

Research Journal of Social and Life Sciences

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UGC Journal No. (Old) 40942, Impact Factor 5.125 (IIFS)

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Professor, Department of Sociology & Social Work
Institute for Excellence in Higher Education
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akhileshtrscollge@gmail.com

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Professor and Head
Department of Political Science
Institute for Excellence in Higher Education
Government T. R. S. College, Rewa (M.P.)
drsandhyatrs@gmail.com

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shuklagayatri@gmail.com

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rnsharmanehru@gmail.com



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Amarpatan, Satna (M.P.)
shikhatiwari5135@gmail.com

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Editorial

The 39th issue of Research Journal of Social and Life Sciences, July-December 2023, is presented before you. Today the topic of discussion is changing life values and our challenges, I believe that life values influence a person's social, political, economic, cultural and personal life. In the absence of values, individual, family, community, society, progress, progress and development of individual life or human life is just an imagination. Hence all types of values are life values. Life values influence a person's life and are a means of achieving his goals. Social values and ideals are changing in the modern era. The form of social relations is changing. As a result of increasing family and personal needs, the burden of earning money has started falling on both men and women, due to which mental dissatisfaction and stress is increasing, which is proving fatal for the joint family system. Urban life has become so busy that a person does not feel any attachment to family life. Due to lack of harmony in life, there has been so much diversity in social ideals and values that due to them family organizations are becoming weak. There are also differences in marital and family ideals of mother, father and child. Such differences of opinion create undesirable tension in families, which disintegrates them. Due to western contact and some modern education system and the demand of time, the new generation is becoming materialistic and individualistic. The western liberal philosophy of life and its resulting individualistic spirit is responsible for the disintegration of the joint family and the ideological basis of the nuclear family and it is going to be prevalent in the future. There have also been changes in the basis of marriage. The new generation has started considering marriage as a compromise. Divorce is not considered bad these days. The basis of marriage has become materialistic rather than the feeling of love or devotion. Apart from this, inter-caste marriage is also one of the main reasons for family disintegration. Most of the young men and women, without thinking, make wrong choices and enter into love marriages and later on finding that their interests and mental levels are different from each other, they run away from each other. This trend is also ending the joint family system. Apart from this, not only the new generation but the older generation is also responsible to a great extent for family disintegration. Parents are also not ready to compromise with the changed values and principles. They expect the new generation to happily accept their dilapidated beliefs and orthodoxies and adopt them in life. Be in control. But when the next generation behaves arbitrarily against their wishes, the elders criticize them harshly, which pollutes the family environment. Due to which family members move away from each other.

In today's materialistic era, the importance of religion is also decreasing. Earlier divorce was considered a sin but nowadays divorce is not considered an irreligious sinful act. As 'Vaster Mark' has written, "Family life is not as important for a person today as it was many years ago. It has become less important for both men and women. In some ways, the benefits of married

life have diminished compared to unmarried life. The belief in the sanctity and superiority of joint family life is waning. Thus, all these reasons are disturbing family happiness, peace and order. In the present era, the biggest responsibility for this family disintegration lies on industrialization, due to which many types of family, economic, religious, social tensions have developed and the materialistic attitude of people has flourished.

A man's reputation is evaluated by his life values which are essential for real success. If we analyze our life values from the Vedic period till now, we remember the great men whom we remember only because of their life values and following those values in life. Life values take a person to the right path and create positive thinking. People who live a valueless life have no real existence in society. They cannot guide anyone, there is no pace and continuity in their life and due to lack of principles such people waste precious moments of their life. The functioning and development of any family, community or society takes place only through ideals and principles. If there is a lack of these in personal and social life, then our entire fabric starts getting distorted, discipline starts deteriorating, life becomes irregular and many other types of negative things start appearing to us. Society always follows those people whose life values have always been high. To achieve social respect and prestige, a person will have to live a value-based life. A person can become useful and meaningful for the society and nation only when he adopts a life based on lawful values. Yes, there are some difficulties and troubles in this path, but through sacrifice and truth, we can imbibe these values and live a successful and positive life.



Professor Akhilesh Shukla
Chief Editor

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Emerging Research Trends and Paradigm Shifts in Social Sciences in India: An Inter-Disciplinary Study

• Madhurima Dasgupta

•• Priyanka Roy

Abstract- Abstract- Research is defined as a systematic and organized effort to explore and understand a specific social, cultural, political, economic problem and find its solution in such a way such that it contributes to the general body of knowledge. It adopts logical method by means of which new or old facts can be discovered or unveiled for analyzing their inter-relationships, sequences and causal explanation which governs them. Social scientific research includes: (i). Social scientist (ii). Research methodology (iii). Research ethics (iv). Contribution to society. Social scientific research originated during the era of Independence in order to explore the socio-economic growth of India by their higher education system. However, recent studies reveal that the aim of social science research is to develop scientific knowledge in order to explain any social behavior or social phenomena. Against this backdrop, the present study explores the emerging research trends in social sciences in India, especially in the discipline of sociology, political science, history along with the major paradigm shifts that has taken place in social research in Indian context. It also attempts to find out the impact of such paradigm shifts on present research in social sciences along with the ways by which the different disciplines of social sciences are able to adapt to such changes. Methodologically, the present research has been conducted by using secondary data and content analysis regarding the major paradigm shifts in social research in India. The findings reveal that major trends have emerged in social scientific research in India in terms of paradigm shifts from basic to applied research, academic to policy-oriented research, one-dimensional to multidimensional research, evidence-based research reports, new arena of social epigenetics, translational sociology followed by an emphasis on autonomous research. All such emerging trends have produced an enormous impact on social scientific research in India. In present society, research priorities in India are being distorted where the quality of research in social sciences have been highly affected due to myriad factors like international aid for educational research, private entrepreneurship in research, private consultancy firms. This signifies that these new trends are merging which needs to be dealt seriously as they signal the emerging shifts in research priorities in near future in India.

Keywords- Research, Content Analysis, Translational Sociology, Social Epigenetics, Autonomous research.

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- Assistant Professor (Sociology), School of Humanities, Management and Social Sciences, The Neotia University, West Bengal
 - Assistant Professor, Department of Sociology, Kanyashree College, Kolkata

Introduction- Research is defined as a systematic and organized effort to explore and understand a specific social, cultural, political, economic problem and find its solution in such a way such that it contributes to the general body of knowledge. It adopts logical method by means of which new or old facts can be discovered or unveiled for analyzing their inter-relationships, sequences and causal explanation which governs them (Mor, 2019). Social scientific research includes: (i). social scientists (ii). Research methodology (iii). Research ethics (iv). Contribution to society (Kaur, 2019). The goals or aims of social research mainly include:

- a. To enhance one's understanding of human behaviour
- b. To acquire knowledge about social issues, problems, phenomena and events.
- c. To identify causal relationship between the social phenomena and issues.
- d. To unveil the old or new facts and explore the research gap between booth.
- e. To debunk any sociological concept like culture, generation gap, class struggle, social distance, power.
- f. To formulate solutions to such social challenges (Unit-12.pdf (egyankosh.ac.in)).

From the concept of research, comes the concept of research design which is the *prima facie* of research and is the blueprint of data collection and analysis. Research design involves the arrangement of conditions for the collection and interpretation of data. Research design involves myriad steps from statement or selection of research problem till writing the research report which completes the research. The nature of design is also flexible, efficient, appropriate which helps to curtail the biases and enhance the reliability of data collected and analyzed. Quality of a good research design is always related with the purpose and nature of research problem studies. Research in social sciences is essential not only to explain any social phenomena or behavior but also to explain the known and measurable causes for a higher potential society which is crucial for humankind's interconnectedness in terms of cultural, economic and resources globally. Further, it also offers myriad possibilities for the conceptual innovation of not only social sciences but also humanities along with the empirical testing at larger scale. (Mor, 2019)

The demand and need for social scientists are accelerating on the part of policy-makers, media and the public as they possess knowledge and skills which are needed to identify and analyze the structural changes in society which paves the way for future change. Such knowledge of social sciences also helps to curtail social problems like poverty, illiteracy, child labor, violence against gender, climatic change and food crisis. Researchers all over the world would be attracted only when there is more emphasis on interdisciplinary or multidisciplinary research followed by shorter duration of research, use of technology in empirical research along with shorter duration of research. All of this dynamic helps the researcher to focus on the

sustained production of quality research for shared prosperity and research progress. Hence, there was an urgent need for the development of vital research capacities in order to allow humankind to explore and understand the present global changes due to the rise of new economic, cultural and scientific centers and also a landscape where knowledge and expertise divide persists (Mor, 2019).

Literature review:

Significance of social research in India- Quality research in social sciences is an age-old tradition of India where Indian Council of Social Science Research (ICSSR), University Grants Commission and other government funded institutions play a significant role which has helped to enrich social science research. The importance of research in social sciences lies in policy formulation and advancement of appropriate knowledge about society (Mor, 2019).

The importance of research design in social sciences is mainly because it is the *prima facie* in social science research as it facilitates the smooth sailing of various research operations making research as efficient as possible. Research design has a great bearing on the reliability of the results arrived at and is the firm foundation of the edifice of entire research process. Without a proper research design, it will be difficult for a researcher to provide a comprehensive of the proposed study. The nature of research in social sciences underwent a paradigm shift with the onset of globalization (Mor, 2019).

Impact of globalization on social research in India- Globalization implies international interdependence where there is interchange of goods and services in terms of import and export along with social and cultural interdependence. Globalization of Indian economy has brought forth two major developments in educational research ---- international assistance for educational development and onset of private entrepreneurship in education and social research. Both of these developments produced an enormous impact on the quality, quantity and nature of research in social sciences in India (Mor, 2019).

Quality of social science research in India- Social scientific research originated during the era of Independence in order to explore the socio-economic growth of India by their higher education system. However, recent studies reveal that the aim of social science research is to develop scientific knowledge in order to explain any social behavior or social phenomena. In this context, Kothari (2004) summarized major objectives of social scientific research:

- a. Contribution to the research ecosystem.
- b. To generalize the findings of research to general population.
- c. Exploring an unexplored and un-researched arena and developing insights into it.
- d. Describing an individual, group, social phenomena objectively.
- e. To study the frequency with which a social phenomenon occurs in order to understand its value in society.

- f. To explore cause effect relationship between two or more variables in order to gain an in-depth understanding about the same (Bhagat & Sahi, 2018).

The quality in social sciences research also implies certain connotations:

- a. **Visibility:** This involves the frequency with which the research work has been cited by various research professionals of social scientific research which is taken as a measure to enhance the credibility of research.
- b. **Comprehensibility:** It involves how well a particular research work is interpreted by professionals in terms of its contribution to research eco-system.
- g. **Acceptance:** This indicator involves the approval of research work which is dependent on certain institutional bodies based on parameters like contribution to the community, rationality and versatility in its content (Bhagat & Sahi, 2018).

Perspectives of Understanding 'Quality' in Research- The quality of social science research can be understood from two perspectives:

- a. **User's perspective:** The quality of research from user's perspective implies the purpose for research which means whether the researcher wants to use the existing research work to add something new to existing body of literature.
- h. **Producer's perspective:** The quality of research from producer's perspective implies the extent to which the producer is successful to disseminate knowledge by publishing research work with quality journals having a good impact factor (Bhagat & Sahi, 2018).

Challenges of social scientific research in India- Sarvanavel (2001) summarized some of the major challenges faced by Indian researchers:

- a. Indian researchers lack knowledge about the latest techniques in research. (Bhagat & Sahi, 2018).
- b. The universities also lack proper infrastructure to conduct adequate research. (Bhagat & Sahi, 2018).
- c. There is also a dearth of quality researchers to conduct quality research in India. (Bhagat & Sahi, 2018).
- d. Funds are also insufficient to derive qualitative output of research. (Bhagat & Sahi, 2018).
- e. There is also dearth of research in new/ emerging social issues which are hardly explored by researchers. (Bhagat & Sahi, 2018).
- f. Another major challenge is regarding plagiarism --- Indian researchers often duplicate or emulate other researcher's work on their own name in order to increase the number of publications which not only deteriorates the research quality but also goes against the ethics of research. (Bhagat & Sahi, 2018).
- g. Tampering with the size of research sample. (Bhagat & Sahi, 2018).
- h. Adopting inappropriate research techniques to enhance the research

significance. (Bhagat & Sahi, 2018).

- i. Falsification of results in order to fit their '*predisposed conclusions*'. (Bhagat & Sahi, 2018).
- j. According to Mapping Report of Social Science Research in India (2011), the only governing bodies funding social scientific research in India are University Grants Commission (UGC) and Indian Council of Social Science Research (ICSSR). Though various non-governmental funding agencies exist, their role is still unexplored. (Bhagat & Sahi, 2018).
- k. Lack of infrastructural facilities at university level is also evident due to lack of involvement of research scholars in research activities (Chatterjee, 2015).
- l. Most of the social scientific research is either politically or economically dominated by political bodies for the vested interests of political parties (Chatterjee, 2015).

Citations to improve the quality of social scientific research in India-

Another major indicator to measure the quality of research in India is in the increasing number of citations. The factors which influence the number of citations of research work are:

- a. **Time dependent factor:** There is greater likelihood of a research work being cited depending upon the temporal dimension of research --- recent research work.
- b. **Journal dependent factor:** The concerned article is likely to be cited depending upon factors like impact factor, visibility, accreditation of the journal in which the article was published.
- c. **Field dependent factor:** This depends upon the longevity of the research work i.e, the likelihood of citation depends upon the shelf life of the research work.
- i. **Author dependent factor:** The likelihood of citation stimulates depending upon the number of authors/ co-authors along with the social connectivity of the author (Bhagat & Sahi, 2018).

Against this backdrop, the present study attempts to explore the new research trends which have evolved in social sciences in Indian context from an interdisciplinary perspective.

Nature and scope of research- The core of the present research explores the following objectives:

- a. To explore the emerging research trends in social sciences in India, especially in the discipline of sociology, political science, history.
- b. To analyze the major paradigm shifts that has taken place in social research in Indian context.
- c. To find out the impact of such paradigm shifts on present research in social sciences along with the ways by which the different disciplines of social sciences are able to adapt to such changes.

Nature of methodology used- The present research has been conducted by using secondary data and content analysis regarding the major paradigm shifts in social research in India. The term 'content analysis' can be operationalized where content implies what is contained which means that it is the analysis of the content in the message. It is also a method where content of the message forms the basis to draw inferences and conclusion about the content. Max Weber (1985) also defines it as a research methodology which uses a set of procedures in order to create valid inferences from text. These inferences can be sender (s) message, the message itself or the spectators of the message. One of the most significant uses of content analysis is to study and explore the changing trends in theoretical content and its methodological approaches by content analyzing the journal articles of the concerned discipline (Prasad, 2008).

Data analysis:Emerging trends and paradigm shifts in social research in India- The major paradigm shifts that have taken place in social science research in India are:

1. Shift from Basic to Applied Research-Basic research mainly involves fundamental research as it involves the principles or laws along with the aims of achieving knowledge for one's own sake. It mainly pertains to the quest for knowledge for particular phenomena without being concerned about its practical use. Example- Developing a theory pertaining to collective behaviour or group dynamics can be fruitful for research. Applied research on the other hand emphasizes on analyzing and solving social problems and is mostly carried out to solve social and socio-psychological problems. Example- research in the field of family planning aims at the application of certain principles for the planning. There has also been a paradigm shift from fundamental to applied research where modern statistical tools have emerged replacing the traditional statistical techniques (King & Lene, 2014).

2. Shift from Empirical to Action Research-While empirical research relies on experience and observation by the researcher where conclusions are drawn after being verified by observation or experiment. In such research it is essential to develop first hand facts in order to have a working hypothesis and to set up an experimental design. The powerful support to such hypothesis is the evidence gathered through experiment or empirical research. On the other hand, action research is conducted through two main stages --- research is carried out in the first stage while second stage implies where practitioners apply knowledge generated from research. A good action research is one which is a product of myriad factors like sound theoretical framework, research experience and problem-solving perspective. For example- implementation of poverty-alleviation programmes (King & Lene, 2014).

3. Breakthrough from Academic to Policy-Relevant Research- The researcher has shifted their emphasis from analytical to prescriptive research since policy relevance of research is highly significant as it is more generalized and not specified to any region. Policy relevance of research is

essentialsince research on government policies and programmes along with implementation of such policies are required for the development of nation. Priorities in research for policy relevance are shifting due to the emergence of private market forces and international aid agencies (King & Lene, 2014).

4. Change from Research study to Research Report and Project-There has been a paradigm shift from research study to research project as the term 'research study' sounds cliché where research report and project implies report to funding agency and society. It even involves action-friendly implication of research which is relevant for implementation of policies in society. Such shift is mainly due to factors like temporal dimension, the commencement and end of research, life-span of project along with its benefits, dimensions regarding closure of the project. These are the reasons as to why all research needs to be projected (King & Lene, 2014).

5. Shift from Research production to Research management- The researcher's role is multi-dimensional as it is not only restricted to conducting quality research but also in research coordination and management. They become research managers due to the increasing growth of consultancy firms in public and private sectors in education and research. This implies that the shift has taken place since these firms do not demarcate between research in education and any other area and they serve as 'brokers' between financiers of research and researchers (King & Lene, 2014).

6. Transformation from One-dimensional to Inter-disciplinary research- With the changes in research design and research type, social research is no longer confined to being one-dimensional or using only one research method. It has now embarked into a multi-dimensional journal where inter-disciplinary research is the forte and more than one research method (mixed method/ triangulation) is given due importance. This will help him or her to develop expertise not only in his or her discipline but will help him to be aware about the strengths and weaknesses of other disciplines as well along with the usage of research tools related to other disciplines. In such case, one discipline becomes core discipline where the research has expert knowledge and prowess while other disciplines complement the core to explain any particular social phenomena (King & Lene, 2014).

7. Paradigm shift to Translational Sociology-One of the key roles of translation in society is occupied by Translational Sociology which provides an interdisciplinary investigation. An emerging style in sociology, translational sociology applies sociological theory in order to explore and address real-world social problems by using scientific methods. The discipline works in collaboration with other disciplines like policymakers, consumers and community stakeholders in multidisciplinary teams. The cynosure of this discipline is that it helps to develop strategies to resolve social problems through evidence-based approaches (Scott, 2022).

8. Paradigm shift to Evidence-Based Practice Movement-The evidence-based practice movement has mainly played a significant role in social science research, especially in criminal justice field. The effectiveness

of interventions is being assessed by experimental program evaluations which are regarded as 'gold standard', amidst the urgency to cut costs. Due to this, various remedies have evolved including statistical modelling, consensus panels, mixed method for the purpose of promoting broader dialogue regarding the effectiveness of program (Scott, 2022).

9. Paradigm shift to *Social Epigenetics* (Epigenetic effects as social cause and consequences)-Epigenetics is a field of study where there is interdisciplinary interaction between biological and social sciences. As an emerging arena of research, Social Epigenetics aims to identify health inequalities at molecular level due to social factors or extreme adversity like nutrition, maternal stress, smoking, alcohol consumption, and intoxication by drugs, lifestyle disease. Due to this collaboration, a new research community has merged which uses new data, methods, and conceptual framework to address a range of emergent research questions. However, social epigenetics continues to remain a nascent field which is ostracized and misinterpreted in social sciences (Deichmann, 2020).

10. Shift from Induced to Autonomous Research- Due to changing trends in research in India, there has been a major paradigm shift from induced to autonomous research. Induced research implies institutions' traditional concept of research which leads to increasing innovation in research. On the other hand, autonomous research involves non-directed research which is conducted to bring about any radical innovation. This means that while induced research is based on existing knowledge and provides little improvement in current product lines, autonomous research leads to major technological breakthrough and helps to create new knowledge processes which require creativity (King & Lene, 2014).

The nature of autonomous researcher includes -

- a. Being highly motivated
- b. To be able to take new responsibility for research projects.
- c. To be enthusiastic about the importance of their innovation-based ideas
- d. To possess an innovator's ideology
- e. Good interpersonal skills with appropriate research design for good research (Sahaf, 2017).

There are certain measures to promote autonomous research:

- a. Resources in terms of public funding for teaching and research.
- b. Donations from private sectors or organizations.
- c. Income by selling services to private sectors.
- d. Student contributions.
- e. More inter-disciplinary research to be enabled and enriched in universities. Due to this, India needs a pool of top-notch researchers, engineers and technicians.
- f. Quality oriented research which would enable better research.
- f. Flexibility, diversity and adaptability in terms of quality research which would help in building a robust system (Sahaf, 2017).

Conclusion- All of these changes imply that with the rapid growth of intermediaries in the public and private sectors, research has also become a financially highly lucrative area. The Indian research who hardly regarded research as financially rewarding are now known as consultants where they are bound to fill up application forms which demands high fee rate with other charges. Due to the onset of private and international organizations, competition has also accelerated regarding identification of the consultants for their jobs which accelerates the fees. This is the reason as to why researchers who used to receive respectable remuneration in public sectors are resigning from the sector and joining the private sector as consultants for a short time-period (King & Lene, 2014).

The paradigm shifts in terms of research in social sciences in India has brought about remarkable changes in the field of educational research. Research which has its bearing upon research design further depends on research purpose and is different in case of exploratory, descriptive or formulative studies. Each type of research design is different and does not suit all categories of designs. For this reason, separate research design is required so that the researcher can decide the data collection and analysis in advance as to which design is more appropriate for his/ her research project. While selecting the research design, the researcher has to give due importance to factors like the type of universe and its nature along with the objectives of the study, sampling frame, standard of accuracy, the level of reliability or validity of research. In present society, research priorities in India are being distorted where the quality of research in social sciences have been highly affected due to myriad factors like international aid for educational research, private entrepreneurship in research, private consultancy firms. This signifies that these new trends are emerging which needs to be dealt seriously as they signal the major shifts in research priorities in near future (King & Lene, 2014).

References-

1. Bhagat, Geeta & Sahi, Mahima (2018, March), *Quality of Social Science Research in India: A Review*, International Journal of Creative Research Thoughts, Vol 6, Issue 1, pgs 652-654, IJCRT1872264.pdf Retrieved 13-08-2023
2. Chatterjee, S. (2015). *Social Science Research in India: Basic Challenges*. International Research Journal of Interdisciplinary & Multidisciplinary Studies. 1(7), 50-55. IJCRT1872264.pdf Retrieved 18-03-2023
3. Deichmann, Ute (2020, September), *The social construction of the social epigenome and the larger biological context*, Epigenetics and Chromatin, <https://epigeneticsandchromatin.biomedcentral.com/articles/10.1186/s13072-020-00360-w#:~:text=A%20sociological%20study%20understands%20%E2%80%9Csocial,DNA%20sequence%E2%80%9D%20%5B20%5D>. Retrieved 11-07-2023
4. Kaur, Balwinder (2019, January), *Analysis of Social Science Research in India: A Mapping Report*, Research Gate, Jan 2019, pg 2, (PDF) Analysis of Social Science Research in India: A Mapping Report (researchgate.net) Retrieved 13-08-2023
5. King, Kenneth & Buchert Lene (2014), *Consultancy and Research in*

- International Education: The New Dynamics*, Norrag publisher, pgs 105-107, 109-111, Retrieved 18-03-2023
6. Mor, Surender (2019), *Emerging Research Trends in Social Sciences*, Bloomsbury India, pgs 1-2. <https://www.researchgate.net/publication/331980070> Retrieved 02-07-2023
 7. Prasad, B. Devi. (2008), *Content Analysis: A method in Social Science Research*, Center for Social Studies. Rawat Publications, Pg 2 (Microsoft Word - Content Analysis. A method of Social Science Research.CSS.\205) Retrieved 25-6-2023
 8. Sahaf, Musadiq (2017), *Changing Trend in Research: A Call for Autonomous Research*, pgs 13-15, 20-25, Retrieved 18-03-2023
 9. Scott. Robert (2022, June), *Emerging Trends in the Social and Behavioural Sciences*, CENTRE FOR ADVANCED STUDY IN THE BEHAVIOURAL SCIENCE, Stanford University Press, *Emerging Trends in The Social and Behavioral Sciences* · Contents · [emergingtrends \(stanford.edu\)](http://emergingtrends.stanford.edu) Retrieved 11-07-2023
 10. *Types of research*, pgs 7,10, 15 Unit-12.pdf (egyankosh.ac.in) Retrieved 02-07-2023

**To improve the police force,
increase in the number of police is necessary.
an analysis**

• Akhilesh Shukla

Abstract- *A policeman on duty at a public place can both burnish or tarnish the image of the entire force, so the police should develop a cordial Police – Area Ratio with the public. Besides their official duties, policemen should involve themselves in social activities like blood-donation, de-addiction camps, police-public meetings and sports activities, with the help of non-government organizations. Transparency in the functioning of the police is essential to win the faith of the public. Night patrolling could be much more helpful in yielding good results as, on the one hand, it brewed confidence among the public and, on the other hand, developed sources in order to get valuable information to curb crime. Indian government should teach Public Relations to Police Officers. Immediate change of Police Act is also necessary.*

Keywords- *Police – Population Ratio (PPR), Police – Area Ratio, Police, Civil Service*

Demography is the statistical study of populations, especially human beings. At a glance, it analyzes living population, i.e., changes over time and space in response to birth, migration, aging, death, etc. Its analysis covers complete society or groups defined by criteria such as education, nationality, religion and ethnicity, etc. Demographic studies also analyze the relationships between economic, social, cultural and biological processes influencing the population. The total population of India, as on 01.10.2018, as provided by the Registrar General of India and the Census Commissioner of India is 130.6 crore, approx., comprising 67.7 crore males and 62.9 crore females. Among the States, Uttar Pradesh, with a population of more than 22.68 crore, holds the distinction of being the most populous state in the country, followed by Maharashtra, with a population of 12.37 crore. Among the Union Territories, Delhi, with a population of more than 2.28 crore, holds the distinction of being the most populous UT in the country, followed by Chandigarh, with a population of 0.19 crore.¹

Police – Population Ratio (PPR) (Per Lakh of Population)- Police per lakh Population Ratio (PPR) against sanctioned total Police (Civil + DAR + Armed) during the year 2018 is 198.65 as compared to 192.95 in the previous year. The highest ratio is 1,314.84 in Manipur.

Police – Area Ratio (PAR) (Per 100 Sq. Kms. of Area)- Police per 100 Sq.

• Professor, Department of Sociology, Government Thakur Ranmat Singh College Rewa (M.P.)

Kms. of Area Ratio (PAR) against sanctioned total Police (Civil + DAR + Armed) during the year 2018 is 78.95 as compared to 78.45 in the previous year. The highest ratio is 7,719.30 in Chandigarh.

The status of approved and actual police force in India in the year 2019 is presented in the table below.²

Sanctioned and actual police - population and area ratio in states/UTs AS ON 01.01.2019

SL. No.	States/ UTs	Civil Police Per Lakh of Population		District Armed Reserve Police Per Lakh of Population		Armed Police Per Lakh of Population		Total Police Per Lakh of Population	
		S	A	S	A	S	A	S	A
1.	Andhra Pradesh	-	-	-	-	-	-	-	-
2.	Arunachal Pradesh	568.72	409.79	138.62	124.54	371.46	327.35	1,078.80	861.68
3.	Assam	71.06	58.74	36.30	25.52	129.04	110.48	236.39	194.74
4.	Bihar	5.27	5.51	2.35	2.18	7.34	6.36	131.65	81.08
5.	Chhattisgarh	177.88	144.51	-	-	103.85	90.41	281.74	234.92
6.	Goa	327.59	275.99	-	-	140.05	87.92	467.64	363.91
7.	Gujarat	91.08	72.90	35.31	28.66	43.13	30.06	169.51	131.62
8.	Haryana	193.54	150.59	-	-	32.60	13.20	226.14	163.80
9.	Himachal Pradesh	157.13	145.84	11.49	11.34	89.65	73.75	258.28	230.93
10.	Jammu & Kashmir	426.99	390.61	-	-	278.19	266.01	705.17	656.62
11.	Jharkhand	52.17	39.67	117.21	98.48	51.39	43.00	220.76	181.14
12.	Karnataka	100.98	85.92	65.52	43.45	15.84	10.27	182.34	139.64
13.	Kerala	107.72	98.85	18.74	15.64	27.02	20.58	153.49	135.08
14.	Madhya Pradesh	119.23	91.28	-	-	39.78	34.84	159.01	126.12
15.	Maharashtra	164.73	145.36	14.42	13.74	16.24	13.32	195.39	172.42
16.	Manipur	667.88	511.12	-	-	646.96	512.62	1,314.84	1,023.74
17.	Meghalaya	197.82	206.60	88.31	81.89	275.43	238.50	561.57	526.99
18.	Mizoram	377.91	297.62	-	-	638.31	473.60	1,016.22	771.22
19.	Nagaland	230.61	240.83	523.98	541.53	523.98	541.53	1,278.56	1,323.90
20.	Odisha	71.97	62.03	24.10	23.06	58.92	52.00	155.00	137.08
21.	Punjab	233.72	214.92	-	-	64.14	58.97	297.85	273.89
22.	Rajasthan	122.01	107.35	-	-	23.64	20.88	145.65	128.23
23.	Sikkim	372.74	366.87	-	-	589.46	398.95	962.20	765.81
24.	Tamil Nadu	126.94	89.69	28.68	46.67	21.96	20.52	177.58	156.89
25.	Telangana	-	-	-	-	-	-	-	-
26.	Tripura	218.78	169.59	110.66	83.89	428.04	338.12	757.48	591.60
27.	Uttar Pradesh	123.65	87.41	-	-	59.10	42.43	182.75	129.84
28.	Uttarakhand	97.80	101.15	59.20	52.65	55.58	51.96	212.58	205.76
29.	West Bengal	100.35	60.83	24.02	16.76	33.86	23.06	158.23	100.65
30.	A & N Islands	562.20	554.47	125.60	67.18	173.02	161.86	860.82	783.51
31.	Chandigarh	337.57	293.77	57.86	57.86	46.56	42.54	441.99	394.17
32.	D & N Haveli	76.79	70.93	-	-	-	-	76.79	70.93
33.	Daman & Diu	150.27	104.08	-	-	-	-	150.27	104.08
34.	Delhi	361.24	322.59	-	-	40.40	36.37	401.64	358.96
35.	Lakshadweep	382.14	311.90	-	-	-	-	382.14	311.90
36.	Puducherry	143.31	107.89	44.67	30.96	54.79	49.29	242.76	188.14
	All India	126.39	99.78	24.29	20.33	47.96	38.11	198.65	158.22

Population Per Police Person (PPP)- Population Per Police Person against sanctioned total Police (Civil + DAR + Armed) during the year 2018 is 503.40 as compared to 518.27 in the previous year. The highest ratio is 1,302.26 in Dadra & Nagar Haveli.

Area Per Police person (APP) (in Sq. Kms)- Area Per Police Person (in Sq. Kms) against sanctioned total Police (Civil + DAR + Armed) during the year 2018 is 1.27, same as the previous year. The highest ratio is 5.75 in Arunachal Pradesh.

Transport Per 100 Police personnel (TPP)- Transport per 100 Police Personnel against sanctioned total Police (Civil + DAR + Armed) during the year 2018 is 7.89 as compared to 8.10 in previous year. The highest ratio is 35.83 in Lakshadweep.

States/UTs-wise Police Person Per Lakh Population (PPR), States/UTs-wise Population Per Police Person (PPP), States/UTs-wise Area in Sq. Kms. Per Police Person (APR) & States/UTs-wise Transport Resources Per 100 Police Personnel (TPP) are shown at the end of this section.

Police, Civil Service and Military are a part of coercive apparatus of any state. Modern state is different from the medieval state in terms of making laws which can control the activities of these forces. A democratic state is a constitutional state. Constitutional laws guide the actions of each organ. To keep a check on the misuse of power by any organ of the state, there is a balance of powers. Executive, judiciary and legislature are three organs of the state which balance each other to bring unity of purpose. If any organ goes outside the laws of the state, it can come under the scrutiny of law by another organ. It regulates the relationship between each organ and citizen. If a citizen feels that he or she is discriminated by any organ of the state, he can resort to judicial review of the state action. Check and counter check help to keep the functioning of the state within the rule of law. A democratic state has to respect the human rights of each citizen and social class and groups. The state has enough space for the movement of each social group. Each group is allowed to protest against the state actions in a peaceful manner. Laws of the state are supposed to protect the rights of a citizen and social group. Democratic state is a limited state vis a vis a citizen and social group. Each social group, be it dominant or subaltern, is protected by the state. A state is basically a limited state except in an unusual situation in a nation's life, such as emergency because of war or internal trouble. The state has laws to restrict the rights of a citizen. In such circumstances the police, civil servants and military have immense powers. These three forces are part of an Administrative State. Moreover they are a permanent part of the executive whereas the political executive is a temporary one. Though they are the subject of control by the political executive, the action of each force can come under scrutiny by the judiciary. In this unit, the relation of each of these forces with the judiciary and legislature, is being analysed. Police is a part of the ancient Indian history. The Mauryan empire did have a police force. During the Moghul period, the Kotwali system monitored the activities of citizens. The British rule created a modern policy by creating a Police Act of 1861. The colonial state allowed the operation of police in a legal manner. They could investigate the criminal case as per the law of the time. The colonial state created a legal framework which limited the police action.

Though they served the interests of the colonial masters, at the same time, the laws of the state gave them autonomy. Even the British citizens came under their control to some extent if they committed crimes which were listed by the Police Act. It is wrong to presume that the Police Act served the interests of colonial masters only. This Act is serving the needs of the Post Independent Indian State. Some of the provisions have been amended, but in essence, the Act has been kept intact. Though the National Police Commission (NPC) has suggested for a new Police Act, the democratic government has not yet felt the necessity of scrapping the old Act.³

The activities of police have got expanded with the changes introduced by the modern society of India. The Indian society is no more an agricultural society though majority of people live in the villages. But in terms of contribution to the national income, the share of agriculture has declined drastically. The contributions of industry and service sector have increased. This transition to an industrial and modern society has brought certain changes in the society. A transitional society has some peculiar problems which need to be tackled by the police. The Indian society is getting urbanised at a faster rate which creates some problems for the police. The problems of the industrial and urban society are different in nature from the rural society. The rural society has changed because of the social changes introduced by the green revolution and political democracy. The caste hierarchy has undergone a radical change. Land reforms such as the abolition of Zamindari system has changed the face of the rural society by removing the hereditary social leaders. It has led to a sharp competition among various caste groups for sharing the social power. The changing balance of social forces in rural society gets reflected in politics.⁴ The democratic politics has brought some changes in the society. Electoral system has strengthened the democratic character of the society. This has led to sharp competition for political power among the social groups and classes of people. The entry of political parties into rural politics has strengthened the competition after leading to violence. Police intervention is sought in such a political situation, for tackling the criminal elements and gangsterism.

The Challenges before the Police Force are-

violent agitations by linguistic groups to redraw the political map of India, strengthening linguistic nationalism.

the tribal groups of the Central India and North Eastern India have organised themselves on ethnic lines.

movement for land distribution very often leads to violence between the rich and the poor in rural India.

agitations organised by the political parties to protest the displacement of people due to major environmental projects by the government or by a private party.

terrorism and militant movements.

growth of religious fundamentalism leading to violent conflicts.

caste clashes between the upper and the lower castes on such issues as access to common property or self respect movement.

violent conflicts between the rural rich and landless labour on the issues of wages. violent conflicts between the upper caste and lower caste in towns on the question of reservation of jobs on caste lines. while social legislations are made by the state, the responsibility to execute those laws is given to the police. The tackling of crimes against children and women are a major responsibility of the present police. introduction of IT has brought in cyber crimes which need to be tackled by the police. the growth of underworld in metropolis has created problems for the police.

India is a federal state and the powers are distributed between the Centre and the States. The police administration comes under the purview of the state government. The problems affecting the state need special attention of the police administration. Very often, unable to handle such a situation, they depend on the Central government for help to maintain the public order. The Central government has Central Reserve Police Force and Border Security Force to aid the state governments. These central forces have specific duties but at the same time, they aid the state governments in the case of law and order situation. There are three groups of states that need special central help: (i) states like Jammu & Kashmir which have terrorist problems, need the assistance of the central police force. (ii) The other group of states is infested with Naxalism which also demand the central help for tackling the situation. (iii) The third group of states where a large-scale communal problem can cause an alarming situation necessitating the intervention of central forces. The central government has created a Rapid Action Force (RAF) within the Central Reserve Police Force. The RAF is an emergency force that is normally airlifted to trouble spots so that quick action can be initiated to contain an explosive situation. Often the central police help in maintaining law and order during the elections times to the State Assemblies and Parliament. The Election Commission has a close interaction with the Home Ministry to call for the central forces to conduct free and fair elections. As there are some areas which are declared as disturbed, the state police try to handle the situation with the cooperation of the central forces. In a competitive political system, there is a large number of political leaders whose life is threatened by the terrorists and need protection by the state. The State has created a Special Security Force drawing from both BSF and CRPF to take care of the VIP movement.

The use of police in India has been frequent and extensive. Very often their non partisan behaviour is questioned. The police is used by a political party or a coalition of parties against their political opponents. Often the police is accused of showing their communal bias while controlling the riot. Majority of them allegedly have caste and class bias and this has led to a negative public perception of the police administration. Various surveys conducted by some independent organizations found that the public do not consider the police as a friendly organ of the state. This perception affects the investigation of crimes. Criticism of the police by the executive, legislature and citizens is very common.

Democracy demands that the police needs to respect the citizens. They have to be helpful to them whenever they come to the police station for

filing any complaint.⁵ This is the age of citizen friendly police administration. But there are many complaints against the police that an ordinary citizen may not be able to file FIR without offering a bribe to the police officer at the Police Station. The investigating officers use the force in dealing with crime suspects. The public often view the police with suspicion. To quote David Bayley, "the survey results demonstrate forcefully what many close observers of police-public relations in India have long thought namely that the Indian public is deeply suspicious of the activities of the police. A considerable proportion except the police to be rude, brutal, corrupt, sometimes in collusion with criminals and very frequently dealing unevenly with their clients." (The Police and Political Development in India, p. 203) This opinion is supported by the NPC report that the Commission expressed its anxiety over the poor state of police- public relations. (Vol. 5, p. 48) The police administration needs to be citizen friendly for bringing back its credibility before the public. In a democracy, the public evaluates the performance of each service. The police administration needs to reform its organization by which the police officer are aware of the citizen's charter and they provide quick and honest services to them. Credibility in democracy will be the biggest asset of the police. Improving police behavior is one of the biggest challenges, as mistrust of the police is deeply imbedded in many levels of Indian society. Most of the time, CHRI, citizens do not want to reach out to the police even in times of crisis. The CHRI conducted a survey of police personnel attitudes and the perception of the Indian public in Tamil Nadu, Rajasthan and Assam to assess the impact of the UNDP training. Staff was amazed to see that the doors were literally slammed in their faces in Assam. People did not want to talk about the police at all, and upon some probing, the CHRI found that, among the many reasons for this fear, were claims that there were incidents of people who had walked by a police station had been abducted by the police for ransom. Presently, the CHRI has started a campaign under the slogan, "Police reforms too urgent to neglect, too important to delay" for its India-based programs. Dr. Mukerjee (a member of CHRI) did point out that, in spite of such incidents, the situation of police behavior in India is not so dire. She credits the government with several spirited initiatives to reform the police system at certain points of time. During the emergency of 1971, Prime Minister Gandhi took forceful measures to consolidate her power, curtailing freedom of speech and expression and arresting numerous voices of dissent. When the Janata Party defeated her in ensuing elections, they instituted the Shah Commission, which looked at the malpractices of the previous government, including the behavior of the police forces during the State of Emergency. The new government set up the National Police Commission (NPC) in 1977, headed by Shri Dharamvira to comprehensively review the working of the police system in India and to suggest new reforms to make it accountable to citizens. The NPC produced a series of eight comprehensive reports on this subject and made several recommendations regarding police welfare, training and public relations. However, when Indira Gandhi returned to power in 1981, she disbanded the National Police Commission and

allegedly disposed of all the reports. The major recommendations from the disbanded National Police Commission that the Commonwealth Human **Rights Initiative is advocating with the present government are:** that a Chief of Police of a State is to be assured of a fixed tenure of office so as to encourage functional independence. It has been commonplace in India for transfers and postings of officers to be used as a kind of reward and punishment, as a result of which, many chiefs of police have had allegiances to political parties; that there be no external interference in police work; that a Security Commission should be established in each State; that the Police Chief be selected by an independent expert committee; and that the Police Act of 1861 be replaced by new legislation.

However, over the last few years, some State governments and police departments have started to draft new legislations for the police, but these fall short in areas like accountability, transparency, superintendence and control over the police and people's participation. The prominent amongst these are the Madhya Pradesh Police Bill, the Andhra Pradesh Bill, Rajasthan, Himachal Pradesh, Assam, Punjab and last week the Minister of State for Home Affairs mentioned that a committee has been set up by the federal Government to draft a Police Act. However, no one is aware of the details which again leads to legislations with out public participation in the process.

In spite of these political setbacks, though, the prospects for police reform on the judicial front have been quite promising. The Supreme Court has been very proactive with regard to bringing about police reforms. The Supreme Court has passed several positive judgments in this regard:

Havala case: concerning money laundering to foreign accounts: the Central Bureau of Investigation (CBI) (a national police body equivalent to the RCMP) had levelled the charge that politicians were involved in such money laundering and that investigations into these activities were being influenced. The Court CBI should have complete superintendent control over its functions; this case was extremely important in being the first judgement where superintendence and control over police has been indicated.

D.K. Basu judgment: a seminal judgment of ten points that addressed the rights of citizens when they come into contact with the police. The guidelines for arrest and detention should be accessible to all citizens, ie. be posted and visible in every police station. However, this really doesn't happen unless and until there is direct advocacy with officers and chiefs. After the 1996 civil writ petition, the Supreme Court asked the Government to look into whether the ten- year-old recommendations of the National Police Commission could be implemented or not. So the Government constituted yet another Commission. This committee was headed by a retired police chief, Mr. J.F. Ribeiro. After a one-year delay during which there were problems over who would chair the committee, it traveled the country seeking citizens' input and concluded that any recommendations made by the State Security Commission should be non-binding. It was clear that these and other findings of the Committee would clearly result in a

dilution of the NPC recommendations. The recommendations made by the Committee were criticized and soon the government instituted another committee in 2000, called the Padmanabhaiah committee. While agreeing with the suggestion of its predecessor that the State Security Commission recommendations should be non-statutory, the new committee stated that community policing should be adopted as a philosophy within the Indian police organization. The Union Home Ministry of India setting up a National Police University that will offer graduate, post graduate and PhD courses to civilians and serving police officers in a range of subjects and pertinent issues like forensic science, biological warfare, criminal psychology, public relations, human rights, insurgency, communal tension and man management.

References-

1. Registrar General of India and the Census Commissioner of India.
2. Data on Police Organization, (As on January 01, 2019) Bureau of Police Research and Development, Ministry of Home Affairs, Govt. of India, New Delhi, Page 21
3. Dr. S. Akhilesh, Organisation and Administration, Gayatri Publication, Rewa, 2003.
4. Dr. S. Akhilesh, Criminology, Gayatri Publication, Rewa, 2003.
5. Dr. S. Akhilesh, Human Rights and Police, Gayatri Publication, Rewa, 2011.

**Impact of water borne diseases
Dysentery and Diarrhoea on human health:A
geographical study
(Special reference to Mandla district)**

• Pratima Sant

Abstract- *The reason for 80 percent of the diseases occurring in the world is directly or indirectly due to unclean and impure water. Realizing the seriousness of the problem, the United States had set a target of providing adequate and clean drinking water to all by the year 2000, declaring the 19th decade of 1980-89 to be celebrated as the International Drinking Water Distribution and Cleanliness Decade. 37.7 crore Indians suffer from water borne diseases in a year in India. According to an estimate, 1.5 crore children are dying of diarrhoea. The environment in which a human life, performs various activities for the fulfilment and development of his needs. To meet the needs, the resources are used as is or by changing the form. The technique of optimum utilization of resources and its conversion in self-interest creates disturbances in the healthy environment, which helps in the development of water-borne diseases.*

Keywords- *Dysentery and Diarrhoea, water borne diseases, human health, health problems.*

Introduction- Dysentery and Diarrhoea: This bacterium is spread by E-coli. Diarrhoea can also be caused by food poisoning. Which can be any bacteria. It is caused by "amoebic dysentery and amoeba histolytica". In this sticky substance is secreted along with the faeces. Dysentery is a disease that includes several types of infection. There is also vomiting in this. This disease spreads through contaminated food, water etc. In this disease mainly infection occurs on the intestines. Diarrhoea is one of the biggest causes of death in children worldwide. Diarrhoea kills more than 3.3 million children in the country. Dysentery and diarrhoea are related to intestinal diseases, in which loose stools and bloody stools are present. In comparison to diarrhoea, open dysentery causes pain and sores and inflammation in the intestines. Its expansion is found in the entire country. It is the second most common disease after cold and flu, but due to the low number of patients reaching the hospital, this disease is found in the registered patients after malaria and gastritis. In fact, asthma and dysentery provide a basis for the emergence and development of fatal epidemics like gastritis and cholera. Dysentery is classified into two categories, the first of which is called bacillary dysentery which is caused by the presence of Entamoeba Histolica

bacteria in the intestines. Second indigestion, bowel cancer, fear, resentment are other products of this disease. The origin of this disease is due to dirt in summer and rainy season. The disease is transmitted to humans by flies. Due to impure water, food, food habit, dirty house, open defecation, etc., this disease keeps expanding continuously.

Objective and methodology of the study- The objective of the present study is to make a geographical study of the impact of water-borne diseases dysentery and diarrhoea on human health in the area. To achieve the objectives of the study, secondary data from district Mandla and primary data have been obtained through personal interview method. For the clarity of the objectives of the study, the data has been analysed using general practical statistical methods by tabulating the data.

Introduction to the study area- Tribal district Mandla is located in the central and south-east of Madhya Pradesh state of India. Situated in the lap of Narmada in the region of Satpura mountain, this district situated in Maikal range comes under Jabalpur division. Jabalpur in the north, Balaghat in the south, Dindori and Kawardha (of Chhattisgarh state) in the east, Seoni district in the west respectively. The life-giving river Narmada of Mandla district surrounds Mandla town from three sides and flows in a half-moon shape. The maximum height of the district from the sea level is 887 m. and minimum 443 m. Till then. Its latitudinal extent is from 22 degree 12' to 23 degree 22' and longitudinal extent is from 80 degree 18' to 81-degree 50' east longitude. This whole area is a part of Satpura region, which is known as Maikal Plateau. The area of this district is 8771.0 Sq.Km. Is. The north to south length of the study area Mandla district is 133 km. and east west 182 kms. Width 182 kms.

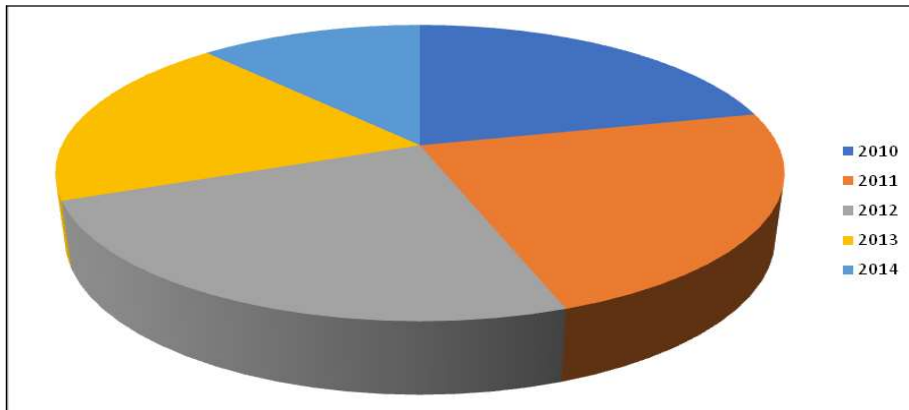
Dysentery and Diarrhoea in the study area- According to the 2001 census, a total of 894236 persons are living in the selected rural and urban units in the study area. In the present study, water-borne diseases dysentery and diarrhoea have the highest impact, whose geographical impact on human health was studied. The details of water borne diseases dysentery and diarrhoea occurring in the study area are as follows: -

Table 01
Number of persons affected by
dysentery in Mandla district in the year 2010-2014

S.N.	Year	Number of persons affected by dysentery
1	2010	1360
2	2011	1475
3	2012	1562
4	2013	1212
5	2014	754

Source: - Based on data received from District Hospital, Mandla.

Number of people affected by dysentery in Mandla district for the year 2010-2014 is represented by circle diagram.



It is evident from the above table number 1 that in the year 2010, 1360, 1475 in 2011, 1562 in 2012, 1212 in 2013 and 754 persons in 2014 have been found suffering from dysentery in the study area.

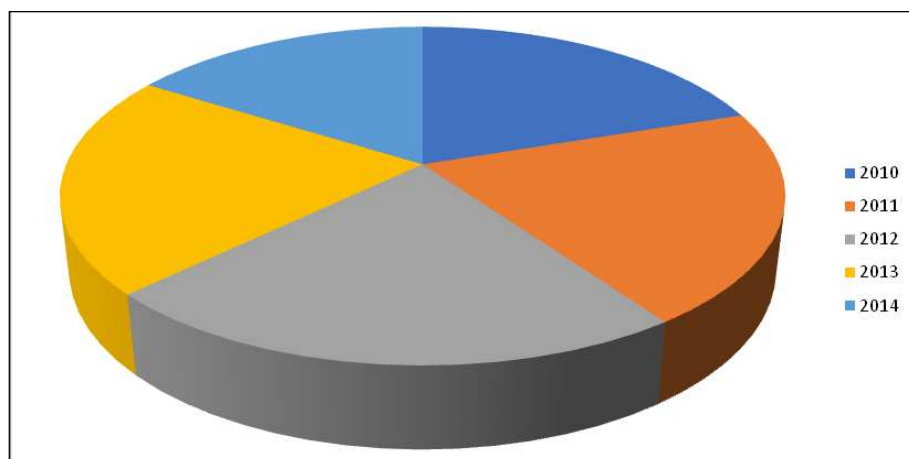
Table -2

Number of people affected by diarrhoea in Mandla district in the year 2010-2014

S.N.	Year	Number of people affected by diarrhea
1	2010	3537
2	2011	3631
3	2012	4025
4	2013	3768
5	2014	2862

Source: - Based on data received from District Hospital, Mandla.

Number of Diarrhoea Affected Persons in Mandla District for the Year 2010-2014 Shown by Circle Diagram



It is evident from the above table number 2 that in the year 2010, 3537, 3631 in 2011, 4025 in 2012, 3768 in 2013 and 2862 people in 2014 have been found suffering from diarrhoea in the study area.

Problems- The population of the study area is increasing day by day. In 1951 the population was 547620 which increased to 894236 in 2001. Obstacles in health services, financial constraints, level of education, unequal distribution of medical facilities, lack of communication media, lack of medical education, cooperation-non-cooperation of health care seeker etc. are the problems in the study area. In proportion to the above rate of population growth, the quality of water resources has been affected, as a result water-borne diseases like dysentery and diarrhoea have emerged. In this way, water pollution adversely affects the health of human beings and many health-related problems arise, which affect the efficiency of human beings and thereby affect their standard of living and income.

Suggestion- Man should be aware of all the factors related to health which are outside the personal area, such as roads, drains, neighbourhood cleanliness, sewage disposal system, clean drinking water, house-plan, control over physical environment Nutrients etc. Increasing industrialization and urbanization have created a serious challenge to human health. Heaps of garbage and filth are accumulating in the metropolitan cities, due to which they are polluted on a large scale. Often there are many geographical and social reasons at the root of the disease, which are generally not taken care of. The first essential condition for the economic, social, cultural and political progress of any nation is that the citizens of that country should have good health and their citizens should live a long life. A healthy citizen can make an invaluable contribution to the all-round development of the country by working longer than his full capacity.

References-

1. 1: Prof. Kailash Choubey, Performance of Health Care System, Chapter 9, Health Medical Geography, Madhya Pradesh Hindi Granth Academy, First Edition 2001, Page-174-175,
2. 2: State Health Committee (VBDCP) and State Health Information Education Communication Bureau, Directorate of Health Services, M.P.
3. WHO (1972). Health Hazards of the Human Environment, World Health Organisation, Geneva.
4. 4: WHO: Amebiasis, Report of WHO Expert Committee Technical Report series 42, 1969, p.52.
5. 2. Opict P.53.
6. 5: Moore, S.W. (1980), Tropical Climate and Indian Diseases J. and A. Churchill, London.
7. District Development Handbook, Mandla.
8. District Hospital, Mandla.

Royal Legitimacy and Power Dynamics: The Sangama Dynasty and Vijayanagara Kingship

• Nachiket B. Paradkar

Abstract- *This research paper delves into the intricate fabric of kingship within the Vijayanagara Empire, focusing specifically on the Sangama Dynasty's imprint on this fundamental aspect of governance. The Sangama Dynasty, the founding rulers of the Vijayanagara Empire, played a pivotal role in shaping the ethos of kingship during their reign. The study investigates the multifaceted dimensions of kingship under the Sangama Dynasty's rule, encompassing its political, social, and cultural implications. Further, it examines the role of religious patronage, administrative policies, courtly culture, and the relationship between the king and the populace in shaping and legitimizing the monarchy.*

Keywords- *Sangama Dynasty, Vijayanagara Empire, Kingship, Culture, Monarchy.*

Introduction- The advent of Afghan Turks as invaders in North India in 11th century CE changed the political map of India for next four centuries. After stabilizing their rule in northern plains of Ganges, they turned their eyes on prosperous Deccan and South India that never accepted suzerainty of North Indian empires and had challenged their authority since ancient times. In the reign of Allauddin Khilji, Delhi Sultanate reached Kanyakumari, but it was unable to incorporate these regions in their empire completely. During the Tughlaq regime, when such attempts were made, both Deccan and South India rebelled against Delhi and established their own rule. In South, Vijayanagara empire emerged as successor of Delhi Sultanate.

In shaping its history, the king as a central authority always played an essential role. Learning from the past, the nature of kingship in Vijayanagara got evolved in the course of time that made this empire sturdier and might be the same reason behind its demise. This paper aims to study evolution of kingship under the Sangama dynasty (1336 CE - 1480 CE), the founders of Vijayanagara empire.

Methodology- The study is centered around understanding and analyzing trends in evolution of Vijayanagara kingship under Sangama rulers. After thorough review of literature, critical analysis of facts is done under empirical research. The study hypothesizes that the Sangama dynasty's approach to kingship was a blend of ancient Hindu and Turkish ideas. It not only consolidated centralised power but also established enduring

paradigms that influenced successive dynasties, leaving a lasting impact on socio-political fabric of medieval South India.

Sangama Regime in Initial Years- The Vijayanagara empire was established by two brothers Harihara I and Bukka I in 1336 CE. As employed earlier as feudatories of Hoysala and Kampili kingdoms and later under Delhi Sultanate, they started their new adventure under guidance of Madhava Vidyaranya. Each of five brothers in Sangama family including Bukka I ruled the provinces of Vijayanagara as *Odeyas* of king Harihara I. Thus, Vijayanagara was more a group of semi-autonomous states than a unified kingdom (). While settling the conflicts with Bahmani sultanate and other kingdoms in South, Bukka I, the next ruler along with Kampana, the crown prince and Gundi, the commander-in-chief expanded the influence of Vijayanagara till Kanyakumari (Sastri, 1995, p. 255). By 1450s, with end of Madurai sultanate, Vijayanagara rose to supremacy in South India. Devraya II, the last prominent ruler of Sangama dynasty further consolidated the position. In this period, the nature of kingship in Vijayanagara evolved because of various circumstances.

Harihara I and Bukka I introduced the titles *Raya* or *Maharaya* but didn't coronate themselves as *Rajadhiraja* (King of kings) or *Rajaparmeshwara* (The supreme king). They were known as *Mahamandaleshwara* and *Odeyai*.e. the greatest among *Samantas* (Wagoner, 1996, p. 862). Additionally, Harihara I proudly took the epitome *Bhashegetappuvarayaraganda* after suppressing feudal lords in present Karnataka region (Hosamani, 2018, p. 2140). Bukka I, in one of the inscriptions carved under his patronage, ironically calls himself *VedamargaPratisthapaka* as well as *HindurayaSuratranai*.e. Establisher of path of the Vedas and Sultan among Hindu Kings respectively (Venkataramanayya, 1967, p. 280). There is no word for the term *HindurayaSuratranai* in Sanskrit and Kannada languages providing satisfactory meaning. Hermann Kulke has argued that early Vijayanagara kings took this title to claim equal status in Hindu Rajas and among Muslim Sultans as various Hindu and Muslim principalities emerged in South India after Tughlaq era with whom they had to confront (Wagoner, 1996, p. 862). They were Sultans in terms of substance and style but not in relative political standing. From the reign of Harihara II, Vijayanagara Kings adopted the title *Rajadhiraja*.

Kabayi, Kullayi and Turkish influence- Burton Stein (2008) criticized the narration of Vijayanagara by historians as a Hindu bulwark against Mohammedan conquest of entire India and considers its origin as the natural result of persistent efforts made by Muslims to conquer and loot South India (p.70). Certain elements in Vijayanagara culture indicate the entry of Turkish elements in Hindu society with ease and no conflicts. Though there are no signs of a complete adaptation, some elements were borrowed to highlight the king's distinct identity.

Figure 01
Mural Painting of Vijayanagara rulers in
Lepakshi Temple Complex (16th Century CE)



(Source: Google)

Abdul Razzaq, an ambassador in the court of Devraya II, has described that the king used to wear *Kabayi*, a long tunic garment and *Kullayi* (Wagoner, 1996, pp. 853, 858). *Kabayi* and *Kullayi* derive their origin from contemporary Arabic fashion styles. Occasionally, Raya used to gift those precious garments to his ministers, but they were not allowed to wear. We can see the king wearing *Kabayi* and *Kullayi* in the mural paintings of Lepakshi Temple. On other hand, Devraya II started employing Muslim bowmen and horsemen to deal with Bahamani supremacy in wars (Chandra, 2017, p. 143). Hence there were no efforts for creating absolute Hindu rule, but amalgamation of both Hindu and Islamic ideas of kingship.

Ritual Kingship and Mahanavami- Mahanavami Dibba, a specially raised and intricately carved platform was used to highlight the King at central ceremonial role in the empire which has political, religious and financial meaning (Barodawala, 2007, p. 51). Mahanavami was a celebration of victory, power and protection and of God Rama, a symbol of the apotheosis of perfect kingship. Abdul Razzaq described it to show the perfect rule and hegemony the Vijayanagara kings enjoys on its inhabitants. Nuniz viewed this as all the gods and people of the world were protected in Vijayanagara.

Figure 02
Remains of Mahanavami Dibba at Hampi, Karnataka.



(Source: Google)

Vijayanagara was seen by contemporaries as a ritual, administrative, commercial, and regulatory center with Hindu dharmic ideology (Stein, 2008, p. 37). Burton Stein emphasized the Hindu dharmic or ritual kingship aspect, where the king always tries to influence the masses by demonstrating the glory of the empire through powerful visual celebrations. The extraordinary diversity within the Empire created a complexity of political, economic as well as ideological interactions that shaped its politics and people beyond its borders (Sinopoli, 2000, p. 388). All local deities including *Vitthala* and *Khandoba* from Maharashtra are found in the temple complex of Vijayanagara. This approach of kings proved fruitful as it developed the space in the minds of non-elites as a place of authority and power even if they had never visited it (Ibid., pp. 375-377).

Vijayanagara, as centre of whole world, demonstrated Raya or the King of Vijayanagara, being at the epicenter of the city is all powerful autocrat of orient despotism, as seen by Abdul Razzaq (Barodawala, 2007, p. 53). He observed Raya as strength of the magnetic field in his account and has reemphasized the divine legitimacy that king causes in the eyes of public. Vijayanagara City had a *Mandala* model of city development like other royal Hindu cities where God and King share common central location (Ibid., p. 46). The power of the presiding deity is manifested inside the *Mandala*. In similar manner, protective influence was animated through the architecture, a highly rational means to reinforce king's own power and communicate to other players that he was firmly in control of political game. This nature of kingship was supported by various Portuguese travelers. Portuguese visitors and Chroniclers described Vijayanagara court as court full of 40 crowned vassal kings (Rao and Subrahmanyam, 2012, p. 216). Fernao Nuniz has mentioned that all the land belongs to the king and from

his hand the captains hold it. Ya'ari highlights the king's role as chief exchequer (Barodawala, 2007, p. 27).

Though kings of Vijayanagara were powerful enough, Vijayanagara witnessed fragile affair away from northern core of kingdom due to cumulative local rebellions and other forms of resistance in 15th century. Harihara II, Devaraya I and Devraya II had to fight with enemies and rival forces for frontiers and borders with imperfectly integrated internal space. Their constant efforts transformed the nature of empire from segmentary to consolidated by subjugating client chiefs like Reddis of Andhra and Zamorin of Calicut. However, after Devaraya II, the political turmoil accelerated with the emergence of complex combinations amongst powerful families which were alert enough to take advantage and ready to seize political power when central authority weakened. Till the coronation of Krishna devaraya, Vijayanagara witnessed an era of usurpation and coup. It witnessed the end of two dynasties – Sangama and Saluva, and gave rise to Tuluva dynasty that became prominent under him. He, by learning from the past, shaped his policy towards centralizing kingship in Vijayanagara in 16th century.

Conclusion- The evolution of kingship in Vijayanagara was most complex process in the medieval South India. The strengthening of the Raya's position from *Mahamandaleshwara* (Feudal lord) to *Rajadhiraja* (King of kings) during 14th -15th century CE witnessed the transformation from segmentary to consolidated kingship under Harihara I and Bukka I and finally in the reign of Devraya II. The vastness of the empire, material prosperity, cultural diversity with a strong wish to have autonomy, peer politics seeking opportunities to usurp powers and weak character of lineage continuity proved troublesome for the Sangama 'Rayas' of Vijayanagara. Thus, inside the capital city, the self-definition of Vijayanagara rulers and their legitimization of imperial authority with an Empire had an important role in shaping this process.

The grandeur of Vijayanagara style of Architecture, Mahanavami celebrations, Adoption of Hindu dharmic nature of kingship with certain Turkish influence were material aspects of this realization. By encouraging God-King relationship, Rayas claimed the supreme position in the empire next to the God and thus unquestionable and as a symbol of natural justice. These efforts of Rayas helped them to emerge as all powerful autocrats of orient despotism and the kingship as a supreme institution present on the earth, in the eyes of subjects thousands of miles away from the capital city as well as among foreign travelers. In conclusion, the Sangama dynasty's approach to kingship facilitated the consolidation of material and virtual power and cultural amalgamation, leaving an indelible mark on the historical narrative of medieval South India.

References-

1. Barodawala, Azim (2007). "As a sapphire...to the blades of grass": The Rationality of Power and Politics in Vijayanagar, (Master's thesis), Lauder Institute, University of Pennsylvania, Philadelphia, USA, https://lauder.wharton.upenn.edu/wpcontent/uploads/2015/06/Barodawla_Thesis_Final.pdf, Retrieved on October 29, 2023.
2. Chandra, Satish (2017). *The History of Medieval India*, Orient BlackSwan, New Delhi.
3. Hosamani, M. S. (2018 July-August), "A Study on Vijayanagara Dynasty: A Golden Era in Karnataka History," *International Journal of Trend in Scientific Research and Development*, 2(5): 2134-2140.
4. Rao, V. Narayana, and Sanjay Subrahmanyam (2012). Ideologies of state building in Vijayanagara and post Vijayanagara south India: some reflections, P. Bang and D. Kolodziejczyk (Eds.), *Universal Empire: A Comparative Approach to Imperial Culture and Representation in Eurasian History*, Cambridge UP, Cambridge: 210-232. *Cambridge Core*, <https://doi.org/10.1017/CBO9781139136952.011>, Retrieved on November 02, 2023.
5. Sastri, K.A. Nilkanta (1955). *A History of South India: From Prehistoric Times to the Fall of Vijayanagar*, Oxford UP, London, *Internet Archive*, <https://archive.org/details/dli.ernet.448836/mode/2up>, Retrieved on November 02, 2023.
6. Sinopoli, Carla M. (2000). From the Lion Throne: Political and Social Dynamics of the Vijayanagara Empire, *Journal of the Economic and Social History of the Orient*, 43(3), Brill: 364-398. *JSTOR*, <https://www.jstor.org/stable/3632447>, Retrieved on October 26, 2023.
7. Stein, Burton (2008). *The New Cambridge History of India: Vijayanagara*, Cambridge UP, Cambridge.
8. Venkataramanayya, N. (1967). The Kingdom of Vijayanagara, R.C. Majumdar et al. (Eds.) *The History and Culture of the Indian People, Vol. VI: The Delhi Sultanate*, 2nd ed., Bharatiya Vidya Bhavan, Mumbai: 277-320.
9. Wagoner, Phillip B. (1996). Sultan among Hindu Kings: Dress, Title and Islamization of Hindu Culture at Vijayanagara, *The Journal of Asian Studies*, 55(4), The Association for Asian Studies: 851-880, *JSTOR*, <https://www.jstor.org/stable/2646526?seq=1>, Retrieved on November 01, 2023.

Puranic mythand religious medicinalimportance of Tulsi

• Uttam Kumar Das

Abstract- *The Tulsi (Ocimumtenuiflorum) is the most revered plant in modern Hinduism and is central to Vaishnava traditions throughout the Indian subcontinent and even among the Hindu diaspora abroad. Puranic views regarding the origin of the Tulsi plant are various. In general, the plant is personified as a woman (named Vrinda or Madhavi, depending on the source) prior to being turned into a plant, she is also a great devotee of God Vishnu. In this paper the importance has been given to look at the traditional religious perspective and historical mention of Tulsi when considering such a sacred plant but the scientific view and medicinal role should also be examined.*

Key words-*Tulsi, Hinduism, Tradition, Ritual, Worship, Medicinal Value.*

Tulsi often referred to as the 'incomparable one', 'elixir of life' or 'queen of the herbs' is native to India and cultivated throughout Southeast Asia. It is also called the 'holy basil' as it is surrounded by legends and myths. The Tulsi plant is revered by Hindus all over and it is considered to be a manifestation of the Goddess herself. Every part of this plant contains some kind of spiritual significance, its roots symbolize a religious pilgrimage, its branches represent divinity, and its crown signifies an understanding of the scriptures. In Hinduism, the Tulsi is venerated as another divinity by lighting incense and applying vermilion. In fact, in many homes, it is grown in the centre of the courtyard of Hindu houses¹ Women in many households, worship it every morning and evening.

Its presence is believed to protect and safeguard the home from any kind of harmful influence. Due to its antibacterial powers, the presence of Tulsi in the vicinity of the house prevents the spread of germs and helps to keep the atmosphere clean. Tulsi leaves are definitely one of the most commonly used ingredients – a remedy for a cough, cold or congested chest. Tulsi has been used for its therapeutic properties since circa 5000 - 4000 BCE. In the Rig Veda, Tulsi is mentioned and that is dated to 3500 - 2600 BCE.² Tulasi has been used in India for around 5000 years and is acclaimed for its healing properties of the mind, body and spirit³ various ancient scriptures and texts that mention the religious and medicinal significance of Tulsi, such as: the Rigveda, the Padmapurana, the Brahmavaivarta Purana, the Skanda Purana and the Charaka Samhita⁴

In the Vedas Tulasi ("matchless") is known as Vaishnavi ("belonging to Vishnu"), Vishnu Vallabha ("beloved of Vishnu"),⁵ Haripriya ("beloved of

Vishnu"), Vishnu Tulasi. The Tulasi with green leaves is called Shri-Tulasi ("fortunate Tulasi") or Lakshmi-Tulasi; Shri is also a synonym for Goddess Lakshmi, Vishnu's spouse. This variety is also known as Rama-Tulasi ("bright Tulasi"); Rama is also one of the principal avatars of Vishnu. The Tulasi with dark green or purple leaves and purple stem is called Shyama-Tulasi ("dark Tulasi") or Krishna-Tulsi ("dark Tulasi"); Krishna is also a prominent avatar of Vishnu. This variety is considered especially sacred to Krishna, as its purple color is similar to Krishna's dark complexion.⁶ One argument mooted is that goddess Lakshmi is also identical with Tulasi and hence it is also known as Lakshmi Priya; Tulasi is also identified with the wives of other incarnations of Vishnu, such as Rama and Krishna. The name Tulasi is also believed to literally translate as "immeasurable". Tula means a scale or balance, where an item is placed on one side and weights on the other to compare and measure the weight. Hence, Tulasi could also mean the one who cannot be measured or compared.

There are three major accounts of the origin of the Tulasi that have been given in the Puranas. These accounts are given in the *Skanda Purana*, *Padma Purana*, *Brahmavaivarta Purana*, *Devi Bhagavat Purana*, and *Shrimad Bhagavat Purana*. The first account is the story of the demon Jalandhara and his wife Vrinda, who was reborn as Tulasi. The story is as follows: Jalandhara, an asura born from Shiva's rage, marries her. Angered by the outcome of the Samudra Manthana, Jalandhara wages a successful war on the devas, conquering svarga, and ruling as a virtuous monarch. However, after hearing details of Parvati's beauty from Narada, he demands Shiva hand her over to him. Infuriated, *His misdeeds and sin led to the Devas pleading to God Shiva to put an end to him*. Shiva declares war on the asura, but finds him to be an invincible foe. After employing his illusory arts, the asura attempts to abduct Parvati in the guise of Shiva. She prays to Vishnu, and makes him realize that the asura was shielded from defeat by the chastity of his wife *Vrinda's pati-vrata Dharma (devotion and chastity of a married woman to her husband)*. Hence, *Bhagavan Vishnu performs an act such that he manages to break the pati-vrata of Vrinda*. Vrinda receives an ominous nightmare where she sees her husband seated on a buffalo, the sky enveloped in darkness, and a sun without lustre. Terrified of what it implied, she ran from forest to forest, forgetting herself. When a sage rescued her from two rakshasas, she begs him to inform her of the tidings of her husband's battle with Shiva. The sage's disciples produce the asura's hands, a head, and a headless trunk, upon which she falls into despair. She urges the sage to resuscitate her fallen husband, which he does. Witnessing her slain husband return to life, Vrinda sported with him for several days, until she realized his true identity. She cursed Vishnu that his wife, too, would be separated from him (Which happens when Sita is abducted by Ravana) and self-immolates, even as the deity attempts to stop her.⁷ Her chastity broken, Shiva prevails over Jalandhara.

After the conclusion of the battle, Vishnu is still traumatized by the death of the beautiful Vrinda, and refuses to move from her pyre. The devas

invoke Prakriti, the personified force of nature, who offers them three seeds to be planted where Vishnu stays, which represent the sattva, rajas, and tamas gunas. The seeds grow to become three plants, Dhatri (born from the Mother Earth), Malati (born from Mother Lakshmi), and Tulasi (born from Mother Gauri), who are personified as three women, Swara, Lakshmi, and Gauri. Three plants emerged from the seeds, The version in the *Padma Purana* instead states that Vrinda herself was reborn as a plant called Tulasi. Vishnu grows infatuated by the sight of these wondrous women. Since Malati is regarded to be "deceptive" (As she stems from Lakshmi, who is already Vishnu's shakti), she is condemned. Bhagavan Vishnu was attracted to the Dhatri and Tulasi plant due to the beauty of Vrinda. The goddesses of Dhatri and Tulasi, however, bear genuine love for Vishnu, and make him forget about his misery. They accompany Vishnu to Vaikuntha, and greatly please and delight him.⁸ In a variation of this legend, Vrinda immolates herself in her husband's funeral pyre, but Vishnu ensures that she is incarnated in the form of Tulasi plant upon the earth. She gains the status of a goddess named Tulasi, while her earthly form is the Tulasi plant.

The second account is uniquely given in the Skanda Purana, Vaishnava-Khanda, Kartika-Masa-Mahatmya (fourth section), chapter eight. This account comes prior to the one mentioned above. This story is related to the Samudra Manthana, or the churning of the ocean by the Suras and Asuras. During this event, Bhagavan Vishnu in the form of Dhanvantari was holding a pot of nectar that bestowed the promise of immortality and freedom from old age. He began to cry with joy upon looking at the pot from which tears dropped into the pot becoming Tulasi. According to this claim, Mother Lakshmi also emerged from this event along with Tulasi, both were given by Bhagavan Hari by Brahma and went with him to Vaikuntha.

The third account is mentioned in the Brahmavaivarta Purana and Devi Bhagavat Purana. Brahmavaivarta Purana, Prakriti-Khanda mentions this story which is also found in the ninth book of the Devi Bhagavat Purana. Once there was a king by the name of Vrishadvaja, who was a great devotee of SadaShiva and was very dear to him, but he was hostile to other deities. He did not allow the rituals of other Devas and did not show any respect to Bhagavan Vishnu. Upset by this, Surya Deva (the Sun god) gave him a curse. Outraged by his curse, SadaShiva went to hunt Surya Deva down who sought refuge in the feet of Brahma. A conversation later takes place between Mahadeva (Shiva) and Narayana in which upon hearing the plea of Shiva for his devotee, Narayana reminds him that time proceeds at a faster rate on earth than in the heavenly abodes, hence Vrishadvaja has already died. It was now the time of his devotee's grandsons, Dharmadvaja and Kushadvaja, who were also under the effect of the curse. Both of their wives went on to perform the tapasya of Mother Lakshmi. The wife of Dharmadvaja, Madhavi, was reborn as Tulasi. She had decided she would perform such a penance so that Narayana would become her husband. After completing a harsh penance, Brahma gave her a boon that she would marry

Sudama, who was cursed to become the demon Shankhacura. Shankhacura was given the Vishnu-Kavaca (armour of protection of Vishnu) by Brahma on the condition his wife remains pati-vrata.

The unfolding of the following events is analogous with the story of Jalandhara given in the first account. Soon a war occurs between the demon and God Shiva, and Bhagavan Vishnu goes to break the pati-vrata of Tulasi. Tulasi then states to Bhagavan Hari that he has not done right by breaking her pati-vrata. He reminds her of the great penance that she has done to attain him as her husband. Hence, he tells her to discard her mortal body and attain her divine form in Vaikuṇṭha.⁹ Her body became the Gaṇḍaki river and her hair became a plant thus called Tulasi. It is also stated here in both scriptures that Vishnu raised Tulasi to the rank of Rama (Lakshmi). Whichever of the three accounts is more authentic is not relevant to Puranic studies. However, the relevance of this plant given in the scriptures should serve to illustrate the importance of Tulasi in Hinduism. Quite a few myths and legends found in the Puranas or ancient scriptures point to the origin of the importance of Tulsi in religious rituals. Although Tulsi is regarded as feminine, in no folklore is she described as the consort the Lord. Yet a garland solely made of Tulsi leaves is the first offering to the Lord as part of the daily ritual. The plant is accorded the sixth place among the eight objects of worship in the ritual of the consecration of the Kalasha, the container of holy water.

According to one legend, Tulsi was the incarnation of a princess who fell in love with Lord Krishna, and so had a curse laid on her by his consort Radha. Tulsi is also mentioned in the stories of Meera and of Radha immortalized in Jayadev's Gita Gobinda. The story of Lord Krishna has it that when Krishna was weighed in gold, not even all the ornaments of Satyabhama could outweigh him. But a single Tulsi leaf placed by Rukmani on the pan tilted the scale. In the Hindu mythology, Tulsi is very dear to Lord Vishnu. Tulsi is ceremonially married to Lord Vishnu annually on the 11th bright day of the month of Karttika in the lunar calendar. This festival continues for five days and concludes on the full moon day, which falls in mid-October. This ritual, called the 'Tulsi Vivaha' inaugurates the annual marriage season in India. A Vaishnava legend relates the origin of the Tulasi to the Samudra Manthana the churning of the cosmic ocean by the devas and the Asuras. At the end of the churning, Dhanvantari rose from the ocean with amrita (the elixir of immortality). Vishnu procured it for the devas, when the asuras tried to steal it. Vishnu is regarded to have shed happy tears, the first of which fell in amrita, and formed the Tulasi.¹⁰

While tree worship is not uncommon in Hinduism, the Tulasi plant is regarded as the holiest of all plants. The Tulasi plant is regarded as a threshold point between heaven and earth. A traditional prayer narrates that the creator-god Brahma resides in its branches, all Hindu pilgrimage centres reside in its roots, the Ganges flows within its roots, all deities are in its stem and its leaves, and that the most sacred Hindu texts, the Vedas are found in the upper part of the holy basil's branches.¹¹ The Tulasi herb is a centre of household religious devotion particularly among women and is referred to

as the "women's deity" and "a symbol of wifehood and motherhood", it is also called "the central sectarian symbol of Hinduism" and Vaishnavas consider it as "the manifestation of god in the plant kingdom". The Tulasi plant is grown in or near several Hindu houses, especially by Brahmins and other Hindu varnas of the Vaishnava sect. A house with a Tulasi plant is sometimes considered a place of pilgrimage.¹² The sacred groves where these herbs are grown are also known as Vrindavana (grove of Tulasi), a miniaturized Vrindavan is a raised cuboid stone or brick structure often in middle of the house's courtyard or in front of the house.

A person who waters and cares for the Tulasi daily is believed to gain spiritual merit and the divine grace of Vishnu, even if he does not worship it. Traditionally, the daily worship and care of the plant is the responsibility of the women of the household. Though daily worship is prescribed, Tuesdays and Fridays are considered especially sacred for Tulasi worship. Rituals involve watering the plant, cleaning the area near the plant with water and cow dung and making offerings of food, flowers, incense, Ganges water, etc. Rangoli (decorative designs) of deities and saints are drawn near its foot. Devotees pray to Tulasi and circumambulate the plant while chanting mantras. The Tulasi plant is often worshipped twice in a day: in the morning and in the evening, when a lamp or candle is lit near the plant.

In the 19th century, some families in Bengal regarded the plant as their spiritual guide or clan deity. In a British Indian census, North western provinces recorded themselves as Tulasi worshippers and not belonging to Hindus, Muslims or Sikhs.¹³ In Orissa, on the first day of the Hindu month Vaishakha (April–May), a small vessel with hole at the bottom is filled with water and suspended over the Tulasi plant with a steady stream of water, for the entire month. In this period, when a hot summer region, one who offers cool water to Tulasi, or an umbrella to shelter it from the intense heat is believed to be cleansed of all sin. The stream of water also conveys wishes for a good monsoon.

A ceremony known as Tulasi Vivah is performed by the Hindus between Prabodhini Ekadashi (eleventh lunar day of the waxing moon of Kartika) to Kartika poornima (full moon in Kartika), usually on the eleventh or the twelfth lunar day. It is the ceremonial wedding of the Tulasi plant to Vishnu, in the form of his image, Shaligrama, or a Krishna or Rama image. Both the bride and the groom are ritually worshipped and then married as per traditional Hindu wedding rituals. It marks the end of the four-month (chatutmasya) period, which corresponds to the monsoon and is considered inauspicious for weddings and other rituals, so the day inaugurates the annual marriage season in India.¹⁴

Tulasi is especially sacred in the worship of Vishnu and his forms Krishna and Vithoba and other related Vaishnava deities. Garlands made of 10000 Tulasi leaves, water mixed with Tulasi, food items sprinkled with Tulasi are offered in veneration to Vishnu or Krishna. Vaishnavas traditionally use japa malas (a string of Hindu prayer beads) made from Tulasi stems or roots called Tulasi malas, which are an important symbol of

the initiation. Tulasi malas are considered to be auspicious for the wearer, and believed to connect him with Vishnu or Krishna and confer the protection of the deity. They are worn as a necklace or garland or held in the hand and used as a rosary.¹⁵ Tulasi's great connection with Vaishnavas is communicated with the fact that Vaishnavas are known as "those who bear the Tulasi round the neck". Some pilgrims carry Tulasi plants in their hands throughout their pilgrimage to Dvaraka, the legendary capital of Krishna and one of the seven most sacred Hindu cities. Different sects consider the use of Tulasi in prayers to deities not related to Vishnu and its incarnations, differently. Some Vaishnavas consider the use of Tulasi for any other deities a sin.

There are conflicting accounts about Tulasi leaves being used in the worship of the god Shiva. While Bael leaves are often offered to Shiva, some authors note that Tulasi may also be offered to him while others say Tulasi cannot be offered to him at all. Tulasi worship is sometimes regarded the worship of Shiva, conveying the deity's omnipresence. Shiva's aniconic symbol – the linga – is sometimes prescribed to have made from the black soil from the roots of the Tulasi plant. As regards to Shaktism Tulasi is taboo in worship of the Devi – the supreme goddess, as the pungent aroma of the Tulasi plant is believed to anger her.¹⁶ It is also not allowed for the worship of Hanuman as he is celibate and Tulasi is regarded as a goddess.¹⁷ In Orissa, the Tulasi plant represents all local deities and rituals to propitiate them are offered in front of the plant. The Navars of Malabar offer Tulasi plants to pacify evil spirits.

In the Shrimat Bhagavatam, the significance of the Tulasi over other plants is described as- Although flowering plants like the mandara, kunda, kurabaka, utpala, campaka, arṇa, punnaga, nagakeshara, bakula, lily and parijata are full of transcendental fragrance, they are still conscious of the austerities performed by Tulasi, for Tulasi is given special preference by the Lord, who garlands Himself with Tulasi leaves-Shrimad Bhagavatam, Canto 4, Chapter 15, Verse part of the Tulasi plant is revered and considered sacred. Even the soil around the plant is holy. The Padma Puranadeclares a person who is cremated with Tulasi twigs in his funeral pyre gains moksha and a place in Vishnu's abode Vaikuntha. If a Tulasi stick is used to burn a lamp for Vishnu, it is like offering the deities lakhs of lamps. If one makes a paste of dried Tulasi wood (from a plant that died naturally) and smears it over his body and worships Vishnu, it is worth several ordinary pujas and lakhs of gaudanam (donation of cows).¹⁸ Water mixed with the Tulasi leaves is given to the dying to raise their departing souls to heaven. Just as Tulasi respect is rewarding, her contempt attracts the wrath of Vishnu. Precautions are taken to avoid this. It is taboo to urinate, excrete or throw waste water near the plant. Uprooting and cutting branches of the plant is prohibited. When the plant withers, the dry plant is immersed in a water body with due religious rites as is the custom for broken divine images, which are unworthy for worship.¹⁹ Though Tulasi leaves are necessary for Hindu worship, there are strict rules for it. A prayer of forgiveness may also be

offered to Tulasi before the act. The word Tulasi is used in many place names and family names.

Tulsi plant has been found from throughout the Indian subcontinent and even among the Hindu diaspora abroad. Study of the phylogenetic tree confirms that all Indian Tulsi varieties belong to the same species as the species is a monophyletic clade (a lineage in which descent is from a common ancestor and includes all descendants). The phylogeny found that the Tulsi varieties of north-central India (Punjab, Gujarat, Madhya Pradesh, Uttar Pradesh, Haryana, and Himachal Pradesh) are the least diverged and almost genetically identical. The most diverged Tulsi varieties were that of Jammu & Kashmir, Jharkhand, Maharashtra, and Kerala. In general, Kashmiri, eastern Indian, and south Indian Tulsi varieties form a separate lineage that diverged from the north-central Indian Tulsi lineage at some point in history. They may have been brought there from north-central India at a later time by human migrations. The idea that Tulsi originated in north-central India and spread further to other regions is an interesting point that may have implications regarding migratory patterns in the Indian subcontinent.

It could be possible that the spread of Vaishnavism throughout India via empires and migration of Brahmins led to the spread of the Tulsi throughout the subcontinent. As of now, there lacks concise evidence that can be used to reach a conclusion as to why this genetic difference exists, but human involvement would most definitely have implications for Indic studies. Further research must be carried out regarding the genetics of the Indian Tulsi. This requires a larger sample as well as a larger region to be studied that would include Tulsi varieties found outside of India such as in Sind of Pakistan and Nepal²⁰. In addition to this, a molecular clock would be helpful in determining the timeline of divergence of the Tulsi plants of different regions. Studies can be troublesome since several human migrations may have caused gene flow in the past. Nonetheless, it is worth delving in to. Such genetic studies would shed light not only on potential migration roots but may also shed light on the agricultural aspects of ancient Hindu civilisation. Many other sacred plants exist in India that can also be genetically studied to give insight to migratory patterns and agriculture in those days.

The genetics of the Tulsi plant is indeed fascinating and holds many implications in regards to Indic studies and the anthropology of India. Such research often only focuses on human genetics, archaeology, astronomical evidence, and linguistics. It often ignores the fact that Hindu civilisation is deeply rooted in its surrounding environment. Our scriptures give reference, relevance, and reverence to various flora and fauna that are native to the subcontinent. It is obvious that with such an admiration of so many living organisms, that over thousands of years our ancestors would have had an everlasting effect on these populations that can be found in the genome of these organisms alone. It is well known that Indian cattle were domesticated thousands of years ago and are considered sacred in Hinduism, but we often

fail to look at the genetics of these domesticated animals to inquire on how different they have become from European breeds and their distant common ancestor. This information holds huge value in evaluating the naturalistic knowledge possessed by our ancestors regarding artificial selection in breeding, domestication, and the migratory routes they took.²¹

The same is true for the Indian Tulsi. Its genome holds many secrets about our past. It is important for Indic studies to take a holistic approach that integrates non-human genetics into the current fabric of scriptural evidence we use to make claims about our civilisation. Archaeology requires that we search for historical objects that may or may have not been preserved. Genetics on the other hand, while not as direct, can be found in the nuclei of any living organism of any extant species under question. It is a powerful field of research with implications far beyond biology alone.

Reference-

1. Simoons, Frederick J. (1998). *Plants of life, plants of death*. Univ of Wisconsin Press pp. 17–18.
2. Chauhan, Dr. Meenakshi (2019). 'Tulsi, Holy Basil (Ocimum Sanctum)'. Planet Ayurveda. Source: <https://www.planetayurveda.com/library/tulsi-ocimum-sanctum>
3. Prakash, S. & Gupta, N. (2011). 'Tulasi: The Wonder Herb (Pharmacological Activities of Ocimum Sanctum)' in Asian Journal of Pharmaceutical and Clinical Research.
4. Narendra Singh, Mahendra Kumar Mishra & Rajeshwar Singh (2014). 'Tulsi: The Mother Medicine of Nature' in International Journal of Herbal Medicine.
5. Simoons, Frederick J. op.cit., p. 14
6. Chatterjee, Gautam (2001) *Sacred Hindu Symbols* Abhinav Publications. p. 93.
7. *Skanda Purāṇa*, Vaiṣṇava-Khaṇḍa, Karttika-Masa-Mahatmya (fourth section), chapters 21-23
8. *Padma Purāṇa*, Uttara-Khaṇḍa, chapters 3-16.
9. www.wisdomlib.org (28 January 2019). 'Story of Tulsi Tulsi'. www.wisdomlib.org. Retrieved 24 September 2022.
10. Deshpande, Aruna (2005). *India: A Divine Destination*. Crest Publishing House. p. 203
11. Littleton, C. Scott (2005). *Gods Goddess and Mythology* Vol-II. Marshall Cavendish. pp. 1124–26.
12. Simoons, Frederick J. op.cit., pp. 7–40
13. Littleton, C. Scott op.cit., pp. 1124–26
14. Flood, Gavin D. (2001). *The Blackwell companion of Hinduism*. Wiley-Blackwell. p. 331.
15. Deshpande, Aruna op.cit., p. 203
16. Simoons, Frederick J. op.cit., pp. 16-17
17. Chatterjee, Gautam op.cit., p. 93.
18. Mani, Vettam (1975). *Puranic Encyclopaedia: A comprehensive Dictionary with special reference to the Epic and Puranic Literature*. Motilal Banarsidass Publishers. p. 797
19. Deshpande, Aruna op.cit., p. 203
20. Bast, F., Rani, P. and D. Meena. 2014. "Chloroplast DNA Phylogeography of Holy Basil (*Ocimum tenuiflorum*) in Indian Subcontinent." *The Scientific*

World Journal vol. 2014, ID 847482.

21. Baran Nilesch, [https:// Pragyata.com](https://Pragyata.com) (September 05, 2018) *The genetics and history of the Indian Tulsi*.

A Critical Study of Poverty Alleviation Schemes in Eastern Uttar Pradesh

• Ram Ratan

Abstract-*Eastern Uttar Pradesh includes a total of 28 districts of the eastern part of Uttar Pradesh. This is also known as Purvanchal. The total population of Eastern Uttar Pradesh is approximately 803.9 lakh. The literacy rate of this area is around 65%. The distribution of wealth and assets in Eastern Uttar Pradesh is unequal due to which some people are rich and most of the people are poor. The main occupation of the people of Eastern Uttar Pradesh is agriculture. From the point of view of development, this region is backward compared to the western region of Uttar Pradesh and other developed states. In the presented study, the widespread poverty in Eastern Uttar Pradesh and the efforts made by the government to address it have been critically studied. Poverty is not a problem but the root of problems for any society and country. If poverty exists on a large scale in a society, it also gives rise to many other problems. Because poor people lack resources, due to which people do not get proper and respectable standard of living. People have to depend on other individuals and governments for educational facilities, health facilities, good standard of living etc. which also gives rise to various other problems. Therefore, there is a need to eliminate the evil of poverty from the society. For this, it is even more important to control the corruption prevalent in the society, because as long as there is corruption, the eligible person will not get the benefit of any government scheme. Due to which development plans will not be able to reach the actual ground. Efforts made by the government to eradicate poverty in Eastern Uttar Pradesh have resulted in some reduction in the number of poor in this region. But this improvement is visible only in government documents because in reality there is widespread poverty in the region. Therefore, there is a need that while planning poverty alleviation, the poor should also be included in policy making and such schemes should be properly monitored so that the benefits of government schemes can reach the real poor.*

Keywords-*Poverty, Population, Wealth, Agriculture, Development*

Introduction- The Eastern Uttar Pradesh is a backward region from the point of view of economic development. The main occupation of the people here is agriculture and the condition of agriculture is also not very strong. Most of the farmers are marginal farmers, who have less than one hectare of cultivable land. They are so trapped in the trap of poverty that they are unable to get out of it even if they want to. Because their main occupation is agriculture and agriculture is only subsistence level. They do not have surplus from agriculture for marketing. So that they can fulfill the basic

needs necessary for their life. With this they are able to fulfill only their most essential needs. And they are not able to take any measures that improve the standard of living. There are 28 districts in the Eastern Uttar Pradesh namely Basti, Siddharthnagar, Sant Kabir Nagar, Gorakhpur, Kushinagar, Deoria, Maharajganj, Ayodhya, Ambedkar Nagar, Amethi, Sultanpur, Gonda, Bahraich, Balrampur, Shravasti, Prayagraj, Pratapgarh, Kaushambi, Azamgarh, Ballia, Mau, Varanasi, Ghazipur, Jaunpur, Chandauli, Mirzapur, Sant Ravidas Nagar, Sonbhadra district. It is bounded by Nepal in the north, Central Region of UP in the west, Bundelkhand proposed in the south-west, Madhya Pradesh province in the south, Jharkhand province in the south-east, Bihar province in the east.

The total area of Eastern Uttar Pradesh is 85845 square kilometers and the total population here is 80390355, which is about 40% of the total population of Uttar Pradesh. The population density in Eastern Uttar Pradesh is 931 persons per square kilometer. In the rural areas of Eastern Uttar Pradesh, about 87.8 Percent of the population resides in urban areas whereas 12.5% of the population resides in urban areas.

Objective of the Study The present study is a study of evaluation of government schemes in the context of alleviation of widespread poverty prevalent in Eastern Uttar Pradesh. Its main objectives are as follows-

- To study the poverty line in Eastern Uttar Pradesh.
- To study the poverty ratio in Eastern Uttar Pradesh.
- To study the major causes of poverty in Eastern Uttar Pradesh.
- To Study the Major Schemes run by the Government for Poverty alleviation in Eastern Uttar Pradesh.

Research Methodology and Data Collection- In the present study, Survey and analytical research method has been used by researcher. Poverty is a subject which can be understood only by meeting poor people. This research is mainly based on secondary data. Under which PSMS report published by "Poverty Monitoring Unit" of Uttar Pradesh Government, district and divisional statistical magazine, inter-district development indicator, statistical diary and Economic Survey of Uttar Pradesh and Multidimensional Poverty Index-2023 published by NITI Aayog etc. has been used. And an attempt has been made to present a critical study of various schemes run by the Government of Uttar Pradesh and Central Government to reduce poverty.

Poverty Line in Eastern Uttar Pradesh- Poverty is defined as a situation in which a person is unable to provide the essential basic needs of life required by his family. No one wants to experience this. But still due to lack of income, lack of resources, lack of Infrastructure, lack of skills etc. people are forced to live in this situation. Poverty monitoring unit "Poverty and Social Monitoring System" has been formed in 1999 to measure poverty of the government of Uttar Pradesh. Income deviation method, calorie consumption deviation method and consumption expenditure method etc. are popular for measuring poverty. In the income deviation method, special importance is given to a person's income. Whereas in the calorie

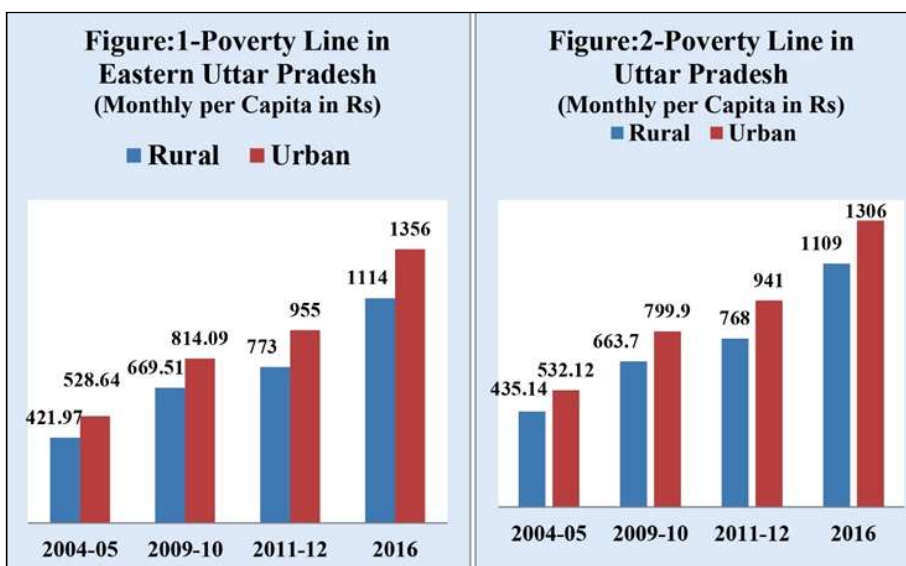
consumption deviation method, the calorie energy obtained from people's consumption is used as the standard. And in the consumption expenditure method, a "standard poverty line" is determined for the people and the person having less consumption expenditure is placed in the category of poverty. The determination of poverty line separately in rural and urban areas in different time periods by the Uttar Pradesh government is given in the following table.

Table 01
Poverty Line in Eastern Uttar Pradesh (Monthly per Capita in Rs)

S No	Year	Eastern Uttar Pradesh		Uttar Pradesh	
		Rural	Urban	Rural	Urban
1	2004-05	421.97	528.64	435.14	532.12
2	2009-10	669.51	814.09	663.70	799.90
3	2011-12	773	955	768	941
4	2016	1114	1356	1109	1306

Source: Monitoring Poverty in Uttar Pradesh, 2016 Economics and Statistics Division, Planning Department, Uttar Pradesh

***Note-** Region level Poverty line is derived using CPI Prepared by DESUP



Source: Prepared by Researcher

It is clear from the above table-1 and figures-1&2 that the standard poverty line in rural areas in Eastern Uttar Pradesh in 2004-05 was around Rs 422, which increased to around Rs 670 in 2009-10 and to Rs 773 in 2011-12 and in 2016 it increased to Rs 1114. Whereas in the urban area of Eastern Uttar Pradesh, the standard poverty line was 528.64 in 2004-05, which increased to Rs 814 in 2009-10, Rs 955 in 2011-12 and it increased to Rs 1356 in 2016.

The standard poverty line in rural areas in entire Uttar Pradesh in 2004-05 was approximately Rs 435. This increased to Rs 664 in 2009-10, Rs 768 in 2011-12 and increased to Rs 1109 in 2016. And the poverty line standard in urban areas in entire Uttar Pradesh increased to approximately Rs 532 in

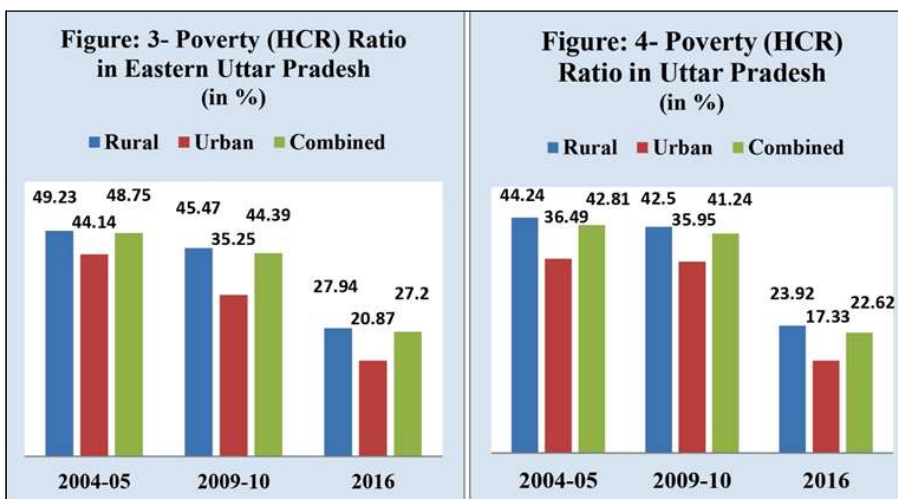
2004-05, Rs 800 in 2009-10, Rs 941 in 2011-12 and increased to Rs 1306 in 2016.

Poverty Ratio in Eastern Uttar Pradesh-The Poverty and Social Monitoring System in Uttar Pradesh estimates the number of poor using the "head count method" based on NSSO state sample data. To estimate poverty in Uttar Pradesh, "Standard Poverty Line" is determined. And poverty is estimated from time to time on the basis of this standard poverty line. According to which, in the year 2004-05, total of 48.75% people in Eastern Uttar Pradesh were living below the poverty line. In which there has been improvement and in the year 2016 only 27.2 percent people are living below the poverty line

Table 02
Poverty Ratio in Eastern
Uttar Pradesh(Based on State Sample Data of NSSO)

S No	Year	Eastern Uttar Pradesh (in Percentage)			Uttar Pradesh (in Percentage)		
		Rural	Urban	Combined	Rural	Urban	Combined
1	2004-05	49.23	44.14	48.75	44.24	36.49	42.81
2	2009-10	45.47	35.25	44.39	42.5	35.95	41.24
3	2016	27.94	20.87	27.20	23.92	17.33	22.62

Source: Monitoring Poverty in Uttar Pradesh-2016, Economics and Statistics Division, Planning Department, Uttar Pradesh



Source: Prepared by Researcher

Table-2 and Figure-3 & 4 show the percentage of families living below the poverty line in Eastern Uttar Pradesh and Uttar Pradesh. In Eastern Uttar Pradesh, in 2004-05, about 49.23% people in rural areas were living below the poverty line and about 44.14% people in urban areas, thus a total of 48.75% people were living below the poverty line. As a result of the implementation of several schemes, in 2016 it reduced to 27.94% in rural areas, 20.87% in urban areas and a total of 27.2% people in Eastern Uttar Pradesh are still forced to live below the poverty line.

Similarly, in Uttar Pradesh in 2004-05, about 44.24% people in rural areas were living below the poverty line. And about 36.49% people of urban areas and thus overall, 42.81% people of Uttar Pradesh were living below the poverty line, which in 2016 reduced to 23.92% in rural areas, 17.33% in urban areas and overall, in entire Uttar Pradesh. 22.62 % people are forced to live below the poverty line.

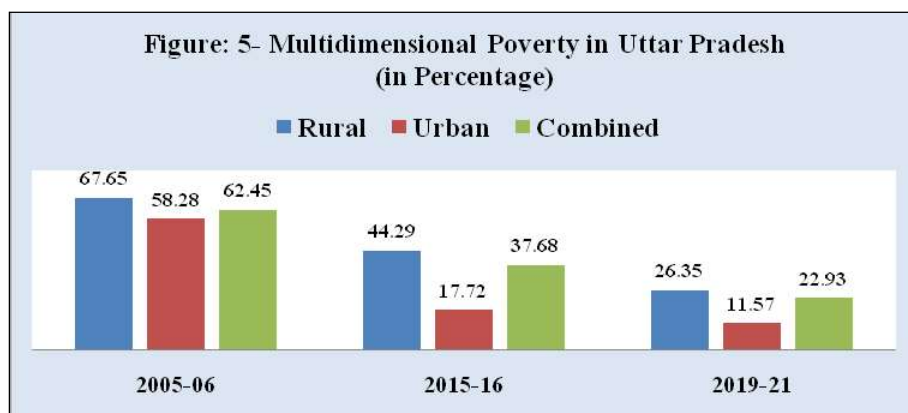
Multidimensional Poverty in Uttar Pradesh- At present, a new concept has emerged in the context of poverty which is known as multidimensional poverty. Actually, the nature of poverty is multidimensional. But the prevalent methods of measuring poverty used to measure only one aspect of it, but at present, district-wise, state-wise Multidimensional Poverty Index is being released by NITI Aayog to measure poverty. Through which information about multidimensional poverty index of any district or state can be obtained. Under this, deviations from availability of resources, availability of educational facilities, availability of health services etc. are measured on various parameters and on the basis of which a multidimensional poverty index is prepared.

Under multidimensional poverty, poverty is determined mainly on the basis of three Indicators: Health, Education and Standard of Living. These three Indicators receive different ratings to determine poverty in any region or state. And in this way the average of marks obtained on the basis of all three Indicators is calculated. This is called multidimensional poverty index. The higher this index, the more multidimensionally poor a person is considered.

Table 03
Multidimensional Poverty in Uttar Pradesh

S No	Year	Uttar Pradesh Multidimensional Poverty(in %)		
		Rural	Urban	Combined
1	2005-06	67.65	58.28	62.45
2	2015-16	44.29	17.72	37.68
3	2019-21	26.35	11.57	22.93

Source: Economic Review 2022-23 (Page-150-151)



Source: Prepared by Researcher

Given the table-3 and figure-5 show the percentage of multidimensionally poor people in Uttar Pradesh. It is clear from the above table that a total of 62.45% people in Uttar Pradesh were multidimensionally poor in the year 2005-06. In which 67.65% of the people living in rural areas were multidimensionally poor and 58.28% of the people living in urban areas were multidimensionally poor. Which has reduced to 22.93% people of Uttar Pradesh is living below the multidimensional poverty line during the year 2019-21. In which 26.35% of the people living in rural areas are multidimensionally poor. And among the people living in urban areas, only 11.57% are multidimensionally poor. Thus, it is clear that the government efforts towards reducing poverty have been successful to some extent. As a result, satisfactory success has been achieved in reducing poverty and multidimensional poverty. But more efforts are still needed for complete success.

Causes of Poverty in Eastern Uttar Pradesh- There is no single cause of poverty for people living in a particular area. Rather, that is why people are poor. Because poverty is like a vicious circle whose causes and result is both poverty. In other words if a person is poor, his income will be less. If the income is less then his savings will be less. If savings are less then investment will be less. If investment is less then production will be less and if production is less then ultimately income will be less. In this way a vicious cycle of poverty will be completed and this process continues continuously. Unless some major effort is made. Therefore, some of the main causes of poverty are as follows-

- Low Level of National Income.
- Low Level of Per Capita Income.
- Low Rate of Economic Development.
- Lack of Infrastructure.
- Traditional Technology of Production.
- Continuous Unemployment.
- Lack of qualified and Skilful Entrepreneurs.
- Increasing Population.
- Unequal Distribution of Income and Wealth.
- Old Social Institutions.
- Lack of Awareness

Poverty Alleviation and Employment Generation Programs in Eastern Uttar Pradesh

Pradhan Mantri Awas Yojana- Indira Awas Yojana was started by the Government of India in 1985-86 to provide permanent housing to families living below the poverty line. Its name has been changed to Pradhan Mantri Awas Yojana in the present government. Under this scheme, eligible families living below the poverty line are provided an assistance of Rs 1.20 lakh to build their own permanent house. Finance for this scheme is arranged by the Central and State Governments in the ratio of 75:25. Under this scheme, permanent houses have been constructed for 27.5 lakh families in Uttar Pradesh by 31 March 2023.

Pradhan Mantri Gram Sadak Yojana-Pradhan Mantri Gram Sadak Yojana was started by the Central Government in the year 2000 to connect rural settlements with paved all-weather roads. The finance for this scheme is arranged by charging the balance on diesel. The contractor concerned is responsible for the maintenance of the road constructed under this scheme for 5 years. Under the first two phases, 7163 km long road has been constructed in Uttar Pradesh. At present its third phase is going on. In the third phase, a target has been set to construct a total of 2500 kilometers of roads in Uttar Pradesh.

Pradhan Mantri Ujjwala Gas Connection Scheme-Ujjwala Gas Connection Scheme was started on 1 May 2016 by the Central Government with the aim of providing smokeless clean fuel for cooking in rural areas, under which till now 10 crore families have been given gas connections. In this, the eligible families are given a gas connection. Gas stove, filled cylinder and accessories are provided. The 10 croreth gas connection was provided to Meera Majhi of Ayodhya district by Honorable Prime Minister Narendra Modi on 30 December 2023.

Prime Minister Kisan Samman Nidhi Yojana-Pradhan Mantri Kisan Samman Nidhi Yojana was started by the Central Government on 1 December 2018 with the aim of providing financial assistance to farmers for agricultural work. Under this scheme, a total of Rs 6000 is provided to each farmer in three equal installments of Rs 2000 in a financial year. Government employees and people paying income tax have been kept out of this scheme. This scheme has been in force in Uttar Pradesh since its inception. The first installment was given to the farmers in the year 2018-19. In which a total of 111.93 lakh farmers of Uttar Pradesh were benefited. Whereas the 12th installment was provided in the year 2022-23 and a total of 179.59 lakh farmers were provided benefits.

Swarnjayanti Gram Swarozgar Yojana-Swarna Jayanti Gram Swarozgar yojana was launched in 1, April 1999. The government launched the above 6 major schemes (IRDB TRYSEM, DWCRA, GKY, MWS and SITRA) a single scheme named 'Swarna Jayanti Gram Swarozgar Yojana' was started. It was financed by the Central and State Governments in the ratio of 75:25. Till December 2007, 27.37 lakh self-help groups have been formed in Uttar Pradesh and a total financial support of Rs 19340.32 crore was provided to 93.21 lakh self-employed. This scheme has been completely merged into MNREGA.

Sampoorna Grameen Rozgar Yojana-Sampoorna Grameen Rozgar Yojana was started by the Central Government on 25 September 2001. The scheme aims to ensure food security along with building sustainable social and economic infrastructure in rural areas. Till 31 December 2007, 11.60 crore man days were generated through this scheme. Approximately Rs 1142.27 crore and 9.55 lakh tonnes of food grains were allocated. This scheme was merged into MNREGA on 1 April 2008.

Prime Minister Employment Generation Scheme-Pradhan Mantri Employment Generation Scheme was started in the budget of the year 2008-09. Pradhan Mantri Employment Generation Program is a credit-linked

subsidy scheme. This is being operated by the Ministry of Micro, Small, and Medium Enterprises to provide employment opportunities in both rural and urban areas. Under this scheme, unemployed youth above 18 years of age will be given a loan of Rs. 20 lakh to 50 lakh to start their employment. In which loan, subsidy ranges from 15 to 35%. In this scheme, up to 35% subsidy is provided on industries set up in rural areas by special category beneficiaries like Scheduled Caste, Scheduled Tribe, Other Backward Class, Minorities, ex-servicemen, Physically Handicapped, and Women. Through this scheme, March 2023 till date, permanent employment opportunities have been provided to approximately 64 lakh persons.

Establishment of Micro, Small, and Medium Industries-The Government of India implemented the industry-based memorandum system in September 2005 by amending the Micro, Small, and Medium Enterprises Development Act 2006 by the Ministry of Micro, Small, and Medium Enterprises. This was again changed and published in the Gazette by the Government of India in the name of Enterprise Registration on 26 June 2020. This is applicable from 1 July 2020. Under this, micro, small, and medium industries have been classified based on the following criteria:

- (i)- **Micro Industries-** Industries where investment in machinery, plant, and equipment is less than Rs 1 crore or annual turnover is less than Rs 5 crore.
- (ii)- **Small-scale Industries-** Such industries where the total investment in machinery, plant, and equipment is more than Rs 1 crore and less than Rs 5 crore or the annual turnover is more than Rs 5 crore and less than Rs 50 crore.
- (iii)- **Medium Industries-** Industries where the total investment in machinery, plant, and equipment is more than Rs 5 crore and less than Rs 50 crore or annual turnover is more than Rs 50 crore and less than Rs 250 crore.

Micro, small, and medium industries play an important role in the rapid and inclusive economic development of Uttar Pradesh and the creation of employment and self-employment opportunities. Therefore, the Uttar Pradesh government is also providing various types of exemptions for the establishment of micro, small, and medium industries. The state government announced the new MSME Policy 2022 on 28 September 2022. Through this 15% increase in employment is possible. In the new MSME Policy 2022 of Uttar Pradesh, a 100% stamp duty exemption has been provided to women when purchasing land for setting up an industry in Eastern Uttar Pradesh (Purvanchal). Under this policy, arrangements have also been made to provide a capital Support (Subsidy) of up to Rs 4 crore to MSME units for the first time. And exemption from inspection from any department has been granted for the first 1000 days of establishment. In the state Rs 41686.77 lakh has been allocated for the financial year 2022-23 to promote micro, small, and medium scale industries.

Pure Drinking Water Scheme-The main objective of this scheme is to ensure the availability of pure drinking water for all by 2030. In this direction, the National Rural Drinking Water Programme, Namami Gange

Programme, etc. are being run by the Government of India and India mark hand pumps have been installed to provide clean drinking water to the people. At present, clean drinking water is being made available to all houses by constructing big water tanks in all the rural and urban areas.

Chief Minister Handicraft Pension Scheme-With the aim of improving the living standards and economic condition of the handicraftsmen of Uttar Pradesh and keeping the ancient arts alive, the Uttar Pradesh Government started the Chief Minister Handicraft Pension Scheme in December 2017 for the handicraftsmen who have completed more than 60 years of age. Under this scheme, a pension of Rs 500 per month is provided to the selected artisans. Under this scheme, pension of Rs 83.12 lakh was provided to 1387 handicraftsmen in the financial year 2021-22. And an amount of Rs 100 lakh has been allocated for the financial year 2022-23.

Pandit Deendayal Upadhyay Self-Employment Scheme-This scheme was started to provide loans to Scheduled Caste and Scheduled Caste people living below the poverty line in rural areas for agriculture and other priority works. Against the total of 49543 applications received in the financial year 2021-22, 10072 applications were received. The loan was approved.

Uttar Pradesh Rural Livelihood Mission-Uttar Pradesh Rural Livelihood Mission Scheme was started to organize at least one female member of poor families in rural areas of Uttar Pradesh through groups and other community organizations and make them self-reliant. At present, the Rural Livelihood Mission Scheme is being implemented under the incentive strategy in 826 development blocks of 75 districts of the state. Through this poverty is being eradicated by increasing the livelihood opportunities of the rural poor and by increasing their family income by developing skills as per employment in external areas and by encouraging self-employment and entrepreneurship. Under this scheme, 46092 groups were formed in the financial year 2017-18 and funds worth Rs 34395 crore were made available to these groups. And in the financial year 2022-23, a total of 92509 groups have been formed and funds worth Rs 82433 crore have been made available to them.

Entrepreneurship Development Training Program-This scheme was started to control the increasing unemployment in Uttar Pradesh and accelerate industrial development, encouraging educated, trained, and technically skilled people to set up their enterprises and promote self-employment. Under this scheme, educated youth are given two weeks of general training regarding Various Entrepreneurship. Under this project structure, information about transactions from banks and other general information is provided. Under this scheme, an amount of approximately Rs 6 lakh was spent on 1200 trainees in the financial year 2021-22. In the year 2022-23, a budget of Rs 12 lakh has been allocated for 3375 trainees.

Vishwakarma Shram Samman Yojana-For the promotion and promotion of self-employed and traditional handicraft arts of traditional artisans like carpenters, tailors, barbers, goldsmiths, blacksmiths, potters, basket makers, etc. in rural and urban areas of the state and to increase the income of self-employed, the Uttar Pradesh government has launched "Vishwakarma Shram Samman Yojana" started Uttar Pradesh. Under this scheme, skill

training and new technology-based toolkits are provided to the artisans. And during the training period, the artisans are provided an honorarium of Rs 200 per day. They are also provided loan facility. Through this scheme, in the financial year 2021-22, Rs 10940 lakh was spent for providing training and tool kits to 75000 traditional programs and handicraftsmen. In the financial year 2022-23, a provision of Rs 11250 lakh has been made for providing training and tool kits to 30000 beneficiaries.

Nivesh Mitra Portal Scheme-Nivesh Mitra Yojana or Single Window Scheme was started to facilitate the establishment of micro, small, and medium industries in Uttar Pradesh. Under this, a three-tier (district level, divisional level, and state level) Udyog Bandhu Yojana is run by the state government for quick resolution of the problems of entrepreneurs related to various departments. Under this, various approvals, no-objections, and consents necessary for the ease of the MSME sector are required from the state government. Nivesh Mitra portal has been arranged by the government. Entrepreneurs can obtain NOC related to various departments by applying themselves on the website investmentmitra.up.in.

Dr. Ram Manohar Lohia Panchayat Empowerment Scheme-Dr. Ram Manohar Lohia Panchayat Empowerment Scheme was started in the year 2016-17 to establish e-governance facility in Gram Panchayat. Under this, there is a provision for software development work and training for e-governance work along with the services of technical guidance personnel in the State Program Management Unit at the state level for the establishment of e-governance in Gram Panchayats. Under this scheme, a budget of Rs 4.05 crore has been allocated in the financial year 2022-23.

Measures to Remove Poverty Eastern Uttar Pradesh- Poverty in Eastern Uttar Pradesh is a big problem for the people of this region and eliminating it is a challenging task. But still following are some major suggestions regarding reducing poverty in Eastern Uttar Pradesh.

- Fulfilment of Minimum Needs of Peoples.
- Development of Agricultural sector.
- Development of Industrial sector.
- Development of Infrastructure.
- Development of Education and Health Facilities
- Changes in Production Technology.
- Eradication of Unemployment.
- Opportunities for Self-employment.
- Special Attention to Backward Areas.
- Effective control on population growth.
- Training for Skill Development of People.
- Stability in the Price Level.

Conclusion- Poverty is the center point of all problems in Eastern Uttar Pradesh. Many efforts are being made by the government to reduce poverty, but the benefits of the efforts made by the government not reaching the real poor is a big failure in this direction. Unless the benefits of poverty alleviation schemes reach the actual poor, it is not possible to achieve the

desired success. Therefore, to remove poverty from Eastern Uttar Pradesh, development of agriculture, development of small-scale industries, cottage industries, development of large-scale industries, development of infrastructure, operation of employment-based schemes etc. are very necessary. And proper monitoring system of the implemented schemes is also very important. Various government schemes should be publicized in the society and awareness should be developed among the people. So that people can get information about the benefits received from government schemes and if they do not receive benefits then they can complain at the appropriate level. Due to which corruption and red-tape will also be controlled and poverty will be reduced in real terms from the society. To raise the standard of living of the poor, the government is providing permanent housing facilities to the people through Pradhan Mantri Awas Yojana and Chief Minister Awas Yojana. Unskilled labor is being provided to the people of rural areas through MNREGA. The government makes arrangements for social security through old age pension, disabled pension, widow pension, Atal Pension Yojana, PMJJBY, and PMSBY etc. Through the National Food Security Act, the government is fulfilling the food needs of the people. Efforts are being made to doubling the farmer's income through Kisan Samman Nidhi and people are being motivated for self-employment through Kisan Credit Card Scheme, Pradhan Mantri Mudra Yojana, and self-reliant India Scheme etc. Thus, it is clear that efforts are being made by the Central and State Government to solve the problems of the people like food, nutrition, education, health, employment etc. And if these efforts and schemes are properly implemented, observed and evaluated, then it will definitely be an important effort towards reducing poverty.

Reference-

- NITI Aayog (2023), Report of National Multidimensional Poverty Index, Government of India.
- GoUP (2021), Inter-Districts Comparative Statistics of Uttar Pradesh, Economics & Statistics Division, State Planning Institute, UP.
- GoUP (2020), Inter-State Comparative Statistics of Uttar Pradesh, Economics & Statistics Division, State Planning Institute, UP.
- GoUP (2021), District Statistical Magazine, 28 Districts of Uttar Pradesh, Economics & Statistics Division, State Planning Institute, UP.
- GoUP (2021), Divisional Statistical Magazine, 8 Divisions of Uttar Pradesh, Economics & Statistics Division, State Planning Institute, U.P.
- GoUP (2021), District-Wise Development Indicators of Uttar Pradesh, Economics & Statistics Division, State Planning Institute, UP.
- GoUP, (2016), A Report on the Fifth Poverty & Social Monitoring Survey, Economics and Statistics Division, Planning Department, Uttar Pradesh.
- GoUP, (2009-10), A Report on the Fourth Poverty & Social Monitoring Survey, Economics and Statistics Division, Planning Department, Uttar Pradesh.

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- GoUP (2012), The Twelfth Five Year Plan, State Planning Commission, Lucknow, Uttar Pradesh.<http://planning.up.nic.in>
 - Uttar Pradesh (2022), Information and Public Relations Department, Uttar Pradesh, Lucknow.
 - Panagariya, Arvind (2012) Myths about Poverty Lines. Times of India, March 30.
 - Alkire, S. (2020), Multidimensional Poverty Measures as Policy Tools. In V. Beck, H. Hahn, & R. Lepenies, Dimensions of Poverty: Measurement, Epistemic Injustices, Activism (p. 200).
 - Alkire, S., & Foster, J. (2011), Counting and Multidimensional Poverty Measurement. Journal of Public Economics, 95(7-8), 476-487.
 - Sen, A. (1985), Dharm Narain on poverty: Concepts and broader issues. In Agricultural change and rural poverty, ed. J. Mellor and G. Desai. Baltimore, Md., U.S.A.: Johns Hopkins University Press.
 - Sen, A. (1996), Economic reforms, employment, and poverty: Trends and options. Economic and Political Weekly 31 (September): 2459-2478.

Studyin relevance for increase in Agriculture Production in India with special reference to Uttar Pradesh

•Ram Lakhan Singh

••Mridula Mishra

Abstract- *The fifth phase of the 21st century is going to be very challenging for India and the world because the world population will now be around 10 billion, for which we will have to increase agricultural production by 70% to supply food grains, which seems impossible considering the current agricultural system. If we have to achieve this supply target, we will have to go beyond traditional agriculture and increase effective efforts towards semi-nutrition agriculture because the main problem we will have to face in achieving this target is the weather and soil. The situation will be availability of irrigation etc. in which weather will prove to be an important factor because by 2027 the global temperature will be at its peak due to which the production of wheat and rice is likely to reduce by about one third. The second important factor will be the structure and condition of the land and soil which should be known. Nitrogen, phosphorus and potassium are important primary nutrients of plants which need to be in proper ratio. Presently the ratio of nitrogen, phosphorus and potassium is 6.7:2.4:1 but it's ideal ratio is 4:2:1, hence the use of nitrogen is excessive compared to this ratio. The third important factor is irrigation. It affects agricultural production the most. If there is adequate irrigation facility on the land, agricultural productivity increases manifold. Even today in India, irrigation facility on 44% land is 56% depending on the year. In this technological era of 21st century, where the world has taken far ahead of the traditional agriculture, today the use of drones in irrigation and other agricultural methods is increasing in the world agriculture. If India adopts these videos, then it will achieve 44% irrigation. There will be a possibility of it expanding from the area to 90%, Uttar Pradesh is an important state of the country and a state contributing 18.89% in agriculture. According to a study, the population of India will increase from 1.38 billion in 2020 to 1.59 billion in 2040, due to which the agricultural production increase in the country will have to be done accordingly, Therefore, the present research paper studies the factors affecting agricultural production productivity are to be studied with special reference to Uttar Pradesh.*

Key words- *Agricultural productivity, food security, poverty, Gross capital formation, Investment in agriculture, Public Distribution System*

Introduction- Agriculture is the backbone of the Indian economy. Despite

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- Research Scholar, Department of Economics and Rural Development Dr Ram Manohar Lohia Avadh University
 - Professor, Department of Economics and Rural Development Dr Ram Manohar Lohia Avadh University

organized efforts for industrialization in the last two decades, agriculture remains an important place in the Indian economy. Agriculture is the main source of livelihood for 49 percent of the country's people. To evaluate the importance of agriculture in the national economy, it would be appropriate to study the trends of agricultural production and productivity. Agricultural production is mainly divided into two parts, food grains and non-food grains. In India, the share of food grains in agricultural production is only a little less than two-thirds. This is clear from the fact that in the agricultural production indices, the average (1979-80 to 1981-82=100) weightage given to food grains and non-food grains was 62.9 and 37.1. Among the food grains, the most important is rice whose weight is (29.7), second place is wheat whose weight is 14.5. Among food grains, edible oils have the most importance, whose weight is 12.6. The weight of sugarcane is 8.1 and the weight of cotton is 4.4. Agricultural productivity should be sustainable and sustainable costs should be reduced to zero. To make integrated farming through soil health management etc. zero budget Possible by focusing on natural farming (ZBNF) and efficient water management can be made. The National Sustainable Agriculture Mission was prepared in this direction. Special emphasis was laid on this during the Twelfth Five Year Plan because cultivable land is limited, hence to increase agricultural production in the future, emphasis will have to be given on increasing agricultural productivity. Keeping this objective in mind, the National Food Policy in the 11th Five Year Plan was National Security Mission (NFSM) was launched under which efforts have been made in several directions to increase productivity in low productivity districts keeping in mind the difference in potential and actual production productivity. Mainly attention has been paid to distribution of good quality seeds. Although the tremendous efforts of the National Sustainable Agriculture Mission (NFSM) have helped in increasing agricultural productivity, the National Sustainable Agriculture Mission has been prepared in this direction. Special emphasis has been given to this during the 12th Five Year Plan. But there is still potential to do much more.

Socio-economic background of Uttar Pradesh-Uttar Pradesh is located in the north central part of India between 23°52'30" and 31°28'30" latitudes. And is between 77°3' and 84°39' East longitudes. Uttar Pradesh geographical area from the point of view, it is the fourth largest state of India, whose area is 2,40,928 square km. Is. Which is 7.3 percent of the total area of the country. Six distinct soil groups in this state These are- Bhavar soil, Terai soil, Vindhya soil, Bundelkhand soil, Aravali soil and alluvial soil. Depending on the characteristics of rainfall and soil, there are 9 different agro-climatic zones of the state. The climate of this state is sub-tropical and favourable for farming. For administrative convenience, Uttar Pradesh has been divided into 18 divisions and 75 districts, under which there are 123950 villages and 753 cities. The density of population in the state was 729 persons per km and the main source of livelihood of the people of the state is agriculture and about 66% of the population earns its living from agriculture and related sectors. Over the period between 2005-06 to 2018-19, the

agricultural growth rate was 3.0% per annum (at 2011-12 constant prices), while the all-India average rate of growth was 3.6% per annum. About 28% of wheat and 12% of rice as well as 44% of sugarcane production of India's total production is produced in Uttar Pradesh. In the year 2012-13, the contribution of the primary sector in the gross state value addition was 27.7 percent, which increased to 23 percent in the year 2019-20. Agriculture has made an important contribution to the economy of Uttar Pradesh. Factors positively affecting agriculture in Uttar Pradesh Irrigation is also an important factor. Net irrigated area is 13.313 million hectares (canals) by 25.18%, by tube wells by 66.94% and by others (7.88%). Gross The irrigated area is 19.218 million hectares and the percentage of net irrigated area is 80.3%. Is. More than Punjab (98.7%) and Haryana (89.1%) compared to Uttar Pradesh. It is an irrigated area. Within the state, however, there are wide variations in irrigation coverage. While regions such as Western Uttar Pradesh, Central and Eastern Uttar Pradesh have high irrigation proportions of 90%, 83% and 77% respectively, in Bundelkhand less than half the area (48%) is under irrigation. The total geographical area of Uttar Pradesh is 29.44 million hectares and forest area is 1.658 million hectares. The cultivated area is 24.17 million hectares (82.1% of the total geographical area) and the net sown area is 16.57 million hectares (68.5% of the cultivated area). The total cropped area is 25.415 million hectares and the area sown more than once is 8.841 million hectares with a cropping intensity of 153.54%. The climate of Uttar Pradesh is predominantly subtropical, but weather conditions vary significantly with location and season. Depending on altitude, average temperatures vary from 12.5–17.5 °C (55–64 °F) in January to 27.5–32.5 °C (82–91 °F) in May and June. Precipitation in the state ranges from 1,000–2,000 mm (39–79 in) in the east to 600–1,000 mm (24–39 in) in the west. About 90% of the rainfall occurs during the southwest monsoon, which lasts from approximately June to September. With most of the rainfall concentrated during this four-month period, floods are a recurring phenomenon which is a problem.

Research Problem - Study of increase in agricultural production and productivity. This has to be done in the context of Uttar Pradesh. Agricultural productivity is an average measure of the efficiency of production. The ratio of output and input in the production process is called productivity. The concept of productivity first appeared in 1766 in the writings of Quesne, the founder of naturalism. Its meaning remained unclear for a long time. Overall productivity reflects the ratio between the production of products and assets in the form of goods and services and the cost of resources used in the process of production. Often the words 'productivity' and 'production' are mistaken as synonyms. Actually, there is a substantial difference between these two words. 'Productivity' is the ratio of resources to total production. The goods and services obtained from all resources are 'production'. In this, the aspect of expenditure is not taken into account because production can be increased by spending more on resources, but it is not necessary that productivity increases. Agricultural productivity refers to production per

hectare in a particular area. Soil, climate, agricultural technology, capital and fertilizers have special importance in agricultural productivity. What happens in some areas, optimum production may not be achieved even by using more fertilizers. Here soil testing is necessary so that the proportion in which irrigation is done in the soil, and fertilizers can be used in the same proportion as required. To maintain productivity, crop spacing and nutrients present in the soil Regular checking of elements is necessary. Physical factors, improved seeds, means of irrigation, fertilizers, mechanization, farmers' skills, capital and new technologies have special importance in increasing agricultural productivity.

Literature Review -The introduction of any research work is prepared from the previous study done in that subject. Various studies are presented before us through books and articles. These books and articles throw light on the subject matter from different perspectives. From this point of view, a review of the available books and articles of magazines related to the subject is being presented, on the basis of which the relevance of the study has been ensured.

Archana S. Mathur, Sujit Das and Subhalakshmi Sircar in their research study "Status of Agriculture in India: Trends and Prospect" found that a 15 percent annual increase in public investment can achieve four percent annual growth rate in the agriculture sector. Which will be equal to the target rate of the 11th and 12th five-year plans. Most of the increased government expenditure will be on investment in rural infrastructure. Which should include expenditure on irrigation and water management projects, stock marketing etc. Is included. Other accounts which are necessary for high agricultural growth rate. They are fertilizers Utilization and remunerative agricultural prices.

C.H. Hanumantha Rao, Agriculture, Food Security Poverty and Environment, 2005, in his research study has estimated that in the late 1980s, agricultural productivity on irrigated land was two to three times higher than that on non-irrigated land. He found that there is a positive relationship between irrigation and agricultural productivity.

Ashok Gulati and Seema Bathla, Capital formation in Indian Agriculture: Trends Composition and Implication for Growth Gulati and Batla, in their research study, had estimated that the public sector (which includes irrigation and energy 7 investment) would decline by 10 percent in agriculture. There is a possibility of 2.4 percent annual decline in domestic product.

Anitha Ramanna, "India's Policy on IPRs and Agriculture" Economics and Political Weekly (EPW) December 22, 2001 in her research study found that merely making laws related to ownership rights is not enough. Law is also necessary for the protection of agricultural resources. India has a huge number of genetic resources and if these were available for free then corporations from developed countries would try to capture them and make patented products.

Government of India, State of Indian Agriculture 2011-2012 Government of India Variation in agricultural growth during the period 2000-01 to 2010-11 as per the report of The coefficient became 1.6 whereas

in the period 1992-93 to 1999-2000 this coefficient was 101. Was. This is not only six times the coefficient of variation in the country's GDP but has also increased over time.

In a research study by Indicas Analytics, "Pulses of the Nation" Business Standard, February 23, 2012, the productivity of pulses has increased by an average of one percent per square meter annually over the entire plan period. As a result of the use of hybrid seeds, the productivity of maize has increased over the years and as a result of the use of BT cotton, the productivity of cotton has increased.

B.D. Dhawan, "Indian Irrigation: As Assessment" in his research study found that in 1983-84 the productivity on irrigated land was about 22 quintals per crop hectare whereas on non-irrigated land it was only 9 quintals per crop hectare. Therefore, there is a positive relationship between agricultural productivity and irrigation.

Ramesh Chandra, S.S. Raju and L.M. Pandey "Growth Crises in Agriculture" Economic and Political Weekly in its research study found that increasing the use of fertilizers is an important option in increasing agricultural production in most of the states. The elasticity of agricultural production towards fertilizer use in different states ranges from 0.134 to 0.700.

Research study by Crop Care Foundation of India found that pests and as a result of diseases, India faces the loss of one crore fifty lakh rupees every year.

There is loss of agricultural production. In a study published in the year 1995 by World Bank India: Sustaining Reform Reducing Poverty-2003, C. Brandon and K. Houman had estimated that as a result of soil degradation in India, agricultural production worth \$1.9 billion is lost every year and Due to water erosion, there is a loss of 20 percent or more in soil productivity in some states of India including Uttar Pradesh.

Dr. Jain, C.K. and Mr. Prakash Ahirwar 2011: "Modern and Innovation of Agriculture" research in which is an important study related to the process of agricultural innovation and the impact of the use of innovative technology on agricultural productivity has been highlighted.

Dr Kumar, Alok Dr Yogi, Rajkumar Dr Singh, Ajay Kumar and Dr Jaiswal, Anil Kumar (August 2016): In the article titled 'Extension education and farmers in agriculture and rural development', government agencies, private institutions, government organizations, Emphasis on the need for cooperation of clubs and farmer committees have given. Towards crop production as well as entrepreneurship development for agricultural development. Have attracted the attention of farmers, such as soil testing laboratory, organic fertilizers and Production etc Dedicated to Rural Development by Ministry of Information and Broadcasting, Government of India

Kurukshetra- May 2018 Special Issue' Technical Agriculture and Rural Areas in Rural Development The following articles have been presented by various experts for sustainable development, which are very useful along with enhancing knowledge. From villages to cities, in an article

presented by the staff reporter on 'Plastic Pollution' in 'Geography and AAP', the magazine of development and environment in India, Year 17. Issue 98, May 2018. The magnitude of plastic pollution has been underlined, the negative impact of this pollution on agriculture, human health and environment has been discussed. The situation of plastic pollution increasing in villages in India and the government efforts for its solution have also been underlined. At the same time, the need for public participation has been emphasized to solve this terrible problem.

Research objective-

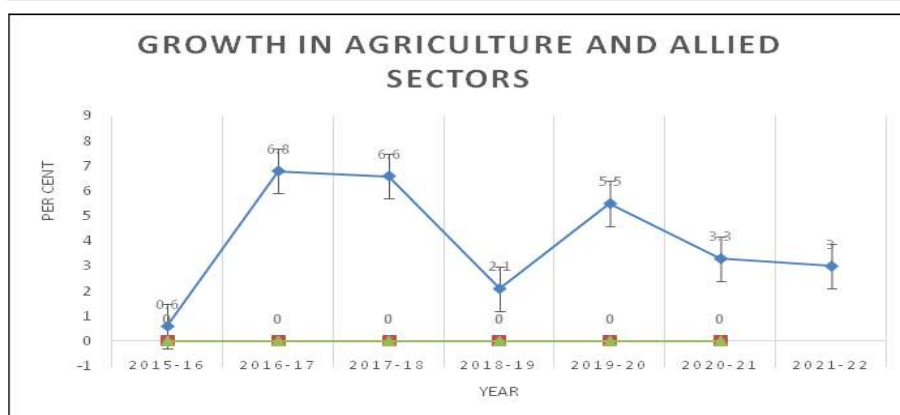
1. To study agricultural production and productivity of Uttar Pradesh.
2. Need and need for integrated management of land and water resources under agriculture.
3. Study of need and opportunity of integrated agriculture within agriculture.
4. Study of factors determining agricultural production and productivity.to do.
5. To study the facilities related to agricultural credit and agricultural marketing.

Research methodology- This research design will be of exploratory type. This research will be based on both primary and secondary data. Questionnaire, schedule and personal interview and survey techniques will be used to collect primary data. For secondary data, government, semi-government data, newspapers, magazines, research papers, research texts, journals, media reports etc. published from time to time will be used. And appropriate statistical methods will be used for classification, tabulation, interpretation and interpretation of data.

Data Analysis & It has proved to be the backbone of the Indian economy as it helps in economic development in many ways, by supplying food grains and raw materials, providing raw materials to the industrial sector, generating surplus in agricultural products and earning foreign exchange through exports. In the While the growth rate remained negative, the growth rate of agriculture was 3.4% and remained a means of livelihood for the elderly people. The contribution of agriculture in gross capital formation was 17% in 2013-14, but it decreased to 15.8% in 2014-15. Investment in agriculture still depends on public investment. It is a misconception that investing like business units is not beneficial for the people. It can still be seen that the potential for development in this sector has still not materialized in the Indian economy. Therefore, we can say that agriculture is still on the margins of development. In the last few years, the growth of agriculture has been either negative or with very normal growth. Agriculture, along with being helpful to people's livelihood in conditions like Covid pandemic, has also provided employment opportunities to them and all the current schemes of the government which come under the Food Security Act or in other words, those who are able to get high quality grains. All of them have been made available at a minimal cost or free of cost. The success of these schemes depends only on the increase in agricultural productivity. To increase

agricultural production, the entire economic and social thought needs to be changed and a new energy can be breathed in. There is a need so that the golden dream of doubling the farmer's income by 2022 seen by the Honorable Prime Minister can be fulfilled.

Year	Agriculture growth rate of India
2014-15	-0.2
2015-16	0.6
2016-17	6.8
2017-18	6.6
2018-19	2.1
2019-20	5.5
2020-21	3.3
2021-22	3.0



Ministry of Statistics and Program Implementation Annual and Quarterly Estimates of Gross Domestic Product at Constant Prices, 2011-12 Series.

The present table shows that growth in Agriculture & Allied sectors over the period of 2015-16 to 2021-22, which shows a slowly declining pattern which initially rises and a drop over at 2018-19 with a sharp rise in 2019-20.

Crop	World Average	India 2016	Maximum Productivity	Country
Rice	4397	2550	6661	China
Wheat	3094	3216	7360	UK
Maize	5097	2664	8858	USA
Lentils	000	739	-	-
Gram	917	973	1663	Ethiopia
Tur	786	885	1320	Myanmar
Groundnut	1626	1424	4069	USA
Rapeseed	1855	1324	3588	UK
Cotton	769	519	1920	Australia
Sugarcane	70470	70	125587	Peru

Source- Ministry of Agriculture, Government of India

The current table explains comparison of each crop produced worldwide with world average, India's share along with Maximum productivity.



Area, production and yield of major crops

Crop	Area (Lakh Hectares)			Production (Million Tonnes)			Yield (kg/hectare)		
	2018-19	2019-20	2020-21*	2018-19	2019-20	2020-21*	2018-19	2019-20	2020-21*
Rice	441.56	436.62	450.67	116.48	118.87	122.27	2638	2722	2713
Wheat	293.19	313.57	316.15	103.60	107.86	109.52	3533	3440	3464
Nutritious/Coarse Grains	221.46	239.88	238.28	43.06	47.75	51.15	1944	1991	2146
Pulses	291.56	279.87	288.33	22.08	23.03	25.72	757	823	892
Food grains	1247.77	1269.95	1293.43	285.21	297.50	308.65	2286	2343	2386
Oilseeds	247.94	271.39	287.88	31.52	33.22	36.10	1271	1224	1254
Sugarcane	50.61	46.03	48.57	405.42	370.50	399.25	80105	80497	82205
Cotton@	126.14	134.77	130.07	28.04	36.07	35.38	378	455	462
Jute and Mesta#	7.05	6.73	6.63	9.82	9.88	9.56	2508	2641	2595

Fourth Advance Estimate @ Production in million bales of 170 kg each # Production of million bales of 180 kg each. The present table focuses on Area for each crop with total output and yield of production over a three-year period presented individually.

Conclusion and suggestions-After considering these issues, the policy makers of India decided that a revolutionary effort was made to increase the productivity in the agricultural sector through land reforms and the use of high yielding varieties of seeds. At the time of independence, 75 percent of the country's population was dependent on agriculture and agricultural productivity was very low. The increase in agricultural production as a result of Green Revolution was due to area expansion and not due to increase in agricultural

productivity. India is one of the largest producing countries in the world in most of the agricultural crops. For example, in the world India has the largest area under paddy (rice) and wheat, in which Uttar Pradesh has made a significant contribution. Therefore, to increase agricultural productivity, increasing the intensity of crops, protection of plants, determining a fixed size of land and use of improved seeds, fertilizers, increasing the facilities of irrigation etc. can help in increasing agricultural productivity. It is likely to increase, because if agricultural productivity increases then 'marketed' The 'surplus' will have a positive impact on the economy and lead to inclusive growth. To reduce poverty level, to develop rural economy and to increase the income of the agricultural sector, it is necessary to achieve a minimum agricultural growth rate. Due to which Uttar Pradesh will definitely meet the demand for food grains in domestic and international markets will play an important role in supply.

Reference-

1. Economic and Political weekly, volume 35 number 13 March 2000
2. India Year Book
3. Food and Agriculture Organization of the United Nations.
4. World Food Summit 1996. Food and Agriculture Organization of the United Nations 1996
5. Joshi P.K. "Pathways to Improve Food Security and Reduce Poverty in Emerging India". Agri. Econ. Res. Review. 2016
6. Rosegrant M.W. "Challenges and Policies for Global Water and Food Security." (2016-17)
7. Jayasuriya S., Mudbhary P., Broca S. "Food Security in Asia: Recent Experiences, Issues and Challenges."
8. Sarkar A.N. "Global Climate Change and Confronting the Challenges of Food Security." Productivity. 2016
9. Rojas R.V., Achouri M., Maroulis J., Caon L. Healthy soils: A prerequisite for sustainable food security. Environ (2016-17)
10. United Nations Sustainable Development Goals: 17 Goals to Transform our World. United Nations (23 July 2017)
11. Cuesta J. Is long-term food insecurity inevitable in Asia?(2014)
12. FAO The State of Food Insecurity in the World (11 September 2017)
13. Narayanan S. "Food Security in India: The Imperative and Its Challenges. Asia Pac. Policy Study" (2015)
14. Global Hunger Index: The Inequalities of Hunger. International Food 2017
15. Upadhyay R.P., Palanivel C. Challenges in achieving food security in India. Iran. J. Public Health.
16. Choithani C. Understanding the linkages between migration and household food security in India. (2016)
17. T., Stein A.J., Qaim M. The global burden of chronic and hidden hunger: Trends and determinants. Glob. Food Secur. 2018
18. Targeted Public Distribution System. (9 September 2017)
19. Kishore A., Chakrabarti S. Is More Inclusive More Effective? The 'New

- Style' Public Distribution System in India. Food
20. Buchan J. India's Food Policy Paradox. Undercurrent (2007)
 21. Planning Commission Public Distribution System (9 September 2017)
 22. Economic Survey २०२०-२१
 23. Banerjee O., Darbas T., Brown P.R., Roth C.H. Historical divergence in public management of foodgrain systems in India and Bangladesh: Opportunities to enhance food security. (2014)
 24. Tanksale A., Jha J.K. Implementing National Food Security Act in India: Issues and challenges. Br. Food J. 2015
 25. Economic Survey: 2020-21
 26. India Year Book: 2020-21
 27. Uttar Pradesh Year Book: 2020-21
 28. Economic and Political Weekly
 29. Mishra and Puri Indian Economy: 2019-20
 30. 32. Dutta and Sundaram Indian Economy: 2019-20
 31. Acharya S.S., 2004. Agricultural Marketing, State of Indian Farmer, A Millennium Study, Academic Foundation New Delhi.
 32. Alagh YK 2004. State of the Indian Farmer, A Millennium Study an Overview, Academic Foundation New Delhi.
 33. Chawla N.K. M.P.G. Krai and Vijay Pol Sharma 2004. Animal Husbandry, State of the Indian Farmer, A Millennium Study, Academic Foundation, New Delhi.
 34. Deha P.V Dharai and, Y.S. Yadav 2004. Fisheries Development, State of the Indian Farmers, A Millennium Study, Academic Foundation New Delhi.
 35. Jalan Vimal (Ed.) 1992. The Indian Economy, Problems and Prospects, Pigeon Publications, New Delhi.
 36. Narayan S. 2005. Organic Farming in India, NABARD Occasional Paper No. 38, Development of Agriculture and Rural Development, Mumbai.
 37. Singh H.P. & Premnath, P. Dutta, M. Sudha 2004. Horticulture Development, State of the Indian Farmer, A Millennium Study, Academic Foundation New Delhi.
 38. Singh Surjit and Vidyasagar 2004. Agricultural Credit in India State of the Indian Farmer, A Millennium Study, Academic Foundation, New Delhi.
 39. Sinha V.K., 1998. Challenges in Rural Development, Discovery Publishing House, New Delhi. Todase, Michael P. 1987. Economic Development in the Third World, Orient Longman Limited, Hyderabad.
 40. Toppo 2004. Organic Vegetable Gardening, Grow Your Own Vegetables Utin for Labor Studies, Tata Institute of Social Sciences, Mumbai.
 41. Government Reports Annual Report, Ministry of Rural Development, Government of India, New Delhi.
 42. Planning Commission 2002. Success Full Governance Initiatives and Best Practices: Experiences from Indian States, Government of India in coordination with Human Resource Development Center and UNDP, Delhi, 2002.

43. Basic Animal Husbandry and Fisheries Statistics, Ministry of Agriculture and Farmers Welfare, Government of India.
44. Archana S. Mathur, Sujit Das and Subhalakshmi Sircar "Status of Agriculture in
45. India: Trends and Prospect
46. C.H. Hanumantha Rao, Agriculture, Food Security Poverty and Environment, 2005
47. Ashok Gulati and Seema Bathla, Capital formation in Indian Agriculture: Trends Composition and Implication for Growth
48. Anitha Ramanna, "India's Policy on IPRs and Agriculture" Economics and Political Weekly (EPW) December 22, 2001
49. Government of India, State of Indian Agriculture 2011-2012
50. Indicas Analytics, "Pulses of the Nation" Business Standard, February 23, 2012
51. B.D. Dhawan, "Indian Irrigation: As Assessment"
52. Ramesh Chandra, S.S. Raju and L.M. Pandey "Growth Crises in Agriculture" Economic and Political Weekly
53. Crop Care Foundation of India
54. World Bank India: Sustaining Reform Reducing Poverty-2003
55. Dr. Jain, C.K. and Mr. Prakash Ahirwar 2011: "Modern and Innovation of Agriculture"
56. Dr Kumar, Alok Dr Yogi, Rajkumar Dr Singh, Ajay Kumar and Dr Jaiswal, Anil Kumar (August 2016): 'Extension education and farmers in agriculture and rural development'

Review of Some Literature on About Hypertension and Dietary Lifestyle Modification

•Roshani Kushwaha

•• Shuchita Tiwari

Abstract- *The problem of hypertension is also called 'silent killer' because the symptoms of this disease are detected very late. People can be helped to control and manage high blood pressure by making certain changes in their lifestyle. Some instructions have been given for the prevention of high blood pressure, which if followed regularly can control hypertension, such as maintaining a regular lifestyle. Exercise should be done regularly so that the level of blood pressure also remains regular. There is a need to pay special attention to your diet on the basis that a balanced diet should be consumed regularly. Alcohol and smoking should not be consumed. All adults should aware this disease and take steps to manage and control it.*

Keywords- *Hypertension, Disease, High Blood Pressure, Lifestyle*

Hypertension is an insidious, common, and deadly disease. Worldwide, it is estimate that one billion people have hypertension. According to WHO, more than 700 million people worldwide suffer from untreated high blood pressure. Nearly 1 in 2 adults in the United States has high blood pressure, according to the ACC & ACHE Hypertension Guidelines. According to the centres for disease control and prevention (CDC), about 45% of adults in the United States have high blood pressure.

According to research published in the Indian Heart Journal in 2019, about one in 3 adults in India suffers from high blood pressure. The overall prevalence of hypertension among adults in India is 30% with 34% urban prevalence and 28% rural prevalence. Unfortunately, only 38% of urban and 25% of rural Indians have high blood pressure under control.

Similarly, The National Family Health Survey of 2015-2016 reported a prevalence of hypertension of 19% among men and 17% among women, which has increased to 24% and 21%, respectively, in 2019-2020.

Similarly, if we look at the statistics of WHO, about 33% of the urban and 25% of the rural population are suffering from hypertension. Only 1 in 10 people in rural areas and 1 in 5 people in urban areas are able to control their blood pressure.

Hypertension is a condition in which arterial blood pressure is chronically elevated. It is defined as a systolic blood pressure equal to or above 140 mmHg and diastolic blood pressure equal to or above 90 mmHg.

The problem of hypertension is also called 'silent killer', because the symptoms of this disease are detected very late. The serious thing is that until the problem increases, 60 to 70 percent people do not even know that they are suffering from hypertension. It continues to affect the functioning of the body and organs and affects the quality of life of the sufferer. Hypertension or elevated blood pressure is a major independent risk factor for coronary heart disease (CHD). Hypertension is a factor for cardiovascular disease including stroke, kidney and other diseases.

Blood pressure is such a problem related to health, which most people do not pay attention to, the main reason for which is the 'lack of information'. Due to poor lifestyle and unhealthy diet, the number of hypertension patients is increasing continuously. The second major cause of hypertension is stress and obesity, which is seen more in people living away from home. According to Clinton's report in 2018, 35% of Indians consume fast food less than once in a week. There is a lack of essential nutrients in junk food, due to which obesity increases.

Unhealthy dietary pattern, Consumption of food containing too much salt, Sedentary lifestyle, Harmful level of alcohol use, Tobacco use, Smoking, Physical inactivity and lack of exercise, Poor stress management are main factors that contributed to development of high blood pressure and its complication.

The present findings in this study revealed that patients under 65 years of age were less likely to practice lifestyle modification by 41%. The prevalence of good lifestyle modification among hypertensive patients in the study area was as follows. Therefore, it is imperative to focus more attention on providing nutritional counselling and health promotion to improve the practice of lifestyle modification in hypertensive patients (Moges Smachew, et.al. 2022).

Chanyalew Worku Kassahum et.al, (2019) conducted a descriptive cross-sectional study among 384 patients with hypertension at Gondar University Specialty Hospital, Ethiopia. As a result of this study, 215 (56%) participants had good knowledge about hypertension and 228 (59.4%) had knowledge about their self-care. The frequency of those participants was good, whose knowledge was good. It was concluded from this study that the knowledge of hypertension among the patients was low and the frequency of self-care was moderate. That's why it is necessary to increase awareness among patients. Further interventions on medication adherence, consumption of a low-salt diet, physical activity, weight management, reduction in cigarette smoking and alcohol consumption are more important.

Supriya Pradhanaga (2017) conducted a study on knowledge, attitude and dietary practices on hypertensive patients of Itahri, Sunsari and she found that in this study 77%, 48.4% and 41% of patient's received good knowledge, attitude and practice scores, respectively. Patients level of education and physical activity were the main contributory factors with KAP score ($p < 0.05$). In dietary practice, she found that patients consume a diet rich in fruits and vegetables, although a high intake of salt was found. This

study revealed good knowledge and attitude, but poor practice scores among the hypertensive patients.

Similarity, in a study published in Lancet, it has been told that unhealthy diet is more responsible for premature deaths. Unhealthy diet is the second biggest factor behind risk cover, death and disability in India in 2017 after malnutrition.

According to the study Dietary risks were the second biggest factor behind death and disabilities in 2017 in India, following on the heel of malnutrition.

A new study published in Lancet has indicated that unhealthy diet is responsible for more premature deaths than any other health risks.

A healthy diet is essential for good health. Diet plays an important role in high blood pressure. The main reason for this due to the association of a poor diet related to the development of high blood pressure. DASH Stand for Dietary Approaches to Stop Hypertension. The DASH diet is a healthy eating plan designed to help treat or prevent high blood pressure (hypertension). DASH was first introduced at meeting of the American Heart Associations in 1996. To test the effect of dietary patterns on lowering blood pressure, the DASH trial randomly followed 656 people with different diets, in which those on the DASH diet were found to have lower BP. The diet is sometimes prescribed by doctors to help treat or prevent hypertension or high blood pressure.

Some studies suggest that olive oil is an important component of the Mediterranean diet. A Mediterranean diet rich in fruits, vegetables and healthy fats helps reduce hypertension. According to another study, the recommended intake of Mediterranean foods and lifestyle modifications help in reducing the complications of other diseases related to hypertension like heart disease, stroke, diabetes etc.

Dietary changes are preferred in hypertension. Diets rich in whole grains, especially whole grains, reduce the risk of high blood pressure. Millet is a traditional nutritionally stable food, which can add variety to the overall diet. That is why millet is recognized as a smart food. By including millets in the diet, it controls the level of lipids in the blood. They play an important role in managing diabetes and hypertension and reducing the risk of developing heart disease.

According to recent clinical studies, people are advised to take millet preparations as foxtail millet can control the increased blood pressure to a great extent.

Vegetarian diet is defined as a dietary pattern. All vegetarian plans emphasize foods of plant origin, especially vegetables, grains, legumes, and fruits. Some vegetarian diets also include eggs and dairy products. Consuming a vegetarian diet is associated with a lower prevalence of hypertension in observational studies.

In a recent study, scientists told that if the patients of high blood pressure or hypertension consume plant-based diet or vegetarian diet, then their blood pressure is reduced. This is due to the fact that the vegetarian diet has a higher portion of glutamic acid and plant-based diet protein, which has

blood pressure-lowering effect.

Apart from hypertension, vegetarian diet and plant-based diet protect against the risk of many other diseases. They contain abundant fibre and antioxidants along with micro and macronutrients. People who use plant-based diet, the problem of hypertension is very less in them

Socio-economic condition in the world suggests that prevention through Lifestyle Modification is the universal “vaccine” against Hypertension. maintain normal weight, dietary sodium reduction, physical activity, smoking cession are decreased blood pressure level. This lifestyle modification is very necessary to control hypertension.

In my view, the problem of hypertension is also called 'silent killer' because the symptoms of this disease are detected very late People can be helped to control and manage high blood pressure by making certain changes in their lifestyle. Some instructions have been given for the prevention of high blood pressure, which if followed regularly can control hypertension, such as maintaining a regular lifestyle. Exercise should be done regularly so that the level of blood pressure also remains regular. There is a need to pay special attention to your diet on the basis that a balanced diet should be consumed regularly. Alcohol and smoking should not be consumed. All adults should aware this disease and take stapes to manage and control it.

References-

1. Giovanni De Pergola and Annunziata D' Alessandro, influence of Mediterranean Diet on Blood Pressure. November.
2. <https://www.amarujala.com> May 17, 2022
3. <https://www.healthifyme.com>blog>
4. <https://www.hsph.harvard.edu>
5. <https://www.jagran.com> 2022
6. april,2020<https://www.m.timesofindia.com> April 7, 2019
7. <https://www.myupchar.com>
8. <https://www.newsnationtv.com/amp/lifestylefood-and-racipe/cookie...> 13july, 2018.
9. <https://www.pubmed.ncbi.nih.gov> 2018
10. <https://www.thehealthsite.com>
11. <https://www.tribune.com.pk/story> May 29, 2019
12. Yokoyama Y., Nishimura K., Barnard D. et al. vegetarian diet and blood pressure, Med 2014;174(4):577-587

Exploring Natural Approaches: Home Remedies for Blood Sugar Control

• Saroj Sinha

Abstract- *Diabetes mellitus is a metabolic disorder identified by increased blood glucose levels resulting from increased hepatic glucose production, reduced insulin secretion, and impaired insulin action. The number of plants described in this study are easily available at home, particularly in India which is being used in diabetes treatment. Home remedies are preferred due to low cost, lesser side effects, and longer shelf life. The effects of these home remedies may postpone the progress of diabetic complications and correct metabolic abnormalities. The uses of aloe vera, bitter guard, bay leaves, cinnamon, jamun seeds, etc., will help reduce the patient's blood sugar levels. This study aims to find out about the use of home remedies by diabetic patients to control blood glucose levels.*

Keywords- *Home remedies, diabetes mellitus, diabetic patients*

1.Introduction- Diabetes is steadily spreading throughout the world. Diabetes is a long-term metabolic disease of the lipid, protein, and carbohydrate metabolism that is characterized by elevated blood sugar levels after meals and during fasting. Diabetes is a complex condition that may result from both insulin insufficiency (lower insulin production) and insulin dysfunction (improper functioning of insulin). Diabetes is a multifactorial disease that, if uncontrolled, can result in several problems. Globally, the prevalence of diabetes is predicted to rise from 4% in 1995 to 5.4% in 2025.¹¹

According to WHO predictions, emerging nations will bear the brunt of it. Studies carried out in India over the past ten years have highlighted the high incidence of diabetes as well as its rapid increase in the urban population. Approximately 57.2 million adults in India are predicted to have diabetes by 2025, compared to the approximately 33 million adults who have the disease currently.¹⁵

Given the data on the rising occurrence, it is imperative to investigate natural home remedies for properly managing diabetes. The field of home remedies for diabetes has grown exponentially in the last few years due to the easy availability of ingredients that are commonly found in Indian kitchens. These remedies are becoming more and more popular in both developed and developing nations due to their natural origins and lower risk of side effects.

Against the backdrop of the above introduction, this study was undertaken with the following objectives.

• Research Scholar, PG Department of Home Science, Kolhan University, Chaibasa

2. Objectives-

1. To assess the knowledge regarding various home remedies used by diabetic patients, to control blood sugar levels.
2. To find out the frequency of use of different home remedies by diabetic patients

3. Hypothesis-

1. The patients are using various home remedies to control their sugar levels.
2. Women have more awareness than men about home remedies.

4. Sample Criteria-

4.1. Inclusion Criteria-

Diabetic patients in different areas of Jamshedpur city.

Patients of age group 35-65, irrespective of their occupation, marital status, education, gender, family type, duration of illness, types of diabetes

4.2. Exclusion Criteria-

Diabetic patients with other morbid conditions have not been included in the study

5. Methodology-

A non-experimental descriptive study research design was adopted to conduct the study among 100 diabetic patients in different areas of Jamshedpur city who were selected randomly. A questionnaire schedule was constructed to collect data regarding knowledge about home remedies and frequency of uses.

6. Description of Tool-

1. Knowledge about home remedies.
2. Frequency of usage of home remedies

7. Observation

Scoring of responses was done on a five-point scale.

Table 01

Distribution of data based on knowledge of diabetic patients about home remedies mellitus, n=100.

Knowledge	Score	Frequency	Percentage
Poor	0-7	0	0.0%
Average	7-14	34	34.0%
Good	15-20	66	66.0%

Table 1 shows the knowledge of diabetic patients about home remedies for diabetes mellitus. This table also shows that 66.25% of patients have good knowledge and 33.75% have average knowledge regardless of their education, occupation, family type, gender, etc. Similar findings were observed in a study by (Sijiet al., 2019) where 69.0% of diabetics had good knowledge of home remedies.

Table02
Rank order of home remedies used by diabetic patients.

S. N.	Home Remedies	Percentage	Rank Order
1	Spinach	88%	1
2	Drumstick	85%	2
3	Tulsi Leaves	82%	3
4	Garlic	79%	4
5	Cinnamon	77%	5
6	Triphala	76%	6
7	Fenugreek	73%	7
8	Giloy	69%	8
9	Turmeric	68%	9
10	Amla	65%	10
11	Bitter Gourd	65%	11
12	Clove	63%	12
13	Lemon	62%	13
14	Cucumber	59%	14
15	Neem Leaves	57%	15
16	Bay Leaves	55%	16
17	Sadabahar	50%	17
18	Ginseng	49%	18
19	Jamun Seeds	46%	19
20	Aloe Vera	45%	20
21	Paneer Ka Phool	41%	21
22	Gurmar	33%	22
23	Belpatra Leaves	30%	23
24	Bael	25%	24
25	Mango Leaves	22%	25
26	Vijaysar	22%	26

The above table depicts that Spinach is the most frequently used home remedy, followed by drumstick and Tulsi leaves. A Study by (**Matpadyet al, 2023**) supports these findings, where diabetic patients showed greater usage of Spinach in comparison to Drumstick and Tulsileaves. All these three are used by more than eighty percent of respondents. Garlic, Triphala, cinnamon, and fenugreek are used by more than seventy percent of respondents

Giloy, turmeric, Amla, bitter gourd, cloves, and lemon are used by more than sixty percent of respondents. Cucumbers, neem leaves, bay leaves, and sadhabahar are used by more than fifty percent of respondents. All other remedies are used by less than fifty percent of respondents. Aloe Vera, Bael, and Baelpatra are the least used by diabetic patients as per this study although they have very good medicinal value. A similar study by (**Kooti et al, 2016**) reported that 75%-80% of diabetic patients use different kinds of home remedies like Fenugreek, Garlic, Triphala, etc and 60%-65% of diabetics used Giloy, Amla, Cloves and lemons to control their blood sugar levels.

Reason:

Spinach-It is a water-soluble vegetable with high fiber, low-glycemic index

food which is a good source of vitamin C, plant-based iron, potassium, and magnesium, and super low calories and pocket friendly also.

Tulsi Leaves-It is well-known anti-bodies, and are found everywhere easily. Tulsi leaves are said to improve pancreatic beta-cell function and insulin secretion, and further increase the uptake of glucose by muscle cells.

Drumsticks-The various vitamins and minerals present in drumsticks help maintain healthy blood sugar levels and are highly advisable for people with diabetes, [insulin-like proteins found in them may help lower blood sugar](#). It is easily available everywhere.

Fenugreek-These are a source of soluble fiber and contain (Galactomannan) an essential constituent that lowers the rate of absorption and digestion of carbohydrates, improving glucose intolerance. It is very frequently used in houses in India.

Table 03
Home Remedies Consumed Everyday

SL. No.	Frequency / Percentage	Home Remedies
1	75% and above	Aloe vera, Amla,
2	60% - 74%	Bay leaves, Cinnamon, Fenugreek, Jamun Seeds, Lemon, Neem leaves,
3	50% - 59%	Belpatra leaves, Bitter guard, Cucumber, Giloy, Grumar, Mango leaves, Paneer ka phool, Sadabahar, Spinach, Triphala, Tulsi leaves, Turmeric, Vijaysar and Any other
4	40% - 49%	Bael, Clove, Drumsticks, Garlic
5	Below 40%	Nil

Table 3 shows that 75% and above diabetic patients use Aloe vera and Amla, 60% - 74% of diabetic patients use leaves, Cinnamon, Fenugreek, Jamun Seeds, Lemon, and Neem leaves, 50% -59% of diabetic patients use Belpatra leaves, Bitter guard, Cucumber, Giloy, Grumar, Mango leaves, Paneer ka phool, Sadabahar, Spinach, Triphala, Tulsi leaves, Turmeric, Vijaysar and Any other, 40% -49% of diabetic patient use Bael, Clove, Drumsticks, Garlic on everyday basis to control their blood sugar levels. A study by (Banerjee et al., 2019) showed similar results regarding the frequency of consumption of home remedies where more than 70% of diabetics used Aloe vera, Amla, and Fenugreek every day.

Reason:

Aloe vera- Aloe vera lowers blood glucose levels in diabetic patients. It also improves the responsiveness of the body tissues towards insulin, thereby making insulin more effective and it is easily available in one's home.

Amla- It prevents glucose spikes, improves metabolism, and protects the heart from the adverse effects of the disease. It is used in most houses as fresh fruits or dried all year long. It is a low-cost fruit.

Table 3.3 shows that below 40% of the diabetic patients are consuming Aloe vera, Amla, Bael, Bay Leaves, Belpatra Leaves, Bitter

Mellon/Bitter Gourd, Cinnamon, Clove, Cucumber, Drumstick, Fenugreek, Garlic, Giloy, Gensing, Gurmar, Jamun Seeds, Lemon, Mango Leaves, Neem Leaves, Paneer ka Phool, Sadabahar, Spinach, Triphala, Tulsi Leaves, Turmeric, Vijayasar and occasionally to control their blood sugar levels.

Table 04
Never consumed home remedies

SL. No.	Frequency / Percentage	Home Remedies
1	75% and above	Bael, Baelpatra leaves, Vijaysar
2	60% - 74%	Gurmar
3	50% - 59%	Aloe vera, Ginsen, Jamun seed, Paneer ka phool, Sadabahar
4	40% - 49%	Bay leaves, Cucumber, Neem leaves,
5	Below 40%	Amla, Bitter Guard, Cinnamon, Cloves, Drumsticks, Fenugreek, Garlic, Giloy, Lemon, Spinach, Triphala, Tulsi leaves, Turmeric, and any other.

Table 4 shows that 75% and above diabetic patients have never used Bael, Baelpatra levels, and Vijaysar, 60% - 74% of diabetic patients have never used Gurmar, 50% - 59% of diabetic patients have never used Aloe vera, Ginsen, Jamun seed, Paneer ka phool, and sadabahar, 40% - 49% of diabetic patients have never used Bay leaves, Cucumber, and Neem leaves and below 40% of diabetic patients never used Amla, Bitter Guard, Cinnamon, Cloves, Drumsticks, Fenugreek, Garlic, Giloy, Lemon, Spinach, Triphala, Tulsi leaves, and Turmeric for the control of their blood sugar levels. Another study by (DPU, 2023) supported the above findings where more than 75% of diabetics never consumed Bael and Baelpatra to control their blood sugar levels.

Table 3 and 4 show that most of the subjects are using more than one home remedy, and for this, they are not sure which remedies are helping them in controlling their blood sugar levels and most are using these remedies from the articles on the internet/web or by the person/family member or friends who saw some benefits on their own.

8. Major Findings

1. Spinach is the most frequently used home remedy.
2. Aloe Vera, Bael, and Baelpatra are the least used by diabetic patients.
3. The various vitamins and minerals present in drumsticks help maintain healthy blood sugar levels and are highly advisable for people with diabetes.
4. From the above research, we concluded the patients have adequate knowledge about home remedies for diabetic mellitus.
5. 75% and above diabetic patients have never used Bael, Baelpatra levels, and Vijaysar,

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References-

1. Banerjee S, Bhattacharjee P, Kar A, Mukherjee P K. L C – M S / M S Analysis and network Pharmacology of *Trigonella foenum graecum*- A plant from Ayurveda against hyperlipidemia and hyperglycaemia. With combination synergy. *Phytomedicine*. 2019; 60: 152944
2. BB Tripathy, Hemraj B Chandalia, Ashok Kumar Das, RSSDI textbook of diabetes mellitus (Rev.2nd ed.), Jaypee Brothers Medical. Publishers, 2012, 325. Available forms: <https://www.Wikipedia.com>.
3. DPU, (Dr.D.Y. Patil College of Ayurved & Research Canter). Effective Home Remedies for Diabetes Management. August, 23, 2023
4. Dr. Regina Castro, Diabetic diet, The Essential Diabetes Book, 2nd edition, 2017. Available forms: <https://www.myoclinic.org>.
5. Herbal Natural Remedies for Diabetes, 2015, Available forms: <https://www.diabetes.co.uk>.
6. Jose Luis Rios, Flavio Francini. Natural products for the treatment of Type 2 Diabetes Mellitus, *Planta Med*. 2015; 81:975-994. ISSN0032-0943 Available forms: <https://www.researchgate.net/publication/26979793>.
7. Kooti W, Farokhiour M, Asazadeh Z, Ashtary – Larky D, Asadi – Samani M, The role of medicinal plants in the treatment of diabetes: A systematic review – *Electronic Physician*. 2016; 8 (1): 1832
8. Matpady, Prabhath; Maidya, G Arun; Gaundar, Niroshkanaa; Shetty, Jeevan; Bhojaraja, Vijayalakshmi S, Anupama, D (2023): The effect of traditional home remedies on glycemic control among people with type 2 diabetes mellitus (T 2 D M). Royal College of Surgeons in Ireland. Journal Contribution
9. Muhammad Shoaib Akhtar, Ayesha Ramzan. Effect of Amla fruit (*Embolica officinalis* Gaertn.) on blood glucose and lipid profile of normal subjects and type 2 diabetic patients, 2016.
10. Pauline J Maddox. Cinnamon in the treatment of type II diabetes, Southern Adventist University, Graduate research projects. 2016; 79, 6. Available forms: <https://knowledge.e.southern.edu/cgi/viewcontent.cgi>.
11. Ramachandran A, Snehlata C., Viswanathan V. burden of Type 2 diabetes and its complications-the Indian scenario. *Curr.Sci*2002-83-1471-1476[Google scholar]
12. Rehan Tariq, Khalid Idrees Khan, Rizwan Ali Masood, Zafeer Naeem Wain, Natural remedies for diabetes mellitus, Tariq et al, *International Current Pharmaceutical Journal*, October 2016; 5(11):97-102. Available forms: <https://www.icpjonline.com/documents/Vol5Issue11/02.pdf>.
13. Shiji George, Akhila Valsan Abraham, Ankit Goyal, Jitesh Dorkar, Prateek Barari, and Vaishali Gaikwad. Assess the knowledge regarding home remedies for diabetes mellitus among diabetic patients. *The Pharma an Innovation Journal* 2019; 8(5): 531-534.
14. Yogita Soni, Ramchandra Mochi, Ghanshyam Gahlot. Effect aloe vera juice on diabetic and diabetic retinopathy subjects, *Indian JL. Sci*. 2016; 4(1):41-45. Available forms: <https://www.semanticscholar.org/0fb6/42ec43abb8e1e6c0a433ed1612fc1b341377.pdf>
15. [<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2275761/#B4>].

An Introduction of Stories:Temsula Ao

•Rekha Dwivedi

••A.B. Pandey

Abstract- *The purpose of the paper is to view the political violence and social realities in the particular state of Northeast India- Nagaland. The paper explains how the Naga struggle with the armed forces to occupy a separate political entity and how they search their identity and peace in the midst of violence and terror. It makes an attempt to give the idea that how the trauma of violence and unstable political conditions of a state bring the fragility of human conditions. Focusing on Temsula AOs short stories collection entitled These Hills Called Home: Stories from a war zone, the paper discusses the social realities of Nagaland during insurgency and counter-insurgency period. The stories depict common people who are victimized by the conflicts, violence and politics of the state and about the violation of human rights by different militant organizations and security forces. The social and cultural milieu forms the central focus of Temsula AOs short stories. Temsula Ao's Laburnum for My Head. Women empowerment relates to giving women more power over their own life and the circumstances they are facing with. Empowering women is to empower them to break the traditional picture of perfect womanhood where patriarchy dominates and women get all the bad things in their life. Women through their self-assertion contribute greatly towards women empowerment. It is this self-assertion of women that forms the core of Temsula Ao's collection of short stories entitled Laburnum for My Head, and this paper. Writers of literature has always been lured and urged by their physical and biological environment to manifest the beauties of nature in their creative endeavour. Temsula Ao's Laburnum for My Head showcases the correlation between literature and the physical and biological aspects of nature. This paper relates Ao's stance on women and environment in Laburnum for My Head by placing the stories in such diverse setting as ecology, environment, non-human animal, violence, bloodshed, marriage, motherhood, animal rights etc.*

Keywords- *Laburnum, ecology, environment, non-human animal, violence, bloodshed, marriage, motherhood, animal rights etc*

Introduction- Temsula Ao is a poet, scholar and novelist from Nagaland, India. She retired as Professor, Department of English at North Eastern Hill University, Shillong in 2010. Ao is a Padma Shri Awardee and a major literary figure in English literature emerging from North East India, along with other names like Mitra Phukan and Mamang Dai. She is also the

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- Research Scholar, English, A.P.S.U. Rewa (M.P.)
 - Professor, Department of English, Government. College, Raipur Karchulian, District. Rewa(M.P.)

recipient of the Governor's Gold Medal 2009 from the government of Meghalaya. Ao also received the Sahitya Akademy Award in 2013, for this collection of short stories that I will be talking about today. Besides this, her first book of short stories *These Hills Called Home: Stories from a War Zone* was translated into Kannada. Her most recent work is *The Tombstone in my Garden*, a collection of five stories from Nagaland.

The Naxalite movement has occupied a lot of mind space and news space in recent times. More often than not the Naxals are hordes of faceless, nameless, ghostly figures that 'infest' (*sic*) an area and have the power to unleash unimaginable terror with their intelligent strategy and meticulous planning. A majority of the stories under review attempt to give a name, a face and a human quality to the Naxals. The complexity of politics, the youth, infatuated with idealism, the urban-rural divide, and most importantly, the people caught in the crossfire of violence are all portrayed vividly in the stories. But it is the disillusionment with the movement and the gross failure of the Naxals to fulfil their flawed, albeit utopian goals that takes centre stage. Temsula Ao *The Letter* is an evocative story about a villager (disguised as a Naxal) who tries to browbeat the poor villagers in order to extract some money for his son's board exam fee (as earlier in the story, the Naxals had robbed him of it). The desperation of the father is captured poignantly as he uses the means of the Naxals out of sheer necessity. The Naxals or 'underground government' are no better than the oppressive 'occupation' forces that are stationed to ostensibly maintain peace. However, one wishes that there was deeper psychological insight into the characters to lift the stories above the ordinary. This is where they fall short, becoming mere descriptions rather than explorations of the characters' inner selves. As the plots become complex the characters fail to keep pace.

An Introduction of Stories

- There are a total of 8 short stories in this collection. In “Laburnum for My Head” we follow a woman whose unsuccessful attempts at having a Laburnum tree, transform into a desire to have that flowering plant on her gravestone after her death.
- In “Death of a Hunter”, we follow *Imchanok*, a great hunter whose views on hunting change after being compelled to hunt a wild animal and then being tormented by dreams about this kill. It is set in pre-Independent India.
- In the next story, “The Boy Who Sold an Airfield”, we get to see a pre-Independence but post WWII scenario, where a witty boy gets into the good graces of the last White men, thus gaining some amount of material power over the locals. It was quite nuanced although at first glance one would laugh at the gullibility of the villagers compared to the quick thinking of the Boy.
- In “The Letter”, the Naga independence struggle is finally acknowledged. It offers an interesting perspective on what is now known to be the longest-running conflict in independent India. It is also a critique of human behaviour within a specific socio-cultural

and political scenario. It is set within the boundaries of the Naga tribes and the divide between the 'commoners' and the 'freedom fighters'.

- In “Three Women”, we follow multiple generations of women in a family and how the concept of insider-outsider is defined especially in the terrible community. There are also poignant insights on motherhood, race and the indigenous identity.
- In “A Simple Question”, we get yet another perspective on the Naga armed struggle, this time focusing on the conflict between the Nagas on the one hand, and the Indian Army on the other.
- In “Sonny”, this conflict is further problematized by bringing in a romantic angle and merging it with the socio-political. The protagonist is a woman whose job as a journalist in a national paper in mainland India, further complicates her position in her hometown.
- In the last story, named “Flight”, we see life from the point of view of a caterpillar that grows and metamorphosed into a butterfly, just as the young boy who kept it slowly loses his grip on life.

Conclusion- Laburnum for My Head. A strange obsession of a woman for laburnum flowers. Unable to successfully grow a laburnum plant on her garden during her lifetime, she wants to have one over her grave. **Death of a Hunter.** A brave hunter, Imchanok, totters when the ghost of his prey haunts him, till he offers it a tuft of his hair as a prayer for forgiveness. **The Boy Who Sold an Airfield.** Pokenmong, the servant boy, by dint of his wit, sells an airfield to unsuspecting villagers. **The Letter.** A letter found on a dead insurgent blurs the boundaries between him and an innocent villager, both struggling to make ends meet. **Three Women.** A woman's terrible secret comes full circle, changing her daughter's and granddaughter's lives as well as her own. **A Simple Question.** An illiterate village woman's simple question rattles an army officer and forces him to set her husband free. **Sonny.** A young girl loses her lover in his fight for the motherland, leaving her a frightful legacy. **Flight.** A boy likes a caterpillar and a girl the butterfly. Just after the first world war, a Naga boy sells a dilapidated air field bequeathed by an American official. An elderly woman would have a Laburnum plant over her grave and manipulates others to follow. A renowned hunter regrets his acts grievously. A Naga woman gets back her husband from the security forces by asking “What do you want from us?” The villagers' vengeance meant for the terrorists but diverted against a loner turns out to be a tragedy. An idealist freedom fighter is betrayed by his own men. Three women, blood relations, display acutely separate identities. That has Won the SAHITYAAKADEMI AWARD

References-

1. [“Poets dominate Sahitya Akademi Awards 2013” Archived](#)
19 December 2013 at the [Wayback Machine](#). [Sahitya Akademi](#). 18
December 2013. Retrieved 18 December 2013.
2. “ Mukherjee, Anusua (May–June 2010). “Foregrounding the Feminine”.
Biblio: A Review of Books. **15** (5 & 6): 14.
3. “Rai, Vineeta (5 December 2009). [“Tales from troubled times”](#). *Business
Standard*. Retrieved 19 February 2020.
4. [The Sunday Tribuner review of Laburnum for My Head](#)
5. [Review of Laburnum for My Head](#)
6. Sikhamoni Gogoi. ' [“An Ecofeminist Reading of Tamsula
Aos Laburnum for My Head”](#).

The Parlance of Love in Emily Bronte's Wuthering Heights

• Wasim Azam

Abstract- *This paper portrays the feature of romanticism with the expression of love. This love is an addiction of romantic love and passionate love. Basically “Wuthering Heights” highlights the nature of transcendental love with the compromise of Victorian morality and religion. The reflection of love feeling and the religion of love are employed with the dominance of physical and mental norms of psychological aspects. This landmark work titled as “Wuthering Heights” is written by English novelist Emily Bronte that is published in 1847. The paper objectifies the manifestation of two souls that are desperate to unite into each other forever not only in this earthly world but also in the heavenly world.*

Keywords- *Love, Death, Transcendence, Religion, Soul*

Introduction- “In the whole story not a single trait of character is elicited which can command our admiration, not one of the fine feelings of our nature seems to have formed a part in the composition of its principal actors. In spite of the disgusting coarseness of much of the dialogue and the improbabilities of much of the plot, we are spellbound” (Haberlag).

Wuthering Heights covers the idea of lovable feelings that can be reflected through the characters named Heathcliff and Catherine. Both love each other with the full intimacy. The dominance of love scene is evolved throughout the novel of which sometimes Judas kiss is evoked with the voluptuous intimacy and sometimes there is a kind of true love between two souls. It seems like that a compass has two directions that are fixed in centre. In the same way, love is touched with the two souls. These two souls are perplexed to mingle in single soul with a powerful touch of kiss. The religion of love is evolved with the expression of blending up the two spirits. Two lovers reject the earthly religious group for approaching the religion of fairyland. The realistic religion of love can be attained after the non-existence in earthly world when two souls meet to each other as they are reunited in one shape.

Expression of Love- Wuthering Heights portrays the theme of love throughout the novel. It is a dominant theme revolved across the novel. It deals with certain Victorian compromise between Love and Judas kiss. But here, there is a real inception of love between Catherine and Heathcliff. There is sometimes an intimacy of romance as the feature of hedonism scales

the sensuality. "Some of the novel's admirers consider it not a love story at all but an exploration of evil and abuse" (Young).

The love between two lovers may be a parcel of an addiction to the beauty of soul. If love is concerned with the romanticism, it may be addicted. If love is concerned with the hedonism, it may be addicted too. But there is a slight difference between love with passion and love with romance. The love between Catherine and Heathcliff is framed with the concern of passionate feelings. "Romantic love or passionate love is in itself an addiction" (Peele).

A lover commits emotionally towards a beloved that may be an addiction relied on either isolation or intimation. The declination of identity crisis with an addiction is led to the one and only one identity as Catherine and Heathcliff wants to be one frame despite of all catastrophic situations that are hindrance to their meetings.

"An addiction exists when a person's attachment to a sensation, an object or another person is such as to lessen his appreciation of and ability to deal with other things in his environment or in himself, so that he has become increasingly dependent on that experience as his only source of gratification" (Peele).

Catherine states her relation to her lover as a source of little visible pleasure that's mandatory to realize. The loss of lover may be caused to the death with a malady of intimation towards only one sight. The lover wants to realize first his beloved under any situations without thinking about self that's a replica of addiction.

"I am Heathcliff" is a frequently quoted phrase from the novel and the idea of ... perfect unity between the self and the other is age-old," so that Catherine reflects that she falls in addiction of love with Heathcliff because "he is more myself than I am. Whatever our souls are made of, his and mine are the same" (ch. 9).

Catherine repeats the proposal of love towards Heathcliff in spite of Edgar Linton's wife. She has no love intimation for Edgar Linton but for only Heathcliff that's why she reflects that Heathcliff is more than I am. It means that there is a blend of two souls in one connection.

True Lovers: Isolation and Intimation- Both the lovers are unified in the whole universe with the perfection of manifestation. Both have a wish to resist the emptiness in their lives as they want to fill their lives with memories of love vibes. Catherine acknowledges her emptiness in her life and confides Nelly about her emotions for love.

"I am tired, tired of being enclosed here. I am wearying to escape into that glorious world, and to be always there; not seeing it dimly through tears, and yearning for it through the walls of an aching heart; but really with it, and in it" (ch. 15, p. 125).

Their meeting of love is existed on the parlance of love only where they are flying in the sky by riding on the spiritual plane. The affection of love between them draws the attention of everyone with new interest. Heathcliff calls Catherine his soul incessantly. This kind of love may be a shadow of happiness or may be a shadow of sadness. With the isolation, there is a possibility of intimation with the passing of time when it gets the

real occasion for it. The dispersion of identities also is mandatory to reunite in one placement with the desperate desire of love.

“Heathcliff and Catherine portray the essential isolation of the soul, the agony of two souls or rather shall we say? Two halves of single soul forever sundered and conflicting to unite” (Lewis).

The Paradigm of Soul: Transcendental Love- The two souls have a wish to mingle in one soul that is a way of realizing the love of transcendence. The transcendence approach breaks the stagnation which comes in the path of love. This kind of love dismantles all boundaries and all limitations of bounded love. There is a requisite of true feelings with an approach of liberty, equity, equality and fraternity. It stuns all conventions and rituals which are hindrances to the road of love. When Catherine is parted from her lover, she cries loudly and is fainted badly. She has no consciousness to ponder about other views of her life. Her husband Edgar Linton basically cares her but she is married to him on the basis of social parameter. Emotionally she has been attached with only one soul named Heathcliff. She feels imprisoned as her body and soul both are imprisoned in the uncontrolled room. She has a need of freedom where she breaths freely and she walks freely. Both the lovers are reunited after their deaths as Catherine takes demise in the memory of her lover whereas Heathcliff dies in the revenge. They are reunited in love after demise of theirs as Christians are reunited with God after their deaths. Nevertheless, they are irregular in their merits to getting closer to the death. Catherine states, “Heathcliff! I only wish us never to be parted from each other.” Death also never comes between them but they triumph with the meeting of two souls.

“Catherine and Heathcliff have faith in their vocation of being in love with one another...they both believe that they have their being in the other as Christians believe that they have their being in God. Look at the mystical passion of these two souls: devotion to intimacy for each other; desire to suffer; ecstatic expression; meticulous nature of social convention and the flesh spirit and mania for self-transcendence. This passion is a medium of overcoming the death and segregation of self from other. This shield may be considered as a purified religious impression” (Polhemus).

The love between two souls dumps the limitations of self and is framed to mingle both the souls. They have a powerful ambition to transcend themselves inherently. There should be a unified identity of two identity entities. They frame new identity by assimilating to each other in one frame of life. This fusion between them inspires lover to assimilate the corpse of Catherine into self. They are dissolved into each other by which no one comes between their loves.

“At the height of being in love the boundary between ego and object threatens to melt away. Against all the evidence of his senses, a man who is in love declares 'I' and 'You' are one, and is prepared to behave as if it were a fact” (Freud).

Conclusion- Wuthering Heights is an elucidation of love sight and an exploration of emotional touch for getting the perfection. Love is a parcel of religious nature exploring the shield on the contrary of demise. Love is a

shield against the cessation of personal identity. The utilization of love is an exploration of irresistible relation between love and death that is reflected through the actions and dialogues of characters in *Wuthering Heights*. Bronte implies the concept of religious love and passionate love with the theory of individualism and impressionism. Love reflects the nature of consciousness through which both the lovers are alive forever in the hearts of readers till the existence of the whole universe.

Reference-

1. Haberlag, Berit (2005). *Reviews of "Wuthering Heights."* GRIN Verlag.
2. Young, Cathy (2018). "Emily Bronte at 200: Is *Wuthering Heights* a Love Story?" *Washington Examiner*.
3. Peele, Stanton and Archie Brodsky (2015). *Love and Addiction*. Broadrow Publications.
4. Smart, Helen (2009). *Introduction to Wuthering Heights*. Edited by Ian Jack, Oxford University Press.
5. Polhemus, Robert M. (1990). *Erotic Faith: Being in Love from Jane Austen to D. H. Lawrence*. University of Chicago Press, Chicago and London.
6. Freud, Sigmund (2010). *Civilization and Its Discontents*. W. W. Norton & Company.

Who humanises the world, indeed: Means or the Masters?

• Bijender Singh

Abstract- *Often, it is said that literature plays a vital role in the life of human beings as the sole purpose of literature—textual or visual i.e. films—is to humanise the world. But it raises doubts as to why we see inhumane practices all around the world whereas all kinds of literature or scriptures represent human values in the first place. No great text teaches violence yet we have to debate on the issue of loss of human values. It means the message does not erupt in the text but in the minds of the readers. This is why the school of reader-response theory focuses on the readers' experiences rather than the text or the author. Roland Barthes clearly states that the author is dead for the reason that once an author has finished writing these are the readers who would interpret the text. Therefore, this paper attempts to map if it means i.e. literature, films or any other media or the Masters i.e. the author or the great Masters like Lord Krishna, Buddha, Nanak, Kabir, Jesus etc. who can humanize the world. For this purpose, literature of various kinds is under scrutiny from different lenses. The study proves that Living Master is of unmatched importance in comparison to the textualisation of their messages.*

Keywords- *Humanities through means or masters, textualisation of teachings, Living Masters, Followers in the spiritual world*

Introduction- All human unhappiness comes from not facing reality squarely, exactly as it is. Buddha—Buddha rightly argues that all unhappiness comes because human beings do not face the realities as they are but differently. Consequently, the world has indeed been witnessing violence, discrimination, domination, and wars for centuries. It is true that all great texts i.e. Gita or Bible attempt to establish peace. In this attempt, literary texts across cultures and countries manifest the disastrous results of malice, vengeance, hatred and violence. For instance, Ramayana and Mahabharata depict the loss owing to human weaknesses. Likewise, all literary writings' sole purpose is to humanize the world through instruction or otherwise. Since, literature undoubtedly has the potential to change minds it, in its different art forms, is still sustaining and surviving. But the grim reality is that it has not changed the world to the degree it has the potential to change the world as we still witness wars, violence, loot, dishonesty, domination and cases of genocide, homicide-suicide etc.

Aims and Objectives- Therefore, this paper aims to analyse if literature's only purpose is to humanize the world, then why we come across

inhumane practices in societies. Great masters have also attempted to the highest degree to teach the relevance of peace and contentment in the world but still, the predicament is the same. So, the purpose of the paper is to investigate what can help in humanizing the world: the means-films and literature-or the Masters as they have been in all societies or the textualisation of their preaching.

Material and Methodology- For this purpose, literature in different forms including meta-narratives i.e. Gita, Ramayana, Mahabharata etc. are under close scrutiny. Further, the core messages of spiritual masters such as Rama, Krishan, Kabir, Nanak, Meera, Sandilaya, Ramakrishana Pramahansa so on and so forth are also under examination. To find the gap between messages and their reception, over the years, various critical frameworks such as reader-response theory and psychoanalysis theory have been used as tools for analysis.

Discussion- Literature has many purposes but the essential of them is to humanize society as it, from the very beginning, has never been a just one as all human beings have universal traits such as hatred, malice, scorn, jealousy, greed etc. The practice of these traits dominantly has reduced societies into unequal and unjust ones. Human history is full of hatred, violence, wars, loot, immorality etc. That is why literature not only mirrors the realities of society but also attempts to purge their foibles and follies as Fielding (2013) mentions in his novel. While Aristotle (1996) argues in the theory of catharsis that literature purifies and purges. Even after a long literary history and teaching-learning of literature in educational institutions, society still needs a drastic change to be more humanistic. The current social scenario compels us to review the role of literature too as every cultural group in the world has literature of great import ranging from classical to modern and now available cross-culturally too but the situation remains the same across cultural currents.

Furthermore, the case with scriptures is not different at all. It is a universal fact that no literary narrative originally promotes, hatred, malice and violence but still the whole world witnesses the same on a daily basis. It means that there is a gap between the message contained in and derived from the text. On this issue, the debate is still going on. In this regard, Barthes (1967) argues in his seminal essay *Death of the Author* that the author is no longer required to decode the meaning of a text. Hence, these are the readers who are the master-decoders of a text. But the question arises if the readers can indeed decode the meaning uniformly as the text is the same. Literacy scholars such as David Bleich, Norman Holland, Stanley Fish, and Wolfgang Iser are instrumental in crafting what has come to be known as reader response. The theory maintains that textual meaning occurs within the reader in response to text and recognizes that each reader is situated in a particular manner that includes factors such as ability, culture, gender, and overall experiences. So, it is clear that the meanings decoded by the readers are dependent on the being of the reader. That means the text doesn't convey always objective meaning.

Since text does not convey the meaning, it is the reader who derives

meaning. This is why society faces violence, brutality and the practice of other negative traits daily on various axes. No text promotes inhumanity, violence and discrimination except a few i.e. Manusmriti which clearly prescribes discrimination based on caste status and punishment inversely to the caste hierarchy in case of violation of the social codes (Manu n.d.). So, mainstream people implemented only the discriminatory section and ignored totally the recommendation of the inter-varna caste shift. This is how the texts are read, interpreted and implemented. Similarly, the messages of masters were and still are decoded by the followers. For example, Jesus said “Love thy neighbour as thyself” (King, 22: 39). The Christians read this statement literally and loved only their next-door neighbour and the predicament of others is a long history which is evident as they invaded and colonized the major part of the world. Furthermore, the very Christianity is divided into hundreds of sects such as Roman Catholics, Protestants, Anglicans etc. Likewise, is the case of Buddhism. Buddhism is divided into Hinayana and Mahayana. Buddha's main teaching is karuna (compassion) but Japan's colonization and violence are well known to all. Jainism is also further divided into Digambar and Shwetambar. Since Vardhaman Mahavir was also against violence. As a result, the followers of Jainism resorted to trade and commerce rejecting agriculture but they did not hesitate to malpractice and exploit others in business. So, the message of all these masters was one and for all. However, people read interpreted and explained the same message differently at their convenience. And, all these differences and deviations came to the fore after the death of the Masters.

The reason for all these differences stemming from a single ideology is that the reader/listener draws meaning out of the words. As long as the masters were alive, the message was clear but no sooner did the Masters attain maha nirvana; the followers re/misinterpreted the messages. So, no speech or text can remain pure if it passes through other readers or minds. So, scribes/writers/editors/translators all get involved in the message conveyed deliberately or ignorantly in the process of writing, editing or translation. The message remains pure as long as Master is alive. In case, the message is received wrongly by the readers, when the Master is alive, the Master can correct it. But, in the absence of a Master, the message/text gets distorted. It gets contaminated. Once, Rabindranath Tagore also mistranslated Kabir. The words of Kabir were 'Chalat mansa achal kinho' God made the mind still] but Rabindranath Tagore translated it as I have made my mind still which is totally opposite to the context Kabir had used these words (Osho, 1975). So, translations by other translations can be imagined. The Gita's message “work without waiting for the fruit of karma” is also mistaken by the readers. Statement of Krishna does not mean one should continue to work without fail ignoring the act—good or bad rather it means that one must work with full dedication to the work undertaken and must not be worried about the results as the concern for the result will end in unsuccessful. Readers/interpreters never ponder over the real message of Krishna and remain involved in all discriminatory practices.

Further, the role of films and media is also questionable. Undoubtedly, films and media are broadcast to reform society. But again, the role of the viewer plays an important role in decoding the meaning. The sole purpose of films is to entertain. Though some films have social messages again the message gets lost in entertainment. A movie is watched differently by different viewers. Some viewers emulate and practise the moral aspect of the film while others do immoral as all the movies do not represent humane and moralistic content only but violent, sexual and asocial content too. Naskar, in this regard, appeals to “Make films that purify the soul with the flow of rational, vigorous and compassionate thinking.” Until films serve the purpose of inculcating and nurturing human values, it is futile to celebrate films. The same is the case with media. The media sometimes reports live incidents that occur in society. In that attempt, someone who is committing suicide gets immolated while media persons remain busy shooting and reporting which only conveys that “work is worship.” This professional attitude of media persons at the cost of one's life indicates the insensitivity of these persons which conveys different connotations to the viewers. If the media and movies had an impact on humanizing society; the whole world would have been the humane one.

Conclusion- In nutshell, it may be concluded that no text has its independent and objective meaning but the meaning lies in the mind of the readers. The being of the reader decodes the meaning of a text. Thus, the reader is superior to the text. And, texts, of course, have multiple purposes—one of them is to humanize the world. But the predicament is that these are read selectively, subjectively and from a location not collectively, objectively and without any ideological position. Though violence, colonisation, discrimination and inhuman treatment are meted out by the followers of the religion all religions have their foundation in love and compassion. The proponent of any religion further divides and distorts the messages either as the readers or the listeners while furthering the message of the text of the master after the master's death. Till the Master is alive the message/meaning is conveyed truthfully but as soon as the readers take the steering wheel of the text, they have the freedom to choose the text, interpret it, and practise it. Thus, the means i.e. the texts-literature, films or media-are not able to humanize the world substantially but the Masters and only Masters as the history verifies that in the time of Masters, the followers could not distort the message hence the love and compassion sustained.

References-

1. Aristotle. (1996). *Poetics*. Penguin Classics.
2. Barthes, R. (1967). “Death of the author.” *Aspen* 5-6. <https://web.archive.org/web/20200419132326/http://www.ubu.com/aspen/aspen5and6/threeEssays.html#barthes>
3. Fielding, H. (2013). *Joseph Andrews*. Rupa & Co.
4. King, J. Bible. <https://www.kingjamesbibleonline.org/Matthew-22-39/>

5. Naskar, A. Humanizing quotes. Goodreads. <https://www.goodreads.com/quotes/tag/humanizing>
6. Osho. (1975). Kahe Kabir Diwana 01-20. <https://oshoworld.com/085-kahe-kabir-diwana-01-20/>

**Correlation Between Body Mass
Index and Fasting Blood Sugar the important
anthropometric parameters affecting the performance
of the College Going Female Athletes**

• Rajimol KC
•• Anooja Thomas

Abstract- *The purpose of the study was to investigate specific nutritional factors affecting the performance of the college female athletes. The sample of the present study comprised of 400 Female Athletes from different colleges in and around Kottayam district. The objective of the study was to identify the correlation between body mass index and fasting blood sugar the important anthropometric parameters affecting the performance of the college going female athletes. The research utilized a quantitative research design, collecting data through structured questionnaires from a random sample of adolescents aged 12-18 years. The data were analyzed using descriptive and inferential statistics, including correlation- regression study and ANOVA. The findings reveal significant gender differences in educational facilities and responsibilities among rural adolescents, while urban areas exhibit no significant differences. Socioeconomic status was found to impact gender inequality, with lower-middle, upper-lower, and lower socioeconomic classes experiencing higher levels of gender disparities. This research contributes to understanding the relationship between the study aimed to assess the relationship between body mass index in predicting high levels of fasting blood glucose (FBG) and provides insights on the possibilities of the correlation between the parameters affecting the performance of the college going female athletes in colleges under the Mahatma Gandhi university, Kottayam district, Kerala.*

Keywords- *Body Mass Index, Fasting blood sugar, Sports performance, Female Athletes*

Introduction- Nutrition plays a vital role in the female athlete's health and performance. There are a varied number of factors which affects the performance of the female athletes. Several studies have reported that higher BMI is associated with reduced levels of physical performance. For example, in some studies, older adults with BMI (kg/m²) in the normal ($18.5 \leq \text{BMI} \leq 22.9$) or overweight range ($23.0 \leq \text{BMI} \leq 24.9$) had better walking speed than those with BMI in the obese ($\text{BMI} \geq 25.0$) or severely obese range ($\text{BMI} \geq 30$) (Shen S, Li J et al ; 2015).

An increase in blood glucose level will result in increase in BMI causing increased lipid biosynthesis and hence body weight. Insulin which is

-
- Ph.D. Scholar, St. Theresa's College, Ernakulam, Kerala, India
 - Associate Professor (Rtd) CMS College Kottayam.

secreted from beta cells of islets of Langerhans from pancreas act through specific cell receptor of insulin sensitive cells which results in enhanced glucose uptake into the cell. Insulin being an anabolic hormone results in energy conservation and thereby signaling the body to produce fat (**Neelam Agrawal, Mukesh Kumar Agrawal, Tannu Kumari, Sunil Kumar; 2017**).

In a cohort study a linear association between baseline BMI and the risk of developing diabetes, which increased with each kg/m² of BMI, associated with 23% (95% CI 1.22% to 1.24%) higher risk of incident diabetes was found. Overall, the effect of BMI on incident diabetes was stronger in younger adults (**Chen Y et al 2018**). **Hartemink et al** conducted a meta-analysis that detected a dose-response relationship between BMI and type 2 diabetes. It was shown that per kg/m² increase in BMI, the risk of diabetes increased by 18% (95% CI 1.16% to 1.20%), accounting for the heterogeneity among studies.

Materials and Methods-The primary objective of this study is to review and analyze the correlation between body mass index and fasting blood sugar levels which affects the performance of the female athletes in colleges under MG University in Kottayam District.

Inclusion Criteria-

1. Female sports person Group II sports category
2. Subjects available at the time of study
3. Female sports person between the ages of 18-28 yrs.

Exclusion Criteria-

1. Female sports persons of sports disciplines other than group III
These 400 female athletes were selected randomly from the aforesaid 12 colleges under the Mahatma Gandhi University. All the 400 female athletes who were willing to participate and permitted by their relatives were taken for the study. Through an interview schedule the preliminary details based on their demographic details and also biochemical parameters were collected. Nutritional assessment by the ABCD (Anthropometry, Biochemical Assessment, Clinical Evaluation and Dietary assessment) method of nutritional assessment. In addition, 400 female athletes were selected for detailed dietary assessment, based on their willingness to participate in 24-hour recall and to respond to food frequency questionnaire.

The interview method of collecting data involves presentation of oral-verbal stimuli and reply in terms of oral-verbal responses. A brief orientation on the use of the questionnaire was given to the selected subjects on how the various variables in the questionnaire were identified, the interview techniques used and data collection procedures. The same was pretested among 20 female athletes, which were included in the actual study. After the pre-test appropriate changes were made in the survey instrument. The questionnaire was modified based on the pre-test administered at 20 selected female athletes. A structured interview schedule was formulated with a view to collect data from the respondents on socio-economic

background, anthropometric details, details regarding general health, biochemical parameters, dietary pattern and the other parameters. Anthropometric survey was conducted among 400 female athletes.

In order to assess the nutritional status of the female athletes' patients, their (a) Height, (b) Body weight and (c) BMI were measured and recorded. Body Mass Index of the 400 selected female athlete were calculated using the following equation:

$$\text{BMI} = \frac{\text{Weight}}{\text{Height}^2}$$

Body mass index (BMI) is a simple index of weight-for-height that is commonly used to classify overweight and obesity in adults. It is defined as a person's weight in kilograms divided by the square of his height in meters (kg/m²). It is a simple, safe, non-invasive and cheap way of estimating body mass and health (**Barisic, T., Mandic, V., & Barac, I; 2017**).

Regarding bioenergetics, glucose and lipids metabolism is upregulated during endurance exercise. Additionally, long-term, regular endurance training results in volume (total distance or training duration per week) dependent, beneficial and specific adaptations on glucose and lipids metabolism, leading to completely different metabolic procedures and functionalities of glucose and lipids metabolic pathways than those observed in sedentary individuals (**Methenitis, S., Feidantsis, K., Kaprara, A., Hatzitolios, A., Skepastianos, P., Papadopoulou, S. K., & Panayiotou, G ; 2022**). The estimation blood glucose level was done by **GOD- POD method**.

Statistical Analysis-The data analysis was based on that of Accreditation on review commission for education for the physician assistant (2013) where data analysis refers to the study of compiled or tabulated data interpreting cause and effect relationships and trends, with the subsequent understanding and conclusions used to validate current practices or make changes as needed for program improvement. The collected data were coded appropriately and were entered into a computer. The statistical software SPSS version 17 was used for the data analysis. Appropriate statistical tools like frequency and percentage, Anova Test, correlation study etc were used.

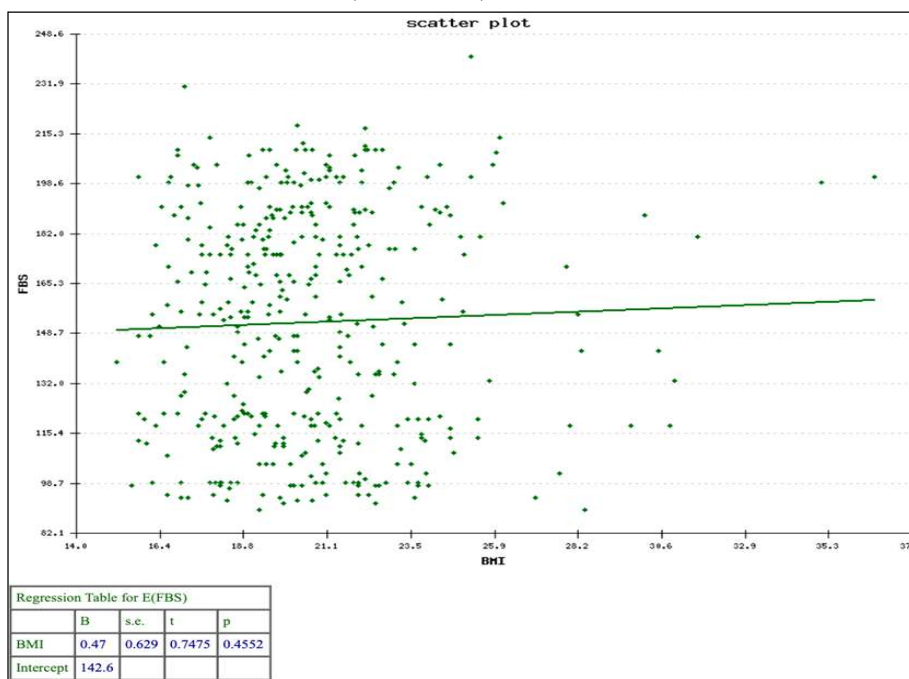
Results- A regression/correlation study describes and measures the extent in which the outcomes of variables are related. This helped to find out whether the high or low values on the one variable predictive of high or low values on another variable or not.

The output of the study consists first of some descriptives of the data and the data read procedure and the correlations between the variables. Scatter plots with the results of a linear (ols) regression is represented. Results are depicted in tables with the regression coefficients, the significance of the regression, and an analysis of Variance. Further there are descriptives for the variables used. In the comparing two groups regression two figures are presented. The first figure shows the regression lines for each of the two

groups uni-variate. The second figure shows the regression kept constant for the third variable. Thus, the difference between the two parallel lines is the difference between the two groups with regard to the dependent variable on the Y axis (FBS) kept constant for the variable on the X-axis (BMI). Simultaneously, the slope of the two parallel lines is the same as the slope of the light blue line, kept constant for the effect of the difference (in location) between the two groups. The scatter plot below illustrates the relationship between fasting blood sugar and body mass index in 400 subjects. It suggests a weak ($r=0.36$), but statistically significant ($p<0.0001$) positive association between fasting blood sugar and body mass index. There is quite a bit of scatter, but there are many observations, and there is a clear linear trend.

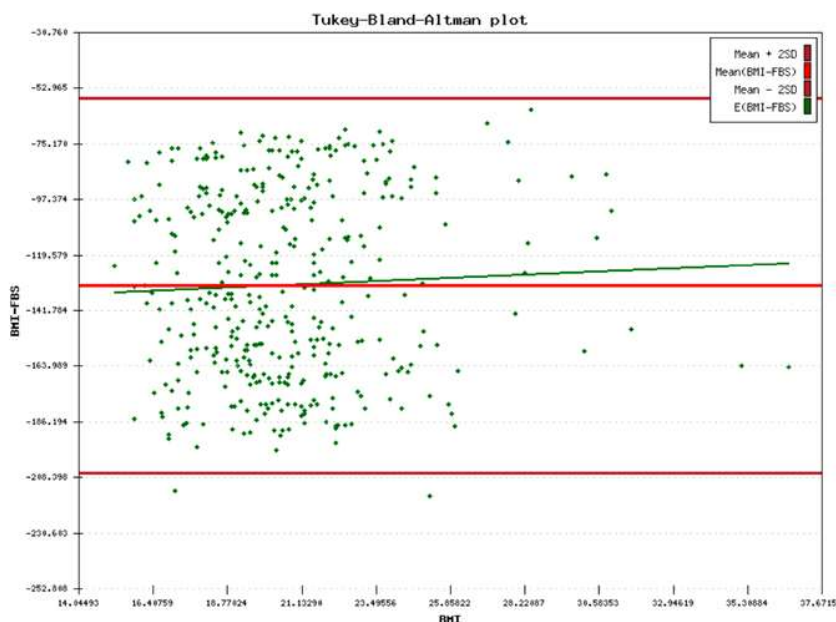
The correlation being weak, still it is statistically significant. This is because most of the outcomes have multiple determinants. For example, body mass index (BMI) is determined by multiple factors ("exposures"), such as age, height, sex, calorie consumption, exercise, genetic factors, etc. So, fasting blood sugar is just one determinant and is a contributing factor, but not the only determinant of BMI. As a result, fasting blood sugar might be a significant determinant, i.e., it might be significantly associated with BMI but only be a partial factor. If that is the case, even a weak correlation might have been statistically significant if the sample size is sufficiently large. In essence, finding a weak correlation that is statistically significant suggests that that particular exposure has an impact on the outcome variable, but that there are other important determinants as well.

z for 95% CI= 1.96 Invalid: 0 Cases-N: 400
r (BMI.FBS)= 0.0374



p= 0.2276

Source	Σ of Sq.	%	Mean Σ -sq	df
Explained	783.47	0.14	783.47	1
Unexplained	558003	99.86	1402	398
Total	558786	100%		399
F-value: 0.5588; p-value: 0.45518				
Residual standard error: 747				



Bland-Altman table			
	value	sd	95% C.I.
Mean	-131.6696	37.43	-135.3377 -128.0015
Mean - 2SD	-206.5292	64.83	-212.8825 -200.176
Mean + 2SD	-56.81	64.83	-63.1632 -50.4567
BIAS: -131.6696; t=-70.3555, df=399; p=1			
E(BMI-FBS)=-142.595(se=13.12)+0.53(0.629)*BMI			

Descriptives for BMI

Mean: 20.6329

Descriptives for BMI

Sum: 8253.16
 Variance: 8.87029
 sd: 2.9783
 se: 0.14892
 95% CI: 20.34 >20.6> 20.92
 Mean: 20.6329

Descriptives for FBS

Mean: 152.303
 Sum: 60921
 Variance: 1400.47
 sd: 37.4228
 se: 1.87114
 95% CI: 148.6 >152> 156

TBA plot or Bland-Altman plot or Tukey mean-difference plot. Plots the difference between two variables on the Y-axis against the mean of the same two variables on X-axis, thus point: $x_i, y_i = \{(v1_i + v2_i)/2, v1_i - v2_i\}$. The plots are

used to study the agreement between two different tests or instruments, represented by the two variables, on the same object or subject. Known as a Bland-Altman plot in medicine and as a Tukey mean-difference plot in most other fields. Important aspects to look for are 1) bias, that the difference between the two measurements is different from zero, 2) heteroscedasticity, that the clout of points widens or narrows dependent on the value on the x-axis, this indicates that the reliability of a measurements changes with the value of the measurement, and 3) trend, which indicates that the bias between the two measurements changes with the value of the measurement.

Discussion- It has been observed that female adolescent athletes are traditionally encouraged to consume a diet rich in carbohydrates to ensure adequate glycogen stores and improve performance. Physical training is known to improve insulin sensitivity, both immediately post exercise and through multiple long-term adaptations in glucose transport and metabolism. However, in contrast, strenuous exercise is known to increase circulating concentrations of catecholamines, such as adrenalin and noradrenaline, to near pathological level resulting in hyperglycemia and hyperinsulinemia post-intense exercise (**Thomas F, Pretty CG, Desai T, Chase JG; 2016**). The benefits of physical activity and exercise on blood glucose, that active individuals, particularly those who are regularly active would have a protective effect against the development of hyperglycemia and subsequent development of T2dm.

In this study it has been proven with a statistically significant positive correlation between body mass index (BMI) and fasting blood sugar (FBS). This study warrants the female athletes to undergo training or exercise failing which the insulin sensitivity will not be improved. A phased scientifically monitored tailored diet should be followed during this phase of sportsmanship. Failing to do so as the fasting blood sugar increase there is a tendency for the BMI to increase and thus the athletes become overweight and cannot maintain their weight according to their requirement.

Conclusion- This study provides an insight to closely monitor the fasting blood sugar levels of adolescent female athletes and also to be careful in following a regimented pattern of physical training or exercise failing which will end up with unfavorable medical conditions.

References-

1. Neelam Agrawal, Mukesh Kumar Agrawal, Tannu Kumari, Sunil Kumar. (2017). Correlation between body mass index and blood glucose levels in Jharkhand population. *International Journal of Contemporary Medical Research*;4(8):1633-1636.
2. Thomas F, Pretty CG, Desai T, Chase JG. (2016). Blood Glucose Levels of Subelite Athletes During 6 Days of Free Living. *J Diabetes Sci Technol*. 10(6):1335-1343. doi: 10.1177/1932296816648344. PMID: 27301981; PMCID: PMC5094325.
3. Shen S, Li J, Guo Q, Zhang W, Wang X, Fu L, Li L, An Y, Liu W, Li H, Huang T, Zhang Z, Niu K. (2015). Body mass index is associated with physical performance in suburb-dwelling older chinese: a cross-sectional study. *PLoS One*. 16;10(3):e0119914. doi: 10.1371/journal.pone.0119914. PMID: 25774797; PMCID: PMC4361482.
4. Methenitis, S., Feidantsis, K., Kaprara, A., Hatzitolios, A., Skepastianos, P., Papadopoulou, S. K., & Panayiotou, G. (2022). Body Composition, Fasting Blood Glucose and Lipidemic Indices Are Not Primarily Determined by the Nutritional Intake of Middle-Aged Endurance Trained Men—Another “Athletes' Paradox”? *Journal of Clinical Medicine*, 11(20), 6057. MDPI AG. Retrieved from <http://dx.doi.org/10.3390/jcm11206057>.
5. Barisic, T., Mandic, V., & Barac, I. (2017). Associations of Body Mass Index and Gestational Weight Gain with Term Pregnancy Outcomes. *Materia socio-medica*, 29(1), 52–57. <https://doi.org/10.5455/msm.2017.29.52-57>
6. Hartemink N, Boshuizen HC, Nagelkerke NJ, et al.(2006). Combining risk estimates from observational studies with different exposure cutpoints: a meta-analysis on body mass index and diabetes type 2. *Am J Epidemiol*. 163:1042–52. 10.1093/aje/kwj141
7. Chen Y, Zhang XP, Yuan J, Cai B, Wang XL, Wu XL, Zhang YH, Zhang XY, Yin T, Zhu XH, Gu YJ, Cui SW, Lu ZQ, Li XY.(2018). Association of body mass index and age with incident diabetes in Chinese adults: a population-based cohort study. *BMJ Open*. 2018 Sep 28;8(9):e021768. doi: 10.1136/bmjopen-201768. PMID: 30269064; PMCID: PMC6169758.

Isolation of Antibiotic Resistant Pseudomonas aeruginosa from Hospital's soil and its Biochemical Characterization

• Lalit Gupta

•• Avinash P.S. Bhaduria

Abstract- *Pseudomonas aeruginosa* is a nosocomial, opportunistic gram-negative bacteria that occurs in soil, water and hospital areas such as hospital toilets, ventilators, sinks, medical instruments and equipments, ICUs, dialysis, Urinary catheters, etc. It has been isolated from a soil sample from a hospital. In this work, authors studied the antibiotic resistance of *P.aeruginosa* against different antibiotics. This study shows the susceptibility and resistance of *P.aeruginosa* to different antibiotics at various levels.

Keywords- Urinary Catheters, Ventilators, Susceptibility.

Introduction- *Pseudomonas aeruginosa* is a gram-negative, rod-shaped bacteria of the Pseudomonadaceae family, causes infections in hospitalized and immunocompromised individuals^[1]. It affects Respiratory system of Health care associated Pneumonia, Ventilator associated Pneumonia, Chronic Bronchitis, ICU patients^[1,2], Urinary System associated with Catheter associated Urinary tract Infections in Hospitalized patients^[3], Skin, Soft tissues^[4] and Blood Stream infections in immunocompromised patients^[5].

P.aeruginosa attached via surface adhesives and Pili to the host's epithelial cells, triggering Cytokines, Chemokines, Interferon release. This attachment depends on the surface of bacterial cells^[6], due to surface adhesions, it secretes defense secretion, resulting in production of biofilms^[7,8].

P.aeruginosa secretes Exotoxin A, Pyocynin, Proteolytic enzymes and possess Type 3 and Type 6 secretion systems. Type 6 secretion system produces VgrG and Hcp proteins^[9] that injects various toxins into its host. Such as ExoU, ExoS, ExoT, ExoY^[7,9,10]. For immune evasion, it forms a capsule that interferes with the host's phagocytosis^[7,10]. ExoS, ExoT, ExoU, induces infections in epithelial cells, resulting in Inflammation and tissue damage^[8].

Review of Literature- *P.aeruginosa* possess multiple resistance due to intrinsic resistance mechanisms such as impermeable outer membranes and acquired gene resistance^[1].

Chromosomal encoded resistance mechanisms such as AmpC Cephalosporinases, Multi drug efflux pumps, OprD porins provides

• Department of Zoology, Janta College Bakewar, Etawah, UP, INDIA

•• Department of Biotechnology, Janta College Bakewar, Etawah, UP, INDIA

resistance to the commonly used antibiotics such as Beta-Lactams, macrolides, glycosides^[1,11].

Increased production of Amp C develops resistance against Beta lactamase antibiotics by AmpC genes induction. Increased production of AmpC via inducing agents' exposures, reversible after removing inducing agents. Various proteins such as AmpG, AmpD, AmpR required for AmpC genes induction^[1].

OprD are substrate specific porins, they transport biomolecules, cations, chelates. Certain hydrophilic antibiotics pass from the outer membranes via porin channels^[1,12].

MexAB-OprM, MexCD-OprJ, MexEF-OprN, MexXY-OprM, EmrE [Resistance Nodulation Division (RND) family] pumps out intracellular drug stock concentrations and makes it less susceptible against different antibiotics such as Aminoglycosides, Beta-Lactams, Glycylcyclines, Macrolides, chloramphenicol^[1,13].

P.aeruginosa produces Extended-spectrum Beta lactamase (ESBL's), Amp C cephalosporinases and Metallo Beta lactamases (MBL's) inactivates antibiotics especially Beta lactamase antibiotics^[14]. Mutations in chromosomal genes of the bacteria affects antibiotics Uptake, many resistances generated via various mutations, enlarges efflux pumps^[15,16]. The development of bio films provides protective metabolism against different antibiotics^[12].

Material and Methodology- The Soil sample was collected from Dr. Satyanarayan Gupta, Government District Pediatric Hospital and Vaccine Centre, Etawah in a sterile polythene bag and transferred to the laboratory in April 2023.

Bacteria were isolated from soil sample by using the serial dilution method on LB media plate. In serial dilution, the suspension was diluted from 10⁻¹ to 10⁻⁴, and diluted suspension was spreaded on LB media plates. Each plate was then incubated overnight to isolate the bacteria on a second LB plate for prepare pure culture. Pure culture was prepared through streak plate method for performing further tests.

Biochemical tests- Various tests are used to identify this bacterium such as Methyl red, VP, Indole, Urease, Catalase, Starch Hydrolysis, Citric acid Utilization, Carbohydrate Fermentation Tests.

Antibiotic Susceptibility Test- This test is used to determine whether the bacteria are susceptible to drug or not. In this work, authors use Kirby disc diffusion method for testing susceptibility of *P. aeruginosa*.

Observations

Table 01
Observations of Morphological and Biochemical Tests

S.No.	Tests	Observation
1.	Gram Staining	Rod Shaped
2.	MR Test	Red Colour
3.	VP Test	Cherry Red Colour
4.	Indole Test	Ring Formation
5.	Urease Test	No Colour Change
6.	Catalase Test	Bubbles Observed
7.	Starch Hydrolysis Test	No Clear Zone
8.	Citric Utilization Test	Blue Colour
9.	Dextrose Utilization Test	Yellow Colour
10.	Maltose Utilization Test	Lack of Yellow Colour
11.	Sucrose Utilization Test	Lack of Yellow Colour

Table 02
Observations of Antibiotic Susceptibility Test

Drugs	1 Cotrimoxazole	2 Ofloxacin	3 Cefotaxime	4 Imipenem	5 PiperacillinTazobactam
Observations	Clear Zone is seen	Clear Zone is seen	Clear Zone is not seen	Clear Zone is not seen	Clear Zone is seen

Results

Table 03
Result of Morphological and Biochemical Tests

S.No.	Tests	Results
1.	Gram Staining	Gram Negative
2.	MR Test	Positive
3.	VP Test	Positive
4.	Indole Test	Positive
5.	Urease Test	Negative
6.	Catalase Test	Positive
7.	Starch Hydrolysis Test	Negative
8.	Citric Utilization Test	Positive
9.	Dextrose Utilization Test	Positive
10.	Maltose Utilization Test	Negative
11.	Sucrose Utilization Test	Negative

Table 04
Results of Antibiotic Susceptibility Test

Drugs	1 Cotrimoxazole	2 Ofloxacin	3 Cefotaxime	4 Imipenem	5 Piperacillin Tazobactam
Observations	Susceptible	Susceptible	Resistant	Resistant	Susceptible

Figure 01
Antibiotic Susceptibility Test of *Pseudomonas aeruginosa*



Conclusion- In this study authors found antibiotic resistance of *Pseudomonas aeruginosa* against Cefotaxime, Imipenem and susceptible against Cotrimoxazole, Ofloxacin, Piperacillin Tazobactam.

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References-

1. Lister PD, Wolter DJ, Hanson ND. Antibacterial-resistant *Pseudomonas Aeruginosa*: clinical impact and complex regulation of chromosomally encoded Resistance mechanisms. Clin Microbiol Rev. 2009;22(4):582-610. Doi:10.1128/CMR.00040-09.
2. Finnan S, Morrissey JP, O'Gara F, Boyd EF. Genome diversity of *Pseudomonas aeruginosa* isolates from cystic fibrosis patients and the hospital environment. J Clin Microbiol. 2004 Jan;42(1):578-81. Doi: 10.1128/jcm.42.1.578581.2004. PMID: 14715759; PMCID: PMC321669.
3. Trautner BW, Hull RA, Darouiche RO. Escherichia coli 83972 inhibits catheter Adherence by a broad spectrum of uropathogens. Urology. 2003 May;61(5):1059-62. Doi: 10.1016/s0090-4295(02)02491-3. PMID: 12736061.
4. Heggers JP, Sazy JA, Stenberg BD, Strock LL, McCauley RL, Herndon DN, Robson MC. Bactericidal and wound-healing properties of sodium Hypochlorite solutions: the 1991 Lindberg Award. J Burn Care Rehabil. 1991 Sep-Oct;12(5):420-4. Doi: 10.1097/00004630-199109000-00004. PMID: 1950882.

5. Shime N, Sawa T, Fujimoto J, Faure K, Allmond LR, Karaca T, Swanson BL, Spack EG, Wiener-Kronish JP. Therapeutic administration of anti-PcrV F(ab')₂ in sepsis associated with *Pseudomonas aeruginosa*. J Immunol. 2001 Apr 15;166(8):5122-8. Doi: 10.4049/jimmunol.166.8.5122. PMID: 11290777.
6. Słotwińska SM. Host and bacterial adhesion. Pol J Vet Sci. 2013;16(1):153-6. Doi: 10.2478/pjvs-2013-0023. PMID: 23691591.
7. Pier GB, Ramphal R. *Pseudomonas aeruginosa*. In: Mandell, Douglas, and Bennett's Principles and Practice of Infectious Diseases. 9th ed. Elsevier; 2020. P. 2829-2844.
8. Lin CK, Kazmierczak BI. Inflammation: A Double-Edged Sword in the Response to *Pseudomonas aeruginosa* Infection. J Innate Immun. 2017;9(3):250-261. Doi: 10.1159/000455857. Epub 2017 Feb 22. PMID: 28222444; PMCID: PMC5469373.
9. Abderrahman Hachani, Nadine S. Lossi, Alexander Hamilton, Cerith Jones, Sophie Bleves David Albesa-Jové, Alain Filloux . Type VI Secretion System in *Pseudomonas aeruginosa* SECRETION AND MULTIMERIZATION OF VgrG PROTEINS. VOLUME 286, ISSUE 14. P12317-12327, APRIL 2011. DOI:<https://doi.org/10.1074/jbc.M110.193045>.
10. Hauser AR. *Pseudomonas aeruginosa*: Virulence Factors and Pathogenesis. In: UpToDate. Accessed July 7, 2023.
11. Livermore, D. M. (2002). Multiple mechanisms of antimicrobial resistance in *Pseudomonas aeruginosa*: our worst nightmare? Clinical Infectious Diseases, 34(5), 634-640.
12. P A Lambert. Mechanisms of antibiotic resistance in *Pseudomonas aeruginosa*. J R Soc Med. 2002; 95(Suppl 41): 22–26.PMCID: PMC1308633PMID: 12216271
13. Poole, K. (2004). Efflux-mediated antimicrobial resistance. Journal of Antimicrobial Chemotherapy, 53(5), 885-896.
14. Livermore, D. M. (2005). Beta-lactamases in laboratory and clinical resistance. Clinical Microbiology Reviews, 18(4), 657-686.
15. Oliver, A., Cantón, R., Campo, P., Baquero, F., &Blázquez, J. (2000). High Frequency of hypermutable *Pseudomonas aeruginosa* in cystic fibrosis lung Infection. Science, 288(5469), 1251-1254.
16. Li, X.-Z., D. Ma, D. M. Livermore, and H. Nikaido. 1994. Role of efflux Pump(s) in intrinsic resistance of *Pseudomonas aeruginosa*: active efflux as A contributing factor to b-lactam resistance. Antimicrob. Agents Chemother. 38:1742–1752.

Polymer nanocomposites: Synthesis and characterization

• Shivangi Mishra

Abstract- *Some significant aspects of polymers are their excellent stiffness, hardness, persistence, resistance to corrosion, absence of conduction, chromatic clarity, simplicity of processing, and relatively inexpensive. Nanostructures are incorporated into polymers to enhance their qualities, such as high barrier properties, better surface functionality, improved thermal properties, and higher electrical characteristics. A relatively small quantity of nano-filler is used in nanocomposite technology. The addition of nano-filler can significantly alter the macroscopic features of the polymer nanocomposite. While nanoscale organic and inorganic components are combined on a virtually molecular level in the former, the characteristics of nanocomposites are significantly better than those of traditional composites. Composite materials, with an estimated yearly expansion rate of 25%, are most needed in engineered polymers and synthetic rubber. Their potential is so great that they are helpful in various applications, from manufacturing to biomedical issues.*

Keywords- *Polymer, Nanocomposite, Nanofiller, Organic components.*

Introduction- Nanotechnology is a new branch of science that involves the creation of nanosized particles from various materials. Taniguchi (1974) was the first to invent "nanotechnology," defining it as the processing, separation, consolidation, and deformation of materials by one atom or molecule.

Two or more different materials with diverse chemical or physical properties are blended to produce composite materials. Its constituent materials, which stay separate and distinct inside the structural element and are not linked together by formal chemical bonds, exhibit characteristics different from those of the composite.

There are two main types of polymers: synthetic and natural. Natural polymers include those which naturally exist and can be extracted for uses. Natural polymers, such as silk, wool, DNA, cellulose, and proteins, are commonly water-based [1]. Nylon, polyethylene, polyester, Teflon, and epoxy are synthetic polymers. Various fillers, such as nano clays, metal-oxide nanoparticles, carbon nanomaterials, and metal nanoparticles, can be incorporated into a polymer matrix to produce a PNC with improved properties [2]

Nanocomposite is formed when one of the composite phases is sized in the nanometric range[3- 4].

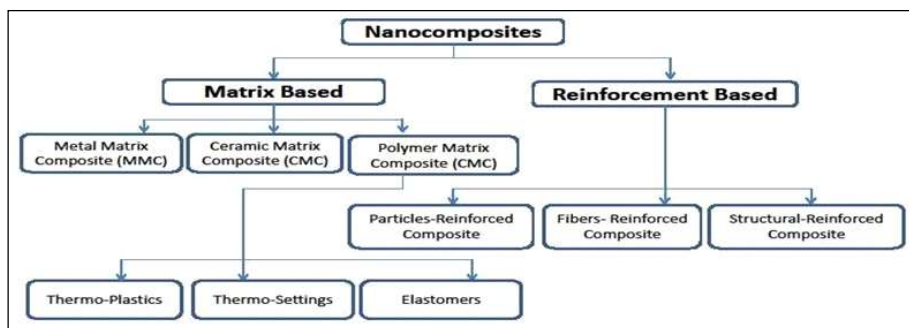
Nanocomposites are created by embedding one substance (the reinforcing phase) into another (called the matrix phase). Nanomaterials can exist in one or both phases. When at least one characteristic size of the fillers is decreased to a nanoscale scale, the interface between the nanofillers and the polymers increases dramatically. It is one developing the idea from the field of nanocomposites. PNCs are generated because the optimal volume and surface area are associated with substantially increased reactivity [5]. When a filler size is reduced from a micrometer to a nanometer, the surface area grows at 10^6 . [6-7] This substantial improvement in the interface area reinforces the interaction between nanofillers and polymer chains. Polymers proximate to the interface significantly affect the macroscopic material properties of the nanocomposites. [8] In the past few years, adding minimal quantities of such inorganic nanoparticles to polymeric materials has helped boost overall morphological, thermodynamic, and fire resistance without compromising its functional properties. [9-10]

Size limits have been stated for these effects: 5 nm for catalytic activity, 20 nm for softening a hard-magnetic material, 50 nm for changes in refractive index, and 100 nm for superparamagnetic, mechanical strengthening, or limiting matrix dislocation movement.

CLASSIFICATION OF COMPOSITES

In terms of a matrix, nanocomposites are divided into three types: ceramic-matrix nanocomposites, metal-matrix nanocomposites, and polymer-matrix nanocomposites.

Figure 01
Classification of Nanocomposites



Ceramic matrix composites (CMCs)- Ceramic matrix composites (CMCs) are a subclass of ceramics and composite materials. They are made of fibers incorporated into a ceramic matrix to create a fiber-reinforced material. Any ceramic substance may comprise the matrix and fibers; carbon and carbon fibers are also considered ceramic substances. Ceramic matrix nanocomposites have been prepared using a variety of techniques. The standard powder method, polymer precursor routes, spray pyrolyzes, vapor techniques (CVD and PVD), and chemical methods, such as the sol-gel process, colloidal and precipitation procedures, and template synthesis, are the most often used methodologies for microcomposites. Al_2O_3 or SiC are the significant components of ceramic matrix nanocomposites. Most

investigations that have been published thus far have indicated that the Al_2O_3 matrix is noticeably strengthened following the addition of a low (i.e., around 10%) volume fraction of Sic particles of the appropriate size and hot pressing of the resulting mixture.

Metal Matrix Nanocomposites- It should be made of a malleable metal or alloy matrix with reinforcement materials implemented at the nanoscale. Manufacturing materials with shear/compression strength and high service temperature capabilities is appropriate for metal matrix nanocomposites [11]. The most popular methods for manufacturing metal matrix nanocomposites are Spray pyrolysis, liquid metal infiltration, rapid solidification, vapor techniques (CVD, PVD), electrodeposition, and chemical methods, including colloidal and sol-gel processes [12,13].

Polymer nanocomposite- Polymer materials are commonly implemented in the industry due to their simplicity of manufacture, lightweight nature, and flexibility. However, they have significant limitations, such as weak modulus and strength, compared to metals and ceramics. In a recent scenario, suitably adding nanoparticles to a polymer matrix can drastically improve its performance by simply capitalizing on the nature and properties of the nanoscale filler (these materials are best defined as nanofiller polymer composites). This technique is especially helpful in producing high-performance composites when the filler dispersion is good and the characteristics of the nanoscale filler are significantly different or superior to those of the matrix.

Synthesis and Characterization- Polymer nanocomposite synthesis is an integral part of polymer nanotechnology. The characteristics of polymers are improved by adding nanometric inorganic compounds, and this has a wide range of uses depending on the inorganic material present in the polymers.

The four main techniques for producing Polymer nanocomposites are melt intercalation, template synthesis, exfoliation adsorption, and in situ polymerization intercalation [14-15]. **Melt intercalation-** Melt intercalation is the most common method for creating thermoplastic polymer nanocomposites. It involves annealing the polymer matrix at high temperatures, adding the filler, and kneading the composite to obtain uniform distribution. It offers the advantage of being environmentally sustainable due to the absence of solvent usage. Furthermore, it is considered conducive to industrial processes such as injection molding and extrusion, making it easier and more cost-effective. The melt intercalation process depends on the surface energy of the polymer.¹⁶

Exfoliation adsorption is based on a solvent in which the polymer or prepolymer is soluble and is also known as polymer or prepolymer intercalation from solution. For instance, the multilayer silicate is expanded and dispersed in a solvent before being combined with the polymer solution. As the polymer, solvent, and nanomaterial are mixed between layers of the materials, the penetrated polymer between the layers of nanomaterials is left intact after the solvent has evaporated, creating nanocomposites and, for water-soluble polymer, used the technique. However, one of the drawbacks

of this process is the use of a massive volume of organic solvent, which is both expensive and harmful.[19]

In-situ polymerization occurs when a low-molecular-weight monomer enters the interface region, causing the filler to swell in liquid or monomer solution.[18] Polymerization can begin with heat, radiation, initiator diffusion, or an organic initiator or catalyst fixed by the cationic exchange. In between the interlayers, the monomers then polymerize to create intercalated or exfoliated nanocomposites. This method has an advantage over melt and exfoliation adsorption methods in achieving better exfoliation.[17]

The inorganic filler is generated in sol-gel technology in an aqueous solution or gel. The polymer acts as a nucleating agent, allowing crystals of the inorganic filler to form. Polymer intercalates between the nanomaterials, and polymer nanocomposites are generated once the filler grows.[20] The polymer acts as a nucleating agent, promoting the formation of the inorganic filler crystals. The polymer becomes trapped within the layers when those crystals grow, forming the nanocomposite. Due to the high temperature utilized during production, which destroys the polymer and causes the developing inorganic crystals to be aggregate, this process is not commonly used.[13-15]

Because of their low weight, design flexibility, and processability, polymer systems are frequently used. In contrast to metals and ceramics, these systems typically display less desirable mechanical characteristics, such as low strength and low elastic modulus. Making polymer composites with high- modulus reinforcing filler enhances the mechanical aspects of these systems while preserving their desired features. [21-23]

To determine the various aspects of polymer nanocomposite, it is required to characterize the nanocomposite materials. Using more than one characterization approach is frequently needed to determine the nanocomposite material accurately. Thermogravimetric analysis, differential scanning calorimetry, transmission electron microscopy, scanning electron microscopy, X-ray diffraction, nuclear magnetic resonance, IR spectroscopy, Raman spectroscopy, X-ray photoelectron spectroscopy, dielectric relaxation spectroscopy, atomic force microscopy, and electron spin resonance are just a few of the numerous nanocomposite characterization techniques that are available.

Differential scanning calorimetry (DSC) is an experimental method for determining the amount of heat energy absorbed by a sample during a controlled temperature increase. Differential scanning calorimetry determines the temperature at which glass transitions and crystals form.

The crystallization of polymer nanocomposites has been determined using the highly effective experimental technique known as XRD. Comparing the areas under the XRD peaks is typically used to estimate the quantity of crystalline material. Measurement and control of the interface strength are crucial to developing carbon nanotube-reinforced polymer nanocomposites with customized interfacial architectures and features.

SEM and transmission electron microscopy are two electron microscope techniques widely employed for the broad visual identification of carbon nanotube-reinforced polymer nanocomposites. Furthermore, optical microscope techniques such as confocal laser scanning microscopy efficiently assess the quality of carbon nanotube dispersion in a polymer matrix. Because of its benefits for high-precision and high-sensitivity observations, atomic force microscopy may be the ideal technology for interface characterization. This microscopy approach can also be used to investigate the interface properties of polymer nanocomposites. The pull-out and peeling methods are two particularly effective approaches for characterizing the interface's features.

Conclusion- In the polymer community, enormous research efforts are underway to characterize the interface's features. An essential component or parameter of nanotechnology is nanomaterials and nanocomposites. Nanocomposites are created by fusing two or three distinct nanoparticles. The characteristics of the associated nanoparticles in nanocomposites vary. Because of these qualities, nanocomposites are valuable and in high demand across all industry sectors. This review article briefly explains the idea of nanocomposites and their associated features. Although nanocomposites are finding many vital uses in various industrial domains, several technological and financial obstacles prevent their widespread commercialization. It has potential applications and includes photovoltaic cells, photodiodes, superconductors, sensors, light-emitting diodes, and field effect transistors.

References-

1. Yuan M., Hu M., Dai F., Fan Y., Deng Z., Deng H., Cheng Y. Application of synthetic and natural polymers in surgical mesh for pelvic floor reconstruction. *Mater. Des.* 2021; 209:109984. doi: 10.1016/j.matdes.2021.109984. [CrossRef] [Google Scholar]
2. Jamróz E., Kulawik P., Kopel P. The Effect of Nanofillers on the Functional Properties of Biopolymer- Based Films: A Review. *Polymers.* 2019; 11:675. doi: 10.3390/polym11040675. [PMC free article] [PubMed] [CrossRef] [Google Scholar]
3. Dalton AB, Collins S, Munoz E, et al. Super-tough carbon-nanotube fibers: these fantastic composite fibers can be woven into electronic textiles. *Nature* 2003; 423 (6941): 703-703.
4. Roy R, Roy RA, Roy DM. Alternative perspectives on "quasi-crystallinity": non-uniformity and nanocomposites. *Materials Letters* 1986; 4 (8-9): 323-328.
5. Luo H., Zhou X., Ellingford C., Zhang Y., Chen S., Zhou K., Zhang D., Bowen C.R., Wan C. Interface design for high energy density polymer nanocomposites. *Chem. Soc. Rev.* 2019; 48:4424–4465. doi: 10.1039/C9CS00043G. [PubMed] [CrossRef] [Google Scholar]
6. Sanada, K.; Tada, Y.; Shindo, Y. Thermal conductivity of polymer composites with close-packed nano and micro-fill structure. *Compos. Part A* 2009, 40, 724– 730, DOI: 10.1016/j.compositesa.2009.02.024 [Crossref], [CAS], Google Scholar
7. Cho, J.; Joshi, M. S.; Sun, C. T. Effect of inclusion size on mechanical properties of polymeric composites with micro and nanoparticles. *Compos. Sci. Technol.* 2006, 66, 1941– 1952, DOI: 10.1016/j.compscitech.2005.

- 12.028 [Crossref], [CAS], Google Scholar
8. Hong, Y.; Li, Y.; Wang, F.; Zuo, B.; Wang, X.; Zhang, L.; Kawaguchi, D.; Tanaka, K. Enhanced thermal stability of polystyrene by interfacial noncovalent interactions. *Macromolecules* 2018, 51, 5620– 5627, DOI: 10.1021/acs. Macro mol. 8b01012 [ACS Full Text ACS Full Text], [CAS], Google Scholar
9. 5. Luo H., Zhou X., Ellingford C., Zhang Y., Chen S., Zhou K., Zhang D., Bowen C.R., Wan C. Interface design for high energy density polymer nanocomposites. *Chem. Soc. Rev.* 2019; 48:4424–4465. doi: 10.1039/C9CS00043G. [PubMed] [CrossRef] [Google Scholar]
10. Müller K, Bugnicourt E, Latorre M, Jorda M, Echegoyen Sanz Y, Lagaron J, et al. Review on the processing and properties of polymer nanocomposites and nanocoatings and their applications in the packaging, automotive, and solar energy fields. *Nanomaterials*. 2017; 7:74-121
11. Bitinis N, Hernandez M, Verdejo R, Kenny JM, Lopez-Manchado MA. Recent advances in clay/polymer nanocomposites. *Advanced Materials*. 2011; 23:5229-5236
12. S.C. Tjong, G.S. Wang, High-cycle fatigue properties of Al-based composites reinforced with in situ TiB₂ and Al₂O₃ particulates, *Mater. Sci. Eng. A* 386 (2004) 48-53.
13. C. Baker, S.I. Shah, S.K. Hasanain, Magnetic behavior of iron and iron-oxide nanoparticle/polymer composites, *J. Magn. Magn.Mater.* 280 (2004) 412-418.
14. L.S. Schadler, S.C. Giannaris, P.M. Ajayan, Load transfer in carbon nanotube epoxy composites, *Appl. Phys. Lett.* 73 (1998) 3842–3844.
15. Mittal, V. (2010) in *Optimization of Polymer Nanocomposite Properties* (ed. V. Mittal), Wiley-VCH Verlag GmbH & Co. KGaA, Weinheim, pp. 1–19.
16. Ray, S.S. and Okamoto, M. (2003) Polymer/layered silicate nanocomposites: a review from preparation to processing. *Prog.Polym. Sci.*, 25, 1539–1641.
17. Pavlidou, S. and Papaspyrides, C.D. (2008) A review on polymer-layered silicate nanocomposites. *Prog.Polym. Sci.*, 33, 1119–1198.
18. Abedi, S. and Abdouss, M. (2014) A review of clay-supported Ziegler-Natta catalysts for the production of polyolefin/ clay nanocomposites through in situ polymerization. *Appl. Catal. Gen.*, 475, 386–409.
19. Mittal, V. (2009) Polymer layered silicate nanocomposites: a review. *Materials*, 2, 992–1057.
20. M. Amin, Methods for preparation of nanocomposites for outdoor insulation applications, *Rev. Adv. Mater. Sci.* 34 (2013) 173–184.
21. A. Rajani, J. Sharma, P.Y. Dave, Synthesis of metal-doped TiO₂ nanocomposites by sol-gel method and their structural properties, *J. Nanosci. Tech.* 6 (2020) 915–917
22. Park, J.H., Jana, S.C., *Polymer*, 44: p. 2091-2100, 2003.
23. Lipatov, Y.S., *Polymer Reinforcement*: ChemTec Publishing 385, 1995.
24. Wu, C.L., Zhang, M.Q., Rong, M.Z., Friedrich, K., *Composites Science and Technology*, 62: p. 1327- 1340, 2002.

A Theoretical Study of Thermo-physical And Cohesive Properties of $\text{LiI}_{1-x}\text{F}_x$ Mixed Alkali Halide.

• A.K. Dixit

Abstract- *I have studied the thermo-physical and cohesive properties such as Cohesive Energy, Gruneisen parameter, Molecular force constant, Restrahl frequency, Debye temperature, Compressibility and Anderson - Gruneisen parameter etc of $\text{LiI}_{1-x}\text{F}_x$ mixed alkali halide under the banner of three body force potential model. Three Body Force Potential (TBFP) model contains long-range forces (Colombians and three body interactions) as well as short range forces (vander-Waal's and overlap repulsive forces).⁽¹⁰⁻¹⁵⁾ I have selected mixed alkali halides for the discussion because mixed crystals are very useful and known as solid solutions. Mixed alkali halides have received considerable attention of investigators⁽¹⁻⁹⁾ due to their scientific and technological importance. The observations show that the micro - hardness of mixed alkali halides is larger than the pure crystals. Some results are very close to their experimental value which shows the superiority of this model over other models.*

Keywords- *Thermo-physical And Cohesive Properties*

Introduction- Ionic solids are model crystals for the analysis of lattice properties. In the same spirit we have used our three body force potential model (TBFP) for the calculation of cohesive and thermo-physical properties of mixed alkali halide $\text{LiI}_{1-x}\text{F}_x$. This potential model consists long-range (Colombian and three body interaction) forces as well as short range forces (overlap repulsive force operating up to next nearest neighbor ions and vander - Waal's interaction)⁽²⁵⁻³⁰⁾. This shows that the inclusion of three body interaction effect, makes the present model suitable for the study of cohesive and thermo-physical properties of mixed alkali halides. Most of the theoretical and experimental workers⁽¹⁰⁻³⁶⁾ have explained the elastic, cohesive and thermo-physical properties of the ionic solids.

Theory and method of Calculations- A large number of attempts have been made to explain the behavior of the ionic solids under some boundary conditions through some potential models. We have applied the TBP model for the calculation of thermo-physical properties of mixed alkali halide. Three body potential model contains long-range forces as well as short-range forces. Colombians force associated with three body interaction force is long-range force while vander - Waal's and Hafemeister-Flygare are short-range forces. The values of input data for different concentrations(x) have been evaluated by applying Vegard's law for second order elastic constants,

lattice constants, ionic radii and vander -Waal's constants of host and dopant materials as –

$$\begin{aligned}C_{ij}(\text{mix}) &= x c_{ij}(A) + (1-x) c_{ij}(B) \\r_{ij}(\text{mix}) &= x r_{ij}(A) + (1-x) r_{ij}(B) \\\rho(\text{mix}) &= x \rho(A) + (1-x) \rho(B) \\C(\text{mix}) &= x C(A) + (1-x) C(B) \\D(\text{mix}) &= x D(A) + (1-x) D(B)\end{aligned}$$

The constituents of mixed crystal are held together by the harmonic elastic forces with no internal stress within the crystal. The values of input data are given in table 1.1. Thermo-physical and cohesive properties included in the discussion are Gruneisen parameter (γ), molecular force constant (f) Debye Temperature (θ_D), Restrahl frequency (ν_0), ratio of volume thermal expansion coefficient to specific heat at constant volume. Relevant expressions have been derived from three body potential model.⁽²⁵⁻³⁶⁾

$$\begin{aligned}U^{\otimes} &= -\alpha_m z^2 e^2 / r - 2nf(r) \alpha_m z e^2 / r + nb \beta_{+-} \exp [(r_1 + r_2 - r) / \rho] \\&\quad + n \square b / 2 [\beta_{++} \exp [(2r_1 - 1.4142r) / \rho] \\&\quad + \beta_{--} \exp (2r_2 - 1.4142r) / \rho] - C / r^6 - D / r^8 \\U'^{\otimes} &= +\alpha_m z^2 e^2 / r^2 + 2nf(r) \alpha_m z e^2 / r^2 - 2nf'(r) \alpha_m z e^2 / r - nb / \rho \beta_{+-} \exp [(r_1 + r_2 - r) / \rho] \\&\quad - n \square b (1.414) / 2 \rho [\beta_{++} \exp [(2r_1 - 1.4142r) / \rho] \\&\quad + \beta_{--} \exp (2r_2 - 1.4142r) / \rho] + 6 C / r^7 + 8 D / r^9 \\U''^{\otimes} &= -2\alpha_m z^2 e^2 / r^3 + 4nf(r) \alpha_m z e^2 / r^3 + 4nf'(r) \alpha_m z e^2 / r^2 - 2nf''(r) \alpha_m z e^2 / r \\&\quad + nb / \rho^2 \beta_{+-} \exp [(r_1 + r_2 - r) / \rho] \\&\quad + n \square b (1.414)^2 / 2 \rho^2 [\beta_{++} \exp [(2r_1 - 1.4142r) / \rho] \\&\quad + \beta_{--} \exp (2r_2 - 1.4142r) / \rho] - 42 C / r^8 - 72 D / r^{10} \\U'''^{\otimes}(r) &= 6\alpha_m z^2 e^2 / r^4 + 12nf(r) \alpha_m z e^2 / r^4 - 12nf'(r) \alpha_m z e^2 / r^3 + 6nf''(r) \alpha_m z e^2 / r^2 \\&\quad - 2nf'''(r) \alpha_m z e^2 / r \\&\quad + nb / \rho^2 \beta_{+-} \exp [(r_1 + r_2 - r) / \rho] \\&\quad + n \square b (1.414)^3 / 2 \rho^3 [\beta_{++} \exp [(2r_1 - 1.4142r) / \rho] \\&\quad + \beta_{--} \exp (2r_2 - 1.4142r) / \rho] + 336 C / r^9 + 720 D / r^{11} \\[U(r)]_{SR} &= +nb \beta_{+-} \exp [(r_1 + r_2 - r) / \rho] \\&\quad + n \square b / 2 [\beta_{++} \exp [(2r_1 - 1.4142r) / \rho] \\&\quad + \beta_{--} \exp (2r_2 - 1.4142r) / \rho] - C / r^6 - D / r^8 \\[U \square (r)]_{SR} &= -nb / \rho \beta_{+-} \exp [(r_1 + r_2 - r) / \rho] \\&\quad - n \square b (1.414) / 2 \rho [\beta_{++} \exp [(2r_1 - 1.4142r) / \rho] \\&\quad + \beta_{--} \exp (2r_2 - 1.4142r) / \rho] + 6 C / r^7 + 8 D / r^9 \\[U \square \square (r)]_{SR} &= +nb / \rho^2 \beta_{+-} \exp [(r_1 + r_2 - r) / \rho] + n \square b (1.414)^2 / 2 \rho^2 [\beta_{++} \exp \\&\quad [(2r_1 - 1.4142r) / \rho] \\&\quad + \beta_{--} \exp (2r_2 - 1.4142r) / \rho] - 42 C / r^8 - 72 D / r^{10}\end{aligned}$$

(i) Gruneisen parameter

$$\gamma = -r_o / 6 [U \square \square \square (r) / U \square \square (r)]_{r=r_o}$$

(ii) Molecular force constant

$$f = 1/3 [U \square \square \square_{SR}(r) + 2/r U \square \square_{SR}(r)]_{r=r_o}$$

(iii) Restrahl frequency

$$\nu_0 = 1/2\pi\sqrt{f/\mu}$$

where μ is the reduced mass of the crystal.

(iv) Debye Temperature. $\Theta_D = h\nu_0/k$

(v) Ratio of volume thermal expansion coefficient to specific heat at constant volume

$$\alpha_v/C_v = -U''(r_0)/2r_0 U'(r_0)^2$$

(vi) Compressibility $\beta = 18r_0/U''(r_0)$

(vii) The Anderson- Gruneisen Parameter

$$\delta_T = -\beta r_0^3/27V U''(r_0)$$

The above relations have been used to calculate the thermophysical and cohesive properties of given mixed halide. The model parameters are given in table 1.1 and calculated thermophysical and cohesive properties of mixed alkali halide are given in table 1.2 .

Table 1.1
Model parameters for mixed
alkali halide $\text{Li}_{1-x}\text{F}_x$ at different compositions

Composition (x)	ρ (10^{-8}cm)	b (10^{-12}ergs)	f (r_0)	af (r_0)	C($10^{-60}\text{erg x cm}^6$)	D($10^{-76}\text{erg x cm}^8$)
0.0 (LiI)	0.442	0.365	0.0041	-0.028	1265	584
0.2	0.429	0.388	0.0037	-0.0252	1021.2	472.4
0.4	0.416	0.411	0.0033	-0.0224	777.4	360.8
0.6	0.403	0.434	0.0029	-0.0196	533.6	249.2
0.8	0.390	0.457	0.0025	-0.0168	289.8	137.6
1.0 (LiF)	0.377	0.480	0.0021	-0.014	46	26

Table 1.2
Thermophysical & Cohesive Properties
of Mixed Halide $\text{Li}_{1-x}\text{F}_x$ At Different Compositions.

Cohesive Property	X=0		X=0.2		X=0.4		X=0.6		X=0.8		X=1.0	
	Calc	Exp.	Calc	Exp.	Calc	Exp.	Calc	Exp.	Calc	Exp.	Calc	Exp.
Gruneisen Parameter γ	1.840	-	1.714	-	1.588	-	1.462	-	1.336	-	1.210	1.60 ²²
Molecular force constant f (10^4 dyn/cm)	5.03	-	5.614	-	6.198	-	6.782	-	7.366	-	7.95	-
Restrahl frequency ν_0 (T Hertz)	11.1	-	11.54	-	11.98	-	12.42	-	12.86	-	13.3	-
Debye Temperature (Θ_D) (k)	508	-	534.03	-	560.05	-	586.08	-	612.10	-	638.13	730 ⁷
Ratio of volume thermal expansion coefficient to specific heat at constant volume α_v/C_v (10^{10}ergs unit)	5.25	-	5.068	-	4.886	-	4.704	-	4.522	-	4.34	-
Compressibility (β) (10^{12} dyn/cm)	4.64	5.83	8.175	-	7.283	-	6.392	-	5.501	-	1.76	1.49 ²³
The Anderson - Gruneisen Parameter δ_T	3.69	-	3.434	-	3.178	-	2.922	-	2.666	-	2.41	-

Result and Discussion- A look at the table 1.2, it is clear that presently estimated end point values of Gruneisen parameter are very close to their experimental values. Some results of ours are still higher than the experimental values. The reason behind is to change in bond length in ionic solids. The compressibility and micro hardness and Ratio of volume thermal expression coefficient to specific heat at constant volume of mixed halide is higher than pure crystals. So, this mixed halide is very important for industrial purpose. Some results are very close to their experimental value which shows the superiority of this model over other models. On the basis of overall achievements, the present TBP model can be regarded to be adequately suitable for the prediction of thermo physical and cohesive properties of mixed alkali halides.

References-

1. Kennedy, S.W., J. Appl. Cryst. 6,293(1973); J.Mat. sci. 9, 1043 (1974).
2. Basset, W.A. and Takahashi, T., "Advance in high pressure research" vol. 4, R.H. wentorf (Academic press London, 1974); Rev. Sci. Instr. 38,37 (1967); Liu, Lingin abd W.A. bassett, j. Geophys. Res. 77, 4934 (1972).
3. Singh, R.K. and Agrawal. M.K., Solid state Communication 17,991 (1975).
4. Singh R.K. and Gupta, D.C., Phase Transition, 53,39 (1995).
5. Singh R.K. Phys. Report 85, 259 (1982).
6. Hafemeister, A.M., Phys. Rev. B 56, 5835 (1997).
7. Tosi, M.P., Solid State Physics 16,1 (1964).
8. Cohen, A.J., Physical Rev. B 12, (1975).
9. Tranquada, J.M. and Ingalls, Phys. Rev. B34 4267 (1986); Phys. Lett. 94 A, 441 (1983).
10. Singh, R.K. and Singh, Sadhana, Phase Transitions, Phys. Rev. B39, 761 (1989).
11. Jog, K.N. Singh R.K. and Sanyal, S.P., Phys. Rev. B35, 5235 (1987); B31, 6047 (1985).
12. Singh, R.K. and Gupta, D.C., Nuovo Cimento, D2, 1235 (1987).
13. Singh, R.K. and Gupta, D.C. and Sanyal, S.P., Physics Status solidi B149, 356 (1988).
14. Ladd, M.F.C., J. Chem. Phys. Solids 60, 1954 (1974).
15. Fumi, F.G. and Tosi M.P., Ibid 25, 345 (1964).
16. Tosi, M.P., J. Phys. Chem. Solids 24, 956 (1963).
17. Fumi, F.G. and Tosi, M.P., Ibid 25, 31 45 (1964).
18. Born, M. and Huang, K., "Dyanamic theory of Crystal lattices" (Oxford U. Press London 1945).
19. Vaidya, S.N. and Kennedy, G.C., J Phys. Cem. Solids, 31, 2329 (1970).
20. Vaidya, S.N. and Kennedy, G.C., J Phys. Chem. Solids, 32, 951 (1971).
21. Bridgeman, P.W., Proc. Am. Acad Arts. Sci. 77, 189 (1949); 72 45 (1937); 74, 21 (1940); 76, 1 (1945).
22. Anderson, O.L., J. Phys. Chem, Solids 27, 547 (1966).
23. Lewis, J.T., et. al. Phys. Rev. 161, 877 (1967).
24. A. Jayaraman, W. Klement & G.C. Kennedy Phys. Rev. 30, 2277.
25. D.E. Munson and R.P. May AIAAJ. 14, 235 (1976)
26. R.G. Mequeen, S.P. Marsh, J.W. Taylor, J. N. Fritz and W.J. Carter, Academic Press New York 1970.
27. S.P. Obsenschain, J. Green, B.H. Ripin and E.A. McLwan, Phys. Rev. utt. 46, 1402 (1981).

28. N.C. Holmes GPP Sala, 1982 P-164.
29. S. C. Rashleigh and R. A. Marshall, J. Appl. Phys. 49, 2540 (1978).
30. Dixit, A.K., Sinha, B.K. Gupta, J.P. Gupta, Napier Indian Research Journal of Science Vol. 6 (pp 83-86), June (2011).
31. Dixit, A.K., Gupta, J.P. Sharma, S.K., Napier Indian Research Journal of Science Vol. 6 (pp 75-78), June (2011).
32. Dixit, A.K., Gupta, J.P. Sharma, S.K., Acta Ciencia Indica Vol. XXXVII, No. 4, 415 (2011)
33. Dixit, A.K. Research journal of social and life science vol. xxxvi (jan-june 2022) pp 214-220.
34. Dixit, A.K. Research journal of Arts Management and Social Sciences (oct-march 2023) pp 176-180



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