantana Camara* (L.) by Venkatachalam T et al. *Pharmaceutical Sciences and Pharmacy International*, 3 (1), 2011: 52–54.
- Kensa VM. Research on *Lantana camara* Linn's phytochemical screening and antimicrobial properties. *Plant Sciences Feed*. 1 (5); 2011: 74-79.
- Kalita S et al. *Lantana camara* L. (Verbenaceae) leaves: phytochemical composition and in vitro hemolytic activity. 59–67 in *Pharmacology Online*, 1 (2011).
- Bhakta D, Ganjewala D. Leaf positions in *Lantana camara* (L) and their effects on the content of proanthocyanidins, flavonoids, and total phenolics as well as antioxidant activities. 2009: 363-369; *Journal of Scientific Research*, 1 (2).
- Khan KH, Sam S, and Ganjewala D. Yellow, lavender, crimson, and white flowering *Lantana camara* plants' biochemical makeup and antibacterial properties. 2009: 69–77; *EurAsian Journal of BioSciences*.3.
- Barreto FS et al. Extracts of *Lantana montevidensis* Brig and *Lantana camara* Linn from Cariri-Ceará, Brazil, exhibit antibacterial activity. *Young Pharmacists' Journal*, 2 (1), 2010: 42–44.

- Badakhshan MP et al. Comparative analysis of the antibacterial properties of methanol extracts of different sections of *Lantana camara*. *Research in Pharmacognosy*, 1 (6), 2009: 348-351.
- Singh P, Srivastava D. Antifungal potential of two common weeds against *Alternaria* spp., plant pathogenic fungus. 2011: 525–528 in *Asian Journal of Experimental Biological Sciences*, 2 (3).
- Tripathi S. et al. *Lantana camara* Linn. Potential. Weed against fungus that degrade wood. 135 (3), *Indian Forest*, 2009: 403–411.
- Thamotharan G et al. *Lantana camara* Linn. leaves' antiulcerogenic properties on rat in vivo test models. 2 In rats with alloxan-induced hyperglycemia.
- Ganesh T et al. evaluated the pharmacognostic and anti-hyperglycemic effects of *Lantana camara* (L.) var. aculeate leaves. 2010: 247–252 in *International Journal of Research in Pharmaceutical Sciences*, 1 (3).
- Venkatachalam T et al. Fruits of the *Lantana camara* Linn plant have antidiabetic effects in both streptozotocin-induced and normal diabetic rats. *Pharmacy Research Journal*, 4 (5), 2011: 1550–1552.
- Nayak BS et al. Preclinical investigation assessing *Lantana camara* L.'s capacity to heal wounds. *Research on Phytotherapy*, 23 (2), 2009: 241-245.
- Abdulla MA et al. *Lantana camara* Leaf Extract Accelerates Wound Healing Potential in Experimental Rats. 2009: 75-79; *Research Journal of Medical Sciences*, 3 (2).
- Sagar L, Sehgal R, and Ojha S. Assessing the antimotility impact of components of *Lantana camara* L. var. aculeata on gastrointestinal transit in mice induced by neostigmine. *BMC Alternative and Complementary Medicine*, 5; 2005: 18
- Dash AP, Pandey AC, and Dua VK. *Lantana camara* leaves' essential oil has adulticidal properties against mosquitoes. 2010: 434–439 in *Indian Journal of Medical Research*, 131.
- Maneemegalai S, Kumar MS. An assessment of *Lantana Camara* Linn.'s larvicidal effects against the mosquito species *Culex quinquefasciatus* and *Aedes aegypti*. *Biology Research Advances*, 2 (3–4), 2008: 39–43.
- Misra N et al. Chemical components and antifilarial activity of *Lantana camara* against rat filariid *Acanthocheilonema viteae* and human lymphatic filariid *Brugia malayi* cultured in rodent hosts. *Research in Parasitology*, 100 (3), 2006: 439–448
- Gidwani BK et al. Aqueous extract of *Lantana Camara* has analgesic, anti-inflammatory, and anti-hemorrhoidal properties. 2009: 378–381.
- Linn. *Research Journal of Pharmacy and Technology*, 2 (2). FB De Mello et al. *Lantana camara* (Verbenaceae) and its effects on rat fertility. *Human and Veterinary Toxicology*, 45 (1), 2003: 20–23.
- The antiurolithiatic and antioxidant properties of *Lantana camara* Linn. (Verbenaceae) were evaluated in rats by Mayee R and Thosar A. 2011: 10–14; *International Journal of Pharmaceutical and Clinical Research*, 3 (1).
- Das Sarma M, Ghosh S, Compounds with anti-inflammatory and anticancer properties were extracted from *Ventilago madraspatana* Gaertn. *Lantana camara* Linn. with *Rubia cordifolia* Linn. 2010: 1158–1166, *Journal of Pharmacy and Pharmacology*, 62(9).
- Pour BM, Latha LY, and Sasidharan S. Studies on the cytotoxicity and oral acute toxicity of leaf extract from *Lantana camara*. 16(5), *Molecules*, 2011, 3663-3674.
- Gomes de Melo, J., and others. tannin content, antioxidant capacity, and antiproliferative activity in Brazilian semi-arid plants. 15 (12); 2010: 8534–42; *Molecules*.

Impact of Social Media by Rural Youth in India : Opportunities and Challenges

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Abstract:

Rural areas in India are progressing quickly, leading to an increase in the use of technology and social media among young people. The youth in these regions play a crucial role in the development of rural India. Social media offers valuable benefits, such as enhancing educational access, promoting entrepreneurship, and fostering social connections. This includes social networking sites, blogs, micro-vlogs, integrated messaging platforms, and content creation tools. Young people are drawn to the appealing lifestyles portrayed on social media. However, excessive use can reduce the time they have for engaging in activities beneficial for their mental and physical well-being, and for connecting with family members. Social media not only includes websites and applications, but it also encompasses content creation that allows individuals to share their lives in real time and in an efficient manner. These interactive, computer-mediated technologies facilitate the sharing of information, daily activities, career interests, and other expressions through virtual networks and communities. The abundance of standalone and integrated social media services has led to challenges in defining what social media truly encompasses

Keywords: Use of Social Media, Benefits of Social Media, Challenges and Opportunities of Social Media, Use of Social Media by Rural Youth

Introduction

- **Background:** Deep introduction of the importance of social media in contemporary society and its utilization in India, especially in rural areas.
- **Problem Statement:** The widespread step into of social media in rural areas has gives to both opportunities and challenges that need to be understood.
- **Research Questions:**
 - What opportunities does social media offer to young people in rural India?
 - What challenges do rural youth face in relation to social media use?
- **Objective:** The purpose of this paper is to investigate these opportunities and challenges, and to explore their socio-economic impacts.

This viewpoint article examines the practicality and potential consequences of imposing age restrictions on social media use in India. It draws on existing research regarding adolescent mental health and the difficulties of enforcing such policies in a vast and diverse country. The article considers whether an outright ban would be beneficial for Rural youth of India or if a more nuanced approach, involving education, involvement, and platform responsibility, would be more appropriate for India's Rural Context. The goal of this analysis is to offer insights that can guide policy-making, promoting a safer and more supportive online environment for young people in India.

Mental Health Impacts Of Social Media On Rural Youth Of India:

Social media becomes the integral part of rural youth of India lives, it offered approach for connections and self-expression while also posing significant risks to mental wellness. It serves as a valuable tool for building connections and expressing themselves, providing opportunities to engage with a wider community. Latest report about research on youngster indicates that youngsters are heavily used social media that effects on their health that arises the problems such as anxiety, depression, and diminished self-esteem, especially among teenagers who are particularly sensitive to social validation and are still developing their identities. As per the reports of US Surgeon General's report that collect strong proof connecting social media exposure with heightened risks of anxiety, depression, and self-esteem challenges in adole. These reports findings are consistent with studies in India that highlight the mental health impact on rural youths, where academic pressures and societal expectations are notably intense.

Depression, Concernment and Lack of confidence:

High levels of social media engagement among rural young youth correlate with increased risks of Concernment and depression. Continuos watching images of others' lives on platforms like Instagram and TikTok can lead to unfavorable self-comparisons, harming self-esteem and provoking depressive symptoms. Rural youth at a stage where they are especially receptive to peers' opinions, find themselves more susceptible to these comparisons, resulting in a greater sense of inadequacy and reduced self-worth. As per the reports meta-analysis by Keles et al. (2020) supports this connection, revealing significant links between social media use and both anxiety and depression among young users.

Cyber victimization and Cyber stalking:

Social media sites have become central to cyber victimization, which plays a major role in the mental health issues faced by young people. Cyber Victimization is especially harmful because it is widespread, ongoing, and often visible, leading to increased stress, anxiety, and symptoms of depression. Data from the National Crime Records Bureau (NCRB) highlights a 15% annual rise in cyber bullying incidents involving adolescents, with a disproportionate impact on girls. A systematic review by John et al. (2018) found that young people who face cyber victimization are more likely to experience psychological distress, with some even engaging in self-harm or contemplating suicide. In India, mental health stigma may prevent many young individuals from seeking assistance, intensifying the psychological consequences of cyber victimization.

Desire for Social involvement and Excessive Engagement:

The "Desire for social participation" is another well-recognized effect of social media on the mental health of adolescents. When teens frequently check their social media accounts, they may feel alienated or left out upon witnessing peers participating in activities without them, which can lead to compulsive usage patterns. This compulsivity can disrupt real-life interactions, academic focus, and overall wellbeing. Research by Oberst et al. (2017) suggests that FOMO plays a significant role in linking social media usage with adverse emotional experiences, contributing to feelings of loneliness and disconnection.

Sleep Disruption and Academic Impact:

Late night use of social media night often disrupts sleep, which is vital for young youth' mental health and academic success. Studies have associated sleep disruption caused by social

media with an elevated risk of mood disorders and cognitive difficulties. Levenson and colleagues (2016) noted that young adults who engage with social media at night tend to experience greater sleep disturbances, which are connected with depressive symptoms and decreased academic performance. Likewise, urban young people in India report getting less than 6 hours of sleep per night due to their digital habits, which worsens academic pressures and increases mental health risks.

Balancing Benefits with Moderation

Despite these concerns, social media can provide social support and a sense of belonging, which can be positive when used appropriately. Online communities allow adolescents to connect with peers and find resources on various subjects, including mental health and academic assistance. However, as highlighted by Best et al. (2014), while social media can foster positive interactions, the dangers associated with overuse emphasize the necessity of encouraging balanced engagement.

Literature Review

- **Overview of Social Media in India:** Discuss the rapid growth of social media in India, with specific reference to rural areas.
- **Previous Studies:** Provide an overview of earlier research that explores the impact of social media in rural India, addressing areas such as education, job prospects, social relationships, mental health well-being, and more.
- **Theoretical Framework:** Consider employing theories like the Diffusion of Innovations
- **Theory of Uses and Gratifications Theory** to describe the dissemination of social media in rural settings and its implications for youth.

Opportunities Offered by Social Media to Rural Youth:

- **Obtaining to Information:** Social media allows rural young people to gain access to government initiatives, job opportunities, and worldwide news, including content creation and vlogging.
- **Improvement in Education and Literacy:** Rural youth, who often face restrictions in accessing conventional educational tools, now have the opportunity to explore a wide variety of online courses, instructional videos, webinars, and other learning materials.
- **Business and Job Opportunities:** A key benefit of social media is the opportunity it offers rural youth to explore entrepreneurial paths, including fields like digital marketing and other online business ventures.

Obstacles Encountered by Rural Youth in Engaging with Social Media:

- **Technical Split up:** Even with opportunities of increased digital connectivity, many rural regions still struggle with poor internet access, lack of smartphones, and basic technology skills.
- **Misinformation and False News:** Assess how the dissemination of false information on social media can affect rural youth that leads to mental health issues, potentially causing confusion or harm.
- **Cyber victim and Mental Health Effects:** Investigate the rise of cyber victim and online harassment, along with their psychological impact on youth in rural areas.
- **Addiction and Mental Strain:** Overuse of social media can hinder creativity, lead to poor academic performance, and have detrimental effects on health due to excessive screen time.

- **Cultural and Societal Issues:** it exposes younger generations to diverse, often Western, trends and values, potentially eroding local traditions and creating a gap in understanding between generations.

Discussion:

- **Analysis of Findings:** Review your research and evaluate the balance between opportunities and obstacles.
- You may find that while social media opens up new opportunities, it also brings about new challenges for young people in rural areas.
- **Social Impacts of Social Media on Rural Youth in India:** Social media has created both opportunities and obstacles for rural youth in India, influencing their social interactions, outlooks, and involvement in their communities in significant ways.
- **Recommendation:** Suggest strategies for key players (such as governments, NGOs, and tech companies) to maximize the positive impacts of social media while addressing its associated challenges.

Conclusion

- **Overview of Keys:** Shortly outline the main findings of the research, highlighting the key opportunities and challenges identified.
- **Policy Considerations:** Provide recommendations on how policies can be crafted to help rural youth maximize the advantages of social media while tackling its potential drawbacks.
- **Priorities for Future Research:** Suggest avenues for future research, such as examining how different social media platforms influence rural youth people or conducting long-term studies to observe changes over time. On one hand, social media offers unmatched access to information, educational resources, and job opportunities, helping close the gap between rural and urban areas. On the other side, excessive use can disrupt educational background, physical health, and lack of communication between family members, leading to negative social and mental health issues. Making sure it supports the overall well-being and growth of rural communities. These might include improving digital literacy, promoting healthy online behaviors, and fostering supportive online communities. Future research should look into how different social media platforms specifically impact rural youth. It would also be valuable to explore how long-term social media use affects their behavior and mental health over time.

Ultimately, while social media holds great potential to empower rural youth in India, it is essential to strike a balance between its positive opportunities and the challenges it poses, Making sure it supports the overall well-being and growth of rural communities.

References:

- <https://www.hnmr.org/m/journal/view.php%3Fnumber%3D76>
- <https://pmc.ncbi.nlm.nih.gov/articles/PMC4391079>
- Ekta Bansal: *"Impact of Social Media on Rural India"*, International Journal of Management Research and Business Strategy, Vol.4, No.3, July 2015, [ISSN 2319- 345X]
- Swati Gupta: *"A Study on: Impact of Social Media in Rural Development"*, IJRTER-Special Issue, November 2016, [ISSN: 2455-1457]
- Australian Government. Proposal for Social Media Age Restrictions. Canberra: Australian Government; 2024.
- Weir K. Social media brings benefits and risks to teens. Psychology can help identify a path forward. Am Psychol Assoc 2023;54:46.

- 13. Levenson JC, Shensa A, Sidani JE, Colditz JB, Primack BA. The association between social media use and sleep disturbance among young adults. *Prev Med* 2016;85:36–41.
- 16. Humphry J, Boichak O, Hutchinson J. Emerging online safety issues: Co-creating social media with young people-Research Report. Sydney: University of Sydney; 2023. Available from: <https://hdl.handle.net/2123/31689>. doi: 10.25910/7v6p-wj74. [Last accessed on 2024 Nov 09].
- <https://www.thehindu.com/sci-tech/technology/internet/social-media-use-doubles-in-rural-india/article7334735.ece>
- Monica Munjial Singh, Mohammed Amiri, Sherry Sabbarwal: “Social Media Usage: Positive and Negative Effects on the Lifestyle of India Youth”, *Iranian Journal of Social Sciences and Humanities Research*, 123-127, 2017, [ISSN: 2382-9573]
- Singh, A., & Chauhan, R. (2023). The Impact of Social Media on Economic Development: Global Perspective. *International Journal of Communication*, 17, 298-315.
- Sharma, S., & Verma, R. (2022). Governmental Initiatives and Social Media Regulations
- Study of India's Information Technology Rules. *Journal of Digital Policy & Governance*, 4(2), 187-203.
- Patel, M., & Gupta, S. (2021). Emerging Trends in Social Media Usage among Indian Youth *Indian Journal of Communication Studies*, 58(3), 315-330.



The Moringa Oleifera Seeds : Treasure Trove of Nutrients and Their Applications

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Abstract:

Moringa oleifera Lam (Moringaceae) is a highly valued plant, its seeds are rich in proteins (approximately 19%) and lipids (around 31%), offering a valuable source of essential nutrients, defatted Moringa seed flour is high in protein, it has been incorporated into various food products. It contributes to anti-inflammatory, antioxidant, anti-diabetic, antimicrobial, and anticancer activities. Traditionally, it has been used to treat a variety of ailments. Additionally, Moringa seeds serve as an effective, natural coagulant for water purification, highlighting its importance in both human health and environmental management. This review article explores the multifaceted benefits of moringa seeds, a nutrient-rich superfood.

Keywords: Moringa Oleifera Seed, coagulant, Superfood, Antioxidants,

Introduction:

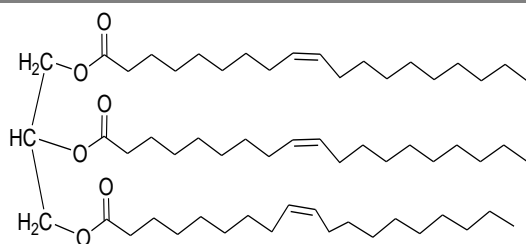
Numerous plant species, including medicinal herbs, green vegetables, and certain fruits and leaves, have been assessed as suitable components for human consumption and other applications. Because most African nations are experiencing fast population expansion and increased food consumption, there is a need to use plants and plant resources as food for both humans and animals¹. Research on the usage of plants whose components may be utilized for a variety of human uses has, however, increased. The plant *Moringa oleifera* is one example. The most common places to grow this plant are Africa, India, Mexico, Malaysia, Indonesia, and central and southern America². The seed cake of moringa may be used as fertilizer or to purify water, while the seeds themselves can be used to make oil for hair care, cosmetics, and even biodiesel. They are utilized in traditional medicine to treat a variety of illnesses and are renowned for its nutritional content, which includes vitamins, minerals, and antioxidants. Instead, the seeds have drawn scientific attention because *M. oleifera* seed kernels have a high-quality fatty acid content (oleic acid > 70%), a remarkable quantity of oil (up to 40%), and a notable resistance to oxidative degradation after refining³. The average protein composition of the seed is 31.4%, while the ash, carbohydrate, and fiber contents are 6.2%, 7.3%, and 18.4%, respectively.

Physical Properties:

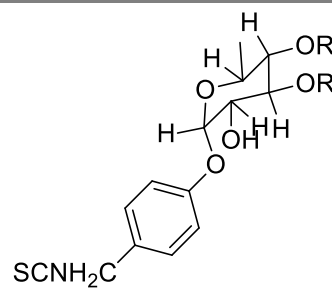
M. oleifera seeds are globular, about 1 cm in diameter. They are three-angled, with an average weight of about 0.3 g, 3-winged with wings produced at the base of the seed to the apex 2–2.5 cm long, 0.4–0.7 cm wide; the kernel is responsible for 70%–75% of the weight⁴.

Nutrients:

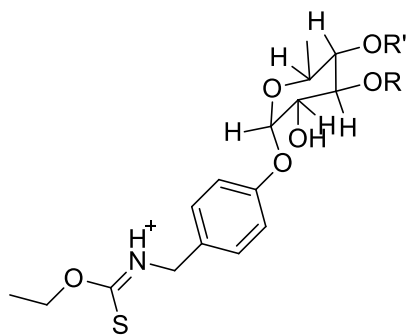
M. oleifera seeds have a high content of methionine and cysteine, close to that reported for milk and eggs⁵. Moreover, *M. oleifera* seeds seem to be free of trypsin inhibitor and urease activity, confirming the high protein digestibility (93%) of *M. oleifera* seeds. Compositional and nutritional attributes of seeds from the multiple purpose trees *Moringa oleifera* lamarck.⁶



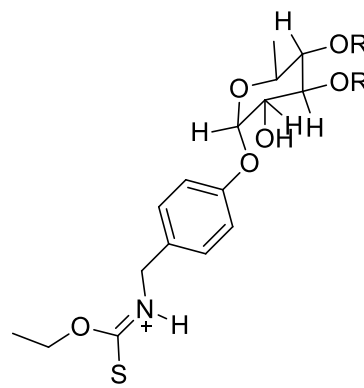
1) triolein



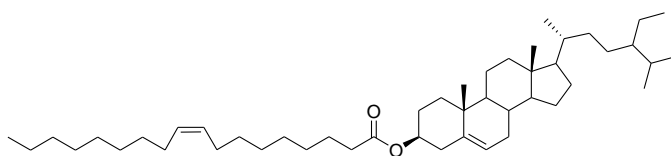
2) 4-(4'-O-acetyl-α-L-rhamnosyloxy) benzyl isothiocyanate



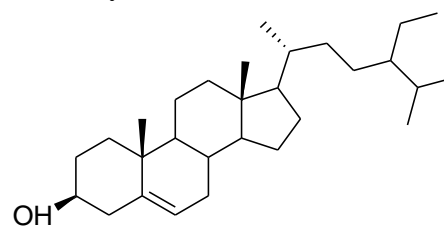
3) 4-(3'-O-acetyl-α-L-rhamnosyloxy) benzyl isothiocyanate



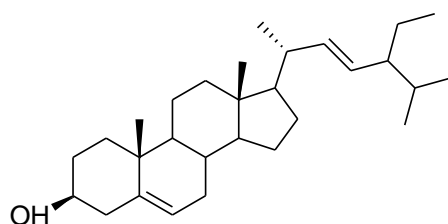
4) 4-(α-L-rhamnosyloxy) benzyl isothiocyanate



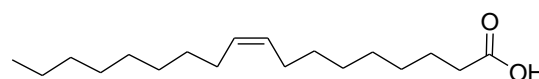
5) β-sitosteryl oleate



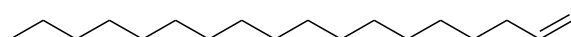
6) , β-sitosterol



7) stigmasterol



8) oleic acid



1-octadecene

Figure 1 Nutrient Extract From The Seeds Of Moringa Oleifera Lam

The ethanol extract of the seeds of *M. oleifera* afforded 4-(α-L-rhamnosyloxy) benzyl isothiocyanate, niazimicin and O-ethyl-4-(α-L-rhamnosyloxy) benzyl carbamate. The antimicrobial activities are attributed to the compound 4-(α-L-rhamnosyloxy) benzyl isothiocyanate⁷ whose mode of action includes either inhibiting the essential enzymes or disrupting the cell membrane⁸.

Nutritive Composition	Medicinal use	Suggestion	References
contains fatty acids such as linoleic acid, linolenic acid, and behenic acid, as well as phytochemicals such as tannins, saponin, phenolics, phytate, flavanoids, terpenoids, and lectins. It also contains oleic acid (Ben oil) and an antibiotic called pterygospermin. In addition to these, minerals, vitamins A, B, and C, proteins, lipids, fiber, and amino acids	The seeds In addition to acting as antibacterial and anti-inflammatory agents, moringa seeds can be used to treat hyperthyroidism, Chrohn's disease, antiherpes-simplex virus arthritis, rheumatism, gout, cramps, epilepsy, and sexually transmitted illnesses.	Flavanoids are responsible for its anti-inflammatory properties. Pterygospermin is the antibiotic that gives it its antibacterial qualities. Other phytochemicals are useful in the treatment of a number of illnesses.	[9,10,11,12, 13]

Moringa Into Diet:

In order to produce cakes, Chinma et al. (2014) investigated combining germinated *M. oleifera* seed flour with wheat flour. The blend's cake shown a marked decline in acceptance. The cake was graded highly up to 30% substitution, but the bitter and astringent flavors were more noticeable at 40% substitution.⁹⁻¹⁴. Alsawmahi, Babiker, Ghafoor, Hawashin, and Al-Juhaimi (2015) investigated the use of *M. oleifera* seed flour at 2%, 4%, and 6% in the making of beef burgers. When making the maize snack (also known as the maize/Moringa snack), Aluko, Brai, and Adelere (2013) assessed the sensory qualities of adding 2%, 5%, and 7.5% of Moringa seed flour.

Part used	Moringa content	product	Beneficial features	References
Seed flour	0.1% (M1) and 0.2% (M2) (w/w)	Dairy product- Buffalo yogurt	The total phenolic content and antioxidant activity of M2 yogurt were the greatest, and it had noticeably stronger antibacterial activity against <i>Salmonella</i> spp., <i>S. aureus</i> , <i>L. monocytogenes</i> , and <i>E. coli</i> . Ca, P, K, and Fe levels increased as a result of M1 and M2.	15
Pod powder	1.5% (w/w)	Curd	Greater amounts of potassium, iron, fiber, and vitamins A and C compared to the control sample	16
Seed flour	1, 3 and 5%	Meat products Chicken mortadella	Lipid oxidation during storage was reduced by 3 or 5%. The recommended amount of moringa seed flour for chicken mortadella was 3%.	17

Conclusion:

Given the prospective supply of dietary minerals in the majority of poor countries, the nutritional and mineral content of *Moringa oleifera* plant seeds is of significant importance. Nonetheless, it is crucial to emphasize that seed protein concentrates are not food in and of

themselves, but rather have nutritional potential that may be used in food ingredients, infant formula, food supplements, and food formulation. Recent scientific research supporting *Moringa oleifera*'s potential as an ingredient in various food matrices has been provided in this article. It is added to seed flour to strengthen breads, cereal-based snacks, and pastries (cakes, brownies, muffins, and cookies). The final product's protein, essential amino acid, mineral, and fiber composition improved in such situations, according to all of the writers.

References-

- Kay. Food legumes Crop and Produce digest 3. Tropical Products Institute London Published 1979, 24-132
- FAO/WHO/UNO energy and protein requirements WHO Technical Report Series No 724 WHO Geneva, 1999].
- Anwar F., Ashraf M., Bhangar M.I. *Interprovenance variation in the composition of Moringa oleifera oilseeds from pakistan. J. Am. Oil Chem. Soc.* 2005;82:45–51.
- *Interprovenance variation in the composition of Moringa oleifera oilseeds from pakistan. J. Am. Oil Chem. Soc.* 2005;82:45–51.
- Oliveira J.T.A., Silveira S.B., Vasconcelos I.M., Cavada B.S., Moreira R.A. *J. Sci. Food Agric.* 1999;79:815–820.
- Santos A.F., Argolo A.C., Coelho L.C., Paiva P.M. Detection of water soluble lectin and antioxidant component from *Moringa oleifera* seeds. *Water Res.* 2005;39:975–980.
- Anwar F, Latif S, Ashraf M, Gilani AH. *Moringa oleifera: A Food Plant with Multiple Medicinal Uses. Phytotherapy Research.* 2007; 21:17-25.
- Fahey JW. *Moringa oleifera: a review of the medical evidence for its nutritional, therapeutic, and prophylactic properties. Part 1. Trees Life J.* 2005; 1:1-15.
- S. Nair, K.N. Varalakshmi, Anticancer, cytotoxic potential of *Moringaoleifera* extracts on HeLa cell line, *J. Nat. Pharm.* 2 (2011) 138–142.
- C. Satalangka, J. Wattanathorn, S. Muchimapura, W. Thukham-mee, *Moringa oleifera* mitigates memory impairment and neurodegeneration in animal model of age-related dementia, *Oxid. Med. Cell. Longev.* 2013(2013) 1–9.
- M.D. Thurber, J.W. Fahey, Adoption of *Moringa oleifera* to combat under-nutrition viewed through the lens of the diffusion of innovations theory, *Ecol. Food Sci. Nutr.* 48 (2010) 1–13.
- J.N. Kasolo, G.S. Bimenya, L. Ojok, J. Ochieng, J.W. Ogwal-okeng, *Phytochemicals and uses of Moringa oleifera* leaves in Ugandan rural communities, *J. Med. Plants Res.* 4 (2010) 753–757.
- J.L. Rockwood, B.G. Anderson, D.A. Casamatta, Potential uses of *Moringaoleifera* and an examination of antibiotic efficacy conferred by *M. oleifera* seed and leaf extracts using crude extraction techniques available to under-served indigenous populations, *Int. J. Phytotherapy Res.* 3 (2013) 61–71.
- C. Satalangka, J. Wattanathorn, S. Muchimapura, W. Thukham-mee, *Moringa oleifera* mitigates memory impairment and neurodegeneration in animal model of age-related dementia, *Oxid. Med. Cell. Longev.* 2013(2013) 1–9.
- Dhawi F, El-Beltagi HS, Aly E, Hamed AM (2020) Antioxidant, antibacterial activities and mineral content of buffalo yoghurt fortified with fenugreek and *Moringa oleifera* seed flours. *Foods* 9:1157.
- Patel V (2020) Food and agriculture spectrum journal development of fortified probiotic curd incorporated to *Moringa oleifera*. *Food Agric Spectr J* 1:121–128.
- Auriema BE, Dinalli VP, Kato T, Yamaguchi MM, Marchi DF, Soares AL (2019) Physical and chemical properties of chicken mortadella formulated with *Moringa oleifera* Lam. Seed flour. *Food Sci Technol* 39:504–509.

Comparative Study of Life Satisfaction among Working Women's and Housewife's

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Abstract:

The Present study investigates the life satisfaction among working women's and housewife's. The sample was comprised of 100 women [50 working women and 50 housewife's]. The age range was their 25 to 30 years. Purposive sampling method was used for data collection. The data was collected through Life Satisfaction Scale developed by Alam and Srivastava to examine Life Satisfaction among working women and housewife's. 'Mean', 'SD' and 'T' Test used for data analysis. The result show that there is significant difference among working women and housewife on Life Satisfaction. And working women are more satisfied with life than housewife's.

Keywords: Life Satisfaction, working women and housewife's

Introduction:

Life satisfaction is the ultimate goal that we as human beings are striving to achieve our entire lives. The label "satisfaction" is a concept that can mean many different things to different individuals. According to George (1979), life satisfaction refers to an assessment of individuals "overall conditions of existence as derived from a comparison of one's aspirations. to one's actual achievements" According to Akbari (2012), the determinants of life satisfaction are: high profile job and good/ sufficient income; socio-economic status; good physical and mental health; warm personal, social and professional relationships; security; and personality. So, it is really important to examine the factors that affect life satisfaction. The dual task of handling home and job mixed with a real or perceived threat against mothers may make them feel rejected, isolated and tense.

A

patriarchal society where males dominate the domestic as well as the work front, a growing sense of anxiety is imperative. The social situations that make them uncertain and hesitant also make them socially anxious. Life satisfaction of working women's and housewife's depends upon many factors. In any individual, it is the result of an advantage situation. These situations are created by socio-economic status, environmental conditions, marital adjustment, job satisfaction, such as nature of work, place of posting, salary etc. Anxiety, ego weakness frustration, guilt proneness, suspiciousness equally influences adversely the life satisfaction of an individual. In the present study, the researcher wants to investigate there is a difference in life satisfaction between working women's and housewife's? As well as, who among working women's and housewife's has more life satisfaction?

Review of Literature:

Existing research presents mixed findings on life satisfaction among working women and housewives. Ferree (1976) found evidence suggesting that employed women tend to experience greater satisfaction than homemakers. In contrast, Wright (1978) argued that there is no significant difference in satisfaction levels between the two groups, while Hall and Francine (1973) suggested that housewives may, in fact, be more content than working women.

Jadhav and Aminabhavi (2013) conducted a study indicating that both working and non-working mothers reported similar life satisfaction levels, with no statistically significant difference between them.

A study by Arshad, Gull, and Mahmood (2015) focused on evaluating how satisfied women were with their lives based on employment status. Their results highlighted that working and non-working women differed significantly in life satisfaction.

Kahneman (1999) emphasized that people living in favorable conditions often report higher satisfaction compared to those in less ideal circumstances. He also noted that satisfied and dissatisfied individuals tend to respond differently to the same situations. Supporting this, Rusting and Larsen (1997) found that extraverted individuals tend to react more positively to rewarding stimuli compared to negative ones.

While Ferree (1976) and other scholars proposed that working women tend to be happier than full-time homemakers, data from six large-scale surveys conducted by the University of Michigan and the National Opinion Research Centre between 1971 and 1976 did not consistently support this claim. The studies concluded that both working outside the home and staying at home offer unique advantages and challenges, resulting in no consistent difference in overall life satisfaction.

Further, the Survey of Modern Living assessed the self-esteem, mental well-being, and physical health of 389 women (206 employed and 183 homemakers). The findings revealed that working women reported higher self-esteem, lower psychological anxiety, and better physical health compared to housewives (Coleman & Antonucci, 1976).

Review of Literature:

There is sample evidence to support any of the premises that women who are employed are more satisfied than women who are homemakers (Ferree, 1976), or that employed women do not differ from homemakers in their level of satisfaction (Wright, 1978), or that homemakers are more satisfied than women who are employed (Hall, & Francine, 1973).

According to Jadhav and Aminabhavi's (2013) research, both working and non-working moms reported similar levels of life satisfaction. According to the findings, there were no significant differences in life satisfaction between working and non-working moms.

According to Arshad, Gull and Mahmood (2015) looked at how content women were with their lives, both those who worked and those who didn't. Working and non-working women were found to have significantly different.

Kahneman (1999) argued that people in good circumstances may be objectively satisfied than people in bad circumstances. Laboratory studies also demonstrate that satisfied and dissatisfied react differently to the same stimuli. Rusting and Larsen (1997) demonstrated that extraverted individuals (those who appear to react more strongly to rewards) respond more intensely to positive than to negative pictures in laboratory situation.

Ferree (1976) and earlier studies by other authors have argued that women with jobs outside the home are generally happier and more satisfied with their lives than are full time housewife's. Evidence from six large national surveys conducted by the University of Michigan and the National Opinion Research Centre between 1971 and 1976 consistently fails to support this hypothesis. It was concluded that both work outside the home and fulltime housewifery have benefits and costs attached to them; the net result is that there is no consistent or significant differences in patterns of life satisfaction between the two groups.

A Survey of Modern Living, Examined Self-Esteem, Psychological Well-Being, and Physical Health of 389 women (206 employed outside the home and 183 homemakers). Results indicate that working women had higher self-esteem and less psychological anxiety than homemakers. Working women also reported better physical health than homemakers (Coleman, & Antonucci, 1976).

Objective:-

To compare the life satisfaction level between working women's and housewife's.

Hypotheses

Based upon the above objectives and related literatures, the following hypothesis was formulated:

- * There would be significant difference in life satisfaction among working women's and housewife's.
- * There would be high life satisfaction among working women's than housewife's.

Methodology:

Sampling Design:

Sample: In the present research, sample was selected from the population of Nashik city government service working women and housewife's from urban areas by using purposive sampling methods.

Sample Size: The total sample size taken for the study was one hundred (100) out of which 50 samples constituted of working women's and 50 constituted of housewife's.

Variables

Independent Variable:-

1. Working Status -
 - i. Working women
 - ii. Housewife's

Dependent Variable:-

1. Life Satisfaction

Control Variables:-

1. Marital Status - (Married)
2. Educational Qualification (Graduate)
3. Age Group (25-30)
4. Socio-cultural status

Tools Used:

1. Personal Data Questionnaire: Designed by the researcher to gather background information about the participants.

2. Life Satisfaction Scale: A standardized scale developed by Alam and Srivastava (1996), comprising 60 yes/no type items. The scale has a test-retest reliability coefficient of 0.84 and a validity coefficient of 0.74.

Statistical Analysis:

Data were analysed using the T-Test to determine the significance of differences in life satisfaction between the two groups.

Result and Discussion:-

Variables	N	Mean	SD	'T' Value	Significance Level
Working women	50	45.67	7.41	3.17	Significant at 0.01
Housewife's	50	41.34	6.15		

The result from Table – 1, show that the mean score of working women is 45.67 and housewife's mean 41.34 and SD is working women 7.41 and housewife's 6.15. The 'T' Test Result is 3.17 which is statistically significant on level 0.01. Hence the hypothesis 'There would be high life satisfaction among working women's than housewife's.' Has been accepted. It means working women are more satisfied with life than housewife's.

Conclusion:-

On the basis of above description, it can be concluded that there is significant difference among Working women's and housewife's, on life satisfaction.

Above description we can say that working women's more satisfied with life than and housewife's.

Reference:-

- Agarwal S. (2001) hdl.handle.net. Life Satisfaction: Working versus non-working. Available at hdl.handle.net.
- Adhikari H. Anxiety & Depression: A Comparative Study between Working and Non-Working Mothers. Global Journal of Human Social Science, 2012.
- Arshad, M., Gull, S., Mahmood, K. (2015). Life satisfaction among working and non-working women. European Journal of Research in Social Sciences. Volume 3, Number 1. Page: 124-126.
- Dr. Anasuya J. Akbari (2012) Life Satisfaction and Stress Among Working and Non-Working Women. PARIPEX – Indian Journal Of Research Volume: 1 | Issue: 9. Page: 174-175
- Gilman R, Huebner ES. A review of life satisfaction research with children and adolescents. School Psychology Quarterly. 2003; 18:192-205.
- Jain S. A Comparative study of Working and Non-Working women in terms of Personality, Adjustment and Anxiety of Indore City, 2009.
- Maqbool, M., Shrivastava, N., Pandey, M. (2014). A comparative study of mental health of working women and housewives. Indian Journal of Health and Wellbeing. Volume 5, Issue 11, Page: 1398-1399.
- Ojha S, Rani U. A Comparative study of the level of Stress and various dimensions of mental health among Working and non-working Indian women. Journal of Psycho-Cultural Dimensions, 2004.
- Singh, S. K. (2014). Life satisfaction and stress level among working and non-working women. The International Journal of Indian Psychology. Volumel, Issue 4, Page: 125-126

Impact of Digital Payment System on Consumer's Spending Behavior

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Abstract:

This research paper aims to analyze the impact of digital payments on consumer spending behavior, focusing on the rise of online banking in the 1990s and the rise of digital payment systems like First Virtual Holdings in 1994. Modes of digital payment include mobile wallets, bank transfers, Google Pay, QR codes, UPI (Unified Payments Interface), phone pay, bank cards (debit and credit), and internet banking. Mobile wallets provide secure digital platforms for cashless transactions, while bank transfers allow funds to be moved directly between accounts without the need for a physical debit card. QR codes allow businesses to generate a QR code for each sale, allowing users to pay using a digital wallet with a tap of a button. UPI (Unified Payments Interface) streamlines money transfers between bank accounts via a single app, enhancing convenience for users. Phone pay allows users to send and receive money, pay bills, recharge mobile and DTH connections, and shop online through a mobile app. Bank cards are easy to use and widely accepted, with strong security measures in place. Online banking allows for easy and secure transactions between bank accounts. Digital payments have become increasingly popular, allowing consumers to make payments anywhere and anytime.

Keywords: Digital payment, mode of digital payment, digital currency, virtual holding, physical currency

Introduction:

Now a days many digital payments mode use by peoples are not need to carry cash by self. The purpose of this study is to analyze the impact of digital payments on consumer's present spending behavior. Digital payments are changing the consumer's buying spending habits influence their behavior. From small shopkeepers to big businessmen, everyone is seen using digital currency. It is more convenient to carry digital currency than cash. The rise of online banking in the 1990's marked a turning point in digital payments. In 1994, a company called first virtual holdings created the first online payment system. Customer could use their cards to safely transfer payments online utilizing this technique. A digital payment has sharp increase since the pandemic corona virus. Digital payments have become increasingly popular, allowing consumers to make transactions without the need for physical currency exchange. They have become more convenient and secure than cash, making them a popular choice for both consumers and businesses. Though Digital payment system have some advantages or disadvantages, is very helpful nowadays.

Objectives:

1. To know about digital payment.
2. To know various mode of digital payment.
3. To know benefits & threats of digital payment.

Research methodology:

This research paper use only secondary data which is collected from websites.

Digital payment system:

Digital payment system concept

Digital payments refer to transactions through electronically, without physical currency exchange, using digital platforms or devices like mobile apps, online banking, and credit/debit

cards. A digital Payment sometimes called an electronic payment. Digital payment is a revolutionized in the financial sector by shifting consumer behavior toward cashless transactions. A digital payment system is an electronic method of transferring value from one account to another, using digital devices or platforms, instead of cash or cheque. In such transactions, both parties utilize electronic means to transfer funds. These systems facilitate digital payments, making them faster, easier, and more trackable for businesses and customers. Now days, carrying money is very risky, so digital currency is used to the maximum extent. In case of emergencies if we forget our wallet or finished our cash, we can still for payment use of digital payment.

Today's world is Technological, every hour or minute the power of technology changes. Consumer is a Centre point of the every industry or business. That's why Consumers convenience is very important to all these. Digital payments have become increasingly popular, with many people and businesses relying on them for sending and receiving money. Usage of digital payment modes consumers to make payment anywhere & anytime. Through digital payment customer encouraging higher spending and repeated purchases.

Modes of digital payment

A mode of payment means the way customer pays for a product or service, whether in a physical store or online. It can also refer to how merchants choose to accept payments from their customers. There are various modes of digital payment system.

1. **Mobile wallets -**

Mobile wallets provide secure digital platforms for cashless transactions, linked to bank accounts or cards. Wallets also support mobile recharges and bill payments for user convenience.

2. **Bank transfer**

A digital movement of funds from one bank account to another through a computerized network is known as an electronic funds transfer (EFT). Funds are moved directly from one bank account to another, without the need for a physical debit card.

3. **Google pay**

Google Pay is a mobile payment service developed by Google to power in-app, online, and in-person contactless purchases on mobile devices, enabling users to make payments with Android phones, tablets, or watches.

4. **QR codes**

Many small scale or large scale businesses can quickly generate a QR code for each sale, allowing users to simply scan it with a mobile phone camera. This then creates a push notification on the phone, allowing the customer to pay using a digital wallet with the tap of a button. It's secure, fast and convenient.

5. **UPI (Unified Payments Interface):**

UPI streamlines money transfers between bank accounts via a single app, facilitating seamless transactions. It permits instant transfers without the need for card or bank details, enhancing convenience for users. Government also started promoting UPI.

6. **Phone pay**

Phone Pay allows users to send and receive money, pay bills, recharge mobile and DTH connections, and shop online, all through a mobile app.

7. **Bank cards - Debit Cards & Credit Cards**

It is Easy to use and widely accepted. You can only spend what's in your bank account. And in credit card ability to make purchases now and pay later. Strong security measures in place.

8. Internet banking

Online banking allows you to transfer money between bank accounts or make payments electronically. It is a convenient and secure payment method, but it may require internet access and some knowledge of Net Banking

9. Aadhar pay

BHIM Aadhar Pay enables Merchants to receive digital payments from customers over the counter through Aadhar Authentication. It allows for any Merchant associated with any acquiring bank live on BHIM Aadhar Pay, to accept payment from customer of any bank by authenticating customer's biometrics. Both Customer and Merchant should have their Aadhar linked to their Bank Account.

10. Online payment

Online Payment is an exchange of currency, electronically through the internet. The process in these payments is the transfer of money from the bank account, debit card, or credit card of a customer to the bank account of a seller.

11. Mobile POS

Mobile POS or mPOS is all about convenience. This digital payment type allows businesses more flexibility in the way they accept payments. Businesses can now make their operations mobile.

These are some modes of digital payment.

Advantages / Benefits of digital payments:

Digital payments remove many of the barriers, especially in terms of global funds transfers. Even if you run a local business, you may have dealings with overseas vendors or suppliers, and digital payments make it easier for the whole world to be connected. Digital payment also helpful to small businesses to go Online.

1. Speed of transfer:

Even traditional bank transfers to someone living in the same home as you can take 2-3 days. Digital payments, on the other hand, occur in real-time & 24*7 availability.

2. Security:

Payment technology is a wonderful thing, allowing us to do more in a convenient online setting. Digital payments use end-to-end security, including encryption and the fact that you don't even need to know or enter in a recipient's bank details.

3. Global payments:

Sending a cheque for an overseas purchase. The exchange rate could change drastically before your local currency reaches your overseas supplier but in modern digital payment methods take care of currency exchange instantly, meaning businesses get paid the right amount in their local currency at the click of a button.

4. Change:

No need for change money i.e coins or any type of change. Through digital payment we can pay exact amount of money.

5. Ecofriendly:

Less use of paper & less printing of Currency notes means reduce waste & we can save trees.

Disadvantages or limitations of digital payment:

1. Fraud risks

Digital payments are vulnerable to fraud, hacking, and identity theft, requiring robust security measures and user vigilance.

2. Data Breaches

The risk of sensitive financial data being compromised during online transactions or stored in databases is a significant concern. Data breaches in digital payments pose a significant threat, leading to

unauthorized access to sensitive information like credit card details and personal data, which can be used for fraudulent activities

3. Weak Passwords and Security Protocols

Reliance on weak passwords or insecure payment methods can lead to unauthorized access and financial loss. Weak passwords and insecure security protocols pose significant risks to digital payments, allowing hackers to gain unauthorized access to accounts and sensitive information.

4. Internet Dependency

Digital payments rely heavily on internet connectivity, which can be unreliable in certain areas, especially rural regions. You cannot use digital payment methods without having a good internet connection. For instance, if you are travelling to a remote area with no mobile network or internet connection, these payment methods are of no use to you

5. Technical Illiteracy

Some individuals, particularly older generations, may lack the technological skills to use digital payment methods effectively. Technological literacy is related to digital literacy in that when an individual is proficient in using computers and other digital devices to access the Internet, digital literacy gives them the ability to use the Internet to discover, review, evaluate, create, and use information via various digital platforms,

6. Transaction Limits:

Some digital payment systems may have transaction limits that can be inconvenient for large purchases, potentially forcing users to make multiple transactions. For general UPI transactions, the daily limit is Rs.1 lakh, with a maximum of 20 transactions per day. However, some banks and specific transaction types (like capital markets, insurance, and foreign remittances) have higher limits, up to Rs.2 lakh or Rs.5 lakh.

Conclusion:

Consumers are looking for ways to save time & effort and they are willing to pay for convenience. Digital payment system did not emerge at that time people had to carry money with them & if they didn't have money they didn't make any purchases but due to the development of digital payment system even if they don't have money they can buy goods & services & pay online. And hence the spending attitude of customer is seen to increase. Even today, compared to urban areas, digital payment system is not being accepted in rural areas. While using digital payments, one must consider its advantages as well as disadvantages.

References:

- <https://www.researchgate.net>
- <https://www.linkedin.com>
- <https://biznext.in/blog/digital-payment-in-india>
- <https://www.betterthan cash.org>
- <https://pay.google.com>

Grape Cultivation and Agro-Based Industries in Niphad and Dindori Talukas of Nashik District

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Abstract:

This study presents an in-depth geographical investigation into the spatial dynamics of grape cultivation and agro-industrial development within Niphad and Dindori talukas of Nashik District, Maharashtra—recognized as India's premier viticultural hub. Employing a mixed-method approach, the research integrates spatial analysis, time-series agricultural data (1990–2020), and primary field surveys involving 300 stakeholders including farmers, processors, and exporters. The findings reveal a significant temporal expansion in vineyard area and wine production infrastructure, driven by favorable agro-climatic conditions, canal-based irrigation, and increasing market orientation. The demographic and operational profiling of respondents highlights widespread adoption of drip irrigation (51%), integrated nutrient management (41%), and varietal preferences aligned with export demand. However, the viticulture sector faces multidimensional challenges: 72% reported input cost volatility, 73% cited market price fluctuations, and over 60% lacked access to institutional credit and cold storage. Spatial disparities, infrastructural bottlenecks, and limited awareness of export quality standards further constrain agrarian advancement.

Keywords: Grape Cultivation, Agro-Based Industries, Nashik District, Rural Development

Introduction:

Agriculture continues to be the foundational pillar of India's economy, accounting for a significant share of rural employment and gross domestic product (GDP), while simultaneously underpinning food security and regional development (Singh & Gupta, 2021). Within this broad agricultural framework, horticulture—particularly viticulture—has emerged as a high-value sub-sector, contributing not only to income augmentation but also to export-led growth (Kumar et al., 2020). Among the various grape-producing states, Maharashtra occupies a paramount position, contributing over 81% of India's total grape production (APEDA, 2022; Sawant & Mote, 2018). Within Maharashtra, Nashik District—often acclaimed as the "Grape Capital of India"—commands particular attention due to its unique confluence of agro-climatic conditions, robust irrigation networks, and well-developed post-harvest infrastructure (Deshmukh et al., 2023; Joshi & Patel, 2019). The talukas of Niphad and Dindori are especially renowned for their intensive viticulture, supporting diverse agro-industrial activities such as raisin production, wine-making, cold storage, and packaging units (Patil et al., 2020; Phatangare et al., 2017). The synergistic

relationship between agriculture and agro-processing industries in this region has fostered rural transformation, economic diversification, and regional development (Shinde & Gaikwad, 2021).

An examination of extant literature reveals a rich tapestry of academic engagement with Maharashtra's viticultural evolution, particularly from the late 20th century onward. The historical trajectory of grape cultivation in the state traces back to colonial experimentation, which later evolved into organized commercial production under the guidance of agricultural universities and government schemes (Jadhav & Pawar, 2015; More & Kale, 2016). The agro-climatic attributes of Nashik—comprising basaltic soils, moderate rainfall, and well-distributed sunshine—have been repeatedly affirmed as ideal for cultivating table and wine grapes (Chavan et al., 2018; Desale & Rane, 2021). Numerous studies have interrogated the operational dynamics of grape-based industries, particularly in relation to value addition, market integration, and export potential (Chand et al., 2020; Kale et al., 2019). Furthermore, scholars have employed theoretical frameworks from agro-industrial geography and spatial economics to interpret the emergence of industrial clusters and value chains in rural agrarian landscapes (Krugman, 1991; Scott, 2006; Bryden et al., 2011). The intersection of land-use change, agglomeration economics, and rural-urban linkages has been instrumental in explaining how viticulture contributes to broader developmental paradigms (Ramachandran & Mishra, 2017; Rao, 2020; Satyavathi et al., 2021).

The significance of this study lies in its ability to offer a nuanced geographical lens through which the spatial dynamics of viticulture and associated agro-industrial development can be examined within the micro-regional context of Niphad and Dindori talukas. These regions represent archetypal cases of agrarian intensification wherein the cultivation of high-value crops such as grapes has transcended subsistence models to catalyze integrated rural industrialization (Wagh et al., 2018; Patil et al., 2020). The intricate linkages between natural resource endowments, infrastructure availability, and industrial agglomeration merit spatially explicit investigation, particularly against the backdrop of liberalized agricultural markets and export-oriented production systems (Rao, 2020; Mehta & Barve, 2020). Moreover, the lack of comprehensive geospatial documentation and interpretive mapping of vineyard distribution, agro-processing cluster formation, and land-use transformations presents a critical research gap. By systematically analyzing these spatial interactions through the application of GIS-based tools, socio-economic field data, and regional planning frameworks, this study contributes to the broader discourse on rural transformation, agrarian change, and sustainable agro-industrial ecosystems (Scott, 2006; Bryden et al., 2011; Shinde et al., 2023). The findings are expected to inform evidence-based policymaking and localized interventions in the domains of agro-export planning, climate-resilient agriculture, and rural economic diversification, thereby aligning with national objectives such as Doubling Farmers' Income and Atmanirbhar Bharat (Satyavathi et al., 2021; Patel & Ramteke, 2022).

Study Area:

The present study focuses on Niphad and Dindori talukas of Nashik District, Maharashtra, located between approximately 19°54'40"N to 20°25'30"N latitude and 73°34'30"E to 74°16'30"E longitude.

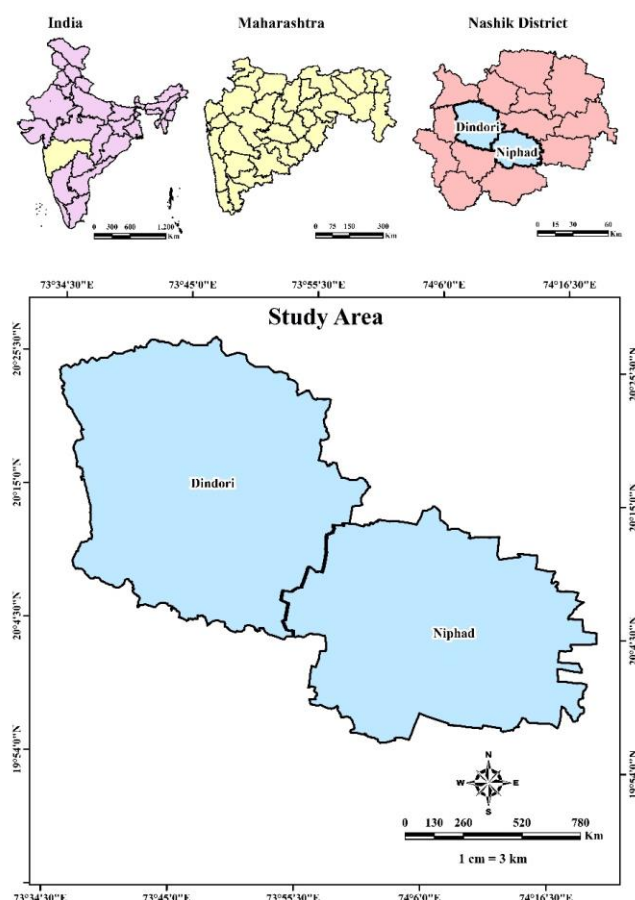


Figure 1: Location Map of the Study Area

These regions lie within the upper Godavari basin, characterized by fertile basaltic soils, moderate rainfall, and favorable thermal regimes, making them exceptionally suited for viticulture. Dindori taluka, with gently undulating topography and a relatively cooler microclimate, supports diversified horticulture, with grapes occupying a predominant share. The area benefits from seasonal streams and limited canal networks, fostering medium-scale cultivation and cooperative-driven agro-enterprise development. Niphad taluka, in contrast, is a flat alluvial tract under intensive canal irrigation, enabling high-density grape plantations and year-round productivity. It serves as a hub for grape export, hosting numerous allied agro-industries such as raisin units, wineries, and cold chains. Together, these talukas exemplify agro-industrial transformation driven by viticulture, offering a valuable micro-regional landscape for spatial and economic geographic analysis.

Methodology:

The study adopts a mixed-method approach integrating spatial analysis, statistical evaluation, and field-based data collection to investigate grape cultivation and agro-industrial dynamics in Niphad and Dindori talukas of Nashik District. Primary data were gathered through structured questionnaire surveys administered to a sample of 300 respondents, comprising grape farmers, raisin processors, winery operators, and exporters. The questionnaire addressed agronomic practices, input use, irrigation methods, post-harvest handling, and market linkages. Additionally, semi-structured interviews and field observations were conducted to supplement

and validate the quantitative findings. Secondary data were obtained from the Census of India, Department of Agriculture, India Meteorological Department (IMD), APEDA, and satellite platforms (Sentinel-2, Landsat-8), offering insights into demographic, climatic, and spatial parameters. A stratified purposive sampling technique was employed to ensure representative coverage across farm sizes, industry roles, and geographic zones. Spatial analysis using ArcGIS and QGIS included supervised classification and NDVI techniques to delineate vineyard zones and agro-processing clusters. Statistical analysis, conducted with SPSS and R, involved de

Result and Discussion:

Area under Grape Cultivation (1990–2020)

The temporal dataset delineates a steady and substantial augmentation in the area under grape cultivation across both Niphad and Dindori talukas during the thirty-year period from 1990 to 2020. In Niphad taluka, the viticultural landscape expanded markedly from 6,120 hectares in 1990 to 10,065 ha by 1995, followed by a pronounced increase to 14,762 ha in 2000. The upward trend persisted with the area reaching 18,788 ha in 2005, 23,485 ha in 2010, and further progressing to 28,182 ha in 2015, ultimately culminating at 32,208 hectares in 2020. Similarly, Dindori taluka experienced a consistent escalation in grape-growing area, beginning with 3,338 hectares in 1990, rising to 5,490 ha in 1995, 8,052 ha in 2000, and subsequently to 10,248 ha in 2005. This upward momentum continued, reaching 12,810 ha in 2010, 15,372 ha in 2015, and attaining 17,568 hectares by 2020.

Table 1: Area under Grape Cultivation (1990–2020)

Year	Niphad Area (ha)	Dindori Area (ha)
1990	6120	3338
1995	10065	5490
2000	14762	8052
2005	18788	10248
2010	23485	12810
2015	28182	15372
2020	32208	17568

Source: Agriculture Census

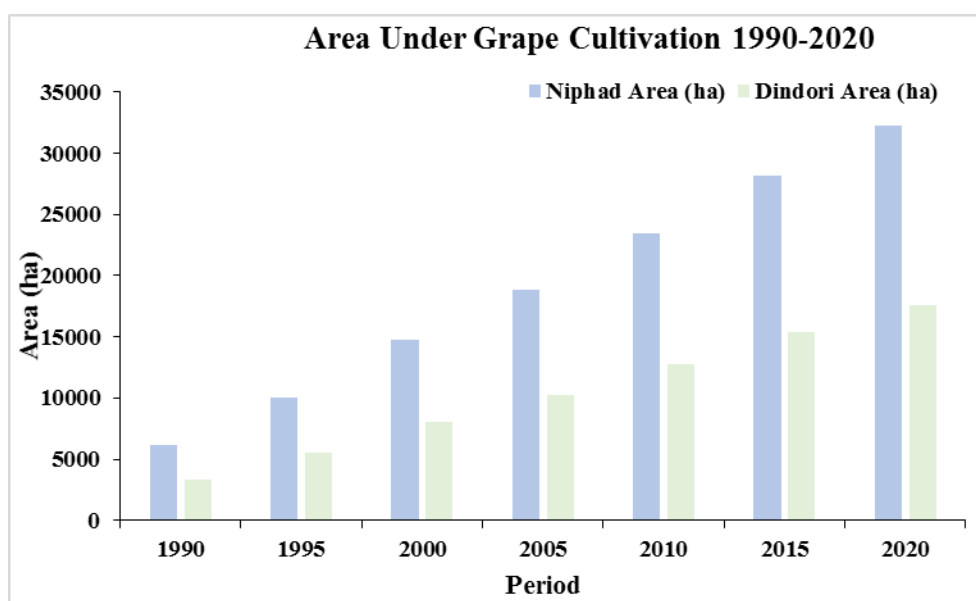


Figure 2: Area Under Grape Cultivation
Website – www.researchjourney.net

Expansion of Wine Production and Units (1990–2020)

The dataset reveals a progressive expansion in both wine production and the number of wine-producing units across Niphad and Dindori talukas over the thirty-year period from 1990 to 2020. In Niphad taluka, wine production increased significantly from a marginal 0.1 lakh litres in 1990 to 1.8 lakh litres in 1995, followed by further growth to 4.2 lakh litres in 2000, 9.0 lakh litres in 2005, and 15.0 lakh litres in 2010. The upward trend continued with production reaching 26.8 lakh litres in 2015, and ultimately 28.8 lakh litres by 2020. Correspondingly, the number of wine production units in Niphad rose from 1 in 1990 to 3 in 1995, 6 in 2000, 11 in 2005, 15 in 2010, 18 in 2015, and peaked at 26 units in 2020. In Dindori taluka, wine production was negligible in 1990 but increased to 0.9 lakh litres by 1995, 2.1 lakh litres in 2000, 4.5 lakh litres in 2005, and 7.0 lakh litres by 2010. This growth further continued to 12.0 lakh litres in 2015 and reached 14.4 lakh litres in 2020. The number of wine-producing units in Dindori followed a similar pattern, increasing from zero units in 1990 to 2 in 1995, 3 in 2000, 5 in 2005, 8 in 2010, 9 in 2015, and 10 units by 2020.

Table 2: Expansion of Wine Industry in Study Area

Year	Niphad Wine Production (lakh litres)	Dindori Wine Production (lakh litres)	Niphad Wine Units	Dindori Wine Units
1990	0.1	0	1	0
1995	1.8	0.9	3	2
2000	4.2	2.1	6	3
2005	9	4.5	11	5
2010	15	7	15	8
2015	26.8	12	18	9
2020	28.8	14.4	26	10

Source: AIWPA

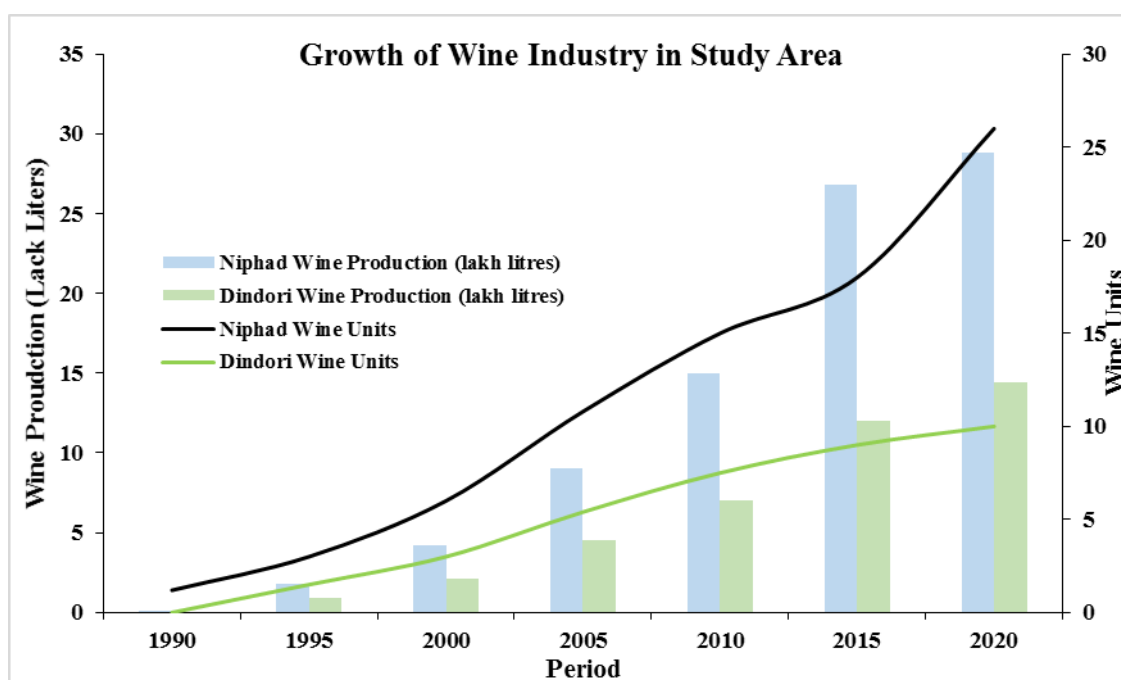


Figure 3: Growth of Wind Industry in Study Area

Demographic Profile of Respondents

A total of 300 respondents were surveyed across the talukas of Niphad and Dindori to examine the socio-economic and operational dimensions of grape cultivation and related agro-industrial activities. The demographic attributes of the surveyed population are delineated below. The age distribution reveals that the majority of respondents (46%) fell within the 36–50 years age bracket, indicating a predominance of individuals in their prime productive years. Respondents below 35 years constituted 24%, while those above 50 years accounted for 30% of the sample, reflecting a balanced demographic structure with both youth and experience represented. In terms of gender composition, 83% of the respondents were male, while 17% were female; no respondents identified as non-binary or other, thereby indicating a male-dominated agrarian landscape, consistent with traditional patterns observed in rural Maharashtra. The educational profile of respondents showed that 37% possessed higher secondary or diploma-level qualifications, followed by 28% with secondary education, and 22% who had attained graduate or postgraduate degrees. A remaining 13% were either illiterate or had completed only primary education, illustrating a moderate to high literacy level among the target population, conducive to technological adoption and market engagement.

Table 3: Demographic Profile of Respondents

Parameter	Category	Frequency	Percentage
Age Group	Below 35 years	72	24
	36-50 years	138	46
	Above 50 years	90	30
Gender	Male	249	83
	Female	51	17
	Other	0	0
	Illiterate/Primary	39	13
Education	Secondary	84	28
	Higher	111	37
	Secondary/Diploma	66	22
	Graduate & Above	66	22
Taluka	Niphad	150	50
	Dindori	150	50
Landholding Size	Small (<2 ha)	102	34
	Semi-medium (24 ha)	126	42
	Large (>4 ha)	72	24
Occupation	Farmer	204	68
	Raisin Processor	42	14
	Winery/Packaging	27	9
	Exporter/Agent	27	9
	Family Labour	93	31
Labour Type	Hired Labour	60	20
	Both	147	49
Seasonal Labour	Yes	186	62
	No	114	38
Cooperative Membership	Member	138	46
	Non-member	162	54
Subsidy/Credit Access	Accessed	114	38
	Not Accessed	186	62

Respondents were equally distributed between the two talukas under study, with 150 individuals (50%) each from Niphad and Dindori, ensuring geographic parity in sampling. The landholding classification indicates that 42% of the respondents belonged to the semi-medium category (2–4 ha), followed by 34% with small holdings (<2 ha), and 24% with large landholdings (>4 ha). This distribution underscores the predominance of medium-scale viticulture operations in the region. With respect to occupational engagement, 68% of the respondents were primarily grape farmers, while 14% were involved in raisin processing, 9% in winery or packaging enterprises, and another 9% were functioning as exporters or agents, reflecting vertical diversification within the grape value chain. In terms of labour structure, 49% employed a mixed labour model, integrating both family and hired labour, whereas 31% depended solely on family labour, and 20% relied exclusively on hired workers. Furthermore, 62% reported the engagement of seasonal labour, particularly during peak pruning and harvesting periods. From an institutional perspective, 46% of the respondents were members of cooperative societies or Farmer Producer Organizations (FPOs), while 54% remained unaffiliated. Regarding financial access, only 38% had availed government subsidies or institutional credit, with the majority (62%) reporting no access, highlighting prevailing asymmetries in formal support mechanisms.

Agricultural and Industrial Practices of Respondents:

The operational characteristics of grape cultivators and agro-industrial stakeholders in Niphad and Dindori talukas were assessed across multiple agronomic and post-harvest parameters, revealing heterogeneous practices shaped by experience, input systems, and market integration. The distribution of farming experience among respondents illustrates that a substantial proportion (37%) possessed 11–20 years of engagement in viticulture, followed by 32% with 5–10 years, and 16% with more than 20 years of continuous involvement. A minority (15%) reported having less than 5 years of experience, indicating recent entrants to commercial grape cultivation. With respect to varietal adoption, Thompson Seedless emerged as the predominant cultivar, preferred by 40% of respondents, followed by Sharad Seedless (28%), Flame Seedless (17%), and other miscellaneous varieties accounting for 15%. This varietal structure reflects both domestic and export-oriented market preferences. The data on irrigation practices reveals that drip irrigation was employed by a majority (51%), underscoring its role in precision water management. Other methods included flood irrigation (21%), well/tube-well-based irrigation (16%), and canal systems (12%), suggesting a diversity of water access strategies influenced by landholding size and infrastructural availability. In terms of fertilizer application strategies, Integrated Nutrient Management (INM) was adopted by 41% of the cultivators, whereas chemical fertilizers were used by 37%, and organic practices by 22%. This stratification suggests a gradual but increasing transition toward balanced nutrient application systems.

The application of plant growth regulators (PGRs) was confirmed by 67% of respondents, indicating a widespread reliance on hormonal treatments to standardize berry size, uniform ripening, and shelf-life enhancement, while 33% reported no usage. Regarding post-harvest handling, grading and packing was practiced by 44%, raisin drying by 21%, and cold storage utilization by 18%. Notably, 17% of respondents did not undertake any form of post-harvest intervention, revealing a segment still reliant on primary market channels without value addition. In terms of agro-industrial engagement, 21% were associated with raisin units, 14%

with cold storage facilities, and 12% with wineries, whereas 53% reported no direct participation in processing activities, highlighting the segmentation between primary producers and processors. The analysis of market channels revealed that 39% of the respondents sold their produce through private traders, followed by local markets (26%), cooperatives (20%), and direct export (15%), reflecting varying degrees of market orientation and bargaining power. With respect to awareness of export quality standards, 43% were aware of APEDA or EU norms, whereas 57% lacked such awareness, potentially limiting their integration into premium markets. Lastly, the access to agricultural extension services varied considerably: 32% received occasional support, 22% reported regular contact, 28% had rare exposure, and 18% had no engagement with institutional advisory systems.

Agricultural and Agro-Industrial Practices of Respondents

The empirical assessment of grape cultivation practices and agro-industrial involvement across Niphad and Dindori talukas reveals significant heterogeneity in agronomic experience, varietal preferences, input systems, post-harvest methods, and market integration. The distribution of farming experience illustrates that a majority of respondents (37%) had 11–20 years of engagement in viticulture, followed by 32% with 5–10 years, and 16% with more than 20 years. A smaller segment (15%) reported less than five years of experience, indicating the recent

Table 4: Agricultural and Agro-Industrial Practices of Respondents

Parameter	Category	Frequency	Percentage
Years of Experience	Less than 5 years	45	15
	5-10 years	96	32
	11-20 years	111	37
	More than 20 years	48	16
	Thompson Seedless	120	40
Primary Grape Variety	Sharad Seedless	84	28
	Flame Seedless	51	17
	Other	45	15
	Drip	153	51
Fertilizer Practice	Flood	63	21
	Well/Tube-well	48	16
	Canal	36	12
	Organic	66	22
	Chemical	111	37
PGR Usage	INM	123	41
	Yes	201	67
	No	99	33
Post-Harvest Practice	Grading & Packing	132	44
	Cold Storage	54	18
	Raisin Drying	63	21
	No Handling	51	17
	Raisin Unit	63	21
Agro-Processing Engagement	Winery	36	12
	Cold Storage	42	14
	None	159	53
	Local Market	78	26
Market Channel	Cooperative	60	20
	Export	45	15
	Private Trader	117	39
Quality Standards Awareness	Aware	129	43
	Not Aware	171	57
	Regular	66	22
Extension Access	Occasional	96	32
	Rarely	84	28
	Never	54	18

induction of novice cultivators into the grape sector. In terms of varietal preference, Thompson Seedless dominated the cultivation profile, being adopted by 40% of respondents. This was followed by Sharad Seedless (28%), Flame Seedless (17%), and a variety of other cultivars collectively accounting for 15%, reflecting both export and domestic market alignment. Regarding fertilization and irrigation practices, drip irrigation emerged as the dominant mode (51%), highlighting technological advancement and efficient water management. Other irrigation modalities included flood irrigation (21%), well/tube-well systems (16%), and canal irrigation (12%). In fertilizer application, Integrated Nutrient Management (INM) was adopted by 41%, chemical fertilizers by 37%, and organic inputs by 22%, suggesting a trend toward balanced and sustainable nutrient regimes.

The usage of plant growth regulators (PGRs) was prevalent, with 67% of respondents confirming their application to enhance berry size, coloration, and ripening uniformity, while 33% refrained from such interventions. In the domain of post-harvest management, grading and packing were the most common practices (44%), followed by raisin drying (21%), cold storage (18%), and no post-harvest handling (17%)—the latter indicative of subsistence or localized market engagement. Concerning agro-processing engagement, 21% of the respondents were linked to raisin units, 12% to wineries, and 14% to cold storage infrastructure, whereas 53% reported no direct involvement in processing activities, underlining the primary production orientation of a substantial portion of the population. The analysis of market access channels revealed that private traders served as the predominant outlet (39%), followed by local markets (26%), cooperatives (20%), and export channels (15%), illustrating varying levels of market penetration and commercialization. In terms of quality standards awareness, 43% of the growers were cognizant of national and international export norms (e.g., APEDA, EU standards), while 57% lacked such awareness, thereby constraining their ability to access high-value markets. Finally, access to extension services varied: 22% reported regular contact, 32% received occasional support, 28% experienced rare access, and 18% reported no access at all. This fragmentation in extension delivery underscores the need for targeted and consistent agronomic advisories to support grape growers.

Challenges Faced by Grape Growers and Processors

Table 5 offers a quantitative overview of the multifaceted challenges encountered by grape growers and agro-processors in Niphad and Dindori talukas, derived from a representative sample of 300 respondents. The results underscore the structural vulnerabilities and operational constraints prevalent across the viticulture value chain. A significant proportion of respondents (72%) identified input cost volatility as a critical impediment, reflecting escalating prices of agrochemicals, fertilizers, and labor. This was closely followed by market price fluctuation, reported by 73%, which highlights the instability in grape prices due to supply-demand mismatches, trader manipulation, and limited regulatory oversight. Pest and disease outbreaks were experienced by 69% of the growers, particularly during humid pre-harvest periods, necessitating costly and intensive pesticide regimes.

Table 5: Statistical Summary of Challenges Faced by Grape Growers and Processors

Challenge Parameter	Frequency	Percentage (%)
Water Scarcity	198	66
Unseasonal Climate Events	183	61
Pest and Disease Outbreaks	207	69
Input Cost Volatility	216	72
Lack of Cold Storage	189	63
Post-Harvest Losses	168	56
Electricity/Power Shortage in Processing	96	32
Labour Shortages (Seasonal)	123	41
Delayed Payments	204	68
Market Price Fluctuation	219	73
Not Part of Cooperative/FPO	162	54
No Access to Subsidy or Institutional Credit	186	62
Lack of Awareness of Government Schemes	138	46
Bureaucratic Complexity in Scheme Access	111	37
Demand for Export Support Infrastructure	105	35

(n = 300)

Infrastructural inadequacies were also prominently reported. Lack of cold storage facilities was cited by 63% of respondents, and 56% faced post-harvest losses due to inadequate grading, packaging, and storage provisions. Electricity and power shortages, which disrupt processing operations in raisin and winery units, were reported by 32%, while 41% faced seasonal labour shortages, particularly during peak pruning and harvest phases. Institutional deficiencies also emerged strongly. A majority (62%) of the sample lacked access to subsidy or institutional credit, with 46% unaware of relevant government schemes, and 37% citing bureaucratic complexity as a barrier to scheme enrolment. Furthermore, 54% of the respondents were not affiliated with any cooperative or FPO, reflecting weak institutional linkages that limit collective bargaining and market leverage. In addition, 66% of respondents reported experiencing water scarcity, especially in areas with inadequate canal coverage. Unseasonal climatic events, such as irregular rainfall and temperature shifts, were reported by 61%, indicating rising climate-induced risks. Lastly, 35% ranked the lack of export infrastructure and support mechanisms among their top three challenges, emphasizing the need for logistical and institutional readiness to engage with global markets.

Conclusion:

The present study offers a comprehensive geographical analysis of grape cultivation and allied agro-industrial development in the talukas of Niphad and Dindori—two viticulturally intensive micro-regions of Nashik District, Maharashtra. Anchored in a mixed-method research design incorporating spatial mapping, statistical modelling, and field-based survey of 300 stakeholders, the findings illuminate the profound structural and functional transformation of these agrarian landscapes over the past three decades. The exponential increase in grape cultivation area—from 6,120 ha to 32,208 ha in Niphad and from 3,338 ha to 17,568 ha in Dindori between 1990 and 2020—signifies not only intensified land use but also a decisive shift

toward high-value, export-oriented agriculture. Parallely, the proliferation of wine-producing units and processing infrastructure has signaled the emergence of clustered agro-industrial ecosystems, reinforcing the thesis of viticulture-led rural industrialization.

Demographic and operational profiling of respondents revealed a dynamic agricultural community characterized by medium-scale holdings, increasing adoption of precision irrigation (51% drip usage), progressive fertilizer strategies (41% INM), and substantial engagement in post-harvest and processing sectors. Yet, the trajectory of agrarian advancement is marred by a constellation of constraints. Over 70% of respondents cited price volatility and escalating input costs as principal threats, while infrastructural deficits—such as inadequate cold storage (63%) and post-harvest losses (56%)—continue to erode economic returns. Institutional exclusion also emerged as a major concern, with 62% lacking access to subsidies or credit, and 46% being unaware of existing government schemes.

From a spatial-economic perspective, the study underscores the critical role of geoclimatic suitability, irrigation infrastructure, cooperative structures, and market integration in shaping differential development patterns within the study area. However, climate uncertainties, policy bottlenecks, and market asymmetries pose significant barriers to inclusive and sustainable agro-industrial growth. The empirical findings point toward the urgent need for spatially targeted interventions including improved extension services, enhanced cold chain infrastructure, simplified subsidy delivery mechanisms, and facilitation of producer-export linkages.

Reference:

- APEDA. (2022). *Grape export statistics*. Agricultural and Processed Food Products Export Development Authority, Government of India.
- Bryden, J., Efstratoglou, S., Ferenczi, T., Knickel, K., Johnson, T., & Refsgaard, K. (2011). *Towards sustainable rural regions in Europe: Exploring inter-relationships between rural policies, farming, environment, demographics, and rural development*. Routledge.
- Chand, R., Saxena, R., & Rana, S. (2020). *Post-harvest infrastructure and marketing of grapes in India*. Journal of Agribusiness and Rural Development, 43(2), 127–138.
- Chavan, S. D., More, N. V., & Patil, R. B. (2018). *Agro-climatic assessment of grape-growing regions in Maharashtra*. Indian Journal of Agricultural Sciences, 88(4), 568–572.
- Desale, S. B., & Rane, A. A. (2021). *Role of climate and soil in viticulture expansion in Nashik region*. Journal of Soil and Water Conservation, 20(1), 44–50.
- Deshmukh, S. K., Pawar, S. R., & Jadhav, M. P. (2023). *Infrastructure-led growth of grape sector in Nashik District*. Journal of Rural Studies, 59(3), 198–210.
- Jadhav, R. R., & Pawar, V. S. (2015). *Historical evolution of grape cultivation in Maharashtra*. Maharashtra Journal of Horticultural History, 9(1), 25–31.
- Joshi, M. K., & Patel, V. R. (2019). *The spatial dynamics of viticulture in Maharashtra: A case study of Nashik*. Indian Journal of Regional Studies, 41(1), 59–67.
- Kale, A., Patil, S., & Gaikwad, V. (2019). *Export potential of Indian grapes: A regional analysis*. International Journal of Economics and Agribusiness, 7(3), 105–112.
- Krugman, P. (1991). *Geography and trade*. MIT Press.
- Kumar, S., Reddy, V., & Sinha, A. (2020). *The emerging horticulture revolution in India: Trends and policy challenges*. Agricultural Economics Research Review, 33(1), 1–13.
- Mehta, S., & Barve, A. (2020). *Institutional finance and grape farmers: A study from Nashik*. Journal of Agrarian and Development Studies, 12(2), 85–93.
- More, D. S., & Kale, V. D. (2016). *Transformation in grape value chains in Western Maharashtra*. Indian Journal of Agricultural Marketing, 30(3), 22–29.
- Patel, A. R., & Ramteke, N. P. (2022). *Atmanirbhar Bharat and horticultural export promotion: Case of grape industry*. Journal of Indian Economic Studies, 11(1), 33–47.
- Patil, N. D., Bhoge, S. M., & Doke, A. D. (2020). *Agro-industrial linkage in viticulture: A study of Nashik region*. Geography and You, 20(2), 76–81.

- Phatangare, K. A., Shinde, D. R., & Gaikwad, M. S. (2017). *Raisin-making cooperatives and rural transformation in Nashik District*. Cooperative Studies Quarterly, 45(3), 108–120.
- Ramachandran, R., & Mishra, S. (2017). *Urban–rural interdependence and agro-industrial clusters*. Economic and Political Weekly, 52(10), 34–42.
- Rao, M. (2020). *Agrarian geography in liberalised India: A case of grape sector*. Indian Geographical Journal, 94(1), 18–31.
- Satyavathi, C. T., Tyagi, R. K., & Singh, R. P. (2021). *Doubling Farmers' Income through Diversified Agriculture*. Indian Journal of Agricultural Sciences, 91(5), 779–786.
- Sawant, S., & Mote, M. (2018). *Emerging grape export hubs in India*. Indian Horticulture, 63(2), 27–30.
- Scott, A. J. (2006). *Geography and economy: Three lectures*. Clarendon Press.
- Shinde, S. M., & Gaikwad, M. R. (2021). *Viticulture and economic transformation of rural Maharashtra*. Indian Journal of Rural Development and Planning, 15(1), 47–55.
- Shinde, S. M., Gaikwad, V. R., & Bhosale, A. R. (2023). *Geospatial assessment of grape agro-processing clusters in Maharashtra*. Geographical Perspectives, 12(1), 90–103.



A Socio-Cultural Exploration of Indian Feminism in Kamala Markandeyas 'Nectar In A Sieve'

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Research Guide

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Abstract:

Literature often mirrors societal values, culture, and tradition. But society's blind adherence to the cultural norms barred the development of society. Usually women falls prey to this cultural clutch and there are always women who dares to break through the cultural trap, finding new path, which later followed by the entire society. Acquiring knowledge through education was culturally banned for women, but a woman came forward by breaking through this cultural norm, started women's education in India, that woman is none other than The first woman teacher in India "Krantijyoti Savitribai phule". It was culturally restricted for the women to cross the threshold of their houses more particularly the kitchen of their house, but even though she did break through this norm, went to London by a crossing not only the threshold of her house but our country and had gained the title of first woman Doctor in India. Rukmini embodies the traits of Indian femininity; she possesses a 'no way give up' spirit, can overcome any handicap to cover her children, constantly works hard to guard her family, and is willing to embrace change, in all of this Rukmini also has an urge to find her identity. Rukmini the protagonist of the novel epitomizes Indian femininity, whereas her daughter Irawadi becomes entangled by tradition and culture. She suffers a lot in her life due to her barrenness, which is a taboo concept in Indian culture. The present research paper will study the female characters in the light of Indian feminism and also will focus on how some socio-cultural issues affects the life of different characters in general and women in particular.

Key words: Indian Feminism, Culture, tradition, quest for identity. Socio-cultural issue

Research methodology:

The present research work will be undertaken with the help of the interpretative and analytical methods. An attempt will be made to come up with the socio cultural realities in light of Indian Feminism by close reading, understanding and investigating the novel Nectar in a Sieve by Kamala Markandaya.

Scope and limitations:

The present research work intends to study social, political, cultural, historical, aspects of novel. The researcher plans to analyze the novels dealing with society and culture, social evils like child bride system, dowry system, marginalization of women, hunger and poverty, misery and ailments, and religious and cultural realities. The research will consider the reflections of socio-cultural realities more from literary viewpoint than from sociological viewpoint.

Introduction:

Kamala Markandaya is an eminent writer worldwide. She occupies a prominent place among Indian-English novelists in Post Modern Era. She got international recognition with her very first novel "Nectar in a Sieve" which was published in 1954. She is a keen observer of human nature her realistic portrayal of Indian personae has opened up the way to the reader to have glimpse of Indian culture and tradition. Her father was working in railways so she got an opportunity to travel through various villages in south India. It got availed her an opportunity to

have a close look at the life of poor peasant. The poor peasants in south India are living miserable life. She had seen their growing problems in the face of modernization. She grew up observing minutely the miserable plight of these peasants. With her language she has drawn beautiful, realistic pen-picture of people. She uses her language as a vehicle for communicating her vision of life. The title of the novel, *Nectar in a Sieve* is taken from a lyric by Samuel Taylor Coleridge, "Work without hope draws nectar in a sieve, and hope without an object cannot live", the title of the novel "*Nectar in a Sieve*" itself reflects about the central theme of the novel, the characters in the novel revolves around this theme. The novel tells us about the inevitable draining of life in the face of suffering and death. All the Characters particularly Rukmini's character in the novel parallel this theme quite closely. Symbolically, it refers to the "nectar" that is happy moments of life and the "sieve" is our life. We work hard with patience to get the nectar, Many time we feel like enjoying nectar but it soon drains away from the sieve of our life and we keep on counting the traces of nectar to the sieve thus the novel draws a parallel between the beauty and the misery of life.

The roots of contemporary Indian feminism are found in Bhakti Movement and other movements that challenged patriarchal structures. Bhakti poets like Akka Mahadevi, Atukari Molla, Sant Mirabai, and Saint Janabai, through their poetry had heralded the feminism in bhakti movement. Actually, social reformers like Raja Rammohan Rai, Mahatma Jyotiba Phule, Maharshi Dhondo keshav Karve, Justice Ranade and Dr. B.R. Ambedkar were among the people, who fought against the patriarchal society for the rights of women. This social leftist has brought about the issues like Sati (widow sacrifice), child marriage and widow remarriage to the forefront and fought to uproot these social evils. Writers like Ismat Chughtai, Kamala Das, Arundhati Roy, and Mahadevi Varma have brought Indian Feminism to light through their literature. Kamala Markandeya novels too throws light on Indian feminism.

Rukmini is an Indian Woman married to Nathan a poor peasant. Her entry in to a thatched roof made her restless initially because she is from a well to do family. Her father was village headman she had enjoyed a very comfortable life at her father's house. He had a good fortune in hand that time to send his elder three daughters with big dowry in to well settle families. When Rukmini's turn came to get marry, her father's economic condition has been decline to such a level that he couldn't manage handsome dowry to marry his fourth daughter in to well to do family. He has to get her marry to a poor peasant, Nathan, who doesn't have even the land of his own. Dowry system is a *Kalanka* to society. Dowry is a social evil need to be address. Kamala Markandeya in a perfect way highlighted this socio cultural issue through Rukmini's character. In a present scenario too there many girls in India falls victim to dowry system. In India not only the illiterate but highly qualified people have been following dowry system. Dowry culture hinders women backward, denying them staid life, suppresses their rights as mortal being. There is another dark reality about dowry is that there is a specific scale in dowry culture, if girl is suitable to manage good stuff of dowry, she will get chance to marry a largely educated and well settled boy, if she could manage moderate, she may get marry to alternate rate boy like clerk or a boy working on a moderate payment. But where there's no dowry like Rukmini, similar girls have to marry peasant like Nathan, a landless, homeless man. When his marriage is fixed he starts building a mud house for his new bride. Rukmini, being an Indian woman, how she could give in so easily before the circumstances? she possesses a 'no way give up' spirit, can overcome any handicap to cover her children, constantly works hard to guard her family, and is willing to embrace change, in all of this Rukmini also has an urge to find

her identity. In Indian tradition, the nine forms of goddess Durga(Nav Durga) represent nine distinguishing characteristics of Indian woman. Every Indian woman possesses these characteristics to varying degrees. Rukmini the protagonist of the novel epitomizes Indian femininity. She worked hard in the field, shoulder to shoulder with her husband to overcome the hardships. Rukmini has very positive attitude towards life. The following lines by Rukmini takes her close to the reader.

While the sun shines on you and the fields are green and beautiful to the eyes, and your husband sees beauty in you which no one has seen before, and you have a good storage of grains laid away, for hard times, a roof over you and a sweet stirring in your body, what more can a woman ask? (17)

It shows the inner disposition of Rukmini. This hinted at her acceptance of fate, love for her husband, faith in bright future, etc. is all visible in it and reflects the general tendency of Indian woman who supposedly accepts their circumstances. It isn't easy for her to overcome the situation, but she has taken everything as a challenge. She worked hard in ranch and grown gold like crop in field. She has accepted the change in her life, and begins to search her identity in new life. She began the note of her wedded life on a happy note and wanted the same for her daughter Irawadi. Ira remains very dear for Nathan and Rukmini as after Ira's birth Rukmini is not able to beget a child for the next six years. Rukmini is always worried about not able to give a son to Nathan. One more social issue is being addressed by Markandeya here. Giving birth to male child gets more importance because culturally a son is considered as the light of the lineage. This temperament can contribute to female foeticide. Rukmini dares to take Dr. Kenny's treatment for infertility without Nathans knowledge. It was a big issue at that time to take an infertility treatment from an English doctor. However due to the treatment, in quick succession, Rukmini bears five sons. With each birth, the family keep growing but the economic condition of the family remain static, with each new comers entry they have a little less to eat. All of them worked hard she could accumulate good crop so she could manage a good marriage for her daughter Ira. The issue of child – Bride has been focused in the novel through Rukmini and Irawadi's marriage. Rukmini got married at the age of twelve. Rukhmini the strong minded woman, who has been awaiting a happy life for her daughter falls prey to the culture of child marriage. And let victimizes her own daughter to be the victim of this socio-cultural issue. Irawadi suffer a lot the consequences of child marriage. Ira is married to a peasant boy at the age of fourteen. Irawadi's husband abandoned her for being barren. Nathan instead of taking serious action against his son- in- law in support of his daughter, blames his own daughter. This high lights the patriarchal temperament of Indian men, if a woman couldn't conceive, or given birth to girl child, the entire blame goes on her. She has to suffer great torment from family and society as well. She has been barred down of all happiness in life by society. Nathan represents Indian Man. Though Rukmini isn't protested against her husband and son in law, she has taken sensible decision to take her daughter to Dr. Kenny for infertility treatment, again, without the knowledge of Nathan. Barrenness is considered as a taboo in society. But Rukmini knows that it could get heal with medical treatment. This shows that despite of being deeply embedded in traditional Indian values, Rukmini dares to accept change.

Irawadi suffers a lot in her life due to her barrenness, which is a taboo concept in Indian culture. Though the barrenness is on the part of man, usually women are victimizing under this taboo. Ira is abandoned by her husband for her incapability to conceive a child. Culturally, patriarchal society marginalized women by limiting their opportunities and role to household and

childcare. If somehow she failed in giving them child, she is being harassed till death by society. After Ira's secret treatment Rukhmini takes her to her son in laws house but found that he marries another woman and there's no place for Ira in his house and life. But still Rukhmini ever could attune herself to the whole tragedy. Since ages we have seen Indian women as the epitome of sacrifice for the family. She has been taught to prioritize family for her own welfare. Irawadi's sacrifice for family destroyed her life. She has to prostitute herself to feed her siblings. The all men characters in the novel are left despairing, having all surrendered to their circumstances. They were unfit to navigate the challenges of life and sought ways to circumvent their difficulties. There are some characters in the novel, like Dr Kenny, Nathan and Selvan, those are representatives of the men who admire and respect women and so, learn to sail through the difficulties in life. The novel describes several instances of drought and floods that devastate the family's crops. These natural disasters increased their financial difficulties, making it impossible to harvest enough to sustain themselves or sell for profit.

The establishment of tannery near the village brings about difficulties in their life. While it offers employment openings, it also leads to environmental declination, social displacement. The tannery represents the intrusion of industrialization into traditional pastoral life, creating pressure and conflict. Markandaya uses irony to focus the contrasts between anticipation and reality. For instance, the original stopgap that the tannery will bring job opportunities is varied with the factual destruction it causes to the community's way of life.

Conclusion:

"Nectar in a Sieve" offers a profound exploration of the roles and challenges of women in rural Indian society. Kamala Markandaya presents a compelling narrative of resilience, empowerment, and systemic struggle through the women characters, particularly Rukhmini the protagonist of the novel. This paper has examined the historical and social context, key themes, and literary techniques that contribute to the novel's portrayal of women's experiences. "Nectar in a Sieve" novel underlines the enduring strength of women, highlighting their capacity to navigate and resist the myriad challenges posed by their environment and society. In conclusion, Kamala Markandaya's "Nectar in a Sieve" offers a powerful Socio-cultural Exploration of Indian Feminism through the character of Rukhmini.

References:

- Markandaya, Kamala (1956). "Nectar in a Sieve". Jaico Publishing House. p.88, 167.
- Krishna Rao A. V. Madhavi Menon K. Kamala Markandaya: A Critical Study of Her Novels 1954-1982. Delhi: B. R. Publishing Corporation: 2017.
- Sarpparaje, M. "Kamala Markandaya's 'Nectar in a Sieve' - The Voice of the Voiceless". Indian Scholar. ISSN 2350-109X. www.Indian scholar.co.in. 2014
- Srinivasa, K.R.I. (1987). Indian writing in English, sterling publishers private Ltd, 1987.
- Sharma, K. K. (1982). (Ed). Indian -English Literature - A perspective Vimal Prakashan
- RAVAL M. R. 'Nectar in a Sieve': A Thematic Study, Vol. 1, Issue:6, August 2013 (IJRHS) ISSN:2320-771X
- Dr. Manju "Empowerment And Struggles: The Role Of Women In Rural Indian Society In 'Nectar In A Sieve'" IJCRT | Volume 12, Issue 6 June 2024 ISSN: 2320-2882

कवी अनिल यांच्या 'दशपदी'तील रचनांची मीमांसा

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प्रस्तावना:

अर्वाचीन मराठी कवितेचा १८८५ ते १९२० हा ३५ वर्षांचा काळ क्रांतिकारी काळ संबोधला जातो. या काळात आधुनिक कवितेचे जनक कवी केशवसुत आणि त्यांचे समकालीन लिहिणारे कवी ना. वा. टिळक, माधवानुज, दत्त, विनायक, लक्ष्मीबाई टिळक यांची एक पिढी पुढील काळात महाराष्ट्राबाहेर मराठी कवितेचा ध्वज फडकवणारे कवी चंद्रशेखर व कवी भा. रा. तांबे यांना नावलौकिक प्राप्त झाला. चंद्रशेखर यांना ग्वाल्हेर येथे हे तर भा. रा. तांबे यांना बडोदे येथे राजकवी म्हणून मान्यता मिळाली. पुण्यामध्ये १९२३ साली माधव ज्युलियन, गिरीश, यशवंत, श्री. बा. रानडे, सौ. मनोरमाबाई रानडे, ग. त्र्यं. माडखोलकर, द. ल. गोखले आणि नाट्यछटाकार दिवाकर यांनी एकत्र येऊन रविकिरण मंडळाची स्थापना केली. यांतील पटवर्धन, गिरीश, यशवंत यांचे मराठी काव्येतिहासात मोलाचे योगदान आहे. रविकिरण मंडळापासून प्रभावित होऊन अनेक कवी लिहिते झाले. पुढील काळात बा. भ. बोरकर, कुसुमाग्रज, अनिल असे नव्या दमाचे कवी काव्यक्षितिजावर आरूढ होताना दिसतात. त्यापैकी बा. भ. बोरकर यांच्यावर भा. रा. तांबे यांच्या भावगीतांचा तर कवी कुसुमाग्रज यांच्यावर केशवसुत यांच्या ओजस्वी वृत्तीचा प्रभाव जाणवतो. सर्वांमध्ये स्वतःचे वेगळे काव्यगुण सिद्ध करणारे कवी म्हणून नावारूपाला आले ते म्हणजे आत्माराम रावजी देशपांडे उर्फ कवी अनिल ! त्यांचा ३४ भावगीते असलेला त्यांनी १९२० ते १९३१ या काळात लिहिलेल्या कवितांचा संग्रह म्हणजे 'फुलवात' हा संग्रह १९३२ साली प्रसिद्ध झाला. त्यानंतर त्यांचे प्रेम आणि जीवन (१९३५), भग्नमूर्ती (१९४०), निर्वासित चिनी मुलास (१९४२), पेंतेव्हा (१९४७), सांगाती (१९६१) असे कवितासंग्रह प्रसिद्ध झाले. पुढे १९७६ मध्ये प्रसिद्ध झालेला, १९७७ सालाचे साहित्य अकादमी पारितोषिक प्राप्त कवितासंग्रह म्हणजे 'दशपदी'. हा संग्रह कवी अनिल यांच्या प्रतिभेचा कळसाध्याय मानावा लागतो. अशा दशपदीतील रचनांची मीमांसा प्रस्तुत शोध निबंधात घेणार आहे.

दशपदी पद्यबंधांचा विचार :- 'दशपदी' या संग्रहाच्या सुरुवातीला 'दशपदी - दर्शन' शीर्षकाखाली कवी अनिल यांनी दशपदी या पद्यबंधा बद्दल आपले विचार व्यक्त केले आहेत. त्यांनीच नमूद केल्याप्रमाणे त्यांना १९५९ रोजी 'विराणी' ही दहा ओळींची कविता सुचली. त्यानंतरही त्यांनी काही दहा ओळींच्या रचना केल्या. त्यांना ते स्वतः दशपदी म्हणू लागले. सांगती या १९६१ साली प्रसिद्ध झालेल्या संग्रहात १३ दशपदी समाविष्ट होत्या. त्यांच्या कवितांबद्दल आस्था असणाऱ्या मंडळींमध्ये दशपदी हे नाव रुळले. प्रा. मंगेश विठ्ठल राजाध्यक्ष यांनी 'एक नवी बांधणी' असा संग्रहाला जोडलेल्या 'अनिल - एक अभ्यास' या प्रारंभीक उल्लेख करताना दशपदी असाच शब्द योजला. अनिल यांनी दशपदी हा नवीन रचना प्रयोग केला असे कुणी म्हटले तर अनिल यांना ते खटकते, कारण प्रयोग करणे हे काव्यनिर्मिती व्यापाराशी सुसंगत नाही. असे त्यांना वाटते.

जयदेवाच्या पद्यबंधांना अष्टपदी म्हणून संबोधले गेले आहे. भारतीय परंपरेत पद्यबंधांना द्विपदी, त्रिपदी, चतुष्पदी, षट्पदी, सप्तपदी, अष्टपदी म्हणण्याची पद्धत होती. या पद्धतीचा पुढील अवीष्कार म्हणजेच कवी अनिल यांची दशपदी. इंग्रजीतील सॉनेट हा रचनाप्रकार कवी केशवसुत यांनी मराठीत आणला. या प्रकाराला सुरुवातीस १४ ओळींची रचना म्हणून चतुर्दशपदी, चतुर्दशीनी म्हटले गेले. पुढे चर्चेतून

स्वनीतक, स्वनीत, सुनीत ही नावे पुढे आली आणि शेवटी सुनीत हेच नाव रुढ झाले कवी अनिल यांना सुनीत नावापेक्षा भारतीय परंपरेत बसणारे चतुर्दशपदी हे नाव सुसंगत वाटते. दशपदी म्हणजे दहा ओळींची अर्थपूर्ण काव्यरचना. ती मुद्रित करताना देखील पाच द्विपदी, दोन चतुष्पदी आणि एक द्विपदी, दोन पंचपदी, अष्टपदी आणि एक द्विपदी असे मुद्रित खंड न करता सलग एका खाली एक दहा ओळी मुद्रित व्हाव्या, असे कवी अनिल यांना अपेक्षित आहे. दशपदीतील एक चरण म्हणजे एक स्वयंपूर्ण स्वतंत्र वाक्य असते, असे म्हणता येण्यासारखे काही चरण असतील पण तो दशपदीचा विशेष नाही. पुष्कळदा एकापेक्षा अधिक ओळींचे वाक्य आणि काही ठिकाणी संपूर्ण दशपदी म्हणजे एक वाक्य मानता येईल. दशपदीमध्ये कुठेही पूर्णविराम, स्वल्पविराम नाही. तर केवळ विषय कलाटणी किंवा भावोदगार काढताना दिलेले उदगार चिन्ह सोडले तर कुठलेही विरामचिन्ह दशपदीमध्ये दिसत नाही. एकाच विषयाला धरून लिहिलेली गझल म्हणजेच मुसलसल गझल. अशा गझलेतील पाच द्विपदी दशपदी रचनेसारख्या वाटू शकतात. पण गझल मुद्रित करताना पाच द्विपदींचे खंड लक्षात येतील असे मुद्रित करतात. गैरमुसलसल गझलेतील प्रत्येक दशपदी वेगवेगळ्या विषयावर भाष्य करते. तेव्हा ती दशपदी नाही हे सहज लक्षात येते.

दशपदी, कवी अनिल व बंगाली कवी द्विजेंद्रलाल राय :- लोकमत दिपोत्सव (२००८) या दिवाळी अंकामध्ये वीणा आलासे यांचा 'दशपदीचे इतिवृत्त' शीर्षक असलेला लेख वाचल्यानंतर संशोधकाने काही नोंदी केलेल्या आहेत यात दशपदी पद्यबंधांचा इतर भारतीय भाषांमध्ये शोध घेत असताना बंगाली कवी द्विजेंद्रलाल राय यांच्या काव्यरचनांचा अभ्यास केला, त्यातून त्यांना असे आढळून आले की अठराशे १८६३ साली जन्मलेल्या द्विजेंद्रलाल यांनी 'दशपदी' हेच शीर्षक देऊन दहा ओळींच्या २७ दशपदी प्रसिद्ध केलेल्या आहेत. या दशपदी त्यांच्या 'त्रिवेणी' (१९१२) या काव्यसंग्रहामध्ये आहेत. त्यांनी काही दहा ओळींच्या स्फुट कविता लिहिल्या आहेत त्या मिळून पन्नास - एक दशपदी द्विजेंद्रलाल राय यांच्या नावावरती आहेत. भारतीय भाषांमध्ये मी दशपदी कुठे लिहिली आहे काय? किंवा कुठे तसा उल्लेख आहे काय? याचा शोध घेत असताना कवी अनिल यांनी म्हटले आहे की, "तमिळ भाषेतील प्राचीन ख्रिस्तपूर्व ५०० ते ख्रिस्तोत्तर ६०० या कालखंडातील काव्यात दहा चरणांचा स्तंभ असलेला पद्यबंध आहे आणि त्याला दशक म्हणतात आणि काही कवींनी पाच चरणांच्या दोन स्तंभांचे एक दशक असा पद्यबंधही रचलेला आहे". यावरून कवी अनिल यांनी दशपदी पद्यबंधाविषयी शोध घेण्याचा प्रयत्न केला होता पण तसे त्यांना आढळून आल्याचे दिसत नाही किंवा असेही म्हणता येऊ शकते की त्यांचे प्रयत्न तोकडे ठरले. कारण रवींद्रनाथ टागोर यांच्या समकालीन असणाऱ्या द्विजेंद्रलाल यांनी त्यांच्या पूर्वी तशा रचना केलेल्या होत्या. द्विजेंद्रलाल यांचा जन्म १८६३ साली तर कवी अनिल यांचा जन्म १९०१ साली झाला. द्विजेंद्रलाल आयुष्याच्या उत्तरार्धामध्ये म्हणजे १९०३ पासून दशपदी लिहीत असल्याचे दिसून येते तर कवी अनिल हेसुद्धा आयुष्याच्या उत्तरार्धात म्हणजे १९५९ पासून दशपदी लिहू लागलेले. एक बंगाली कवी आहे तर दुसरा मराठी कवी आहे. दोघांच्या दशपदी लेखनातील अंतर जवळपास ५६ वर्षांचे आहे. कवी अनिल यांना फक्त 'द्विपदीपासून आपण जयदेवाच्या अष्टपदी पर्यंत आलो. दशपदी हा त्याच्या पुढील स्वाभाविक टप्पा आहे. 'एवढेच ज्ञात होते. म्हणजेच कवी अनिल यांना इतर भाषांमधील कुणाची दशपदी पद्यबंध असलेली रचना माहीत असल्याचे किंवा वाचल्याचे समजणे कठीण आहे. मराठीत आपण स्वतंत्र पद्यबंध निर्मिला असे अप्रत्यक्षपणे ते 'दशपदी-दर्शन' या प्रारंभिकेतून सांगण्याचा खटाटोप करतात

दोन्ही कवींच्या दशपदी लेखनातील योगायोगाने एक वैशिष्ट्य वीणा आलासे यांना जाणवते. दोघांचेही ही वैवाहिक जीवन भावसमृद्ध होते. पण पत्नीच्या निधनानंतर आलेली व्याकुळता, उदासीनता, एकटेपणा, मृत्यूवरील चिंतन दोघांच्याही काव्यात आविष्कृत होते. ही लक्षात येण्यासारखी बाब आहे. अनिल यांच्या साहित्याचे अभ्यासक डॉ. पंडितराव पवार यांनी 'अनिल: एक बीजकवी' या लेखात, 'यापूर्वी बंगाली कवी द्विजेंद्रलाल राय यांनी 'दशपदी' रचना केल्याचा संदर्भ मिळतो, परंतु कवी द्विजेंद्रलाल राय यांनी दशपदी

घडवलेली आहे, जाणीवपूर्वक रचना केलेली आहे, असे जाणवते तर कवी अनिलांची 'दशपदी' ही घडलेली आहे, त्यामुळे ती अधिक स्वाभाविक भावगीतासारखी, अधिक भाववाही आणि मुक्तछंदात असल्याने लयबद्धही आहे म्हणून मराठी काव्यप्रवाहात मुक्त छंदाच्या प्रवर्तनाप्रमाणेच 'दशपदी'ची रचना ही ऐतिहासिक घटना आहे' असे मत नोंदविले आहे. (अनिलांच्या एकवीस कविता, डॉ. पंडितराव पवार पृ. क्र. १२०-१२१) कवी अनिल यांच्या आधीच्या कविता संग्रहातील मुक्तछंद व चिंतनशील दीर्घकाव्य बघता दशपदीतील रचना आकाराने लहान आहेत. 'पसरट कवितेची व्यावहारिक गरज भागविता भागविताच अंतर्मुख, विचुक आणि कोमल कवितेची 'तहान' ही त्यांच्या प्रतिभेला लागलेली होती. त्यातूनच त्यांना 'दशपदी' सारखा रुपबंध गवसला. बंगालमधील द्विजेंद्रलाल रॉय यांच्या दशपदीपेक्षा अनिलांची दशपदी स्वभावतःच भिन्न असल्याचे मत द. भि. कुलकर्णी यांनी मांडले आहे. (प्रयोग अनिकांचे, कुलकर्णी द. भि., कवी अनिलांची कविता : काही आकलने संपा. प्रा. पवार पंडितराव, पृ. क्र. १७९)

दशपदी'तील सामाजिक मीमांसा :

दशपदीचे दोन भाग आहेत. पहिल्या भागात दोन लेख आहेत. कवी अनिल यांनी दशपदी च्या सुरुवातीला पृ. क्र. ७ ते पृ. क्र. २३ 'दशपदी-दर्शन' अशी एक प्रारंभिका जोडलेली आहे यामध्ये त्यांनी दशपदी लिहिण्या मागील स्वतःची भूमिका व दशपदी पद्यबंधाची चर्चा केलेली आहे. त्यानंतर पृ. क्र. २४ ते पृ. क्र. ५० दरम्यान विजया राजाध्यक्ष यांनी कवी अनिल यांच्याशी दशपदी च्या संदर्भात विचारलेले विविध प्रश्न आणि कवी अनिल यांनी त्यांना दिलेली उत्तरे अशी मुलाखतीच्या अंगाने जाणारी चर्चा ही 'पदचर्या' म्हणून मुद्रित केलेली आहे. त्यानंतर दुसऱ्या भागामध्ये म्हणजेच पृ. क्र. ५३ ते पृ. क्र. ९१, अनिल म्हणतात त्याप्रमाणे 'एक उणे चाळीस' रचना ह्या दशपदी आहेत. एक असंग्रहितकविता नंतर समाविष्ट झालेली आहे ती म्हणजे, 'आता आनंदाचे दिस' ही एक अपूर्ण दशपदी आहे. ही नऊ ओळींची रचना पृ. क्र. ९२ वर सर्वात शेवटी आहे. त्यानंतर पृ. क्र. ९३ ते ९५ या तीन पानात प्रत्येक दशपदीची 'स्थल-काल आणि छंद' नोंद करण्यात आलेली आहे. 'कवि अनिलांची कविता: काही आकलने' या प्राचार्य पंडीतराव पवार संपादित ग्रंथामध्ये, 'अनिलांची कविता आणि 'दशपदी' या डॉ. नागनाथ कोत्तापल्ले यांच्या लेखात त्यांनी उपस्थित केलेला मुद्दा अधोरेखित करण्यासारखा आहे. ते म्हणतात, "दशपदी ह्या रुपात व्यक्त होणारी कविता फक्त प्रवासातच संभवू शकते का?" कारण दशपदीत शेवटी दिलेल्या नोंदीवरून असे लक्षात येते की अनिल यांनी प्रत्येक दशपदी ही प्रवासातच लिहिली आहे. दशपदी हे अनिलांचे आत्मनिष्ठ चिंतन आहे. याच मताशी सुसंगत मत 'कवि अनिलांची कविता: या ग्रंथामध्ये समाविष्ट 'दशपदी- एक चिंतन' या लेखामध्ये डॉ. प्रल्हाद वडेर यांनी, 'अनिलांच्या दशपद्या हे एक प्रदीर्घ चिंतन आहे. सुट्ट्या सुट्ट्या रचनांमधून अनिल नावाचा एक माणूस आपल्या गत आयुष्याचं जणू सिंहावलोकन करतो आहे'. असं म्हटलेलं आहे. भारतीय साहित्य अकादमीने गौरवलेल्या मराठी ग्रंथांचा मागोवा घेताना दशपदीबद्दल समीक्षक एकनाथ पगार यांनी म्हटले आहे, 'दशपदी हा केवळ प्रयोग नाही हे प्रत्यक्ष कवीचे भाव दर्शन आहे . ते दहा चरणातून प्रकट होत राहिले आहे'

♦ एक ते चाळीस दशपदींचा धांडोळा:

१) **विराणी:** कवी अनिल यांची व्यक्तीनिष्ठ कविता आहे. 'परमेश्वराविषयीची विरह भावना व्यक्त करणारे स्फुटकाव्य 'अशी वाङ्मय कोशाच्या चौथ्या खंडांमध्ये विराणीची व्याख्या दिलेली आहे. प्रिय व्यक्तीच्या विरहात सुद्धा विराणी अथवा विरहिनी लिहिली गेली आहे. आर्तता, उत्कटता, प्रकट शृंगार आणि नादानूकुल रचनाही विराण्यांचे विशेष आहेत. जीवन व्यवहारांमध्ये माणूस प्रेम करणाऱ्या माणसांपासून खूप दूर निघून

जातो.जीवनाच्या व्यथा-विवंचनांमध्ये गुरफटतो.जेव्हा पूर्णपणे तो स्वतःला हरवून बसतो त्यावेळेस माणसाची अवस्था कवी अनिल यांच्या 'विराणी' या दशपदीतील आशयाप्रमाणेच होते. माणसाला हरण्याची किंवा हरवल्याची जाणीव जेव्हा होते त्यावेळेस तेव्हा तो फार दूर आलेला असतो.आशेचा कुठलाही किरण भोवती दिसत नाही.'हारल्याची हरवल्याची जाणीव सलत राहते अशा वेळी काळजात विरून जावे वाटते!' या कवितेतील,'मेघ काळे क्रूर','गुडघा गुडघा चिखल','गडद अंधकार','विझून गेली वात','काळीकुट्ट रात' या प्रतिमा कविला सर्व बाजूने घेरणा-या शत्रूप्रमाणे वाटतात.पुन्हा प्रियजनांकडे परतण्याचे सर्व मार्ग संपुष्टात आल्याचे संकेत देणा-या आहेत.

२) तदात्मता :- कवी अनिल यांचे निसर्गाचे निरीक्षण किती सूक्ष्म होते आणि त्या निसर्गातही मानवी भावनांचा अचूक वेध घेण्याची त्यांची प्रतिभा किती अलौकिक होती याची प्रचिती देणारी तदात्मता ही दशपदी.या दशपदी सुंदर दृश्य कवी शब्दबद्ध करतो.सूर्य आणि सृष्टी यांची प्रतिके घेऊन कवी स्त्री पुरुषाच्या पहिल्या प्रेमाची अनुभूती प्रकट करतो.'तेव्हा संवेदना अबोध काही तदात्मतेची थरारून जाते प्रितीचा पहिला स्पर्श जाणवून सारे अंगांग शहारून जाते!'

३) एक दिवस :- या दशपदीत स्वतःला आलेल्या एकटेपणाचे व वैफल्याचे वर्णन अनिल यांनी केलेले आहे.मन नैराश्याने ग्रासल्यानंतर कवीच्या तोंडून ओळी बाहेर पडतात,

'जीव लागत नाही माझा असा एक दिवस येतो

कधी अधून-मधून केव्हा लागोपाठ भेट देतो'

आलेले नैराश्य लवकर जात नाही.या नैराश्यात कवी अंतर्मुख होऊन आयुष्याचा हिशोब लावताना -नैराश्याने कुंथून कवितेचा शेवट करताना असे लिहितो 'अश्रू बाहेर गळत नाहीत आत जळत राहतात'.

४) आणीबाणी :- ही कविता राजकीय आणीबाणीची आहे, असे वाटू शकते. पण ही कविता कवीच्या वैयक्तिक आयुष्यावर कविने केलेले चिंतन आहे.कवी म्हणतो, 'अशा काही रात्री गेल्या ज्यात काळवंडले असतो.

अशा काही वेळा आल्या होत्या तसे उरलो नसतो' जीवनातील अनेक पेच प्रसंगांना सामोरे जाताना संघर्ष करताना माणसाची होणारी अवस्था मांडतो. कवी विफलतेमध्येही सकारात्मक ऊर्जा देणारी शेवटची ओळ लिहितो, 'तसे काही जवळ नव्हते नुसते -हात हाती होते!

५) तळ्याकाठी :- कवी एकांत शोधत आत्मचिंतनासाठी एखाद्या तळ्याकाठी जाऊन बसावेसे वाटते की ज्या ठिकाणी प्रचंड शांतता त्याच्या मनाला लाभते.शांतता भंग करणारा कुठलाही व्यत्यय येत नाही.'जिथे शांतता स्वतःच निवारा शोधीत थकून आली असते'इतकी निरवता कवीला तळ्याकाठी लाभते. 'कवी अनिलांची कविता:काही आकलने'या ग्रंथात समाविष्ट आनंद जोर्वेकर यांच्या 'तळ्याकाठी'या लेखात त्यांनी शांततेचे चित्र रंगवणाऱ्या टेनिसनच्या 'इन मेमोरीम'मधील ओळींशी या कवितेची तुलना केली आहे.

Calm is the morn without a sound

Calm as to suit the calmer grief

And only thro' the faded leaf

A chestnut patters to the ground

कारण अशा शांततेतच साऱ्या विकरांच्या विसर्जनाच्या आणि शुद्ध,अपाप विचारांच्या, भावनांच्या, सर्जनाच्या शक्यता दडलेल्या असतात.

६) खेळणी :- या दशपदीत कवी बालपणीच्या विविध खेळण्यांचा पुनर्जादवा घेतो.स्वतःकडे असलेल्या विविध खेळण्यांची आठवण कवीला होते.बालपणी आपल्याकडे महाग असलेली चिनी मातीची बाहुली नव्हती हेही त्याला आठवते.बालस्वभावामुळे काही खेळणी तुटली तेव्हा रडूही आले.हळूहळू मोठे होताना सगळे खेळ मागे पडतात.व्यवहारी जगात माणसाच्या आयुष्याचा खेळ होतो.कवी कवितेचा शेवट करताना,'बाळखेळण्यांमधून

मन अजून निघता निघत नाही!'.ही ओळ लिहितो.या ओळीचे नाते संत तुकारामांच्या'लहानपण देगा देवा,मुंगी साखरेचा रवा'या पंक्तींशी जोडता येण्यासारखे आहे.मोठं झाल्यानंतर निरागस आयुष्य वाट्याला येत नाही.

७) पावसाळी सांज :- कवी अनिल यांचे मन निसर्गाकडे सारखे खेचले जाते याचे अजून एक उदाहरण म्हणजे 'पावसाळी सांज'ही दशपदी.आपले मन कवी निसर्गाशी जोडून घेतात. पावसाळी सांजेचे दृश्य रंगवताना कवीला प्रियजनांची आठवण होत असावी म्हणून कवितेचा शेवट करताना कवी'एकीकडे उरी भरून येते एकीकडे रिते होत राहते!'

८) दोन वाटा :- आयुष्याच्या प्रवासात वाटांचे फार महत्त्व आहे.कोणत्या मार्गाने जायचे हे माणसाला ठरवावे लागते.यशस्वी होणा-या माणसाचा मार्ग सोपा नसतो.कोणत्या वाटेने गेलो असतो तर इच्छित लवकर साध्य झाले असते? हा विचार कविला पडलाय तसा प्रत्येक माणसाला पडतो.दुसरी वाट भुरळ घालते.जी वाट चालणारा निवडत नाही तिच जास्त खुणावते.पण शेवटी ज्या वाटेने आपण आलो तिच वाट आपली असते.म्हणून कवी लिहितो.,तसे व्हायचे नव्हते-हीच माझी वाट होती!'. 'वाट'हे प्रतिक घेऊन कवीने जीवनासाध्यासाठी निवडाव्या लागणा-या मार्गांचे,निर्णयांचे वर्णन केले आहे.

९) जुई :- साध्या जुईच्या फुलावर लिहिलेली दशपदी.कवीच्या भाववृत्तीचे दर्शन घडवणारी आहे.जुईचा मंद सुगंध मन मोहून घेतो.पावसाळ्यातील सर ओसरून गेल्यावर समोर दिसणा-या जाईचे नितळ देखणे रूप नाजूक कोवळ्या फांद्यांचा बांधा पाचूच्या पानात जाई झाकून घेते.फुलांची मादकता मार्दवात विरून जाते.कवीला हे इतके सुंदर निसर्गचित्र पाहून प्रचंड सुख लाभल्याची जाणिव होते.म्हणूनच कवी लिहितो,

'मादकता जाते मार्दवी विरून सौंदर्य सोजवळाआड दडते

सोलीव सुखाचे स्वप्नच एक जीवाला जागतेपणी पडते!

१०) श्रावणझड :- श्रावणझड ही सुद्धा कवीने निसर्गाशी एकरूप होऊन लिहिलेली दशपदी.श्रावणसर बाहेर कोसळत आहे पण कवी मात्र अंतरामध्ये भिजलेला आहे.'पक्षी खुपसून चोच एक पक्षी निजलेला'ही ओळ प्रतिकात्मक आहे.पाऊस पडत असताना ज्याप्रमाणे पक्षी कुठेतरी निवारा शोधून बसतो.कवितेत अनेक वर्णांची पुनरावृत्ती आहे.जसे की-र,ल,प,ब,त,थ,ळ,ण,झ इत्यादी.कवीने अनुप्रासाची संघटना करून नादमयता निर्माण केली आहे.हेही या कवितेचे विशेष आहे. श्रेष्ठ कवितेतील भावानुभवात अनेक सौंदर्यात्मक संगती असतात आणि म्हणूनच तिच्यातील अनुभवसत्यात तिच्यातील अनेक अर्थसंगती द्योतित करण्याचे सामर्थ्य एकाच वेळी असते.अनिलांच्या ह्या कवितेतही असेच आहे." असे या कवितेचे विशेष सांगताना म.शं.वाबगावकर यांनी म्हटले आहे

११) शरदागम :- ही सुद्धा कवी अनिल यांची निसर्ग सौंदर्य रेखाटणारी रचना आहे.शरद ऋतूचे आगमन होणार आहे,अशा वेळी सृष्टीच्या रूपात होणारे सूक्ष्म बदल कवी शब्दातून टिपत आहे.शरद ऋतू इतक्यात आला नाही,म्हणून शेवंतीला पिवळी फुले फुलवण्यासाठी घाई करू नको असेही सुचवत आहे.

'शेवंतीला कुणी उगीच सांगे इतक्यात तुझी वेळ आली नाही

गवताचे सोने होण्याआधीच पिवळ्या फुलांची नको करू घाई!

कवीचा ऋतूमानाचा अभ्यासही या ओळीतून दिसतो.

१२) लावण्य :-या दशपदीतून कवी अनिल यांची सौंदर्यदृष्टी प्रकट होते.कवील अचानक एखादी डोळे दिपवणारी सुंदर स्त्री दिसते.कवी तिच्याशी एकरूप होतो.ओढला जातो.पूर्व जन्मांचे नाते असल्याचे कविला जाणवत राहते.इतके हे लावण्य मनाला व्यापून उरते.'जागच्या जागी राहून हृदय प्रीतीचा वर्षाव करून घेते!'कवी या लावण्यवतीच्या प्रेमात पडतो.फक्त स्त्रीच नाही तर अशी मन मोहून टाकणारी कुठलीही गोष्ट असू शकते.मन निर्मळपणे प्रेमात पडते.हाच उत्कट प्रेमभाव कवी व्यक्त करतो.

१३) एकाकी :- आपल्या जवळची व्यक्ती गेल्यानंतर माणूस एकटा पडतो. त्याच्या आठवणीत भिजून जातो. कवी अनिल यांनी 'पदचर्या' मध्ये विजया राजाध्यक्षांना या कवितेबद्दलची आठवण सांगितली आहे. (दशपदी, पृ. क्र. ३१) प्रवासात असताना आपल्या मुलगा किशोर याचे अचानक जाणे मनाला बोटत असते. त्यावेळी घरी एकट्या असणा-या पत्नी कुसुमावती म्हणजे किशोरच्या आईला हे दुःख कसे पेलवत असेल? या गोष्टीचा विचार करून कवी व्याकुळ झालेला आहे.

"आधारच तुझ्या पायाखालचा निघून गेला कसा एकाएकी

ज्यावर आहे मी अजून चालत तुझ्यावाचून वाट एकाकी!

१४) साथ :- कवी अनिल यांनी कामानिमित्त अनेक ठिकाणी प्रवास केला. या काळात प्रवासातील एकटेपणात काव्य सोबत होतेच. पण काव्यात आविष्कृत होणारे निसर्गघटकही साथीला होते. कवीला प्रवास करायचा आहे. पण या प्रवासात त्याच्या सोबत वारा असणार आहे. वा-याशी एकरूप होऊन प्रवास करायचा. पण वा-याबरोबर चालणे कठीण आहे कारण, 'स्वतःच्या भोवती रिंगण धरून कधी समेवर येतच नाही.'

या कवितेतही, 'न, ल, त, र, ह, व' असे वर्ण पुन्हा पुन्हा आल्याने वाचताना नादमयता निर्माण होते.

१५) गतार्थ :- शब्दांच्या सार्थतेवर भाष्य करणारी ही दशपदी. अर्थाने शब्दांना पोरके करू नये. शब्द कधीही गतार्थ ठरू नये अशी मनिषा कवी व्यक्त करतो. ज्यावेळी शब्दांना अर्थ उरत नाही, त्यावेळी वाणी एकाकी पडते. नाहीतर, 'मोल हरवता भाव भरलेले भाषेचे कोशही वाटती रिते' अशी स्थिती होते. अर्थाचा जीव जाऊ न देता संवाद करणे महत्वाचे असते. अर्थाशिवाय शब्द, शब्दाशिवाय संवाद, संवादाशिवाय नाते अर्थहीन ठरते, 'अवघा संसार संवादजीवी अवचित असा असंपृक्त होतो!' म्हणून कवी शेवटी अशी ओळ लिहून जातो.

१६) माघ :- कवीची आणि निसर्गाची एकरूपता हे दशपदीचे लक्षण मानावे लागेल. इतकं विविधांगी निरीक्षण कवीचे आहे. माघ महिन्यातील निसर्गरूपे कवी 'माघ' या कवितेतून व्यक्त करतो आहे. माघातील संध्याकाळ, पडछाया, झाडावरील शेंगांचे पिवळेपण, ऊन यांचे वर्णन कवी करतो. 'खडकांना बळ मिळते विस्मृतीच्या घोटांतच' पाणी आटत गेल्याने खडक सुकतात. हेही काव्यातून कवी सांगतो.

१७) फाल्गुन :- माघ या दशपदी नंतर कवीने फाल्गुन ही दशपदी लिहिली आहे. ऋतुचक्रानुसार माघ महिन्यानंतर फाल्गुन महिना येतो. जंगलाचे, तेथील वृक्षलतांचे सूक्ष्मपणे केलेले निरीक्षण कवी शब्दबद्ध करतो. वडाचे तप भंगणे, वनलतांचे नेणतेपण करवंदीचे चवचाल चाळे, पळसाचे कासावीस होणे, पिंपळावर आळ येणे, अशा प्रतिमा झाडांचे मानवीकरण करतात. प्रत्येक ओळ ३५ मात्रांची आहे. 'गुरू-लघू-गुरू-गुरू' अशी आवर्तने कवितेत लय निर्माण करतात. फाल्गुन महिन्यात वने निस्तेज होतात. पानगळ होते. रान पिवळे पडते. पावसाची आस लागते. म्हणून कवी लिहितो,

'पेट घेतो असह भगव्या धगधगीतून ओल उरलेला उमाळा.....

'ही वने पस्तावलेली भाळलेल्या वंचनांची फाल्गुनाची !'

१८) माड :- हीदेखील निसर्ग दशपदी आहे. सागरकिनारी असणा-या नारळाच्या झाडांशी असलेल्या एकरूपतेतून ही दशपदी लिहिल्याचे जाणवते. भरतीच्या लाटा ह्या काठावरील माडांना हानी पोहचवत असतात. वाळूही पुढे सरकत असते. माड आपले अस्तित्व खंबीरपणे उभे राहून टिकवून ठेवतो. या ठिकाणी 'माड' हे माणसांचे तर लाटा, वाळू, वारा हे संकटांचे प्रतिक आहे. अशा प्रत्येक संकटाला माड परतवून लावतो. शेवटी संकट टाळून पुढे जाणे, उभे राहणे हे अस्तित्वासाठी गरजेचे असते.

'वळवाच्या मेघाने कणवाने बरसावे

माडाने आलेल्या घटकेला टाळावे!

१९) प्रीती :- ही एक तरल प्रेमानुभवाची दशपदी आहे. जीवन प्रेमाने व्यापलेले आहे. एकमेकांवर निरतिशय प्रेम केल्याने आलेली समृद्धता, तृप्त मन, एकरूपता यावर कवी भाष्य करतो. या कवितेत कवीने अनुप्रास योजला आहे. 'किती, रिती, खूप, मुके, बोल, गलो, पुष्कळ, फार, निळा, असे शब्द पुन्हा पुन्हा आले आहेत. वाचनात एक लय व गती प्राप्त होते. एकमेकांचे होऊन उरलो यासाठी कवी आभाळ व सागर यांची प्रतिके वापरतो आणि लिहितो,

'सागरास रंग देता निळा निळा नभाने स्वतःचा फिका पाडला

आणि आभाळास हृदयी धराया जळाने आपला जीव पाडला!

२०) कालवा :- एका विशिष्ट क्षणीच शिंपल्यात असलेल्या कालव व खड्यापासून मोती तयार होतात. यात कालव भरडले जाते. ब-याचदा वेळ न साधल्याने त्याला मोती होण्याचे भाग्य प्राप्त होत नाही. सागराच्या पाण्यात विसावताही येत नाही. शिंपल्यात असलेले कालव अधांतरी राहते. याच निसर्ग स्थितीचे वर्णन कवी करताना लिहितो,

'कधी कधी पण भरती ओहोटी सवेच न्यायाचे विसरून जाते

आणि कालवाला त्याच्या व्यथेसह कोरड्या वाळूत पसरून देते!

२१) उशिराचा पाऊस:- या दशपदीत कवी उशिरा आलेल्या पावसाची नोंद घेत आहे. पहिल्या पावसासारखाच हाही पाऊस हातावर झेलून घेण्याचे आवाहन कवी करतो आहे. हा पाऊस पापण्यांवर ल्यावा, घामात मिळवावा, डोक्यात पेरावा, पाठीवरती निथळू द्यावा. पाऊस उशिरा आला म्हणून त्याची कुठेही तक्रार करू नये. म्हणून कवी लिहितो,

'पाटघड्यांवर बसवून त्याशी कोडकौतुकाचा खेळ खेळावा!

या कवितेत वा, णे अशा वर्णांची खूपदा आवर्तने झाली आहेत.

२२) अदृष्ट :- ही कवी अनिल यांची निसर्ग प्रतिमांनी सजलेली पण गूढ वाटावी अशी दशपदी. सोबत करणारी जीवलग व्यक्ती साथ सोडून जाते. तेव्हा समोरचा अंधार वाढत जाऊन पुढे जाणे अवघड होते. अचानक अदृश्य झालेल्या प्रीयजनामुळे कवी व्याकुळ होतो.

शोधिता अश्रूंच्या भिंगांतून तुला अंधार डोळ्यांस आता विचारतो

कुठे धरित्रीचे चरित्र संपते कुठे आभाळाचा आरंभ होतो!

धरतीचा शेवट कुठे होतो आणि आभाळाचा आरंभ कुठे होतो याचा थांग लागत नाही. म्हणूनच एकदा दूर गेलेली प्रिय व्यक्ती परत येत नाही.

२३) फुलांचे आयुष्य :- फुलांचे आयुष्य ते किती? फुलाचे छोटेसे आयुष्य सुवासाने जगाला भारून टाकते. या फुलांत प्रेमाचे गोडवा भरलेले असतो. खरे प्रेम फुलांच्या सहवासात बहरते.

'फुलांचे आयुष्य दिवसा तासांनी नसते गणना करावयाचे'

अशी नाजूक ओळ कवी फुलांसाठी लिहितो. कारण फुलांच्या सहवासात 'नांदत असते वेल्हाळ वेळा प्रेमात साद हरवलेली!

याची कवीला जाणीव आहे.

२४) हलन्त :- अपूर्ण वर्ण दर्शविण्यासाठी हलन्त वापरला जातो. कवी अनिल यांनी या कवितेतील प्रत्येक ओळीतील शेवटचे अक्षर हलन्त युक्त वापरले आहे. हा या कवितेचा विशेष आहे. म्हणजेच वाचताना शेवटच्या अक्षरावर जोर द्यायचा नाही. व्यंजनाचा पूर्ण उच्चार करावयाचा झाला तर त्यात स्वर मिसळवा लागतो. म्हणून कवी लिहितो,

'आरंभाला सूर न लागे न लाभे स्वराचा अंन्त

नांगर टाकूनी पडली नावांची व्यंजने हलन्त!

यात हलन म्हणजे नांगर, नांगरासारखेच हलन्त अपूर्ण व्यंजन दाखवण्यासाठी वापरले जाते जगत्, निषत्,

भगत,स्वगत,फलक्,झलक्,क्वचित्, किंचित्, अन्त्,हलन्त् असे शब्द मुद्रित केलेले आहे.

२५) सगर्भ :- इच्छा नसताना काहीतरी जन्माची येऊ पाहते.सृजनाच्या काळ जाणवून लागतात पण मन आशा निर्मितीसाठी तयार होत नाही.इच्छेविरुद्धचे हे सृजनापत्य कवीला नकोसे वाटते.कवीची मनस्थिती ठीक नाही.कारण'प्रीय सोडून गेलेले खूण ठेवुनी उलटी'अशी कवीची अवस्था आहे.म्हणून हे डोहाळे हिरमुसले आहेत.अभिसाराचे साहस अंगलट आले आहे.सृजन आहे पण अनवांछित आहे.म्हणून कवी लिहितो,'वैभव हे सृजनाचे दैवाने ठगलेले!'

२६) सावल्या :- सोडून गेलेल्या व्यक्तीच्या आठवणी सावली होऊन समोर येतात.तेव्हा त्यांच्याशी एकरूप झालेला कवी'तू आहेस स्वतः कि चित्र जिवंत झालेले'असा हरवून जातो. हे सगळे भास असतात.खरे मात्र काहीच नसते.सावल्या अबोल असतात.कवी त्या सावल्यांना आधार द्यायला जातो पण त्या निसटून जातात.

'एक पडता उचलतो तर पटकन् पाच खाली पडतात

चुकून बाहेर आल्या सावल्या चटकन् त्यांच्या आड दडतात!'

२७) चित्र :- अतीव प्रेम असलेल्या व्यक्तीच्या आठवणीत बुडालेला कवी आसवांना रंगात बुडवून कुणीच पाहिले नाही असे चित्र काढणार आहे.पण त्याला स्वतःलाच प्रश्न पडतो की कितीही जीव ओतला तरी चित्र ते चित्रच त्याला ख-या व्यक्तीची ,तिच्या प्रेमाची सर येणार नाही.चित्र सुंदर होईल पण त्यांतून व्यक्ती बाहेर येणार नाही.हा आशय रंगणारी ही दशपदी.

'ते आतिल चित्र कधी बाहेर न येईल

आरंभासच अडेल पूर्ण कुठुन होईल!

२८) स्वान्त :- कवी अनिल यांची आत्ममग्नता दर्शवणारी दशपदी.स्वतःच्या आतील अंधारात बुडालेल्या कवीला बाहेरील प्रकाश दिसत नाही.

'जीवनाच्या स्तनकुंभस्पर्शासह मृत्यूचे चुंबिता अधर श्याम'

कवी एकाकीपणात करत असलेले जगलेल्या जीवनाचे आणि ओढ लागलेल्या मृत्यूचे चिंतन या ओळीतून प्रकट होते.

२९) झाले :- या दशपदीमधून कवी आपल्या काव्य जीवनाचे विश्लेषण करत आहे.किती लिहिले यापेक्षा काय लिहिले याला महत्व आहे असे कवीला सूचित करायचे आहे.सगळेच लेखन रसिकप्रिय असेल असे नाही.प्रत्येक काळात थोर कवी होऊन गेले.त्यांना लोक जसे आठवतात-विसरतात तसेच माझेही होईल.

'किती सहज दाद दिलीत एवढे मात्र बरे झाले

तुमचे आमचे नाते निदान तेवढ्यापुरते खरे झाले!'

या कवितेत कवीने दहाही ओळींचा शेवट 'झाले'याच शब्दाने केलेला आहे.

३०) नाटक :- नाटकाशी संबंधीत विविध बाबींशी कवी माणसाच्या जीवनाची तुलना करतो.माणसाला रोजच अवतीभवती जिवंत नाटक बघायला मिळते.यात भोवतीची माणसेच पात्र रंगवत असतात.दिवस उगल्यापासून नाना प्रकारची माणसे,त्यांचे संवाद,स्वभाव,जीवन व्यवहार आपण अनुभवत असतो.कधी तो प्रेक्षक असतो तर कधी स्वतःच नाटकातील एखादे पात्र असतो.

३१) जीवन :- दशपदी या संग्रहातील ही छोट्या छंदातील रचना.प्रत्येक ओळीत बारा ते चौदा अक्षरे. स्वतःच्या जीवना संदर्भातील चिंतन या कवितेतील अवघ्या चाळीस शब्दांत मांडण्याचा प्रयत्न कवी करत आहे.कवीच्या हातून काहीतरी निसटून आहे.त्याने मोलाचे काही गमावले आहे.आता जीवनाचे काय होईल याचे भविष्यकथन कवी करत आहे. जाईल, राहील, छाईल, पाहील, नेईल, चाहील, खाईल, साहील,येईल,बाहील अशी भविष्यकाळ दर्शवणारी क्रियापदे कवितेत आहे.छा जाना , चाहना अशी हिंदीतील क्रियापदे कवी मराठी वळणाची करून कवितेत बसवतो.

३२) काळी :- काळी जमीन हे प्रतिक घेऊन सामान्य स्त्रीबद्दल, तिच्या सोशिकतेबद्दल भाष्य करणारी ही कविता. ही काळी उन्हाणे न्हाते. तिला कसल्याही नटण्याचा सोस नाही. मात्र गोठपाटल्या घातलेल्या हातात लोखंडी विळा शोभून दिसतो. मातीही तशीच. वरून उन्हाळा सहन करण्याची ताकद आतील ओलावा देतो. काळी माती आणि शेतात राबणारी सामान्य स्त्री अशी प्रतिकात्मक तुलना कवी या कवितेतून करतो.

'भारीच सोशीक हिची वहिवाट झडीवर झड घेते सामावून

कोरडे पंधरवाडे गेले तरी साहते आतल्याआत ओलावून!

३३) लहरा :- गाणे गाण्यासाठीची साथ आणि जीवनातील जोडीदाराच्या सोबतीचे महत्त्व याची तुलना कवी या दशपदीत करतो. गाणे चांगले होण्यासाठी साथीदारांनी चांगली समरसून साथ करणे जसे गरजेचे तसे जीवन गाणे सुखी होण्यासाठी जोडीदाराची भूमिका मोलाची. आपल्या जोडीदाराबद्दल तो कृतज्ञही आहे. म्हणूनच कवी लिहितो,

'मी गाता तू दिलीस साथ आर्त अंतरिची

शब्दांचा ऋण पिटता अर्थाच्या नंतरची'

लहरा ही एक संगीतातील धून. ही धून लागल्यावर नाचावेसे वाटते. अशीच तुझ्या साथीमुळे माझे जीवन आनंदमय झाले.

३४) दाद :- ही कवीची वसंतराव देशपांडे यांनी गायलेली गाजलेली रचना.

'कुणी जाल का सांगाल का सुचवाल का ह्या कोकिळा

रात्री तरी गाऊ नको खुलवू नको अपुला गळा '

कवीची मनस्थिती ठीक नाही. एकाकीपण व अस्वस्थता व्यापलेली असताना, रात्रीच्या वेळी कोकिळ पक्ष्याने गाणे योग्य वाटत नाही. 'आताच आभाळातला काळोख मी कुरवाळला' या ओळीतून कवीच्या मनातील दुःख व्यक्त होते. यातून मन सावरत असताना कोकिळ कितीही सुंदर गायला तरी ते सुखकारक नाही.

३५) एकरंग :- रंग हे प्रतिक कवीने विविध अर्थाने कवितेत वापरले आहे. प्रीतीचा रंग, जगताने उधळलेले रंग, इंद्रधनुष्याचे रंग, स्वतःचा रंग, गडद रंग, उडून गेलेले रंग, आसवांचा रंग असे रंग कवीने अनुभवलेले आहे. पण ज्या रंगात कवी अधिक रंगला, जो रंग त्याला अधिक भावला तो रंग फक्त प्रेमाचा रंग होता, हे कवी मोकळेपणाने व्यक्त करतो. कवितेची सुरुवात करतानाच कवी म्हणतो,

'एकरंग प्रीतिचा तयात जीव रंगला माझा

तसा कशात नाही मग जीव रंगला माझा'

या कवितेतून प्रेम हेच जीवनलक्षण असल्याचे कवी सूचित करतो. निरलस प्रेमाचा रंग कधीही मिटत नाही. हेच कवीला सांगायचे आहे.

३६) मी :- ही सुद्धा गजल सदृश गेय दशपदी आहे. या दशपदीमधून कवी स्वतःबद्दलचा खुलासा करतो. कवीचे जगणे प्रवाहच्या सोबत कधीच नसते. तो स्वच्छंदी जगतो. कोण आपल्या सोबत आहे कोण नाही याची काळजी करणे कवीचा स्वभाव नाही.

'सोडून जातात पुढे सोबतिचे सर्व सखे

माझ्या मनमुकुरातच मज पाहत बसतो मी'

३७) पुन्हा :- ही गजल सदृश रचना आहे. मनाला भुरळ घालणारे क्षण आयुष्यात पुन्हा पुन्हा येत राहतात. हे सांगताना कवी,

'चटकचांदण्या रात्री येत राहतात पुन्हा

जीव पाखरू अवचित सापडते त्यांत पुन्हा

मोहाचे क्षण पुन्हा पुन्हा आयुष्यात येतात आणि कवीला खेचून घेऊ पाहतात याचे वर्णन कवी या दशपदी मध्ये करत आहे.

३७) चाललो :- 'वाटेवर काटे वेचीत चाललो

वाटले जसा फुलाफुलांत चाललो'

वाचताना गजल वाटावी अशी रचना पण ही गजल नाही. जीवनाची वाट चालताना, आहे त्या परिस्थितीत आनंद मानत, पुढे गेलो. काट्यांनाही फुले समजून जगलो. मग सगळे जगणेच आनंदगणे झाले. असे कवीला सांगायचे आहे. कधी सर्वासह मिसळून तर कधी कवी एकटा होता. वेळ कुणासाठी थांबत नाही. हेच कवीला स्वानुभवातून सुचवायचे आहे. कवी अनिल यांची ही वसंतराव देशपांडे यांनी गायलेली अतिशय प्रसिद्ध अशी गेय रचना आहे.

३९) तुझ्याविना :- जीवनात प्रिय व्यक्तीचे जाणे नेहमीच छळत राहते. ती पोकळी कधीच भरून निघत नाही. पुढील जीवन जगणे असह्य होऊन जाते. पत्नी कुसुमावती यांच्या निधनानंतर कवी अनिल यांच्या जीवनातही असेच एकाकीपण निर्माण झाले. म्हणून ते लिहितात,

'कितीक काळ हालला असा तुझ्याविना

कळे न श्वासांची चालला कसा तुझ्याविना'

या विरहात कवीला कुठल्याच गोष्टीत चैतन्य दिसत नाही. इतक्या आठवणी पत्नीच्या दाटून येतात. या आठवणींनी कवी व्याकुळ होतो. 'स्मरणावर प्राण जळे कसा तुझ्याविना!' हे स्मरणच कवीला सरणासारखे वाटते कारण इतके हे जीवन असह्य वाटते.

ही गजल सदृश गेय रचना आहे.

४०) आता आनंदाचे दीस :- ही नऊ ओळींची रचना आहे, म्हणजेच अपूर्ण दशपदी आहे. ही रचना 'सत्यकथे'त, जुलै १९८२ च्या अंकात प्रसिद्ध झालेली आहे. अनिल यांच्या निधनानंतर प्रसिद्ध झालेल्या 'दशपदी'च्या दुस-या आवृत्तीत शेवटची (चाळीसावी) रचना म्हणून समाविष्ट केलेली आहे. या कवितेची निश्चित तारीख नोंदवलेली नाही. मरणाची चाहूल लागल्यानंतर, आयुष्याबद्दल कवीने सार्थकता व्यक्त केली आहे. जसे खेळ संपल्यानंतर खेळाडू रिंगणातून बाहेर पडतात. हार असो की जीत, मैदानात उतरून आपण खिलाडू वृत्तीने डाव खेळलो, याचे समाधान असते. त्याप्रमाणे हा जीवनाचा डाव. पण मरणाइतकी आनंददायी गोष्ट दुसरी नाही याची कवीला जाण आहे. कारण सर्व पाशातून आता मुक्त होणार आहे.

'आता आनंदाचे दीस अंती हसण्याची वेळ

आला संपत संपत माझ्या जीवनाचा खेळ'

ही अष्टाक्षरी छंदातील रचना आहे.

निष्कर्ष :

१. लेखिका वीणा आलासे यांच्या 'दीपोत्सव' दिवाळी (२००८) मध्ये प्रकाशित 'दशपदीचे इतिवृत्त' या लेखाच्या आधारे हे म्हणता येईल की कवी अनिल यांच्यापुर्वी बंगाली कवी द्विजेंद्रलाल राय यांनी दशपदी हा रचनाप्रकार लिहिलेला आहे. मात्र मराठीमध्ये दशपदीचा परिचय कवी अनिल यांनी करून दिलेला आहे.
२. दशपदी हे अनिलांचे आत्मनिष्ठ चिंतन आहे. याच मताशी सुसंगत मत 'कवि अनिलांची कविता: काही आकलने' या प्राचार्य पंडीतराव पवार संपादित ग्रंथामध्ये समाविष्ट 'दशपदी- एक चिंतन' या लेखामध्ये डॉ. प्रल्हाद वडेर यांनी, 'अनिलांच्या दशपद्या हे एक प्रदीर्घ चिंतन आहे. सुट्या सुट्या रचनांमधून अनिल नावाचा एक माणूस आपल्या गत आयुष्याचं जणू सिंहावलोकन करतो आहे'. असं म्हटलेलं आहे

रूढार्थाने सामाजिक जाणिवेचे दर्शन दशपदीमधून घडत नसले तरी कवितेतील 'मी'हा समाजाचेच प्रतिनिधित्व करत असतो. दशपदीत आलेले व्यक्तिनिष्ठ अनुभवचित्रण हे समाजातील कुठल्याही व्यक्तीचे अनुभव असू शकतात. प्रेम, विरह, एकाकीपणा, भावनाकल्लोळ, साहचर्य, निसर्ग मानव संबंध, प्रवासानुभव, आयुष्याचे चिंतन, स्वसंघर्ष याबाबींचा विचार करता कवी अनिलांची कविता 'स्व'द्वारे सामाजिक आत्मनुभव व्यक्त करतांना दिसते.

३. दशपदी ही कवी अनिल यांची व्यक्तिनिष्ठ कविता आहे. आत्ममग्नवृत्तीने दशपदीचे लेखन कवी अनिल यांनी केलेले आहे
४. बऱ्याच ठिकाणी दशपदी ही गजलसदृश वाटावी अशी आहे पण दशपदी ही गजल नाही.
५. निसर्गाची ओढ, निसर्गाचे सूक्ष्म निरीक्षण, निसर्गातील विविध घटकांचे मानवीकरण करण्याची कवी अनिल यांची वृत्ती दशपदी मधून प्रकट होते.
६. दशपदी कवी अनिल यांच्या मनातील एकाकीपणाचे दर्शन घडवितात.
७. प्रेम व प्रिय व्यक्तीचा विरह या भावना दशपदीतून प्रतिबिंबित होतात.
८. दशपदी कवीच्या स्वच्छंदीपणाचे दर्शन घडवतात.
९. कवीचे जीवन आणि मृत्यू यांचे चिंतन देखील दशपदी मधून घडते.
१०. दशपदी या उत्तम भावकविता आहेत. गेय स्वरूपाच्या दशपदी या संग्रहात समाविष्ट आहेत.
११. दशपदीच्या शेवटी उदगारवाचक चिन्ह दिलेले आहे. कोणतेही विरामचिन्ह ओळींमध्ये दिलेले नाही त्यामुळे एखादी ओळ वाचताना यती स्थान कुठे घ्यावे ? हे वाचकाला कळत नाही. वाचकांच्या आकलनानुसार भिन्न अर्थ निघू शकतात.

संदर्भ :-

१. दशपदी, अनिल, मौज प्रकाशन गृह, मुंबई, तृ.आ. फेब्रुवारी (२००९)
२. अनिलांच्या एकवीस कविता, (डॉ.) पवार पंडितराव, पद्मगंधा प्रकाशन, पुणे, प्र.आ. (२०१३)
३. कवी अनिलांची कविता : काही आकलन, (प्रा.) पवार पंडितराव, दास्ताने रामचंद्र आणि कं. प्र. आ. (२००१)
४. दशपदीचे इतिवृत्त, आलासे वीणा, दीपोत्सव, लोकमत दिवाळी अंक (२००८)
५. वाटले फुलाफुलात चाललो, पगार एकनाथ, आस्वाद, गावकरी, दि. ०९/०५/२०१०

१३ व्या वित्त आयोगाकडून ग्रामपंचायतींना मिळणाऱ्या निधीचा अभ्यास

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गोषवारा (Abstract) -

तेराव्या वित्त आयोगाच्या शिफारशीनुसार १ एप्रिल २०१० ते ३१ मार्च २०१५ या कालावधीत केंद्र सरकारने राज्यांसाठी निधी वितरित करताना सदर निधीची परिगणना लोकसंख्या, उच्चतम दरडोई उत्पन्नापासून तफावत, हस्तांतरणाचा निर्देशांक अनुसूचित जाती/जमाती ची लोकसंख्या व वित्त आयोगाच्या निकषानुसार केली जाते. १३ व्या वित्त आयोगाने राज्यांना ३,८४,६१७ अनुदान देण्याची शिफारस केली यापैकी साधारणतः २.५ % अनुदाने स्थानिक स्वराज्य संस्थांना वर्ग करण्याची शिफारस करण्यात आली. प्रस्तुत संशोधन अभ्यासात १३ व्या वित्त आयोगाकडून मिळणाऱ्या निधीचा अभ्यास केला आहे.

प्रस्तावना (Introduction) -

"केंद्र सरकारने १३ व्या वित्त आयोगाच्या बहुतेक शिफारशी शब्दशः स्वीकारल्या आहेत, ज्यामुळे आता राज्यांना केंद्राकडून अधिक पैसे मिळतील. वित्त आयोगाने वित्तीय तूट कमी करण्याचे आवाहनही केले."

१३ व्या वित्त आयोगाचा अहवाल डिसेंबर २००९ मध्येच राष्ट्रपतींना सादर करण्यात आला. २६ फेब्रुवारी २०१० रोजी, ते सरकारने लोकसभेत सादर केले आणि त्यातील बहुतेक शिफारशी केंद्र सरकारने शब्दशः स्वीकारल्या. यावेळी वित्त आयोगाने आपल्या अहवालात विशेष उदारता दाखवली आहे आणि राज्यांवर विशेष कृपादृष्टी दाखवली आहे आणि केंद्राने राज्यांना कराच्या रकमेच्या ३०.५ टक्के ऐवजी ३२ टक्के रक्कम द्यावी अशी शिफारस केली आहे. स्थानिक स्वराज्य संस्था अनेकदा तक्रार करतात की त्यांना पुरेसे आर्थिक अधिकार दिले गेले नाहीत ज्यामुळे ते विकास कामे सुरळीतपणे पार पाडू शकत नाहीत. हे लक्षात घेऊन, वित्त आयोगाने शिफारस केली आहे की स्थानिक स्वराज्य संस्थांना पुढील पाच वर्षांसाठी विभाज्य रकमेच्या २.५ टक्के रक्कम मिळावी. वित्त आयोग एवढ्यावरच थांबला नाही आणि केंद्राकडून मिळणाऱ्या एकूण महसुलातील राज्यांचा वाटाही ३८ टक्क्यांवरून ३९.५ टक्के करण्याची शिफारस केली.

राज्यांप्रती असलेला आपला पक्षपात कायम ठेवत, वित्त आयोगाने राज्यांना मिळणाऱ्या अनुदानाची रक्कम वाढवण्याची शिफारसही केली आहे. परंतु या अनुदान रकमेचा बहुतांश भाग प्राथमिक शिक्षण आणि पर्यावरण यासारख्या कल्याणकारी योजनांवर खर्च करावा अशी अट देखील घालण्यात आली आहे.

संशोधनाची उद्दिष्टे-

१. १३ व्या वित्त आयोगाकडून ग्रामपंचायतींना मिळणाऱ्या निधीचे अध्ययन करणे.
२. १३ व्या वित्त आयोगाकडून मिळणाऱ्या निधीतून केल्या जाणाऱ्या कामांचा अभ्यास करणे.

संशोधन पद्धती -

प्रस्तुत विषयाच्या अभ्यासासाठी द्वितीय स्रोतांचा अवलंब करण्यात आला आहे. यामध्ये संदर्भ ग्रंथ, पुस्तके, शोध पत्रिका, लेख, मासिके, वृत्तपत्र, आणि प्रकाशित झालेली माहिती व इंटरनेटचा आधार घेण्यात आला आहे.

तेरावा वित्त आयोग-

तेरावा वित्त आयोग (FC-XIII) राष्ट्रपतींनी १३ नोव्हेंबर २००७ रोजी संविधानाच्या अनुच्छेद २८० अंतर्गत २०१०-१५ या कालावधीसाठी शिफारसी करण्यासाठी स्थापन केला. डॉ. विजय केळकर यांची

आयोगाचे अध्यक्ष म्हणून नियुक्ती करण्यात आली. डॉ. इंदिरा राजरामन, प्रोफेसर एमेरिटस, नॅशनल इन्स्टिट्यूट ऑफ पब्लिक फायनान्स अँड पॉलिसी (NIPFP), डॉ. अबुसालेह शरीफ, मुख्य अर्थशास्त्रज्ञ, नॅशनल अप्लाईड इकॉनॉमिक रिसर्च कौन्सिल (NCAER) आणि प्रोफेसर अतुल शर्मा, माजी कुलगुरु, राजीव गांधी विद्यापीठ (पूर्वी अरुणाचल विद्यापीठ) यांची पूर्णवेळ सदस्य म्हणून नियुक्ती करण्यात आली. श्री. बी.के. चतुर्वेदी, सदस्य, नियोजन आयोगाचे अंशकालिक सदस्य म्हणून नियुक्ती करण्यात आली. श्री सुमित बोस यांची आयोगाचे सचिव म्हणून नियुक्ती करण्यात आली (परिशिष्ट २.१). त्यानंतर, राष्ट्रपतींनी डॉ. अबुसालेह यांच्या जागी डॉ. संजीव मिश्रा, माजी सचिव (व्यय), अर्थ मंत्रालय यांची आयोगाचे सदस्य म्हणून नियुक्ती केली. शरीफ, जे सामील होऊ शकले नाहीत.

केंद्रिय वित्त आयोगाच्या शिफारशीनुसार राज्यातील पंचायत राज संस्थाना त्यांच्या बळकटीकरणासाठी अनुदान देण्यात येते. दि. १ एप्रिल २०१० पासून १३ वा वित्त आयोगास प्रारंभ झाला असून त्याचा कालखंड एप्रिल २०१० ते मार्च २०१५ असा आहे. राज्य स्तरावरून जिल्ह्यांना निधी वितरित करताना सदर निधीची परिगणना जिल्ह्यांची ग्रामीण लोकसंख्या, जिल्ह्याचे ग्रामीण क्षेत्रफळ, उच्चतम दरडोई उत्पन्नापासूनची तफावत, जिल्ह्याच्या ग्रामीण भागातील अनुसूचित जाती व जमातीच्या लोकसंख्येचे प्रमाण, वित्त आयोगाच्या व निधीच्या खर्चाचे प्रमाण व भारताचे नियंत्रक व महालेखापरिक्षक यांनी ठरवून दिलेल्या सुधारीत नमुन्यात लेखे ठेवण्यासाठी अंमलबजावणी करणे (प्रिया सॉफ्ट) या निकषानुसार केली आहे. तेरावा वित्त आयोगांतर्गत राज्यातील पंचायत राज संस्थांच्या बळकटीकरणासाठी प्राप्त होणारा निधी जनरल बेसिक ग्रँट, जनरल परफॉर्मस ग्रँट, स्पेशल एरिया बेसिक ग्रँट, स्पेशल एरिया परफॉर्मस ग्रँट या ४ प्रकारच्या ग्रँटच्या स्वरूपात प्राप्त होणार आहे.

तेराव्या वित्त आयोगाचा निधी जिल्ह्यातील पंचायत राज संस्थासाठी जि.प. स्तर १०%, पं. स. स्तर २०% व गा.पं. स्तर ७०% प्रमाणात वाटप करण्यात येते. जिल्हा परिषद स्तरावरून पंचायत समितीसाठी जनरल बेसिक ग्रँट व जनरल परफॉर्मस ग्रँट वाटप 7 निकषानुसार करणेत येते. तसेच जि.प. स्तरावरून गां.पं.साठी जनरल बेसिक ग्रँट व जनरल परफॉर्मस ग्रँट स्पेशल एरिया बेसिक ग्रँट व स्पेशल एरिया परफॉर्मस ग्रँट वाटप ८ निकषानुसार करणेत येते.

शासन निर्णय क्र. तेरावा वित्त आयोग २०१०/प्र.क्र. २२/वित्त ४ दि. ३० ऑगस्ट २०१० नुसार वितरित निधीतून गां.प. स्तरावर १२ बाबीवर खर्च करता येतो, पं.स.स्तरावर १० बाबीवर खर्च करता येतो. तर जि.प. स्तरावर १० बाबीवर खर्च करता येतो.वरील तिन्ही स्तरांतून दुरुस्तीच्या योजनां प्राधान्याने घेणेच्या असून, ग्रामपंचायत कार्यालय/ ग्रामसचिवालय, बांधकाम तसेच त्यांची देखभाल दुरुस्ती या कामासाठी ग्रामपंचायतींना निधी कमी पडत असल्यास, पंचायत समिती स्तरावरील निधी उपलब्ध करून देता येईल.शासन निर्णय क्रमांक तेविआ-२०१०/प्रक्र२२/वित्त-४/ दिनांक १० डिसेंबर २०२२ नुसार, गावांतर्गत गटारे व गांवातर्गत रस्ते बांधकाम (मुरमीकरण, खडीकरण, डांबरीकरण, सिमेंट क्रॉक्रीटीकरण) ही ग्राम पंचायत स्तरासाठी वितरित निधीतून घ्यावयाची बाब जिल्हा परिषद व पंचायत समिती स्तरावरील वितरित निधीतूनसुध्दा हाती घेण्यास मान्यता देण्यात आलेली आहे.

पंचायती राज संस्थांची रचना-

भारतीय संविधानाचा भाग नववा पंचायती राजशी संबंधित आहे. या भागाचे शीर्षक 'पंचायती' आहे आणि त्यात कलम २४३ ते २४३ ओ पर्यंतच्या तरतुदींचा समावेश आहे . ७३ व्या घटनादुरुस्ती कायद्याने, १९९२ ने पीआरआयना संवैधानिक दर्जा प्रदान केला. या कायद्याने संविधानाची अकरावी अनुसूची सादर केली आहे, ज्यामध्ये कलम २४३-जी अंतर्गत पंचायतींच्या २९ कार्यात्मक बाबींची यादी आहे. हा कायदा

संविधानाच्या कलम ४० ला व्यावहारिक स्वरूप देखील देतो जो एक निर्देशक तत्व आहे जो सांगतो की राज्याने ग्रामपंचायतींचे आयोजन करावे आणि त्यांना स्वशासित घटक म्हणून काम करण्याचा अधिकार द्यावा. ७३ व्या घटनादुरुस्ती कायद्याने राज्यांना वीस लाखांपेक्षा जास्त लोकसंख्या असलेल्या ठिकाणी त्रिस्तरीय व्यवस्था स्थापित करणे बंधनकारक केले :

तीन-स्तरीय प्रणाली-

१. ग्रामपंचायत (गावस्तरीय)
 २. पंचायत समिती (ब्लॉक पातळी)
 ३. जिल्हा परिषद (जिल्हास्तरीय)
- ग्रामपंचायत (ग्रामस्तरीय): प्रशासनाचे प्राथमिक एकक जिथे नोंदणीकृत मतदार थेट निर्णय प्रक्रियेत सहभागी होतात.
 - पंचायत समिती (ब्लॉक लेव्हल): ग्रामपंचायती आणि जिल्हा परिषदांमधील कामकाजाचे समन्वय साधणारी मध्यस्थ संस्था.
 - जिल्हा परिषद (जिल्हा पातळी): जिल्ह्यातील पीआरआयचे निरीक्षण आणि नियमन करणारी सर्वोच्च संस्था.

ग्रामपंचायत-

महाराष्ट्र राज्यास पंचायत राज व्यवस्थेची एक गौरवशाली परंपरा आहे. त्रिस्तरीय पंचायत राजव्यवस्थेचे देशातील एक उत्तम उदाहरण म्हणून महाराष्ट्र राज्याकडे पाहिले जाते. महाराष्ट्र ग्रामपंचायत अधिनियम १९५८ व महाराष्ट्र जिल्हा परिषद व पंचायत समिती अधिनियम १९६१ द्वारे या संस्थांना वैधानिक स्वरूप प्राप्त झाले आहे. १९९३ मध्ये ७३ व्या घटना दुरुस्ती नुसार संपूर्ण देशात पंचायत राज संस्थेचे स्वरूप व रचना निश्चित करण्यात आली आहे. राज्यातील पंचायत राज संस्थांकडे विविध विषय त्यासाठी आवश्यक निधी व कर्मचारीवृंद यांचे हस्तांतर करून त्यांना बळकट व सक्षम करण्यात आले आहे. पंचायत राज संस्थेच्या त्रिस्तरीय रचनेमध्ये जिल्हापातळीवर धोरणात्मक निर्णय, तालुका स्तरीय पर्यवेक्षकीय कामकाज, व ग्रामस्तरावर प्रत्यक्ष अंमलबजावणी करण्यात येते. गावात विविध योजनांची अंमलबजावणी करण्यासाठी जिल्हापरिषद व पंचायत समिती स्तरावरील विविध क्षेत्रीय अधिकारी / कर्मचारी ग्रामपंचायतींना तांत्रिक सेवा / मार्गदर्शन करतात. ग्रामपंचायतीचा सचिव हा जिल्हा परिषदेने नियुक्त केलेला अधिकारी / कर्मचारी आहे.

ग्रामपंचायत यास "मिनी संसद" म्हणून ओळखले जाते. १ मे १९६० रोजी महाराष्ट्र राज्याची निर्मिती झाली त्याच्या पूर्वीपासून म्हणजेच १९५८ पासून मुंबई ग्रामपंचायत कलम ५ नुसार ग्रामपंचायती ची स्थापना करण्यात आली. या कलमा नुसार प्रत्येक गावामध्ये एक ग्रामपंचायत असा उल्लेख आहे. ज्या गावांची लोकसंख्या ६०० पेक्षा जास्त आहे त्या गावांमध्ये ग्रामपंचायत स्थापन केली जाते ज्या गावांची लोकसंख्या ६०० पेक्षा कमी आहे त्या गावांमध्ये गट ग्रामपंचायत स्थापन केली जाते.

अ.क्र.	लोकसंख्या	सदस्य संख्या
१.	६००-१५००	७
२.	१५०१-३०००	९
३.	३००१-४५००	११
४.	४५०१-६०००	१३
५.	६००१-७५००	१५
६.	७५०१ पेक्षा जास्त	१७

प्रत्येक वर्षी ऑक्टोबर - नोव्हेंबर मध्ये ग्रामविकास समितीची बैठक बोलावली जाते यात विविध गरजांवर विचार केला जातो उदा. आरोग्य, शिक्षण, महिला कल्याण इ. गरजा पूर्ण करण्यासाठी गावाकडे

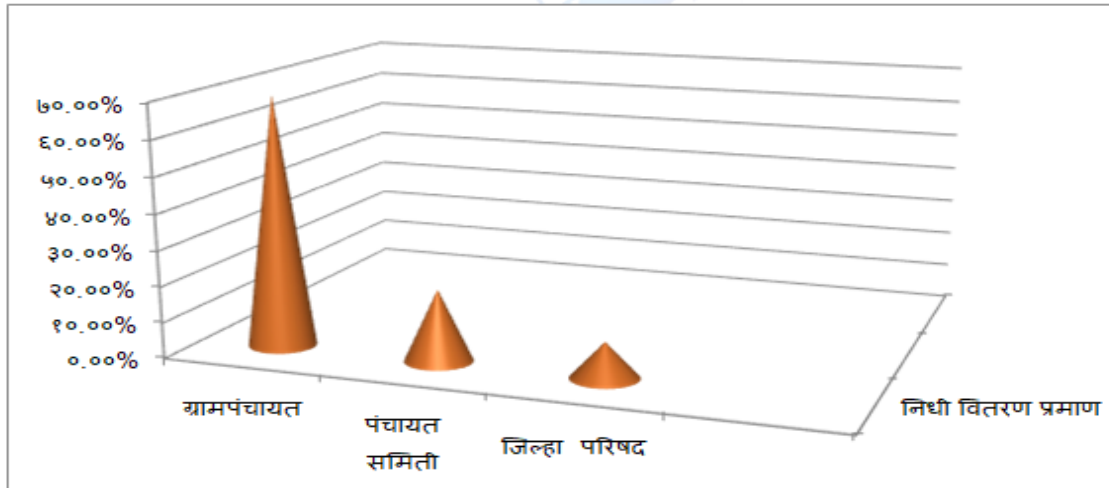
किती निधी आहे व सरकारकडून किती अपेक्षित आहे याविषयी अंदाजपत्रक तयार केले जाते याविषयी ग्रामीण अर्थकारणाचे अभ्यासक दत्ता गुरव यांच्या मते, गावातल्या सर्व योजनांचे एकत्रित अंदाजपत्रक ३१ डिसेंबर पूर्वी पंचायत समितीला पाठविणे आवश्यक असते हे अंदाज पत्रक पंचायत समिती राज्य सरकारकडे मंजुरीसाठी पाठवीत असते . एका गावाकरिता केंद्र राज्य व इतर अशा जवळपास ११४० योजना आहे यात गावासाठी कोणती योजना द्यायची हे ते गाव कोणत्या जिल्ह्यात येते व कोणत्या भौगोलिक क्षेत्रात येते यानुसार ठरत. जर योजना राज्य सरकारची असेल तर १०० % निधी राज्य सरकार देते आणि केंद्राच्या बहुतांशी योजनांसाठी ६०% केंद्र सरकार आणि ४०% राज्य सरकार देते.

वित्त आयोगांतर्गत केंद्र सरकारकडून राज्यातील विविध स्तरावर प्राप्त होणारा निधी-

अ.क्र.	वित्त आयोग	जिल्हा परिषद स्तर	पंचायत समिती स्तर	ग्रामपंचायत स्तर
१.	दहावा	१००%	--	--
२.	अकरावा	१००%	--	--
३.	बारावा	२०%	३०%	५०%
४.	तेरावा	१०%	२०%	७०%
५.	चौदावा	--	--	१००%
६.	पंधरावा	१०%	१०%	८०%

१३ व्या वित्त आयोगानुसार निधी वितरणाचे प्रमाण-

अ.क्र.	स्थानिक स्वराज्य संस्था	निधी वितरण प्रमाण
१.	ग्रामपंचायत	७०%
२.	पंचायत समिती	२०%
३.	जिल्हा परिषद	१०%



१३ व्या वित्त आयोगानुसार निधी वितरणाचे निकष -

अ.क्र.	निकष	टक्केवारी
१.	जिल्ह्याची ग्रामीण लोकसंख्या (२०११ च्या जनगणनेनुसार)	२५%
२.	जिल्ह्याचे ग्रामीण क्षेत्रफळ	१०%
३.	वित्तीय क्षमता अंतर	४७.५%
४.	वित्तीय शिस्त	१७.५%
५.	एकूण	१००%

या वित्त अयोगाने २०१० ते २०१५ या काळात राज्यांना ३,८४,६१७ कोटी रुपयांची अनुदाने देण्याची शिफारस केली. यापैकी २५% अनुदान पंचायत स्थानिक स्वराज्य संस्थांना वर्ग करण्याची शिफारस केली.

वरील निकषानुसार ग्रामपंचायत स्तरावर करावयाच्या बाबी -

१. ग्रामपंचायत क्षेत्रात निर्माण झालेल्या विविध मत्तांची देखभाल व दुरुस्ती
२. गावांतर्गत गटारे व रस्ते बांधकाम तसेच त्यांची देखभाल व दुरुस्ती करणे .
३. ग्रामपंचायत कार्यालय /ग्रामसचिवालय बांधकाम तसेच त्यांची देखभाल व दुरुस्ती करणे.
४. दहनभूमी /दफनभूमी देखभाल व दुरुस्ती .
५. आरोग्य व घनकचरा व्यवस्थापनाची निगडीत कामे .
६. घनकचरा प्रक्रियेसाठी पर्यावरण संतुलित तंत्रज्ञान वापरून शास्त्रीय पद्धतीने कमी खर्चाचे प्रकल्प हाती घेणे .
७. ग्रामसभा व ग्रामपंचायत सभा यांच्या दृक्श्राव्यचित्रिकरणाची व्यवस्था करण्यासाठी आवश्यक उपकरणे / साधने घेणे व त्यासाठी आवश्यक तंत्रज्ञान उपलब्ध करून घेणे .

सारांश -

१३ व्या वित्त आयोगाच्या माध्यमातून केंद्र सरकारने ग्रामपंचायतींना विकासासाठी निधी दिला, ज्यातून पिण्याच्या पाण्याचा पुरवठा, सार्वजनिक सुविधा आणि इतर विकास कामांवर खर्च केला गेला.

विकासकामांचा वेग वाढावा व पंचायत राज व्यवस्था मजबूत बनावी. यासाठी १३ व्या वित्त आयोगाने जिल्हा परिषद व पंचायत समित्यांना देण्यात येणाऱ्या निधीत कपात करून जास्तीत जास्त निधी ग्रामपंचायतीला देण्याचे धोरण अवलंबिले. या निर्णयामुळे जिल्हा परिषदेला मिळणाऱ्या निधीतील ७० टक्के रक्कम आता थेट ग्रामपंचायतीला मिळाली. या निधीचा योग्य वापर करण्याची जबाबदारी आणि कर्तव्य सरपंच आणि ग्रामपंचायत या गाव कारभार्यांच्या हातात होती, त्यामुळे गावच्या विकासाचा सूक्ष्म अभ्यास, योग्य नियोजन व समन्वयातून आदर्श गावांनी आकार घेतला.

केंद्र व राज्य शासनाकडून ग्रामपंचायतींना मोठ्या प्रमाणावर निधी उपलब्ध होत आहे. त्याचे योग्य नियोजन झाले तर विकासाच्या योजनांचा लाभ तळागाळातील लोकापर्यंत नेता येईल. त्यासाठी शासनाकडून येणाऱ्या निधीचे योग्य नियोजन करणे, शासनाच्या मार्गदर्शक सूचनांचे पालन करून नविन कामांच्या निर्मितीची व त्या कामांचा दर्जा या सर्व बाबींसाठी ग्रामपंचायत पदाधिकारी विशेषतः सरपंच हे प्रशिक्षित व गावच्या विकासाच्या दृष्टीने पूर्ण जाण व व्यवहारी असणे आवश्यक आहे.

संदर्भ -

१. डॉ. प्रदीप आगलावे -सामाजिक संशोधन पद्धती २००७ श्री. साईनाथ प्रकाशन ,नागपूर
२. संतोष दास्ताने - अर्थशास्त्र -२०१९
३. ग्रामपंचायत विषयी माहिती - spptnber 2021 by shivaram
४. वित्त आयोग - wikipedia
५. <https://www.majagaav.com>
६. <https://rajpanchayat.com>
७. <https://mr.vikaspedia>
८. <https://www.nitinsir.in>
९. [https://visit.in\(nashikdistrik,Maharashtra village directory@v list.in\)](https://visit.in(nashikdistrik,Maharashtra village directory@v list.in))
१०. - देसले किरण जी, दीपस्तंभ 'अर्थशास्त्र' पाचवी आवृत्ती (जुलै २०१५) भारतीय कररचना, पुष्ट क्रमांक १६२
११. <http://zgmunshi.byethost7.com/vitta.html>

१२. http://rajeshkhadke.blogspot.com/2012/04/blog-post_3231.html
१३. Twelfth Finance Commission Report, Chapter 8: Annexure, 425
१४. देसाई व भालेराव "भारतीय अर्थव्यवस्था" जानेवारी 2001, तृतीय आवृत्ती, पृष्ठ क्रमांक- 740, निराली प्रकाशन, पुणे
१५. <https://www.jagranjosh.com/general-knowledge>



बाजार संरचना - भौतिक दुकानांऐवजी डिजिटल उपकरणांद्वारे मार्केटिंग बदलणारा मार्केट फंडा - एक विश्लेषणात्मक अभ्यास

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प्रस्तावना-

तंत्रज्ञानाचा विकास वाढत असताना, डिजिटल मार्केटिंग, सोशल मीडिया मार्केटिंग, सर्च इंजिन मार्केटिंगचा वापरही वाढत आहे. इंटरनेट वापरकर्ते वेगाने वाढत आहेत आणि डिजिटल मार्केटिंगला सर्वाधिक फायदा झाला आहे कारण ते प्रामुख्याने इंटरनेटवर अवलंबून असते. ग्राहकांची खरेदी करण्याची वृत्ती बदलत आहे आणि ते पारंपारिक मार्केटिंगपेक्षा डिजिटल मार्केटिंगकडे अधिक कलत आहेत.

डिजिटल मार्केटिंग हा मार्केटिंगचा एक घटक आहे. जो उत्पादने आणि सेवांचा प्रचार करण्यासाठी इंटरनेट आणि ऑनलाइन आधारित डिजिटल तंत्रज्ञानाचा वापर करतो. १९९० आणि २००० च्या दशकात त्याच्या विकासामुळे ब्रँड आणि व्यवसाय मार्केटिंगसाठी तंत्रज्ञानाचा वापर कसा करतात हे बदलले. डिजिटल प्लॅटफॉर्म मार्केटिंग योजना आणि दैनंदिन जीवनात वाढत्या प्रमाणात समाविष्ट होत गेले, आणि लोक भौतिक दुकानांना भेट देण्याऐवजी डिजिटल उपकरणांचा वापर वाढवत असल्याने, डिजिटल मार्केटिंग मोहिमा प्रचलित झाल्या आहेत, ज्यामध्ये सर्च इंजिन ऑप्टिमायझेशन (SEO), सर्च इंजिन मार्केटिंग (SEM), कंटेंट मार्केटिंग, इन्फ्लुएंसर मार्केटिंग, कंटेंट ऑटोमेशन, कॅम्पेन मार्केटिंग, डेटा-चालित मार्केटिंग, ई-कॉमर्स मार्केटिंग, सोशल मीडिया मार्केटिंग, सोशल मीडिया ऑप्टिमायझेशन, ई-मेल डायरेक्ट मार्केटिंग, डिस्प्ले अ‍ॅडव्हर्टायझिंग, ई-बुक्स आणि ऑप्टिकल डिस्क आणि गेम्स सामान्य झाले आहेत. डिजिटल मार्केटिंग हे टेलिव्हिजन, मोबाईल फोन (एसएमएस आणि एमएमएस), कॉलबॅक आणि ऑन-होल्ड मोबाईल रिंग टोन सारख्या डिजिटल माध्यमे प्रदान करणाऱ्या नॉन-इंटरनेट चॅनेलपर्यंत विस्तारित आहे. नॉन-इंटरनेट चॅनेलचा विस्तार डिजिटल मार्केटिंगला ऑनलाइन मार्केटिंगपासून वेगळे करतो.

डिजिटल मार्केटिंगचे वेगवेगळे घटक:

➤ सर्च इंजिन मार्केटिंग -

सर्च इंजिन हे एक वेब आधारित साधन आहे जे वापरकर्त्याला त्यांना हवी असलेली माहिती शोधण्यास मदत करते. सर्च इंजिनची उदाहरणे म्हणजे गुगल, याहू, बिंग, बायडू इत्यादी. सर्च इंजिन मार्केटिंग म्हणजे कोणत्याही सर्च इंजिनमध्ये वापरकर्त्याच्या वेबसाइटची रँक वाढवणारी कोणतीही क्रिया. सर्च इंजिन मार्केटिंग सर्च इंजिन ऑप्टिमायझेशन (SEO) आणि पेड सर्च असे दोन प्रकार आहेत.

➤ ईमेल-

तुमच्या व्यवसायासाठी मध्यम ते उच्च ROI देणारे चॅनेल म्हणून ईमेलला काढून टाकणे इतके कठीण का आहे याची अनेक कारणे आहेत, परंतु ईमेलमधून तुम्ही काढून घेऊ शकत नाही ती म्हणजे त्याची बहुमुखी प्रतिभा. जरी ईमेल ही उपलब्ध असलेली नवीनतम तंत्रज्ञान नसली तरी, ते तुम्हाला तुमच्या मार्केटिंग बजेटला धक्का न लावता वैयक्तिकरण आणि ऑटोमेशन सारख्या सामग्री मार्केटिंगमधील नवीनतम ट्रेड लागू करण्यास अनुमती देते. मेलमध्ये इतर मार्केटिंग उद्दिष्टांना देखील समर्थन देण्याची क्षमता आहे, म्हणून हे आश्चर्यकारक

नाही की 73% आणि 63% B2B मार्केटर्स म्हणतात की ईमेल हे अनुक्रमे लीड्स निर्माण करण्यासाठी आणि महसूल वाढवण्यासाठी त्यांचे सर्वोत्तम साधन आहे.

महसूलाव्यतिरिक्त, ईमेल तुम्हाला पुढील अनेक प्रकारे मदत करतो: □ ईमेल इतका व्यापक झाला आहे की २०२० मध्ये तो ३.९ अब्ज वापरकर्त्यांपर्यंत पोहोचला आहे आणि २०२३ मध्ये हा आकडा ४.३ अब्ज वापरकर्त्यांपर्यंत वाढण्याची अपेक्षा आहे - जगाच्या लोकसंख्येच्या निम्म्याहून अधिक! □ ईमेल अजूनही सर्वोत्तम परतावा देते, एका अभ्यासातील ७३% प्रतिसादकर्त्यांनी SEO आणि पेड सर्चच्या तुलनेत अनुक्रमे ७२% आणि ६७% चॅनेलला उत्कृष्ट म्हणून रँकिंग दिले आहे. □ ईमेल मार्केटिंगवर खर्च केलेल्या प्रत्येक \$१, तुम्ही गुंतवणुकीवर सरासरी \$४२ परतावा अपेक्षित करू शकता. □ डेस्कटॉपवर १०% च्या तुलनेत ६२% पर्यंत ओपन मोबाइल डिव्हाइसवर केले जातात.

सोशल मीडिया सोशल मीडिया मार्केटिंग काही अतिशय फायदेशीर कारणांमुळे या यादीत आहे, परंतु हे फक्त सोशल मीडिया वापरकर्त्यांची संख्या ३.८१ अब्ज पर्यंत पोहोचण्याबद्दल नाही. लोक वैयक्तिक संबंध प्रस्थापित करण्यासाठी वापरत असलेले एक चॅनेल असण्यापासून, सोशल मीडिया मूळ कल्पना केलेल्यापेक्षा भव्य, मोठे आणि चांगले काहीतरी बनले आहे.

I. **फेसबुक:** हे नंबर वन सोशल मीडिया प्लॅटफॉर्म आहे. कंपनी फेसबुकवर त्यांचे उत्पादन आणि सेवांचा प्रचार करू शकते.

II. **गुगल:** हे गुगलचे सोशल नेटवर्क आहे, वापरकर्ते त्यांच्या सामान्य आवडी आणि मैत्रीच्या आधारे सहजपणे कनेक्ट होऊ शकतात.

III. **ट्विटर:** त्याची रणनीती ब्रँड जागरूकता आणि विक्री वाढवणे, नवीन फॉलोअर्स आकर्षित करणे आणि रूपांतरणांना चालना देणे आणि चालना देणे आहे.

पारंपारिक आणि डिजिटल मार्केटिंगमधील तुलना:

पारंपारिक मार्केटिंग हा मार्केटिंगचा सर्वात ओळखण्यायोग्य प्रकार आहे. बहुतेक लोक पारंपारिक मार्केटिंगची सवय करतात कारण ते दीर्घायुषी असते. पारंपारिक मार्केटिंगची काही उदाहरणे म्हणजे १.वर्तमानपत्र किंवा मासिकातील २.जाहिराती. ३.बिलबोर्ड, ४.ब्रोशर, ५.टीव्ही किंवा रेडिओवरील जाहिरात ६.पोस्टर इत्यादींचा समावेश आहे. हा मार्केटिंगचा एक नॉन-डिजिटल मार्ग आहे. तर डिजिटल मार्केटिंग ग्राहकांपर्यंत पोहोचण्यासाठी विविध डिजिटल चॅनेल वापरते. पारंपारिक मार्केटिंग व डिजिटल मार्केटिंग यातील फरक खालील प्रमाणे सांगता येईल.:

- पारंपारिक मार्केटिंग डिजिटल मार्केटिंग पारंपारिक मार्केटिंग म्हणजे मार्केटिंग संप्रेषणाच्या उद्देशाने पारंपारिक चॅनेल किंवा माध्यमांचा वापर करणारे मार्केटिंग.
- डिजिटल मार्केटिंग म्हणजे इंटरनेट, स्मार्टफोन, डिस्प्ले जाहिराती आणि इतर डिजिटल माध्यमांसारख्या डिजिटल चॅनेलद्वारे उत्पादने आणि सेवांचे मार्केटिंग.

विलंबित निकाल जलद आणि रिअल-टाइम निकाल ग्राहक जाहिराती वगळू शकत नाहीत, कारण त्यांना त्या पाहण्याच लागतात. ग्राहकांना त्यांना रस नसलेल्या जाहिराती टाळण्याची किंवा वगळण्याची परवानगी देते. एकतर्फी संवाद द्वि-मार्ग संवाद

डिजिटल मार्केटिंगचे फायदे :

१.कमी खर्चीक -

डिजिटल मार्केटिंगचा मुख्य फायदा म्हणजे लक्षित प्रेक्षकांपर्यंत किफायतशीर आणि मोजता येण्याजोग्या पद्धतीने पोहोचता येते. इतर डिजिटल मार्केटिंग फायद्यांमध्ये ब्रँड निष्ठा वाढवणे आणि ऑनलाइन विक्री वाढवणे समाविष्ट आहे. □ जागतिक पोहोच - वेबसाइट तुम्हाला नवीन बाजारपेठा शोधण्याची आणि

फक्त कमी गुंतवणुकीत जागतिक स्तरावर व्यापार करण्याची परवानगी देते. □ कमी खर्च - योग्यरित्या नियोजित आणि चांगले लक्षित डिजिटल मार्केटिंग मोहीम पारंपारिक मार्केटिंग पद्धतीपेक्षा खूपच कमी खर्चात योग्य ग्राहकांपर्यंत पोहोचू शकते.

२. ग्राहकांचा मोकळेपणाने सहभाग -

ट्रॅक करण्यायोग्य, मोजता येणारे परिणाम - वेब ॲनालिटिक्स आणि इतर ऑनलाइन मेट्रिक साधनांसह तुमचे ऑनलाइन मार्केटिंग मोजल्याने तुमची मोहीम किती प्रभावी आहे हे स्थापित करणे सोपे होते. ग्राहक तुमची वेबसाइट कशी वापरतात किंवा तुमच्या जाहिरातींना कसा प्रतिसाद देतात याबद्दल तुम्ही तपशीलवार माहिती मिळवू शकता. □ वैयक्तिकरण - जर तुमचा ग्राहक डेटाबेस तुमच्या वेबसाइटशी जोडलेला असेल, तर जेव्हा जेव्हा कोणी साइटला भेट देतो तेव्हा तुम्ही त्यांना लक्षित ऑफरसह स्वागत करू शकता. ते तुमच्याकडून जितके जास्त खरेदी करतील तितके तुम्ही तुमचे ग्राहक प्रोफाइल सुधारू शकता आणि त्यांच्यासाठी प्रभावीपणे मार्केटिंग करू शकता. □ मोकळेपणा - सोशल मीडियामध्ये सहभागी होऊन आणि ते काळजीपूर्वक व्यवस्थापित करून, तुम्ही ग्राहकांची निष्ठा निर्माण करू शकता आणि त्यांच्याशी संवाद साधण्यास सोपे असल्याची प्रतिष्ठा निर्माण करू शकता.

३. एकाच ठिकाणी माहिती -

डिजिटल मार्केटिंग तुम्हाला कंटेंट मार्केटिंग युक्त्यांचा वापर करून आकर्षक मोहिमा तयार करू देते. ही सामग्री (प्रतिमा, व्हिडिओ, लेख) सामाजिक चलन मिळवू शकते - वापरकर्त्यांकडून वापरकर्त्यांकडे प्रसारित केली जाते आणि व्हायरल होते. □ सुधारित रूपांतरण दर - जर तुमची वेबसाइट असेल, तर तुमचे ग्राहक खरेदी करण्यापासून फक्त काही क्लिक दूर असतात. इतर माध्यमांप्रमाणे जिथे लोकांना उठून फोन कॉल करावा लागतो किंवा दुकानात जावे लागते, डिजिटल मार्केटिंग हे एकसंध आणि तात्काळ असू शकते.

डिजिटल मार्केटिंगचे तोटे □-

कौशल्ये आणि प्रशिक्षण - डिजिटल मार्केटिंग यशस्वीरित्या पार पाडण्यासाठी तुमच्या कर्मचाऱ्यांकडे योग्य ज्ञान आणि कौशल्य आहे याची खात्री करणे आवश्यक आहे. साधने, प्लॅटफॉर्म आणि ट्रेंड वेगाने बदलतात आणि तुम्ही अद्ययावत राहणे अत्यंत महत्वाचे आहे. □ वेळखाऊ - ऑनलाइन जाहिरात मोहिमा ऑप्टिमायझ करणे आणि मार्केटिंग सामग्री तयार करणे यासारख्या कामांमध्ये बराच वेळ लागू शकतो. गुंतवणुकीवर परतावा सुनिश्चित करण्यासाठी तुमचे निकाल मोजणे महत्वाचे आहे.

१. उच्च स्पर्धा -

डिजिटल मार्केटिंगद्वारे तुम्ही जागतिक प्रेक्षकांपर्यंत पोहोचू शकता, परंतु जागतिक स्पर्धेलाही तोंड द्यावे लागते. स्पर्धकांपासून वेगळे राहणे आणि ऑनलाइन ग्राहकांना उद्देशून येणाऱ्या अनेक संदेशांमधून लक्ष वेधून घेणे हे एक आव्हान असू शकते. □

२. तक्रारी आणि अभिप्राय -

तुमच्या ब्रँडबद्दलचा कोणताही नकारात्मक अभिप्राय किंवा टीका तुमच्या प्रेक्षकांना सोशल मीडिया आणि पुनरावलोकन वेबसाइटद्वारे दिसू शकते. ऑनलाइन प्रभावी ग्राहक सेवा प्रदान करणे आव्हानात्मक असू शकते. नकारात्मक टिप्पण्या किंवा प्रभावीपणे प्रतिसाद न दिल्यास तुमच्या ब्रँड प्रतिष्ठेला हानी पोहोचू शकते.

३. सुरक्षा आणि गोपनीयतेच्या समस्या -

डिजिटल मार्केटिंगसाठी ग्राहकांचा डेटा गोळा करणे आणि वापरणे याभोवती अनेक कायदेशीर बाबी आहेत.

निष्कर्ष-

आजच्या डिजिटल युगात ग्राहकांची खरेदी करण्याची वृत्ती वाढत आहे. ग्राहक वर्गाचे इंटरनेटवर अवलंबित्व वाढले आहे. त्यामुळे डिजिटल इंडियाचे स्वप्न साकार करण्यासाठी मार्केटिंगच्या व्यापार रणनीतीत बदल करणे आवश्यक आहे. अर्थात पारंपारिक कडून डिजिटलकडे वेगाने प्रस्थान करण्याची वेळ आली आहे.

संदर्भ:

१. भागवती आणि डी. एम. दत्ता, "डिजिटल मार्केटिंगवर परिणाम करणाऱ्या घटकांची ओळख पटविण्यासाठी साहित्य पुनरावलोकनावर एक अभ्यास," इंटरनॅशनल जर्नल ऑफ सेल्स अँड मार्केटिंग मॅनेजमेंट रिसर्च अँड डेव्हलपमेंट, ऑगस्ट, खंड ८, क्रमांक ३, पृष्ठ १-८, २०१८
२. Mailer Lite(2021)The ultimate Guide to Social Media Advertising Retrived From <http://www.maillite.com/social> media marketing guide .
३. <https://neilpatel.com/what-is-affiliate-marketing/>



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प्रास्तविक :-

शाहिरी काव्याचा अभ्यास करताना मराठी काव्यात प्राचीन काळापासून कोणकोणते प्रवाह आले व त्यातून शाहिरी कालखंडा पर्यंतच्या कवितेने अनेक वळणे घेत ती कविता कशी विकसित झाली. त्यात होत जाणाऱ्या बदलांचा आढावा याठिकाणी घेणे आवश्यक आहे. मराठी भाषेचे अस्तित्व अकराव्या शतकात शिलालेखातील वाक्यरूपात आढळते तर बाराव्या शतकात ते ग्रंथरूपात सापडते, संस्कृत भाषेच्या ज्ञानाचा स्पर्श प्राकृत भाषकांना त्यांच्याच भाषेतून करून देण्याचे मोलाचे कार्य मुकुंदराज यांनी केले त्यामुळे मराठी साहित्यात ते आद्य कवी ठरतात, यानंतर आद्य कवयित्रीचा मान महानुभाव पंथातील महदंबेला मिळतो तिचे काव्य 'धवळे' या रूपात व्यक्त होते तर महानुभाव पंथातील 'साती ग्रंथ' यांचे स्वरूप 'ओवीबद्ध काव्यग्रंथ' या रूपात अवरते. पुढे तेरावे शतक व सतरावे शतक असा संत कवितेचा जवळपास चारशे वर्षांचा दीर्घ कालखंड आहे. यात तेराव्या शतकातील मराठी काव्याचे स्वरूप पाहता ज्ञानेश्वरीची अमृतवाणी मराठी मनाला रीझवताना दिसते. समाजाला सगुण भक्ती व मानवतेची उपासना शिकवून भागवत धर्माची पताका पंढरपूर पासून ते पंजाब पर्यंत नेणारे नामदेव आपल्या अभंगरूपी काव्यातून आठरापगड जातीमधील लोकांशी सख्यत्व जोडतात. यानंतर सकल संतमेळ्याने विठ्ठल भक्ती व्यक्त करण्यासाठी काव्याचाच आधार घेतला, लोकशिक्षक संत एकनाथांनी गवळणी, विराण्या, कुंटण व ग्रंथ लेखनातून मोठ्या प्रमाणात साहित्य निर्मिती करत 'भारुड' हा एक नवीन व महत्वाचा काव्यप्रकार मराठीत रूढ केला. तत्वचिंतन आणि तत्वविवेचन हा संत कवितेचा गाभा असून त्यांची दृष्टी तत्वज्ञानाची होती आणि सामान्य जीवाचे प्रबोधन हा संत काव्याचा प्रमुख हेतू होता.

सतरावे आणि अठरावे शतक असा पंडित कवितेचा जवळ जवळ दोनशे वर्षांचा कालखंड आहे. यामध्ये कलाकवी मुक्तेश्वर, वामन पंडित, रघुनाथ पंडित, सामराज, श्रीधर, नागेश, विठ्ठल, मोरोपंत इत्यादी पंडितांच्या संस्कृत गणवृत्तात लिहिलेल्या अख्यांनपर रचनेस पंडिती काव्य असे संबोधता येते. मोक्षप्राप्ती ही संतांची भूमिका तर कवित्व आस्वाद आणि पांडित्य प्रदर्शन ही पंडितांची दृष्टी होती. याबाद के. ना. वाटवे म्हणतात कि, " संत काव्याप्रमाणे निवृत्तीपर आणि भाक्तीशांतरसाचा आविष्कार करणारे पंडिती काव्य नाही. तर नवरसांचा जाणीवपूर्वक आविष्कार घडविण्याची त्यांची प्रेरणा आहे. मूळ अख्यानावर व प्रसंगावर म्हणजेच आर्ष सामग्रीवर कलापूर्ण संस्कार केल्यानंतर निर्माण झालेले विदग्ध काव्य म्हणजेच पंडिती काव्य होय."१" संत कवी आणि पंडित कवी यातील नेमके वेगळेपण दर्शविणारे विरील विधान असून त्यांच्या काव्यनिर्मितीमागील हेतू व प्रेरणेवर प्रकाश टाकलेला आहे. पुढे संत आणि पंडित यांच्या काव्यापेक्षा अगदी वेगळी व स्वतंत्र वळणाची कविता अठराव्या शतकात लिहिली जाऊ लागली. शाहिरी काव्य किंवा शाहिरी कविता असा तिचा उल्लेख केला जातो. ही शाहिरी कविता " साधारणपणे इ.स. १७५० ते इ.स. १८५० या शंभर वर्षांच्या काळात लिहिली गेलेली कविता आहे."२" शाहीर राम जोशी, अनंत फंदी, सगनभाऊ, प्रभाकर होनाजी बाळा, परशुराम इत्यादी शाहिरींच्या लेखणीतून आणि मुखातून निर्माण झालेल्या ह्या काव्याचे विषय, हेतू व प्रेरणा या संत आणि पंत काव्यापेक्षा अगदी निराळे होते. लोकांच्या जीवनातील विविध प्रसंग, पराक्रमी वीर पुरुष व सौंदर्याने आणि अदाकारीने मोह घालणाऱ्या सुंदर तरण्या स्त्रियांच्या भावभावना आणि समजातील रंगेल व

रगेलपणा या सर्वातून प्रत्ययाला येणाऱ्या अनेक गोष्टींच्या संस्कारातून शाहिऱांच्या कवितेचा जन्म झाला. म्हणूनच वि.पा. दांडेकर शाहिरी काव्याच्या मराठीपणाबद्दल म्हणतात, “ मराठ्यांचे मनगट, मराठ्यांचे मन, मराठ्यांच्या भावभावना, मराठ्यांचे आचार विचार, मराठ्यांचा पोशाख, आणि मराठ्यांचा मानधनी मोठेपणा, या सर्वांचे प्रतिबिंब लावण्यांत व पोवाड्यात उत्तम प्रकारे पडले आहे. हे खरे मराठी काव्य होय.”^३ यावरून असे म्हणता येईल कि, शाहिऱांनी लोकांच्या भावना लोकांच्याच शब्दांत लोकांसाठीच मांडल्या म्हणून ते खरोखर लोककवी ठरतात.

शाहीर राम जोशी यांच्या शाहिरी काव्याचे स्वरूप व रचना :-

शाहीर राम जोशी हे पंडिती काव्य आणि शाहिरी काव्य यांना जोडणारे एक दुवा होते. राम जोशी यांची जडण-घडण व त्यांच्यावर झालेल्या संस्कारातून आणि अनुभवातून त्यांची काव्यरचना उदयाला आली. त्यांच्या काव्यात इतिहास, पुराण व वर्तमानकाळ या गोष्टींची सरमिसळ झालेली आहे. त्यांच्या लावण्यांचे वर्गीकरण केले तर प्रत्येक गटातील लावण्या वेगवेगळ्या गुणवैशिष्ट्यांनी परिपूर्ण असल्याचे जाणवते. राम जोशींच्या सुरुवातीच्या लावणीत त्यांनी स्वतःचे नाव न टाकता त्या 'धोंडी' शाहिऱांच्या नावेने लिहिल्या आहेत. आणि नंतरच्या इतर प्रत्येक लावणी रचनेत शेवटी त्यांनी आपले नाव 'कविराय' असे लिहिलेले आढळते. राम जोशी यांनी कृष्ण कथा व लौकिक जीवन यावर लिहिलेल्या लावण्यांमध्ये शृंगार रसाचा विशेष प्रभाव जाणवतो आणि प्रणय शृंगार हा राम जोशींच्या काव्यातील एक महत्वाचा गाभा आहे. असे असले तरीही शृंगाराला शह देणाऱ्या काही बोधपर लावण्याही त्यांनी लिहिल्या.

“किती गोड किती गोड सुभग सुंदरी ! दृष्टीला पडली रे !

पंकजासनी करी घडली रे, जिचे रूप चमक चांदणी ! वयाने कवळी !

केतकी परीस हि पिवळी ! कां बसे ग सरळ अंगुळी !

जशी ती चवळी र वाटे असावी जवळी ! ”४“

अशी सुंदर कोवळी काया असलेली मुलगी आपल्याजवळ असावी अशी कामुक इच्छा व्यक्त करणारे राम जोशी दुसऱ्या लावणीत आपले स्वतःचेच मत खोडून काढतात,

“मन सुमन करुनिया हरीच्या पदी वाही ! नाही तर हे बा तुला बुडवतील साही !

आपुल्या जागा तू बरे विचारून पाही ! कविरायला आवड भक्ती रंगेली !

तनु दारोदार भारणाच्या भरी गेली ! ”५“

पहिल्या लावणीत शृंगार रस, स्त्री सौंदर्य याविषयी पुरुष मनातील आकर्षण व कामुकता याचे वर्णन केले असून दुसऱ्या लावणीत त्याच स्त्रीचे सौंदर्य व सहा प्रकारचे विकार यामुळे माणूस कसा फसतो याची माहिती सांगत सर्वांना सावध करत एक बोधपर शिकवण दिली आहे. यातून लावणी रचनेच्या दोन्ही बाजूवर प्रकाश पडून लावणीच्या आशय – विषयातील वैविध्यता समजण्यास मदत होते.

शाहीर राम जोशी यांच्या लावण्यांचे वर्गीकरण :-

- १) श्रीगणेश व इतर आराध्य दैवतांच्या 'दैवत वर्णनपर' लावण्या
- २) कृष्ण-राधा, गोप गोपी यांच्या शृंगार अध्यात्माच्या रूपाने 'शृंगारिक (पौराणिक)' लावण्या
- ३) समाजातील स्त्री-पुरुष, पती-पत्नी, प्रियकर-प्रेयसी यांच्या इच्छा व भावना व्यक्त करणाऱ्या 'शृंगारिक (लौकिक)' लावण्या
- ४) मानवाला कर्तव्याची जाणीव करून देणाऱ्या 'उपदेशपर' लावण्या
- ५) विविध विषयावर 'लावण्या व पोवाडे'

शाहीर राम जोशी यांच्या दैवत वर्णनपर लावण्या स्वरूप व विशेष :-

‘राम जोशीकृत लावण्या’ या डॉ. वि. म. कुलकर्णी आणि डॉ. गंगाधर मोरजे संपादित ग्रंथात शाहीर राम जोशी यांच्या ‘देवदेवतांचे वर्णन’ करणाऱ्या जवळपास ०९ लावण्या लिहिल्या आहेत. त्यापैकी १,३,४,६,७ व ९ अशा एकूण ०५ लावण्या श्री गणेशाच्या स्तुतीपर व त्यांना वंदन करण्यासाठी लिहिल्या आहेत. श्रीगणेश वंदनेला ‘गण’ म्हणतात. ‘महाराज गौरीनंदना’ या पहिल्याच लावणीत गणपतीचे आशीर्वाद मिळावे आणि गीत गायनाला अखंड स्फूर्ती मिळावी म्हणून प्रार्थना केलीली आहे. या लावणीचे विशेष म्हणजे हि गणपती पंचायतनावरची लावणी असून यामध्ये श्री गणेश, नारायण (विष्णू), शिव, जगदंबा व सूर्यनारायण या देवतांना वंदन केलेले आहे

“हे रामनामघोषणा विश्वशोषणा मदननाशना हे भूप्रतीपाळा ! हे स्मशानवासा कैलासाद्रीपाळा !! “६”

या रचनेतून राम जोशी यांनी शिव शंकराला मदननाशाची (कामनाशाची) प्रार्थना केली आहे. शृंगार रसात बुडालेल्या शाहिराने हि उपरती झाल्याची व ज्ञान बोधाची सूचक भाषा वापरणे हि एक विशेष उल्लेखनीय बाब त्यांच्या रचनेत दिसून येते. तसेच त्यांच्या लेखनात संस्कृत भाषेचा प्रभाव असल्याचेही ठिकठिकाणी जाणवते, संस्कृत भाषेतील यमक जुळविण्याचा मोह राम जोशींना मराठी रचना करताना देखील काही ठिकाणी होतो. ‘धाव गणपती सदनी या’ हि लावणी (क्र. ०३) ताल आणि लय याचे उत्तम उदाहरण असून

“ धाव पाव हावभाव दाव घाव दाव राव हा नको ” हे धृपद असून

“ तार तार भाव बार कारभार फार बार बार पार करी ”७”

असा पहिल्या कडव्याचा शेवट आहे. यावरून पंडिती काव्यातील संस्कृत प्रचुरता आणि यमक – अनुप्रास यांची प्रचीती या काव्यातून निश्चितपणे येते. तसेच ‘वंदे श्रीगजमुखमगजनिबलाम् विधीसुललितभालम्’ हि लावणी (क्र.०७) श्री गणेशावरील संस्कृत भाषेतील लावणी असून तो एक संस्कृत गण आहे. तो संस्कृत खोत्र रूपाने लिहिला आहे.

राम जोशी हे सोलापूरचे म्हणून ते नियमितपणे सोलापूर जिल्ह्यातील बार्शी या ठिकाणी, तुळजापूर आणि पंढरपूर येथे नेहमी दर्शनाला जात असत म्हणून तिथल्या देव – देवतांवर त्यांनी लावण्या रचल्या, यातून त्यांची धर्म आणि भक्तिभावाची साक्ष पटते. ‘दाट साधूचा हाट भागवत’ हि लावणी (क्र ०२) बार्शीच्या भगवंतावरील सुरेख रचना असून यात ‘आला हो बाईल पाठीवरी’ या उल्लेखातून भगवंताच्या मूर्तीच्या पाठीवर पाठीमागून लक्ष्मीची मूर्ती कोरलेली आहे आणि तिचे दर्शन पाठीमागे लावलेल्या आराश्याद्वारे भक्तांना होते हा पौराणिक संदर्भ येतो. ‘भूतळात जशी या स्थळांत’ ही लावणी (क्र. ०६) तुळजापूर ठिकाणाचे वर्णन आणि तुळजाभवानी आईचे सुंदर, लोभस वर्णन करणारी ‘दीर्घ लावणी’ आहे. ही लावणी चार मोठ्या कडव्यांची असून पहिल्या तीन कडव्यांत प्रत्येकी वीस ओळी व शेवटच्या चौथ्या कडव्यात एकोणवीस ओळी आहे.

“भूतळात जशी या स्थळांत यमुनाचळांत हिमनगबाळा ! अशी भुवनत्रयी कोणती दुजी वेल्हाळा !!धृ !!”८”

या लावणीत स्थान महात्म्य आणि आदिशक्तीचे स्वरूप वर्णन करून तुळजाभवानी हे पार्वतीचेच रूप असल्याचे स्पष्ट करण्यासाठी, ‘हिमनगबाळा’ हा शब्द वापरला असून त्याचा अर्थ हिमालयाची कन्या अर्थात ‘पार्वती’ असा होतो. या लावणीत पुढे देवीने श्रीरामाला लंकेचा रस्ता दाखवला त्या जागेचा उल्लेख ‘घाटशीळ’ असा आलेला आहे. देवीच्या नवरात्रोत्सवाचे वर्णन करताना नैवेद्यात पहिला मान भाजी-भाकरीचा असल्याचे सांगत त्यातून देवीची गरीब, सामान्य व दीन दुबळ्या भक्तांशी एकरूप होण्याची भावना मांडली आहे. ‘शेषाचलकृतनिवास’ ही लावणी (क्र.०८) ‘गिरीच्या व्यंकटेशावर’ रचलेली एक महत्वपूर्ण आणि वैशिष्ट्यपूर्ण लावणी असून बालाजीचे मूळ स्थान हे दक्षिणेकडील असूनही

" सुभक्त वत्सल देऊळगावी राजाच्या राहुनी ! घेतसे पूजा बहु मानुनी !! "९"

या ओळीवरून भक्त उद्धारासाठी हे दैवत महाराष्ट्र येथील देऊळगावराजा येथेही राहिले आणि यातून आपली मराठी परंपरा व संस्कृती दक्षिणेकडील संस्कृतीशी जोडला गेला, अश्या प्रकारे मराठी काव्याची उदारमतवादी तत्वे पुढे शाहीर राम जोशी यांनी चालविले असे दिसून येते, दोन भिन्न संस्कृतीच्या संगमाचे वर्णन असल्याचे यात जाणवते. 'क्षमातळी इजसमान नाही' हि लावणी (क्र. ०९) 'पंढरपूर क्षेत्रवर्णन' आणि विठ्ठलाचे वर्णन दीर्घ रचनेतून केलेले आहे. पंढरपूर नगरीचे, विठ्ठलाचे, संत - महंतांचे, चंद्रभागा आणि भक्तिभावाचे वर्णन करताना आपल्या रचनेत अनेक प्रतिक व प्रतिमांचा वापर करून राम जोशी यांनी नेमकेपणाने आणि वास्तव चित्रण केले आहे. प्राचीन मराठी काव्यात अशी वर्णने दुर्मिळ व क्वचितच आढळतात.

हाती आलेले काही निष्कर्ष :-

१. श्री गणेशाला वंदन करताना संस्कृत भाषेत गण रचना करणारे व त्या काळी तामाशाला आलेल्या मराठी भाषक लोकांसमोर संस्कृत भाषेत ती गाणारे शाहीर राम जोशी व त्यांची काव्यरचना ही खरोखर निर्भीड होती.
२. गणपती पंचायतनावरची लावणी ही आशय व रचना दृष्ट्या वेगळी ठरते. ह्या एकाच लावणीत, श्री गणेश, नारायण (विष्णू), शिव, जगदंबा व सूर्यनारायण या देवतांना वंदन करून त्यांना प्रार्थना केलेली आहे. शिवशंकराला मदननाशाची (काम नाशाची) विनंती एका शृंगाररसात बुडालेल्या शाहिराने करावी हि विशेष उल्लेखनीय बाब व वेगळेपण ह्या रचनेचे आहे.
३. 'धाव गणपती सदनी' या लावणीतील यमक-अनुप्रास व संस्कृतप्रचुर जुळणीच्या रचनेवरून राम जोशींच्या काव्यातून पंडिती काव्याची प्रचीती येते.
४. राम जोशी यांनी रचलेल्या एकूण ०५ श्री गणेश वंदनेतील प्रार्थनेतून त्यांच्या लावणीला आत्मबोधाचे स्वरूप प्राप्त झालेले दिसून येते.
५. राम जोशी यांच्या दैवतवर्णनपर लावण्यांतून तत्कालीन धार्मिक स्थळे व त्यांचे स्थान महात्म्य, त्या-त्या ठिकाणाचे ऐतिहासिक संदर्भांचे अचूक वर्णने, त्याचबरोबर अनेक शास्त्रीय व पौराणिक घटकांचे अभ्यासपूर्ण व बारकाईने केलेले लेखन म्हणजे त्यांच्या रचना कौशल्य, कल्पकता आणि स्व-काव्यरचेवरील आत्मविश्वास यातून दिसून येतो.
६. तुळजापूरच्या भवानी मातेच्या नैवेद्याचा पहिला मान भाजी भाकरीचा, व बालाजीच्या परंपरागत नैवेद्यातील पदार्थांचे खुमासदार वर्णनांतून त्या काळची प्रादेशिक व परंपरागत व्यंजन, खाद्य पदार्थ व स्वयंपाकाच्या विविध पाक कृतींवर प्रकाश टाकून आपल्या रचनांतून संस्कृती दर्शन घडविले आहे.
७. मराठी माणसाचे श्रद्धा स्थान व अस्मिता (अनेकांची कुलदेवी) असलेली तुळजापूची तुळजा भवानी आई आणि सर्वसामान्य, कष्टकरी व शेतकरी या सर्वांचे आराध्य दैवत पंढरपूरचा विठ्ठल यांच्यावर सर्वात मोठी व दीर्घ लावणी रचना करून, शाहीर राम जोशी यांनी तपशीलात्मक लावणी रचनेचा प्रत्यय आणि निवेदन शैलीचे एक उत्तम उदाहरण वाचकांसमोर मांडले असून, त्याद्वारे अनेक प्रतीके - प्रतिमा यांचा वापर करून महाराष्ट्राच्या संस्कृतीचे, परंपरेचे, सश्रद्ध भक्तीचे, एकता आणि समानतेचे उन्नयन केले आहे.

संदर्भ सूची :-

१. नसिराबादकर ल. रा., 'प्राचीन मराठी वाङ्मयाचा इतिहास', फडके प्रकाशन, कोल्हापूर, आवृत्ती सातवी १९९७, पृ.क्र. १५१

२. देशपांडे केजकर प्रकाश, 'शाहिरी कविता एक चिकित्सा', स्वरूप प्रकाशन औरंगाबाद, प्रथमावृत्ती २००९, पृ.क्र. ११
३. नसिराबादकर ल. रा., 'प्राचीन मराठी वाङ्.मयाचा इतिहास' , फडके प्रकाशन, कोल्हापूर, आवृत्ती सातवी १९९७, पृ.क्र. २२०
४. कुलकर्णी वि.म., मोरजे गंगाधर (डॉ.) (संपादक), 'रामजोशीकृत लावण्या', पद्मगंधा प्रकाशन, पुणे, आवृत्ती पाचवी १९९८, पृ.क्र. ८४
५. तत्रैव पृ.क्र. १०२
६. तत्रैव पृ.क्र. २६
७. तत्रैव पृ.क्र. २९
८. तत्रैव पृ.क्र. ३०
९. तत्रैव पृ.क्र. ३५

संदर्भ ग्रंथ सूची:-

१. कुलकर्णी वि.म., मोरजे गंगाधर (डॉ.) (संपादक), 'रामजोशीकृत लावण्या', पद्मगंधा प्रकाशन पुणे, आवृत्ती पाचवी १९९८
२. देशपांडे केजकर प्रकाश, 'शाहिरी कविता एक चिकित्सा', स्वरूप प्रकाशन औरंगाबाद, प्रथमावृत्ती २००९
३. नसिराबादकर ल. रा., 'प्राचीन मराठी वाङ्.मयाचा इतिहास' , फडके प्रकाशन कोल्हापूर, आवृत्ती सातवी १९९७
४. अदावंत म.ना. (संपा.), 'पैजण' , साहित्य प्रसार केंद्र, नागपूर, प्रथम आवृत्ती १९५४
५. केळकर य.न., 'तंतकवी तथा शाहीर' , संगम प्रकाशन पुणे, तिसरी आवृत्ती १९९०
६. घाटे शरद, 'सुंदरा मनामधि भरली', दिलीपराज प्रकाशन पुणे, २००९
७. मोरजे गंगाधर, 'मराठी लावणी वाङ्.मय', मोघे प्रकाशन पुणे, १९६४
८. धोंड म. वा. ' मराठी लावणी ' , मौज प्रकाशन मुंबई, चौथी आवृत्ती, जानेवारी २०१३

फ्रि वेट आणि मशिन वेट प्रशिक्षण कार्यक्रमाचा खेळाडूंच्या कंबर, गुडघे आणि पायाचा घोटा यांची स्थिरता आणि गतिशिलता या घटकावर होणाऱ्या परिणामांचा अभ्यास

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सारांश:

सदर संशोधनात संशोधकाने आदिवासी भागातील खेळाडूंच्या स्थिरता व गतिशिलता या घटकावर फ्रि वेट आणि मशिन वेट प्रशिक्षणाचा होणारा परिणामाचा तुलनात्मक अभ्यास आहे या संशोधनासाठी पेठ तालुक्यातील एम.जे. एम. महाविद्यालयातील २५ वर्षांआतील ४५ खेळाडूंची सहेतुक पद्धतीने निवड करण्यात आली. खेळाडूंचे तीन समान गटात विभाजन करण्यात येणार असून प्रत्येक गटात १५ असे तीन समान संख्यांच्या गटात विभागणी करण्यात आली. यासाठी प्रायोगिक संशोधन पद्धतीतील तीन गट पूर्व चाचणी व उत्तर चाचणी या अभिकल्पानुसार प्रशिक्षण कार्यक्रम सुरु होण्यापुर्वी व प्रशिक्षणानंतर खेळाडूंच्या स्थिरता आणि गतिशिलता मोजण्यासाठी एफ एम एस् कसोट्यांचा वापर करण्यात आला त्यासाठी ओव्हरहेड डिप स्कॉट, इन लाईन लंज रोटरी स्टॅबिलिटी या प्रमाणित कसोट्या घेण्यात आल्या सहा आठवडे प्रत्येक आठवड्याला सहा दिवस या प्रमाणे स्थिरता आणि गतिशिलतेसाठी फ्रि वेट आणि मशिन वेट प्रशिक्षण हे उपचार प्रशिक्षणाच्या तत्वानुसार देण्यात आले व नियंत्रीत गटाला ते पुर्वीपासुन करत असलेले प्रशिक्षण घेत राहतील सहा आठवड्यानंतर तीन हि गटांची पश्चात चाचणी घेतली पुर्व व पश्चात चाचणी मध्ये संकलीत केलेल्या माहितीचे विश्लेषण व अर्थनिर्वचन करण्यासाठी इंडीपेंडंट टि-टेस्ट व वन वे अॅनोव्हा या संख्याशास्त्रीय तंत्राचा वापर केला असता. फ्रि वेट प्रशिक्षणा व्दारे ओव्हर हेड डिपस्कॉट, हर्डल स्टेप, इन लाईन लंज, रोटरी स्टॅबिलिटी या कसोट्यांच्या कार्यमाना मध्ये ००५ या सार्थकता स्तरावर सार्थक फरक दिसुन आला तर मशिन वेट प्रशिक्षणाचा खेळाडूंच्या ओव्हर हेड डिपस्कॉट हर्डल स्टेप, इन लाईन लंज, रोटरी स्टॅबिलिटी या कसोट्यांच्या कार्यमाना मध्ये ००५ या सार्थकता स्तरावर सार्थक फरक दिसुन आला नाही. फ्रि वेट प्रशिक्षण हे कंबर, गुडघा, पायाचा घोटा, शरीराच्या धडाची स्थिरता आणि गतिशिलता, नितंबाच्या स्नायूंची ताकद व कॉट्रीसेप या स्नायूंची लवचिकता वाढविण्यासाठी जास्त उपयुक्त आहे व मशिन वेट प्रशिक्षण हे स्थिरता आणि गतिशिलता वाढविण्यासाठी उपयुक्त नाही.

महत्वाचे शब्द: फ्रि वेट प्रशिक्षण, मशिन वेट प्रशिक्षण, स्थिरता, गतिशिलता

प्रस्तावना:

सद्यस्थितीत कार्यात्मक प्रशिक्षण देण्याकरिता वैविध्यपूर्ण आणि योग्य प्रकारचे साहित्य बाजारात विक्रीसाठी मुबलक प्रमाणात उपलब्ध असल्यामुळे नेमके कोणते साहित्य घ्यावे? त्या साहित्याचा वापर कसा करावा? याबाबत संभ्रमावस्था निर्माण झालेली आहे. वेगवेगळ्या साहित्याच्या सहाय्याने वैविध्यपूर्ण आणि मनोरंजनात्मक वातावरणात कार्यात्मक प्रशिक्षण देता येणे शक्य असले तरीही बहुधा साधारण आणि सुगम प्रकारच्या साहित्याच्या सहाय्यानेच कार्यात्मक दिले जाते हे सर्वश्रुत आहे. योग्य प्रकारे वापराचे आणि आयोजनाचे ज्ञान असल्यास L साहित्याची आवश्यकता नसते: कारण खरे पाहता. आपले शरीर हेच कार्यात्मक

प्रशिक्षणासाठी सर्वोत्तम साहित्य असते. खेळाडूंना त्यांची शारीरिक तंदुरुस्ती सर्वकाळ चांगली ठेवण्यासाठी आणि आदर्श अशा मानकांचे अवलंबन करण्यासाठी तसेच प्रतिकारक्षम सरावासाठी सध्या उपलब्ध असलेल्या साहित्या मध्ये र पाडण्या करिता मुलास अशा उपकरणांची चर्चा प्रस्तुत घटकात करण्यात आली आहे.

मुदगल (Dumbbell):

कोणत्याही स्वरूपाची कार्यात्मक हालचाल करण्याचा प्रतीकात्मक सराव करण्यासाठी मुदगलाचा (आकृती १.२) वापर करण्यात येतो. त्यामुळेच सरावासाठी तयार करण्यात येणाऱ्या उपकरणांच्या यादीमध्ये मुदगल प्रथम क्रमांकावर असतो. मुदगल हालचाली साठीचे स्वातंत्र्य देते आणि त्यामुळे शरीराच्या प्रत्येक अवयवाकडून स्थैर्य मिळणे आवश्यक असते, जे प्रामुख्याने शरीराच्या ऊर्ध्वगातील अवयवांत सामर्थ्य दर्शक हालचाली दरम्यान अस्थिरता आढळून येते. कार्यात्मक प्रशिक्षणातील हालचालीचा वेग आणि त्यातील क्षमता व सामर्थ्य प्रशिक्षणाच्या विकसनाच्या सर्व अवस्थांचा विचार करून प्रामुख्याने मंद ते वेगवान, प्रखर ते सौम्य या स्वरूपाचा दिसून येतो. मुदगल हे वेगवेगळ्या स्वरूपात पहावयास मिळतात. त्यामध्ये अपरिवर्तनीय वजन असलेले, तसेच त्यात बदल करता येऊ शकणारे आणि विविध आकारांचे असतात. व्यायाम सरावासाठी मुबलक जागा उपलब्ध असल्यास आणि एका पेक्षा अधिक खेळाडूंना सराव करता यावा यासाठी अपरिवर्तनीय वजनाचे मुदगल वापरणे सोयीस्कर ठरते. कार्यात्मक प्रशिक्षणासाठी सरावाकरिता आकाराने मोठे असलेले आणि अधिक वजनाचे मुदगल वापरता येत नाही. त्यासाठी साधारणतः ५ ते ५० पौंड म्हणजेच २ कि.ग्रा. ते २३ कि. ग्रा. वजन असलेले मुदगल वापरले जातात. वजन परिवर्तनीय करता येऊ शकणारे ३५ ते ४५ पौंड म्हणजेच १६ ते २० किलो वजन असलेले मुदगलाचे संच वापरणे अधिक श्रेयस्कर ठरते.

रबरी पट्ट्या (Bands) आणि कप्पी (आकृती १.३)

कार्यात्मक प्रशिक्षणा मधील पुढील महत्वाची उपकरणे रबरी पट्ट्या आणि कप्पीचा संच होय. वेगवेगळ्या आकाराच्या व जाडीच्या रबरी पट्ट्या आणि कप्पी प्रतिकारक्षमता विकसित करण्यासाठी तसेच समांतर आणि कर्णरेषीय तिरप्या दिशेने करावयाच्या सरावासाठी उपयुक्त उपकरण ठरतात. त्यांच्या अनऊर्ध्व प्रभार कार्यक्षमतेमुळे अवर्तनीय बदल, दाब देणे, वल्हवणे, डेडलिफ्ट्स, लांगिंग इत्यादी उभे राहून करायच्या सरावातून इतर कोणत्याही उपकरणा प्रक्षा अधिक सुयोग्य अवरोधक्षमता निर्माण करू शकतात.

स्टॅबिलिटी बॉल (Stability Balls)

स्टॅबिलिटी बॉल कार्यात्मक प्रशिक्षणासाठी बऱ्याच काळापासून वापरात असून प्रचलित आहे. नव्याने निर्माण करण्यात आलेले गोळे हे अधिक सुरक्षित, आघात अवरोधक आणि पिकाऊ आहेत. कार्यात्मक प्रशिक्षणात वापरकर्त्यासाठी अत्यंत उपयुक्त असणारे हे एक उपकरण आहे. उदाहरणार्थ, ज्या स्थितीमध्ये साधारण स्तर राखता येत नाही अशा स्थितीमध्येही स्टॅबिलिटी बॉल आधार प्राप्त करून देतात. तसेच ते स्थिरीकरण प्रशिक्षणासाठी प्रमाणबद्ध अशी अस्थिर मात्रा पुरवितात ज्यायोगे सांध्यांना उत्तम प्रकारची स्थिरता प्राप्त होते. याआधी स्टॅबिलिटी बॉल बेंच प्रेस करिता साधन म्हणून वापरले जायचे. तथापि, अलीकडच्या काळामध्ये हा व्यायामाचा प्रकार कालबाह्य झाला आहे. तरीही ह्या उच्च जोर काढण्यासाठी स्थिर अशा बाकाचा वापर करावा. पुश-अप्स, क्रंच,

वॉल स्लाईड्स इत्यादी सौम्य प्रकारच्या अस्थिर स्वरूपांच्या सरावासाठी स्टॅबिलिटी बॉल वापरण्यात यावे. त्यामध्ये ५५ ते ६५ सेंटीमीटर व्यासाचे स्टॅबिलिटी बॉल प्रामुख्याने लोकप्रिय आहेत.

वेट मशिन: या प्रकारच्या साहित्यामध्ये विशिष्ट स्नायुची ताकद वाढविण्यासाठी यंत्राचा वापर करून त्या स्नायु मध्ये योग्य कोनात हालचाल घडवून आणली जाते त्यामुळे त्या हालचाली मध्ये आवश्यक त्याच स्नायुचा वापर होउन ताकद वाढवली जाते. या प्रकारच्या व्यायाम प्रकारांमध्ये दुखापत होण्याची शक्यता खूप कमी असते म्हणून नविन खेळाडूसाठी प्रशिक्षक या पध्दतीचा वापर करतांना दिसतात. यामध्ये खूप वेग-वेगळ्या पध्दतीचे साहित्य आढळते ते खालील प्रमाणे:

१. लाईनर गार्डेड मशिन: या प्रकारच्या मशिन मध्ये एकाच दिशेने हालचाल होते व भार वाढविण्यासाठी वेट प्लेटचा वापर केला जातो यात हालचाली विशिष्ट कोनात होत असतात त्यामुळे दुखापत होण्याची शक्यता कमी असते व जास्तीत-जास्त वजन उचलणे शक्य होते उदा स्मिथ मशिन, हॅक स्कॉट मशिन इ.

२ केबल पुली मशिन: या मध्ये केबलच्या तरफेच्या सहाय्याने वेग-वेगळ्या दिशेने वजन उचलले जाते. यात केबल एका ठिकानी स्थिर असते व ती तरफेच्या सहाय्याने फिरते. त्यामुळे वेग-वेगळ्या स्नायुच्या हालचाली होतात. उदा. बेंच प्रेस मशिन, रोईंग मशिन इ

मोकळ्या साहित्यासह केले जाणारे व्यायाम:

या प्रकारच्या व्यायाम प्रकारां मध्ये खेळाडू मशिनचा वापर न करता अतिरिक्त वजन घेउन व्यायाम करतात या हालचाली करत असतांना खूप नियंत्रण ठेवावे लागते उदा. बारबेल व वेटप्लेट च्या सहाय्याने बेंच प्रेस, स्कॉट करणे काही साहित्य वेगळ्या प्रकारा मध्ये मोडते. उदा मेडिसीन बॉल, केटल बॉल, वेटेड बेल्ट इ. त्याच प्रमाणे मोकळ्या साहित्याचा वापर करून ज्या हालचाली केल्या जातात त्यासाठी विविध स्थिर-अस्थिर साहित्याचा वापर करून त्या हालचालीची तिब्रता कमी-जास्त केली जाते स्थिर हालचाली करण्यासाठी वेट बेंच, फ्रि-स्टँडींग बेंच, वेट रँक इ.चा वापर केला जातो आणि अस्थिर हालचाली करण्यासाठी स्विस् बॉल, बोसू बॉल, स्टॅबिलिटी डिश इ. वापर केला जातो. मानवी शरीर हे एक यंत्र असून यातील ज्ञानेंद्रिया मध्ये कारक क्रीया करण्याची क्षमता असते. ज्ञानेंद्रियांच्या सर्व क्षमता ह्या प्रॉप्रोसेप्शन मध्ये येतात. प्रॉप्रोसेप्शन मध्ये सांध्यातील हालचाल आणि सांध्याची स्थिती यांची संवेदना मिळत असते (लेफर्ट, १९९८) आणि प्रतिशिस क्रीया, सांध्यातील गतीमानता आणि स्थिरता ह्या सर्व हालचाली प्रॉप्रोसेप्शन मध्ये येतात (मॅकगेल, १९९८) या सर्व हालचाली फ्रि वेट आणि मशिन वेट प्रशिक्षणाद्वारे क्षमता वाढविली जाते.

संशोधन कार्यपध्दती:

प्रस्तुत संशोधनासाठी पेठ तालुक्यातील एम जे एम महाविद्यालयातील २५ वर्षांआतील ४५ खेळाडूंची सहेतुक पध्दतीने निवड करण्यात आली खेळाडूचे तीन समान गटात विभाजन करण्यात येणार असुन प्रत्येक गटात १५ असे तीन समान संख्याच्या गटात विभागणी कारण्यात आले.

न्यादर्श निवड आणि गटात विभागणी या सहेतुक पध्दतीने झाल्यानंतर खेळाडू ज्या प्रमाणे प्रशिक्षण घेत आहे त्यातील वापरण्यात येण्याचा व्यायाम अभ्यास करून योग्य व्यायाम प्रकारांची निवड करून फ्रि वेट आणि मशिन वेट प्रशिक्षण कार्यक्रम तयार करण्यात येणार आहे. उपचार मात्रा उत्तर चाचणी अशाप्रकारे केलेली केलेली संपूर्ण कार्यपध्दती पुढील प्रमाणे राहिल.

प्रयोगिक गटातील खेळाडूंची सकाळच्या दोन सत्रात शरीराच्या विविध घटकांच्या चाचण्या घेतल्या जाणार आहे अशा प्रकारे पुर्व चाचण्याचे नियोजन करण्यात आलेले आहे. सकाळचे एक सत्र असे आठवड्यातील ६ दिवस स्थिरता आणि गतिशिलतेसाठी फ्रि वेट आणि मशिन वेट प्रशिक्षण कार्यक्रम हा उपचार ६ आठवडे

दिला जाणार आहे तसेच प्रयोगीक गटासाठी उत्तेजक पुरक शिथिलीकरणाचे व्यायाम देण्यात येणार आहे ज्यापद्धतीने पूर्व चाचण्या घेतल्या त्याच पद्धतीने त्याच पद्धतीने सहा आठवड्याच्या प्रशिक्षणानंतर दोन्ही गटातील शारीराच्या विविध घटकांच्या उत्तर चाचणी घेण्यात येणार आहे.

जे खेळाडू प्रयोगीक गटात असतील त्यावर ६ आठवडे प्रत्येक आठवड्याला ६ दिवस या प्रमाणे स्थिरता आणि गतिशिलतेसाठी फ्रि वेट आणि मशिन वेट प्रशिक्षण देण्यात आले व नियंत्रीत गटाला ते पुर्वीपासुन करत असलेले प्रशिक्षण घेत राहतील. प्रस्तुत संशोधनात वर्णनात्मक सांख्यिकीतील मध्यमान, प्रमाण विचलन इंडीपेडन्ट टि-टेस्ट व वन वे अँनोव्हा वापर केला जाणार आहे.

विश्लेषण व अर्थनिर्वचन:

१ फ्रि वेट आणि मशिन वेट प्रशिक्षण कार्यक्रमाचा खेळाडूंच्या ओव्हर हेड डिप स्कॉट कसोटीच्या कार्यमानावर होणाऱ्या परिणामाचे विश्लेषण:

१. ओव्हर हेड डिप स्कॉट कार्यमान विश्लेषण:

सदर संशोधनामध्ये खेळाडूंच्या स्थिरता आणि गतिशिलता या घटकावर फ्रि वेट आणि मशिन वेट प्रशिक्षण कार्यक्रमाचा होणारा परिणाम पाहण्यासाठी संशोधकाने फ्रि वेट मशिन वेट आणि नियंत्रीत गट या तीन गटातील खेळाडूंवर प्रशिक्षण कार्यक्रम राबवण्या पुर्वी पूर्व चाचण्या व राबवल्या नंतर उत्तर चाचणी घेतल्या खालील कोष्टक क्र. १ मध्ये उत्तर चाचणी मधुन पुर्व चाचणीचे गुण वजा करुन आलेले कार्यमान मांडलेले आहे

कोष्टक क्र. १

वर्णनात्मक सांख्यिकी ओव्हर हेड डिप स्कॉट कार्यमान बदल

गट	खेळाडू संख्या	मध्यमान (कि.ग्रॅ.)	प्रमाण विचलन
फ्रि वेट	१५	१.१३	०.७४
मशिन वेट	१५	०.४७	०.९९
नियंत्रीत	१५	०.३३	०.७२

कोष्टक क्र.१ वरून असे दिसुन येते कि, फ्रि वेट प्रशिक्षणा मध्ये १५ खेळाडूंचा सहभाग असुन ओव्हर हेड डिप स्कॉट कसोटीच्या कार्यमानाच्या मध्यमानात १.१३ (२०७४) एवढी वाढ झाली मशिन वेट प्रशिक्षणा मध्ये १५ खेळाडूंचा सहभाग असुन ओव्हर हेड डिप स्कॉट कसोटीच्या कार्यमानाच्या मध्यमानात ०.४७ (१०.९९) एवढी वाढ झाली असुन नियंत्रीत गटा मध्ये १५ खेळाडूंचा सहभाग असुन ओव्हर हेड डिप स्कॉट कसोटीच्या कार्यमानाच्या मध्यमानात ०.३३ (५०.७२) एवढी वाढ झाली.

कोष्टक क्र.२

एकमार्गी अँनोव्हा : ओव्हर हेड डिप स्कॉट कार्यमान बदल तुलना

स्त्रोत	वर्ग बेरीज	स्वाधीनता मात्रा	वर्ग मध्य	F	सार्थकता मात्रा
गटांमधील	५.५१	२	२.७५	४.०१	०.०२
गटांतर्गत	२८.८०	४२	०.६८		
एकूण	३४.३१	४४			

वरील कोष्टक क्र २ मध्ये गटांची तुलना केली असता. F मुल्य ४.०१ इतके आढळले हे मुल्य ०.०५ सार्थकता स्तरावर सार्थक आहे (P=0.01). यावरून असे लक्षात येते कि तीन हि गटांच्या ओव्हर हेड डिप स्कॉट

कार्यमाना मध्ये झालेला बदल संख्याशास्त्रीय दृष्ट्या सार्थक आहे. या तीन गटामधील कोणत्या गटातील बदल हा संख्याशास्त्रीय दृष्ट्या सार्थक आहे हे समजण्यासाठी सेफी'स पोस्ट हॉक चाचणीचा वापर केला आहे

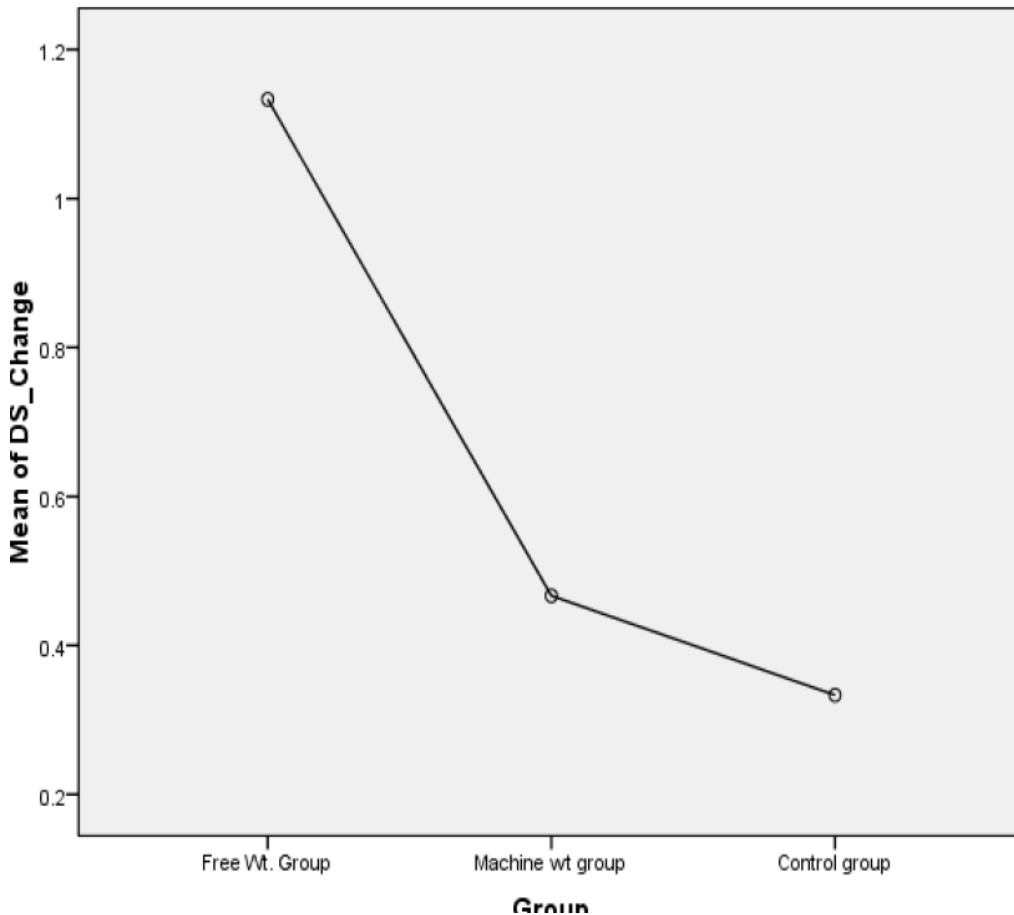
कोष्टक क्र. ३

बहुस्तरीय तुलना: ओव्हर हेड डिप स्कॉट कसोटी पोस्ट हॉक टेस्ट

गट	गट	मध्यामानातील फरक	प्रमाणित त्रुटी	सार्थकता स्तर
फ्री वेट	नियंत्रित गट	०.८०	०.३०	०.०३
मशिन वेट	नियंत्रित गट	०.१३	०.३०	०.९०
फ्री वेट	मशिन वेट	०.६६	०.३०	०.१०

*. The mean difference is significant at the 0.05 level..

कोष्टक क्र.३ वरील दिलेल्या पोस्ट हॉक तक्त्यावरून असे दिसून येते की, ओव्हर हेड डिप स्कॉट कसोटीचा फ्री वेट आणि नियंत्रित गट यांमध्ये मध्यमानातील फरक ०.८० व प्रमाणित त्रुटी ०.३० असून सार्थकता स्तर ०.०५ या स्तरावर सार्थक फरक दिसून येतो मशिन वेट आणि नियंत्रित गट यांमध्ये मध्यमानातील फरक ०.१३ व प्रमाणित त्रुटी ०.३० असून सार्थकता स्तर ०.०५ या स्तरावर सार्थक फरक दिसून येत नाही व फ्री वेट आणि मशिन वेट प्रशिक्षण गटामधील मध्यमानातील फरक ०.६६ व प्रमाणित त्रुटी ०.३० असून सार्थकता स्तर ०.०५ या स्तरावर सार्थक फरक दिसून येत नाही.



आकृती १ मध्ये फ्री वेट, मशिन वेट आणि नियंत्रित गट यांच्या ओव्हर हेड डिप स्कॉट कसोटीचे मध्यमान मांडण्यात आले आहे.

मशिन वेट प्रशिक्षणा व्दारे ओव्हर हेड डिप स्कॉट, कसोटीच्या कार्यमाना मध्ये सार्थक परिणाम झाला नाही फ्री वेट प्रशिक्षणा व्दारे ओव्हर हेड डिप स्कॉट कसोटीच्या कार्यमाना मध्ये सार्थक परिणाम झाला.

संदर्भ:

- Al-Amood.W.S.Buller. A.J and Pope.R. (1973).Long-term stimulation of cat fast twitch skeletal muscle. Nature: 244:225-7.
- Anderson.K.G and Behm.D.G. (2004). Maintenance of EMG activity and loss of force output with instability. J Strength Cond Res 18: 637-640.
- Buller.A.J. Eccles.J.C and Eccles.R.M.(1960). Interaction between motoneurons and muscles in respect of the characteristic speeds of their responses. J Physiol: 150:417-39.
- Dubowitz.V.(1967).Cross-innervated mammalian skeletal muscle: histochemical, physiological and biomechanical observations. J Physiol; 193:481-96.
- Gregory, G. (2012) An analysis of the muscle activation of a push up when in instability is introduced. indiana university of pennsylvania.
- Hennig R and Lomo T.(1987). Effects of chronic stimulation on the size and speed of long-term denervated and innervated rat fast and slow skeletal muscles. Acta Physiologica Scand; 130:115-31.
- Kavcic, N., S., Greniek and S.M.McGill. (2004). Determining the stabilizing role of individual torso muscles during rehabilitation exercises. Spine 29:1254-1265.
- Kornecki.,s.et.al.(2001) Muscular cooperation during joint stabilization, as reflected by EMG. Eur J Appl physiol, V.85.p.453-461.



द्राक्ष शेतीतील नवीन तंत्रज्ञानाचा वापर आर्थिकदृष्ट्या शाश्वत

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९७६७५८१४६३

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प्रास्ताविक –

२१ व्या शतकातील शेती व्यवसाय हा सुधारित तंत्रज्ञान यावर आधारित असलेला व्यवसाय दिसून येतो. कृषी उद्योगात भरपूर उत्पादन घेण्यासाठी नवीन तंत्रज्ञान, नवकल्पना यांचा समावेश केला जात आहे. हे जरी खरे असले तरी शेती उद्योगात जगातील अनेक भागात उत्पादकांना हवामान बदल आणि बदलत्या हवामान पद्धती, संकुचित ऋतू , दुष्काळ, उष्णता, मजूर, आणि उच्च उत्पादन खर्च यामुळे निर्माण होणाऱ्या आव्हानांना तोंड द्यावे लागते. यामुळेच द्राक्ष बाग व्यवस्थापन पद्धतीचे मूल्यांकन करण्यासाठी वापरलेले तंत्रज्ञान आणि द्राक्ष वेळी कामगिरीचे सातत्याने निरीक्षण करण्याची आवश्यकता वाढत आहे.

द्राक्ष उत्पादक तसेच पर्यावरणीय आणि आर्थिक दृष्ट्या शाश्वत राहण्याशी संबंधित योग्य निर्णय घेण्यासाठी आधार म्हणून त्यांच्या द्राक्ष बागाबद्दल तपशीलवार तंत्रज्ञानाची माहिती मिळवण्यात आणि वापरण्यास अनुमती देणारी तंत्रज्ञान उपलब्ध होत आहे. स्मार्टफोन प्लस यांच्या व्यापक उपलब्धतेमुळे उत्पादकांना माहिती मिळवण्याचा आणि द्राक्ष बागेतील द्राक्षाची कार्यक्षमता आणि फळांचे गुणधर्म मोजण्याचा मार्ग बदलला आहे. भविष्यात नॉन इनवेन्सिव्ह, सेन्सिंग तंत्रज्ञानाचे डिझाईन केलेला रोबोटिक उपकरणाच्या वापरामुळे द्राक्ष बागेतील अनेक कामे स्वयंचलित होण्याची शक्यता निर्माण झाली आहे.

अलीकडे देखील द्राक्ष बागेच्या व्यवस्थापनासाठी नवीन तंत्रज्ञानाचा वापर मोठ्या प्रमाणात केला जात आहे. तंत्रज्ञानाचा वापर जरी होत असला तरी द्राक्ष उत्पादकांना पर्यावरणीय समस्यांना देखील तोंड द्यावे लागत आहे. बदलत्या हवामानाचा आणि मातीच्या परीस्थितीच्या परिणामांच्या देखील समस्या निर्माण होत आहे.

उद्दिष्टे :

- नवीन तंत्रज्ञान व द्राक्ष उत्पादन वाढीचा अभ्यास करणे.
- व्हीटीकल्चर मधील नव तंत्रज्ञानाचा अभ्यास करणे.
- नवीन तंत्रज्ञानामुळे झालेल्या आर्थिक फायद्यांचा अभ्यास करणे.

गृहीतके : नवीन तंत्रज्ञान हे आर्थिकदृष्ट्या शाश्वत आहे.

डिजिटल तंत्रज्ञान आणि लागवडी बाबत व्यवस्थापन व फलोत्पादन शाखा-

द्राक्ष शेतीमध्ये संवेदना तंत्रज्ञानाचा वापर वेगाने विस्तारत आहे. या तंत्रज्ञानामुळे भविष्यातील द्राक्षबाग या विषयावर विचार मंथन केले जाते. भविष्यात मातीचे गुणधर्म, भूरचना, वनस्पतीची वाढ, पोषक तत्वे, पाण्याची स्थिती, कीटक आणि रोग, पीक अंदाज, उत्पन्न आणि फळांची रचना, द्राक्ष बागेचे नमुने, हार्वेस्टिंग याविषयी डिजिटल तंत्रज्ञानाच्या साहाय्याने प्रकाशझोत टाकला जातो. यामध्ये तंत्रज्ञानाने होणारी

आर्थिक बचत देखील अधोरेखित केले जात आहे. द्राक्ष बागेची मानवी मजुरी व तेच काम तंत्रज्ञानाने होत असल्याने वेळेचे आणि पैशाची बचत साध्य केली जात आहे .

प्रॉक्सिमल साईल सेंसर, मोबाईल प्लॅटफॉर्मवर जमिनी संदर्भात मातीचा डेटा मिळवता येतो. रियल टाईम किलो मॅट्रिक जीपीएसमुळे नवीन द्राक्ष बाग डिझाईन करताना मातीच्या गुणधर्माचा अभ्यास करून द्राक्ष बागेचा पुनर्विकास करता येतो.डिजिटल तंत्रज्ञानामुळे पायाभूत सुविधा आणि उपकरणांची स्थिती निश्चित करता येते. मातीतील पोषक तत्वे, पाण्यातील पीएच आणि सेंद्रिय पदार्थांच्या शोधाच्या बाबतीत सेंसर उपयुक्तता वाढली आहे.

कीटक, रोग आणि तंत्रज्ञान -

द्राक्ष बागेत सध्या दृश्य तपासणीद्वारे कीटक आणि रोगांचा प्रादुर्भाव आणि तीव्रता याविषयी मूल्यांकन केले जाते. अर्थातच ही प्रक्रिया वेळखाऊ आणि व्यक्तीनिष्ठ व खर्चिक आहे. ज्यामुळे प्रचंड खर्च येतो. परंतु हा खर्च करीत असताना जोखीम कमी जास्त होण्याची मोठी शक्यता असते.परंतु तंत्रज्ञानाच्या साहाय्याने द्राक्ष बागेत रोग शोधण्यासाठी सीव्ही, थर्मोग्राफी, स्पेक्ट्रोकोपी यासारख्या नॉन इनवेन्सिव्ह तंत्रज्ञानाचा वापर केला जात आहे. पारंपरिक पद्धतीपेक्षा त्याचे असंख्य फायदे आहेत. या नवीन तंत्रज्ञानामुळे द्राक्ष बाग कीटक आणि रोगांची वस्तुनिष्ठ विश्लेषण होते यामुळे आर्थिक बचत होते. तंत्रज्ञानामुळे फवारण्याचा वेळ आणि प्रमाण सुधारले. संसर्ग पसरण्याचा धोका कमी होईल. खर्च कमी करण्यासाठी तसेच रोग शोधण्याकरिता अचूक संधी देखील उपलब्ध होत आहे. वनस्पती रोग शोधण्यासाठी सीव्ही आणि एच एस आय हे सर्वात शक्तिशाली मापक दरातील तंत्रज्ञान आहे. डाऊनी सारख्या रोगाचे मूल्यांकन करण्यासाठी सीव्ही,एचएसआय आणि एम एल वापरले गेले आहे. या तंत्रज्ञानाचा वापर द्राक्ष वेलीची डावणी, खोडाचे रोग, विषाणू इत्यादींची होणारी प्रतिक्रिया तपासण्यासाठी केला जात आहे.

द्राक्ष वेल पाण्याची स्थिती आणि तंत्रज्ञान -

सध्याच्या हवामान बदलाच्या परिस्थितीत ज्यामुळे पाणी पुरवठ्याची घट आणि तापमानात वाढ होत आहे. द्राक्ष बागेच्या पाण्याची स्थिती आणि सिंचन व्यवस्थापनाचे मूल्यांकन करणे आवश्यक झाले आहे. त्यामुळे नवीन तंत्रज्ञान पद्धतीने पाण्याचे व्यवस्थापन केल्यामुळे उत्पादनात वाढ आणि आर्थिक बचत होते. आज देशात बहुतांशी द्राक्ष बागांना स्मार्टफोन वरून पाणी व्यवस्थापन केले जात आहे. द्राक्ष बागेच्या पाणी व्यवस्थापनाची स्थिती मूल्यांकन देखील या तंत्रज्ञानाने केले जात आहे. द्राक्ष शेतीत आर्द्रता निर्देशांक कोणत्या प्रकारचे आहे, यासाठी देखील फायलो, आऊटगो ,फसल, निरो, केविसन यासारख्या कंपन्यांचे तंत्रज्ञान मोठ्या प्रमाणात द्राक्ष उत्पादक वापरतात. त्यामुळे योग्य नियोजन करणे अगदी सोयीचे झाले आहे.

द्राक्ष उत्पादन औषध फवारणी व तंत्रज्ञान -

पारंपारिक पद्धतीने औषध फवारणी आता कालबाह्य ठरत आहे. नवीन तंत्रज्ञानाच्या साहाय्याने औषध फवारणी केल्याने त्याचे अनेक फायदे अधोरेखित झाले आहे. नवीन तंत्रज्ञान वापरामुळे औषधांची, वेळेची बचत झाली आहे. अलीकडच्या काळात अॅग्रोफॅब,मिश्रा, ड्रॅगन, कॅफिनी,चिमा इ. यासारखे नवीन तंत्रज्ञान वापरले जाते. अतिशय किफातशीर सुविधा व मापक दरात हे तंत्रज्ञान उपलब्ध आहे

डिजिटल तंत्रज्ञानाने देशांतर्गत व आंतरराष्ट्रीय बाजारात मार्केटिंग -

द्राक्ष हे नाशवंत फळ आहे. हार्वेस्टिंग नंतर केवळ ४० ते ६० दिवस ती चांगली राहतात. ज्या ठिकाणी उत्पादित केली जायची त्याच ठिकाणी ती विक्री होत होती. परंतु महाराष्ट्रासारख्या प्रायोगिक भूमीमध्ये महाराष्ट्राने कोरॉगेटेड बॉक्स तयार करून द्राक्ष भारतभर दोन दिवसातच पोहोचविले. त्याचबरोबर आंतरराष्ट्रीय बाजारातही द्राक्ष फळाने आपले स्थान निर्माण केले आहे. द्राक्ष आता निर्यात केली जातात. व त्यातून मोठे मार्केटिंग होताना दिसते. देशात व आंतरराष्ट्रीय बाजारात डिजिटल तंत्रज्ञानाचा वापर करून द्राक्ष मोठ्या प्रमाणात निर्यात केली जात आहे. द्राक्ष निर्यात करणे नवीन तंत्रज्ञानाने निर्यातक्षम उत्पादन घेणे शक्य झाले आहे.

निष्कर्ष -

पर्यावरणीय बदल, मजुरांची कमतरता तसेच द्राक्ष बागेच्या भविष्यातील आव्हानांना तोंड देण्यासाठी नवीन तंत्रज्ञान वापरण्याची आवश्यकता आहे. नवीन तंत्रज्ञान हे मापक दरात उपलब्ध होत असल्याने आर्थिक दृष्ट्या शाश्वत आहे. नवीन तंत्रज्ञानामुळे द्राक्ष उत्पादनात वाढ होत असल्याने शेतकऱ्यांच्या उत्पन्नात भर पडते. द्राक्ष शेतीत आर्द्रता निर्देशक तंत्रज्ञानाचा वापर होतो. त्यामुळे योग्य नियोजन व व्यवस्थापन होत आहे. औषधे फवारण्यासाठी अॅग्रोफॅब, मित्रा, ड्रॅगन, कॅफिनी, चिमा इत्यादी नवीन तंत्रज्ञानामुळे कीड नियंत्रण, सीव्ही आणि एच एस आय यामुळे रोग विषयक अचूक निदान होते. त्यामुळे द्राक्ष उत्पादन वाढण्यास मदत मिळते. एकूणच नवीन तंत्रज्ञान हे द्राक्ष शेतीसाठी आर्थिक फायद्याचे आहे.

नवीन तंत्रज्ञानाच्या साह्याने औषध फवारणी यंत्र -



इ.एस.एस



मित्रा

नवीन तंत्रज्ञानाच्या साह्याने द्राक्ष शेतीत आर्द्रता निर्देशांक यंत्र -



फसल



फायलो

संदर्भ-

१. रामटेके एस.डी (२०१६), प्रकाशक महाराष्ट्र राज्य द्राक्ष बागायतदार संघ पुणे.
२. एस. फाउंटस, बी. एस्पेजो-गार्सिया, ए. कासिमाती, एम. मायलोनास, एन. दारा डिजिटल शेतीचे भविष्य: तंत्रज्ञान आणि संधी
३. जी बचस <http://bacchus-project.eu>
४. https://www.google.com/search?sca_esv=d52286dabd1f67ed&q=agrospray+centre+agriculture

क्वाड, आणि ब्रिक्स : चीनसोबतचा समतोल साधण्याचे भारतासमोर मोठे आव्हान

श्री ज्ञानेश्वर कचरू मोगल

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मोबाईल क्र. ९४२२५८९२८२, ९९७५०४७९३३

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गोषवारा:

भारत चीनचा शेजारी देश आहे आणि दोन्ही देशांमध्ये 4500 किमी लांब सीमा आहे. चीनबाबत धोरण आखताना भारत अनेक गोष्टींची काळजी घेतो. भारत चीनचा सामना करण्यासाठी क्वाड या संघटनेत सहभागी झाला आहे. परंतु ब्रिक्स या संघटनेत भारत चीन बरोबर काम करत असताना चीनसोबत समतोल साधून ठेवायचे मोठे आव्हान भारतासमोर आहे. कारण गेल्या 3-4 वर्षांत आणि विशेषतः 2020 नंतर चीनची भूमिका बरीच नकारात्मक झाली आहे. इतकंच नाही तर चीनचे भारत, अमेरिका, ऑस्ट्रेलिया आणि जपानशी संबंधही बिघडलेत. चीनने आक्रम पवित्रा घेतला तर त्याचा परिणाम भारतावर होऊ शकतो. BRICS आणि QUAD मधील भारताच्या सदस्यत्वाचा त्यांच्या परराष्ट्र धोरणाच्या निर्णयांवर होणारा परिणाम विविध घटकांच्या अधीन आहे, ज्यामध्ये विकसित होत असलेली भौगोलिक राजकीय गतिशीलता, प्रादेशिक घडामोडी आणि भारताचे स्वतःचे राष्ट्रीय हित यांचा समावेश आहे. या संस्थांचे प्राधान्यक्रम, अजेंडा परस्परविरोधी हितसंबंधही असू शकतात. भारताने या गतिशीलतेकडे काळजीपूर्वक लक्ष देणे आवश्यक आहे. भारताला दोन्ही संघटनांचे सदस्यत्व कायम ठेवणे गरजेचे देखील आहे. या समस्येला उपाय म्हणून कोणत्याही एका गटावरील अवलंबित्व कमी करणे, संतुलित परराष्ट्र धोरण स्वीकारणे, जागतिक व्यवस्थेतील संभाव्य जोखीम आणि अनिश्चिततेपासून बचाव करणे, इंडो-पॅसिफिक प्रदेशात भारताची स्थिती मजबूत करणे हे आहे.

प्रस्ताविक:

क्वाड सिक्युरिटी डायलॉगचे चार सदस्य राष्ट्र म्हणजेच अमेरिका, ऑस्ट्रेलिया, जपान आणि भारत या प्रदेशात चीनच्या वाढत्या प्रभावाला आळा घालण्यासाठी एका व्यासपीठावर एकत्र आले आहेत. भारत यातला एक महत्त्वाचा देश आहे. QUAD च्या निर्मितीचे मुख्य अघोषित उद्दिष्ट इंडो-पॅसिफिक प्रदेशात म्हणजेच हिंद महासागर आणि पॅसिफिक महासागर यांच्यामध्ये येणारे क्षेत्र चीनच्या वाढत्या प्रभावाला लगाम घालणे आहे. त्याच वेळी, इंडो-पॅसिफिक क्षेत्रातील इतर देशांना चिनी वर्चस्वापासून वाचवणे हा त्याचा उद्देश आहे. इंडो-पॅसिफिकमधील सामरिक सागरी मार्ग कोणत्याही लष्करी किंवा राजकीय प्रभावापासून मुक्त ठेवणे हा क्वाडमागील हेतू आहे. याकडे मुळात चिनी वर्चस्व कमी करण्याच्या उद्देशाने धोरणात्मक गटबाजी म्हणून पाहिले जाते. QUAD च्या गटांमध्ये सामील झाल्यामुळे सागरी सुरक्षा आणि दहशतवादविरोधी सहकार्याद्वारे भारताची प्रादेशिक सुरक्षा वाढली आहे. नियम-आधारित जागतिक व्यवस्था, नेव्हिगेशनचे स्वातंत्र्य आणि उदारमतवादी व्यापार प्रणाली सुरक्षित करणे हे क्वाडचे मुख्य उद्दिष्ट आहे. इंडो-पॅसिफिक प्रदेशातील राष्ट्रांसाठी

पर्यायी कर्ज वित्तपुरवठा ऑफर करण्याचेही उद्दिष्ट आहे. मात्र, बैठकीत संघटनेच्या अजेंड्यांचा विस्तार करण्यात आला आहे. दुसरीकडे भारत आणखी एका व्यासपीठावर बराच सक्रीय आहे जिथे भारत आणि चीन महत्वाची भूमिका बजावतात. हे व्यासपीठ आहे 'ब्रिक्स'चं. भारत आणि चीन व्यतिरिक्त रशिया, ब्राझिल आणि दक्षिण आफ्रिका ब्रिक्स संघटनेचे सदस्य आहेत. भारत एकीकडे चीनविरोधी संघटनेचाही सदस्य आहे आणि दुसरीकडे चीनसोबतच्या एका संघटनेतही सदस्य आहे. अशावेळी भारत चीनबरोबरच्या संबंधात समतोल कसा साधतो हे आव्हान भारतासमोर आहे.

संशोधनाची उद्दिष्टे :

- १) भारतीय परराष्ट्र धोरणात समतोल साधत असताना भारतासमोरील आव्हाने यांचा अभ्यास करणे
- २) ब्रिक्स आणि क्वाड संघटनांच्या वैशिष्ट्यांचा अभ्यास करणे.
- ३) भारतासमोरील आव्हाने कशी आहे व त्यावर काय उपाययोजना करता येतील यांचा अभ्यास करणे.

संशोधन पद्धती:

या संशोधनपर शोधनिबंध हा वेबसाईट, वर्तमान पत्रातील लेख ,रिसर्च पेपर,संदर्भ पुस्तके या सारख्या दुय्यम सामग्रीवर आधारित आहे.

BRICS संघटनेची स्थापना :

ब्रिक्स(BRICS) हे भारत, ब्राझील, रशिया, चीन आणि दक्षिण आफ्रिका या देशांच्या शिखर संघटनेचे संक्षिप्त नाव आहे. सुरुवातीला फक्त चार देश या संघटनेचे सदस्य होते आणि "ब्रिक" या संक्षिप्त नावाने ओळखले जात होते. २०१० मध्ये दक्षिण आफ्रिका समाविष्ट झाल्यावर संघटनेचे नाव ब्रिक्स झाले.

ब्रिक्सची उद्दिष्टे:

१. आर्थिक आणि राजकीय स्थिरता वाढवणे हे ब्रिक्सचे उद्दिष्ट आहे.
२. २०५० पर्यंत हे देश उत्पादने,सेवा आणि कच्चा माल यांच्यात परस्पर देवाण घेवाण करणे.
३. विकासाला चालना देण्यासाठी सदस्य देशांमधील सहकार्य वाढवणे, सखोल करणे आणि व्यापक करणे.
४. सर्व सदस्य राष्ट्रांच्या प्रगतीसाठी प्रयत्न करणे.
५. प्रत्येक देशाच्या आर्थिक ताकदीचा उपयोग संबंध निर्माण करण्यासाठी आणि तेथील स्पर्धा दूर करण्यासाठी करणे.

या उद्दिष्टांमुळे BRICS हा नवीन आणि आश्वासक राजनैतिक आणि राजकीय गट बनत आहे.

ब्रिक्सची वैशिष्ट्ये:

BRICS ची प्रमुख वैशिष्ट्ये जी आहे त्याला एक यशस्वी समुदाय बनवतात:

१. BRICS देशांच्या अर्थव्यवस्थांची किंमत \$28.5 ट्रिलियन पेक्षा जास्त आहे - जागतिक अर्थव्यवस्थेच्या सुमारे 28% आहे.
२. BRICS देशांची एकत्रित लोकसंख्या सुमारे 3.5 अब्ज आहे, जी जगाच्या एकूण लोकसंख्येच्या 45% आहे.

३. BRICS हा पाच प्रमुख विकसनशील देशांचा समूह आहे.

४. BRICS मध्ये युरोपियन युनियन किंवा युनायटेड स्टेट्समधील कोणताही देश नाही.

QUAD ची स्थापना:

क्वार्टीलॅटरल सिक्योरिटी डायलॉग म्हणजे **Quadrilateral Security Dialogue (QSD)** ही अमेरिका, भारत, जपान आणि ऑस्ट्रेलिया या चार देशांमधील एक धोरणात्मक युती तयार झाली. QUAD ची स्थापना 2007 मध्ये झाली. क्वाड ज्याला 'चतुर्भुज सुरक्षा संवाद' (QSD) म्हणूनही ओळखले जाते, हा एक अनौपचारिक धोरणात्मक मंच आहे. ज्यामध्ये युनायटेड स्टेट्स ऑफ अमेरिका (यूएसए), भारत, ऑस्ट्रेलिया आणि जपान या चार राष्ट्रांचा समावेश आहे.

QUAD ची उद्दिष्टे:

1. QUAD च्या निर्मितीचे मुख्य अघोषित उद्दिष्ट इंडो-पॅसिफिक प्रदेशात म्हणजेच हिंद महासागर आणि पॅसिफिक महासागर यांच्यामध्ये येणारे क्षेत्र चीनच्या वाढत्या प्रभावाला लगाम घालणे आहे.
2. इंडो-पॅसिफिक क्षेत्रातील इतर देशांना चिनी वर्चस्वापासून वाचवणे.
3. इंडो-पॅसिफिकमधील सामरिक सागरी मार्ग कोणत्याही लष्करी किंवा राजकीय प्रभावापासून मुक्त ठेवणे.
4. नियम-आधारित जागतिक व्यवस्था निर्माण करणे,
5. नेव्हिगेशनचे स्वातंत्र्य आणि उदारमतवादी व्यापार प्रणाली सुरक्षित करणे.
6. इंडो-पॅसिफिक प्रदेशातील राष्ट्रांसाठी पर्यायी कर्ज वित्तपुरवठा करण्याचे ही उद्दिष्ट आहे.

QUAD वैशिष्ट्ये:

1. QUAD हि चीनच्या विस्तारवादी भूमिकेमुळे लोकशाही राष्ट्रांची झालेली धोरणात्मक युती आहे.
2. इंडो-पॅसिफिक राष्ट्रांमधील सुरक्षेचा चौकोन निर्माण झाला आहे.
3. राष्ट्रांच्या सुरक्षा व सार्वभौमत्व रक्षणासाठी आवश्यक असणारी क्षमता QUAD मध्ये आहे.

भारतासमोरील आव्हाने:

आंतरराष्ट्रीय राजकारण आणि वाटाघाटींमध्ये मोठी भूमिका बजावण्याचे भारताचे उद्दिष्ट आहे, जे BRICS च्या महत्त्वपूर्ण भूमिकेवर अधिक जोर देत आहे. भारतीय धोरणात्मक हितसंबंधांना प्रोत्साहन देणे, संरक्षण करणे आणि त्याचा फायदा घेणे आणि त्याचा दर्जा वाढवणे यावर लक्ष केंद्रित केले जात असले तरी, भारताच्या धोरणात्मक गणनेत क्वाडचा वाढता दर्जा पाहता भारत सरकारने इंडो-पॅसिफिक क्षेत्राला प्राधान्य दिले पाहिजे असा काहींचा तर्क आहे. आंतरराष्ट्रीय राजकारण भारतासमोर अनेक पेचप्रसंग उभे राहतात अशा वेळी खूप मोठे आव्हान भारतासमोर आहे.

१. भारताचे परराष्ट्र धोरणात होणारे बदल:

अलिप्ततावादी धोरण आणि लष्करी स्वायत्तता ही दोन तत्वे प्रदीर्घकाळ भारताच्या परराष्ट्र धोरणाचा अविभाज्य भाग होती. आता इंडो-पॅसिफिक आणि क्वाडच्या निमित्ताने भारत या तत्वांपासून काहीसा दूर जात

एका वेगळ्या प्रकारे परराष्ट्र धोरणाची आखणी करत आहे. स्वातंत्र्य मिळाल्या नंतर भारताने अलिप्ततावादी धोरणाचा अवलंब केला. ज्या वेळेस संपूर्ण जग दोन बाजूंमध्ये विभागले जात होते त्या वेळेस कोणतीही बाजू निवडण्याचे भारताने ठरवले. परंतु भारताने परराष्ट्र धोरणात बदल करून जागतिक महासत्तांचा सहयोग घेण्याचे ठरविले आहे. जागतिक आणि प्रादेशिक आव्हानांना सामोरे जाण्यासाठी QUAD आणि BRICS या दोन्हीकडील ताकदीचा फायदा भारताला घेता येईल असे परराष्ट्र धोरण निर्माण करावे लागेल.

२. चीन आणि रशियाची वाढती जवळीक:

चीन आणि रशिया यांच्यातील सहकार्य मजबूत झाल्यामुळे त्यांच्यात जवळीक वाढली आहे. रशिया आणि चीन यांच्यातील वाढत्या मैत्रीमुळे भारत आणि रशिया यांच्यातील जुन्या मैत्रीला तडा जाईल, अशी भीती व्यक्त केली जात आहे. रशियाचे राष्ट्राध्यक्ष व्लादिमीर पुतिन यांच्या बीजिंग दौऱ्यानंतर नवी दिल्लीतही धोक्याची घंटा म्हणून पाहिले जात आहे. संरक्षण वर्तुळात भारताने रशियापासून दूर जाण्याची मागणीही केली जात आहे. रशिया आपला दशकानुवर्षे जुना मित्र भारत चीनसाठी खरच सोडून देईल का? असे झाल्यास भारतासमोर मोठे आव्हान राहील.

३. चीनची विस्तारवादी नीती:

भारत आणि चीन यांच्या सीमेवर गेल्या अनेक वर्षांपासून तणाव असून, सीमेवरील तणाव न वाढविण्यावर सहमती झाली असली, तरी परिस्थिती सुधारलेली नाही. चीनच्या कारवाया काही कमी झालेल्या नाहीत. इंडो-पॅसिफिक समुद्रात चीन आक्रमक होत असून, त्या टापूतील देशांवर चीन दादागिरी करीत आहे. चीन आर्थिकदृष्ट्या शक्तिशाली झाला हे खरे; परंतु आता त्याच्या महत्वाकांक्षा वाढत असून, तो त्याच्या अटीवर जागतिक राजकारणाला नवे वळण देऊ पाहत आहे. एकीकडे तो 'बेल्ट अँड रोड' प्रकल्पाद्वारे नवीन व्यापारी मार्ग विकसित करतो आहे, भारताच्या सर्व शेजारी देशांत आर्थिक गुंतवणूक करून सामरिक परिमाणे बदलतो आहे आणि दुसरीकडे आक्रमक होत सीमाप्रश्न उकरून काढतो आहे.

४. QUAD च्या अजेंड्याचा विस्तार:

चीन विरोधात सदस्य राष्ट्रांमध्ये नौदल क्षमता आणि सहकार्य वाढवण्याच्या उद्देशाने क्वाडची स्थापना करण्यात आली आहे. धोरणात्मक भागीदारी, इंडो-इन-पॅसिफिक धोरण तयार करणे, आर्थिक सहयोग, मानवतावादी सहाय्य आणि आपत्ती निवारण असा संघटनेच्या अजेंड्याचा विस्तार करण्यात आला आहे. भारतीय परराष्ट्र मंत्रालयाने जारी केलेल्या एका प्रसिद्धीपत्रकातील माहितीनुसार, "सदस्य राष्ट्रांचे प्रमुख समान हितसंबंधांच्या स्थानिक आणि जागतिक मुद्द्यांवर चर्चा करतील. तसेच एक स्वतंत्र, मुक्त आणि सर्वसमावेशक हिंदी-प्रशांत महासागर प्रदेश राखण्याच्या दिशेने सहाकार्याच्या व्यावहारिक क्षेत्रांवर विचारांची देवाण-घेवाण करतील." या अजेंड्याचा विस्तार झाल्यामुळे भारतासमोर समतोल राखण्याचे आव्हान निर्माण झाले आहे.

५. UNSC ची अकार्यक्षमता:

संयुक्त राष्ट्र सुरक्षा परिषद (UNSC) सध्या अकार्यक्षम आहे. जागतिक राजकारणात युनेन युद्ध आणि इस्त्रायलने गाझावरील हल्ला यांसारख्या संघर्षांमध्ये UNSC ची निर्णय क्षमता व अकार्यक्षमता दिसून आली. आंतरराष्ट्रीय कायद्याचे उल्लंघन केले जात आहे. UNSC च्या अकार्यक्षमतेमुळे त्याच्या अधिकार आणि आदेशांकडे दुर्लक्ष होत आहे. चीनचा आक्रमक स्वभाव बघता भारतासाठी हि धोक्याची घंटा आहे. चीनविरोधी

क्वाड गटात भारतासमोर आव्हान निर्माण झाले आहे. चीनची संरक्षण स्थिती बघता भारताला चीनविरोधी भूमिका घेणे हे सर्वात मोठे आव्हान आहे.

६. धोरणात्मक स्वायत्तता :

विविध उद्दिष्टांसह भारत दोन्ही गटात सामील झाला आहे. यामध्ये धोरणात्मक स्वायत्तता राखणे गुंतागुंतीचे व राजकीय डावपेचांना कारणीभूत ठरू शकते. उदाहरणार्थ: रशिया आणि युक्रेन संघर्षावर भारताची स्वतंत्र भूमिका QUAD भागीदारांच्या स्थितीशी जुळणार नाही, ज्यामुळे त्याचे राजनैतिक धोरण गुंतागुंतीचे होईल. भारताची स्वतंत्र भूमिका धोरणात्मक स्वायत्तता राखण्यासाठी अडचणीची ठरू शकते. सार्वभौमत्व टिकविणे हे भारतासमोर तगडे आव्हान असेल.

७. राजनैतिक संबंध मजबूत ठेवणे:

रशिया-युक्रेन युद्धात भारताच्या संतुलित कृतीमुळे क्वाड सदस्य आणि पाश्चिमात्य मित्र राष्ट्रांमध्ये निराशा निर्माण झाली आहे. पाश्चात्य विश्लेषकांनी “लोकशाहीचे हुकूमशाहीपासून रक्षण” या संदर्भात भारतावर टीका केली आहे. युक्रेनच्या संकटादरम्यान अमेरिकेने व त्यांच्या नेतृत्वाखालील संस्था यांनी ठामपणे रशियाविरोधी पवित्रा घेतला. परंतु भारत तटस्थ राहिला या कृतीने रशिया व अमेरिका दोन्ही गट नाराज झाले. लोकशाही व साम्यवादी राष्ट्र भारताच्या कृतीवर नाराज झाल्याने त्यांच्याबरोबर राजनैतिक संबंध मजबूत ठेवण्याचे आव्हान भारतासमोर आहे.

८. आर्थिक अवलंबित्व:

भारतीय कंपन्यांनी रशियन तेल आणि वायू क्षेत्रात US\$ 16 अब्ज पेक्षा जास्त गुंतवणूक केली असल्याने, पाश्चात्य निर्बंधांचे पालन केल्यास गुंतवणूकीवर नकारात्मक परिणाम होईल. रशियावर भारताचे लष्करी अवलंबित्व लक्षणीय आहे. भारतीय लष्करातील ५० टक्क्यांहून अधिक उपकरणे रशियन वंशाची आहेत. 2023 मध्ये भारत आणि चीन दरम्यानचा द्विपक्षीय व्यापार US\$ 113.83 अब्ज होता चीन भारताचा सर्वात मोठा व्यापारी भागीदार आहे. भारताच्या एकूण आयातीत चीनचा वाटा 13.8% आहे. वाणिज्य मंत्रालयाच्या आकडेवारीनुसार, 2021-22 मध्ये अमेरिका आणि भारत यांच्यातील द्विपक्षीय व्यापार 119.42 अब्ज डॉलर आहे. 2020-21 मध्ये तो 80.51 अब्ज डॉलर होता. अमेरिकेतील निर्यात 2021-22 मध्ये 76.11 बिलियन डॉलर झाली आहे, जी मागील आर्थिक वर्षात 51.62 अब्ज डॉलर होती. 2020-21 मध्ये सुमारे 29 अब्ज डॉलरच्या तुलनेत आयात वाढून 43.31 अब्ज डॉलर झाली आहे. आर्थिक अवलंबित्व हे भारतासाठी आव्हान आहे.

भारतासमोरील आव्हाने यावरील उपाययोजना:

BRICS आणि QUAD यांसारख्या प्रतिस्पर्धी संघटनांमध्ये भारताच्या सदस्यत्वाचा त्याच्या परराष्ट्र धोरणाच्या निर्णयांवर महत्त्वपूर्ण परिणाम होऊ शकतो असे काही मार्ग येथे आहेत.

१. संतुलित परराष्ट्र धोरणाचा पाठपुरावा करणे.
२. चीनवरील वाढत्या आर्थिक अवलंबित्वाला पर्याय निर्माण करणे.

३. जागतिक व्यवस्थेतील संभाव्य जोखीम आणि अनिश्चिततेपासून बचाव करणे.
४. इंडो-पॅसिफिक प्रदेशात भारताची स्थिती मजबूत करणे.
५. चीनकडून राजकीय आणि सुरक्षा समर्थन मिळणाऱ्या आशियाई देशांसाठी राजकीय आणि आर्थिक सुरक्षिततेचे वातावरण निर्माण करणे.
६. संवाद आणि सहकार्यासाठी पर्यायी मार्ग निवडणे
७. सहकार्यावर भर देणे आणि बहुध्रुवीय जागतिक व्यवस्थेला प्रोत्साहन देणे.
८. इंडो-पॅसिफिक प्रदेशातील लोकशाही देशांमधील सुरक्षा आणि धोरणात्मक सहकार्यावर लक्ष केंद्रित करणे
९. ब्रिक्स मधील सदस्य राष्ट्रांसोबत आर्थिक सहकार्य, गुंतवणूक आणि व्यापाराच्या संधी निर्माण करणे.
१०. चीनच्या प्रत्येक कृतीला मॅनेज करणे आणि उत्तम संबंध प्रस्थापित करणे.

सारांश:

QUAD आणि BRICS या दोन्ही गटांचे संस्थापक सदस्य असलेला एकमेव देश या नात्याने, भारतासमोर एकमेकांना प्राधान्य न देता दोन्ही गटांप्रती असलेल्या आपल्या वचनबद्धतेमध्ये संतुलन राखण्याचे आव्हान आहे. आर्थिक स्वावलंबित्व, राजकीय भूगोल, वाढता प्रभाव लक्षात घेता कोणत्याही राष्ट्राला त्याच्यावर असेलला चीनचा प्रभाव कमी करणे शक्य नाही. तरीदेखील BRICS आणि QUAD या दोन्हीमध्ये भारताच्या उपस्थितीमुळे समतोल ढासळला जाणार नाही. प्रतिस्पर्धी संघटनांमध्ये भारताच्या सदस्यत्वाचा त्याच्या दोन्ही संघटनांचे सदस्यत्व कायम ठेवणे देखील गरजेचे आहे. QUAD आणि BRICS सारख्या विविध बहुपक्षीय गटांमध्ये भारताचा सहभाग विकसित होत असलेल्या जागतिक भू-राजकीय परिदृश्यामध्ये संधी आणि आव्हाने दोन्ही सादर करतो. समकालीन घडामोडी आंतरराष्ट्रीय संबंधांना आकार देत असल्याने, या मंचांमधील भारताच्या धोरणात्मक सहभागाने सुरक्षा सहकार्य, आर्थिक एकात्मता आणि राजनैतिक स्वायत्तता यांचा समतोल राखला पाहिजे. आपल्या अद्वितीय स्थानाचा लाभ घेऊन, भारत आपल्या राष्ट्रीय हितांचे रक्षण करताना जागतिक स्थिरता आणि समृद्धीमध्ये योगदान देऊ शकतो

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- १) देवळाणकर शैलेश, (२०१८) भारताचे परराष्ट्र धोरण नवीन प्रवाह, सकाळ प्रकाशन, पुणे
- २) सिकरी राजीव (२०१०) भारताच्या परराष्ट्र धोरणाचा पुनर्विचार आव्हाने आणि नीती, संपादन चिन्मय आर घारेकर
- ३) देवळाणकर शैलेश, (२०१४) भारत आणि जग, भारताचे परराष्ट्र धोरण आणि सुरक्षा संबंध' सकाळ प्रकाशन, पुणे
- ४) सिंह वीरेंद्र, (२०२०) भारत अमेरिका संबंध, न्यू कनसेप्ट पब्लिकेशन्स
- ५) पाटील एम.झेड, (२०१९) दक्षिण आशिया आणि भारत अमेरिका संबंध, प्रशांत पब्लिकेशन्स
- ६) भिडे चिंतामणी (२०१८) समकालीन आंतरराष्ट्रीय राजकारण, डायमंड पब्लिकेशन्स, पुणे

७) काशीकर मोहन, (२००७) आंतरराष्ट्रीय राजकारण सिद्धांत व स्वरूप, यशवंतराव चव्हाण महाराष्ट्र मुक्त विद्यापीठ, नाशिक

८) पाटील के.बी., धर्माधिकारी के.डी. (२०१९) भारतीय राष्ट्रीय सुरक्षा, अथर्वपब्लिकेशन्स, धुळे

***हिंदी संदर्भ**

१) फाडीया बी.एल. (२०१९) अन्तर्राष्ट्रीय सन्बन्ध (International Relations) साहित्य भवन

पब्लिकेशन्स, जोधपुर

२) हरी डी.के., हेमा हरी डी.के. (२०१५) इन्डो जापान सहस्राब्दीयो से संबंध, श्री श्री पब्लिकेशन्स ट्रस्ट

***English Reference**

1. Dr.Jash Amrita (2021) The Quad Factor in the Indo-Pacific and the Role of India, Journal of Indo-Pacific Affairs
2. Ramanujam, Chari Seshadri, (2021) Regional Dynamics of the Indo Pacific Region and Implications of Chinas Influence in India's Extended Neighborhood (/jspui/handle/10603/341846)
3. Vignesh R (2022) New Gunboat Diplomacy in The Indo Pacific and Its Implications for India's Maritime Security (/jspui/handle/10603/360238),

***Research Paper and Articles**

1. <https://www.financialexpress.com/business/defence-brics-summit-2023-unity-and-collaboration-for-global-growth-and-sustainable-development-3215503/>
2. <https://www.stimson.org/2022/brics-quad-and-indias-multi-alignment-strategy/>
3. <https://thediplomat.com/2023/07/as-the-quad-blossoms-why-does-brics-matter-for-india/>
4. <https://www.isas.nus.edu.sg/papers/between-the-brics-and-the-quad-indias-new-internationalism/>
5. <https://www.orfonline.org/marathi/research/russias-brics-chairmanship-the-2020-summit-and-challenges-ahead77736>
6. <https://www.google.com/amp/s/www.bbc.com/marathi/international-56364834.amp#ip=1>
7. <https://www.google.com/amp/s/www.loksatta.com/sampadkiya/visheshlekh/brics-and-india-look-for-to-walk-akp-94-2028037/lite>
8. <https://www.google.com/amp/s/www.esakal.com/amp/sampadkiya/brics-purpose-itself-was-forgotten-center-of-world-politics-rjs00>
9. <https://www.civildaily.com/news/the-importance-of-both-quad-and-brics/>
10. <https://currentaffairs.chinmayaias.com/importance-of-balancing-brics-and-quad/>
11. <https://southasianvoices.org/brics-quad-and-indias-multi-alignment-strategy/>
12. <https://thediplomat.com/2023/07/as-the-quad-blossoms-why-does-brics-matter-for-india/>
13. <https://www.sanskritiias.com/current-affairs/quad-and-brics-indias-strategic-partnership-34-13>

भारतातील डिजिटल मार्केटिंगवरील अभ्यास : संधी आणि आव्हाने

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मो.न.-९८२३३१६४४३

सारांश:

डिजिटल मार्केटिंगच्या पहिल्या पद्धतींमध्ये ते इंटरनेटवर पारंपारिक विपणन , त्याची साधने आणि धोरणे यांचे प्रक्षेपण म्हणून परिभाषित केले गेले. तथापि, डिजिटल जगाची वैशिष्ट्ये आणि विपणनासाठी त्याचा वापर यामुळे चॅनेल, स्वरूप आणि भाषांचा विकास झाला आहे ज्यामुळे ऑफलाइन अकल्पनीय साधने आणि धोरणे निर्माण झाली आहेत. फेब्रुवारी २०२५ पर्यंत, जगभरात ५.५६ अब्ज इंटरनेट वापरकर्ते होते, जे जागतिक लोकसंख्येच्या ६७.९ टक्के होते. भारतात, इंटरनेट वापरणारे ग्राहक झपाट्याने वाढत आहेत आणि भविष्यात हे आणखी वाढणार आहे. २०२० पर्यंत भारतातील इंटरनेट वापरकर्ता संख्या ६२२ दशलक्षांपर्यंत पोहोचली होती. IMAI Kantar ICUBE 2020 अहवालानुसार, भारतात २०२५ पर्यंत ९०० दशलक्ष सक्रिय इंटरनेट वापरकर्ते असण्याची शक्यता आहे, ... हा अभ्यास ऑनलाइन मार्केटिंगचे मुख्य फायदे आणि तोटे समजून घेणे असेल, जे इंटरनेटद्वारे त्यांची उत्पादने विक्री करू इच्छिणाऱ्या घटकांना फायदेशीर ठरेल. आणि ऑनलाइन मार्केटिंगच्या फायदे आणि तोटे जाणून घेण्याऱ्या प्रत्येक संस्थेसाठी उपयुक्त ठरेल.

कीवर्ड्स: शोध इंजिन ऑप्टिमायझेशन (SEO), नेटवर्क सर्व्हर, सोशल मीडिया मार्केटिंग, ईमेल जाहिरात, सोशल नेटवर्किंग, औद्योगिक जाहिरात, ई-कॉमर्स, , आउटबाउंड कॉल हँडलिंग

१. प्रस्तावना:

आता हे सर्वज्ञात आहे की आपण ज्याला 'मार्केटिंग' म्हणतो त्यात गेल्या दोन दशकांत मोठे बदल झाले आहेत आणि या परिवर्तनात इंटरनेटची महत्त्वाची भूमिका आहे. इंटरनेट "जगभरातील संगणकांना जोडणारे भौतिक नेटवर्क आहे. त्यात नेटवर्क सर्व्हरची पायाभूत सुविधा आणि त्यांच्यामधील विस्तृत क्षेत्रीय संप्रेषण दुवे असतात जे इंटरनेटवरील प्रचंड प्रमाणात माहिती ठेवण्यासाठी आणि वाहतूक करण्यासाठी वापरले जातात".

इंटरनेटच्या परिचयामुळे विविध क्षेत्रांची रचना आणि कामगिरी बदलली आहे, उदा. आदरातिथ्य, प्रवास, आरोग्य आणि औषधे, शिक्षण इत्यादी. इंटरनेटच्या परिचयाने नियम बदलले आहेत आणि मार्केटिंग व्यावसायिकांना त्याचे पालन करण्याशिवाय पर्याय नाही. खरं तर मार्केटिंग हे इंटरनेट-आधारित तांत्रिक नवकल्पनांनी मोठ्या प्रमाणात क्रांती घडवून आणलेल्या असंख्य क्षेत्रांपैकी एक आहे. हॅलोवे म्हणतात की "माहिती आणि संप्रेषण तंत्रज्ञान हे मार्केटिंगच्या सर्व घटकांमध्ये महत्त्वाची भूमिका बजावू लागले आहे आणि नवीन संज्ञा व्यवसाय आणि त्याच्या ग्राहकांमधील संवादात विपणनाचे महत्त्व ओळखते". वाणिज्य आणि मार्केटिंगच्या केंद्रस्थानी इंटरनेटच्या आगमनाबद्दलचा सर्वात प्रमुख मुद्दा असा आहे की, इंटरनेट हे केवळ प्रमोशनचे एक नवीन माध्यम मानले जात नाही, इतर पारंपारिक, इंटरनेट-पूर्व प्रकारच्या मार्केटिंग वस्तू आणि सेवांमध्ये एक नवीन प्रकार मानला जातो. कारण या डिजिटल मार्केटिंगमुळे एक नवीन व्यवसाय प्रतिमान विकसित झाले आहे. नवीन संप्रेषण तंत्रज्ञानाने एक नवीन गतिमान वातावरण निर्माण केले आहे ज्यामध्ये मार्केटर-केंद्रित, वरपासून खालपर्यंत, एकतर्फी दृष्टिकोन ग्राहक-केंद्रित परस्पर प्रक्रियेला स्थान देतो.

२. डिजिटल मार्केटिंग म्हणजे काय?

इंटरनेट आणि डिजिटल तंत्रज्ञानाचा वापर करून उत्पादने आणि सेवांचा प्रचार करण्याच्या पद्धतीला डिजिटल मार्केटिंग म्हणतात. याला ऑनलाइन मार्केटिंग असेही म्हणतात. डिजिटल मार्केटिंगमुळे ब्रँडची जागरूकता वाढते आणि विक्री वाढते. डिजिटल मार्केटिंग हे इंटरनेट, मोबाईल डिव्हाइसेस, सोशल मीडिया, सर्च इंजिन, डिस्प्ले जाहिराती आणि इतर माध्यमांद्वारे उत्पादने आणि सेवांचा प्रचार आणि विक्री करण्याचे एक साधन आहे. डिजिटल मार्केटिंग ब्रँड जागरूकता निर्माण करण्यात आणि नवीन किंवा विद्यमान प्रेक्षकांसह उत्पादनांची विक्री वाढविण्यात मदत करते. डिजिटल मार्केटिंगचा एक महत्वाचा पैलू म्हणजे विक्रेते विशिष्ट प्रेक्षकांपर्यंत पोहोचण्यासाठी डिजिटल मार्केटिंगच्या माध्यमातून प्रयत्न करत आहेत. डिजिटल मार्केटिंगमध्ये ऑनलाइन होणाऱ्या सर्व विपणन क्रियाकलापांचा समावेश होतो. हे शोध इंजिन ऑप्टिमायझेशन (SEO), सशुल्क जाहिराती, सोशल मीडिया मार्केटिंग, सामग्री विपणन आणि ईमेल मार्केटिंग यासह विविध क्षेत्रात कार्यरत आहे. आज, पारंपारिक मार्केटिंगच्या उपप्रकाराऐवजी, डिजिटल मार्केटिंग ही एक नवीन घटना बनली आहे जी मार्केटिंग उद्दिष्टे साध्य करण्यासाठी 'खरेदीदाराच्या आवडीनुसार बदल' आणि मोठ्या प्रमाणात वितरक एकत्र आणते. अलिकडच्या काळात अधिक मोजता येण्याजोगे, सर्वव्यापी आणि परस्परसंवादी. डिजिटल मार्केटिंग धोरणांचा विकास ब्रँड आणि संस्थांसाठी अधिक विपणन संधी प्रदान करतो.

३. अभ्यासाची उद्दिष्टे

अभ्यासाचे मुख्य उद्दिष्टे खालीलप्रमाणे आहेत:

- १) डिजिटल मार्केटिंगची संकल्पना स्पष्ट करणे.
- २) डिजिटल मार्केटिंगच्या संधी आणि आव्हानांचे विश्लेषण करणे.

४. डिजिटल मार्केटिंग: स्मॉट दृष्टीकोन

डिजिटल मार्केटिंगचे स्मॉट विश्लेषण म्हणजे थोडक्यात सांगायचे तर, स्मॉट विश्लेषण म्हणजे कोणत्याही विषयाचे सखोल विश्लेषण ज्यामध्ये त्याची ताकद, कमकुवतपणा, संधी आणि धोका बाहेर काढला जातो. यामुळे वापरकर्त्याला त्या विषयाचे सर्व पैलू, नकारात्मक आणि सकारात्मक दोन्ही समजून घेण्यास मदत होते. या शोधनिबंधाद्वारे वाचकांना जग डिजिटल मार्केटिंगकडे कसे आणि का वाटचाल करत आहे याबद्दल अधिक स्पष्टता प्रदान करण्याचा हेतू आहे.

४.१. भारतातील डिजिटल मार्केटिंगचे सामर्थ्य

- १) स्वस्त किमतीत अधिक प्रेक्षकांना लक्ष्य करणे आणि त्यांच्यापर्यंत पोहोचणे सोपे आहे.
- २) आजच्या व्यवसायाच्या गरजांनुसार मोहिमा सहजपणे वैशिष्ट्यपूर्ण केल्या जाऊ शकतात आणि अधिक पूर्ण केल्या जाऊ शकतात.
- ३) जग इंटरनेटवर अधिक अवलंबून असल्याने, ते व्यवसायाला मोठ्या प्रमाणात लोकांपर्यंत पोहोचण्यास आणि त्यांच्याशी जोडण्यास मदत करते.
- ४) डिजिटल मार्केटिंग पारंपारिक मार्केटिंग पद्धतीच्या तुलनेत खूप पैसे वाचवते, कारण ते स्वस्त आणि कार्यक्षम आहे.
- ५) डिजिटल मार्केटिंगमुळे ब्रँड म्हणून ओळखले जाणे खूप सोपे झाले आहे.
- ६) डिजिटल मार्केटिंगचे पर्याय एक किंवा दोन पर्यंत मर्यादित नाहीत, अनेक पर्याय आहेत आणि जर नियोजनाप्रमाणे कार्य होत नसेल आणि त्यामुळे मोठे नुकसान होत असेल तर लोक एका व्यवसायातून दुसऱ्या व्यवसायात प्रवेश करण्याचा पर्याय निवडू शकतात.

७) डिजिटल मार्केटिंगच्या माध्यमातून लहान व्यवसायांना प्रोत्साहन देणे सोपे आहे कारण ते किफायतशीर आहे. उद्योजकांना ते खूप उपयुक्त वाटते कारण त्यांना यासाठी मोठ्या भांडवलाची आवश्यकता नसते आणि ते त्यांना डिजिटल जगात एक ठसा उमटवण्यासाठी एक मोठे व्यासपीठ देते.

८) पारंपारिक पद्धतीने डिजिटल मार्केटिंग मोहिमा करण्यासाठी मोठ्या टीमची आवश्यकता नाही ज्यामुळे पैसे, वेळ आणि श्रम वाचतात आणि ग्राहकदेखील वाढतात.

४.२. भारतातील डिजिटल मार्केटिंगचा कमकुवतपणा

- १) इंटरनेट वापरत नसलेल्या लोकांपर्यंत पोहोचण्याचे आव्हान असते .
- २) अनेक वेगवेगळ्या मार्केटिंग पर्यायांच्या उपलब्धतेमुळे गोंधळामुळे डिजिटल मार्केटिंग मोहिमा अयशस्वी होण्याची उच्च शक्यता असते.
- ३) नवीन बदल आणि तंत्रज्ञानाशी जुळवून घेणे प्रत्येकाला शक्य होत नाही.
- ४) बदलत्या मानवी वर्तन आणि गरजांबद्दल सखोल समज असणे आवश्यक आहे.
- ५) जर तुमचा ब्रँड किंवा उत्पादन वापरकर्त्यांच्या गरजांना न्याय देत नसेल, तर सार्वजनिकरित्या वाईट पुनरावलोकने मिळण्याची शक्यता खूप जास्त असते, ज्यामुळे प्रतिष्ठेला हानी पोहोचू शकते.
- ६) समाज माध्यमे किंवा डिजिटल व्यासपिठावरील वाईट पुनरावलोकने किंवा तक्रारींवर नियंत्रण ठेवणे हे एक मोठे काम आहे आणि त्यामुळे व्यवसाय बंद देखील होऊ शकतात.
- ७) माहिती विश्लेषण ही अजूनही एक मोठी समस्या आहे आणि त्यात खूप कमी लोक प्रगत आहेत कारण माहिती प्रत्यक्षात काय म्हणते हे फार कमी लोकांना समजते.

४.३. भारतात डिजिटल मार्केटिंगच्या संधी

- १) डिजिटल मार्केटिंगमुळे तरुणांसाठी अधिकाधिक रोजगार निर्माण होत आहेत, कारण हे क्षेत्र वाढत आहे आणि व्यावसायिकांची संख्या कमी आहे.
- २) तुमच्या उत्पादनाची पोहोच वाढवा, ज्यामुळे थेट नफा होतो.
- ३) उद्योजकांना त्यांच्या प्राथमिक व्यवसायाव्यतिरिक्त पैसे कमवण्याचे बरेच मार्ग आहेत, उदा. - वेबसाइटवर जाहिरातींसाठी जागा देणे, ई-कॉमर्समध्ये संलग्न विपणन इत्यादी.
- ४) जर डिजिटल विपणन सर्वत्र पूर्ण क्षमतेने आले तर देश डिजिटल होण्यास मदत होईल, म्हणजेच आपल्या लोकसंख्येचा मोठा भाग स्मार्ट आणि जलद जीवन जगू लागेल.
- ५) यामुळे आपल्या भारतीय सरकारी संस्था डिजिटल होण्यास मदत होईल.
- ६) रेल्वे, महानगरपालिका इत्यादी सर्व कामकाज जलद आणि सुरळीत होईल.
- ७) सरकारी संस्थांची मौल्यवान आणि गोपनीय माहिती साठवणे सोपे आणि सुरक्षित होईल.
- ८) "डिजिटल इंडिया" बनवण्याचे स्वप्न साकार होऊ शकते.

४.४ भारतात डिजिटल विपणनाचा धोका

- १) जर उत्पादन परिपूर्णपणे काम करत नसेल तर उलटफेर होण्याची शक्यता जास्त असते म्हणजेच ते उत्पादन नावाला नुकसान पोहोचवू शकते.
- २) वेगवेगळ्या विपणन क्षेत्रांच्या सतत बदलत्या प्रवृत्तीमुळे आणि सामग्री अनुकूलेसाठी, शोध इंजिनच्या सतत बदलत्या नियमांमुळे, सतत जागरूकता आवश्यक आहे, जे खूप कठीण आहे.
- ३) पूर्ण सुरक्षिततेसह माहिती साठवणे अजूनही एक मोठे प्रश्नचिन्ह आहे.
- ४) चुकीच्या पद्धतीने माहितीचे विश्लेषण केल्याने हानिकारक परिणाम होऊ शकतात जे अनेक कंपन्यांमध्ये आढळतात.

५) या डिजिटल व्यासपीठाच्या वाढीसह, ग्राहक त्यांच्या भावना आणि मते अधिक स्पष्टपणे मांडू लागले आहेत आणि या व्यासपीठाच्या उपलब्धतेमुळे त्यांच्याकडे कोणत्याही उत्पादनाचे नुकसान करण्याची तसेच त्याचे समर्थन करण्याची शक्ती आहे, जी व्यावसायिकांसाठी एक उच्च धोका आहे.

६) दिवसेंदिवस ते विपणनाच्या सर्व पारंपारिक पद्धतींना व्यापत आहे, ज्यामुळे शेवटी दूरदर्शन हा पारंपारिक विपणनाचा एकमेव स्रोत म्हणून राहू शकतो.

५. डिजिटल मार्केटिंगचे महत्त्व

कोणत्याही व्यवसायाने त्यांच्या उत्पादनासाठी ऑनलाइन विपणनामध्ये गुंतवणूक करणे का अत्यंत महत्त्वाचे आहे याची काही कारणे खाली दिली आहेत.

५.१ किफायतशीर

डीएम (डिजिटल मार्केटिंग) ही जाहिरात करण्याच्या सर्वोत्तम किफायतशीर मार्गांपैकी एक आहे, कारण ऑनलाइन विपणनामध्ये मध्यस्थांची साखळी कमी असल्याने भौतिक विपणनाच्या तुलनेत इंटरनेटवर उत्पादनांचे मार्केटिंग कमी खर्चिक आहे तसेच उत्पादन प्रदर्शन कक्षाच्या किंवा भौतिक विक्रीच्या ठिकाणावर कमी खर्च येतो आणि ऑनलाइन उपस्थिती स्थापित करण्यासाठी मार्केटिंग लेख किंवा समाज माध्यमांचा वापर अधिकाधिक करता येतो. आणि व्यावसायिकाला भाड्याने मिळणाऱ्या मालमत्तेचा आणि त्याच्या देखभालीचा खर्च करावा लागत नाही कारण दुकानात प्रत्यक्ष प्रदर्शनासाठी मोठ्या प्रमाणात उत्पादन खरेदी करण्याची आवश्यकता नाही.

५.२ सोयीस्कर

डिजिटल मार्केटिंग भौतिक दुकानाच्या उघडण्याच्या आणि बंद होण्याच्या वेळेची चिंता न करता २४/७ सेवा प्रदान करण्यास सक्षम असते. हे ग्राहकांना देखील सोयीस्कर आहे कारण ते कधीही आणि जगभरातील कोणत्याही ठिकाणाहून तुमचे ऑनलाइन दुकान शोधू शकतात आणि त्यांच्या सोयीस्कर वेळी खरेदी करू शकतात.

५.३ वेबसाइट ट्रॅफिक वाढवणे

वेबसाइट ट्रॅफिक म्हणजे एका विशिष्ट वेळेत वेबसाइटला भेट देणाऱ्या वापरकर्त्यांची (visitors) संख्या किंवा वेबसाइटवर होणाऱ्या क्रियाकलापांची (activities) नोंद होय. विपणन व्यूहरचना म्हणून लेख किंवा समाज माध्यमांचा वापर वेबसाइटवर व्यवसाय वाढविण्यास मदत करेल. साइटला जितके जास्त लोक भेट देतील तितके जास्त विक्रीसह बंद होण्याची आणि उत्पादनांमध्ये लोकांची आवड निर्माण होण्याची शक्यता जास्त असते.

५.४ इंटरनेट विपणन

इंटरनेट विपणन अंतराच्या अडथळ्यांवर मात करते. डिजिटल विपणनामुळे व्यावसायिक जगातील कोणत्याही भागात स्थानिक दुकान स्थापित न करता वस्तू विक्री करता येते, त्यामुळे बाजाराची व्याप्ती खूप विस्तृत होते. तथापि, आंतरराष्ट्रीय स्तरावर उत्पादन किंवा सेवा विकण्याची डिजिटल विपणनाची इच्छा असल्यास, उद्योजकाची उत्पादने स्थानिक बाजारपेठांसाठी योग्य आहेत आणि स्थानिक व्यवसायिक नियम आणि नियमांचे पालन करतात याची खात्री करण्यासाठी स्थानिकीकरण सेवांचा वापर केला जातो. सेवांचे स्थानिकीकरण, भाषांतर आणि उत्पादन सुधारणा विपणनामध्ये समाविष्ट होतात, जे स्थानिक बाजारपेठेतील फरक प्रतिबिंबित करतात..

५.५ सहवास सुधारते

ग्राहक धारणा पातळी वाढवण्यासाठी आणि ग्राहकांशी संबंध निर्माण करण्यासाठी एक चांगले व्यासपीठ डिजिटल मार्केटिंगद्वारे प्रदान केले जाते. उदाहरणार्थ जेव्हा एखाद्या ग्राहकाने उत्पादन खरेदी केलेले असते, तेव्हा संबंध सुरू करण्याचे पहिले पाऊल म्हणजे व्यवहाराची पुष्टी करण्यासाठी पाठपुरावा ई-मेल पाठवून आणि नंतर ग्राहकाचे आभार मानून उचलले जाते. व्यावसायिक संभाव्य ग्राहकांना स्वतःच्या

वेबसाइटवर विद्यमान उत्पादनाबाबत उत्पादन पुनरावलोकने देण्यासाठी आमंत्रित करू शकतात आणि यामुळे सहवासाची भावना निर्माण होण्यास मदत होईल.

५.६ वैयक्तिकरण

व्यावसायिक खरेदी इतिहासाचे आणि प्राधान्यांचे पार्श्वचित्र तयार करून, डिजिटल मार्केटिंग व्यवसायाला ग्राहकांसाठी प्रस्ताव वैयक्तिकृत करण्यास मदत करेल. व्यावसायिक उत्पादनाची माहिती आणि वेब पृष्ठांचा मागोवा घेऊन ग्राहकांना आकर्षित करू शकता जे त्यांच्या आवडी प्रतिबिंबित करणाऱ्या लक्षित प्रस्तावाची अपेक्षा करण्यास मदत करतात.

५.७ विक्री वाढवा

इंटरनेट मार्केटिंगमुळे विक्री वाढते कारण ते ग्राहकांना प्रत्यक्ष ठिकाणी जाण्याऐवजी किंवा मेलद्वारे प्रस्ताव फॉर्म पाठवण्याऐवजी ऑनलाइन उत्पादने खरेदी करण्याची संधी देते. यामुळे खरेदी शक्तीचा आवेग दर वाढेल ज्यामुळे व्यावसायिक संस्थांना महसूल वाढेल आणि त्यांच्या गुंतवणुकीवर उत्कृष्ट परतावा मिळेल.

५.८ ग्राहकांना कायमचे उपलब्ध

डिजिटल मार्केटिंग तंत्रांचा वापर करून व्यवसायिक त्यांच्या ग्राहकांना त्यांना हवी असलेली उत्पादने शोधण्यासाठी २४ तास सेवा उपलब्ध करून देऊ शकतात; भौतिक दुकानांमध्ये खरेदी फक्त सामान्य कामकाजाच्या तासांमध्ये केली जाते जी ग्राहकांच्या कामाच्या वेळापत्रकावर आणि जीवनशैलीवर परिणाम करते.

५.९ चांगला रूपांतरण दर

जर व्यवसाय संघटनेला प्रोत्साहन देण्यासाठी वेबसाइट असेल, तर तुमचे ग्राहक तुमच्या वेबसाइटवरून खरेदी पूर्ण करण्यापासून काही क्लिक दूर असतात. त्यामुळे खरेदीचा वेग वाढून व्यावसायिकाला चांगला परतावा मिळतो.



६. डिजिटल मार्केटिंगची आव्हाने:

६.१. मार्केटिंग एकत्रीकरण:

ऑनलाइन आणि ऑफलाइन विक्री प्रयत्नांद्वारे अनेक चॅनेल वापरले जातात, उदा. ईमेल जाहिराती, 'सामाजिक जाळे' किंवा 'सामाजिक संबंध', आउटबाउंड कॉल हँडलिंग (संपर्क केंद्र एजंट किंवा प्रतिनिधीने अनेकदा विक्री किंवा लीड जनरेशनच्या उद्देशाने केलेला कॉल) इत्यादीसारख्या समस्यांना तोंड द्यावे लागते. हे एकात्मिक मोहिमेचा भाग म्हणून एक ठोस आणि मोजता येण्याजोगे ध्येय साध्य करण्यासाठी वापरले जातात., परंतु ते बहुतेकदा कामाचे वेगवेगळे भाग म्हणून हाताळले जातात. म्हणून सर्व मार्केटिंग प्रयत्नांचे समन्वय साधणे हेच प्राधान्याने केले पाहिजे. पारंपारिक मोहिमेसोबतच, ई-मार्केटिंग केले पाहिजे आणि व्यवसाय योजनेच्या शेवटी ते टाळले जाऊ नये.

६.२. सुरक्षा आणि गोपनीयता:

बहुतेक लोक वेब कंपन्यांवर पूर्णपणे विश्वास ठेवत नाहीत आणि म्हणूनच, संगणकावरील आभासी किंवा डिजिटल जागेवर स्वतःबद्दल माहिती देण्यास ते कचरतात. जेव्हा माहिती गोळा करणाऱ्या कंपन्या फसवणूक करणाऱ्यांच्या संपर्कात येतात तेव्हा हे विशेषतः खरे आहे. एक ठोस धोरण स्वीकारणे आणि एक निर्दोष सुरक्षा उपाय लागू करणे, ई-व्यवसायांसाठी अत्यावश्यक बनते. एका विशिष्ट परिस्थितीत एन्क्रिप्शन सिस्टम (एनक्रिप्शन ही एक पद्धत आहे ज्याद्वारे माहिती गुप्त कोडमध्ये रूपांतरित केली जाते जी माहितीचा खरा अर्थ लपवते.) हे एक साधन आहे ज्यामध्ये ऑनलाइन कंपन्यांनी गुंतवणूक करण्याचा गंभीरपणे विचार केला जातो.

६.३. अवैयक्तिक सेवा:

ग्राहक सेवा प्रदान करण्याच्या इलेक्ट्रॉनिक पद्धती ऑनलाइन कार्यरत असलेल्या व्यवसायांद्वारे वापरल्या जातात, जसे की संभाव्य वापरकर्त्यांच्या प्रश्नांची उत्तरे देण्यासाठी वेबसाइटवर माहिती पोस्ट करणे आणि ईमेल करणे. कधीकधी ग्राहकांना हे खूपच अवैयक्तिक किंवा बेफिकीर वाटले. या समस्येचे निराकरण करण्यासाठी व्यापाऱ्यांनी वेबद्वारे वस्तू विकण्यासाठी कार्यक्षम चेकआउट प्रक्रिया विकसित केल्या पाहिजेत. कॉल हँडलिंग सेवा नियुक्त करणे देखील विचारात घेतले जाते, जेणेकरून ग्राहकांना त्वरित उत्तरांची आवश्यकता असलेल्या समस्यांबद्दल चौकशी करताना खऱ्या लोकांशी बोलता येईल.

६.४. उत्पादक चिन्ह जागरूकता सुधारणे:

कंपन्यांसाठी एक मोठे आव्हान म्हणजे: प्रामुख्याने त्यांची उत्पादने आणि सेवा (मूर्त आणि अमूर्त उत्पादने) विकण्यासाठी इंटरनेटचा वापर करणे. कारण, पारंपारिक जाहिराती (जसे की दूरदर्शन, आकाशवाणी, 'होर्डिंग किंवा मोठा फलक' आणि प्रति) याव्यतिरिक्त, वापरकर्त्यांद्वारे ऑनलाइन जाहिराती अधिक वापरल्या जाऊ शकतात ज्यामध्ये मोहिमेचा संदेश अधिक मजबूत केला जाऊ शकतो आणि व्यावसायिकांच्या इच्छेनुसार ग्राहकांना वारंवार सादर केला जाऊ शकतो. म्हणून वेब कंपन्यांसमोरील आव्हान म्हणजे जाहिरातीच्या बाबतीत अधिक नाविन्यपूर्णता निर्माण केली पाहिजे.

६.५. इतर आव्हाने खालीलप्रमाणे आहेत:

- अ) **माहिती तंत्रज्ञान विभागाशी व्यवहार करणे:** माहिती तंत्रज्ञान विरुद्ध विपणनाचे वर्तुळ बराच काळ चालू आहे. परंतु, हे समजून घेण्याची वेळ आली आहे की, व्यावसायिकांचे विपणन कार्यक्रम अधिक कार्यक्षमतेने अंमलात आणण्यासाठी व्यावसायिकाला आपल्या माहिती तंत्रज्ञान मित्रांसोबत भागीदारी करण्याची आवश्यकता आहे. सोप्या अर्थाने, व्यावसायिकाला त्यांची आवश्यकता आहे आणि त्यांना व्यावसायिकांची आवश्यकता आहे किंवा दोघेही एकमेकांना पूरक आहेत.
- आ) **सतत शिक्षण:** २१ व्या शतकातील व्यावसायिकांना सतत शिक्षणाची आवश्यकता आहे. असे म्हटले जाते की विपणनामधील ज्ञानाची मुदत संपण्याची तारीख असते आणि ज्ञान अद्ययावत करण्यासाठी व्यावसायिक विकासाची आवश्यकता असते. वर्ग घेणे, प्रमाणपत्र मिळवणे, पुस्तक वाचणे, सेमिनार किंवा चर्चासत्रांमध्ये सहभागी होणे, जे व्यवसायासाठी योग्य आहे, परंतु शिकत राहणे गरजेचे आहे.
- इ) **वाईट विपणन:** कोणीही स्वतःला वेब डिझायनर, व्यावसायिक सल्लागार, शोध इंजिन ऑप्टिमाइजेशन तज्ञ इत्यादी म्हणू शकतो. चुकीच्या पद्धतीने तयार केलेल्या आणि अंमलात आणलेल्या विपणन कार्यक्रमांमुळे व्यवसायाची हानी झाली आहे आणि ग्राहक, व्यावसायिक आणि इतर संबंधित पक्षांमध्ये अविश्वास निर्माण होतो, योग्य वेळी किंवा योग्य मार्गाने विपणन केल्याने व्यावसायिकाला स्वतःच्या व्यवसायाच्या बाजूने येणारे उत्पन्न टिपण्यास मदत होते जे दीर्घकाळ टिकण्यास मदत करते.
- ई) **विश्वासाचा अभाव:** सर्वसाधारणपणे, ओळख चोरी, फसवणूक, अनाहूत जाहिराती आणि तांत्रिक अडचणींमुळे विपणनावर अनेकदा अविश्वास निर्माण होतो. त्यामुळे व्यावसायिकाला एकतर समस्येचा भाग व्हावे लागते किंवा उपायाचा भाग व्हावे लागते, व्यावसायिकाला ते ठरवावे लागते.
- उ) **सर्व काही जाणून घ्या:** विपणनाचे सर्व पैलू कोणीही पूर्णपणे समजून घेऊ शकत नाही. जाणून घेण्यासारखे खूप काही आहे आणि व्यावसायिक जे काही जाणून घेण्यासाठी प्रयत्न करतात ते ध्वनीच्या वेगाने बदलत आहे. जर व्यावसायिकाला तज्ञ व्हायचे असेल, तर त्याला ई- मार्केटिंगच्या एका पैलूमध्ये विशेषज्ञता मिळवावी लागेल.
- ऊ) **नैतिक पद्धती:** इंटरनेटमुळे अनैतिक व्यवसायांचा एक अभूतपूर्व समूह निर्माण झाला आहे. नवीन असलेल्या व्यावसायिकांना नेहमीच आर्थिक घोटाळ्यांना सामोरे जावे लागले आहे, परंतु इंटरनेटने त्यांना मोठ्या संख्येने बाहेर काढले आहे असे दिसते. व्यावसायिकाने स्वतःच्या पद्धती स्पष्ट आहेत का याची वारंवार

खात्री केली पाहिजे आणि स्वतःच्या ग्राहकांना ई-कॉमर्सच्या काही तोट्यांबद्दल शिक्षित करण्याचा प्रयत्न केला पाहिजे.

ए) **कॉर्पोरेट संस्कृती:** अनेक कंपन्यांमध्ये प्रत्येक विभाग वेबसाइटचा "मालक" असतो किंवा कोणताही विभाग वेबसाइटचा "मालक" नसतो. वेबसाइट विपणनाच्या असाव्यात, वित्त/ऑपरेशन्स/माहिती तंत्रज्ञान किंवा कायदेशीर क्षेत्राच्या नसाव्यात. जेव्हा समितीला काही माहिती नसते, तेव्हा समितीद्वारे चांगले विपणन करणे कठीण असते. या परिस्थितीत सहकार्य महत्त्वाचे असते आणि व्यावसायिक सहकाऱ्यांनी यासाठी १०० टक्के सहकार्य द्यावे, परंतु व्यावसायिकाने त्याबाबत अंतिम निर्णय घेतला पाहिजे.

ऐ) **आंतरराष्ट्रीय वाणिज्य:** इंटरनेटमुळे जगभरातील ग्राहकांना आणि त्यांच्या बैठकीच्या खोलीच्या (किंवा जिथे त्यांचा संगणक आहे तिथे) जवळ उत्पादने आणि सेवा उपलब्ध करून देणे शक्य झाले आहे. या नवीन जागतिक चॅनेलमुळे परदेशातून येणाऱ्या आणि बाहेर जाणाऱ्या उत्पन्नाचा अभूतपूर्व प्रवाह वाढू शकतो आणि त्याचा परिणाम शेवटी आपल्या देशांतर्गत अर्थव्यवस्थेवर नाट्यमय परिणाम करू शकतो. संस्कृती आणि परंपरांच्या बाबतीत इतर देशांच्या लोकांशी आपले बरेच साम्य आहे, परंतु काही फरक देखील आहेत ज्याला विविधतेत एकता म्हणून ओळखले जाते. चांगल्या आंतरराष्ट्रीय व्यापारासाठी तसेच संबंधांसाठी डिजिटल मार्केटिंग ही गुरुकिल्ली आहे., याबाबत व्यावसायिकाने विचार केला पाहिजे.

ओ) **बौद्धिक संपदा:** दुसऱ्याचे कष्ट चोरणे कधीच सोपे नव्हते. संगीतापासून सॉफ्टवेअर, चित्रपट आणि प्रतिमांपर्यंत दररोज सर्वकाही इंटरनेटवरून काढून टाकले जाते. ही एक वाईट गोष्ट आहे.

औ) **ग्राहकांच्या अपेक्षा:** यापूर्वी कधीही ग्राहकांनी जास्त अपेक्षा केल्या नव्हत्या. ग्राहकांच्या अपेक्षा व्यवस्थापित करणे व्यावसायिकांसाठी अत्यंत महत्त्वाचे आहे, कारण जर व्यावसायिकाला माहित नसेल की त्याचे स्पर्धक कठोर स्पर्धा करतील, तर तो बाजारात दीर्घकाळ टिकू शकणार नाही. ग्राहकांशिवाय त्याचा व्यवसाय होणार नाही कारण ग्राहकांना बाजारपेठेचा राजा मानले जाते, म्हणून त्यांना जाणून घेण्यासाठी वेळ काढला पाहिजे, त्यांच्याशी योग्य काळजी आणि आदराने वागले पाहिजे.

७. निष्कर्ष:

डिजिटल मार्केटिंग हे अनेक कंपन्यांच्या धोरणाचा अविभाज्य भाग बनले आहे. आजकाल, लहान व्यवसाय मालकांसाठी देखील त्यांच्या उत्पादनांचे किंवा सेवांचे मार्केटिंग करण्याचा एक अतिशय किफायतशीर आणि कार्यक्षम मार्ग आहे. डिजिटल मार्केटिंगला कोणतीही सीमा नाही. कंपनी स्वतः आणि तिच्या उत्पादनांचे आणि सेवांचे प्रचार करण्यासाठी स्मार्ट फोन, टॅब्लेट, लॅपटॉप, टेलिव्हिजन, , डिजिटल मोठा फलक आणि समाज माध्यमे , एसडिओ (शोध इंजिन ऑप्टिमायझेशन), व्हिडिओ, आशय, ई-मेल आणि बरेच काही यासारख्या माध्यमांचा वापर करू शकते. पुढील काही वर्षांत, भारतातील ऑनलाइन मार्केटिंग आणखी मजबूत होईल. तथापि, दीर्घकालीन शाश्वतता थेट बाजारपेठेतील बदल, नवोन्मेष आणि बाजारपेठेतील स्पर्धकांद्वारे परस्परसंवाद यासारख्या घटकांवर अवलंबून असते. क्रेडिट कार्डचा वाढता प्रवेश आणि संगणकीय सुलभतेमुळे आशादायक वाढ दिसून आली आहे. शिवाय, संधी शोधणारे ग्राहक या बदलाला धरून आहेत कारण इंटरनेट किरकोळ विक्रेते –घाऊक विक्रेत्यांच्या तुलनेत विशेष सवलतीच्या किमतीत उत्पादने प्रस्तावित करतात असे दिसून येते. देशातील ग्राहक आता खरोखरच सर्वोत्तम तंत्रज्ञानाद्वारे समर्पित, सुव्यवस्थित, कार्यक्षम आणि जागतिक दर्जाच्या खरेदी अनुभवाची अपेक्षा करू शकतात. जर वापरकर्त्यांच्या गरजांना सर्वोच्च प्राधान्य दिले तर डिजिटल मार्केटिंग अधिक यशस्वी होऊ शकते.

संदर्भ:

१. एम सुगुना, व्ही सेल्लादुराई (२०१७), “भारतात डिजिटल मार्केटिंगचे SWOT विश्लेषण”, इंटरनॅशनल जर्नल ऑफ मल्टीडिसिप्लिनरी एज्युकेशन अँड रिसर्च, खंड २; अंक २, पृष्ठ ३७-४०.
२. निहारिका, सतींदर (२०१५), “भारतात इंटरनेट मार्केटिंगचा अभ्यास: आव्हाने आणि संधी”, विज्ञान, अभियांत्रिकी आणि व्यवस्थापनातील अलिकडच्या नवोपक्रमांवर दुसरी आंतरराष्ट्रीय परिषद, जवाहरलाल नेहरू विद्यापीठ, नवी दिल्ली. © २०१९ जेटीआयआर मार्च २०१९, खंड ६, अंक ३ www.jetir.org (ISSN-2349-5162) JETIR1903173 जर्नल ऑफ इमर्जिंग टेक्नॉलॉजीज अँड इनोव्हेटिव्ह रिसर्च (JETIR) www.jetir.org ४६३
३. आफ्रिना यास्मिन, सादिया तस्लीम, कनिझ फतेमा (२०१५), “आव्हानात्मक युगात डिजिटल मार्केटिंगची प्रभावीता: एक अनुभवजन्य अभ्यास”, इंटरनॅशनल जर्नल ऑफ मॅनेजमेंट सायन्स अँड बिझनेस अँडमिनिस्ट्रेशन, खंड १, अंक ५, पृष्ठ ६९-८०.
४. रुक्मिका महाजन (२०१५), “ई-मार्केटिंग – आव्हाने आणि संधी”, इंटरनॅशनल जर्नल ऑफ बिझनेस मॅनेजमेंट अँड सायंटिफिक रिसर्च, खंड १२, पृष्ठ ४९-५२.
५. राशी सिंघल (२०१६), “ई-मार्केटिंग: ग्रोथ अँड चॅलेंजेस इन इंडिया पर्सपेक्टिव्ह”, इंटरनॅशनल जर्नल ऑफ अँडव्हान्स्ड रिसर्च फाउंडेशन, खंड ३, अंक ७, पृष्ठ ५-९.
६. वाघमारे (२०१२), “ई-कॉमर्स; अ बिझनेस रिव्ह्यू अँड फ्युचर प्रॉस्पेक्ट्स इन इंडियन बिझनेस”, इंडियन स्ट्रीम्स रिसर्च जर्नल, खंड २, क्रमांक ४, पृष्ठ १-४.
७. गंगेश्वर (२०१३), “ई-कॉमर्स ऑर इंटरनेट मार्केटिंग: अ बिझनेस रिव्ह्यू फ्रॉम इंडियन कॉन्टेक्स्ट”, इंटरनॅशनल जर्नल ऑफ ई-सर्विसेस, सायन्स अँड टेक्नॉलॉजी, खंड ६, क्रमांक ६, पृष्ठ १८७-१९४.
८. कराकाया, चार्लटन (२००१), “इलेक्ट्रॉनिक कॉमर्स: करंट अँड फ्युचर प्रॅक्टिसेस!”, मॅनेजरियल फायनान्स, खंड २७, क्रमांक ७, पृ. ४२-५३.
९. कायनामा, आणि कीस्लिंग (२००१), “वेब-आधारित इंटरनेट मार्केटिंग कोर्सचा विकास”, जर्नल ऑफ मार्केटिंग एज्युकेशन, खंड २२, क्रमांक २, पृ. ८४-८९.
१०. http://www.jumpseller.com/files/oths/final_ecommerce.

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सारांश :

संत साहित्यापासून ते आधुनिक साहित्यापर्यंत मराठी साहित्याने वाचकांना मानवी मूल्यांसह विविध जीवनमूल्ये दिलेली आहेत. साहित्य मूल्यव्यवस्थाबरोबर मानवी जीवनाचे त्यांच्या कष्टाचे, विचारांचे, संघर्षमय परिस्थितीचे आणि बदलत्या समाजव्यवस्थांचे चित्रण साहित्यात दिसते. संतांनी, समाजसुधारकांनी, विचारवंतांनी व मराठी लेखकांनी लेखणीच्या माध्यमातून कष्टकरी माणसांच्या जीवन संघर्षांचे चित्रण केले. साहित्याच्या माध्यमातून उपेक्षित व कष्टकऱ्यांच्या कष्टाला आणि त्यांच्या जीवन संघर्षाला न्याय देण्याचा प्रयत्न केलेला आहे. कामगारांच्या संघर्षमय जीवनाला साहित्याच्या माध्यमातून समाजासमोर मांडून त्यांच्या समस्या सोडविण्याची गरज व्यक्त केले आहे. मुंबई हे कामगार वर्गाचे विश्व आहे. विकासाचे ते केंद्रबिंदू आहे. याच कामगारांच्या श्रमावर मुंबईचा आणि देशाचा विकास होत आहे. काळाच्या ओघात कामगार वर्गाची अवस्था अतिशय खडतर बनत आहे. त्यांचे जीवन संघर्षमय बनत आहे. परीणामी कामगारांच्या कष्टाची आणि त्यांच्या संघर्षाची दखल घेत मराठी साहित्यिकांनी कामगारांच्या जीवनाकडे आपला मोर्चा वळवून, कामगार वर्गाचे चित्रण केले. कामगारांविषयीचे साहित्य निर्माण होऊ लागले. कामगार साहित्याबद्दल समीक्षक सदा कऱ्हाडे लिहितात, “ कामगारांच्या वास्तव जीवनाचे दर्शन घडविणारे तसेच कामगारांच्या जीवनानुभवांचे, त्यांच्या संवेदनांचे, जाणिवांचे दर्शन घडविणारे साहित्य म्हणजे कामगार साहित्य.” १

मराठी लेखकांनी कामगारांचे जीवनांविषयी लेखन केले. यामध्ये प्रत्यक्षात कामगार वस्तीमध्ये वास्तव करणारे, कामगारांच्या खांद्याला खांदा लावून काम करणारे कवी नारायण सुर्वे हे महत्वाचे कवी मानले जातात. प्रत्यक्षात कामगार वर्गाचे जीवन पाहिले, अनुभवले ते काव्याच्या माध्यमातून व्यक्त केले. जो कामगार आहे. त्याला माणूस म्हणून जगण्याचे दिलेले हक्क मिळाले पाहिजे, ही त्यांची भूमीका सामाजिक न्याय आणि समानता मिळवून देणारी आहे. त्यामुळे कवी नारायण सुर्वे यांनी काव्यातील कष्टकरी कामगार वर्गाच्या जीवनाचा शोध घेतलेला आहे.

प्रस्तावना :

कवी नारायण सुर्वे यांनी कष्टकरी, कामगार वर्गाचे, त्यांच्या कुटुंबाचे आणि बदलत्या सामाजिक परिस्थितीचे चित्रण काव्यातून केले. कामगार वर्गाच्या समस्या, समाजाची बदलती परिस्थिती, यंत्रयुगामुळे कामगार वर्गाचे होणारे शोषण, यांचे होणारे परीणाम यांची काव्यातून मांडणी केली. कवी नारायण सुर्वे हे समाजचिंतन कवी असल्यामुळे उपेक्षित कष्टकरी समाजाकडे पाहण्याचा त्यांचा दृष्टीकोन मानवतावादी आहे. कामगारांच्या जीवनाचा उद्धार

करणे, त्यांच्या गरजा आणि जाणीवा वाचकांपर्यंत पोहचविणे हाच काव्यलेखनाचा हेतू आहे असे जाणवते. कामगारांच्या जीवन जाणवा मांडताना कवीने वास्तवता मांडलेली आहे. महिला कामगारांचे चित्रण देखील वाचकांच्या मनाचा ठाव घेते. शाळेच्या वर्ग खोलीमध्ये अक्षर ओळख होते. परंतु माणसाला जीवनाची खरी ओळख जगाच्या शाळेत मिळते. अक्षर ओळख बरोबर जीवनशिक्षण हे देखील महत्वाचे आहे. जीवनात आलेले अनुभव, भेटलेली माणसं आणि यशासाठी करावा लागणारा संघर्ष, या सर्वांमधून योग्य दिशा मिळत जाते. त्याचा प्रत्यय कवी नारायण सुर्वे यांचा 'माझे विद्यापीठ' हा कवितासंग्रहाचे वाचन करीत असताना पहावयास मिळतो. यासाठी आपण कवी नारायण सुर्वे यांच्या काही निवडक कवितांचा विचार करू

गृहितके :

- १) कामगार जीवन आणि त्यांच्या जीवन संघर्ष विषयीचे चित्रण केले आहे.
- २) धार्मिक संघर्षात कामगारांचे नुकसान होते.
- ३) संघर्षमय परिस्थितीत कामगार स्वःताला घडविण्याचा प्रयत्न करतात.

उद्दिष्टे

- १) कामगारांचे जीवन आणि संघर्षाचा शोध घेणे.
- २)
- ३)

संशोधन पद्धती :

सदर शोध निबंधात विश्लेषणात्मक पद्धतीचा वापर करण्यात आलेला आहे.

१) कामगारांचे संघर्षमय जीवनानुभव

कामगारांच्या जीवनासंघर्षाचे चित्रण करताना, कामगार म्हणून कवीला आलेले अनुभव शब्दबद्ध केले आहे. कामगारांचा जीवन संघर्ष मोठा आहे. स्वतःचा संपूर्ण परिवार, घरदार सोडून पोटासाठी आणि घरातील माणसांच्या सुखासाठी कामगारांना गाव सोडावे लागते. शहरी संस्कृतीमध्ये आपल्या सोबत आपले घरदार असावेत, असे प्रत्येक कामगारांना वाटते. परंतु वाढती महागाईमुळे शक्य होत नाही. संपूर्ण परिवारासाठी कामगार म्हणून त्यांच्या एकट्याचा संघर्ष मोठा असतो. काहीना घरातील लोकांना सोबत घेत छोट्याश्या खोलीत रहावे लागते. परंतु काहींच्या नशिवात मात्र घरचे सोबतीला मिळत नाही. दुनियेतील लोकांना सोबत घेत संघर्ष करावा लागतो. कवीच्या वाट्याला देखील असाच जीवन संघर्ष आलेला असतो. या दुनियेत एकटा आलोय आणि एकट्यालाच हे संघर्षमय जीवन जगायचे आहे. या संघर्षमय परिस्थितीतही जगण्याचा आनंद शोधायचा प्रयत्न करीत असतो. कामगारांना नवी क्रांती करावयची आहे. हीच भावना काव्यातून व्यक्त होते. कवी नारायण सुर्वे यांचे जीवन म्हणजे कामगार वर्गाचे संघर्षमय जीवन आहे. कवी नारायण सुर्वे यांचे जीवन आणि काव्य या संदर्भात कवी कुसुमाग्रज लिहितात, “ श्री सुर्वे यांची कविता बरीचशी लढाऊ वृत्तीची आहे. समाजक्रांतीची उपासना करणारी आहे. नव्या आनंदवन भुवनाचे स्वप्न पहाणारी आहे.”^२ या जगात निराधार असणाऱ्या कवीला आधार मिळत नसल्यामुळे सार्वजनिक इमारतींचा आधार मिळतो. सार्वजनिक जीवनात कवीला एकलेपणाची जाणीव

झाली. या परिस्थितीतून बाहेर पडावयाचे असेल तर, स्वःला सक्षम करण्याची गरज आहे. जीवनात आलेल्या अनुभवांचे चित्रण करताना, कवी नारायण सुर्वे आपल्या “माझे विद्यापीठ” या कवितेत लिहितात.

“ ना घर होते ना गणगोत, चालेन तेवढी पायाखालीची जमीन होती.

दुकानांचे आडोसे होते: मोफत नगरपालिकेची फुटपाथ खुलीच होती.” ३

समाजव्यवस्थेत गरीब आणि श्रीमंतीची दरी निर्माण झालेली आहे. ही दरी दूर करण्याची गरज आहे. आर्थिक विषमतेवर आधारलेल्या समाजव्यवस्थेत कामगार वर्गाचे नुकसान करीत आहे. कामगारांचा जीवनसंघर्ष हा श्रमाच्या पातळीवर होत असल्यामुळे श्रमजीवी वर्गास जगण्यासाठी संघर्ष करावा लागतो. प्रसंगी अनेकांना एकलेपणा येतो. सोबत कोणीही नसते. याचे चित्रण कवी करतात.

कामगारांना पोटासाठीच्या संघर्षाबरोबरच जातीपातीच्या राजकारणाचा त्रास सहन करावा लागतो. माणसामाणसांमध्ये भेदभाव निर्माण करणाऱ्या धार्मिक दंगली होतात. या धार्मिक दंगलीत कवीचा सोबती याकुब दंगलीत मारला जातो. जातीचा वा धर्माचा भेदभावामुळे कामगाराला जीव गमवावा लागतो. जीवनाच्या शाळेत मिळालेला जातीपातीचा आणि धर्मसंघर्षाचा तिढा समाजाचे मोठे नुकसान करतो. याची नोंद कवीने काव्यातून व्यक्त केली आहे. या धार्मिक संघर्षामध्ये कामगारांचे नुकसान होते. दंगलीमुळे त्यांच्या रोजीरोटीसह जीवनमरणाचा प्रश्न निर्माण होतो. श्रमिक वर्गाचे चित्रण करणारे कवी नारायण सुर्वे यांच्या काव्याबद्दल स.त्र्यं.कुल्ली लिहितात, “ सुर्व्याची कविता ही शोषित पीडित श्रमिकवर्गाच्या व्यथावेदनांची जीवनसंघर्षाची आणि त्यातून उमलणाऱ्या क्रांतिस्वप्नाची कविता आहे.” ४

तर दुसरीकडे या दुनियेत आपण कसे वागले पाहिजे, कसे जगले पाहिजे.? याचे चिंतन करताना कवी नारायण सुर्वे लिहितात. “अशा नंग्याच्या दुनियेत चालायची वाट, लक्षात ठेव सगळ्या खाणाखुणा’ (पृष्ठ १३) भौतिकसुखाबरोबर सत्ता आणि संघर्षमय परिस्थितीत माणसं बदलतात. माणूसकी आणि नाती विसरतात. एकमेकांचा सूड घेतात. माणूस म्हणून स्वतःला हरवून जातात. तो एकटा पडतो. त्यामुळे कवी स्वःचा शोध घेत असतात. काळ समाज आणि माणसं सतत बदलत आहे. स्वःचा शोध घेताच येत नाही. याची खंत व्यक्त करताना कवी लिहितात.

“ नाही सापडला खरा माणूस: मीही तरी मला अजून कुठे पुरता सापडलो.?

सदतीस जिने चढून उतरताना मीही नाही का कैकदा गोंधळून झापडलो. ” ५

बदलत्या समाजाच्या मानसिकतेमुळे कवीला कामगार जीवनाची वाट आपणच चालू ठेवावी असे वाटते. कामगार म्हणून अनेकदा चांगले वाईट अनुभव येतात. स्वार्थासाठी, सत्तेसाठी दुनिया बेईमान होत आहे. अशा प्रसंगी कवीचे कामगार मन बेईमान होत नाही. स्वः बेईमान न होता, दुनियेसाठी आरसा व्हावा. अशी अपेक्षा ठेवणारा कामगार कवी दिसतात. तो सत्य जपण्याचा प्रयत्न करतो. सर्वांना सोबत ठेवण्यात धन्यता मानतो. दुनियेच्या विचारात बदल झाला तरीही कवीने आपले विचार बदलत नाही. कधीही सत्तेसाठी पैशासाठी बेईमान झाले नाही. अंधारात प्रकाशाचा किरण निर्माण केला. त्यामुळेच ‘एक आम्ही असे निघालो’ या कवितेत कवी नारायण सुर्वे लिहितात, “ प्रत्येक रात्र आत्म्याशी चर्चा करण्यात घालविली एक आम्हीच असे निघालो: बेईमान झालो नाही” (पृष्ठ २०) माणसांच्या जगण्यात

इमानदारी असावी. इमानदारी ही कवीच्या मनाला सुखद निर्माण करते. भांडवलशाही अर्थव्यवस्थेत कामगारांचे शोषण होत आहे. कामगारांनी सत्याचा आणि आदर्शाचा रस्ता निर्माण केला आहे.

कामगार म्हणून जगण्यासाठी स्वःची वाट शोधावी लागते. सत्य आणि आदर्श नितीमत्ता हीच आपली योग्य वाट आहे हे कवी मानतात. कामगारांचा जीवनसंघर्ष कायम आहे. उद्याच्या चांगल्या प्रकाशासाठी कामगार सर्वांशी न्यायाने आणि सत्याने वागतात. जगाकडून अथवा नशिबाकडून चांगली अपेक्षा ठेवण्यापेक्षा स्वःत जगणे जगणे, शिकणे, धडपडणे त्यातून नवे आकाश निर्माण करणे ही कामगार असणाऱ्या कवीची भूमिका योग्य वाटते. त्यासाठी स्वतःला घडविणे आवश्यक आहे. म्हणूनच 'स्वतःलाच रचित गेलो.' या कवितेत कवी लिहितात.

“ आकाशाच्या मुद्रेवर अवलंबून राहिलो नाही

उगीच कुणाला सलाम ठोकणे जमलेच नाही.” पृष्ठ २८

मुंबईत राहणारे कवी कधी नशिबावर किंवा कुणाच्या मदतीवर अवलंबून राहत नाही. जगण्यासाठी स्वाभीमान प्रामाणिकपण आणि कष्ट करण्याची ईच्छाशक्ती असणे आवश्यक आहे. हा दूरदृष्टीचा विचार मांडलेला आहे.

मुंबईतील कापड गिरणी हे कामगारांच्या रोजी रोटीचे ठिकाण आहे. गिरणीत काम करणारा बाप रिटायरट झाला की, बापाच्या जागेवर त्याच कामगाराचा मुलगा नोकरी करतो. कामगारांना आणि त्यांच्या परीवारास रोजीरोटी देणाऱ्या मुंबई शहराबद्दल कवी लिहितात,

‘इथेच या सागरतीरी झुंजतच त्यानेही देह ठेवला,

त्याच्याच साच्यावर दमेकरी मुकादमाने मला नेमला.” (पृष्ठ ३४)

कामगारांची अवस्था काळाच्या ओघात बिकट होत आहे. मुंबई शहर हे आपले घर आहे. या जाणीवेतून शहराची साफसफाई होत असते. परंतु ज्या कामगारांनी मुंबई शहर साफ सफाई करून स्वच्छ, सुंदर केले. त्याच शहरवासीयांनी सफाई करणारे कामगार नकोसे वाटतात. या वास्तवतेचे चित्रण कराताना, कवी लिहितात,

“ नरकासम चाळीत राहून स्वच्छ करतो तुझे रस्ते,

उठवलो जातो कधी दंडुकेवाले जसे उठवतात फिरस्ते.” (पृष्ठ ३५)

कामगारांच्या जीवनाचे वास्तव चित्रण करीत असताना त्यांचे होणारे शोषण थांबविणे गरजेचे आहे. ज्यांनी मुंबई शहरात स्वच्छता निर्माण केली. त्यांनाच या महानगरवासियांकडून अपमानस्पद वागणूक दिली जातेय. हे दुर्दैवी प्रसंग कवी काव्यात व्यक्त करतात. आज कामगारांना न्याय मिळवून देण्याची गरज आहे. त्यांना माणूस म्हणून वागविणे गरजेचे आहे.

२) कामगारांचे कुटुंबप्रेम आणि संघर्ष :

कामगारांचे जीवन संघर्षांनी, संकटांनी भरलेले आहे. रोजीरोटी मिळविण्याच्या नादात आनेक कामगार घरापासून दूर जातात. तर काहीजण कुटुंबाला सोबत घेत जगण्यासाठी संघर्ष करतात. कामगारांना स्वःतःचे काम आणि कुटुंब दोन्हीही जबाबदारीने जपायची असतात. काळ बदलत आहे. वाढती महागाई घरातील काहींना उपाशी ठेवू लागली. वाढती महागाई आणि कमी रोजगारी यामुळे पैशाच्या अडचण निर्माण होत असताना, घरच्या महिलांनाही

उदरनिर्वासाठी कामावर जावे लागते. तीचे कष्ट घराला आधार देणारे असते. तिच्यासाठी काम शोधण्याची वेळ येते. अशा कामगारांचे वर्णन करताना कवी नारायण सुर्वे लिहितात.

“... पंखाखाली बसलीस चार पिले ठेवून

कोनाडा हळहळला — कळवळला

नारायणा—गदगदला

शिक्यावरची भाकर घे पुटपुटला

उद्यापासून तिलाही काम बघ बाबा ..” ६

कुटुंबावर जेवढे प्रेम गरजेचे आहे. तेवढाचा भाकरीचा चंद्र महत्वाचा आहे. रोटीसाठी संघर्ष करणारा नायक आपल्या कुटुंबासाठी आपुलकी आणि प्रेम जपणारा दिसतो.

कामावर असताना अनेकदा अपघात घडत असतात. प्रसंगी यंत्रयुगाच्या आघाताने कामगारांचा जीव संपला जातो. आपला सहकारी यंत्रयुगाच्या अपघाताने मरतो. अशा परिस्थितीत कवीचे मन व्याकूळ होते. या परिस्थितीचे चित्रण करताना कवी ‘घंटा’ या कवितेत कवी लिहितात.,

“ तिचे शव माझ्या पुढ्यात आहे.

एक उघडा डोळा: माझ्यावर रोखलेला

दुसरा मिटलेला तिच्या मालकीचा ” ७

कष्टकरी, कामगार यांच्या कष्टाला आणि जीवाला मोलच नाही. अशी व्यवस्था निर्माण होत आहे. सातत्याने कष्ट करीत जीवन संघर्ष चालू ठेवणे हे कामगारांच्या नशिबी येते. याचे दुःख कवीला होते. कुटुंबाच्या अडचणी सोडवू शकत नाही. घरावर आणि घरातील माणसांवर प्रेम, माया करता येत नाही. उगीच संसार निर्माण केला, अशी मनात भावना कामगारांच्या मनात निर्माण होते. आपण कोणलाही सुखी ठेवू शकत नाही. याची जाणीव असणारा कामगार जाणवतो. ‘उगीचच’ या कवितेत भावना व्यक्त करताना, कवी लिहितात.

“ उगीचच जोडली बायकोपोरे, सगेसोयरे उगीचच कुडून घेतले एक घर जन्मभर” (पृष्ठ २५) कमी दाम आणि अधिक काम या प्रवृत्तीमुळे कामगारांचे रोजचे जगणे महाग होत आहे. पैशाभावी कुटुंबाच्या गरजा पूर्ण होत नाही. संघर्ष कामगारांच्या मनात आणि संसारात निर्माण होतो. परिस्थितीपुढे माणूस हतबल होतो. आपल्याच चिमुकल्यांना मारहाण करतो. मारहाणीमुळे आपला बाप मुलांना काळ वाटतो. पोरांना मारल्यामुळे आपण ‘असा कसा दगड झालो.’ ही भावना कामगारांच्या मनात निर्माण होते. ‘असा कसा दगड झालो.’ या कवितेत कवी लिहितात.

“ असा कसा दगड झालो.

बाप असून काळ वाटलो त्यांना,

कशी चिडीपीप होऊन समोर

थरथरली पखांत

हात जोडीत टिपे गाळीत नाही.

नाही .. नाही चा पुकारा करीत.” ८

कवी नारायण सुर्वे यांच्या कवितेतून कामगार जीवन, त्यांच्या रोजीरोटीचा प्रश्न, समाज व्यवस्थेमुळे होणारे शोषण आणि सर्वांमधून जीवन जगण्याची कामगाराची धडपड दिसून येते.

या सर्वांमधून कामगारांना स्वः जीवनाचा अर्थ समजला. येथील समाजव्यवस्था समजली. या सर्वांमधून कामगारांसारखे माणसाने माणूस म्हणून सत्यासोबत जगणे आवश्यक असल्याचे दिसून येते.

निष्कर्ष :

कवी नारायण सुर्वे यांच्या 'माझे विद्यापीठ' या कवितासंग्रहातील निवडक कवितांचा विचार केला असता, पुढील प्रमाणे निष्कर्ष दिसून येतात.

- १) कामगारांचे आर्थिक शोषण होत आहे.
- २) संकटसमयी किंवा अडचणीच्या प्रसंगी स्वः चिंतन करतो.
- ३) कामगार प्रत्येक संकटात मार्ग शोधण्याचा प्रयत्न करतो.

शिफारशी :

कवी नारायण सुर्वे यांच्या 'माझे विद्यापीठ' या काव्यसंग्रहातील निवडक कवितांचा विचार करताना, कष्टकऱ्यांचे होणारे शोषण स्पष्ट दिसत आहे. कामगारांचे जीवन बदलण्यासाठी पुढील शिफारशी सूचविण्यात येत आहेत.

- १) कामगार आणि त्यांच्या मुलांसाठी शिक्षणाची व्यवस्था निर्माण करावी.
- २) कामगारांचे काम, रहाणीमान, त्यांच्या गरजा आणि भविष्यातील विशेष तरतूद यांचा विचार करीत श्रमाचे चांगले मोल देणे आवश्यक आहे.
- ३) कामगारांच्या कल्याणासाठी विविध योजना निर्माण करणे व त्या योजना कामगारांना ज्ञात करून देणे.
- ४) कामावर झालेल्या अपघाती कामगारांच्या परीवारासाठी योग्य भरपाई मिळावी.
- ५) धोकादायक यंत्र आणि कामाचे ठिकाणी महिलांना काम देऊ नये.

समारोप :

कवी नारायण सुर्वे यांच्या 'माझे विद्यापीठ' या काव्यसंग्रहातील निवडक कवितांचा अभ्यास केला असता, कामगार जीवनाचे, त्यांच्या मनोवस्थेचे, सामाजिक व्यवस्थेचे, कामगारांच्या होणाऱ्या शोषणाचे चित्रण केले आहे. कामगारांच्या वाडयावस्त्यात राहणारे, स्वःत कामगार जीवनाचा अनुभव घेणारे कवी असल्यामुळे कामगारांचे पारदर्शक जीवन मांडलेले आहे. कामगार जीवनाचे चित्रण करीत कामगारांच्या स्वप्नांचे आणि भविष्याचे चिंतन केले आहे. कामगार वर्ग सातत्याने कष्ट करीत असताना, समाजस्वच्छता ठेवत असताना, समाजाच्या उन्नतीसाठी प्रयत्न करीत असताना तो उपेक्षित ठरला आहे. कवी नारायण सुर्वे यांच्या काव्यलेखनाबद्दल डॉ.एस.एम.भोसले लिहितात, “ नारायण सुर्वे यांची कविता ही नारायण सुर्वे नामक कवीची कहाणी नसून उभ्या विश्वास सडून जात असलेल्या, खचत पिचत असलेल्या अवघ्या श्रमणाऱ्यांच्या श्रद्धानिष्ठांची जिवंत कहाणी आहे. ती कुणा एका जिंदगीच्या बरबादीची कहाणी नसून अवघ्या जिंदगीच्या उत्थानाची कथा आहे. म्हणून हार नाही, मागार नाही, धाकाने प्रहार करीत पुढे सरणे आहे.”^९ त्यामुळे अशा कामगार जीवनातील व व्यवस्थेतील समस्या दूर होणे ही काळची गरज आहे. असे नमूद करावेसे वाटते.

संदर्भ सूची :

१. मांजर्डेकर स्नेहल(संपा.) 'श्रमकल्याणयुग साहित्य संमेलन विशेषांक,' कल्याण
२. आयुक्त महाराष्ट्र कामगार मंडळ, मुंबई, प्रथम आवृत्ती, १९९५ पृष्ठ क्र ४२
३. सुर्वे नारायण, 'ऐसा ग ब्रह्मा,मी', पॉप्युलर प्रकाशन, मुंबई प्रथम आवृत्ती १९६२ पृ ८
४. सुर्वे नारायण, 'माझे विद्यापीठ', पॉप्युलर प्रकाशन, पुणे चौथे पुनर्मुद्रण, २०१७ पृष्ठ १३
५. कुल्ली स.त्र्यं, 'तीन अर्वाचिन कवी' मार्क्सवादी दृष्टिक्षेप, लोकवाङ्.य गृह मुंबई
प्रथम आवृत्ती १९८९ पृष्ठ १०४
६. सुर्वे नारायण, 'माझे विद्यापीठ', पॉप्युलर प्रकाशन, पुणे चौथे पुनर्मुद्रण, २०१७ पृ १४
७. सुर्वे नारायण, 'माझे विद्यापीठ', पॉप्युलर प्रकाशन, पुणे चौथे पुनर्मुद्रण, २०१७ पृष्ठ १८
८. सुर्वे नारायण, 'माझे विद्यापीठ', पॉप्युलर प्रकाशन, पुणे चौथे पुनर्मुद्रण, २०१७ पृ २३
९. सुर्वे नारायण, 'माझे विद्यापीठ', पॉप्युलर प्रकाशन, पुणे चौथे पुनर्मुद्रण, २०१७ पृ ३३
१०. कुल्ली स.त्र्यं, 'तीन अर्वाचिन कवी' मार्क्सवादी दृष्टिक्षेप, लोकवाङ्.य गृह मुंबई
११. प्रथम आवृत्ती १९८९ पृष्ठ ११२





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