Academic Journal of Sukuna-AJoS, Volume 5(1), 2025 (2082) ISSN 2594-3138 (Print)

Academic Journal of Sukuna

AJoS

A Peer-reviewed Interdisciplinary Journal

Research Management Cell
(RMC - Sukuna)
Sukuna Multiple Campus
Sundarharaincha, Morang
Koshi Province, Nepal

www.sukuna.edu.np. sukunamc2048@gmail.com rmcsukuna1@gmail.com

Academic Journal of Sukuna – AJoS

A Peer Reviewed Interdisciplinary Journal

Research Management Cell
Sukuna Multiple Campus
Sundarharaincha, Morang
Koshi Province, Nepal

Web site: www.sukuna.edu.np
Email: info@sukuna.edu.np
sukunamc2048@gmail.com
rmcsukuna1@gmail.com

Academic Journal of Sukuna – AJoS

A Peer Reviewed Interdisciplinary Journal

Sukuna Multiple Campus, Sundarhaincha, Morang, Koshi Province, Nepal

Publisher: RMC-Sukuna

Year of Publication: July 2025 AD/Ashad 2082 BS

Specialization Category: Interdisciplinary

Language: English and Nepali

ISSN: 2594-3138 (Print)

Periodicity of publication: Annual

Website: www.sukun.edu.np

Email: info@sukuna.edu.np, sukunamc2048@gmail.com,
rmcsukuna1@gmail.com

Phone No.: 021-547617 021-547717 9852045617

Copies: 100 pieces

Price: NRC 550/- (4 USD) for individual

NRC. 750/- (5.5 USD) for institutional

…….

Academic Journal of Sukuna – AJoS

A Peer Reviewed Interdisciplinary Journal

Format of the Paper

Introduction with literature review, Methodology, Results and Discussion with conclusions, (Shortly named as **IMRAD**).

Title of the Paper (Centered)

Word limit: The title should summarize the main idea of the paper simply and, if possible, in a way that is engaging for readers. For research papers, it should be a concise statement of the main topic of the research and should identify the variables or theoretical issues under investigation and the relationship between them.

Name of the Author/s
Affiliation of the Author/s
Email of Principal Author:

Abstract (Centered)

It should contain 250 words or not more than 250 words.

Keywords: It should contain 3 to 6 terms.

(Indent and italicized the terms 'keywords'.)

Introduction (Centered)

The author should include background, problems, objectives, literature review, and hypothesis (if any). It should contain 1200-1700 words.

Methods and Materials (Centered)

The author should include brief description of how the research was conducted and the paper (article) prepared. For example: design, population, sample, sources etc. It should contain 500-800 words.

Result and Discussion (Centered)

The result should include presentation and analysis through table, picture, graphs, diagrams, images and text. It should contain 800-1200 words. If the section has sub-headings, place the sub-headings accordance with level of heading mentioned by APA 7th edition.

The discussion should include the interpretation of results and findings. It should contain 1200 - 1800 words. If the section has sub-headings, place the sub-headings accordance with level of heading mentioned by APA 7th edition.

Conclusions

The author should conclude his/her result and discussion. This section should contain 300-500 words.

Acknowledgement (If any)

References (Centered)

It should be arranged accordance with APA 7th edition.

Appendices (If any)

Journal Publication Process

The following publication process was adopted by the 'Research Management Cell (RMC - Sukuna) and Editorial Board of Journal Publication.

1. Based on the action plan, RMC - Sukuna announced 'Call' for articles along with the given publication guidelines for journal publication.
2. RMC -Sukuna formed an editorial board from the pool of experts from the country and aboard.
3. RMC -Sukuna collected the articles as per the guideline procedures.
4. RMC -Sukuna handed over the articles to the editorial board.
5. The editorial board provided preliminary feedback to the authors.
6. Incorporating the feedback, the authors submitted the article/s to the editorial board.
7. The editorial board formed a list of experts for review and sent requests them to be the reviewers then received consent from them.
8. The editorial board also developed an evaluation form for the evaluation of the article/s.
9. The board sent the article/s to the reviewers with the review form without disclosing the author's identity (coded copies) for evaluation.
10. Having received the reviewed articles from the reviewers, the rejected articles were sent back to the authors mentioning/including the reasons of rejection, and then excluded the rejected articles from the list, however, the remaining articles were sent to the respective authors along with the feedback without disclosing the identity of the reviewers.
11. The authors were asked to modify the articles and submit to the address of the editorial board based on the feedback given to them within the given time (in the case of modification required).
12. RMC - Sukuna examined 'plagiarism' and provided its result report to the editorial board.
13. The editorial board meeting made decision of final acceptance/rejection of each individual article for publication.
14. Having made the final decision of accepted articles and the design of the manuscript, the editorial board submitted the manuscript to the RMC -Sukuna authority for publication.
15. The RMC, with the consent of campus authority made the decision for publication of the journal.

Editorial Notes

This fifth volume of 'Academic Journal of Sukuna' - AJoS, has been an outcome of the continuity of the previous academic publications in the form of 'Interdisciplinary journal. The volume principally serves the campus roadmap of encouraging teaching faculties and non-teaching staff for the publication of their research work along with the genuine inclusion of the articles invited from other institutions. It has, thus, been a treasured integrated piece, a meaningful contribution to the academic audience.

We had a large collection of 22 articles in the beginning but in course of the intensive review, the number was high-pitched reduced by 50 % to be a rigorous collection of 11 scholarly finalized papers of multiple disciplines. However, outcome has been the best combination of multiple disciplines and mediums the authors opted to disseminate the information to the readers. Each article has perspectives on the issues and spirit of embracing multidisciplinary information. Written on 'Geometric knowledge use on Vedic Rituals and Transmission Techniques' and 'Mathematical Activities in Kewarat Culture' contain ingenious perspectives. Nepali literature focused articles have maternity, environmental and the expressive reality views. Perspectives such as gender-based wage differences, pedagogical points in terms of the medium of instruction and critical faculty motivation towards research publication are also explored. Habitat preferences of Pangolins; principles of structural, electronic and mechanical properties of $LiBeF_3$ and eugenol from clove buds and testing antimicrobial activity are integrated science literatures to enrich the publication.

The editorial team has obeyed the fundamental principles of editing with the canonical guidelines of the APA Manual (7^{th}) along with the subordinate guidelines of RMC - Sukuna. The team hopes that the current edition will inspire other campus faculties, new generation in the pipelines and the readers of the wider community to contribute for the global and local agenda issues ahead.

Team of Editors
Academic Journal of Sukuna – AJoS
Vol. 5 (Issue 1)
2025 July (2082 Ashad)

Table of Contents

Academic Journal of Sukuna – AJoS, A Peer-reviewed Interdisciplinary Journal
Volume 5 (Issue 1) 2025 July (2082 Ashad), Pp. 1 – 37 ISSN 2594-3138 (Print)
Research Management Cell (RMC – Sukuna), Sundarharaincha, Morang

An Ethnographic Lenses on Mathematical Activities in Kewrat Culture

Doi: https://doi.org/10.3126/ajos.v5i1.81794

Akhilesh Kumar Das[1*] and Dandapani Gautam[2]

[1]M Ed Student and Teacher of Shree Public Secondary School, Rangeli, Morang, Nepal

[2]Faculty of Sukuna Multiple Campus Morang, Nepal

[*]Email: akdas2041@gmail.com

Abstract

A study explores the mathematical knowledge embedded in the daily practices of the Kewrat community of Nepal. Employing an ethnography research design, with aims to identify the traditional counting, measurement, and geometrical concepts used by the Kewrat people and their potential pedagogical applications. The information from respondents selected with purpose sampling of 5 - elderly community members, 2 - native school teachers, 10 – students from Kewrat family and their parents with interview, observation and photographs, shows that that mathematical practices in the Kewrat culture is based on counting, measuring, arithmetic operations and geometrical principles. The study found that "ganda," "vira," "vanja," and "skori" are used in counting, fingers and hands are used for arithmetic operations, indigenous measurement tools are "dandi" for weight, "lota" and "kat-tha" for volume, and "bitta" and "haat" for measuring length and calculating area. Kewrat people also demonstrate a practical understanding of geometrical concepts, such as cones, cylinders, and prisms, applied in crafting tools for daily uses. These findings highlight the richness of cultural mathematics and its relevance to formal education. This study suggests incorporating these traditional practices into mathematics classrooms to enhance student engagement, promote hands-on learning, and connect cultural knowledge with academic concepts.

Keywords: Culture, Ethnomathematics, Kewrat

Introduction

Culture is a set of shared beliefs, values, customs, and practices that evolve organically within a group of people (Fowler & Fowler, 2014). According to Geertz (1973), culture is "symbolically constructed," meaning that it is expressed and communicated through various forms, such as rituals, art, and social practices. Every culture uses mathematics as a tool of communication and for the performance of their activities. Bishop (1988) describes mathematics as a pan-human phenomenon, emphasizing that all human cultures possess their own mathematical systems and practices and concludes counting common to all cultures are counting, locating, measuring, designing, playing and exploring are cultural products common to all cultures.

Identifiable cultural groups are known as 'ethno' and 'Mathema' means to explain, understand and manage reality specifically by counting, measuring, classifying, ordering, inferring and modeling patterns arising in the environment and the 'tics' mean art or technique (Fowler & Fowler, 2014). Thus, ethno-mathematics is the study of mathematical techniques used by identifiable cultural groups in understanding, explaining, and managing problems and activities arising in their own environment. Nepal is a multilingual and multicultural country, as stated in the Constitution, with various ethnic groups, each possessing unique cultural traditions and practices. Among them, the Kewrat is an ethnic group living in Morang District, consisting of 8,809 people (Central Bureau of Statistics, 2022). We can observe the unique mathematical system in counting, measuring and classifying being practiced in Kewrat culture. So, this study focuses on the mathematical ideas and practices inherent in the Kewrat culture, aiming to bridge the gap between cultural heritage and mathematical understanding with the primary objective to investigate the mathematical practices inherent in Kewrat culture and to examine the pedagogical implications of mathematical practices in the Kewrat community for school mathematics. This raises important questions: Can the mathematical activities found in different cultures be recognized

through various philosophical perspectives? Can the mathematical ideas of the Kewrat community be included in the local formal education curriculum? The discussion that follows addresses these questions.

The Absolute philosophy of mathematics views mathematics as a certain, objective, unchangeable body of knowledge founded on the firm base of deductive logic (Ernest, 1991, 1998). This view does not value the mathematics of culture. Next, fallibilism considers mathematics as the result of social processes (Ernest, 1991). In the past few decades, a fresh wave or movement of fallibilist philosophy of mathematics has been gaining ground. These perspectives propose a different and opposing image of mathematics as human, corrigible, historical, and changing (Davis & Hersh, 1980; Ernest, 1994b; Lakatos, 1976; Tymoczko, 1986).

The fallibilist philosophy of mathematics accepts and includes the practices of mathematicians, the history and application of mathematics, its position in human culture and behavior and issues of education and values as authorized philosophical concerns.

The different cultural practices and beliefs of people in the environment like mathematical practices of Kewrat culture, school mathematics and different mathematical philosophy are examined on the following framework and demonstrate the value of integrating traditional knowledge into contemporary education. This approach not only fills a research gap in connecting ancient mathematical principles with modern pedagogical practices but also promotes a richer, more inclusive mathematics education that acknowledges the contributions of diverse cultures.

Khanal (2008) has studied on ‘Ethnographic study on mathematical concepts and pressure by Porter’. It is concluded that going of knowledge is the process of observing, reflection of thinking, performing, practicing and creating. To fulfil each and every mathematical need potter applies mathematical concepts in their daily potter mathematics. The conventional mathematical concepts were embedded in the work of

potter. This shows mathematics is used in profession, now question comes whether mathematics is used in other ethnic activities?

Rai (2011) studied on 'Mathematical concept and process of practice by Dumi Rai at Khotang district and found the Dumi rai have two types (one counting number in the Dumi language and next place value system) of numeration system: They use The Dumi Rai have their own traditional system of measurement: length is measured with fingers, and hand, area of land is measured according to seeding and poaching time, volume is measured by 'muthi', pathi' and 'muri'. This literature shows that mathematics by ethnic group in their traditional system of measurement. Now question comes whether research related to mathematics used by different ethnic people are made?

UNESCO (1998) has conducted research on the topic 'Developing culturally contextualized mathematics resource materials: capturing local practice of Tamang and Gopali communities' and found that the parents, teachers and students were very positive towards culturally responsive teaching and curriculum materials.

This discussion shows mathematics is used in profession like potter and also in the activities of different ethnic groups and research in ethnographic study of mathematics are also being carried out. Nepalis one of the multicultural countries, where different ethnic group are living and they have practice mathematical activities of their own cultural system. We can observe mathematical activities being practiced in Kewrat culture also. From the literatures it can be argued that that culturally relevant mathematics teaching builds the mathematical bridge between students' home culture and school mathematics. of different ethnic groups.

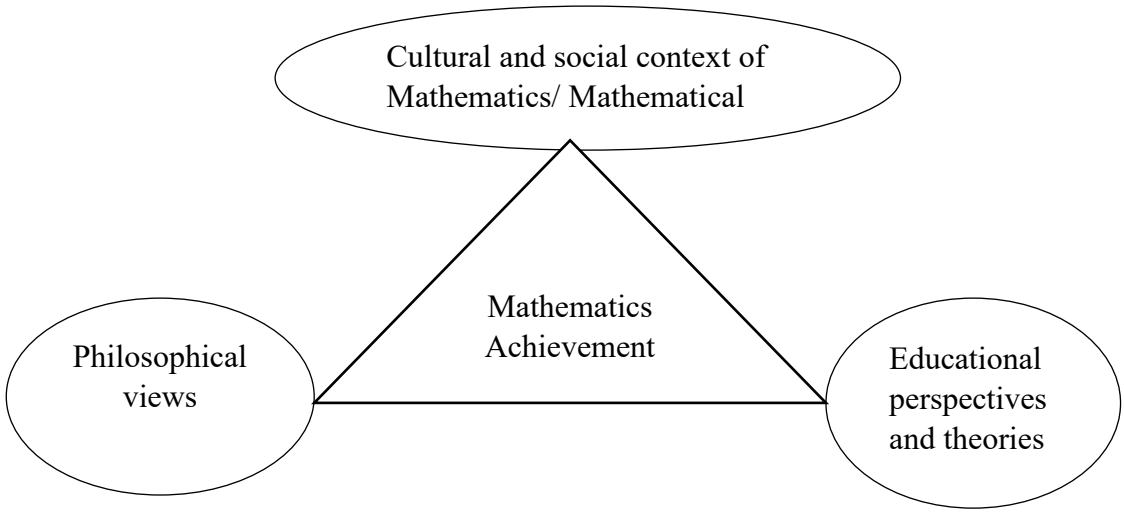
Now a days school mathematics is viewed from three different perspectives: cultural context of mathematics, philosophical views of mathematics and educational perspectives and learning theories. Cultural and social context of mathematics is driven by cultural act ivies with social aspects of mathematics like mathematical activities of

Kewrat culture and teaching learning activities in the school influenced by the social activities. on the other hand, mathematics has its own philosophy to, and the local mathematical knowledge and global understanding mathematical should be in the framework of philosophy of mathematics. Teaching learning activities of mathematics in the school are influenced by cultural activities and social aspects, humanistic view as well modern theories of pedagogies. So, the cultural context, philosophical perspectives and educational perspectives are connected to school mathematics curriculum.

This relation is presented in the following table.

Figure 1

Conceptual Framework of this study



Methods and Materials

Methodology refers to the overarching strategy of the research. It includes ontology, epistemology, research design, the area of the study, tools for data collection, and quality standards (Guba & Lincoln, 1994). The mathematical practiced activities of a Kewrat Community are studied so this study is in subjective reality. Epistemology involves knowledge and reflects a particular understanding of what it means to know representing how we know what we know (Crotty, 1998). Mathematical activities of Kewrat were explored through interaction with Kewrat people, by observing their

behavior with participation in their society. So, this study is ethnographic in design and qualitative in nature. This ethnographic research aimed to find the mathematical concept and practice among the Kewrat community. Kewrat people were inhabitants of Sunwarshi Municipality of Morang district. Sunwarshi Municipality of Morang district was the study area taken with purposive sampling. The respondents of this study are 5- old people of age above 60years, 10- parents, 10- students, 2- mathematics Kewrat teachers from Kali Secondary School, Sunwarshi-4 and Bishnu Basic School of the study area. The primary data were taken with the tools like observation, interview and photography and the secondary data from different journal articles, books and other published and unpublished documents.

Quality Standard

Generally, a quality standard is a way of judging the quality of research. There are eight key markers of quality in qualitative research: worthy topic, rich rigor, transferability, credibility, praxis, resonance, ethics and meaningful coherence (Guba & Lincoln ,1994). Transferability, credibility, dependability, and conformability as quality standards is addressed in this study. Transferability is maintained by providing a rich description for the readers so that they can compare their own real-world situation, social context with the social setting of the research. One of the other of this study is the member of the Kewrat community, so the information provides thick and rich description and information for readers about the process of this research and its finding. This helps to mantained Conformability

Results and Discussion

The mathematical activities of Kewrat culture are discussed under the counting system, addition, subtraction, multiplication and division, measurement system and use of geometry in their daily lives.

Number Concepts and Counting System in Kewrat Culture

The concept of mathematics has ancient roots, starting with the basic idea of counting. In the early stages of human civilization, people likely used simple methods, such as one-to-one correspondence, to count their family members, livestock, or other

objects. These methods, along with the development of numerical ideas and special languages for expression, represent important milestones in mathematical development. Mathematics serves as a crucial tool for solving daily life problems, and its application varies across different communities. The way mathematics is learned and used is often influenced by the culture and environment of each community. Although the older Kewrat people are illiterate, they have developed and applied mathematical concepts through practical use in their daily lives. Kewrat people predominantly use their native counting system, which has been in practice for generations. However, younger children who have received formal education tend to use the conventional counting system. The researchers did not find any indigenous script used by the Kewrat community for recording numbers, as the counting system is based on oral traditions. For example, when a researcher asked an elderly man feeding pigeons, "How many pigeons are in your farm?" the response was "pacha ganda ek-ta," meaning "twenty-one." This reflects how Kewrat people use their unique counting language. The counting system follows a pattern for numbers, with terms like:

ek-ta (one), dui-da (two), tin-da (three), chaar-da (four), pass-ta (five), chhau-da (six), saat-da (seven), aatha-da (eight), nau-da (nine), dass-ta (ten), saya-da (hundred)

This sequence continues as a means of quantifying objects, showing that the Kewrat people have developed their own practical system for counting based on their cultural and daily needs. Additionally, they employ a group counting system for larger quantities. This system reflects the cultural factors that shape how mathematics is used in different societies.

Kewrat peoples are habitual to use different group counting system such as 'ganda', 'vira', 'jori', 'solahi', ' darjan', kkori', etc. as mentioned in appendix- 1. When the researcher visited one of the 55- years- old sample kewrat People, he explained that 'ganda' is used to count crabs, eggs, ducks etc., 'vira' is specially used to count 'jute', 'jori' is used to count couple of different thing such as Pigeons, hen, bananas etc., 'solahi' is used to count paddy's bundle , 'darjan' is used to count bananas, gauva, etc., 'kori' is specially used to count money like ' ek-kori taka', 'dui- kori taka' it means 20 Rupees, 40

Rupees respectively, and so on. Counting System in Kewrat culture is mentioned on table in appendices – 1. When asked about knowledge transmission of counting, all the participants respond that they learned such counting system by their elders and society peoples. This shows that Kewrat people acquired knowledge through self-construction in their society. They have their own ethno-mathematics.

Counting parts in term of whole (Fractional number)

Kewrat peoples use of fractional numbers in daily life. They use fractions to tell work done, quantity of fruits, and area of lands etc. One day, a respondent of the age of 65 who was eating breads and asked him how many breads can you eat nowadays? He told me *adhai- 'kha ruti khawa sakechhi'.* It means, he can eat 2 full and one half of breads. He was asked other questions related to fraction but he could not respond in writing script but orally he explained using the terms such mentioned on the above table. He gave me some examples such as '*paune din kattha khet*' it means $2\frac{3}{4}$ *kattha* land, '*der din kaar kaam'* it means $1\frac{1}{2}$ day work done.

The Counting of Money

The counting system of money in Kewret community is based on base 20. They called "taka" for money. Also, they use "dallar" which is made as paisa, sukka, aathana, ek-taka and dui-taka. The money (taka) counting is expressed in terms of paisa, anni/aana, sukka, mohar and kori are as follows:

Table 1

Money Conversation Table

Money unit Devanagari	In Kewrat
1paisa	Ek -Paisi
25 paisa **(**1 suki)	1 Chaar aanni / Chaar aana
50 paisa (1 mohar)	1 Aathani/Aathana= 2 Chaar aanni
75 paisa (3 suki)	1 Bara-anna=3 Chaar anni
100 paisa (2 Mohar) = 1 Rupiya	1 Taka
20 Rupiya	1 Kori=20 Taka

Source: Field Survey, 2023

The Kewrat culture demonstrated unique methods of using arithmetic operations-addition, subtraction, multiplication, and division-in various daily life activities, including trade, estimating crop quantities, and other routine practices. This is discussed in the following sections.

Addition and Subtraction. The Kewrat people traditionally use their hands, feet, fingers, and finger joints to perform addition and subtraction. In addition to physical tools, they employ mental strategies such as partitioning, gathering, and cancellation techniques to calculate numerical values.

Example 1

To add 40 and 20, they represent 20 using all fingers and toes-ten fingers and ten toes equaling twenty. To calculate 40, they repeat this full-body count twice. Then, to add an additional 20, they perform the count once more. This process leads them to state the result as **"***tin kori***,"** which translates to 60.

Example 2

When they calculate large addition and subtraction between the number like 430 and 310 then they use finger nodes and get results of addition and Subtraction by partition, cancelation and gathering technique orally.

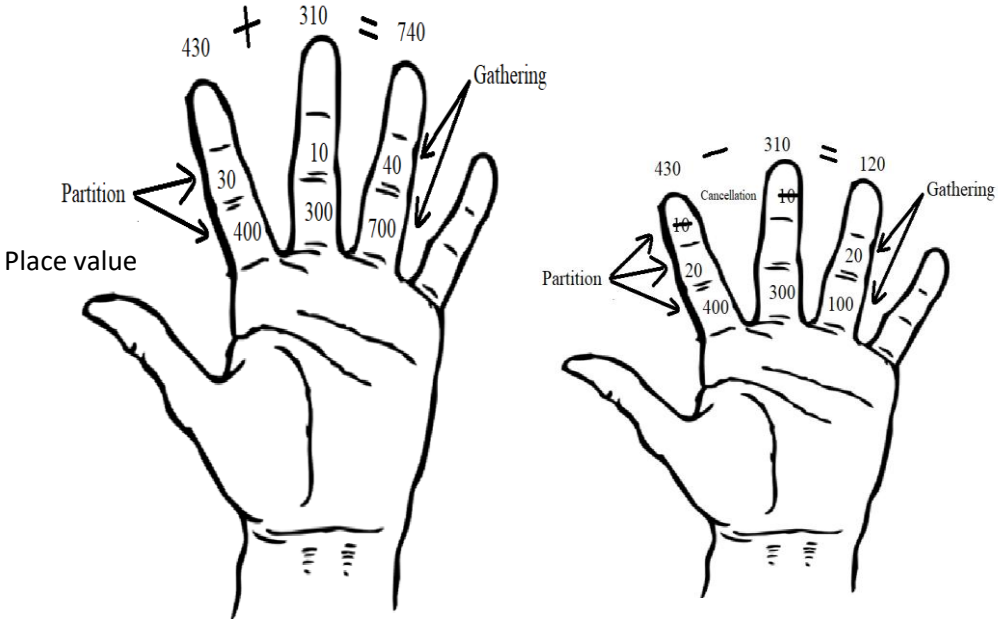
One of the sample people explained to me that they have to add some large number like 430 and 310, then they use finger nodes. They use partition and gathering technique as 430 breaks 400 and 30, which are keeping in the hundred place and ten place ,respectively, in nodes of any first finger as they feel easy and 310 breaks into 300 and 10, which are kept in the hundred place and ten place respectively in nodes of next finger, then they add the ten place number and hundred place number separately then keep it in nodes of next finger and finally they get the result by gathering the obtained hundred place number and ten place number of last finger as shown in the figure below.

Similarly, when they have to subtract the number s such as 310 from 430, they do not follow place value: They would break numbers like 430 into 400, 20, and 10, and

310 into 300 and 10, aiming to find common components between the two. This allowed them to simplify the numbers and apply cancellation more easily during calculations. They keep the above separated number as shown in the figure below, and then they perform cancelation and gathering techniques to obtained the final result orally.

Figure 2

Addition and Subtraction in Kewrat Culture Using Finger



Multiplication. Multiplication problem is solved orally by using following counting system known as "khaata" like:

ek-kang: ek-kang is the counting system as: 1, 2, 3, 4, 5, 6, 7, 8, 9, and 10.

du-kang: du-kang is the counting system as: 2, 4, 6, 8, 10, 12, 14, 16, 18, and 20.

tin-kang: tin-kang is the counting system as: 3 ,6, 9, 12, 15, 18, 21, 24, 27, and 30.

Similarly, they use *sabaiya*, *derha*, *dunai* as shown in the table below:

Table 2

Sabaiya Multiple Table

Sabaiya	
ek-sabaiya	= saba Ek ($\mathbf{1\frac{1}{4}}$)
dui-sabai	= adhai ($2\frac{1}{2}$)
tin-Sabaiya	= paune chaar ($3\frac{3}{4}$)
chaar-sabaiya	= paacha (5)
pachasSabaiya	= saba chha ($6\frac{1}{4}$)
chha-sabaiya	= sadhe saat ($7\frac{1}{2}$)
saat-sabaiya	= paune Nau ($8\frac{3}{4}$)
aatha-sabaiya	= dass (10)
nau-sabaiya	= saba eghara ($\mathbf{11\frac{1}{4}}$)
dass-sabaiya	= sade barah ($\mathbf{12\frac{1}{2}}$)

Table 3

Deraha Multiple Table

Deraha	
ek-dere	= der($\mathbf{1\frac{1}{2}}$)
dui-dere	= tin **(**3)
tin-dere	= sadhe Chaar ($4\frac{1}{2}$)
chaar-dere	= chha(6)
pacha-dere	= sadhe saat($7\frac{1}{2}$)
chha-dere	= nau **(**9)
saat-dere	= sadhe Dass **(**$\mathbf{10\frac{1}{2}}$)
aatha-dere	= barah **(**12)
nau-dere	= sadhe Terah **(**$\mathbf{13\frac{1}{2}}$)
dass-dere	= pandra ($\mathbf{15}$)

Table 4

Araihiya Multiple Table

Araihiya	
ek-areh	= arai **(**$2\frac{1}{2}$)
dui-areh	= pacha **(**5)
tin-areh	= Sadhe Saat **(**$7\frac{1}{2}$)
chaar-areh	= dass **(**10)
pacha-areh	= sade barah **(**$\mathbf{12}\frac{1}{2}$)
chha-areh	= pandra **(**15)
saat-areh	= sadhe satra($\mathbf{17}\frac{1}{2}$)
aatha-areh	= bis **(**20)
nau-areh	= sadhe baaish($22\frac{1}{2}$)
dass-areh	= pachis **(**25)

The Kewrat community traditionally uses oral 'Garang' multiplication tables for large number calculations. This indigenous system of counting is not part of formal school mathematics, and only a few individuals possess expertise in reciting and applying these tables.

Table 5

Eghaar Garang Table

Eghaar Garang	
eghaar Eghaaraang (11x11)	= ek-Sau Ekaish (121)
eghaar Barahaang (11x12)	= ek-Sau Battis **(**132)
eghaar Terahaang (11x13)	= ek-Sau Trichalis (143)
eghaar Chaudharaang (11x14)	= ek-Sau Chawann (154)
eghaar pandraang (11x15)	= ek-Sau paisathi (165)
eghaar soraang (11x16)	= ek-Sau Chayatar (176)
eghaar Sataraang (11x17)	= ek-Sau satasi (187)
eghaar Athaaraang (11x18)	= ek-Sau Anthanabbe (198)
eghaar Unaisaang (11x19)	= dui-Sau Nau **(**209)
eghaar Bisaang (11x20)	= dui-Sau Bish **(**220)

Table 6

Baar Garang Table

Baar Garang	
baar eghaaraang (12x11)	= ek-sau battis **(**132)
baar barahaang (12x12)	= ek-Sau Chauwalis (144)
baar terahaang (12x13)	= ek-Sau Chhapanna (156)
baar chaudharaang (12x14)	= ek-Sau Aarsathi (168)
baar pandraang (12x15)	= ek-Sau Assi **(**180)
baar soraang (12x16)	= ek-Sau Bayanabe (192)
baar sataraang (12x17)	= eui-Sau Chaar (204)
baar athaaraang (12x18)	= eui-Sau Sorah **(**216)
baar unaisaang (12x19)	= eui-Sau Athaish (228)
baar bisaang (12x20)	= eui-Sau chaalis (240)

Division. For division, the Kewrat people use a technique based on partitioning and halving. For example, to divide 50 by 4, they perform the calculation mentally using the following steps. If 50 divided by 4: they are doing the partition as 40+10, then half of it is 20+5 and again half of its 10+ adhai ($2\frac{1}{2}$)= sadhe baar ($12\frac{1}{2}$) and so on

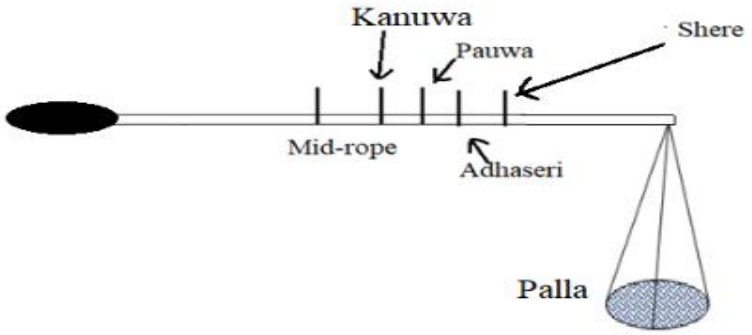
Measurement System

Weight Measurement

The Kewrat people also have traditional weight measurement systems. Units such as kanuwa, pauwa, aadha sher, shere, pasheri, daseri, bishi, chaalisa, and man are very commonly used in this culture. The most important tool used in the Kewrat community for measuring weight is "dandi". which is traditionally made of bamboo or wood rood, with one side tie with "palla" i.e. plate-like structure of bamboo work tied with rope. Its other side is balanced by marking weight by hanging rope as in figure. and it is calibrated by comparing weight with other people's " dandi".

Figure 3

Traditional Dandi



The Kewrat measurement weight system is much influenced by the modern measurement system. They also use “dak and palla”. "dhak and palla”, which are modern physical balances or beam balance. They used the following measurement units;

1 kanuwa = 62.5 gram approx.

4 kanuwa= 1 pauwa (250 gm)

2 pauwa= 1 aadh-Sheri

2 aadh-sheri= 1 aheri= 1 Kg

5 sheri= 1 pasheri

2 paseri= 1 daseri

2 dasheri= 1 bishi

2 bishi= 1 chaalisa

1 chaalisa= 1 man

Volume Measurement

In the Kewarat community, volumetric measurement is mainly used to measure paddy, wheat, oil, and milk etc. One of the sample people said that units of volume measurement widely used are: "kilo", " pauwa", " aadhseri”, " bishi”," Chalisa". The measurement of volume is used in daily life. Pots such as lota, glass, kath-tha, bottle, dhaki, kothi etc. are used for volume measurement. They use "bishi”, "chalisha" unit to

measure paddy, wheat, Corn by using "kath-tha" They measure volume of liquid materials like milk by using "lota","glass" as "kilo" unit.

Measurement of Length, Distance and Time

Kewret has their own measurement system of length and distance and practice in their traditional measurement system. Kewret people and farmers used their traditional measurement system to measure the distance and length units such as aangul, thu-thu, bitta, muthan haat, haat, kosh. If they have to measure the very short length of anything they use fingers wideness distance as eK- aangul, dui- aangul. similarly, they use thu - thu to measure, which is the distance between the tip of the thumb and to tip of the pointer finger presented below.

Figure 4

Figure of 4 Aangul (3 inch approx.)

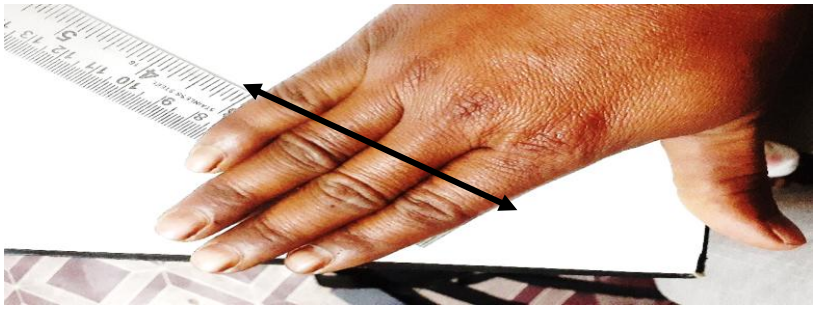


Figure 5

Figure of Ek- Thu-thu (6 inch approx.)

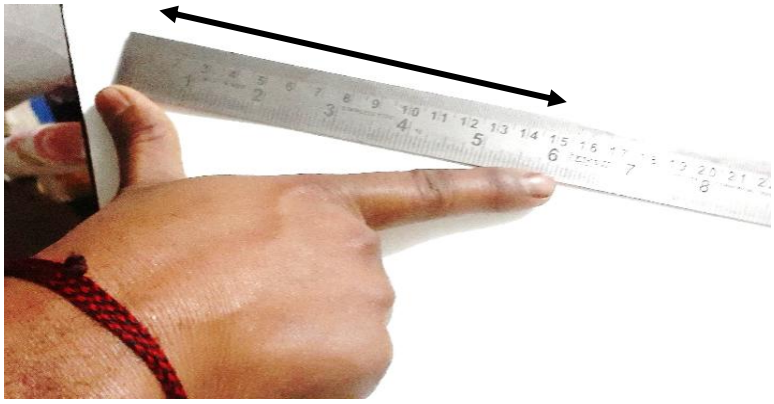
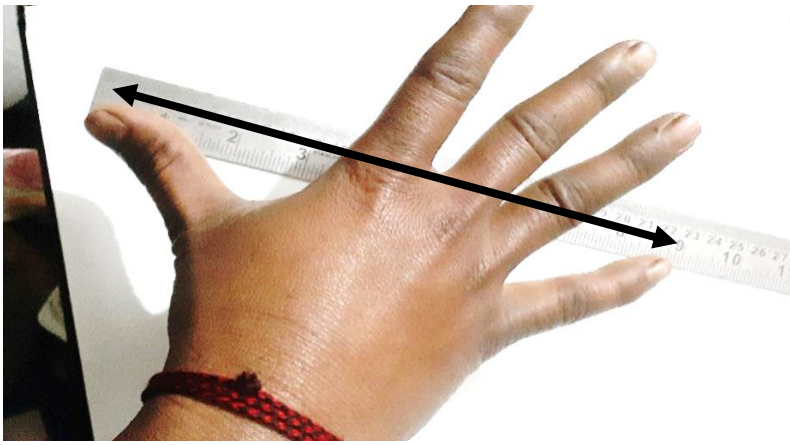


Figure 6

Figure of Ek-Bitta (9 Inch approx.)



They use bitta to measure the short distance between the tips of the thumb and the tip of the middle finger which is shown in the above figure. Moreover, their measurement unit is haat and it is determined by the distance from elbows tip to the middle finger tip, as shown in figure below.

Figure 7

Figure of One Haat

Length conversation

1 aangul= 0.75 inch (Approx.)

4 aangul= 1 giraha (3 inch Approx.)

8 aangul= 1 Thu-tha (6 inch approx.)

12 aangul= 1 Bitta (9 inch approx.)

2 aitta = 1 Haat (18 inch approx.)

3 thu-tha= 1 Haat

4 haat= 1 dega (6 feet approx.)

2000 dega= 1kosh (12000 feet or 3.66 km)

4 kosh= 1 jajan (9 mile or 14.48 km)

10 kosh = 1 din (One Day)

These measures are still in use to measure the length and breadth of houses, land, wood, and rope in farming. Elder Kewrat people still use kosh to measure the long distance. They believe that a man can travel approximately 10 kosh per day.

When there was no watch, they used the shadow to guess the time. When the shadow is approaching the object, they think time is closing to 12 o'clock and when the sun is just above the man, they also guess time is 12 o'clock. They divided 24 hours as baar pahar din and baar pahar raat.

They divide different parts of day and night as follows:

4 am to 6 am=varauwa

6 am to 9 am=bihana

Before 12 o'clock= epahare

12 o'clock= bar pahar din

2 o'clock= dafariya

after 12 o'clock= upahare

3 pm to 7 pm=sanjhuwa

time between 7 pm to 11 am=raat

mid night= bar pahar Raat also called,

yesterday= kaal

today = aaj

tomorrow =kaal

a day after tomorrow = parsu

Area Measurement

Measurement of an area is mostly used in estimating farmland and constructing houses. Measurement of area is used by Kewrat people in their daily lives is to measure the area of their house. The simplest method used by the Kewrat for measurement of area is one to one correspondence that has verification. When they start to construct houses, they measure by a rope in which different symbols are marked on the basis of the length measure in haat which is used to measure the required length of the ground. The researcher asked a to the elderly kewret people, how to make a house? He said, if we want to build a small house then we need 9 Haat breadth and 13 Haat length, if we build a medium size house then we need 9 haat breadths and 15 haat lengths. The houses, 9 by 15, has 3 medium size rooms. They were drawn on the right side by stretching-bending a rope to the required shape of the new house. The wooden nail is nailed to the ground hole in equal distance from the rope.

Figure 8

Area Measuring Using Rope for the Construction of House

Das & Gautam, 2025 (2082), An Ethnographic Lenses . . .

Measurement of Land for Farming

The Kewrat people called 'amin' for the one who has knowledge of land measurement, they use hand measure of land for buying and selling for farm or fields. The units used by them are as follows:

9 haat=1 Laggi (i.e 13.5 feet approx.)

4.5 haat × 4.5 haat = (1/2 Laggi × 1/2 Laggi) =1 kanwa (45.5625 sq.feet)

1 laggi ×1 Laggi=1 dhur (182.25 Sq. feet)

4 kanwa= 1 dhur

20 dhur=1 kattha (3645 Sq. feet)

20 kattha=1 bigha, If the land is square then length of 1 dhur = 9 haat and breadth is also 9 haat

They used bigha-kattha-dhur-kanwa i.e. bik ka-dh-Ka unit system for measurement of crop land for example, 2-15-13-3 represents for 2 bigha, 15 kattha, 13 dhur and 3 kanwa area of land

Geometrical Knowledge Used in Kewarat Culture

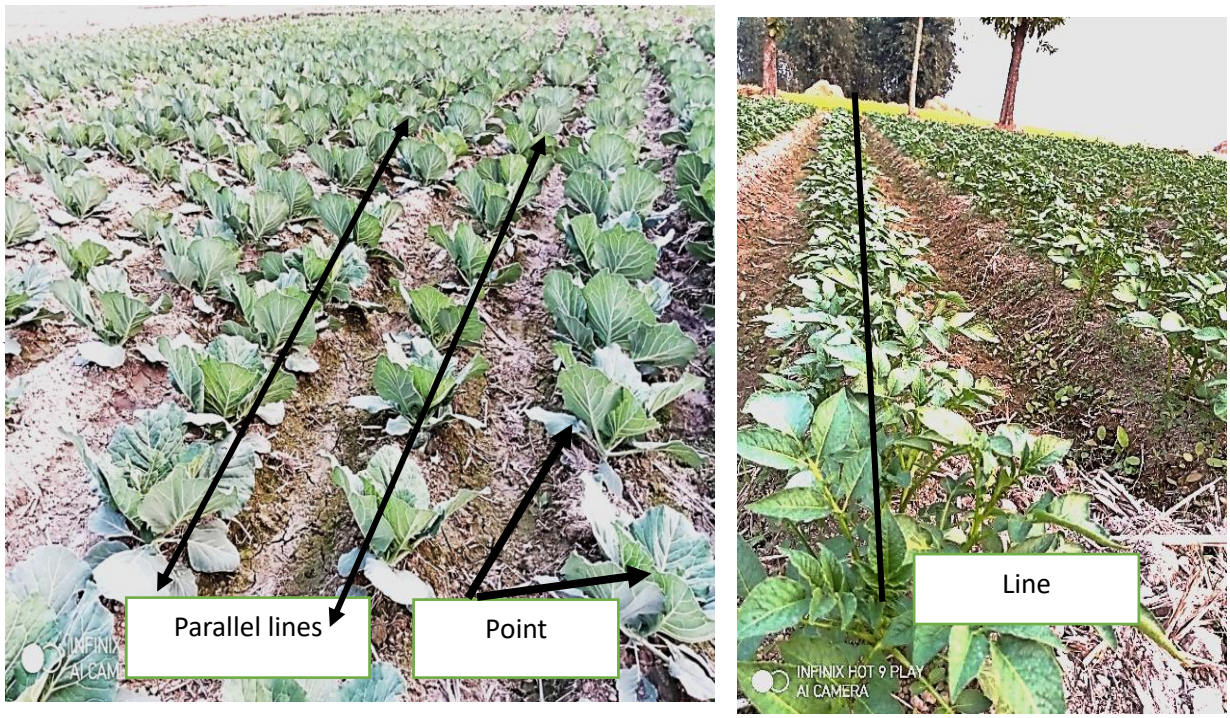
Kewrat people performed different geometrical activities in their farming. They are discussed as below:

Construction of Cabbage and Potato Field

Kewrat people used a rope and two sticks of the same size and the rope was mark in equal intervals with color. They made straight the rope straight and dug a small gaddha (hole in field) at every color mark, which represents the concept of a point for planting cabbage plants, then put the two sticks on both the ends of the rope and then changed the place of the rope to make the another dyang (i.e. line concept). Dyang is a line made for parallel lines, they barabar (equal) dyang.This shows that Kewrat culture hasmany artifacts for point, line and parallel lines as shown in figure below.

Figure 9

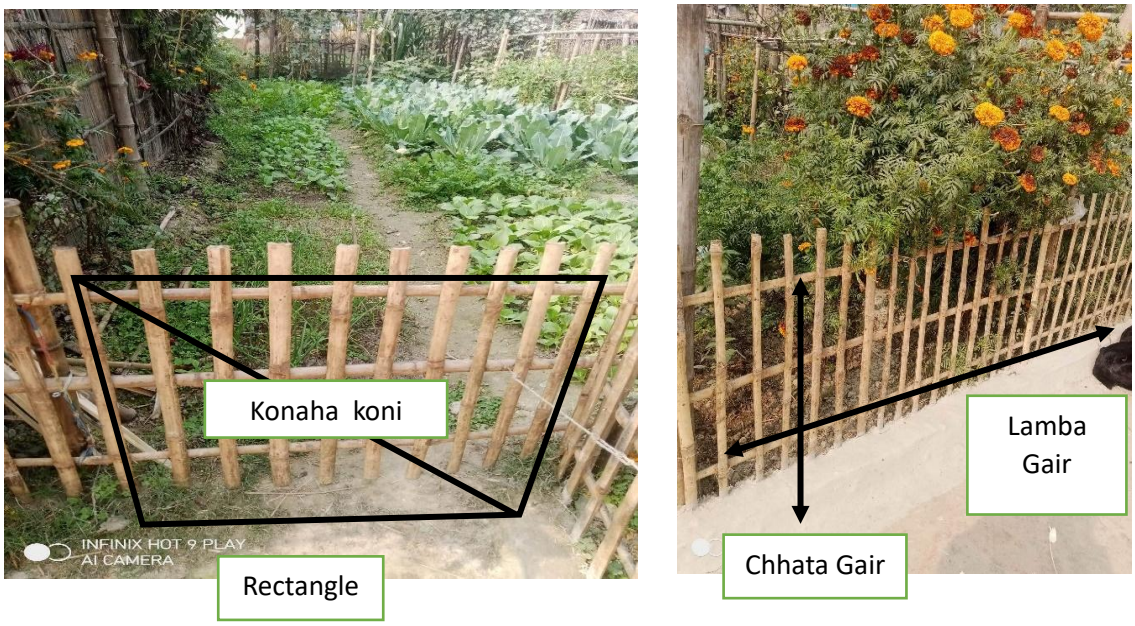
Figure of Cabbage and Potato Field



Kewrat people fenced-in their garden by using bamboo pegs which are in a rectangular shape. The researcher asked them to say the shape name. They called its name as " chaukhutia taati", which means "rectangular fence" as given below. They also explained that first they put horizontally " lamba gair", which means long bamboo stick, then they fix the lateral side by putting vertically "Chhata Gair “which means short bamboo stick. They also fix the corner properly by measuring " kona koni," which means equal diagonal using thin rope and finally they fix all the vertical bamboo sticks putting these at equal intervals.

Figure 10

Figure of Bamboo Fence



Mara and Kothi

The Kewrat community uses the concept of a cylinder in their daily activity, to make Mara and Kothi. An elder Kewrat people whose occupation is also agriculture is asked the concept of a cylinder but could not give the meaning of a cylinder but can construct and use Mara for keeping paddy and kothi for rice. Again, he was asked - how do you make Mara and Kothi goho (Cylindrical)? His response was personal practice. The following figure is the concept of cylinder in Kewrat communities:

Figure 11

Figure of Kothi and Mara in Shape of cylinder

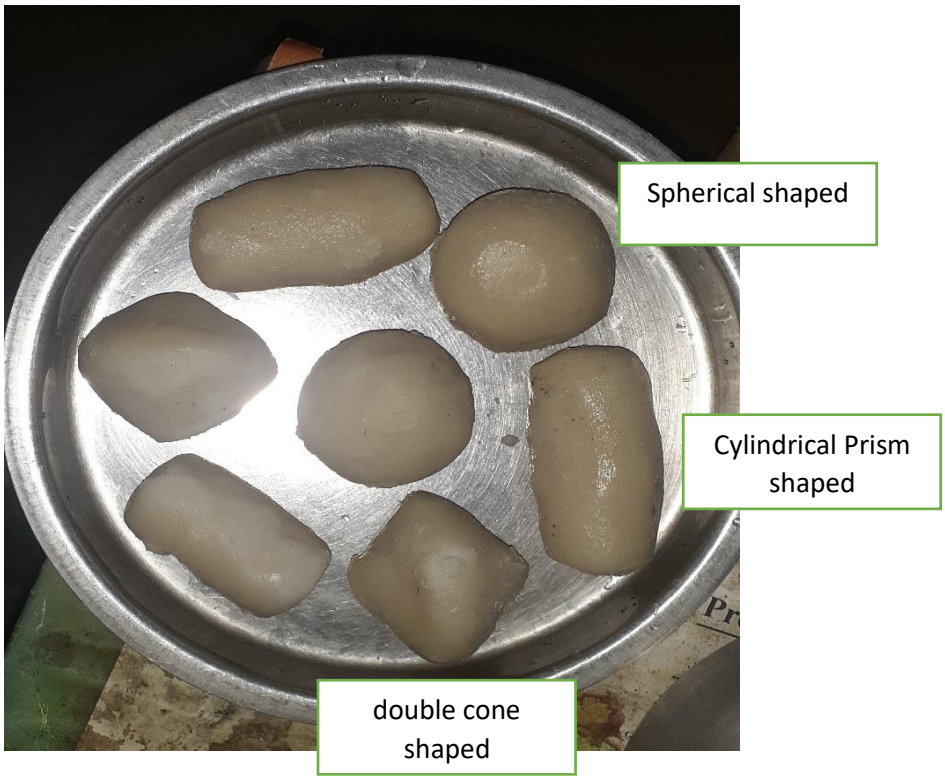
Kothi is made of mud and Mara is made of bamboo. It has a circular mouth.

Pit-tha

The researcher observed their Pit-tha is a special type of food or Sweet made on the occasion of Hukka (Tihar) Festival by the steaming process of Chaauler gunda (rice powder). It has different geometrical shapes like cylindrical prism, cone, and sphere as in the figure given below. Children of the Kewrat community mostly like this sweet and also enjoy cooking *pit-tha.*

Figure 12

Figure of Different Geometrical Shaped Pit-tha



Chulha, Kothi, Binda, Thali, Kath-tha

The Kewrat people follow a traditional process of making *Binda*, *Chulha*, and *Kothi* during the harvesting of paddy. They made binda using paddy straw in a circular shape by a coiling method starting from a point. They do not know the circle but say it is goho (circular in shape). The mouth plate (Dhakani) of kothi is circular shape it is made up of mud and also make chulha. They draw a circle on the ground where they make it. Then they give its cylindrical shape. Circle is also understood by thali, mouth of lata and kath - tha as given in the figure. Kewrat people say center as "bicha" they have no formal concept of diameter and radius but they use "bichaa bich"

Figure 13

Figure of Chulha, Kothi, Binda, Thali, Kath-tha

Kat-tha

Through the observation, it was found that Kewrat community used the concept of similarity, which they called "*ekke kisam*". This concept was found when the sample population was using different size.

Figure 14

Figure of Similar Kath-tha

Through observation and interview, the researchers found that Kewrat people have the concept of congruence.

Figure 15

Figure of Two Congruence Mara

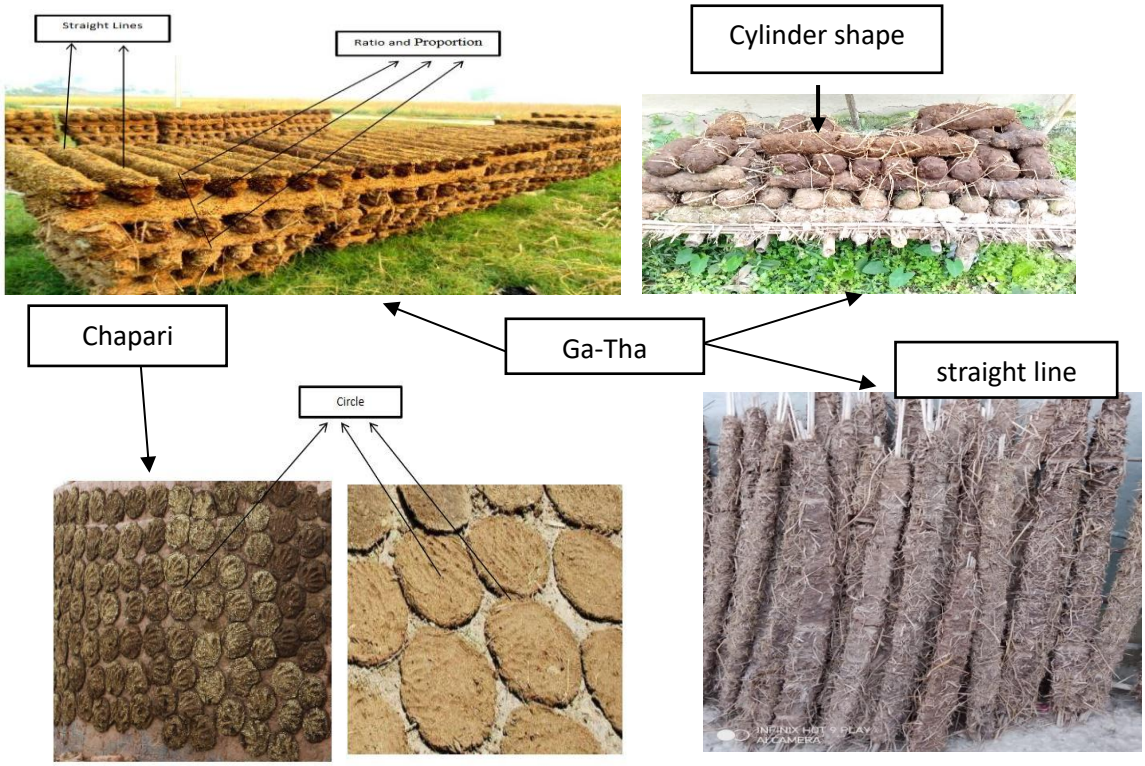
Ga-tha

Generally, ga-tha is the most useful firewood in the Kewrat community. Kewrat people specially used dung as an alternative to firewood. Around 70 to 80 percent of households in the Kewrat community have been using ga-tha for cooking. Women make

it by using cow dung. Fresh dung stock on open ground, and women are mixing this fresh dung with dry grass. In the local language, there are different names and shapes of ga-tha, which is long in shape, and likewise chapari which is circular in shape; some are cylindrical.

Figure 16

Ga-tha and Chapari in Different Shape



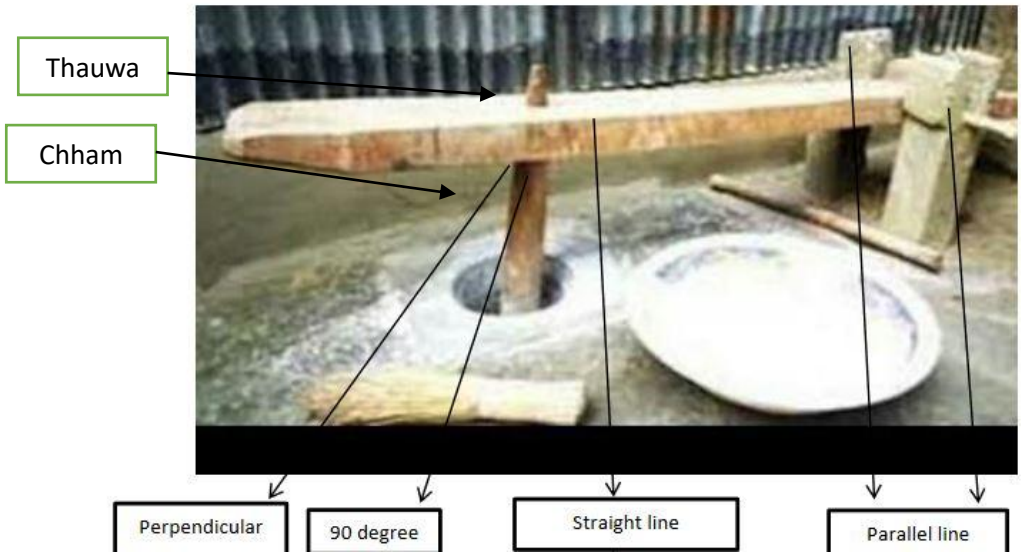
Dheki

Dheki is one of the most useful traditional materials which are made of wood. It is a kind of traditional machine which is used for beating paddy, maize, rice, and wheat etc. to construct this dheki; firstly, they buried the two poles called machiya in the land in such a way that they are mutually perpendicular and parallel. The manual wooden thresher dheki is made of wooden in a cuboid shape and works like a lever, but is instead used for grinding. The framework consists of a fulcrum (aaglo) having two

pillars on each side, an effort area (where one person stands on the long, thick plank of wood, making an effort at every interval), and a long, and thick plank of horizontal wood, which has a small vertical extension called thauwa that fits into a wooden hole called chham made in the ground.

Figure 17

Figure of Dheki

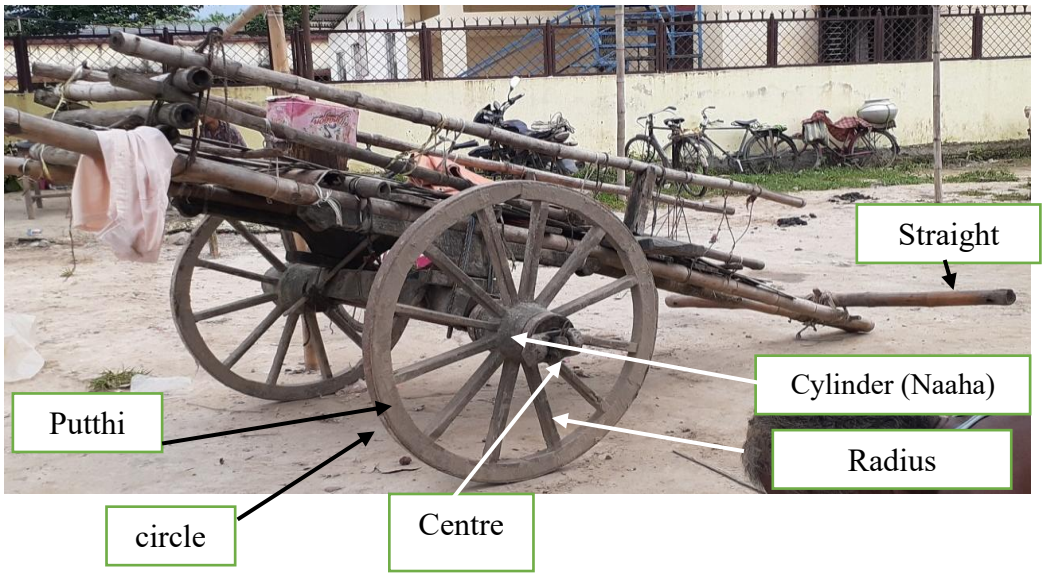


Bayal Gari

Kewrat people uses bayal gari for transportation purposes. They use bamboo, wood planks, and rope to make it. To make it, they use different geometrical ideas. But the Kewrat people explain this geometrical idea used in bayal gari in their traditional term ‘gol’ (circle), siddha (straight line), putthi (circumference of wheels), dariya (radius) and naaha (cylindrical shape of wheel), etc.

Figure 18

Figure of Bayal Gari



Patiya (Mat)

Patiya is the significant item made by the Kewrat using the basketry techniques. This is a mat made out of paddy stalk locally. The wrapped procedures are working for making the gundri. The wrapping strand of a rope in this case passes round the bundle of paddy stalk, over two and under one bundle. This process is continued until the desired length is achieved after which the rope is tied into a knot and passed between the last bundle at short distances, and the process is continued. Therefore, a mat is wrapped at distances of about 30-35 cm. throughout its breadth to ensure that it is tight enough and the stalks do not begin to come off after some time. The process of wrapping is completed if the sides are finished. Apart from sitting this mat is used as a mattress in winter for sleeping because it provides heat.

Figure 19

Figure of Making Patiya

Figure 20

Figure of Patiya role

Chhitki Jaal and Tapi

The researcher observed that Kewrat people use chhitki jaal for fishing purpose. when asked about the shape of chhitki jaal responsed to the researcher chaukhuniya (square) and also it is same in length on both sides. The researcher visited a man making tapi which is conical in shape and is used to save and control chickens, hens and ducks also sometimes used for fishing. which is illustrated in the figure.

To make chhitki jaal, they use two bamboo sticks which are tied crossing as given in the figure below, then a square shaped piece of jaal is fixed.

Figure 21

Figure of Chhitki Jaal

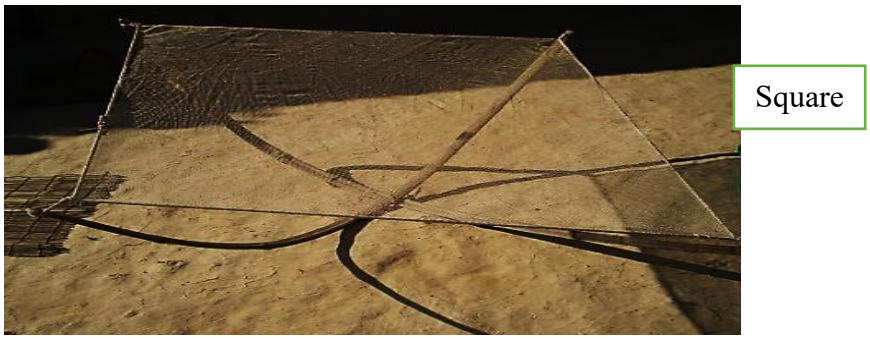


Figure 22

Man Making Tapi

Puwaler Tal

Kewrat people stock their paddy straws known as puwal in a combined shape of cylinder and cone shape,which is called puwaler tal as in the figure.

Figure 23

Puwaler Tal

Ghar

Most of the Kewrat' house (ghar) is structured as in the figure below, made up of clay, bamboo, paddy straw, wood with so many geometric shapes such as triangle, trapezoid, congruence.

Figure 24

Kewarat People's House (Ghar)

Kewrat people use mathematical activities as tool of performance in their lives. They have their own system of counting, numeration system and use of geometrical concepts in practice although these practices have not been in recorded form. The geometrical concepts like circle form in oven (chulha), perpendicular, parallel form in dheki, rectangular form in tati, cone form in tapi, spherical form in mara and rectangular, cubical, truncated, and triangle, from many household goods can be found in Kewrat culture. The geometrical shapes practiced in this culture reflects the practical application of school geometry in real life contexts. Now a days, however, a child does not know the local measurements like volume of one 'pawa' milk poured from a jog by milk man, volume of oil contained in a packet of oil and its consumption of a family in a day and not get discussed in his classroom, too. Though, local governments have

implemented local curriculum at the basic level of education, focused such cultural activities. If such applied mathematics of lived cultures are discussed in the school curriculum, students would have greater opportunities to solve mathematical problem using hands on methods. Hence, it is recommended that the concerned local governments include mathematical ideas used by Kewrat people in their local curriculum, so that these hands- on techniques can enhance be used to pedagogical implication of modern mathematics in schools.

References

Bishop, A. J. (1988). The interaction of mathematics education with culture. *Educational Studies in Mathematics, 19*(2), 179–191. https://doi.org/10.1007/BF00751231

Central Bureau of Statistics (2022). *National population and housing census 2021 (2078 B.S.): National report*. Government of Nepal, National Planning Commission. https://cbs.gov.np/

Crotty, M. (1998). *The foundations of social research: Meaning and perspective in the research process*. SAGE Publications.

Davis, P. J., & Hersh, R. (1980). *The mathematical experience*. Penguin Books.

Ernest, P. (1991). *The philosophy of mathematics education*. Falmer Press.

Ernest, P. (1998). *Social constructivism as a philosophy of mathematics*. SUNY Press.

Ernest, P. (1994b). *Philosophy of mathematics and mathematics education*. Routledge Falmer.

Fowler, H. W., & Fowler, F. G. (Eds.). (2014). *The concise Oxford dictionary of current English* (11th ed.). Oxford University Press.

Geertz, C. (1973). *The interpretation of cultures: Selected essays*. Basic Books.

Guba, E. G., & Lincoln, Y. S. (1994). Competing paradigms in qualitative research. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of qualitative research* (pp. 105–117). SAGE Publications.

Khanal, S. (2008). *Ethnographic study on mathematical concepts and processes used by potters* [Unpublished master's thesis]. Department of Mathematics Education, Tribhuvan University.

Lakatos, I. (1976). *Proofs and refutations: The logic of mathematical discovery* (J. Worrall & E. Zahar, Eds.). Cambridge University Press.

Rai, M. (2011). *Mathematical component and process practiced by Dumi Rai at Khotang District* [Unpublished master's thesis]. Department of Mathematics Education, Tribhuvan University.

Tymoczko, T. (Ed.). (1986). *New directions in the philosophy of mathematics*. Birkhäuser.

UNESCO (1998). *New trends in mathematics teaching* (Vol. 6). UNESCO Publishing. https://unesdoc.unesco.org/

Appendices

Appendix-I

Table of Group Counting System in Kewarat

Group	Its Value	Example, Use, quantity	Remarks
ganda	four objects	2 ganda gakhara (i.e 2x4=8 no. of crab) 3 ganda Dimma (i.e 3x4=12 no. of egg) 2 ganda tin-da Haas (i.e 2x4+3=11 no. of duck) etc. aadha ganda=1/2x4= 2 object	count like: ek-ta (i.e 1), dui-da (i.e 2), tin-da (i.e 3), then ek-ganda (i.e 4), ek-ganda ek ta (i.e. 4 + 1 = 5) and so on
Vira	four objects	Vira is used specially count to jute ek-vira= 4 muth-thi (1 muth-thi jute is a small bunch of jute) ek-vira Patuwa= 4 small bunch of jute	4 based counting system
jori	two object (one pair)	1 jori Kela (2 piece of Banana) 4 jori Kab-tar (4x2=8 no. of Pigeon) aadha jori =1/2x2= 1 object	2 based counting system
Solahi	16 objects	Solahi is specially used by Kewarat Farmer to count Paddy, wheat, etc crop (i.e 1 Bajha= a bunch of paddy or other crops use full part cutting) 1 solahi= 16 bajha ek Sosahi dhan= 16 bunch of paddies aadha dolahi= 1/2x16=8 bajha	16 Based counting system
Darjan	12 pieces of object	1 darjan Kela= 12 piece of Banana aadha darjan= 1/2x12=6 piece ex-pauwa darjan=1/4 x 12= 3 piece	12 based counting system

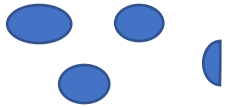
Group	Its Value	Example, Use, quantity	Remarks
Kori	20 objects	specially used in counting money 1,2,3,4,5.....19, 1 Kori, 1 Kori 1, 1 Kori 2, ..., 1 Kori 19, 2 Kori so on i.e. 5 kori taka= 5x20=100 rupees 4 kori 15 taka= 4x20+15=95 rupees arahai kori taka=$2\frac{1}{2} \times 20 = 50$ Rupees	20 based system of counting which is in practice from long period of time by Kewrat
Panja	it is used for 8, 3 according to situational use	<u>i.e for paddy (Dhan) planting worker</u> 1 Muth-thi Bihan= 1 bunch of paddy seedling 8 muth-thi Bihan= 1 panja bihan 4 panja bihan = 1 Jan (1 worker) i.e forp paddy (Dhan) cutter worker 1 muth-thi dhan= 1 small bunch of paddy plant cutting 3 muth-thi dhan= 1 panja dhan 4 panja dhan= 1 bajha dhan 16 bajha dhan = 1 solahi dhan	
Bishi	20 objects	specially used to count rice,wheat, corn volumetric quantity comparing weight i.e 1 Kath-tha = 1 unit volume (1 full vessel) or 1 unit Mass 20 Kath-tha=1 Bishi 10 Kath-tha= 1/2 Bishi 2 Bishi= 1 Chalisaa	20 based counting
Chalisaa	40 objects	1 chalisaa= 2 Bishi	40 based counting
Sekara	100 objects	1 sekara Aam= 100 piece of mango 2 sekara kagaj thali= 200 Piece of paper plate	100 based counting

Source: field Survey, 2023

Appendix -II

Table of Counting Parts in terms of Whole (Fractional Number)

Unit of part	Pictorial presentation	Unit Value
ek-ta /Gata-da		1 unit or 1 part
ek-pauwa		1/4 part
eadha		1/2 part
tin-pauwa		3/4 part
gata		1 part
sawa ek		$1\frac{1}{4}$ parts
der		$1\frac{1}{2}$ parts
paune dui		$1\frac{3}{4}$ parts
sawa dui		$2\frac{1}{4}$ parts

Unit of part	Pictorial presentation	Unit Value
adhai		$2\frac{1}{2}$ parts
paune tin		$2\frac{3}{4}$ parts
sadhe tin		$3\frac{1}{2}$ parts

Source: Field Survey, 2023

Academic Journal of Sukuna – AJoS, A Peer-reviewed Interdisciplinary Journal
Volume 5 (Issue 1) 2025 July (2082 Ashad), Pp. 38 – 61, ISSN 2594-3138 (Print)
Research Management Cell (RMC – Sukuna), Sundarharaincha, Morang

Use and Transmission of Vedic Geometric knowledge: What, Where and How?

Doi: https://doi.org/10.3126/ajos.v5i1.81801

Dandapani Gautam[1]*, Lekhnath Sharma PhD[2],
Dinesh Raj Panta[3], Jayanta Acharya PhD[4]
[1]Faculty of Sukuna Multiple Campus, Morang, Nepal
[2] Prof. Tribhuvan University, Nepal
[3]Prof. Nepal Sanskrit University
[4] Prof. Nepal Sanskrit University
*Email: dandapani04@gmail.com

Abstract

This article explores the geometric knowledge embedded in Vedic rituals, focusing on the construction of Agnikundas (fire altars) as detailed in the Vedic texts Sulba Sutras, Kundamandip Siddhi and also highlights the central place of geometry in Vedic rituals including the use of right-angled triangles, square roots, and precise measurements to construct ritual spaces. Through field observations and interviews with Sanskrit scholars and ritual practitioners, the research uncovers the informal transmission of this knowledge and its absence from modern Sanskrit curricula. A survey of 100 participants revealed limited awareness of these geometric principles. The knowledge of constructing Agnikundas is transmitted to the generations through participatory approach with the seniors means they learned through hands-on learning, and culturally responsive approach to learning geometry. The study indicates the need of curriculum reform on Sanskrit intuitions to include Vedic geometry used on rituals to bridge traditional knowledge and contemporary education. Integrating this ancient practice could enhance students' understanding of geometry while preserving cultural heritage.

Keywords: Vedic Rituals, Aagnikunda, Geometry, hands -on learning

Introduction

Every people grow up with performing ritual activities in his/ her culture. Culture is a set of shared beliefs, values, customs, and practices that evolve organically within a group of people (Cambridge Dictionary of culture; online,2025). Culture encompasses language, social norms, arts, religion, and other elements that bind individuals together. According to Geertz (1973), culture is "symbolically constructed," meaning that it is expressed and communicated through various forms, such as rituals, art, and social practices. Culture forms the foundation for the development of more formalized expressions of beliefs, such as rituals. Rituals are structured actions that emerge as formalized expressions of culture. They are often symbolic and tied to religious or social practices, functioning as ways to communicate cultural beliefs and values within a community. Bell (1997) explains that rituals, particularly religious ones, help maintain social or cosmic order through symbolic actions. Rituals are deeply connected to cultural practices and serve to enact and formalize cultural norms.

The Vedic culture drew up a program of sixteen rituals for the shaping of men. The usual practice of rituals in Vedic cultures were popularized believing that performing the rituals make the entire life successful. Shori (2006) writes that "rituals assert the activities to upraise the soul, mind and body. Vedic rituals are of three kinds; Nitya (to be performed daily), Naimitya (performed on special occasion) and Kamya (optional/performed with specific intention). There are sixteen rituals in Vedic culture (also called Naimitya or indispensable) to perform in a person's life up to his/her death. Vedic people believe that God will be happy if requested through sacrifices on fire placing on an Agnikundas (specially designed fire place) of different shapes on different rituals. Vedic rituals are sacred practices rooted in the ancient Vedic texts known as the Vedas. For instance, in the Vedic tradition, rituals involve the construction of the Agnikunda (fire altar). These rituals require understanding of geometry, as documented in the Sulba

Sutras, ancient texts that prescribe the geometric principles for constructing fire altars (Kak, 2005).

In Vedic culture, various activities related to mathematics used to call ‘Hisab or Ganita”. The word ‘Hisab’ which typically means ‘calculation’ or ‘account’ as noun, and ‘to calculate’ or ‘to account for’ as verb (kumar, 2005). The word ‘Ganit’ used to mean mathematics in the early Vedic period and later the word ‘Rekha Ganit’ used to mean for geometrical works as like topic of modern geometry (Nepali Ganit Kosha, 2075). The word Sulba Sutra is commonly referring to Mathematics calculations based on Sulba means a rope or string. The word Sulba is derived from the Sanskrit language ‘Sulab’ meaning ‘to measure’: a chord employs in measuring while constructing and in Vedic rituals. (Upadhaya, 2075).

Vedic text Sulba Sutras explained the geometric knowledge and procedure to construct the exact shape of Agnikundas in Vedic rituals. Therefore, it is important to explore, how Vedic geometry was used to construct Agnikunda is such a precise way, following the rigors geometric construction and calculation. Paramhans (2004) explains main three geometrical constructions related to building Agnikundas on ritual performance consist of make a circle on a given straight line, transform the square shape in equal area, and make another circle with double of the area of the original circle. The literatures indicate that Vedic rituals demand knowledge of plane geometry and its transformation. In Nepalese context, we do not find much research related to the use of geometry in ritual performance. Now questions arise; What is the content of geometric knowledge used on Vedic rituals? How geometrical knowledge is transmitted to the practitioners of Vedic rituals? Are the Vedic rituals being performed with the use of geometrical knowledge? Is this geometrical knowledge different from geometry of school mathematics? To explore the answers of questions as such, this study aims to explore the geometrical knowledge used in Vedic rituals, focusing on the construction of Agnikundas. It seeks to understand their purpose, structure, and dimensions; examine

current construction practices; and assess how this knowledge is transmitted across generations and can be integrated into schools' geometry learning. With these overarching objectives, this study focused to explore geometry used in Vedic rituals and geometry teaching learning techniques on performing Vedic ritual with the following methods and materials.

Methods and Materials

Ancient Vedic texts such as the *Sulba Sutras* and Sanskrit texts like *Kundamandip Shiddhi* were taken as the basis for this study. To find the geometry teaching learning techniques used on Vedic rituals, dyadic interview with 50 Sanskrit scholars (Sanskrit teachers, practitioners of Vedic rituals like Guru – purohits having their Sanskrit education from Nepal and India and professors of Sanskrit University) and a total of 100 students from grades nine and ten, studying in various Gurukuls of Jhapa district and involved in performing Vedic rituals, were surveyed using a questionnaire. The Vedic rituals performed on the different occasion in Nepalese context were observed to triangulate the information obtained. So, this research is based on historical cum survey in design, explorative and analytic in nature.

Result and Discussion

Geometrical knowledge used on performing rituals as mentioned on different Vedic texts and its current practices are discussed below.

Use of Geometrical knowledge in Vedic rituals

Vedic rituals demand fire on the central part of Vedi (place for performing ritual) for offering materials. It is mentioned for offering materials on Agnikunda from western direction to the east when Kritika Nakshatra will appear in the east (Satapatha Bhramana II;3ka.4 pra,1bra). Dikshit (1957) writes that Kritika Nakshatra appeared in the east before 3068 BC in the east. This evidence shows that Bhranmana period was before 3068 BC and geometrical knowledge is being used in Vedic rituals from the same

time. For performing Vedic rituals there needs determination of four directions known as cardinal directions. The process of finding cardinal is discussed as below.

Finding Cardinal Directions (East, West, North, South)

To find the cardinal direction Vedic people used to place a pole upright on the ground then describe a circle with its center at the midpoint of the pole. Next, fix pole longer than radius of the circle and observe the shadows cast by the pole as they intersect the circumference of the circle during sunrise and sunset. This process of finding cardinal direction gives the intersection of two straight lines perpendicularly and this is same as today's rectangular axes of coordinate geometry. The cardinal direction helps to place different fires in a Vedi of Vedic rituals.

Vedic ritual demands three specific Agnikundas of same area in different shapes are Ahavaniya Agni in square shape, Garhapatya Agni in circular in shape and Daksina Agni in semi – circular shape. Ahavaniya and Garhapatya Agni are in a straight line (North to south and Daksina Agni is in the east). The only criteria are of equal in area and Daksinagni (Semicircular shaped) placed at a distance of $\sqrt{5}$ units from Ahavaniya (Square shaped) Agni and $\sqrt{2}$ units from Garhapatya (Circular shaped) Agni. The construction of Square and transforming to circle and semicircle demands the activities with the use of geometrical and arithmetical knowledge. Now questions arise: how Vedic people learnt to construct such geometrical shapes maintaining area equal? What is the nature of geometrical knowledge used? If Vedic people used concept of decimal values like $\sqrt{5}$, $\sqrt{2}$ then why such knowledge is not discussed in the school education?

The proof the geometrical knowledge is not demonstrated on the Sanskrit texts but mentioned in the form of verses. Gurjar (1947) writes that the geometrical knowledge used on Vedic rituals is empirical and demonstrative in nature. In addition, Gurjar writes the system created by the Vedic geometry is: Divide the figure and readjust, Construct the figures with general enunciation, Construct the number of square

units in each side, Construct a figure with combinations of areas in different shape. Transformations of areas in square to other shapes like rectangle, circle, semicircle and isosceles trapezium. Hence, we can conclude the system created by geometry used on Vedic ritual is demonstrable.

To construct these Agnikundas, there needs length units. Some of the length (nonstandard units used on Vedic rituals only) measures found on Sanskrit text used for the construction are Angula (Standard Unit) also called Eak Haat (One fifth the length of ritual performer taken from toes to the top of the middle finger while standing by raising both hands). And the derived units are Aratni (21 Angulas), Ratne (22 anguls), Pada (12Angulas), Vyama (96 Angulas), Prakrama (30 Angulas), Purusa 120 anguls, Janu (32 Angulas) (Kundamandap Shiddhi 2999).

This shows that different measurement units are utilized in the construction of Agnikundas for ritual performances, so great care is taken to ensure precise shape and size of the Kundas. Now question comes how are the units used to construct Agnikundas? The use of different units to construct Agnikundas of rectilinear and circular roots are as follows.

For the number of sacrifices (Hawans) below 100, a square of side length 21anguls, For 100 – 999 sacrifices (Hawans), square of side length 22 anguls, for 1000 – 9999 sacrifices square of side length 24 anguls, for 10000 – 99999 sacrifices 34 anguls (Dui Haat), for 100000 – 999999 hawans square of side length 41 Angul (Char Haat) and for 1,00,00,000 and above Hawans square of side length Aath Hat is requires (Kundamandap Shiddhi, P. 53, 2999).Now question comes if 24 anguls is Ek hat Why 34 anguls is Dui Haat and not of 48 angul? The following table illustrates the answer of such question.

Table 1

The Details of Measurement for Agnikundas with rectilinear root (Square)

Hasta		1	2	3	4	5	6	7	8	9	10
Kshetra	Barguangul	576	1152	1728	2304	2880	3456	4032	4608	5184	5760
Kshetra	Angul	24	34	41	48	53	58	63	66	72	75

Source: Kundamandap Shiddi, P. 60

The table shows that square with side length is 24 anguls has area 576 sq. Angul and its two times is 1152 Sq. Angul and its square root is 33.941125, so they take the round figure 34 anguls called (Dui Hat) to construct the Agnikundas of 1152 sq. Anguls and similarly. This shows that ancient Vedic people have knowledge of square, square root, concept of decimal and rounding to near counting number. Now question comes what is the purpose of construction of Agnikunda in Vedic rituals? what are the roots (shape on the top face of Agnikunda) and dimensions (measurements and proportions) of Agnikundas use on Vedic rituals?

The purpose of constructions of Agnikundas in different Vedic rituals is listed on the following table.

Table 2

Purpose to construct different Aagnikundas on Vedic rituals (Yagya karya)

S.N.	Shape of Kunda (Fire Alter)	Purpose
1	Chaturastra Kunda (Rectilinear root)	For Karya siddhi
2	Yoni Kunda (Vagina root)	Request for the birth of Son (Putra lav)
3	Ardha Chandra Kunda	Desiring for peace (Kalyan)

4	Trikod Kunda (Triangular root)	Request to destroy enemies (Satru nas)
5	Wartul Kunda	For peace (Shanti Prapti)
6	Sadasrta Kunda	On death or Uchhed karma
7	Padhma Kunda	Requesting for rain
8	Astrasta Kunda	For desiring prosperity (Arogya kolagi)

Source: Kundamandap Shiddi, P. 55 - 56

Now it is discussed the construction of different types of Agnikunda from mathematical perspectives. When constructing Agnikundas, great care is taken from two perspectives (Dimensions and shapes) called as Ved. Dimensional (Aayam Ved) perspective of focuses on the measurements and proportions, ensuring they are constructed according to the specifications laid out in the Vedic texts. Shape (Aakriti Ved) involves the design of the top face of the Agnikundas, which can vary based on the ritual's needs and the specific wishes to be fulfilled. Both the dimensions and the shape of the Agnikunda are tailored to accommodate the number of sacrifices and the objective of the rituals. The following discussion is made on dimensions and shapes of Agnikunda.

Types of Agnikunda Based on Dimensions

According to dimensions, Agnikundas are categorized into five types: Chaturastra Kunda (Square Kunda), Trikona Kunda (Triangular Kunda), Ardhachandra Kunda (Half-Moon Kunda), Vrittakunda (Circular Kunda) and Uttara Kunda (Rectangular Kunda). This shows that dimensions of Agnikundas are in geometrical shapes same as the shapes discussed on the school geometry. Aagnikundas are viewed from the three different perspectives according to their shapes. They ae as follows:

Vertual Kunda (circular shaped)

Aagnikundas of circular shaped on the top face on the ground are four in types. They are Vrita kunda (circular shaped), Aarda Chandra Khnda (Semicircular shaped), Padhma Kunda (shape in the form of lotus flower), Surya Kunda (shaped in the form of Sun).

Konatmak Kunda (angular kunda)

Konatmak Kunda refers to Agnikundas with distinct corners. The term "Kon" signifies the number of corners, with various altars constructed according to this characteristic. The design and shape of these Kundas are integral to the rituals they support. There are eleven different Agnikundas classified based on the number of corners.

The classification of Agnikundas based on the number of corners highlights the meticulous approach of Vedic practitioners in designing fire altars. Each type of Kunda serves a specific purpose and aligns with the intentions of the rituals performed. They are Trilon Kunda (Triangular kunda), Chaturastra Kunda (Kunda made by four sides), Panchastra Kunda (Kunda made by five sides), Sadastra kunda (Kunda made by six sides), Saptastra kunda (Kunda made by seven sides),Aastrastra kunda (kunda made by eight sides), Nawastra kunda (kunda made by nine sides), Rudra Kunda also called Ekadas kunds (Kunda made by eleven sides),Sadtrisastra kunda (kunda made by thirty-six sides),Asta Chatwaristra kunda (kunda made by forty-eight sides).

This discussion shows that Agnikundas are constructed in different mathematical shapes with different units of length measurement. Now question arises like; What are the parts of Agnikundas? Do the parts of Agnikundas utilize the mathematical properties? The following discussion is made on the parts of Anikundas.

Parts of Aagni Kunda

Each agnikunda has five parts: Khat, Kantha, Yoni, Mekhala and Navi. Khat (depth /garahiyai) of agnikuda under the ground level. The length of Khath below the

ground level is $\frac{5}{8}$ part of total length and $\frac{3}{8}$ above the ground called Mekhalas (Source: Kundamandap Siddhi, 2017). For example, if an Aagnikunda is of 24 anglul then the length of khat is 5 out of 8 parts means of 15 anglus and 9 anguls above the ground called Makhelas. The height above the ground is also divided into three layers. The third layer of the Mekhala is located just above the ground, forming the bottom of the three layers. This layer has a height of 1/12 of the side length of the Agni Kunda, the second layer is with height is $\frac{1}{8}$ part of the side length of the Agnikundas and the topmost layer positioned just above the second Mekhala, making it the highest layer of height $\frac{1}{6}$ of the side length of Agnikundas.

Yoni, Kantha and Navi

A Yoni-shaped is constructed at the center of one side of the first layer of the Mekhala. This shape is created by placing a leaf of Pipal tree onto the soft clay positioned in the middle of that side of the first Mekhala. Kantha is the bottom face of the Agnikunda, this is same in face and size as its top face. Navi is the location where the fire is placed at the center of the Kanth. To initiate the ritual performance, the fire must be created or placed on the Navi. In other words, sacrificial fires are established on the Kanth of the Agni Kunda, and offering the materials (Hawans) are made on this fire placed on the Navi.

The Sanskrit texts Kundamandap Siddhi, Sanskar Prakash outlines the principles for constructing Agnikundas. To begin Vedic ritual, a square-shaped area of desired dimensions of agnikunda is outlined on the ground. This square-based area then is transformed into other desired shapes for the construction of agnikundas as per the wishes of the practitioners of performing the rituals. The fire alters constructed with the help of square are as follows.

Chaturastra (Rectilinear root) Kunda

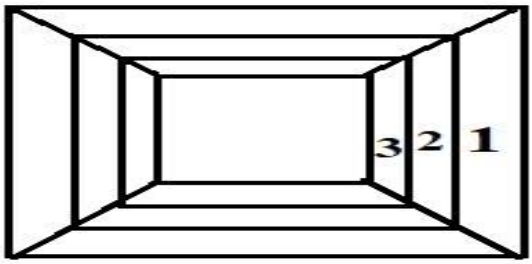
The Chaturastra Kunda is characterized by its four sides. Generally, a square is constructed on the ground of measure 24 angul (or one hand), khat and three layers of mekhelas are constructed on it as illustrated in the accompanying figures.

Figure 1

Geometric Structure of the Caturastra Kunda

Figure 2

Geometric Structure of Caturastra Kunda with three layers of Mekhala



The objective of construction of chaturastra is to complete work “Karya Siddhi”, and the requirements are; Area: 576 sq. Angul, Side length: 24 anguls, height of first mekhla of 4 angul or one sixth part of total length, Second Mekhala: of height 3 Angul or of one eighth of total length, Third mekhela of height 2 angul or of height twelfth part of the total length. To construct the material required are rope of length: 24 + 24+ 24+

24 = 96 angul, Four bamboo poles or nails, bamboo pegs of length 3,2 and 1 anguls, two ropes or bamboo pegs of length $24\sqrt{2}$.

Construction Procedure

A rope of 96 angul is divided into four equal parts, with nails placed at each division to form the shape of a square. Two poles of length $24\sqrt{2}$ anguls are placed at opposite poles of the square to secure the construction. A pit is dug to a depth of 15 anguls, with three Mekhala (raised parts) constructed above the ground at heights of 2, 3, and 4 anguls, respectively. This four-sided figure, referred to as Chaturastra, is square-shaped, with an area of 576 square anguls.

Trikod Kunda

The objective of construction of the Trikod Kunda is to destroy enemy (Shatru Nas). The requirements of Trikod Kunda are; Area: 576 sq. Angul, Side length: 24 Anguls, height of first mekhla of 4 angul, Second Mekhala of height 3 Angul and third mekhela of height 2 angul.

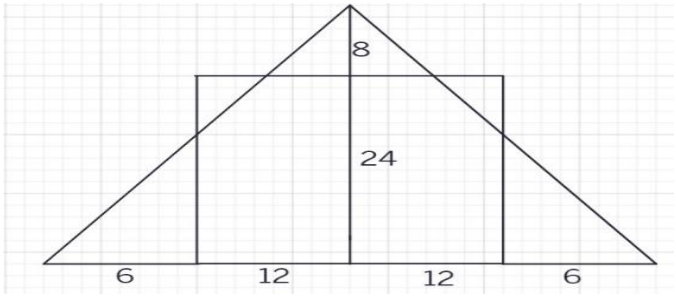
Construction procedure

Start by measuring a square that is 24 angul on each side. Drive nails into the ground at the corners of the square to secure the shape, add length of measure 6 angul outward from both the left and right sides of the base of the square. Total length this increases the total base length from 24 angul to 34 angul. Identify the midpoint of the square and draw a vertical line dividing the square into two equal halves. Extend this vertical line downward by an additional 8 angul, resulting in a total length of 32 angul. Draw straight lines from the extended endpoints of the vertical line to the outer corners of the base (the new endpoints created by the 6 angul extensions). This connection creates a triangular shape equal to the square. The height is the total vertical length of 32 anguis. This triangular area equals the area of the original square (24 angul × 24

angul = 576 square angul), indicating that both shapes are proportional despite their different configurations.

Figure 3

Geometric Structure of Trikod Kunda equal in area of Caturastra Kunda



Brita Kunda

The Objective of constructing Brita Kunda is attainment of Peace (Shanti Prapti) and the requirements to construct Brita kunda are; Area: 576 sq. Angul, Side length: 24 Anguls, two ropes or bamboo pegs of length $24\sqrt{2}$, height of first mekhla of 4 angul or one sixth part of total length, Second Mekhala: of height 3 Angul or of one eighth of total length, third mekhla of height 2 angul or of height twelfth part of the total length, markers (chalk or stones for marking points).

Procedure

First construct a square for this measure a rope of 96 anguls and mark four equal points to create a square with each side measuring 24 anguls. Drive four bamboo pegs into the ground at each corner to secure the shape (label the corners A, B, C, D). Placing the two bamboo pegs of length $24\sqrt{2}$ on the opposite corners level the shape of square on the ground. This square has area of 676 sq. anguls.

Figure 4

Geometric Structure of Wartul Kunda and Its Three Mekhalas

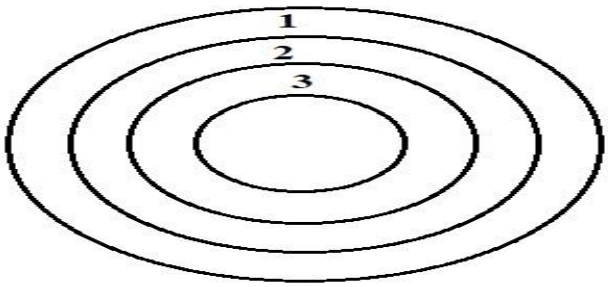
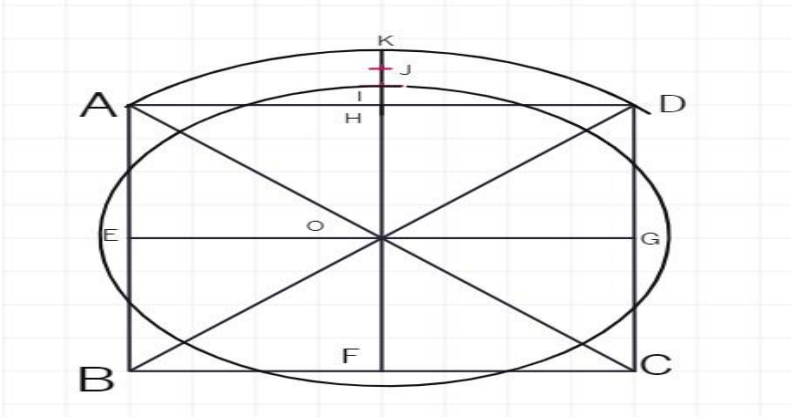


Figure 5

Geometric Structure of Wartul Kunda Derived from Caturastra Kunda



Draw a circle with center (O) at the intersection of diagonals and radius (OA) equals to half of the diagonal of the square. Produce the line joining the midpoints of opposite sides of square (FH) up to the circle at a point K and divide the external length of the line drawn (HK) into three parts at the points say I and J. Lastly, construct a circle of radius from center to the first point of division (OI). This is the required circular shape on of the Agnikunda and construct khat and mekhala on the circular face.

Ardha Chandra (Semi Circular) Kunda

The objective of constructing Ardhachandra kunda is Kalyan Prapti. A square of area 576 sq. Angul with Side length: $24\sqrt{2}$ anguls is required. This construction is made with two ropes or bamboo pegs of length 48, height of first mekhla of 4 angul (one sixth part of total length), Second Mekhala of height 3 Angul (of one eighth of total length), and the third mekhla of height 2 angul (of height twelfth part of the total length), markers (chalk or stones for marking points).

Yoni Kunda

Yoni kunda is constructed for the purpose of Putra Lav (Request for the Birth of a Son). The requirements to construct Yonu kundas are, area: 576 sq. angul, Side length: 24 Anguls, height of first mekhla of 4 angul or one sixth part of total length, Second Mekhala: of height 3 Angul or of one eighth of total length, Third mekhla of height 2 angul or of height twelfth part of the total length.

Material Required

Rope of length: 24 + 24+ 24+ 24 = 96 Angul, four bamboo poles or nails, bamboo pegs of length 3,2 and 1 anguls, two ropes or bamboo pegs of length $24\sqrt{2}$, A shovel for digging, chalk or stones for marking points.

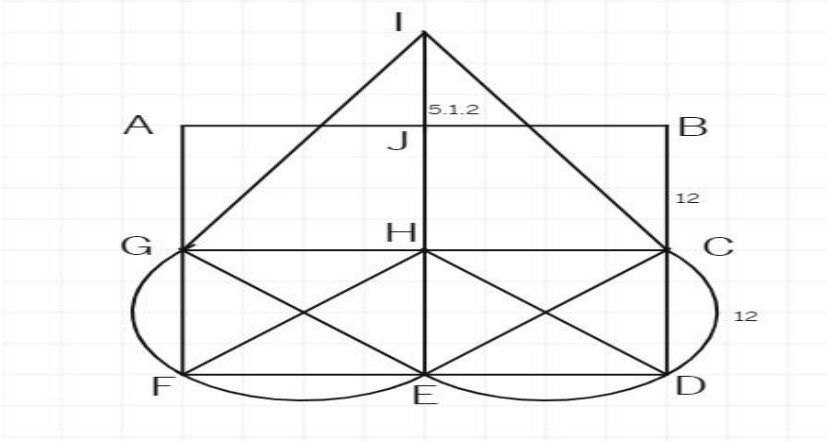
Procedure

Constructing a square of area 576 sq.anguls: A rope of 96 angul is divided into four equal parts, with nails placed at each division to form the shape of a square. Two poles of length $24\sqrt{2}$ anguls are placed at opposite poles of the square to secure the construction. A pit is dug to a depth of 15 anguls, with three Mekhala (raised parts) constructed above the ground at heights of 2, 3, and 4 anguls, respectively. This four-sided figure, referred to as Chaturastra, is square-shaped, with an area of 576 square anguls. Identify the middle horizontal line between the opposite sides so that the square is divided into four equal parts. Draw the diagonals of two squares on lower parts of the

initial square. Draw semi circles on outside of both squares taking center at the point of intersection of two diagonals as shown in the figure.

Figure 6

Geometric Structure of Kunda Derived from Caturastra Kund



Forming the Triangle

Produce the middle horizontal line JE 5.1.2 anguls outside. Connect the endpoints of the extended middle line (E and I) to the endpoints of the other middle line of the square Gand C. This will form a triangle (IGC) that sits above the square. Now the triangle with four semicircles is in the form of Yoni shape as desired. Here the use of 5.1.2 angul shows that the Vedic people have concept of fractions.

Sama Sasadstra Kunda

Sama (equal in side length) Sasadastra kunda (Kunda with six sides) and the objective of constructing Sama Sadastra Kunda is for requesting Death (Uchhed).

Requirements

Area: 576 sq. Angul, Rope of length $12\sqrt{2}$, 7 bamboo poles, height of first mekhla of 4 angul or one sixth part of total length, Second Mekhala: of height 3 Angul or of one eighth of total length, third mekhla of height 2 angul or of height twelfth part of the total length, markers (chalk or stones for marking points).

Figure 7

Geometric Structure Sasadstra Kunda *Derived from Wartul Kunda*

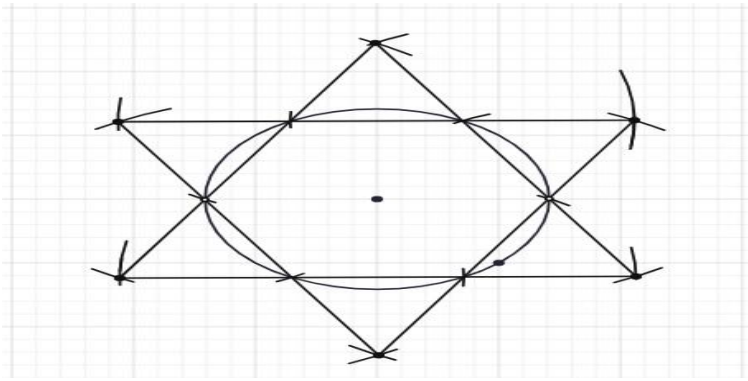
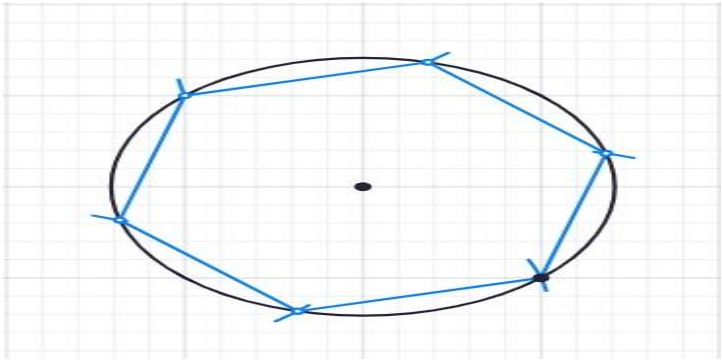


Figure 8

Outline of Sama Sasadstra Kunda on the top face



Procedure

Fix a pole at a point and draw a circle of radius $12\sqrt{2}$ anguls taking centre at the pole. Take a rope equal to the circumferences of the circle and divide the rope into six equal parts. Join the consecutive points marked and obtain the hexagonal shape. This is the required shape of agnikunda. Now construct Khat and Mekhalas on the Hexagonal shape becomes Sama Sasadstra Kunda.

Sama Aastrastra Kunda

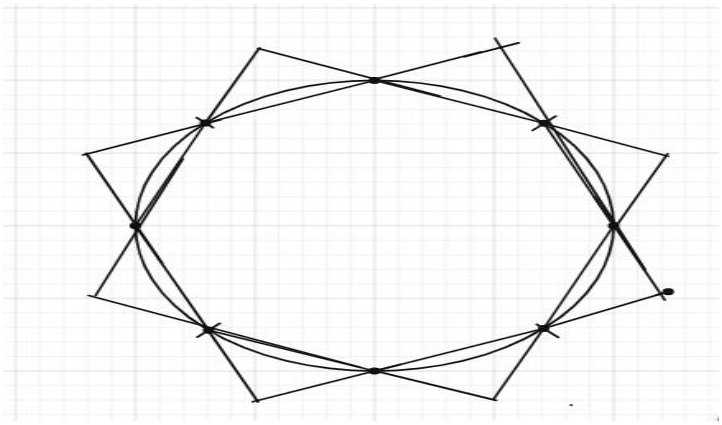
Sama Aastrastra Kunda means Agnikunda with eight equal sides and the objective of constructing Sama Aastrastra Kunda is for desiring prosperity (Arogya ko lagi)

Requirements

Area: 576 sq. Angul, Rope of length $12\sqrt{2}$, 7 bamboo poles, height of irst mekhla of 4 angul or one sixth part of total length, Second Mekhala: of height 3 Angul or of one eighth of total length, third mekhla of height 2 angul or of height twelfth part of the total length, markers (chalk or stones for marking points).

Figure 8

Geometric Structure of Sama Aastrastra Kunda



Procedure

Fix a pole at a point and draw a circle of radius $12\sqrt{2}$ anguls taking centre at the pole. Take a rope equal to the circumferences of the circle and divide the rope into eight equal parts. Join the consecutive points marked and obtain the octagonal shapes desired. Now completing by constructing khat and Mekhalas gives required shape of Sama Aastrastra Kunda

Padhma kunda

Padhma Kunda, designed in the form of a lotus flower and constructed for the purpose of requesting rain. The Padhma Kunda is a sacred structure modeled after a lotus flower, symbolizing purity and beauty. It is constructed with the intention of requesting rain, essential for agricultural prosperity.

This discussion explores the geometrical knowledge used on Vedic ritual highlights the importance of geometric understanding in both traditional and modern contexts. Now question comes, how the ritual activities concerning mathematics are being taught in Sanskrit institutions in Nepal? Do students in Gurukuls recognize the interrelationship between the geometrical knowledge required for constructing Agnikundas? Is there an awareness of how traditional practices can enhance their understanding of geometry in a contemporary educational framework? To find the answer of such question the following discussion is made.

Current Practices of Agnikunda Construction in the Nepalese Vedic Ritual

Nowadays, we can observe the rituals being performed not only in designated areas but also in rooms, on the roofs, and balconies of home. In contemporary practice, priests may create the Agnikunda using circular utensils like a Tagari or by placing two or three bricks. To assess the contemporary practices on the construction of Agnikundas, visits were made in different Sanskrit institutions of Nepal. They are Gurukuls Devghat Chewtan, Sanskrit schools and Pindeshwor Vidhyapeeth in Dharan Sunsari, and different Gurukuls located in Morang and Jhapa district. Through dyadic interviews with the Gurus at each institution, several key observations emerged.

It was found that the construction methods for Agnikundas are not included in the school level Sanskrit curriculum. Instead, students learn the construction techniques informally from their seniors through hands-on practice and observation during ritual activities. The curriculum of Veda on grade eleven of Sanskrit education mentioned the construction of Agnikundas but the curriculum is in general form and not in specific,

because which Agnikundas are to be construct and construction manuals is not specified. This absence further highlights the limited inclusion in Veda Curriculum of comprehensive training regarding the practical aspects of constructing these sacred Agnikundas. Discussions with educators at the Sanskrit university revealed that there was previously construction manuals for Agnikundas included in the Uttarmadhyama course. However, this course has since been omitted at the University level, Changes in University Curriculum resulted a significant gap in the formal teaching of Agnikunda construction practices.

This discussion shows that there is a rich tradition surrounding the construction of Agnikundas, current educational practices lack formalized training and resources in this area. This gap points to a need for revitalizing the curriculum to include comprehensive manuals and instructional materials that would preserve and transmit this vital aspect of Vedic ritual practice to future generations.

Summary

Regarding the construction of Agnikundas, a questionnaire was administered to a total of 100 students from grades nine and ten, studying in various Gurukuls of Jhapa district and involved in performing Vedic rituals. The responses collected from the respondents is described and analyzed in the following section.

Out of the total participants, 90 percent did not provide a response regarding the reason to offer materials into the Agnikunda during the performance of Vedic rituals. Only 10 percent of the students responded, and their understanding was that the Agnikunda is constructed to contain and protect from fire during the rituals.

In the context of performing Vedic rituals, 95 percent of the participants indicated that the Agnikunda is generally pre-constructed by the Yajamana (ritual performer) at the center of the designated ritual space. A small portion, comprising 5 percent, reported that they advise the Yajamana to use a bamboo peg of one hand length as a measuring unit to construct a four-sided Agnikunda. According to the Sulba Sutra,

the term *Chaturastra* (four-sided) denotes a square or a rectangle; however, in practical application, the geometric accuracy associated with the concept of a square or rectangle is often neglected.

While performing Vedic rituals, 100% respondent reported that the Agnikunda is constructed by the Yajamana (ritual performer) themselves without external instruction. Furthermore, all respondents indicated that they do not consider the prescribed measurements of the upper and lower parts of the Agnikunda during construction, as such measurements are not known to them. This suggests a lack of awareness or transmission of the geometrical guidelines outlined in traditional Vedic texts regarding the proper construction of ritual altars.

While performing Vedic rituals, 100% participants responded that the construction of four-sided Agnikundas is commonly practiced. However, none of the respondents reported having knowledge of or paying attention to the specific length, breadth, or area of the Agnikunda as mentioned in the Vedic texts. This indicates a general lack of awareness and consideration for the exact geometrical dimensions prescribed in traditional sources, suggesting that the construction is based more on convention than on scriptural guidelines.

About the instruments used to construct Agnikundas, all participants respond that traditional tools such as a bamboo peg, *khanti* (a large iron nail used for digging), *kodalo* (spade), rope, and *tagari* (a circular-shaped utensil used to carry sand, soil) are used. This indicates that the use of simple, locally available tools—particularly the bamboo peg and rope—has practical value and could be effectively incorporated into present-day school geometry teaching to promote empirical and hands-on learning experiences.

The responses of 100% respondents was they did not learn about the types of Agnikundas during their education in Gurukuls or Sanskrit institutions. Regarding their formal education, the respondents were from Gurukul students of grades 9 to 10. Their

responses indicated that they had not studied any Vedic texts or textbooks that contain the procedures or manuals for constructing Agnikundas. This suggests a significant gap in the curriculum, where knowledge related to the construction of Agnikundas is either absent or not adequately introduced to students at the school level.

Regarding the meaning of '*Angul'* measure, only 5 percent of the participants responded, interpreting it as the width of the middle finger of their hand, while the remaining participants did not provide any answer. In terms of the necessity of constructing an Agnikunda for ritual performance, all participants agreed that the presence of an Agnikunda is essential for offering sacrificial materials. Additionally, when Vedic rituals are performed in limited spaces such as inside a room, on a rooftop, or in a balcony (particularly in urban areas),100% respondent responses were, use of '*Tagari'* as a substitute for the Agnikunda. This practice reflects an adaptation to spatial constraints while still maintaining the essential element of sacrificial offering.

Conclusion

The use of the geometrical knowledge uses to construct Agnikundas on Vedic rituals is based on the shapes like square, circle, semicircle, triangle, Hexagon and Octagon maintaining the area equal to each other. For the construction of Agnikunda, first they used to construct a square and transformed the square into the desire shape for constructing Agnikunda. Khat and Mekhalas are the two parts of Agnikundas, total length of Khat and Mekhala is equal to the side of square. The responses of the practitioners show that Agnikundas are not constructed as mentioned in the Sanskrit texts, so the mathematical properties of construction are not cared on practices. In addition, the responses show that teaching learning activities on construction of Agnikunda are not mentioned in the curriculum of Sanskrit education intuitions but Agnikunda is constructed with the knowledge transmitted through the participatory activities with seniors in the Vedic rituals. It indicates that geometrical knowledge is transmitted through hands-on learning, and culturally responsive approach to learning

geometry. The geometrical knowledge used on Vedic rituals is based on the use of right-angled triangle, symmetry and Proportions Approximation of Square Roots**,** are also the common topic of school geometry. Both Vedic ritual geometry and School geometry focus on understanding shapes, their properties, and the relationships between them. The Vedic ritual geometry provides an early example of how geometry was used for practical and spiritual purposes, which parallels to modern geometry for practical problem-solving in various fields today. Incorporating the ancient Vedic geometrical knowledge into school curricula could enrich students' understanding of the historical and cultural significance of mathematics.

References

Bell, C. (1997). *Ritual: Perspectives and dimensions*. Oxford University Press.

Datta, B. (1932). *The science of sulba sutra: The lecture notes*. Calcutta University.

Dikxit, S. B. (1957). *Bharatiya Jyotish* (S. Jharkhandi, Trans.). Prakashan Burero.

Geertz, C. (1973). *The interpretation of cultures: Selected essays*. Basic Books.

Godbole, R. (2022, January 15). *Squaring a circle and shulbha sutra-square and circle with equal areas?* [Video]. YouTube. Retrieved Jun 12, 2025, from https://www.youtube.com/watch?v=jgN5poka94I&t=261s

Gurjar, L. V. (1947). *Ancient Indian mathematics and Veda*. Continental Book Service.

https://dictionary.cambridge.org/dictionary/english/culture

Katyaayan, A. (2017). *Kundamandap Siddhi*. Chaukhamba Surabharati Prakashan.

Kātyāyana (1974). *Kātyāyana Śulbasūtra* (S.D.Khadilkar,Ed.). Vidika Samsodhan Mandala.

Kumar, A. (2005). *Comprehensive Hindi-English dictionary*. Bharat Publishers.

Kunkarmi, R. (2000). *Chaar Sulba Sutra* (1st ed.). Mahashi Sandipani Rastriya Veda Bidhaya Pratisthan Bharatpuri.

Sayancharya, S. T., & Swami, H. (n.d.). *Satapatha Brahmana*. Nag Prakashan.

Shabrack, K. (2004). *Thinking through rituals: Philosophical perspectives*. Routledge.

Sharma, V. K., & Upadhaya, M. P. (Eds.). (2075). *Nepali Ganita Kosha*. Shabdartha Prakashan.

Shori, M. (2006). *The sixteen rituals of Aryans*. Vaanprastha Sadak Ashram.

Srinivasiengar, C. N. (1967). *The history of ancient Indian mathematics*. World Press.

Kak, S. (2005). *The architecture of ancient India: Space and time in Vedic ritual*. *Studies in History*, 21(1), 1-20. https://doi.org/10.1177/025764300502100101

Tilak, B. G. (1925). *Vedic chronology and Vedanga Jyotisha*. Messrs Tilak Bros.

Tridevi, B. S. (1985). *Samskar Prakash*. Lal Bahadur Shastri Kendra Sanskrit Vidyapeeth.

Academic Journal of Sukuna – AJoS, A Peer-reviewed Interdisciplinary Journal
Volume 5 (Issue 1) 2025 July (2082 Ashad), Pp. 62 – 86, ISSN 2594-3138 (Print)
Research Management Cell (RMC – Sukuna), Sundarharaincha, Morang

Gender Pay Gap in the Construction Industry: Evidence from Morang District, Nepal

Dio: https://doi.org/10.3126/ajos.v5i1.81821

Hom Bahadur Thapa*,
Krishna Prasad Acharya
Sita Ram Khatiwada
Faculties of Sukuna Multiple Campus, Sundarharaincha, Morang
*Email: homthapa2@gmail.com

Abstract

The issue of gender-based wage differentials in the construction industry has profound historical roots tracing back to early human societies where labor was divided by gender. This long-standing division has evolved but persisted, evident in today's global workforce, including in sectors like construction, where such disparities are noticeable. The study focuses on measuring and analyzing these gender-based wage differentials within Sundarharaincha-12, Morang in Nepal, employing a quantitative research design. The methodology involves structured questionnaires aimed at capturing data from 50 sample sizes of construction workers on wages, job roles, educational background, and personal demographics to provide a comprehensive analysis of the factors contributing to wage disparities. Despite legal mandates for equal pay, significant disparities persist, with women earning approximately 16% less than their male counterparts for similar work. The findings underscore a significant gender-based wage gap, with women predominantly in lower-wage roles and virtually absent from higher-paying positions like masonry or contracting. The

study recommends that Enforce policies that guarantee equal pay for equal work, irrespective of gender, particularly in labor-intensive roles and offer training and education, especially for women, to help them qualify for higher-paying roles such as masons or contractors. By addressing these issues, there is potential not only to enhance gender equality but also to improve the overall productivity and efficiency of the construction sector in developing regions like Nepal.

Keywords: Gender-based, wages differentials, construction industry, wage survey, Male and female construction worker

Introduction

Gender based wage differentials have deep historical roots, extending from hunting and gathering societies to agricultural civilization. In early human societies labor was typically divided along gender lines men and women. There has been a difference between men and women on the basis of gender. Even at the present modern era social, professional and wages distinction is deeply rooted and exists in different parts of the world. Gender-based wage differentials refer to the gaps in earnings between male and female workers performing similar tasks or roles within a specific industry or occupation.

In general, "construction work" refers to the manual labor-intensive processes involved in creating, modifying, maintaining, or dismantling buildings, infrastructure and facilities. It includes a broad variety of jobs and pursuits executed by different experts and laborers in the construction sector. "Construction work" means the construction of a building, road, bridge, canal, tunnel, internal or inter-state waterway, railway, construction work or construction of a power station, telecommunication, telephone or telegraphic structure and similar other structure, and this term also includes installation of any machine, tool or equipment in that structure.

"Construction labor" means a labor who is engaged in the construction work (Government of Nepal 2017). This is one of the biggest sectors in terms of job creation but the wages differentials have been well-documented, raising questions about the factors contributing to their existence and their implications for workers and firms in the construction sector.

Women are most often designated as “helpers” whose work is assumed to be unskilled. Whereas men's designation and pay rate change over time as they acquire experience (Kanel, 2021), women continue to be classified as helpers even when carrying out tasks considered skilled. According to the latest Nepal Labour Force Survey (NLFS-III), women earn on average 16% less than men per month in construction (Central Bureau of Statistics, 2019) While equal pay is mandated in the 2015 Constitution (Government of Nepal, 2015), it is very rarely implemented. The daily rate has increased in recent years for both men and women, with a boom in construction, but workers note that it has not kept pace with inflation. In addition to being socially unfair, the way men and women are treated differently in the workplace wastes human resources and hurt the economy.

Every developing country is facing the problem of gender-based wage differentials. It is observed that women are getting low wages as compared to men due to their low level of education, less productivity, lack of technical skills and so on (Blau & Kahn, 2017). Although it is widely recognized that increasing women's education levels has a positive impact on quality of life including higher income, economic growth and improving child health (Dollar & Gatti, 1991; Barro, 2001; Schultz, 2002) they still tend to receive less education compared with men in many developing regions.

In Nepal like many other developing countries, the construction industry stands as a significant contributor to economic growth and development. However, within

this sector, gender-based wage differentials continue to exist. Despite efforts towards gender equality in various spheres, the construction workforce remains predominantly male, with women often facing barriers to entry and advancement, as well as unequal pay practices.

The research problem focuses on the persistent wage disparity between male and female construction workers in Sundarharaincha Ward No. 12, Morang, despite legal mandates for equal pay. Women in the construction sector often earn significantly less than men for similar work, primarily due to occupational segregation, limited access to skill development, and societal biases that confine them to lower-paying roles. This wage gap not only affects women's financial stability but also perpetuates broader economic inequalities. Understanding the extent and causes of this disparity is crucial for developing effective policies and interventions to promote gender equality in the construction industry.

Like many other sectors, the general problem of construction sector shows notable gender wage difference. Despite performing similar tasks, female workers often receive lower wages compared to their male counterpart. When men and women are paid differently for the same work, it creates unfairness between genders. This wage gap not only makes it harder for women to achieve financial stability but also keeps economic inequalities in place. Various researches indicate that women often earn significantly less than men for similar work, with wage variation noted across various region including India and Nepal. A Central Bureau of Statistics report has brought to light wide disparity between male and female workers in Nepal - women earn 29.45 per cent less than their male counterparts on an average, even if the level of education among both the genders is the same. Despite equal work hour, men typically receive higher pay, reflecting broader systemic issues of gender discrimination within the construction industry (Dhungana, 2019).

The study aims to measure the extent of gender-based wage differential among construction worker. Gender-based wage differentials within the construction industry present a significant challenge to achieving gender equality and economic justice. Despite efforts to promote inclusive practices, disparities persist, impacting the livelihoods of individuals and the overall socio-economic landscape of the region. The research problem lies in understanding the underlying factors contributing to these wage differentials and figuring out effective strategies to address them.

This study attempted to explain what is the extent of gender-based wage differentials in the construction industry.

The study is based upon the results of a survey conducted among 50 construction workers in Nepal, specially focusing in Sundarharaincha Municipality ward No. 12. The study is limited to one locality and may not be applicable to other regions. The sample size is relatively small, which may affect the power of statistical tests. The study focuses primarily on worker perspective and may not thoroughly analyze the enforcement or impact of labor laws and polices related to wage equality.

Gender-based wage disparities have deep historical roots, originating from early human societies where labor was divided along gender lines. Although this division has evolved, significant wage gaps persist, particularly in the construction sector (Manesh, 2020; Yamamoto et al., 2019). Women have traditionally been confined to roles perceived as "helpers," leading to lower wages and limited recognition for skilled labor performed alongside men. As highlighted by Kanel (2021), women who engage in skilled tasks are often misclassified as unskilled laborers, further perpetuating wage disparities (Denk & Nikolic, 2020).

Central Bureau of Statistics (2019) provides empirical data showing that, on average, women earn 16% less than men in construction roles. This disparity is further reinforced by the underrepresentation of women in higher-paying positions such as

masonry and contracting. For instance, local reports indicate that women masons earn approximately Rs. 550 per day, while male masons can earn up to Rs. 1,500 for performing similar tasks—highlighting the stark contrast in pay despite equal skill levels.

Human Capital Theory as proposed by Marginson (2017) offers a framework to understand wage disparities based on differences in education, training, and experience. It emphasizes the economic value of investing in human development and predicts labor market outcomes such as wages and employment. However, this theory does not directly address the gender-specific challenges prevalent in the construction sector.

On the other hand, Wage Discrimination Theory, as discussed by Becker (1957) and Bergmann (1986), examines wage differences arising from gender, race, ethnicity, and other sociocultural factors. It provides a broader framework for analyzing wage disparities and is particularly relevant in studying gender-based pay gaps in sectors like construction. However, it often lacks an in-depth focus on sector-specific dynamics.

Devi (2018) in her study identifies the dual burden faced by women who must manage both employment—often in difficult or violent conditions—and household responsibilities. The study attributes the lack of education and family income as the primary drivers pushing women into unorganized sectors like construction. Moreover, most of these women lack social security and access to healthcare. While the study sheds light on crucial issues, it lacks detailed data to quantify the extent of these burdens.

Saikia & Shome (2023) argue that delayed implementation of gender-sensitive regulations has intensified gender-based discrimination at the workplace. Women in construction face numerous challenges, including unsanitary conditions, unequal pay,

limited facilities, and being relegated to secondary roles. Although this study presents a comprehensive overview of gender-based workplace challenges, it would benefit from more empirical data to substantiate its claims.

Central Bureau of Statistics (2019) estimates that 111,000 women are employed in construction, with 93% in informal jobs. This reflects a growing female presence in the sector—up from 0.7% in 2008 to 4.2% of all women employed by 2019. Despite these increases, men continue to dominate in both labor and contractor roles. While this data provides insight into female participation, it does not extensively analyze gender-based wage discrimination.

The International Labour Organization (ILO, 2017) and the Government of Nepal (2017) set minimum wage standards (Rs. 17,300) and prohibit discrimination based on gender, religion, caste, and other attributes. However, enforcement in the construction sector, especially informal and unorganized worksites, remains weak. Although these frameworks are intended to promote equality, they have not ensured the fundamental right to safe and fair working conditions.

Both Kanel (2021) and Central Bureau of Statistics (2019) provide empirical evidence of gender-based wage disparities in Nepal's construction sector. Kanel (2021) emphasizes the misclassification of skilled female workers, while Central Bureau of Statistics (2019) provides wage comparison statistics and broader labor force trends. The theoretical contributions of Human Capital Theory and Wage Discrimination Theory help contextualize these disparities but lack a specific focus on construction.

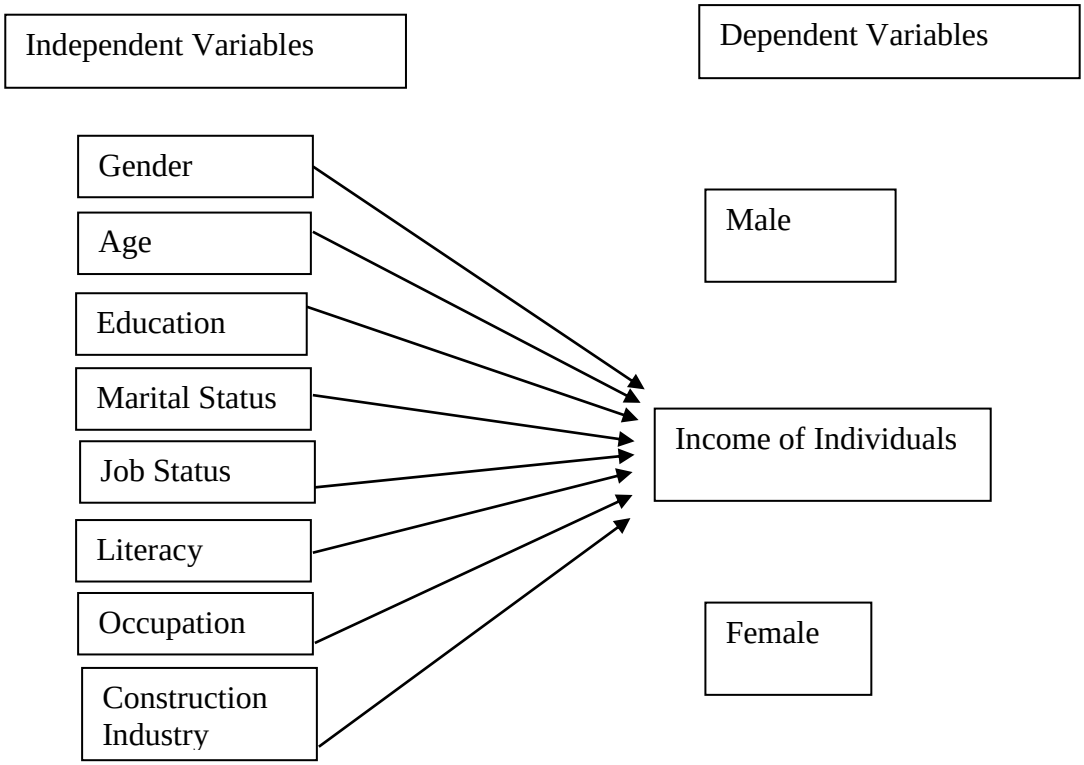
Studies by Devi (2018**)**; Saikia & Shome (2023) bring forward the dual burden and workplace challenges experienced by women in construction. They emphasize sociocultural and regulatory issues, though limited by a lack of quantitative data. Legal

and institutional analyses from ILO and national labor acts reveal gaps between policy and practice in ensuring fair treatment and pay equity.

Despite the valuable insights provided by the existing literature, several gaps remain. Most studies discuss general patterns of wage discrimination, with limited focus on the specific gender-based wage differences within the construction sector. Notably, no existing research has been identified on gender-based wage differentials in the construction industry in Sundarharaincha-12, Morang. This presents a critical gap that the present study aims to address.

Figure 1

Wage difference between male and female



The conceptual framework of this study examines the relationship between income levels (dependent variable) and a set of independent variables including gender,

age, education, marital status, job status, literacy, occupation, and the construction industry context. The primary focus is to explore how these socio-demographic and occupational factors influence the earnings of individuals, particularly highlighting gender-based wage differences among male and female construction workers. Variables such as education and literacy are expected to enhance income opportunities, while job status and occupation may determine wage levels based on employment type and skill level. This framework aims to provide a comprehensive understanding of the factors contributing to income disparities within the construction sector.

Methods and Materials

The study employs a quantitative research design aiming to collect and analyze numerical data to examine gender-based wage differences among construction workers. The study utilized a purposive sampling method**,** selecting respondents based on specific criteria such as gender, occupation, and involvement in informal construction work. The goal was to ensure equal representation of male and female laborers, allowing for a direct and meaningful comparison of their wages.

The research was conducted in Sundarharaincha-12, Morang, Nepal, as it is a rapidly developing area with increasing construction and industrial activities, making it a suitable and timely site to study gender-based wage differences in the construction sector. This ward has seen a significant rise in informal construction projects, offering easy access to laborers working without formal contracts conditions where wage discrimination is often more prevalent. Other wards within the municipality were not selected due to lower construction intensity, limited access to informal worksites, and challenges in achieving gender balance among respondents.

Data for the study was collected through structured questionnaires administered to the respondents. The questionnaire was carefully designed to gather comprehensive information on several key areas, including demographic details such as age, education

level, and years of experience. It also collected data on wage rates, both hourly and annually, along with information related to job position and working hours. In addition, the questionnaire explored respondents' views on the prospects of wage increases and promotion opportunities, as well as their perceptions of wage fairness within the workplace.

This study is exploratory in nature and seeks to examine gender-based wage disparities among construction workers in informal settings. A sample size of 50 respondents was chosen. It was thought that a smaller but balanced sample would be adequate for making preliminary conclusions because it was difficult to reach an officially registered population in the informal sector and there was no official data on the overall number of construction workers in the region.

The collected data was analyzed by using Microsoft Excel and SPSS. Basic statistical tools such as mean**,** median and percentages were used to summarize and compare the wages of male and female construction workers. These techniques helped to identify average earnings, typical wage levels, and the overall distribution of income, supporting a clear understanding of gender-based wage differences.

Result and Discussion

This section presents the findings of the study based on data collected through structured questionnaires from construction workers**.** The results are systematically organized into tables and interpreted to identify significant trends and patterns, with a particular focus on gender-based disparities within the construction sector. Key variables analyzed include age, educational attainment, work experience, wage levels, job positions, and workplace conditions. The analysis further examines respondents' perceptions of wage fairness and satisfaction with current compensation. Special attention is given to the differential experiences of male and female workers,

particularly in terms of income and occupational roles. Each table is accompanied by a detailed interpretation to provide clarity and contextual understanding of the findings.

Table 1

Demographic and Working Environment of Workers

Variables		Male	Female
Count			
Age	20-29	2	6
	30-39	11	9
	40-49	8	8
	50 and above	3	3
Marital Status	Married	24	26
Education	Illiterate	8	16
	Basic Education	14	10
	SEE	2	0
Years of Experience	0-5	2	9
	6-10	13	12
	Above 10	9	5
Work Place	Field	24	2

Source: Field Survey, 2080

This table provides demographic, educational, and workplace data broken down by gender in the construction sector in Sundarharaincha-12, Morang, Nepal. It categorizes the workforce by age, marital status, education level, years of experience, and workplace location.

Age Distribution: The majority of men are between 30 and 49 years old, with no males under 20. There are 2 males aged 20-29, 11 males aged 30-39, and 8 males

aged 40-49. Women tend to be slightly younger, with 6 females aged 20-29, 9 females aged 30-39, and 8 females aged 40-49. Both genders are similarly distributed in terms of age, with a notable number of females in the younger age group (20-29) compared to males.

Marital Status: All the male and female workers are married. There are no unmarried workers in this sample for either gender, which could reflect the social or cultural context in the region.

Education: 8 men are illiterate, 14 have basic education, and 2 have completed Secondary Education Examination (SEE). No men have university-level education.16 women are illiterate, 10 have basic education, and none have SEE or university education.

A larger proportion of women are illiterate (16) compared to men (8), and women have no representation in higher education levels (SEE or above). This difference in education levels could contribute to gender-based wage disparities, as men may be more qualified for skilled positions due to their higher levels of education.

Years of Experience: Most men have 6-10 years of experience (13), followed by more than 10 years (9). Only 2 have 0-5 years of experience. A greater number of women have less experience, with 9 women having 0-5 years of experience, 12 with 6-10 years, and only 5 with more than 10 years of experience. Women tend to have less experience compared to men, with more women in the 0–5-year range. This could affect wage levels, as those with more experience tend to earn more, potentially contributing to wage gaps between genders.

Workplace Location: All 24 males work in the field, with no males in office roles. Similarly, all 26 females also work in the field, with no women in office: Both genders are solely represented in field work, which might involve manual labor, but

the specific types of field work (skilled vs. unskilled) could influence wage differences.

The data suggest that women are generally less educated and less experienced compared to men. This could potentially lead to women being offered lower-paying or unskilled jobs in construction, which could result in a gender-based wage disparity. Since both men and women are employed in fieldwork, it's possible that the type of tasks performed by each gender differs, which could contribute to wage differences. Men may be assigned more physically demanding or skilled roles, while women may be doing lighter, less technical work.

Table 2

Classification of Job Position and Hourly Wages by Gender

			Job Position/Title							
				Labor		Mason		Contractor	Total	
Hourly Wages/Salary			N	%	N	%	N	%	N	%
Less than	Gender	Male	8	25					8	25
100		Female	24	75					24	75
Total			32	100					32	100
100-200	Gender	Male	8	80	3	100	3	100	14	87.5
		Female	2	20	0	0.0	0	0.0	2	12.5
Total			10	100	3	100	3	100	16	100
More	Gender	Male	1	100	1	100			2	100
than 200		Female	0	0.0	0	0.0			0	0.0
Total			1	100	1	100			2	100
Total	Gender	Male	17	39.5	4	100	3	100	24	48
		Female	26	60.5	0	0.0	0	0.0	26	52
	Total		43	100	4	100	3	100	50	100

Source: Field Survey, 2080

This table is a cross-tabulation of distribution of hourly wages among males and females across three job positions: Laborer, Mason, and Contractor. It provides insights into gender-based wage differences by analyzing the distribution of male and female workers across different wage categories and job roles (labor, mason, and contractor).

Eight males (25%) and twenty-four females (75%) are in the lowest wage category (less than 100NPR/hour). Thirty-two workers (100%) earn less than 100 NPR/hour, with females dominating this category. A large proportion of females are paid the lowest wages, showing that women are overrepresented in low-wage positions compared to men. This indicates a potential wage disparity, where women might be confined to lower-paying roles or receive lower wages for the same work.

Eight males (80%) in labor positions, three males (100%) in mason positions, and three males (100%) in contractor positions fall into the wage category (100-200 NPR/hour). Only two females (20%) are in labor positions in this wage range, with no women working as masons or contractors. Sixteen workers earn between 100 and 200 NPR/hour, with men representing the overwhelming majority (87.5%). Men dominate the higher wage category, especially in skilled positions such as masons and contractors. This suggests that men are more likely to be placed in higher-paying, skilled roles, while women remain underrepresented in these jobs.

Only one male in labor and one male in a mason position earn more than 200 NPR/hour. No females are in the wage category (more than 200 NPR/hour). Only two workers are in the highest wage category, and both are male. There is a complete absence of women in the highest-paying category, reinforcing the gender wage gap. Men are more likely to access the best-paying roles in the construction industry.

Labor roles have a significant number of both men and women, but more women (26 or 60.5%) are laborers compared to men (17 or 39.5%). This suggests that women are primarily concentrated in lower-skilled, lower-paid positions. All 4

masons are male (100%), which shows that this skilled position is exclusively filled by men in this context. All 3 contractors are male (100%), indicating that managerial or supervisory positions are also exclusively male-dominated. There is a clear gender discrimination in job roles. Women are concentrated in lower-wage, less-skilled labor roles, while men occupy all the skilled (mason) and supervisory (contractor) positions, which are better compensated.

Even though the workforce is relatively balanced in terms of gender representation (48% male, 52% female), there is a significant gender-based wage gap. Men dominate the higher-paying roles and wage categories, while women are concentrated in lower-wage positions.

Women make up 75% of workers earning less than 100 NPR/hour. This highlights the pay gap where women are overrepresented in the lowest-paying jobs. All workers earning more than 100 NPR/hour in skilled roles (mason and contractor) are men. This shows a gender bias in assigning or accessing higher-skilled, better-paid jobs. Women are completely absent from the wage category above 200 NPR/hour. This suggests that women are not given access to higher-paying opportunities, reinforcing the gender wage gap in the construction sector in this region.

Table 3

Factors that contribute to the Gender- Based Wage Differences

Frequency Percent		
Difference in educational background and Training	14	28.0
Lack of negational skills among women	6	12.0
Gender stereotypes and biases	0	60.0
Total	50	100

Source: Field Survey, 2080

This table highlights the factors contributing to gender-based wage differences in the construction works in Sundarharaincha-12, Morang, Nepal. It lists three key factors along with their frequency and percentage based on a sample size of 50 respondents.

Fourteen respondents (28%) identified differences in educational and background and training as a contributing factor. Educational disparities between men and women are a significant factor in wage differences. As seen in previous tables, women tend to have lower education levels, which limits their access to higher-paying, skilled positions like masons and contractors. Men with better education or training are more likely to qualify for higher-wage roles, while women remain in lower-wage, less-skilled positions. This aligns with the 28% of respondents who believe that differences in education and training contribute to the gender wage gap.

Six respondents (12%) highlighted lack of negotiation skills among women as another contributing factor. Some women may lack negotiation skills or confidence to demand higher wages or seek better positions. In male-dominated industries like construction, women may be less likely to negotiate for better pay, which could contribute to their concentration in lower-wage roles. Although this factor is noted by a smaller proportion of respondents (12%), it still plays a role in wage disparities.

Thirty respondents (60%) identified gender stereotypes and biases as the primary factor. Gender stereotypes and biases are considered the most significant factor, accounting for 60% of responses. In the construction industry, traditional views may perceive men as more capable in skilled or physically demanding roles, pushing women into lower-paid, less-skilled jobs regardless of their ability. Cultural biases and societal expectations about gender roles can limit women's opportunities for advancement and contribute to wage inequality. This aligns with the gender exclusion observed in the previous tables, where men dominate higher-paying positions.28% of

the respondents believe education is the key issue. 12% add that negotiation skills are a factor, bringing the total cumulative percentage to 40%. 60% point to gender stereotypes and biases, which, when combined with other factors, account for 100% of the perceived causes of gender wage differences.

Table 4

Perception of Gender- Based Wage difference

	Frequency	Percent
Disagree	4	8.0
Neutral	4	8.0
Agree	35	70.0
Strongly Agree	7	14.0
Total	50	100

Source: Field Survey, 2080

This table presents the distribution of responses regarding gender-based wage differences in the construction works of Sundarharaincha-12, Morang, Nepal. It shows how participants perceive the existence of wage disparities between men and women in this industry, with a sample size of 50 respondents.

A small proportion of respondents (8%) do not believe that there are gender-based wage differences in the construction industry. These individuals may feel that wages are fair or equitable between men and women or may not have observed significant disparities. Another 8% of respondents are neutral on the issue. This could indicate a lack of strong opinion or sufficient knowledge to agree or disagree about wage differences. They may not be aware of the full scope of wage disparities or have mixed views. The majority of respondents (70%) agree that gender-based wage differences exist. This suggests that the perception of wage inequality between men

and women is widely acknowledged by most of the workers or people involved in the construction sector. They recognize that women are often paid less than men or are restricted to lower-paying positions. An additional 14% strongly agree that gender-based wage differences are present.

The table shows a clear consensus that gender-based wage differences are perceived as a significant issue in the construction industry. With 84% of respondents either agreeing or strongly agreeing, the data indicates that the majority of people involved believe there are disparities in pay between men and women. Only a small minority of respondents (16%) are either neutral or disagree with this view, further emphasizing the prevalent recognition of wage inequality in the sector.

Table 5

Worker Satisfaction with Current Wages and Benefits

	Frequency	Percent
Disagree	4	8.0
Neutral	4	8.0
Agree	35	70.0
Strongly Agree	7	14.0
Total	50	100

Source: Field Survey, 2080

This table provides data on the level of satisfaction with current wages and benefits among construction workers. It reflects the workers' overall attitudes toward their compensation.

A significant portion (30%) of respondents is dissatisfied with their current wages and benefits. These workers likely feel that their compensation is inadequate, possibly due to low pay or insufficient benefits, which could be linked to the gender-

based wage disparities observed earlier, especially among female workers. A small percentage (8%) is neutral, neither satisfied nor dissatisfied. This group may feel that their wages and benefits are average or may not have strong opinions on the matter. The majority (62%) of respondents' report being satisfied with their wages and benefits. These individuals may feel that their compensation meets their expectations or is fair given their work. This suggests that, despite the observed wage disparities, most workers are content with their earnings and benefits.

The findings of this study reveal significant gender-based wage disparities within the construction industry. Data indicate that female workers are disproportionately represented in low-wage, unskilled labor roles, while men predominantly occupy higher-paying skilled and supervisory positions, such as masons and contractors. This pattern mirrors broader global and national trends, where structural inequalities and entrenched gender norms perpetuate occupational segregation and wage gaps (Blau & Kahn, 2017; Denk & Nikolic, 2020). The following discussion explores the key factors contributing to these disparities namely, human capital deficiencies, workplace discrimination, legal enforcement challenges, and socioeconomic constraints and examines their implications for policy and future research.

Educational attainment and work experience emerged as key factors contributing to these wage differentials. A majority of female respondents were either illiterate or had only basic education, whereas male participants demonstrated higher educational achievement. According to Human Capital Theory, wage differences can largely be attributed to variations in education, training, and accumulated work experience (Marginson, 2017). In the context of this study, most female respondents had limited or no formal education, significantly restricting their opportunities for career advancement in the construction sector. In contrast, male participants were more

likely to have completed basic or vocational education, enabling them to qualify for better-paying skilled jobs. These findings suggest that limited access to formal education and vocational training restricts women's upward mobility within the construction sector. Similar conclusions were drawn by Devi (2018), who noted that inadequate education and financial pressures at the household level often push women into informal and low-paid labor.

However, education alone does not fully explain the persistence of wage inequality. Structural and cultural barriers also play a critical role in reinforcing gender-based occupational segregation. Gender-based discrimination and workplace biases appear to be significant contributors to wage disparities. Sixty percent of respondents identified gender stereotypes and prejudices as major causes of wage differences. This aligns with Wage Discrimination Theory, initially proposed by Becker (1957) and later expanded by Bergmann (1986), which posits that wage gaps often stem from institutional and social discrimination rather than purely economic considerations.

A notable example of such discrimination is the misclassification of women's labor. Despite performing skilled tasks, women are frequently labeled as "helpers" or assistants, thereby excluded from higher-paying job classifications. Kanel (2021) observed similar patterns in Nepal, where women's contributions to skilled construction work are often unrecognized, resulting in lower wages and limited career advancement opportunities. Additionally, data from the Central Bureau of Statistics (2019) show that women in the construction sector earn approximately 16% less than their male counterparts, even when working under similar conditions. These statistics corroborate the study's findings and underscore the systemic undervaluation of women's labor.

Perception data further highlight the extent of gender-based wage disparities. A substantial majority (84%) of respondents acknowledged the existence of gender-based wage differences. However, 62% of participants expressed satisfaction with their

current wages and benefits. This apparent contradiction may reflect the normalization of inequality or a lack of awareness regarding labor rights among female workers. Dhungana (2019) similarly found that many workers in Nepal accept wage disparities due to deep-rooted social conditioning and the absence of viable employment alternatives.

Despite legal provisions mandating equal pay—such as Article 18 of the Constitution of Nepal (2015) and Section 3 of the Labour Act (Government of Nepal, 2017)—enforcement remains weak, particularly in the informal sectors where many women are employed. The International Labour Organization (ILO, 2017) emphasizes the importance of eliminating workplace discrimination, yet ineffective institutional oversight continues to allow wage disparities to persist. Saikia and Shome (2023) argue that delays in implementing gender-sensitive labor policies exacerbate workplace inequities and disproportionately affect women. For instance, while anti-discrimination laws exist on paper, enforcement mechanisms are often absent or poorly resourced, especially in rural areas and informal settings. Furthermore, there is a lack of targeted programs aimed at improving women's access to skilled training, certification, and job placement in the construction industry.

To bridge this gap, policymakers must prioritize the development of inclusive labor regulations and ensure robust implementation through regular monitoring and accountability frameworks. Strengthening labor inspectorates and promoting partnerships between government agencies, employers' associations, and civil society organizations could enhance compliance and support vulnerable workers.

Moreover, female workers in the construction industry face a dual burden: they must perform physically demanding jobs while also managing domestic responsibilities. Access to social protection, health services, and childcare facilities remains minimal.

Barro (2001) and Schultz (2002) have highlighted that enhancing women's access to education and economic opportunities significantly contributes to both economic growth and social development. However, in many developing contexts including Nepal gender disparities in education and labor market participation remain deeply entrenched due to patriarchal norms and lack of institutional support. Addressing this issue requires a multifaceted approach that includes providing childcare facilities at worksites, offering flexible working hours, and expanding access to health insurance and maternity leave. Such measures would not only improve women's well-being but also increase their labor force retention and productivity.

Conclusion

This study sheds light on the persistent gender-based wage differentials in the construction industry in Sundarharaincha-12, revealing that women face substantial barriers to achieving equitable pay. Despite the constitutional mandate for equal pay, numerous factors contribute to ongoing disparities, such as lower educational attainment, lack of access to skilled positions, and societal biases that limit opportunities for women.

The data reflects a critical societal issue where, although a segment of the workforce recognizes wage disparities, the entrenched perceptions and systemic barriers have not been adequately addressed. As such, gender inequality remains pervasive within the construction sector, influencing economic growth and societal equity.

To tackle gender-based wage disparities within the construction field requires a comprehensive strategy involving strict enforcement of equal pay legislation together with skill development initiatives for women and awareness programs that confront hiring discrimination. Closing the wage gap between male and female construction workers creates economic justice for women while simultaneously enhancing industry

productivity and efficiency. The sector's support for equal opportunities and fair wages will enable broader economic development and social advancement in Nepal.

The implications of these findings are significant for policy-makers, industry stakeholders, and advocates for gender equality. First, there is an urgent need for education and vocational training programs tailored to women in construction, allowing for skill development and qualification for higher-paying roles. Second, enforcement of existing labor laws that mandate equal pay for equal work must be prioritized, ensuring compliance across all levels of the industry.

Organizations should also focus on creating an inclusive workplace culture that actively challenges gender stereotypes and biases. Training programs should not only target women but also engage male counterparts to foster awareness and respectful collaboration on the job site.

Ultimately, addressing gender-based wage differentials in the construction industry can enhance not only the economic empowerment of women but also contribute to the overall productivity and efficiency of the sector. As developing regions like Nepal strive for economic growth, promoting fairness and equality in pay practices will be crucial for sustainable development and social justice.

References

Barro, R. J. (2001). Human capital and growth. *American Economic Review, 91*(2), 12–17. https://doi.org/10.1257/aer.91.2.12

Becker, G.S. (1957). *The economics of discrimination*. University of Chicago Press.

Bergmann, B. R. (1986). *The economic emergence of women*. Basic Books.

Blau, F. D., & Kahn, L. M. (2017). The gender wage gap: Extent, trends, and explanations. *Journal of Economic Literature*, *55*(3), 789–865. https://doi.org/10.1257/jel.20160995

Central Bureau of Statistics [CBS] (2019). *Nepal labourforce survey 2017/18*(NLFS-III). Government of Nepal.

Central Bureau of Statistics [CBS] (2019). *Nepal labourforce survey 2019.* Government of Nepal.

Denk, A., & Nikolic, H. (2020). Gender discrimination in purchase and sale in Croatian construction. In B. Katalinic (Ed.), *DAAAM International Scientific Book 2020* (Vol. 1) 661–667). DAAAM International Vienna.https://doi.org/10.2507/31st.daaam.proceedings.092

Devi, I. P. (2018). Gender discrimination in wage earnings: A study of Indian wage market. *Indian Journal of Labour Economics, 61*(1), 27–46. https://doi.org/10.1007/s41027-018-0117-1

Dhungana, S. (2019, June 20). CBS report brings to fore huge gender pay gap. *The Himalayan Times*. https://thehimalayantimes.com/nepal/central-bureau-of-statistics-report-brings-to-fore-huge-gender-pay-gap

Dollar, D., & Gatti, R. (1999). *Gender inequality, income, and growth: Are good times good for women?* (Policy Research Report on Gender and Development, Working Paper Series No. 1). The World Bank. https://doi.org/10.1596/1813-9450-1

Government of Nepal (GoN) (2015). *Nepal gazette.* Government of Nepal.

Government of Nepal (2017). *Labouract, 2074*. Government of Nepal.

International Labour Organization [ILO]. (2017). *World employment and social outlook trends for women*. International Labour Office.

Kanel, K. (2021). *Research on inequality and exploitation in wages based on gender in Nepal*. Action Aid Nepal.

Manesh, S. N. (2020). *Temporal and spatial analysis of the wage gap for women and underrepresented minorities in the AEC workforce.* [Unpublished Doctoral dissertation], University of Nevada, Las Vegas.

Marginson, S. (2017). Human capital theory and education policy. *Journal of Education Policy, 32*(3), 309–322. https://doi.org/10.1080/02680939.2016.1236191

Saikia, M., & Shome, M. K. (2023). Employee motivation and organizational commitment of workers in public and private limited tea garden of Assam: a comparative study. Seybold. *Report18(3), 171–193.*

Schultz, T.P. (2002). Wage gains associated with height as a form of health human capital. *American Economic Review*

Yamamoto, Y., Matsumoto, K., Kawata, K., & Kaneko, S. (2019). Gender-based differences in employment opportunities and wage distribution in Nepal. *Journal of Asian Economics, 64*, 101131. https://doi.org/10.1016/j.asieco.2019.101131

Academic Journal of Sukuna – AJoS, A Peer-reviewed Interdisciplinary Journal
Volume 5 (Issue 1) 2025 July (2082 Ashad), Pp. 67 – 74, ISSN 2594-3138 (Print)
Research Management Cell (RMC – Sukuna), Sundarharaincha, Morang

Habitat Preferences of the Chinese Pangolin (*Manis pentadactyla*) in Southern Sankhuwasabha, Nepal

Doi: https://doi.org/10.3126/ajos.v5i1.81828

Kishor Dahal*[1]

[1]Faculty of Sukuna Multiple Campus, Sundarharaincha, Morang

*Email: kishordahal47@gmail.com

Abstract

A field survey was conducted in September - October 2023 to assess the habitat preferences of pangolins in Madi Municipality, Sankhuwasabha. Using six (500 m × 500 m) transect strips across forest and cropland habitats, 20 pangolin burrows were recorded, 16 in forests (bamboo, Nepalese alder, grassland) and 4 in croplands (millet, paddy, tea). Most burrows were found in grey soils and near water sources, indicating specific habitat preferences. These findings suggest that conservation efforts should prioritize forest habitats and areas near water sources to ensure the protection of pangolin populations.

Keywords: Burrow distribution, Habitat preference, Pangolin, Sankhuwasabha, Soil type

Introduction

Pangolins, the world's only scaled mammals, face an existential threat from extensive poaching for their meat and scales and rapid habitat destruction (Duckworth et al., 2008; Molur, 2008). In Nepal, two species, the Chinese Pangolin (*Manis pentadactyla*) and the Indian Pangolin (*Manis crassicaudata*), are recorded (Shrestha, 1981). Despite being protected under CITES Appendix II and Nepal's National Park and

Wildlife Conservation Act of 1973, their populations continue to decline drastically (CITES, 2000).

Effective conservation strategies against these pressures, as well as emerging threats from climate disasters, are severely hampered by a lack of fundamental ecological data. These solitary, nocturnal mammals primarily feed on ants and termites (Prater, 1971; Heath & Vanderlip, 1988; Suwal, 2011) and have low reproductive rates (Shrestha, 2003). The detailed information on their specific habitat preferences within eastern regions of Nepal remains rare. This knowledge gap is particularly in the Sankhuwasabha district, where pangolin presence is reported but their ecology specially habitat preferences have never been scientifically studied.

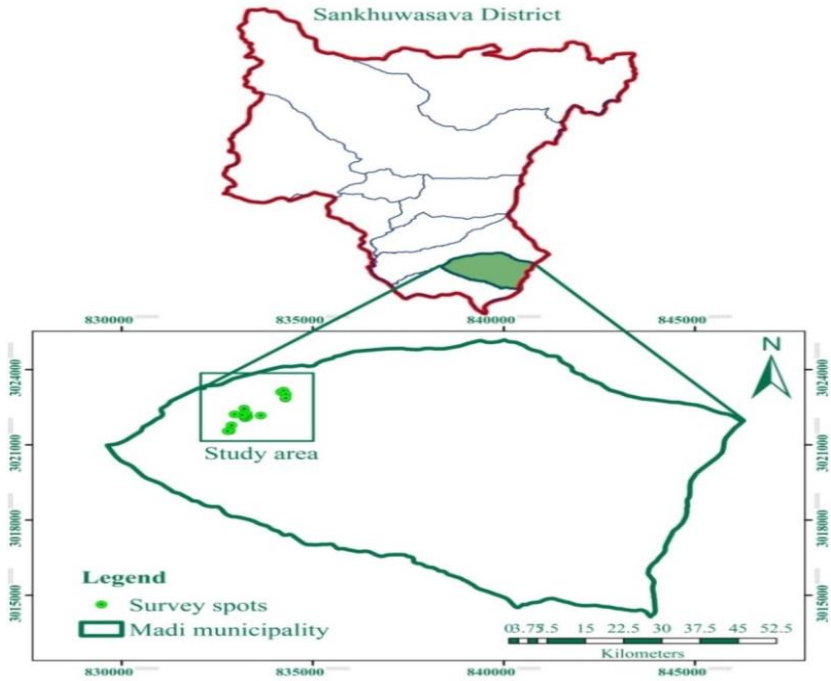
Therefore, the objective of this study is to identify and characterize the habitat preferences of pangolins in the southern part of Sankhuwasabha district. By providing the first systematic ecological assessment in this region, this research aims to generate essential baseline data to inform evidence-based conservation actions and land management policies, contributing to the long-term survival of these threatened species in Nepal.

Methods and Materials

The research was conducted in Madi municipality, located in the southern part of the Sankhuwasabha district, Nepal (Figure 1). This region, situated in the Mid-Hill Zone of Nepal, is characterized by significant variations in altitude, landscape, and climate (ICIMOD, 2016). The study site encompasses a mosaic of landscapes, including forests, grasslands, terraced farmland, and human settlements. Geographically, the area is positioned between 27°20' N and 27°30' N latitude and 87°32' E to 87°49' E longitude, with elevations ranging from 1,000 to 1,900 meters above sea level. The local soil has a porous and sandy texture, with colours varying from grey and brown to brownish-black.

Figure 1

Map of the study area



The study was carried out in September and October 2023, focusing on two primary land-use types: forests and cultivated lands. A systematic strip transect method (Buckland et al., 2001) was employed for the survey. Within each land-use type, three representative survey sites were selected, each covering an area of 500 m × 500 m (25 ha). The forest sites comprised distinct sub-habitats: a bamboo-dominated forest, a Nepalese alder (*Alnus nepalensis*) forest, and a grassland area. Similarly, the cultivated land sites were selected in areas of millet cultivation, paddy fields, and a tea garden. Within each 500 m × 500 m site, five parallel linear transects, each 500 m in length, were established. These transects were spaced 100 m apart to ensure representative coverage of the plot. Burrows were observed by walking at a slow and steady pace along the centerline of each linear transect, within a 20 m belt on both sides. The resulting width of the surveyed strip is 40 m for each transect.

The survey focused on identifying and characterizing newly constructed pangolin burrows. Newly constructed burrows were observed if they had freshly excavated soil at the entrance, lacked vegetation growth or cobwebs within the opening, and showed minimal signs of weather-induced erosion. For each newly identified pangolin burrow, geographical coordinates (latitude and longitude) were recorded using a GPS device (Garmin eTrex 10). The colour of the surrounding soil was noted, and classified as grey, brown, or brownish-black. The data were analyzed using Microsoft Excel 2010.

Results and Discussion

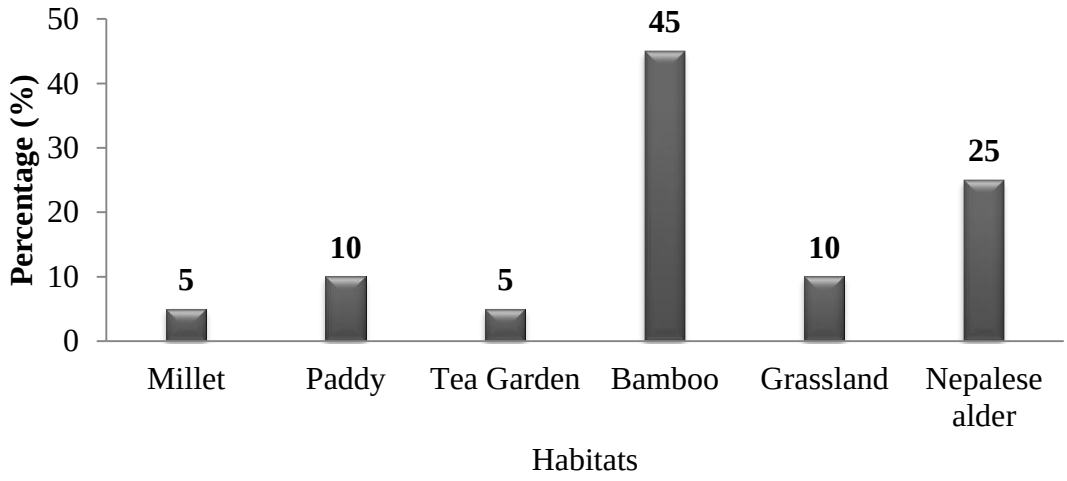
Throughout the study period, a total of 20 pangolin burrows were documented (Table 1). A strong preference was observed for forested areas, which contained 80% (n=16) of all recorded burrows, compared to agricultural land, which contained only 20% (n=4).

Among the different habitat types, bamboo forest was the most preferred habitat for pangolin, accounting for 45% (n=9) of all burrows. Nepalese alder habitats had 25% (n=5) of the burrows, while grassland accounted for 10% (n=2).

Burrows were least common in agricultural areas, with only one burrow found in a millet field (5%), two in paddy fields (10%), and one in a tea garden (5%) (Figure 2).

Figure 2

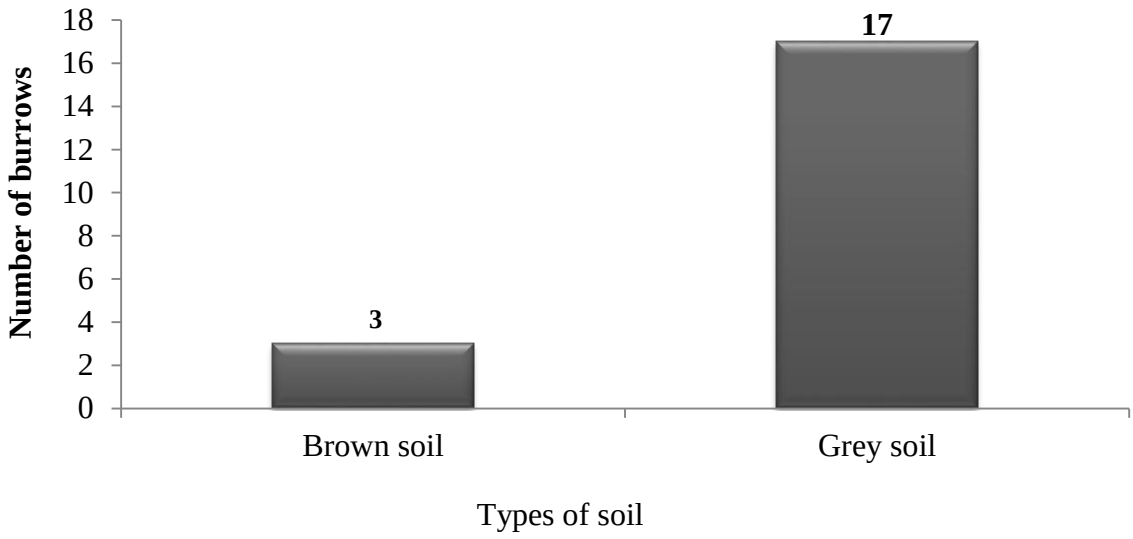
Number of burrows recorded in different habitat types



Analysis of the burrow substrate revealed a clear preference for a specific soil type. The vast majority of burrows (85%, n=17) were located in grey soil, while only 15% (n=3) were found in brown soil (Figure 3).

Figure 3

Proportion of pangolin burrows found in brown soil versus grey soil



Furthermore, a majority of the burrows (60%, n=12) were situated in close proximity to water sources, such as streams and ponds, with the remaining 40% (n=8) located away from these areas.

The present study revealed that the preferred habitat for Chinese pangolins (*Manis pentadactyla*) is a forest environment, which aligns with previous research (Gurung, 1996; Acharya, 2001; Bhandari & Chalise, 2014; Katuwal et al., 2017; Suwal et al., 2020; Dhami et al., 2023; Panta et al., 2023). This preference is likely driven by the dual ecological requirements of abundant food and secure shelter. Forests provide a rich biomass of ants and termites (Swart et al., 1999; Ellwood et al., 2002; Okwakol and Sekamate 2007; Ackerman et al., 2009; Lee et al., 2017) and offer essential cover from both natural predators and human disturbance. Conversely, the observed scarcity of burrows in cropland areas supports the conclusion that human-dominated landscapes are

less suitable, likely due to a combination of reduced prey availability, lack of protective cover, and direct anthropogenic pressures (Sharma et al., 2020b).

A key finding from this research was the pangolins' preference for grey soil, which is abundant in the study area. This contrasts with earlier studies that identified a preference for brown soil (Suwal, 2011; Bhandari & Chalise, 2014; Suwal et al., 2020). It indicated that, as long as the soil has the right texture for digging and maintaining a stable burrow, its specific color may be less important than the presence of essential resources such as food and forest cover.

The present study found that burrows were documented at elevations between 1276 m and 1494 m. This finding is highly consistent with the optimal altitude ranges reported in other studies from the mid-mountain regions of Nepal (Thapa et al., 2014; Dorji, 2017; Sharma et al., 2020a; Wu et al., 2020; Acharya et al., 2021; Suwal et al., 2021), likely because this elevation band offers the best combination of climate, vegetation, and prey availability.

The present study revealed that 60% of the burrows were situated close (within 20 m) to water sources. This finding aligns with research by Shrestha et al. (2021) and Dhami et al. (2023), which also showed a strong association between burrows and water, suggesting that such environments support high numbers of ants and termites. Additionally, pangolins require direct access to water for drinking and to help regulate their body temperature (Suwal, 2011; Katuwal et al., 2013). These findings show that pangolins choose their habitats based on several important factors, mainly forests that offer enough food, and water.

Conclusions

The present study in Madi municipality, Sankhuwasabha, confirms that Chinese pangolins have highly specific habitat requirements. It shows a definitive preference for forest environments, particularly bamboo and Nepalese alder stands, over agricultural

lands. The pangolins' choice to selectively burrow in grey, sandy soils and near water sources also influences their local distribution.

Acknowledgements

The author sincerely acknowledges the Campus Chief Arjunraj Adhikari, Assistant Campus Chief Ganesh Prasad Dahal, and Nara Prasad Bhandari of Sukuna Multiple Campus for encouragement and support. The author is grateful to the Research Management Cell (RMC) for the funding and to Dibya Raj Dahal for his mapping assistance. Finally, the author sincerely thanks the anonymous reviewer for their valuable and constructive feedback, which significantly enhanced the quality of the manuscript.

References

Acharya, P.M. (2001). Status and Distribution of Pangolin in the Nagarjun forest in central Nepal. Workshop on Asian Pangolin. Taipei, Taiwan. December 17-18, 2001.

Acharya, S., Sharma, H.P., Bhatarai, R., Poudyal, B., Sharma, S., & Upadhaya, S. (2021). Distributon and habitat preferences of the Chinese Pangolin Manis pentadactyla (Mammalia: Manidae) in the mid-hills of Nepal. *Journal of Threatened Taxa 13*(8): 18959–18966. https://doi.org/10.11609/jot.3952.13.8.18959-18966

Ackerman, I. L., Constantino, R., Gauch, H. G., Lehmann, J., Riha, S. J., & Fernandes, E. C. M. (2009). Termite (Insecta: Isoptera) species composition in a primary rain forest and agro forests in Central Amazonia. *Biotropica* 41, 226–233. doi: 10.1111/j.1744-7429.2008.00479.x

Bhandari, N., & Chalise, M. K. (2014). Habitat and distribution of Chinese pangolin (*Manis pentadactyla* Linnaeus, 1758) in Nagarjun Forest of Shivapuri Nagarjun National Park, Nepal. *Nepal Journal of Zoology* 2, 18–25.

Buckland, S. T., Anderson, D. R., Burnham, K. P., Laake, J. L., Borchers, D. L., & Thomas, L. (2001). *Introduction to distance sampling: Estimating abundance of biological populations*.

CITES. (2000). Prop. 11.13. *Manis crassicaudata, Manis pentadactyla, Manis javanica*. Transfer from Appendix II to Appendix I (India, Nepal, Sri Lanka, United States).

Dhami, B., Neupane, B., Devkota, B. P., Maraseni, T., Sadadev, B. M., & Bista, S. (2023). Factors affecting the occupancy of Chinese pangolins (*Manis pentadactyla*) suggest a highly specialized ecological niche. *Ecosphere* doi: 10.1002/ecs2. 4356

Dorji, D. (2017). Distribution, habitat use, threats and conservation of the Critically Endangered Chinese Pangolin (*Manis pentadactyla*) in Samtse District, Bhutan. *Ruford Small Grants, UK*. htps://www.ruford.org/projects/dago_dorji

Duckworth, J. W., Steinmitz, R., Pattanavibool, A., Zaw, T., Tuoc, D., & Newton, P. (2008). *Manis pentadactyla*. In: IUCN 2011. IUCN Red List of Threatened Species.Version 2011.2. www.iucnredlist.org

Ellwood, M.D., Jones, D.T., & Foster, W.A. (2002). Canopy ferns in lowland dipterocarp forest support a prolific abundance of ants, termites, and other invertebrates. *Biotropica* 34: 575–583.

Gurung, J. B. (1996). A Pangolin Survey in Royal Nagarjung Forest in Kathmandu, Nepal. *Tiger Paper 23*(2): 29-32.

Heath, M. E., & Vanderlip, S. L. (1988). Biology, husbandry, and veterinary care of captive Chinese pangolins (*Manis pentadactyla*). *Zoo Biology 5*(4): 387-390.

ICIMOD. (2016). Overview of Nepal. http://lib.icimod.org

Katuwal, H. B., Neupane, K. R., Adhikari, D., & Thapa, S. (2013). Pangolin trade, ethnic importance and its conservation in eastern Nepal.Small Mammals Conservation and Research Foundation and WWF-Nepal, Kathmandu, Nepal.

Katuwal, H.B., Sharma, H.P., & Parajuli, K. (2017). Anthropogenic impacts on the occurrence of the critically endangered Chinese pangolin (*Manis pentadactyla*) in *Nepal. J. Mammal. 98* (6), 1667-1673. doi.org/10.1093/jmammal/gyx114.

Lee, R. H., Cheung, K., Fellowes, J. R., & Guénard, B. (2017). Insights into the Chinese Pangolin's (*Manis pentadactyla*) Diet in a Peri-Urban Habitat. *Tropical Conservation Science*. doi.org/10.1177/1940082917709648

Molur, S. (2008). *Manis crassicaudata*. In: IUCN 2011. IUCN Red List of Threatened Species.

Okwakol, M.J.N., & Sekamate, M.B. (2007). Review article soil macro fauna research in ecosystems in Uganda. *African Journal of Ecology* 45: 2–8.

Panta, M., Dhami, B., Shrestha, B., KC, N., Raut, N., Timilsina, Y.P., Khanal Chhetri, B.B., Khanal, S., Adhikari, H., Varachova, S., & Kindlmann, P. (2023). Habitat preference and distribution of Chinese pangolin and people's attitude to its conservation in Gorkha District, Nepal. Front. *Ecology Evolution.* . doi: 10.3389/fevo.2023.1081385

Prater, S. H. (1971). The Book of Indian Animals. Bombay Natural History Society, India.

Sharma, H.P., Rimal, B., Zhang, M., & Sharma, S. (2020a). Potential distribution of the critically endangered Chinese Pangolin (*Manis pentadactyla*) in different land covers of Nepal: Implications for conservation. *Sustainability 12*(3), 1282.

Sharma, S., Sharma, H.P., Chaulagain, C., Katuwal H.B., & Belant, J.L. (2020b). Estimating occupancy of Chinese Pangolin (*Manis pentadactyla*) in a protected and non-protected area of Nepal. *Ecology and Evolution 10*(10): 4303–4313. https://doi.org/10.1002/ ece3.6198

Shrestha, A., Bhattarai, S., Shrestha, B., & Koju, N. P. (2021). Factors influencing the habitat choice of pangolins (*Manis pentadactyla*) in low land of Nepal. *Ecology Evolution*. 11, 14689–14696. doi: 10.1002/ece3.8156

Shrestha, T.K. (1981). Wildlife of Nepal. A study of Renewable Resources of Nepal, Himalayas. Curriculum Development Centre, Tribhuvan University, Kathmandu.

Shrestha, T. K. (2003). Wildlife of Nepal (Second Edition), Kathmandu, Nepal.

Suwal, T.L. (2011). Status, distribution, behavior and conservation of Pangolins in private and community forests of Balthali in Kavre, Nepal. M.Sc. Thesis. Central Department of Zoology, Tribhuvan University, Nepal.

Suwal, T. L., Thapa, A., Gurung, S., Aryal, P. C., Basnet, H., & Basnet, K. (2020). Predicting the potential distribution and habitat variables associated with pangolins in Nepal. *Global Ecology Conservation*. doi.org/10.1016/j.gecco.2020.e01049

Suwal, T.L., Thapa, A., Gurung, S., Aryal, P.C., Basnet, H., Basnet, K., Shah, K.B., Thapa, S., Koirala, S., Dahal, S., & Katuwal, H.B. (2021). Predicting the potential distribution and habitat variables associated with pangolins in Nepal. *Global Ecology and Conservation*, 23, e01049.

Swart, J. M., Richardson, P. R. K., & Ferguson, J. W. H. (1999). Ecological factors affecting the feeding behavior of pangolins (*Manis temminckii*). *Journal of Zoology*. 247, 281–292. doi: 10.1111/j.1469-7998. 1999.tb00992.x

Thapa, P., Khatiwada, A.P., Nepali, S.C., & Poudel, S. (2014). Distribution and conservation status of Chinese Pangolin (*Manis pentadactyla*) in Nangkholyang VDC, Taplejung, Eastern Nepal. *American Journal of Zoological Research* 2, 16-21. htps://doi. org/10.12691/ajzr-2-1-3

Wu, S.B., Sun, N.C.M., Zhang, F., Yu, Y., Ades, G., Suwal, T.L., & Jiang, Z. (2020). Pangolins Science, Society and Conservation; Chapter 4 – Chinese Pangolin (*Manis pentadactyla* Linnaeus, 1758), 49–70pp. htps://doi.org/10.1016/B978-0-12-815507-3.00004-6

Appendices

Appendix - I

Habitat Preferences of the Chinese Pangolin (*Manis pentadactyla*) in Southern Sankhuwasabha, Nepal

Table 1

Burrows distributed along different attributes studied

Cropland	Millet field	Transects	1st	2nd	3rd	4th	5th
		Number of burrow	-	-	1	-	-
		Soil colour	-	-	Brown	-	-
		Soil type	-	-	Sandy	-	-
		Insect colony	-	-	-	-	-
		Altitude	-	-	1392 m	-	-
	Paddy field	Transects	1st	2nd	3rd	4th	5th
		Number of burrow	-	1	-	-	1
		Soil colour	-	Grey	-	-	Grey
		Soil type	-	Sandy	-	-	Sandy
		Insect colony	-	Ant	-	-	-
		Altitude	-	1420 m	-	-	1443 m
	Tea plant filed	Transects	1st	2nd	3rd	4th	5th
		Number of burrow	1	-	-	-	-
		Soil colour	Grey	-	-	-	-
		Soil type	Sandy	-	-	-	-
		Insect colony	Ant	-	-	-	-
		Altitude	1494 m	-	-	-	-

Appendix I: Habitat Preferences of the Chinese Pangolin (*Manis pentadactyla*) in Southern Sankhuwasabha, Nepal

Table 1 (Continue)

Burrows distributed along different attributes studied

Forest	Bamboo field	Transects	1st	2nd	3rd	4th	5th
		Number of burrow	2	2	1	2	2
		Soil colour	Grey, Brown	Grey	Grey	Grey	Grey
		Soil type	Sandy	Sandy	Sandy	Sandy	Sandy
		Insect colony	-	-	-	-	-
		Altitude	1361 m, 1402m	1417 m, 1425 m,	1436 m	1447 m, 1463 m	1472 m, 1474 m
	Grassland	Transects	1st	2nd	3rd	4th	5th
		Number of burrow	-	1	-	-	1
		Soil colour	-	Grey	-	-	Grey
		Soil type	-	Sandy	-	-	Silty
		Insect colony	-	-	-	-	-
		Altitude		1332 m			1377 m
	Nepalese alder	Transects	1st	2nd	3rd	4th	5th
		Number of burrow	1	-	1	1	2
		Soil colour	Grey	-	Grey	Brown	Grey
		Soil type	Sandy	-	Sandy	Sandy	Sandy
		Insect colony	-	-	-	Ant	-
		Altitude	1276 m	-	1317 m	1368 m	1414 m, 1415 m

Appendix - II

Photo plates

Burrows of cropland




Millet field Tea plant fie Paddy field

Burrows of forest








Burrows at bamboo field






Burrows at Nepalese alder field Burrows at grassland field

Academic Journal of Sukuna – AJoS, A Peer-reviewed Interdisciplinary Journal
Volume 5 (Issue 1) 2025 July (2082 Ashad), Pp. 100– 118, ISSN 2594-3138 (Print)
Research Management Cell (RMC – Sukuna), Sundarharaincha, Morang

First Principles Study of Structural, Electronic and Mechanical Properties of $LiBeF_3$ under Pressure Effect

Doi: https://doi.org/10.3126/ajos.v5i1.81830

Kshitiz Kshetri[1*], Uchit Chaudhary[2], Ependra Tamang[3],
Basanta Raj Dangal[4], Abhinash Acharya[5], Kumar KC[6],
and Bhairab Sundar Singh Thakuri[7]
[1,2,3,6,7]Central Department of Physics, Tribhuvan University
[3]Faculty, Department of Science, Sukuna Multiple Campus,
[4]Patan Multiple Campus, Tribhuvan University
[5]Clarkson University
[*]Email: kkshetri16@gmail.com

Abstract

The structural, electronic and elastic properties of $LiBeF_3$ under high pressure were investigated using the density functional theory. The optimized lattice constant and the bulk modulus of elasticity at 0 GPa were obtained as 3.500 Å and 104.79 GPa, respectively, which are in good agreement with the previously available results. To study the effect of pressure, variable-cell relaxation (vc-relax) calculations were performed at different pressures ranging from 0 to 50 GPa. The mechanical properties of $LiBeF_3$ reveal that it is mechanically stable at the chosen pressures of 0, 10, 20, 30, 40 and 50 GPa. The Pugh's ratio and Poisson's ratio for $LiBeF_3$ were consistent throughout the increase in pressure, suggesting the brittle nature and dominance of ionic bonding in $LiBeF_3$. The electronic band gap of $LiBeF_3$ at 0 GPa was found to be 7.46 eV with indirect nature. On further increasing the pressure, the band gap of the $LiBeF_3$ crystal increased while maintaining its indirect nature. The Young's modulus, shear modulus and anisotropy factor of $LiBeF_3$ were also investigated and presented in this paper.

Keywords: anisotropic, non-magnetic, optoelectronics, perovskites, ultra-wide bandgap

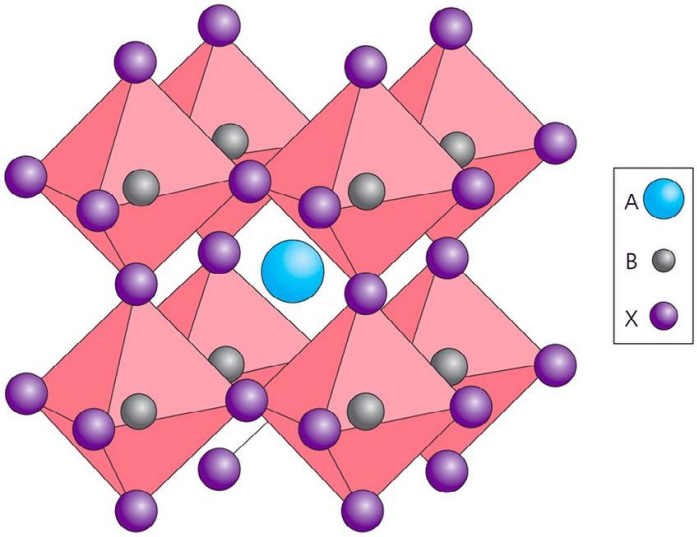
Introduction

Perovskites are a category of materials having unique properties and their crystal structure are characterized by a chemical formula ABX_3 where A and B are cations with A larger compared to B while X represents anions (Varma, 2018).

Structurally, a perovskite is in three dimensions where B cation is surrounded by octahedron atoms and A cation is in the center of the eight octahedra cuboctahedral gap as shown in the figure 1.

Figure 1

Perovskite crystal structure



The perovskite structure is characterized by its unique arrangement of ions and its cubic symmetry, which has inspired the synthesis and study of a wide range of synthetic perovskite materials with diverse compositions and properties. Perovskite materials have several applications such as random-access memories, solar cells, sensors, supercapacitors and light emitting diodes (Kim et al., 2019; Jena, et al., 2019; Bui & Shin, 2023; Kumar et al., 2022; Fakharuddin et al., 2022). Perovskites seem to have been used extensively in technological applications these days but extensive research on perovskites and its probable applications began when Miyasaka et al. (2009;

as cited in Kojima et al., 2009) studied photovoltaic function of the organic-inorganic lead halide perovskite compounds $CH_3NH_3PbBr_3$ and $CH_3NH_3PbI_3$.

Recently, the perovskites with crystal formula ABF_3 (where A is an alkali metal and B a divalent transition metal) have been studied in considerable detail and can be used as a good base for determining further suitable half metallic complex perovskites. Complex alkali metal fluorides have received considerable attention from scientists because of their technical appeal for extended applications in organofluorochemical chemistry as fluorinating agent and as catalyst in various reactions. Fluoride-type perovskites have great potential applications such as photoluminescence, high-temperature superconductivity, colossal magneto-resistivity (CMR) (Chenine et al., 2018).

The unique properties of fluoro perovskites seems to make them useful for application in the medical field during radiation therapy and imaging plates for x-rays and gamma rays (Babu et al., 2020). Similarly, they seem to have great potential to be used in generation of energy because of their ever-increasing power conversion efficiency (Khan et al., 2023). They are also seen as probable constituents for light absorber in less toxic and high-performance perovskite solar cells and promoting cycling stability and rate capability in lithium ion batteries (Pak et al., 2023; Zhang et al., 2022).

$LiBeF_3$ in particular with its ultra-wide indirect band gap lying in the vacuum ultraviolet region, seems to be promising to be used in the field of optoelectronic and optics applications, and vacuum ultraviolet transparent material in the semiconductor industry (Benmhidi et al., 2017; Jin et al., 2019).

Syrotyuk and Shved (2014) used LDA and GW formalism to study the electronic band structure of $LiBeF_3$ and discovered that this compound has an indirect bandgap nature.

Benmhidi et. al. (2017) investigated the band structure of $LiBeF_3$ crystal by using density functional theory and showed that $LiBeF_3$ displays an indirect band gap of 7.83 eV at 0 GPa. They considered the exchange correlation potentials using the Perdew-Wang parameterization of the local density approximation (LDA). They concluded that $LiBeF_3$ is mechanically stable and they predicted that $LiBeF_3$ is a candidate vacuum-ultraviolet-transparent material for use in the semiconductor industry.

Jin et al. (2019) performed the first principles calculations of $LiBeF_3$ using the LDA and GGA-PBE functionals, and they found that $LiBeF_3$ has an indirect band gap nature with a band gap of 7.64 eV. They also studied the optical properties of $LiBeF_3$ and concluded that the absorption part of $LiBeF_3$ lies in the ultraviolet region and is suitable for optoelectronic and optics applications. To sum up, the structural, electronic, optical, thermodynamic and transport properties of $LiBeF_3$ at 0 GPa has been investigated to date.

However, the structural, electronic, mechanical, and optical properties of $LiBeF_3$ under higher pressure than ambient pressure have not been investigated yet. Good insights into these properties at higher pressures are required for the synthesis and practical applications of the compound. So, it is necessary to study these basic properties of $LiBeF_3$ crystals at higher pressure. In this research, the Projector Augmented Wave (PAW) (Blöchl, 1994) based on density functional theory (DFT) (Hohenberg & Kohn, 1964; Kohn & Sham, 1965) was used to investigate the structural, electronic and elastic properties of $LiBeF_3$ at pressures ranging from 0 to 50 GPa. The modulation of pressure on different properties of the $LiBeF_3$ presented in this paper would serve as a theoretical framework for the synthesis and application of $LiBeF_3$ in the near future.

Methods and Materials

The structural, electronic and mechanical properties of a $LiBeF_3$ unit cell were investigated based on the first principles technique. The calculations are performed

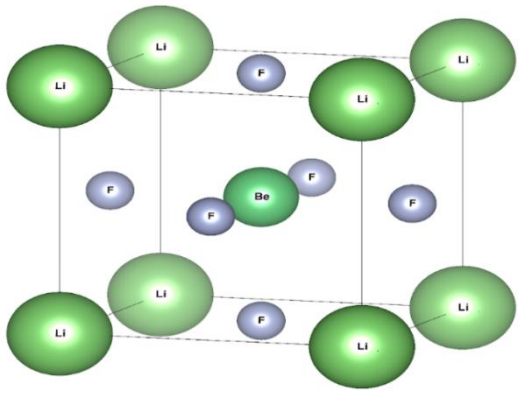
using density functional theory and the projector augmented wave (PAW) technique using the Perdew–Burke–Ernzerhof (PBE) (Perdew et al., 1996; Perdew et al., 1997) exchange–correlation functional. Quantum Espresso (QE) (Giannozzi et al., 2009; Giannozzi et al., 2017) code was used to perform the DFT calculations. The Brillouin zone was sampled through a Monkhorst-Pack (Monkhorst & Pack, 1976), 8x8x8 k-point mesh, and the cut-off energy was set to 100 Rydbergs. An extension to the quantum ESPRESSO, thermo_pw (Corso, 2014) was implemented for the approximation of elastic properties. All the properties of $LiBeF_3$ discussed in this paper were estimated for a unit cell of $LiBeF_3$ under the external isotropic pressure of 10, 20, 30, 40 and 50 GPa, including the ambient pressure of 0 GPa.

Result and Discussion

Structural and Elastic properties

Figure 2

Unit cell of $LiBeF_3$



$LiBeF_3$ consists of a cubic unit cell lying in the Pm-3m space group. The unit cell of $LiBeF_3$ is represented in figure 2. The Li atom is positioned at (0.0, 0.0, 0.0); similarly, the Be atom is situated at (0.5, 0.5, 0.5) and the F atoms are located at (0.0, 0.5, 0.5), (0.5, 0.0, 0.5), and (0.5, 0.5, 0.0), respectively. The unit cell of $LiBeF_3$ was optimized using the PBE functional and it was found that the energy of its nonmagnetic state was lower

than the ferromagnetic state. Thus, it was assured that $LiBeF_3$ exists in a non-magnetic state, which was already proven by the previously available literature as well. Taking it into account, the further calculations in this research paper of $LiBeF_3$ is performed for the non-magnetic state.

The optimized lattice parameter of $LiBeF_3$ at 0 GPa and 0 K was found to be 3.500 Å. However, the lattice parameter of cubic $LiBeF_3$ decreased to 3.405, 3.336, 3.280, 3.235 and 3.194 Å on applying the pressure of 10, 20, 30, 40 and 50 GPa, respectively.

The formation and cohesive energy were calculated to check the chemical stability of the compound at 0 GPa. The formation and cohesive energy of $LiBeF_3$ can be expressed (Ray et al., 2024) as,

$$E_{for} = E_{LiBeF_3}^{total} - (E_{Li}^{bulk} + E_{Be}^{bulk} + 3E_F^{bulk}) \quad (1)$$

$$E_{coh} = E_{LiBeF_3}^{total} - (E_{Li}^{iso} + E_{Be}^{iso} + 3E_F^{iso}) \quad (2)$$

E_{for} and E_{coh} stand for the formation energy and cohesive energy of $LiBeF_3$, while E^{bulk} and E^{iso} are respectively total energy per atom in bulk and single isolated form of Li, Be and F. The formation energy and cohesive energy were observed to be -4.10 eV and -4.87 eV respectively. The negative formation energy and the negative cohesive energy point towards the energetic stability of the compound and it can be concluded that the compound can be extracted chemically in typical conditions.

Further, to assure mechanical stability, the elastic constants of the material should satisfy Born criteria (Born & Huang, 1954). For a cubic system, three independent elastic constants (C_{11}, C_{12}, and C_{44}) should satisfy the three conditions initially proposed by Born in 1954: $C_{11} - C_{12} > 0$; $C_{11} + 2C_{12} > 0$; $C_{44} > 0$.

The calculated elastic constants at various pressures are presented in Tables 1 and 2 and it is clear that these parameters satisfy the criteria for mechanical stability of $LiBeF_3$ at all the considered pressures. The independent elastic constants C_{11} and C_{33} suggest the response of the solid to uniaxial strain and the elastic constant C_{44} describes the resistance

towards shape deformation. The higher C_{11} and C_{12} in comparison to C_{44} indicate the lesser resistance of $LiBeF_3$ towards the shear deformation as compared to a uniaxial deformation.

The elastic constants can also be applied to determine various other elastic properties of materials. Bulk modulus, Shear modulus, Young's modulus and Poisson's ratio can be estimated using Voigt, Reuss and Hill estimations (Voigt, 1966; Hill, 1952; Reuss, 1929). In the cubic systems, the Voigt and Reuss bulk modulus of elasticity are equal (deWit, 2008), and it can be expressed as,

$$B = \frac{1}{3}(C_{11} + 2C_{12}) \quad (3)$$

The Voigt shear modulus (G_V) and Reuss shear modulus of elasticity (G_R) in terms of elastic constants C_{11}, C_{12} and C_{44} are:

$$G_{\square} = \frac{1}{5}(C_{11} - C_{12} + 3C_{44}) \quad (4)$$

$$G_{\square} = \frac{5C_{44}\,(C_{11} - C_{12})}{4C_{44} + 3\,(C_{11} - C_{12})} \quad (5)$$

The actual modulus of elasticity is approximated as the arithmetic mean of these values by Hill as

$$G = \frac{1}{2}(G_V + G_R) \quad (6)$$

And the Young's modulus of elasticity (E) and Poisson's ratio (ν) are estimated using the Bulk modulus of elasticity and Shear modulus of elasticity,

$$E = \frac{9BG}{(3B + G)} \quad (7)$$

$$\nu = \frac{(3B - 2G)}{2(3B + G)} \quad (8)$$

Table 1

Obtained Value of a_0, C_{11}, C_{12}, C_{44}, B_0, E, G, E_{for}, E_{coh} at 0 GPa and 0 K

a_0 (Å)	C_{11} (GPa)	C_{12} (GPa)	C_{44} (GPa)	B_0 (GPa)	E (GPa)	G (GPa)	E_{for} (eV)	E_{coh} (eV)
3.500	136.53	88.92	81.03	104.79	128.36	49.72	- 4.10	- 4.87
3.424[a]				117.88[a]	154.34[a]	60.21[a]		
3.466[b]				111.64[b]		61.40[b]		
3.515[b]				119.05[b]		56.29[b]		
3.482[c]								

[a] Theoretical (Benmhidi et al., 2017), [b] Theoretical (Jin et al., 2019), [c] Theoretical (Flocken et al., 1985)

The lattice constant, elastic constants, bulk modulus, Young's modulus, shear modulus, cohesive energy and formation energy of $LiBeF_3$ at ambient pressure 0 GPa and temperature 0 K along with the previously available data

Table 2

The lattice constant, elastic constants, bulk modulus, Young's modulus and shear modulus of $LiBeF_3$ at various pressures

Pressure (GPa)	a_0 (Å)	C_{11} (GPa)	C_{12} (GPa)	C_{44} (GPa)	B (GPa)	E (GPa)	G (GPa)
0	3.500	136.53	88.92	81.03	104.79	128.36	49.72
10	3.405	136.64	88.98	81.06	104.86	128.45	49.76
20	3.336	137.38	89.34	81.23	105.36	129.02	49.97

30	3.280	138.81	90.01	81.55	106.27	130.15	50.40
40	3.234	140.47	90.80	81.96	107.35	131.43	50.89
50	3.194	142.25	91.65	82.34	108.52	132.80	51.41

The Pugh ratio (G/B) is crucial in extracting information regarding the brittleness of a material (Pugh, 1954). The critical value is 0.57 for Pugh's ratio. It is observed that materials having Pugh's ratio greater than 0.57 exhibit a ductile nature and a brittle nature for Pugh's ratio lower than 0.57. In the case of $LiBeF_3$, Pugh's ratio was found to be 0.47 at 0 GPa, and on increasing the pressure, significant changes in the ratio were not observed. Thus, it can be supposed that $LiBeF_3$ is brittle in nature for all the considered pressure ranges.

Similar to Pugh's ratio, Poisson's ratio can be used to estimate the nature of bonding in the compound. For a poisson's ratio less than 0.25, the compound is said to have covalent bonding, and the compound is considered to possess ionic bonding for the value of a Poisson's ratio greater than 0.25. Like the Pugh's ratio, the Poisson's ratio of $LiBeF_3$ was too found to be constant throughout the increasing pressure and it was recorded to be 0.29 for all the pressure ranges. Since the obtained values are greater than the critical Poisson's ratio, it can be said that $LiBeF_3$ is dominated by ionic bonding.

There is a parameter called elastic anisotropy that explains whether the elastic properties of material vary with direction. It may affect various physical properties of materials. The anisotropy factor proposed by Zener (Zener, 1948), depending on elastic constants C_{11}, C_{12} and C_{44} is given by,

$$A = \frac{2C_{44}}{C_{11}-C_{12}} \qquad (9)$$

The value of the anisotropy factor should be 1 for a perfect isotropic material, while any value different than 1 represents anisotropy in the material. The anisotropy

factor for $LiBeF_3$ is presented in table 2. The anisotropy factor was obtained to be 3.40 for 0 GPa and it gradually decreased till it reached 3.25 for 50 GPa but its value was nowhere near 1. So, it can be easily inferred that $LiBeF_3$ is anisotropic, and its physical properties vary with direction.

Table 3

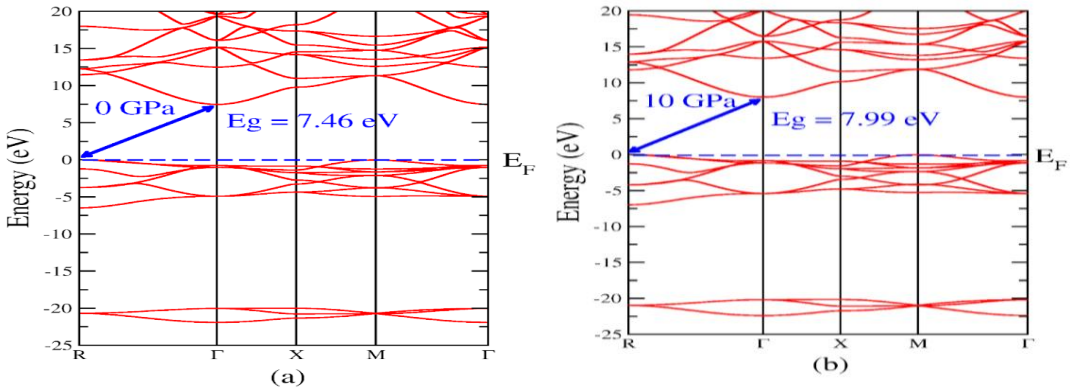
The Pugh' ratio, Poisson's ratio and anisotropy factors of $LiBeF_3$ at different pressures

Pressure (GPa)	n	ν	A
0	0.47	0.29	3.40
10	0.47	0.29	3.40
20	0.47	0.29	3.38
30	0.47	0.29	3.34
40	0.47	0.29	3.30
50	0.47	0.29	3.25

Electronic Properties

Figure 3

Band structures of $LiBeF_3$ at pressures ranging from 0 to 50 GPa



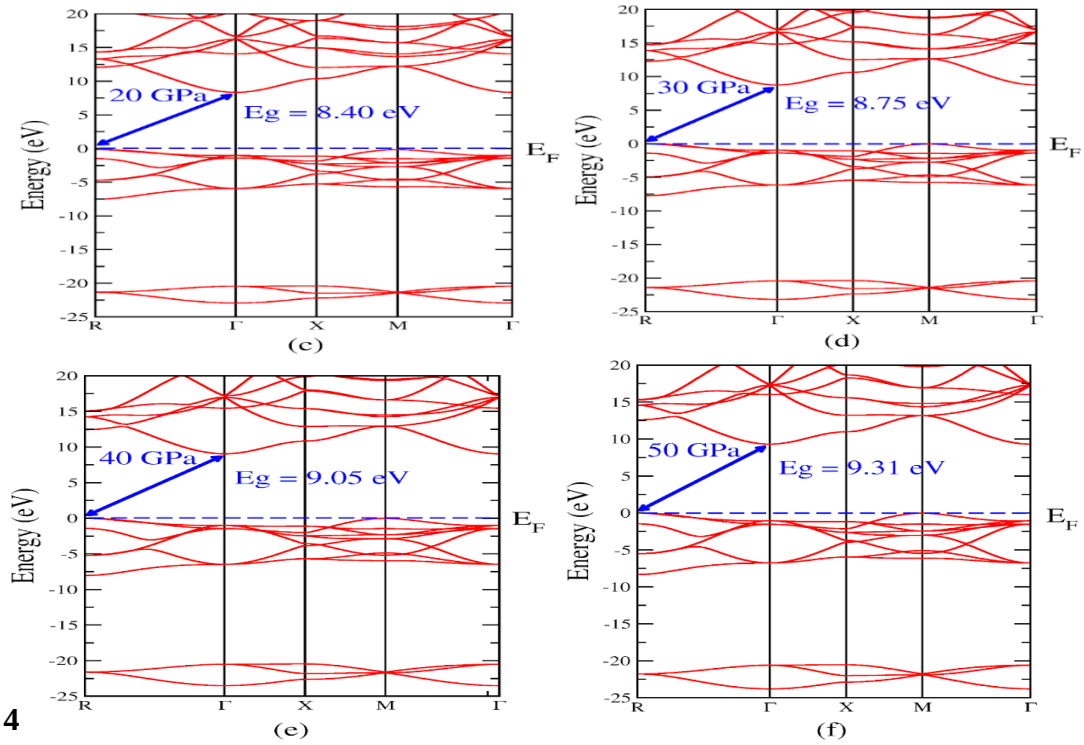


Table 4

Band gaps of $LiBeF_3$ at pressure range of 0 to 50 GPa

Pressure (GPa)	Band Gap (eV)
0	7.46, 7.83[a], 7.26[b], 7.27[b], 7.64[b], 8.52[c], 7.73[d],
10	7.99
20	8.40
30	8.75
40	9.05
50	9.31

[a] Theoretical (Benmhidi et al., 2017), [b] Theoretical (Jin et al., 2019)

[c] Theoretical (Syrotyuk & Shved, 2014), [d] Theoretical (Nishimatsu et al., 2002)

To determine the electronic properties and study its composition, the band structure calculations of $LiBeF_3$ at different pressures are performed and plotted in figure 3. The dotted line at the energy level of 0 eV represents the fermi level and conduction and valence bands lie on either side of the fermi level, with the valence band below the fermi level and the conduction band present above the fermi level. From band structure observation, it can be seen that the valence band maximum of $LiBeF_3$ lies at the symmetry point R while the conduction band minimum lies at the point Γ thus indicating towards the indirect band gap. The band gap of $LiBeF_3$ at 0 GPa was found to be 7.46 eV which is in excellent agreement with the previously available results. With such a large value of band gap, $LiBeF_3$ can be referred to as an insulating material. On increasing the pressure from 0 to 50 GPa, the band gap of $LiBeF_3$ further increases gradually. However, it is found that $LiBeF_3$ maintains its indirect band gap nature throughout the increment of pressure. On increasing the pressure, the lattice constant decreases and the electron transition integral rises. As a result, the energy band gap of $LiBeF_3$ increases on changing the pressure positively. Different values of band gaps obtained at various pressures are presented in Table 4.

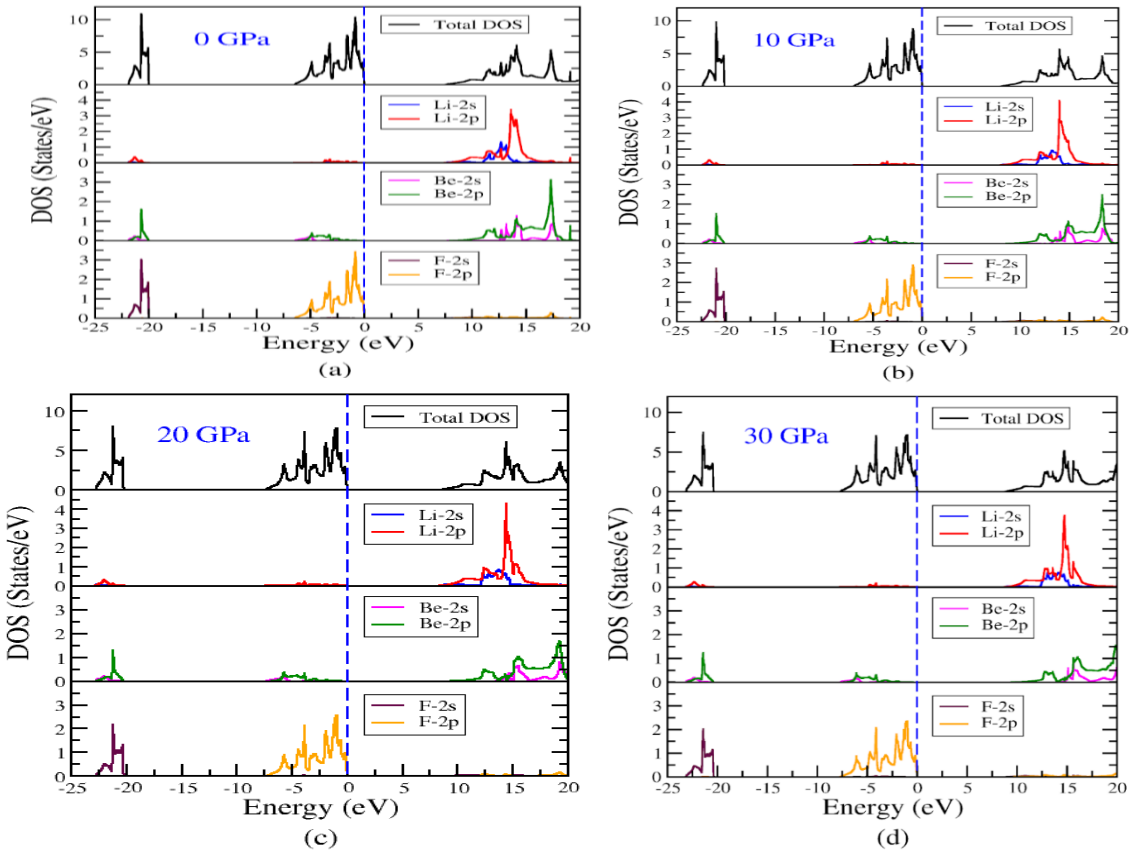
For deeper insights into the band structure of $LiBeF_3$, the density of states of $LiBeF_3$ indicating the contribution from individual atoms was calculated for different pressures, which are presented in figure 4. In 0 GPa pressure, as shown in figure 4 (a), the bottom of the valence band ranging from -21.91 to -20.00 eV is mainly derived from the F-2s and Be-2p states with minor contributions from the Li-2p and Be-2s states. A hybridization is observed between these states. In the second region, ranging from -6.46 to 0 eV, a significant contribution appears to be from the F-2p state, with smaller contributions from the Li-2p, Be-2s and Be-2p states. Hybridization is observed in this region as well.

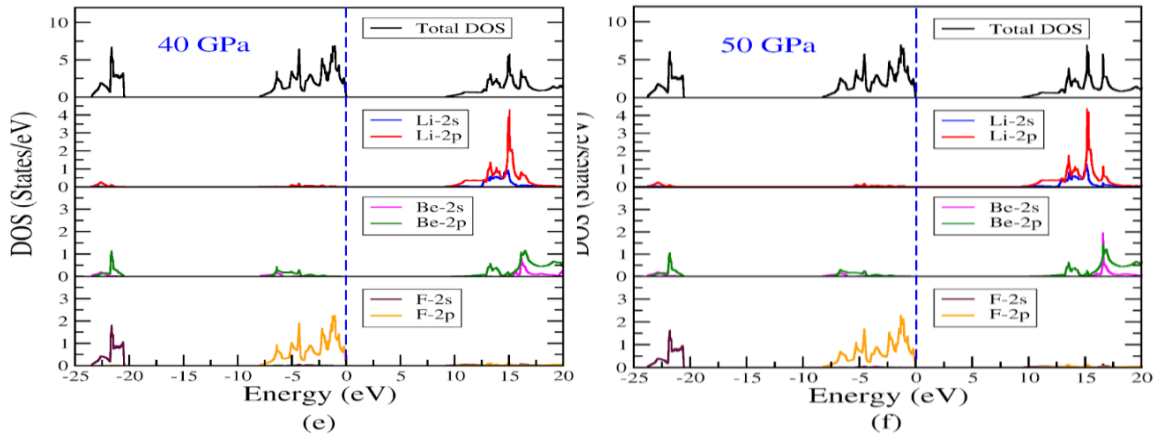
Similarly, the third region existing between 7.51 eV and 16.66 eV above the fermi level is mainly composed of 2s and 2p states of Li and Be with main contributions from

Li-2p. At the end, in the fourth region lying at 16.66 eV and beyond, a sharp peak is observed by the main contribution from the 2p state of Be and a small contribution from the 2s state of Be. Minute contributions from the 2p state of Li and 2p state of F are also observed in this region. It can be seen that the Li-2p state gradually shifts away from the fermi level on increasing the pressure. As a result, the band gap increases.

Figure 4

Density of states of $LiBeF_3$ at pressures ranging from 0 to 50 GPa





Conclusion

The structural, mechanical and electronic properties of $LiBeF_3$ were investigated at various pressures using the PAW-PBE method under the framework of density functional theory. The calculated structural parameters, moduli of elasticity and band gap at 0 GPa are consistent with the previously available results. However, the obtained values at higher pressures could not be compared due to the lack of data. From the calculation of structural properties, it was observed that the lattice parameter of $LiBeF_3$ decreases with increasing the pressure and the analysis of mechanical properties reveals that $LiBeF_3$ is mechanically stable at the pressure range from 0 to 50 GPa. The electronic property of $LiBeF_3$ points out that the band gap of $LiBeF_3$ at ambient 0 GPa pressure is 7.46 eV and on further increasing the pressure, the band gap of $LiBeF_3$ increases and becomes 9.31 eV at 50 GPa. Thus, the band gap of $LiBeF_3$ lies in the ultraviolet region and $LiBeF_3$ can be used in optoelectronics and it can also be considered as a promising candidate for vacuum-ultraviolet-transparent lens material in optical lithography. In this research, Pugh's ratio and Poisson's ratio were also determined. Through the analysis of Pugh's ratio, it was revealed that the $LiBeF_3$ crystal is brittle in nature and it does not lose the

brittleness on increasing pressure. Similarly, through the Poisson's ratio, it can be seen that the bonding $LiBeF_3$ is ionic predominantly.

Furthermore, the observed pressure-induced widening of the band gap in $LiBeF_3$ contributes valuable insights to the design and development of ultra-wide bandgap (UWBG) materials. Such materials are highly relevant in extreme-environment optoelectronics, ultraviolet photodetectors, and radiation-hardened devices. The increasing band gap under compression suggests potential applications in UV-transparent optical components, including high-pressure windows and lenses for deep-ultraviolet (DUV) lithography.

References

Babu, K. E., Neeraja, K., Deenabandhu, D., Ratna, A. M. V., Kumar, V. V., Kumari, K. B., Taddesse, P., Aregai, G. T., Mehar, M.V.K, Babu, B. V., Samatha, K. & Veeraiah, V. (2020). First-principles study of structural, elastic, electronic and optical properties of cubic perovskite LiMgF3 for novel applications. *Journal of Physics: Conference Series, 1495*(1), 012010. https://doi.org/10.1088/1742-6596/1495/1/012010

Benmhidi, H., Rached, H., Rached, D., & Benkabou, M. (2017). Ab initio study of electronic structure, elastic and transport properties of fluoroperovskite LiBeF3. *Journal of Electronic Materials, 46*(4), 2205–2210. https://doi.org/10.1007/s11664-016-5159-0

Blöchl, P. E. (1994). Projector augmented-wave method. *Physical Review B, 50*(24), 17953–17979. https://api.semanticscholar.org/Corpus ID:43534257

Born, M., & Huang, K. (1954). *Dynamical theory of crystal lattices*. Oxford University Press. https://api.semanticscholar.org/CorpusID:59567814

Bui, T. H., & Shin, J. H. (2023). Perovskite materials for sensing applications: Recent advances and challenges. *Microchemical Journal, 191*, 108924. https://doi.org/10.1016/j.microc.2023.108924

Chenine, D., Aziz, Z., Benstaali, W., Bouadjemi, B., Youb, O., Lantri, T., Abbar, B. & Bentata, S. (2018). Theoretical investigation of half-metallic ferromagnetism in sodium-based fluoro-perovskite NaXF3 (X = V, Co). *Journal of Superconductivity and Novel Magnetism, 31*, 1927–1934. https://doi.org/10.1007/s10948-017-4204-4

Corso, A. D. (2014). *thermo_pw* [Computer software]. Thermo_pw user's guide (v.1.6.1).

deWit, R. (2008). Elastic constants and thermal expansion averages of a nontextured polycrystal. *Journal of Mechanics of Materials and Structures, 3*(1), 195–212. https://doi.org/10.2140/jomms.2008.3.195

Fakharuddin, A., Gangishetty, M. K., Abdi-Jalebi, M., Chin, S. H., Bin Mohd Yusoff, A. R., Congreve, D. N., Tress, W., Deschler, F., Vasilopoulou, M. & Bolink, H. J. (2022). Perovskite light-emitting diodes. *Nature Electronics, 5*(4), 203–216. https://doi.org/10.1038/s41928-022-00745-7

Flocken, J. W., Guenther, R. A., Hardy, J. R., & Boyer, L. L. (1985). First-principles study of structural instabilities in halide-based perovskites: Competition between ferroelectricity and ferroelasticity. *Physical Review B, 31*(12), 7252–7260. https://digitalcommons.unl.edu/physicshardy/37

Giannozzi, P., Andreussi, O., Brumme, T., Bunau, O., Nardelli, M. B., Calandra, M., Car, R., Cavazzoni, C., Ceresoli, D., Cococcioni, M, Colonna, N., Carnimeo, I., Corso, A. D., Gironcoli, S., Delugas, P., DiStasio, R. A., Ferretti, A., Floris, A., Fratesi, G., . Baroni, S. (2017). Advanced capabilities for materials modelling with Quantum ESPRESSO. *Journal of Physics: Condensed Matter, 29*(46), 465901. https://doi.org/10.1088/1361-648X/aa8f79

Giannozzi, P., Baroni, S., Bonini, N., Calandra, M., Car, R., Cavazzoni, C., Ceresoli, D., Chiarotti, G. L., Cococcioni, M., Dabo, I., Corso, A. D., Gironcoli, S., Fabris, S., Fratesi, G., Gebauer, R., Gerstmann, U., Gougoussis, C., Kokalj, A., Lazzeri, M., . . . Wentzcovitch, R. M. (2009). QUANTUM ESPRESSO: A modular and

open-source software project for quantum simulations of materials. *Journal of Physics: Condensed Matter, 21*(39), 395502. https://doi.org/10.1088/0953-8984/21/39/395502

Hill, R. (1952). The elastic behaviour of a crystalline aggregate. *Proceedings of the Physical Society. Section A, 65*, 349–354. https://doi.org/10.1088/0370-1298/65/5/307

Hohenberg, P., & Kohn, W. (1964). Inhomogeneous electron gas. *Physical Review, 136*(3B), B864–B871. https://doi.org/10.1103/PhysRev.136.B864

https://people.sissa.it/~dalcorso/thermo_pw/ug.1.6.1.pdf

Jena, A. K., Kulkarni, A., & Miyasaka, T. (2019). Halide perovskite photovoltaics: Background, status, and future prospects. *Chemical Reviews, 119*(5), 3036–3103. https://doi.org/10.1021/acs.chemrev.8b00539

Jin, Z., Wu, Y., Li, S., Chen, S., Zhang, W., Wu, Q., & Zhang, C. (2019). First-principles calculation of the electronic structure, optical, elastic and thermodynamic properties of cubic perovskite LiBeF3. *Materials Research Express, 6*(12), 126309. https://doi.org/10.1088/2053-1591/ab5edc

Khan, H., Sohail, M., Arif, M. S., & Abodayeh, K. (2023). Insight into the physical properties of fluoro-perovskites compounds of Tl-based TlMF3 (M = Au, Ga) compounds studied for energy generation utilizing the TB-MBJ potential approximation approach. *Materials, 16*(2), 686. https://doi.org/10.3390/ma16020686

Kim, H., Han, J. S., Kim, S. G., Kim, S. Y., & Jang, H. W. (2019). Halide perovskites for resistive random-access memories. *Journal of Materials Chemistry C, 7*(18), 5226–5234. https://doi.org/10.1039/C8TC06031B

Kohn, W., & Sham, L. J. (1965). Self-consistent equations including exchange and correlation effects. *Physical Review, 140*(4A), A1133–A1138. https://doi.org/10.1103/PhysRev.140.A1133

Kojima, A., Teshima, K., Shirai, Y., & Miyasaka, T. (2009). Organometal halide perovskites as visible-light sensitizers for photovoltaic cells. *Journal of the American Chemical Society, 131*(17), 6050–6051. https://doi.org/10.1021/ja809598r

Kumar, R., Kumar, A., Shukla, P. S., Varma, G. D., Venkataraman, D., & Bag, M. (2022). Photorechargeable hybrid halide perovskite supercapacitors. *ACS Applied Materials & Interfaces, 14*(31), 35592–35599. https://doi.org/10.1021/acsami.2c07440

Monkhorst, H. J., & Pack, J. D. (1976). Special points for Brillouin-zone integrations. *Physical Review B, 13*(12), 5188–5192. https://doi.org/10.1103/PhysRevB.13.5188

Nishimatsu, T., Terakubo, N., Mizuseki, H., Kawazoe, Y., Pawlak, D. A., Shimamura, K., & Fukuda, T. (2002). Band structures of perovskite-like fluorides for vacuum-ultraviolet-transparent lens materials. *Japanese Journal of Applied Physics, 41*(Part 2, No. 4A), L365–L367. https://doi.org/10.1143/jjap.41.l365

Pak, C. J., Jong, U. G., Kang, C. J., Kim, Y. S., Kye, Y. H., & Yu, C. J. (2023). First-principles study on the optoelectronic and mechanical properties of all-inorganic lead-free fluoride perovskites ABF3 (A = Na, K and B = Si, Ge). *Materials Advances, 4*, 4528–4536. https://doi.org/10.1039/d3ma00457k

Perdew, J. P., Burke, K., & Ernzerhof, M. (1996). Generalized gradient approximation made simple. *Physical Review Letters, 77*(18), 3865–3868. https://doi.org/10.1103/PhysRevLett.77.3865

Perdew, J. P., Burke, K., & Ernzerhof, M. (1997). Generalized gradient approximation made simple (Erratum). *Physical Review Letters, 78*(7), 1396. https://doi.org/10.1103/PhysRevLett.78.1396

Pugh, S. F. (1954). XCII. Relations between the elastic moduli and the plastic properties of polycrystalline pure metals. *The London, Edinburgh, and Dublin Philosophical*

Magazine and Journal of Science, 45(367), 823–843. https://doi.org/10.1080/14786440808520496

Ray, R. B., Rai, R. K., Yadav, D. K., & Kaphle, G. C. (2024). Exploring FeMnVAl Heusler alloy: Physical, mechanical, and magnetic properties. *Journal of Lumbini Engineering College, 6*(1), 93–104. https://doi.org/10.3126/lecj.v6i1.66288

Reuss, A. (1929). Calculation of the flow limits of mixed crystals on the basis of the plasticity of monocrystals. *Zeitschrift für Angewandte Mathematik und Mechanik* [Journal of Applied Mathematics and Mechanics], *9*(1), 49–58. https://doi.org/10.1002/zamm.19290090104

Syrotyuk, S., & Shved, V. (26-30 May 2014). *Quasiparticle electronic band structure of the cubic LiBeF3 crystal* [Conference Paper]. IEEE International Conference on Oxide Materials for Electronic Engineering (OMEE). Doi**:** 10.1109/OMEE.2014.6912336

Varma, P. C. R. (2018). Low-dimensional perovskites. In S. Thomas & A. Thankappan (Eds.), *Perovskite photovoltaics* (pp. 197–229). Elsevier. https://doi.org/10.1016/B978-0-12-812915-9.00007-1

Voigt, W. (1966). *Lehrbuch der Kristallphysik [*Textbook of crystal physics (excluding crystal optics)]. Springer Nature Link. https://doi.org/10.1007/978-3-663-15884-4

Zener, C. (1948). *Elasticity and anelasticity of metals*. University of Chicago Press.

Zhang, Y., Liu, Y., Zhou, J., Wang, D., Tan, L., & Yi, C. (2022). 3D cubic framework of fluoride perovskite SEI inducing uniform lithium deposition for air-stable and dendrite-free lithium metal anodes. *Chemical Engineering Journal, 431*, 134266. https://doi.org/10.1016/j.cej.2021.134266

Academic Journal of Sukuna – AJoS, A Peer-reviewed Interdisciplinary Journal
Volume 5 (Issue 1) 2025 July (2082 Ashad), Pp. 119 – 139, ISSN 2594-3138 (Print)
Research Management Cell (RMC – Sukuna), Sundarharaincha, Morang

Faculty Motivation and Research Productivity in Nepal's Community Campuses: A Quantitative Analysis

Doi: https://doi.org/10.3126/ajos.v5i1.81832

Matrika Thapa*, Trilochan Sitaula,
Mohan Kumar Karki and Surendra Babu Shrestha
Faculties of Sukuna Multiple Campus, Sundarharaincha, Morang
*Email: matrikathapa203@gmail.com

Abstract

The level of faculty motivation regarding the publication of research is very important towards expansion of academic knowledge, institutional and professional growth. The study deals with the intrinsic and extrinsic issues that affect the research productivity of the faculty members in the community campuses, and the assistance and challenges of the faculty members in community campus settings. Among the data collected, the quantitative method was used to collect data among faculty members using structured questionnaires. Descriptive statistics (mean and standard deviation), along with inferential statistics (ANOVA, independent t- tests and multiple regression analysis) were used in the examination of the data. The results indicate that intrinsic factors, or those factors related to intellectual satisfaction and personal interest are significant drivers of the productivity of research, whereas the extrinsic factors, or those circumstances associated with career promotion and financial rewards also influence the productivity of research. Nevertheless, it was also determined that institutional support was very poor with the most notable problems being high teaching loads, restrained research resources, and time restraints. There was also evidence regarding gender-based and age gap in research output. In the study, both the issues and the suggested solutions point to the

necessity of institutional changes, such as improved levels of funding research, higher levels of mentorship, and workload reduction, to provide a more favorable research environment. These lessons carry useful implications to policymakers, teachers, and administrators at the community campuses who want to enhance academic faculty interested in the publication of research works.

Keywords: Motivation, faculty, research, challenges, productivity, and institutional support

Introduction

Faculty motivation to perform research and publish scholarly products is the most critical focus of academic progress, knowledge distribution, and institutional status. Publication of research work is not simply an academic pursuit; it is part and parcel of national development program because research, when published, creates evidence-based responses and spawns critical questioning (Sivertsen & Meijer, 2020). Research productivity in higher education plays a major role in determining the university ranking, grant competition and in the faculty appraisal system (Geuna,1999; Times Higher Education, 2021).

It is important therefore to understand what makes faculty conduct research. The Self-Determination Theory (Deci & Ryan, 2000) holds the notion that intrinsic motivations like intellectual interest, satisfaction as well as personal interest is crucial towards long-term scholarly practice. Those faculty members, who perceive research as mentally stimulating, have a greater chance to engage in sustainable academic performance (Amabile, 1993; Bland et al., 2005). There is also the effect of extrinsic motivators such as advancement in career, institutionally recognized, and economic gain and they happen to be significant in systems that have correlation between promotion and tenure with publication record (Fairweather, 2002; Hemmings & Kay, 2010).

The culture of research in Nepal is backward, and this is more prevalent in the case of community campuses, which are undermined by a lack of infrastructure support,

appropriate funding sources, and a conundrum of high teaching loads (Regmi, 2019; UGC Nepal, 2022). More so, unlike central universities which have a whole wing that focuses on research, community campuses cannot develop the enabling environment to carry research activities as a result of policies gap and lack of resources. The research study conducted by Subedi (2018) in the Journal of Education and Research emphasized some systemic problems of the lack of incentives and mentoring in Nepal universities, particularly those beyond the capital.

This situation is complicated even further by gender and demographic inequalities. It has been indicated that socio-cultural norms and institutional bias are disproportionally affecting female faculty in Nepal and lead to lower rates of research output by them than males (Shrestha & Singh, 2022; Xu, 2015). Likewise, those in mid-career are more likely to engage in research since they have promotion and professional growth pressures on them (Neve & Feldman, 2015; Chapagain, 2020).

Although there is increasing knowledge that faculty research is important, the context is not well understood in the distinct realities of the community campuses of Nepal. The current literature has narrowed to look at research intensive Universities leaving a critical gap of literature on local, teaching oriented Universities. Furthermore, the relationship between intrinsic and extrinsic motivators about the interaction with institutional support and demographic variables on the faculty research productivity among such conditions is less investigated empirically (Phuyal, 2023; Ghimire et al., 2024).

Despite having increased focus on research publication in higher education globally, faculty members in community campuses in Nepal face unique problems that remain unexplored. While existing literature highlights intrinsic (e.g., intellectual satisfaction) and extrinsic (e.g., career advancement, financial incentives) motivators for research publication (Ryan & Deci, 2000; Subedi, 2018), most studies focus on

universities or research-intensive institutions, neglecting the specific context of Nepal's community campuses.

Nepal has an underdeveloped research culture in general and community campuses, in particular, since they are limited in infrastructure and funding and carry excessive teaching loads (Regmi, 2019; UGC Nepal, 2022). In contrast to central universities where there is a separate wing of research, in the community campuses finding the conducive environment to conduct the research work has been a challenge due to lack of a policy and funds. According to a research by Subedi (2018), in Journal of Education and Research the problems are found to be systematic in Nepal since there is no incentive and mentorship provided in academies especially out of the capital.

This situation is complicated by the gender and demographic differences. It is supported by evidence that female faculty in Nepal experience a disparity of pressure due to socio-cultural norms and institutional discriminations, which lead to a less research publication compared to the male faculty members (Shrestha & Singh, 2022; Xu, 2015). Likewise, you would also find mid-career faculty to be more research-active because of promotion-related and professional development pressure (Neve & Feldman, 2015; Chapagain, 2020).

Though the value of faculty research is increasingly being appreciated, the reality of community campuses in Nepal has not been routinely investigated before. The lack of literature is significant concerning local teaching-based higher educational institutions because the majority or current research is carried out on more research-intensive institutions. In addition, little empirical research has been conducted to explain the extent to which these factors combine to affect the research productivity of faculty using institutional support and demographic variables in these environments (Phuyal, 2023; Ghimire et al., 2024).

This paper therefore tries to bridge this gap by analysing the motivation, institutional barriers and demographic which influence faculty research activity at

community campuses in Nepal. In so doing, it shall endeavor to bring policy changes therefore encouraging research culture, and spurring new academic input by the grass roots-level institutions. The results may also be used to increase Nepal accreditation activities and augment evidence-based advancements of tertiary education.

In the case of Nepal, community campuses still appear to be dominated by intrinsic motivators. A research by Phuyal (2023) established that the motivation level was high among faculty whose interest in research was due to personal interest and interest in growth as compared to the faculty motivated by external factors. According to a study conducted by Ghimire et al. (2024) hope and self-efficacy, or psychological capital, were also found to be the main predictors of intrinsic research motivation in Nepali faculty.

Extrinsic motivation, on the other hand, is the one that occurs through promised reward in the form of promotion or monetary award to the individual along with professional atelier as well. Fairweather (2002) found out that extrinsic rewarding acts as a performance incentive in academic performance whereby tenure and promotion is based on research output. Hemmings and Kay (2010) have established the fact that publication records tend to be applied as career advancement criteria. According to the findings of Lee and Bozeman (2005) the faculty is more likely to participate in research when they are given ample incentives and recognition at the institutions.

An extrinsic motivation is not fully developed in Nepal as it is a new institutional device. In the community campuses, Subedi (2018) observed that there are no standardized reward systems applicable in community campuses in regard to research productivity. It has however been suggested that, when used, such motivators can be effective. According to Gautam (2020), the links between financial incentives and promotional criteria and publication-based had modest consequences on faculty engagement when it comes to research. The authors were able to conclude that though

intrinsic factors proved dominant, extrinsic motivators of recognition and payment were supportive of them (Ghimire et al., 2024).

One other significant element that may cause faculty interested in research to be more or less motivated is institutional support. Research grants, training, mentorship and time with protection are some of the support mechanisms that create a good research culture. Brink et al. (2013) highlighted the usefulness of performance systems and well-organized HRM practices in assisting young-career researchers. They may be underdeveloped in developing countries such as Nepal. Regmi (2019) underlined that the problematic mentoring, weak infrastructure, as well as administrative support, lowers the productivity of faculty research. In line with that, UGC Nepal (2022) gave the findings of lack of funds, uncertain policies and lack of chances to collaborate in community campuses.

Research productivity is also a demographic element that is dependent on individual age, gender, and academic experience. Researchers have established that early-career scientists publish more due to increased pressure to establish as an academic (Fox & Mohapatra 2007). The study conducted by Xu (2015) identified that gender differences in publication output were consistent over time, and unequal institutional resources and family-care responsibilities were observed to be predisposing factors in female academics. Shrestha and Singh (2022) found that the development of several barriers is specific to women in community campuses in Nepal namely institutional bias and low accessibility of research functions. Gharti (2023) complained, however, that gender is not necessarily a major determinant, because his respondents pointed to no significant performance disparities between the sexes in the higher education institutions in Kathmandu. Rather, age diversity has been discovered to influence teaching performance positively and consequently research participation.

Faculty motivation has been the subject of numerous studies conducted in different contexts but the community campuses in Nepal have not been well researched.

Studies have been focused in research-intensive institutions but little is known about motivation in teaching-intensive and resource-scarce institutions. Moreover, the synergy of intrinsic and extrinsic motivations and their effect on institutional settings are also not fully understood so far locally (Phuyal, 2023). This paper seeks to fill these gaps by looking at motivating factors, institutional forces, and population factors that determine faculty research activity among Nepal community campus campuses.

This study focuses on providing the context-specific information about the intrinsic and extrinsic motivators that influence faculty members in Nepalese community campuses. Similarly, the finding can help to formulate the policy at the institutional and national levels. This study also addresses the critical role of demographic variables in pursuing the faculty's motivation towards publication. Furthermore, encouraging faculty research publication through this study can have positive effect on institutional reputation and quality accreditation of community campuses. Lastly, this study will contribute to local knowledge production, enabling community campuses to address Nepal’s developmental challenges more effectively through evidence-based research.

The main aim of this study is to assess faculty motivation levels towards research publication in community campuses, including key motivating factors and barriers along with to examine the impact of the institutional support system and motivational factors on research publication in community campuses. Based on the objectives, the following hypotheses were formulated:

H1: There is a significant difference in research productivity between male and female faculty members.

H2: There is a significant difference in motivation for research publication across different age groups of faculties.

H3: Intrinsic motivation significantly predicts faculty research productivity.

H4: Extrinsic motivation significantly predicts faculty research productivity.

H5: Institutional support significantly predicts faculty research productivity.

Methods and Materials

The research study used a descriptive and analytical research design under the quantitative research design to survey the motivation of faculty to publish a research in community campuses of Nepal. The method used was appropriate to establish the major motivational motives, obstacles, and contexts of demographic aspects that determine the productivity of a research, as well as statistical assessment of trends and correlations.

The sampled population included full time faculty working in the different campuses of a community within the Koshi Province in Nepal. The sample was comprised of 150 participants, and the stratified random sampling technique was adopted to make sure that it is demographically balanced in terms of discipline, gender, academic ranking and location.

The Closed-ended, on a 5-point Likert (1 = Strongly Disagree, 5 = Strongly Agree) scale questionnaire was used to gather the information with demographic inquiries (age, gender, scholastic level, experience)

The questionnaire was spread through an online format and physically according to the accessibility at various campuses and choice of faculty. The informed consent was obtained by all respondents, and the confidentiality is strictly observed during the process.

In order to guarantee instrument reliability, pilot test was done and Cronbach alpha was determined. The calculation yielded a reliability coefficient of items in the form of the motivation scale = 0.85, which is deemed as good.

This study used Statistical Package for the Social Sciences (SPSS) to analyze the data that was collected. Descriptive statistics (mean and standard deviation), along with inferential statistics (ANOVA, independent t- tests and multiple regression analysis) were used in the examination of the data.

The author of the research observed the professional ethics closely. The researcher took into consideration voluntary participation, informed consent, and anonymity of respondents. This study was conducted entirely for academic purposes.

This study was conducted only in community campuses affiliated with Tribhuvan University. This research focused entirely on full-time faculty members only, excluding part time, visiting and contract-based faculty members. This study was limited to study the influence of intrinsic and extrinsic motivational factors and selected demographic variables on research productivity. This research did not explore the institutional policy of the concerned campuses in depth. It also did not consider the impact or quality of research publication of community campuses. The findings were based on the responses from only 150 faculty members.

Result and Discussion

The demographic characteristics of faculty is highlighted in table 1

Table 1

Demographic Characteristics of the Faculty

Demographic Variable	Category	Frequency (n)	Percentage (%)
Gender	Male	80	53.3
	Female	70	46.7
Age Group	25-34 years	40	26.7
	35-44 years	60	40.0
	45-54 years	40	26.7
	55 and above	10	6.7
Marital Status	Married	100	66.7
	Unmarried	50	33.3
Teaching Experience	0-5 years	30	20.0
	6-10 years	50	33.3
	11-20 years	40	26.7
	21 years and above	30	20.0

Source: Field Survey, 2024

The demographic profile of the faculty in terms of their gender was comparative among themselves: 53.3 percent of the faculty are males with 46.7 percent of the faculty being female. In terms of age, the highest was among 35 - 44 years category (40.0%, n = 60) followed by 25- 34 years and 45- 54 years with 26.7 percent (n = 40). A very small percentage of the faculty (6.7% n = 10) fell in the age category of above 55 years and above; therefore, the faculty was largely mid-career. This market force raises a condition whereby, this group of institutions will be at the mercy of a relatively young and dynamic whose possible long-term services and innovations, form the population of this academic. In the analysis of the marital status, 66.7 percent (n = 100) of the respondents were married people, in other words, 33.3 percent (n = 50) were not married. The implication of this distribution is that the majority of the faculty would be carrying out a mix of work and family life and this would influence their teaching load, administrative responsibilities but also on their overall job satisfaction. Analysis of the teaching experience shows that 33.3 percent (n = 50) of the faculty had the teaching experience range of 6 to 10 years followed by 5.0 to 20 years (26.7%, n = 40) of teaching experience and 0 to 5 years (20.0%, n = 30) and 21 and more years (20.0, n = 30).

Motivation Levels (Intrinsic and Extrinsic)

The motivation level of faculty is highlighted in table 2.

Table 2

Motivation Levels of Faculty

Motivational Factor	Mean	Standard Deviation
Intrinsic Motivation (Intellectual satisfaction)	4.2	0.68
Intrinsic Motivation (Personal interest)	4.5	0.59
Extrinsic Motivation (Career advancement)	4.0	0.72
Extrinsic Motivation (Financial incentives)	3.8	0.81
Institutional Support	3.2	0.95

Table 2 shows that that mean scores (M = 4.5, SD = 0.59 and M = 4.2, SD = 0.68) whose highest mean scores belong to the intrinsic aspects of motivation that were the personal interest and the intellectual satisfaction. Based on these findings, it can be concluded that members of the faculty can be motivated primarily on the interest of the individual to become involved in publication and the satisfaction that it brings to their intellectual curiosity. The standard deviations are low that indicate the direction towards uniform responses and the intrinsic motivation of the participants is strong. Under extrinsic motivation, the career development as well as financial incentives averagely scored 4.0 (SD = 0.72) and 3.8 (SD = 0.81) respectively. These results imply that there is a part that the external rewards play but it is not as effective as the intrinsic rewards. The variances in expectations or by-institution compensatory standards could be the reasons behind the greater standard deviation in the feedback of the financial incentives. The lowest score (M = 3.2, SD = 0.95) was recorded with institutional support with regard to the desire of the respondents to be helped by the institutions. The high standard deviation also means that there is no consistency with regard to how support systems are felt hence there should be more participation of the administration as well as greater clarification of the policy.

Challenges Faced

The following table presents the challenges faculty members face in research publication.

Table 3

Challenges Faced by Faculty

Challenges	Mean	Standard Deviation
Heavy Teaching Load	4.4	0.55
Limited Research Resources	4.1	0.70
Lack of Institutional Support	3.5	0.85
Time Constraints	4.2	0.67
Lack of Collaborative Opportunities	3.7	0.80

Table 3 highlights the challenges encountered by faculties. The highest mean (M = 4.4 SD=0.55) was reported in the area of too much teaching load. The implication is that, the teaching loads are heavy and hence the research has less time and energy in most Community Campuses with teaching emphases. The low standard deviation means that there was much agreement with regard to the respondents, which is a pointer that it is a general bottleneck. The time limit is also seen as the major barrier and the average (SD = 0.67) is high (4.2) that confirms that the workload determines the focus of the faculty members on research. The two problems are inter-connected in the direction of structural in the academic set-up that have over focused on the instructional roles to the depreciation of academic productions. The third one was limited research resources (M = 4.1, SD = 0.70) they were moderate to high scores of agreement that due to low research resources, the access to databases, research funds, and funds the research productivity falters. This limitation may be unsuitable to faculties in state-owned or low-resource based institutions. There were no opportunities of collaboration which ranked average 3.7 (SD = 0.80) elaborating that this should not be considered a major issue as per when it comes to publishing but it remains a critical barrier in that there is no form of academia networking or cooperation.

Gender Differences in Research Productivity

The researcher conducted an independent samples t-test to determine whether there is a statistically significant difference in research productivity between male and female faculty members.

Table 4

Independent Sample t-Test

Group	Mean Research Output	Standard Deviation	t-Value	p-Value
Male	3.5	0.95	2.11	0.036*
Female	3.0	0.89		

*Significant at $p < 0.05$.

These findings prove that there is a statistically significant difference in the mean values of the research output of the two groups, t =2.11, p =.036, which indicates that gender is a significant aspect of research output. The mean research output among the male faculty was higher (M = 3.5, SD = 0.95) than that of the female faculty (M = 3.0, SD = 0.89). Therefore, because the p-value is smaller than the pre-determined alpha value of .05, the difference is a statistically significant result. This observation means that men faculty workers on average generate higher research outputs than women faculty workers in the target institution.

Effect of Age on Motivation for Research Productivity

An ANOVA test was conducted to examine whether age groups differ significantly in their levels of motivation for research publication.

Table 5

ANOVA Matrix

Age Group	Mean Motivation Level	Standard Deviation
25-34 years	4.0	0.78
35-44 years	4.3	0.65
45-54 years	3.8	0.85
55 and above	3.6	0.92

Source	Sum of Squares	df	Mean Square	F-Value	p-Value
Between Groups	4.32	3	1.44	2.93	0.034*
Within Groups	98.27	146	0.67		

*Significant at $p < 0.05$.

The analysis established that there was a statistically significant difference in research motivation per age, F(3, 146) = 2.93, p = .034, which shows that age forms an avenue leading to diversifications on motivation of research. The mean motivation level is high among the age bracket 35 44 (M = 4.3, SD = 0.65) where the level of motivation in the age group 25 34 (M = 4.0, SD = 0.78) is also high. Conversely, the motivation was less with faculty aged 45-54 (M =3.8, SD = 0.85) and above 55 years (M =3.6, SD

= 0.92). These findings indicate that the mid-career faculty members are more enthusiastic with regard to the involvement in research publication which is perhaps because of the pressure of career advancement and institutional promotion at that age.

Predictors of Research Productivity

A regression analysis was conducted to explore how intrinsic motivation, extrinsic motivation, and institutional support predict research productivity.

Table 6

Regression Results

Predictor Variable	B	Standard Error	Beta	t-Value	p-Value
Intrinsic Motivation	0.42	0.11	0.45	3.82	0.001**
Extrinsic Motivation	0.28	0.10	0.30	2.80	0.007**
Institutional Support	0.15	0.08	0.18	1.87	0.067

$R^2 = 0.52$, Adjusted $R^2 = 0.50$

The total regression model was significant with 52 percent of the variance in research productivity ($R^2 = 0.52$, Adjusted R 2 = 0.50), which means that there was a good fit of the model. The most significant and strong predictor was intrinsic motivation (B = 0.42, SE= 0.11, 045, t = 3.82, p =.001). This implies that intellectually stimulated faculty members who take a personal interest in research are more probable to demonstrate a greater research output. The great and positive beta value confirms the imperativeness of self-motivated curiosity and intellectual satisfaction in enhancing academic productivity. Another major predictor of research productivity was in extrinsic motivation (B = 0.28, SE = 0.10, B = 0.30, t = 2.80, p = .007), which shows that research performance on faculty is influenced positively by external factors including opportunities to advance careers and monetary reward. This is because this discovery implies the worth of institutional systems of recognition and reward in the encouragement of scholarly personnel to research. Institutional support on the other

hand had a positive relationship with research productivity but not significant (R^2 = 0.03, B = 0.15, SE = 0.08, 0.18, t = 1.87, p = 0,067). that the value of the coefficient does not differ significantly on the traditional p <.05 level, although there seems to be a trend to increase an influence towards a positive one. It could be an indicator of irregular or inadequate support systems in institutions.

The sample showed a fairly balanced gender distribution, with slightly more male (53.3%) than female (46.7%) participants. This relatively equitable composition suggests that the institution has made progress in promoting inclusivity in hiring and retaining faculty. In terms of age, the majority of respondents fell within the 35–44 years range (40%), indicating a workforce that is not only young but also likely to be at a stage where career advancement and research activity are prioritized. These results resonate with earlier findings by Neve and Feldman (2015), who noted that mid-career academics often engage more actively in research due to pressures related to promotion and job security.

Additionally, most faculty reported being married or in long-term relationships, suggesting they have successfully navigated the balance between professional responsibilities and personal life. As Greenhaus and Beutell (1985) highlight, maintaining this balance contributes to overall job satisfaction and work performance. Institutions may therefore benefit from implementing flexible policies that support both family and career commitments.

Researchers singled out intrinsic motivations as the most potent drives to their research activity. They described themselves as being very intellectually satisfied (M = 4.2) and personally interested (M = 4.5), which were even higher than the external incentives of career growth (M = 4.0) and financial compensation (M = 3.8). These perceptions concur with the Self-Determination Theory by Deci and Ryan (2000), who

conclude that real curiosity and self-direction is the main ingredients to motivation over time and excellent performance.

The institutional support was, however, not so high (M = 3.2, SD = 0.95), which may indicate possible inadequacy of available resources or discrepancy between support experience across the departments. According to Bland et al., (2005), dichotomy within the support system or lack of proper articulation (or communication) of the support system can be detrimental to the academic motivation and output. As such, it is crucial to enhance institutional support, particularly by establishing of better communication and availability of personnel.

Some of the key factors that prevented research were achieved by the faculty. The heaviest teaching loads (M = 4.4) and time constraints (M = 4.2) were identified as the biggest obstacles, which differs with Rox (2014), who noticed the same trends in the environments where teaching has high precedence over research. Also, having adequate research infrastructure was considered a limiting factor (M = 4.1) which served to strengthen the organization with more access to financing and databases as well as technical assistance in the resource-constrained environment (Brew & Boud, 1995).

Although the opportunities to collaborate and support of institutions had lower averages, the large standard deviations reveal that faculty have different experiences. This implies that, although certain departments will host effective cooperative working conditions, others can be below par. Institutional leaders are advised to work on consistent methods of improving collaboration and guaranteeing fair assistance to each of the units.

Gender differences in the productivity of research resulted in the presence of a large gap as was seen in statistical analysis. Male faculty had expressed more output (M = 3.5) than that of female faculty (M = 3.0). According to Xu (2015), these disparities are typical in the world and usually are the results of systematic differences in resource

accumulation and support by institutional paradigms. These results demand specific interventions like encounters and mentorship programs, the provision of grants and the development of leadership to enhance equity and deal with possibilities of gender-based prejudices in the academic framework.

There was a high variation in the level of motivation among the various age groups. The most motivated group of faculties were mid-career (35 44 years) followed by the early-career (25 34 years). Faculty between 45 and over became de-motivated, which could be a result of change of priorities or burnout (Levinson et al., 2006). The trends reveal that the support mechanism needs to be designed according to the stage of the career in order to keep motivation and productivity through the career of an academic in an institution.

A multiple regression showed that intrinsic motivation was the best predictor of research output (0.45, P= .001) than extrinsic motivation (0.30, P =.007). These results confirm the perception of Amabile (1993) that creativity and research excellence is mainly as a result of internal motivation, which is curiosity and self-interest. Although the trend of institutional support was on the positive side, it was not significant (p = .067), implying that either its application is different in different instances, or that it is not quite effective in its present form.

In order to enhance faculty motivation and performance in research, institutions ought to center on building a culture that grants credence to intellectual interest and personal development, but on the other hand, must enhance support mechanisms in administration and infrastructure. Such investments in the way of mentorship, training and research facilities may serve as long-term investments and retention of the institutions in terms of scholarly production and reputation.

Conclusion

To sum up the paper, the presented study has helped shed light on the multidimensional aspect of faculty motivation to conduct research publication at the Nepali community campuses. The evidence shows that internal forces, including intellectual gratification and personal interest, are of eminent importance in keeping the research interesting, and extrinsic forces, including career development and money, also play a significant role. However, the study highlights the fact that institutional support is not at par and faculties are often held back due to excessive workload in teaching and inadequate research facilities and time. More so, the analysis shows that there is a continuing discrepancy between research productivity based on gender and age groups, and this indicates that academic institutions should be more inclusive and equal.

These results have profound implications on the policy maker and the leader of any institutions of higher education and the campus administrators. In order to develop a healthy research culture, the priority should be given to those reforms that would improve the amounts of research budget funds, introduce organized mentorship programs, and introduce some changes in the workload dynamics. Removal of the alleged barriers especially the gender inequality and career stage will play key role in enhancing better involvement of faculties as well as increasing the level of research productivity. Institutional support systems: Enhancing institutional support systems will not only make all community campuses gain academic grounds, but will also bringing them towards the larger goal of national development and quality of education in that country. Converting these insights into usable strategies allows the stakeholders to establish an enabling environment that allows long-term scholarly contributions and enhancing research capacity of community campuses in Nepal.

References

Amabile, T. M. (1993). Motivational synergy: Personal interest, goals, and creativity. *Journal of Personality and Social Psychology, 47*(3), 628–641. https://doi.org/10.1037/0022-3514.47.3.628

Bland, C. J., Center, B. A., Finstad, D. A., Risbey, K. R., & Staples, J. G. (2005). A theoretical, practical, predictive model of faculty and department research productivity. *Academic Medicine, 80*(3), 225–237. https://doi.org/10.1097/00001888-200503000-00007

Brew, A., & Boud, D. (1995). The place of research in staff development. *Higher Education, 29*(3), 285–303. https://doi.org/10.1007/BF01384737

Chapagain, B. R. (2020). *Job satisfaction among academicians in Nepal: The influence of institutional sector and demographic factors*. Quantitative Economics and Management Studies, 2(2), 94–104.

Deci, E. L., & Ryan, R. M. (2000). The "what" and "why" of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry, 11*(4), 227–268. https://doi.org/10.1207/S15327965PLI1104_01

Fairweather, J. S. (2002). The mythologies of faculty productivity: Implications for institutional policy and decision making. *The Journal of Higher Education, 73*(1), 26–48.

Fox, M. F., & Mohapatra, S. (2007). Social-organizational characteristics of work and publication productivity among academic scientists in doctoral-granting departments. *The Journal of Higher Education, 78*(5), 542–571.

Gautam, D. K. (2020). Faculty research productivity in Nepalese universities. *Molung Educational Frontier, 10*(1), 72–89. https://doi.org/10.3126/mef.v10i1.33246

Geuna, A. (1999). *The economics of knowledge production: Funding and the structure of university research*. Edward Elgar Publishing.

Gharti, A. (2023). Examining age diversity, gender diversity and teaching performance in higher education in the Kathmandu Valley. *Nepal Journal of Multidisciplinary Research, 6*(3), 129-144.

Ghimire, B., Karki, D., Dahal, R. K., & Joshi, S. P. (2024). *The impact of psychological capital on faculty motivation in higher education institutions of Nepal: A cross-sectional study*. Journal of Business and Management, 8(2), 36–49.

Greenhaus, J. H., & Beutell, N. J. (1985). Sources of conflict between work and family roles. *Academy of Management Review, 10*(1), 76–88. https://doi.org/10.5465/amr.1985.4277352

Hemmings, B., & Kay, R. (2010). Research self-efficacy, publication output, and early career development. *International Journal of Educational Management, 24*(7), 562–573.

Lee, S., & Bozeman, B. (2005). The impact of research collaboration on scientific productivity. *Social Studies of Science, 35*(5), 673–702.

Levinson, W., Kaufman, K., Clark, V., & Tolle, S. W. (2006). You've got to get up every morning and decide to be happy: Stories of resilience from physicians nearing retirement. *Academic Medicine, 81*(5), 433–441. https://doi.org/10.1097/00001888-200605000-00011

Neve, H., & Feldman, K. A. (2015). Relationships of college faculty's motives for teaching, research, and service with their perceived abilities, experiences, and values. *Teaching in Higher Education, 20*(1), 1–23. https://doi.org/10.1080/13562517.2014.987750

Phuyal, P. (2023). *Motivation and professional development of faculty respondents in community colleges: A case study in Eastern Nepal*. *Journal of Management, 6*(1), 116–133.

Regmi, K. D. (2019). Why don't Nepalese academics publish? *Higher Education Policy, 32*(3), 511–529.

Rox, T., (2014). Dimensions of academic teaching cultures: Exploring patterns through thematic analysis. *Studies in Higher Education, 39*(4), 653–667. https://doi.org/10.1080/03075079.2012.721361

Ryan, R. M., & Deci, E. L. (2000). Intrinsic and extrinsic motivations: Classic definitions and new directions. *Contemporary Educational Psychology, 25*(1), 54–67.

Shrestha, S., & Singh, A. (2022). Gender and Research Productivity in Nepalese Academia: A Case of Community Campuses. *South Asian Educational Review*, *5*(1), 45-60

Sivertsen, G., & Meijer, I. (2020). Normal versus extraordinary societal impact: How to understand, evaluate, and improve research activities in their relations to society? *Research Evaluation, 29*(2), 136–148. https://doi.org/10.1093/reseval/rvaa016

Subedi, B. P. (2018). Challenges of research and innovation in Nepal. *Journal of Education and Research, 8*(1), 1–13. https://doi.org/10.3126/jer.v8i1.25336

Times Higher Education (2021). *World University Rankings 2021 methodology*. https://www.timeshighereducation.com/world-university-rankings/world-university-rankings-2021-methodology

UGC Nepal. (2022). *Annual report 2021/22*. University Grants Commission Nepal. https://www.ugcnepal.edu.np/publication

Brink, V. M., Fruytier, B., & Thunnissen, M. (2013). Talent management in academia: Performance systems and HRM policies. *Human Resource Management Journal, 23*(2), 180–195. https://doi.org/10.1111/j.1748-8583.2006.00030.x

Xu, L. (2015). Women and research productivity in higher education: A comparative perspective. *Higher Education Policy, 28*(2), 189–206. https://doi.org/10.1057/hep.2014.26

Academic Journal of Sukuna – AJoS, A Peer-reviewed Interdisciplinary Journal
Volume 5 (Issue 1) 2025 July (2082 Ashad), Pp. 140 – 159, ISSN 2594-3138 (Print)
Research Management Cell (RMC – Sukuna), Sundarharaincha, Morang

Implementing English as a Medium of Instruction: Qualitative Inquiry of Mathematics and Science Teachers

Doi: https://doi.org/10.3126/ajos.v5i1.81837

Mukti Nath Dahal[1*]
Navaraj Koirala[2]
[1]Faculty of Sukuna Multiple Campus, Sundarharaincha, Morang
[2]Administrative Officer of Multiple Campus, Sundarharaincha, Morang
[*]Email: dahalmukti352@gmail.com,

Abstract

This study examines the views of public school teachers on pedagogical issues, including diverse learning styles, technology integration, facilitating students' engagement in learning, and addressing social-emotional engagement of learners, as they implement English as a medium of instruction in Nepal. The paper focuses on the challenges and opportunities of shifting Nepali medium of instruction to English medium instruction. The study employed qualitative research to explore the subjective experiences of science and mathematics teachers. The participants of the study were eight teachers of Sundarharincha Municipality, Morang. An interview guideline was prepared to collect the information from the participants. Their experiences were subsequently analyzed and interpreted under explicit themes and sub-themes. The main findings of the study showed that the teachers were found to be positive towards the implementation of EMI; however, they have experienced the burden of implementing English as a medium of instruction. The school administration claimed to have adopted EMI, but still the medium of instruction used in the classrooms is Nepali due to the lack

of language proficiency of teachers and students, insufficient resources of the schools, and the lack of preparation for shifting the medium. As a result, EMI is a kind of burden for the public-school teachers and students in the present context.

Keywords: English Medium Instruction (EMI), Nepali Medium of Instruction (NMI) language policy, Multilingual, Lingua franca

Introduction

English is the widely used medium of communication in the world. As a master key, English opens the storehouse of knowledge in every field, especially geography, world history, science and technology, and so on. It is an international lingua franca for communication among the people of the world. People are well aware of the extensive use of English language and it has gained its popularity for communication in the international community.

In the era of globalization, it is clear that the global language is used to measure the competencies of an individual. As businesses look to expand into new markets and integrate global operations, they find that, more and more, their employees need to work together across geographic regions (Nunan, 2005). He links the learning English language with globalization and promotes a broader understanding of people. Therefore, people understand that language opens opportunities in the global industry.

Realizing the dominance of English in every aspect of human civilization, every individual, social, and educational institution are concerned with it and they are practicing the trend as the medium of communication and generating knowledge regarding it one of the indicators of human civilization. Many countries begin to use English as the language of instruction in their educational organizations (Ernawati et al., 2021). With this perspective, Genc & Yuksel (2021) further clarify that the English language is not only used to teach language but to instruct other academic subjects, especially in countries where English is not their mother tongue. This means most of the

educational institutions are using this language as a medium of instruction, believing that it is a key source for getting success in an international academic platform.

In Nepal, as Nepali is the common lingua franca, the use of Nepali Language in the multilingual setting seems very obvious and comfortable in Nepalese schools. So, only Nepali language has been used in the Nepalese public schools as the medium of communication and instruction for a long. On the other side, English-medium private and institutional schools and English-medium public schools have been practicing English as the medium of communication and instruction in their schools for long. The evidence shows that students in public schools learn English as a means of study, they experienced it just as a subject to be studied as their core course and the medium of instruction is solely Nepali. However, in the recent time Nepalese Public schools have now become aware of the dominance of English, and performance in English language has become a matter of prestige, as well, for them. This whole scenario is creating the environment for medium of instruction shift from Nepali to English Language. This shows that the medium of communication in schools is on the verge of shifting to English, which is what is referred to the EMI.

In a multilingual context, the shift from NMI to EMI seems challenging to the multiple stakeholders, specifically to the teachers during the teaching and learning process. In this regard, Joshi (2020) explored the necessity of promoting Nepali as a medium of instruction in the multilingual context of Nepalese education. This idea correlates with the idea of Phyak (2024) where he exclaims that EMI policy in the context of English ecology in higher levels of education in Nepal goes beyond the use of an English-only environment. He claimed that Nepali as a medium of instruction possesses the potential of being an inclusive and mainstream language in Nepal. Language change, even in a single subject, could bring severe disruptions to the learning process as per the linguistic psychology of school-level students. Shrestha

(2023) states that the teachers appointed 15-20 years before are still in service and are compelled to teach in English medium classes in public schools. It is not an easy task for them because they did not undertake their study in English Medium in their whole life.

As discussed in the above context, EMI underlies various challenges such as applying EMI in multilingual settings, teacher trainings, elaboration of subject matter, level-wise and subject-wise knowledge increment, etc., which are inherent in the transition to English as a primary medium of instruction. The Public Schools of Nepal have been using Nepali or the dominant mother tongue as a medium to instruct in schools. However, many public schools are shifting to English as a medium of instruction because of public pressure and the growing craze for the English language. It is obvious that public schools are advertising themselves to be better schools now, just because they have used EMI in their schools. So, some discussion question arises: Are public schools ready to use EMI? Can teachers who have long used Nepali Medium Instruction (NMI) transit to EMI effectively and sustainably? Is the education system operating more like a pendulum, following to the trend rather than applying a systematic and research-driven process? How do the teachers perceive and emotionally respond to this trend? As far as our knowledge goes, none of the research works are in this area. Hence, this study is of interest to explore these challenges from the teachers' perspectives.

This study explores the implementation of English as a Medium of Instruction (EMI) in public schools, concentrating specifically on mathematics and science teachers. It aims to understand how teachers perceive and experience the transition from Nepali Medium Instruction (NMI) to EMI, providing information on their lived realities regarding this shift. Central to the investigation are questions that explore teachers' perceptions, the pedagogical challenges they encounter during EMI implementation,

and the approaches they employ to navigate these issues. The research seeks to uncover key problems in implementing EMI, particularly in teaching learning activities, and further aims to evaluate possible approaches that benefit teachers solve pedagogical. Moreover, the study is focused to provide a nuanced view, on the basis of the teachers lived experience, on the EMI transition and contributes practical insights for formulating future educational policy, decision making, and teacher support mechanisms.

English medium instruction has gained global concern, particularly for the adoption of globalization and the response of internationalization of education. Rose and McKinley (2017) analyze Japan's move toward English-medium instruction to make their education system global. They claim that EMI helps to make a shift of policy from traditional to market-driven education, best fit to a competitive world. Mahboob (2020) provides a post-colonial perspective of EMI implementation, and he proposes that EMI is very relevant in countries with a colonial past where the British established educational systems. In such a case, English continues to function as a social interaction and communication. He also addresses that English is not only about using English textbooks, but also transforming knowledge into English. On the same note, Murray and Scarino (2014) emphasized their study on the relational aspect of language education in the Asia-Pacific countries. They investigated that language learning is not unique to the different places where its variation is found in terms of ecological context.

Regarding the case of Nepal, the constitution of Nepal (2015) allows the use of Nepali and English or both in educational institutes (Government of Nepal [GoN], 2015). The Education Act (1971) emphasizes the use of English while teaching the English subject. Again, the Ministry of Education (2009) attempts to improve the quality of basic education and supports the use of twenty-first-century skills in the

classroom, but EMI is not mandatory. There seems policy ambiguity that creates tension of EMI potential in the real classroom practice.

Through this short theoretical discourse, we can generalize that EMI has become a matter of global integration; meanwhile, there is a danger of the extinction of local languages and cultures. Anyway, EMI is promoted as a gateway to reaching the international standard.

In recent years, as a growing trend of internationalization, many countries have revised their national curricula as per the international standard with a strong emphasis on multicultural competencies. One of the main elements of this international adoption of curricula is the inclusion of EMI policy in basic and higher education. This emphasis is particularly on non-English-speaking countries where English is a foreign or second language. Nepal is not far from this trend where English takes a main position of commerce, education, communication, industry, and tourism.

The Education and Sports Ministry of Nepal emphasized English language proficiency and competency to compete with international standards. Along with this line, many community schools have shifted to EMI to arouse interest among the students and meet the ongoing demand of English medium schools. This policy aims to enable Nepalese citizens to get entry in higher education competently both in the nation and abroad. However, this trend raises some queries like equity, teachers' preparation, extinction of local culture and tradition.

There are no exact statistics in Nepal to determine the shifting ratio of public schools from Nepali medium instruction (NMI) to EMI, but this trend is happening throughout the country. The community schools' stakeholders have been suggesting using EMI as a main point of the school improvement plan in recent years because they suggest that teachers compete with institutional schools in terms of quality. Therefore, public schools are trying to implement EMI by giving appointments to novice teachers who do

not have much experience, like expert teachers. Richards (2015, p.8) says, "They are typically less familiar with subject matter, teaching strategies, and teaching contexts".

Studies highlight the opportunities and challenges of EMI integration abroad and in Nepal in various research. Sah and Li (2018) revealed that the students are still lacking adequate content knowledge in English language skills, though they have adopted English as a medium of instruction. The study contributed to EMI-specific training for teachers, limited instructional settings, and poor communication skills among teachers. Similar issues are elaborated in Pun and Thomas (2020) study. They found that subject teachers often lacked confidence and negative beliefs in teaching English due to insufficient training and ineffective EMI implementation.

In a similar vein, Ojha (2022) attempted to find out the attitudes of secondary-level teachers using EMI; he revealed that teachers were generally positive towards the potential use of EMI to improve the educational quality, though they encountered hidden practical challenges. Globalization and socio-economic power in the English language have become another reason for the increasing trend of using EMI in public schools. EMI does not only mean to use English content, but it is the way of transforming information into English for students in some subjects. On the one hand, it has become the most demanding issue in community schools, and on the other hand, it can create the problem of the extinction of local languages.

While drawing upon a comprehensive analysis of long educational practices in Nepal, Nepali language has been used as the first official language since 1905, and this was made the language of education from Grade 1 in public schools in Nepal since 1976 (Government of Nepal, 2006). English has been taught as a compulsory subject in schools since the establishment of the Durbar High School. It is one of the oldest schools in Nepal and was established in 1886 during the Rana regime. However, this education was limited only to royal family members. Education in the English language

was open to the public only in 1951. Curriculum Development Centre has revised school school-level curriculum to address the main aims of Secondary Education (MoE, 2019). The main objective of school-level education is to empower students with a well-rounded education. It also enables them to lead fulfilling lives, contribute to society, and adapt to the challenges and opportunities of the 21st century. With this perspective, there is a mushrooming trend of using EMI in many Nepalese public schools, though the education policy of the government has not made the necessary to the language medium. Nepal Law Commission (2015) declares that teachers can use Nepali, English, or both languages in the classroom as a medium of instruction. While teaching English as a compulsory subject, the medium of education shall be English.

Likewise, in the research work of Indonesian teachers and students' perspectives on EMI, they strongly accepted the policy of EMI in the classrooms (Setoningsih, 2022). Oktaviani (2019) also explained the pros and cons of teachers' perspectives for implementing EMI and their challenges. The main advantage of implementing EMI is that educational institutions meet the world's requirements in many aspects. However, applying EMI has certain difficulties, like training to implement EMI, limited resources, insufficient teaching materials, low proficiency of teachers, lack of teaching resources, and no proper guidelines for implementing EMI, and so on.

In most cases reviewed above, they focused on the issues of university or higher education. Only a few research works seem to have been conducted in the Nepalese context regarding the teachers' perspectives on EMI. Therefore, studying on the basic level of education regarding the use of EMI and the perception of teachers was found meaningful. The study in this context aims to explore the pedagogical issues of basic-level teachers implementing EMI in science and mathematics subjects.

English Language Teachers, educators, and administrative authorities have identified a plethora of pedagogical challenges associated with the implementation of

EMI. Foremost among these challenges is the proficiency level of educators and administrative staff in English, which significantly affects students' comprehension of complex subject matter. Moreover, students frequently encounter obstacles to active participation due to limited vocabulary and a lack of knowledge of the details of English syntax. Consequently, learners feel burdened with the cognitive strain of acquiring English as a second language to assimilate foundational concepts and things. Furthermore, the adaptation of curricular frameworks and the provision of adequate teacher training to facilitate effective EMI implementation in schools at present is not impossible, but it is challenging them.

This paper differs from other discussions on studying about the implementation of EMI in Education because we have studied the teachers' problem and perception in implementing EMI at the "basic level". Most previous studies primarily focused on the study of EMI on higher-level education and secondary level, getting the data from students, parents, and teachers, those neglected the research work on pedagogical issues, implementing EMI at the basic school level from the teacher's perspective. The present study, therefore, attempts to unravel the problem of how EMI in the public schools has played a role in equalizing the achievement gaps between NMI and EMI among the public-school students ultimately. Further, data collections for this type of study have been found in other places, but not done in the present study area.

A conceptual framework in research writing is a structured sketch that represents the theories and explains key concepts, variables and relationship that guide a study. Therefore, conceptual frameworks behind this study are teachers’ perception, pedagogical issues and navigating complexities. The details of these indicators are given below:

Teachers' Perception

The use of English medium instruction in public schools in the context of Nepal certainly creates positive and negative impacts. Teachers are under observation whether they use EMI effectively or not. The use of instruction in non-English speaking setting brings challenges to the teachers where they have conventionally habituated to use Nepali as a medium of instruction. Teachers' opinions, attitudes and beliefs regarding the use of EMI, they might be unaware of their own biases shown the learners (Lipport, 2017). Therefore, teachers' awareness regarding the learners' performance in English classes need to raise positive attitudes.

Pedagogical Challenges

Pedagogical challenges refer to the difficulties and obstacles the teachers face in delivering effective instruction in teaching English-medium classes in multilingual settings. The challenges vary in number depending on the language proficiency in English, the students' language background, and the teaching context. The insufficient English exposure of both teachers and students is the key factor in creating pedagogical challenges. Teachers in the public schools are in a struggle with their English language skills, which can hinder communication and limit their ability to explain complex concepts.

Navigate Complexities

In order to avoid the complexities of using EMI in public schools, joint planning activities are required. Teachers are required to develop professional skills, and these professional skills are obtained through training. Supportive resources can help the teachers access teaching aids. Collaborative strategies like Peer learning, group activities are also helpful to bridge the language gaps.

Methods and Materials

The Participants of the study

In order to carry out the research work purposefully, we have selected eight teachers from Sundarharaincha Municipality, Morang, working in basic and secondary schools which included 4 mathematics teachers and 4 science teachers. The Participants include only teachers following national curricula of mathematics and science for grade 6-8.

Purposive sampling with maximal variations in qualitative research methodology has been applied in selecting participants to cover a wide range of teachers working in public schools who reflect different perspectives regarding the use of EMI. The selected eight Participants were basic and secondary school teachers, ranging from both school-appointed and government-appointed teachers working in public schools. The selected teachers' range of considerable teaching experiences and training of the participants, which is needed to gather general and acceptable data on teacher perception of EMI. The researchers aim at gathering village teachers' as well as city area teachers' having specific experiences of implementing EMI in public schools.

Procedures

The participant teachers were from five schools. The schools include two basic schools, one model secondary school of Koshi province, and two secondary schools following the national curriculum. The selected five basic and secondary schools are in Sundarharaincha Municipality. All of these are public schools funded by the government. For obtaining data, we prepared the interview guideline and had multiple communications. The experience of the teachers, as described by them, was recorded in audio and notes.

Analysis

While analyzing the interview data, the themes were generated randomly. Next, the themes were re-grouped into similar categories. Finally, the connections were made with the research questions. The qualitative data have been analyzed based on the teachers' attitudes and perceptions regarding the shifting trend of EMI in public schools. Some information on training, supportive materials, and language labs is considered to understand the diversity of teachers' pedagogical perceptions and practices.

Results and Discussion

Based on the methodology adopted in this research, interview guidelines were prepared, and the teachers visited their schools. A significant qualitative insight was brought from the basic-level mathematics and science teachers. Their perceptions and lived experiences on EMI implementation in public schools were interesting as well.

Mathematics and science teachers from rural and urban areas have different perceptions on the shift of NMI to EMI. The teachers' perception varies based on their appointment. Such as government-appointed teachers showed different attitudes toward EMI than school-appointed teachers. However, both of them have a common concern about the use of EMI in public schools, though they lack language proficiency and training.

Another interesting result was the challenges of public-school teachers implementing EMI. Almost all the teachers responded to the difficulty in explaining the terminology and abstract concepts in English for teaching mathematics and science. EMI teachers' difficulty is the lack of EMI-oriented training, visual aids, and extra supportive books.

Likewise, the study also revealed that the teachers are not able to use English as sole language of instruction, they are using common language along with English as a teaching strategy in order to ensure student understanding. The students' participation

and engagement in learning is very controversial due to the lack of sufficient explanation and elaboration in English. Further, the majority of the teachers viewed that they need to build up language capacity engagement activity by employing EMI-specific training, workshops, and seminars.

This section presents the results of the interview data. Based on the data, there were various perspectives/attitudes found towards the use of EMI across the schools of Sundarharaincha Municipality. It is found that all participants saw EMI as a pedagogical burden, but the school management committee and school administration promised better English skills and security of future jobs for their students which could be failing to keep. The obtained research data of EMI are illustrated by three major themes: (a) EMI as a burden for teachers; (b) Class Management and discrimination; (c) EMI as future preparation.

EMI as a Burden for Teachers

Teachers are aware of applying English as a medium of instruction in their teaching subjects. However, the non-trained and less experienced novice teachers find it difficult to maintain. Bista (2015) analyzed the practical challenges of teaching English in Nepal and identified infrastructural and technical barriers. The requirements of school resources are language labs, audiovisual materials, computers, and internet connectivity. Many schools have an insufficient number of resources, so quality enhancement is in question. Moreover, teachers have no opportunities to improve their English through interaction with native speakers. Hu and Lei (2013) conducted a case study on the professor and students, focusing on the "relentless internationalization and marketing of higher education," and concluded that English proficiency is urgently required for national, institutional, and personal development. The public-school teachers consider English language learning to the level of teaching students, and errorless communication is very difficult for them. Most teachers use mixed language (i.e. Nepali

and English) in the class. They claim it is hard to use the English language to deliver the subject matter. Abhinash, one of the experienced teachers, explains:

> *Teachers' language proficiency is a major challenge to implementing EMI, especially for non-language teachers. Young and energetic science/ mathematics teachers might be more competent in subject matter than older teachers might be able to but they are still lacking in using appropriate classroom language.*

The medium of instruction policy in English obstructs learners' understanding of complex scientific terms, formulas, definitions, and basic mathematical concepts of word problems. In this regard, Nayan, the youngest teacher among the participants, thinks *the students from the Nepali medium class face major challenges. In science classrooms, technical words, their meanings, and definitions need to be clarified in students' common language.* It is also seen that the students from multilingual and multicultural backgrounds do not want to communicate in English, though they have been admitted to an English-medium class. Similarly, Saha (2023) states that socioeconomically diverse students hardly aspire to communicate in English. One of the most controversial issues that emerged in the interview was the Lack of teacher training and methodology that can be employed in EMI classes. Teachers from basic schools are still lacking sufficient training, seminars, and workshops for EMI. Harinarayan, Jenisha, and Monika opined that *we do not have training or workshops for EMI due to insufficient funding and a lack of planning in our schools.*

This shows the lack of training, inability to develop proficient language skills, and non-English background of students are observed as the challenges for the shift to EMI. As stated by Dearden (2014), many teachers receive no specific EMI training, and as a result, do not develop the necessary linguistic competence and pedagogical skills to deliver content effectively in English. Similarly, Saha (2023) thinks that the major

challenges include stakeholders' insincerity, teacher understaffing, inadequate technology, resources, and teachers' additional duties affect ELL support.

Class Management and Discrimination

In the process of data collection, eight teachers were interviewed, and all of them said that EMI is necessary in their subjects. The teachers understood the significance of English in this globalized world and were convinced to apply EMI, but the English Medium class management is often crucial. The government-aided basic schools are gradually changing the medium of instruction from the junior classes, whereas secondary schools can manage two medium classes in the same shift or a different shift. Here are two of the secondary teachers' statements.

> *We managed EMI classes in the morning time in our school because of the lack of furnishing, classroom limitations, teachers' management, and so on. English medium classes began from the junior classes. We change one class NMI to EMI every year.*

One teacher of a model secondary school mentions:

> *We do not have two shift EMI classes, but we managed all EMI classes almost in the day shift, except classes 11 and 12. We have a sufficient number of classrooms and teaching staff. We managed Nepali and English medium classes in parallel.*

This indicates that the implication of EMI for all is not possible. The students need to be divided in terms of the medium of instruction, which has created discrimination among the students, and it has become a burden to the teachers and management. Regarding the discriminations faced by the students Paudel (2021) offers a critical overview in the context of the rapid implementation of EMI in the Nepalese public schools that marginalized the local languages and their distinct culture. He argues

that if EMI is not carefully implemented, it may create linguistic hierarchy and imperialism.

EMI as future Preparation

People commonly think the purpose of English in Nepal is to give students foreign language competency to study higher education and job opportunities in a foreign country. In this regard majority of the teachers agreed that parents force community schools to implement EMI to better prepare them for higher education and global opportunities. Abhinash, who is also the vice principal of a school, informed that although

> *the schools face challenges in implementing EMI, the school administration and management team encourages to adopt of EMI, particularly for protecting the public schools.* He continued, *previously there were a few students in our school, but when we shifted to EMI, the number of students increased gradually.*

To support the shift, Nayan said, *I think that shifting in medium is quite good because parents are paying huge amount in private schools in the name of medium*. Bhumi, a teacher and coordinator of English medium classes of secondary level, opined; I *think Nepali workers in foreign or English-speaking countries require using English so the parents want their children to study in English medium.*

In a nutshell, this research showed that, despite many challenges, the teachers were positive towards EMI implementation in public schools in Nepal. This study also revealed that the teachers are using a bilingual approach to facilitate learning activities due to the low language proficiency of both teachers and learners and the lack of English-medium teaching and learning exposure in the public schools. Therefore, the shift to EMI feels burdensome to the management and the teachers in public schools. Furthermore, language, culture, tradition, and socioeconomic status of parents are other barriers to implementing EMI. In the absence of the basic aspects of curriculum

implementation like textbooks, teaching materials, the students' and the teachers' readiness in English, the proper implementation of EMI was felt doubtful. In addition, it is found that the implementation of EMI is merely due to the community pressure for preparing the students for a competitive global market, but lacks concrete preparation. However, with the positive attitude of teachers, strong willingness of the school management committee, and the support of parents and students, this initiative can be a milestone for the schools if EMI is felt necessary aspect of learning for students. For this, government and policymakers urgently need to rethink the curriculum, teachers' preparation, and an appropriate action plan for school-level education.

It is seen that there is a pressing need for the government to align its language education policies with the realities and demands of public schools. This includes revising the current bilingual education policy to better support the transition to EMI in a manner that is equitable and sustainable for all students. Additionally, comprehensive training programs for teachers are crucial to enhance their language proficiency and pedagogical skills, enabling them to effectively deliver content in English. Furthermore, the availability of appropriate textbooks and teaching resources must be ensured to create a more supportive environment for both teachers and students.

Conclusions and Implications

The implementation of English Medium Instruction (EMI) in public schools in Nepal reflects a significant shift in educational priorities, driven largely by parental demand and the perceived success of private schools in providing quality education. While teachers recognize the necessity of EMI for enhancing students' language skills and preparing them for higher education and global job markets, they face substantial challenges, including inadequate language proficiency, lack of training, and resource constraints. The findings suggest that although there is a strong commitment from teachers and school management to adopt EMI, these efforts are often hindered by

systemic issues within the educational framework. Furthermore, the parallel management of Nepali and English medium classes has led to discrimination among students and increased burdens on teachers, highlighting the need for a more cohesive and supportive approach to EMI implementation.

Despite these findings and the useful implications obtained from this research article, the researchers realized that the present study does not focus on students' and parents' voices. This research used a Single instrument (i.e., interview with free discussion) to collect the data. There are ample possibilities for future studies that can concentrate on classroom observation and interviews with parents, management committees, and school principals to learn more about how English is used as a medium of instruction in the classroom.

References

Bista, S. D. (2015). *Shifting the medium of instruction in Nepalese schools: An attitudinal study of ELT practitioners* [Unpublished master's thesis]. Tribhuvan University, Kirtipur, Nepal

Dearden, J. (2014). *English as a medium of instruction - a growing global phenomenon*. University of Oxford. https://www.britishcouncil.org/educational/ih

Ernawati, E., Sofendi, S., & Silvhany, S. (2021). English as a medium of instruction (EMI): A primary school teachers' and students' perceptions. *International Research in Counseling and Education, 5*(1), 24–32. https://doi.org/10.24036/00414za0002

Genc, E., & Yuksel, D. (2021). Teacher questions in english medium instruction classrooms in a Turkish higher education setting. *Linguistics and Education, 66*, 100992. https://doi.org/10.1016/j.linged.2021.100992

GoN (2015). *Constitution of Nepal*. GoN.

Government of Nepal (2006). *National curriculum framework, 2007*. Curriculum Development Centre.

https://doi.org/10.1080/19313152.2017.1401448

Hu, G., & Lei, J. (2013). English-medium instruction in Chinese higher education: A case study. *Springer*, *67*(5), 551–567. https://www.jstor.org/stable/43648674

Joshi, D. R. (2020). Medium of instruction in Nepal-exploring necessity of promoting Nepali as medium of instruction in the context of Nepalese school education [Master's thesis]. University of Oslo, Oslo.

Lipport, L. B. (2017). *How mainstream teacher attitudes affect English language learner student learning in the mainstream classroom* (Capstone Project No. 119). School of Education Student Capstone Projects. https://digitalcommons.hamline.edu/hse_cp/119

Mahboob, A. (2020). Has English medium instruction failed in Pakistan? In J. F. D. Giri, R. Sharma, & A. D'Angelo (Eds.), *Functional Variation in English: Theoretical Considerations and Practical Challenges* (pp. 261–276). Springer. https://doi.org/10.1007/978-3-030-52225-4_17

Ministry of Education (1971). *Education Act*. Government of Nepal.

Ministry of Education, Science and Technology [MoE] (2019). *National Curriculum Framework, 2019.* Government of Nepal.

Ministry of Education. (2009). *School sector reform plan 2009–2015*. Government of Nepal.

Murray, N., & Scarino, A. (Eds.). (2014). *Dynamic ecologies: A relational perspective on languages education in the Asia-Pacific region* (Vol. 9). Springer. https://doi.org/10.1007/978-94-007-7012-5

Nepal Law Commission (2015). *The Constitution of Nepal*. GoN. https://www.lawcommission.gov.np

Nunan, D. (2005). *The global English pedagogical approach: The evolution of technology and value of online English language learning*. Global English Corporation.

Ojha, J. R. (2022). Attitudes of secondary level teachers towards EMI in English medium schools of Mahendranagar. *Journal of Bhuwanishankar, 1*(1), 91-102.

Oktaviani, U. (2019). Teachers' perspectives and challenges towards English as a medium of instruction (EMI). *Lingua Jurnal Bahasa & Sastra*, *20*(1), 58-64.

Paudel, P. (2021). Using English as a medium of instruction: Challenges and opportunities of multilingual classrooms in Nepal. *Prithvi Journal of Research and* Innovation, 3(1), 43-56. https://doi.org/10.3126/pjri.v3i1.37434

Phyak, P. (2024). English-medium instruction in higher education in Nepal. In K. Bolton, W. Botha & B. Lin (Eds.), *The Routledge Handbook of English-Medium Instruction in Higher Education* (pp. 394-409): Routledge.

Pun, J. K. H., & Thomas, N. (2020). English medium instruction: Teachers' challenges and coping strategies. *ELT Journal*. https://doi.org/10.1093/elt/ccaa024

Richards, J. C. (2015). *Key issues in language teaching*. Cambridge University Press.

Rose, H., & McKinley, J. (2017). The prevalence of pedagogy-related research in applied linguistics: Extending the debate. *Applied Linguistics*, *38*(4), 599-604.

Sah, P., & Li, G. (2018). English medium instruction (EMI) as linguistic capital in Nepal: Promises and realities. *International Multilingual Research Journal, 12*(2), 109–123. https://doi.org/10.1080/19313152.2017.1401448

Saha, M. (2023). English teachers' attitudes towards learners: Effects on the rural pedagogies in Bangladesh. *Ampersand*, *10*, 100107.

Setoningsih, D. A. (2022). The secondary education students' and teachers' perspectives on EMI. *English Learning Innovation (englie), 3*(1), 17-26.

Shrestha, K. (2023). *English as a medium of instruction: Pedagogical practices and perceptions of public school teachers and students*. https://www.researchgate.net/publication/37002540

Academic Journal of Sukuna – AJoS, A Peer-reviewed Interdisciplinary Journal
Volume 5 (Issue 1) 2025 July (2082 Ashad), Pp. 160 – 179, ISSN 2594-3138 (Print)
Research Management Cell (RMC – Sukuna), Sundarharaincha, Morang

Extraction of Eugenol from Clove Buds and Testing its Antimicrobial Activity

Doi: https://doi.org/10.3126/ajos.v5i1.81842

Nawaraj Shrestha[*1] and Tika Prasad Upadhyaya[2]
[1]Student of Department of chemistry, Sukuna Multiple Campus
[2]Proram Coordinator, Science Department, Multiple Campus
Email of Principal Author: nawarajstha52@gmail.com

Abstract

Eugenol, the primary component of clove oil, is a natural compound produced by Eugenia caryophyllata for protection against microorganisms and pests. Due to its easy isolation and potential as an antimicrobial medicine, eugenol has gained interest in the medical and food industries. This interest is driven by the negative perception of synthetic drugs and the traditional use of plant-based medicines. As a result, a project was conducted to assess the antimicrobial activity of eugenol against various human pathogenic bacteria and fungus. The test organisms included both Gram-positive bacteria {e.g., Bacillus spp., Streptococcus pyogenes, and methicilline-resistant Staphylococcus aureus (MRSA)} and Gram-negative bacteria (e.g., Escherichia coli, Salmonella typhi, Pseudomonas aeruginosa, Klebsiella pneumoniae, and Shigella sonnei). Additionally, Aspergillus genus fungus was used. Eugenol was isolated from hydro-distilled clove oil, and three different concentrations of the test solution were prepared: 1% (v/v), 0.5% (v/v), and 0.25% (v/v). The antimicrobial activity of eugenol was evaluated by applying 100µl of each eugenol concentration to wells made in Muller Hinton agar (MHA) and Potato dextrose agar (PDA) plates, on which the pathogens were swabbed. The results displayed a positive outcome, as evidenced by the presence of a zone of inhibition indicating the inhibition of microbial growth. Overall, the study demonstrated the antimicrobial

effectiveness of eugenol against various microorganisms, including Gram-positive and Gram-negative bacteria, as well as the Aspergillus genus of fungus. These findings highlight the potential of eugenol and similar phytochemicals in the development of antimicrobial medicines and their applications in the food industry for safety and preservation purposes.

Keywords: Eugenols, phytochemicals, anti-biotic resistance, zone of inhibition, anti-microbial activity

Introduction

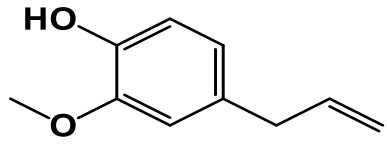
One of the serious issues in the community is public health. It is always under the threat of infectious diseases, which guide the economy of any country. The alarming threat to the economy is partially due to the increasing properties of antimicrobial resistance among fatal pathogenic microorganisms (Jeyakumar & Lawrence, 2021). So, there is a need for research on new fields or classes of antibiotics. Nowadays, it is believed that plant-origin bioactive compounds, i.e., phytochemicals, are alternatives to synthetic and resistant antibiotics. The challenge of the development of this class of antibiotics is due to a lack of sufficient knowledge about the mechanism of drug interaction at the molecular level (Jeyakumar & Lawrence, 2021). So, eugenol (EUG) could be one of the antibiotics derived from the plant. EUG belongs to the phenylpropanoid group of essential oils. Phenylpropanoid is synthesized through the mevalonate and shikimate acid metabolic pathways. Essential oils are volatile, and they are secondary plant metabolites. So, they can be obtained from the essential oils of clove bud (*Eugenia caryophyllata*) by hydro-distillation (Patra, 2012).

Clove essential oil (EO) is one of the cheap sources of EUG, which is a light yellow, transparent liquid with a specific clove aroma and a yield of 12.8% (v/w). Among the 95.8% of the total amount of EO, EUG (76.23%) was found to be a major component of the essential oil, followed by -caryophyllene (11.54%), caryophyllene

(4.29%), and eugenyl acetate (1.76%) (Xu et al., 2016). The structure of eugenol is given below,

Figure 1

Structure of Eugenol



4-allyl-2-methoxyphenol

Some of the properties, Molecular formula and Molecular weight of 4-allyl-2methoxy phenol are given below.

Table 1

Molecular formula and Molecular weight

S.N.	Formula and Weight	Composition
1	Molecular formula	$C_{10}H_{12}O_2$
2	Molecular weight (g/mol)	164.20
3	Solubility	water, alcohol, chloroform, ether
4	Melting point (°C)	− 9.2
5	Boiling point (°C)	254

It is believed that deep research on phytochemicals having antimicrobial properties, the preparation of different derivatives, and testing on them could lead to an alternative to antibiotic resistance. EUG extracted from the essential oil of clove buds (*Eugenia caryophyllata* or other plant species belonging to the corresponding plant family) could be an anti-microbial agent for human pathogenic microorganisms. So, testing the antimicrobial strength of EUG purified from hydro distillation clove buds on different drug-resistant human pathogenic microorganisms is for the search of new drugs (Levy, 2005).

Most of the known antibiotic-resistant bacteria continue to increase in frequency and number globally and are one of the emerging problems that complicate and impede

the treatment of critical infectious diseases (Levy, 2005).*Staphylococcus aureus*vancomyc in resistance, gram-negative pathogens wide spectrum lactamases resistance, and *Escherichia coli* and *Neisseria gonorrhoeae* fluoroquinolone resistance are some of the examples of increased drug tolerance by microorganisms in patients suffering from infectious diseases (Levy, 2005). To identify new lucrative applications for antibiotics for chronic diseases, many major pharmaceutical companies have pulled back from the field of antibiotic discovery based on microbial origin (Levy, 2005).With the alarming decrease of new anti-microbials coming to market and with new threats arising from gram-negative infections at the same time, the number of drug options for us on the market is perilously close to none or only a single effective agent for some life-threatening infections(Levy & Marshall, 2004). So, testing the antimicrobial strength of EUG purified from hydro distilled clove buds on different drug-resistant human pathogenic microorganisms, i.e., gram-positive (*Bacillus spp.*, *Streptocuspyogenes,* and MRSA) and gram-negative (*Escherichia coli, Salmonella typhi, Pseudomonas aeruginosa, Klebsiellapneumoniae, and Shigellasonnei*) bacteria, as well as fungus (*Aspergillus spp.),* is for the search of new drugs. Which should be with public health; parallelly, it should not give rise to drug-resistant microbes (Levy & Marshall, 2004). About twenty-seven species of *Syzygiumaromaticum* are found all over the world, and about twenty-two of them are growing in China these days. Actually, *S. aromaticum* (clove) belongs to the *Syzygiumgaertn* genus of the plant family Myrtaceae, which originated on the Moluccas Islands of Indonesia. The composition of clove oil is found to be completely different due to differences in soil, water, climate conditions, i.e., producing area, and extraction method (Hu et al., 2018). Although the chemical composition of clove oil varies according to producing area and extraction method, the most abundant chemical component is EUG. By using gas chromatography-mass spectrometry (GC-MS) technique to analyze chemical composition, 13 samples of EO

of *Syzygiumaromaticum* from Indonesia, Madagascar, and two provinces of China have been analyzed (Hu et al., 2018). From this chemical composition analysis, it has been found that 21 to 36 kinds of individual chemical species are present in each sample separately. Altogether, 72 different individual chemical species, i.e., kinds of molecules were present, where the proportion of volatile components was 96.16% to 99.91%, where EUG (48.2 to 50.22) %, α-selinene (41.13 to 42.88) %, and cis-α-bisabolene, ocimene, santolinatriene, and humulene are 3.60% to 4.21%. From the above information, we can obtain EUG from clove buds for testing antimicrobial properties in a testable amount at a reasonable cost.

The current top concern for food safety authorities, the food processing sector, and ultimately the general public is microbial foodborne illness. Consumers are simultaneously concerned about food preservatives. The spread of methicillin-resistant bacteria, including one of the antibiotic-resistant pathogens, MRSA, has prompted researchers to resurrect their hunt for antibacterial complexes derived from natural plant sources. Herbs and spices have been added to food systems since antiquity, not just to improve flavor but also as food preservatives and folk remedies (Khalil et al., 2017). Over the past few decades, plant phytogenic chemicals have drawn a lot of attention because of their diverse biological and biochemical roles. Eugenol, a polyphenol found in clove oil, has been shown to have strong antibacterial properties against a variety of strains of both gram-positive (*Enterococcus faecalis, Staphylococcus epidermidis, Streptococcus pyogenes, Staphylococcus aureus, Streptococcus pneumonia, Listeria monocytogenes, Bacillus cereus, and Bacillus subtilis*) and gram-negative (*E. coli, Proteus valgaris, Salmonella choleraesuis, Salmonella typhi)* b acterias. In gram-negative and gram-positive bacteria, eugenol destroys the cell membrane and cell wall, causing cell lysis and the release of intracellular fluid along with the lipid and protein contents. Studies on biofilms conducted in vitro and in vivo show that eugenol has a

potent eradicative and inhibitory effect. In the case of biofilms generated by methicillin-resistant *Staphylococcus aureus* (MRSA) and methicillin-resistant susceptible *Staphylococcus ureus* (MSSA) strains, 50% inhibition was seen at a concentration of 0.5×MIC (minimum inhibitory concentration (Khalil et al., 2017). Very early on in the creation of magic medication, antibiotic resistance was reported. In an original study published in 1929, Sir Alexander Fleming reported that some bacteria, notably the organism now known as *Escherichia coli,* were immune to the effects of penicillin. Edward Abraham and Ernest Chain first noted the existence of a penicillin-destructive enzyme in *E. coli* in 1940. Several years passed before the medication was frequently utilized to treat patients. Many of the early fungal cultures were infected with bacteria that weakened the antibiotic as it was being generated, making it difficult to initially produce large amounts of penicillin. Bacterial antibiotic resistance has developed into a common and well-researched issue in the following decades (Guilfoile, 2006).

Methods and Materials

Materials

In the process of obtaining Eugenol (EUG), various materials and equipment were utilized. To extract EUG clove buds, dichloromethane, diethylether, dil.HCl and dil.NaOH were used. For the media preparation in microbiological experiments, nutrient agar (NA), Muller Hinton agar (MHA), and potato dextrose agar (PDA) were used. The test organisms were *Escheriachia coli, Salmonella typhi, Pseudomonas aeruginosa, Klebsiella pneumoniae, and Shigella sonnei, Bacillus spp., streptococcus pyogenes, and MRSA,* as well as the fungus *Aspergillus.* Then during this experiment required equipment were a distillation setup, separating funnel, autoclave, electronic weighing machine, glassware, incubator, micropipette, micropipette tips, and a refrigerator. A sample of eugenol was taken only from the distillation method because it was cheap and easy to obtain. Test bacteria were taken from clinically isolated samples in

Bishweshwar Prasad Koirala Institute of Health Science (BPKIHS). These materials and tools collectively facilitate the extraction and testing processes in the laboratory.

Methods

Distillation of clove buds

80 grams of clove buds were ground into powder, and 20 grams of the powder were then subjected to four steam distillations in a 500-ml distillation flask. The oil underwent a four-hour distillation process before collection of the entire oil-water mixture.

Separation of clove oil form distillate

Since clove oil components were soluble in non-polar organic solvents like dichloromethane (DCM), distillate was combined several times with 15 ml of DCM until the DCM became clear. Finally, oil was collected from the separated DCM-oil mixture by evaporating at about 45°C.

Isolation of eugenol from oil

The most common method for making eugenol from natural oil sources involves combining the essential oil with dil. NaOH (3%) solution and stirring the mixture until a phenolic alkali salt is formed. The insoluble non-phenolic fraction is subsequently removed using a solvent DCM. The undissolved component is taken out, the alkali solution is acidified at low temperatures, and the released eugenol is purified by fractional distillation (Kamatou et al., 2012).

So, clove oil was treated with excess dil. NaOH and the remaining components of oil were separated by using the non-polar solvent DCM. Then the separated aqueous solution was neutralized with dilute HCl. Neutralization was tested using litmus paper. Then the neutralized solution was treated with 15 ml of diethylether (DEE) several times. Finally, EUG was obtained by evaporating the DEE-EUG separated mixture at about 45 °C.

Figure 2
Isolation of eugenol from oil

Preparation of eugenol's different concentration

DMSO (dimethyl sulfoxide) is an organosulfur compound with the formula $(CH_3)_2SO$. This colorless liquid is an important polar aprotic solvent that dissolves both polar and non-polar components and is miscible in a wide range of organic solvents as well as water. It has no antimicrobial activity. So, it was one of the best solvents for antimicrobial screening. 20µl of EUG was mixed with 1980µl of DMSO to make a 1% (v/v) solution by volume. By dilution, half of the 1% (v/v) solution was converted into 0.5% (v/v), and similarly, 0.25% (v/v) was obtained. Then, these stoke solutions were ready for antimicrobial screening.

Preparation of standard inoculum of test organism

The anti-bacterial activity of EUG was to be tested against seven bacteria: *Escherichia coli, Salmonella typhi, Pseudomonas aeruginosa, Klebsiella pneumoniae, Shigella sonnei, Bacillus, Streptococcus pyogenes, and* MRSA, along with one fungus, *Aspergillus.* The stock culture of the organism was inoculated on Nutrient Agar plates, and the organism that grew on the nutrients agar (NA) plates was preserved in Nutrient Agar slants. Nutrient broth was inoculated with freshly sub-cultured bacteria and

incubated at 37 °C for 5 hours to match the turbidity to that of 0.5 McFarland standards. Such prepared inoculum was used to spread onto Muller-Hinton agar using a sterile cotton swab to make a lawn of bacteria.

Screening of EUG for Antimicrobial activity (Agar well diffusion Method)

In order to see the anti-microbial activity of EUG agar, the well diffusion assay was performed. In this assay, Muller Hinton Agar (MHA) plates were used for the growth of each bacterial species, and Potato Dextrose Agar (PDA) was used for the growth of fungus species. A total of seven MHA and one PDA plate were prepared in order to test the antibacterial activity of seven different bacterial species and one fungal species. In the wells of 5mm diameter created in the inoculated agar media with sterile cork borer, test solution was loaded into each well and incubated at 37 °C for 24 hours for bacteria and at 25 °C for 3 days for fungus. Then, plates were checked to determine the effect of the EUG on desired bacteria by the appearance of a zone of inhibition around the well.

Testing the value of MBC&MFC in the range of 1% (v/v) to 0.0078% (v/v)

In this testing, 96 well plates were used.

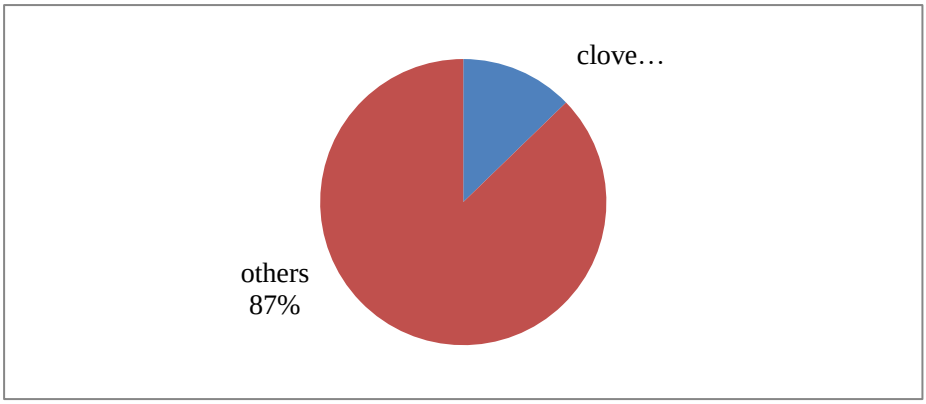
Result and Discussion

Hydro distillated clove oil

Clove EO is one of the cheap sources of EUG, which is a light yellow, transparent liquid with a specific clove aroma and a yield of 12.8% (v/w) (Xu et al., 2016). About 9.5 ml of clove oil was obtained from 80 grams of clove buds, which is about 11.87 % (v/w) of the clove buds, which was a very low amount of yield. For a greater yield, a different method should be applied.

Figure 3

Clove oil yield on hydro distillation of clove buds

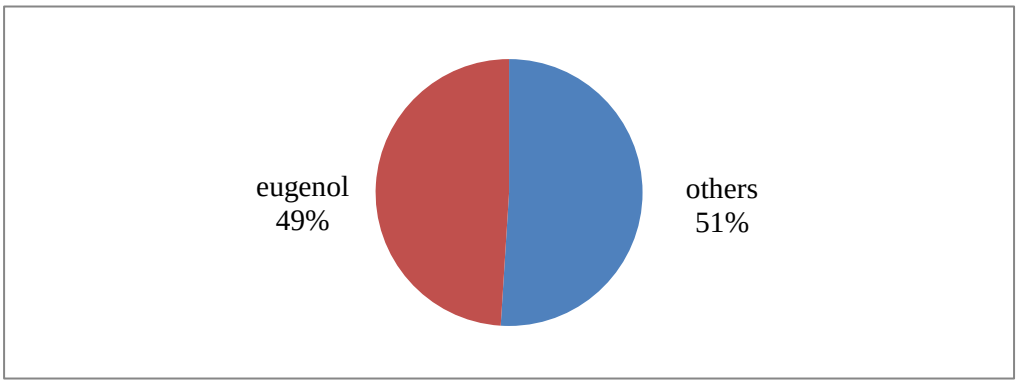


Eugenol in clove oil

On isolation of EUG from clove oil, 5 ml of EUG was obtained, which is about 49% by volume of clove oil. This, somehow, according to the literature, is just at the lower limit of the given range. According to Xu et al. (2016) clove EO is one of the cheaper sources of EUG. Among the 95.8% total amount of EO, the EUG (76.23%) was found to be the major component of the essential oil, followed by -caryophyllene (11.54%), caryophyllene (4.29%), and eugenyl acetate (1.76%).

Figure 4

Clove oil yield on hydro distillation of clove buds

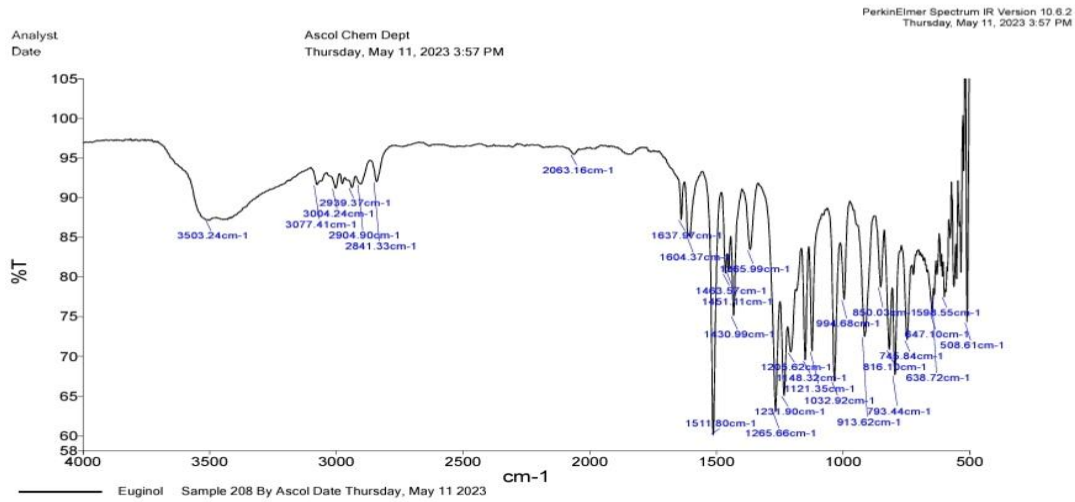


Some relevant conformation of EUG

EUG has phenolic, etheric, and allyl groups on it, so it must show some reactions related to these functional groups. Here, two tests were performed: one on the complex-forming nature of the phenolic group and one on the unsaturation nature of the allyl group. It gives a sky-bluecolor complex with ferric chloride. Unsaturated compounds (alkenes and alkynes) decolorize or discharge the violet color of Baeyer's reagent (alkaline $KMnO_4$ solution) by giving an addition reaction (Khadka et al., *2*018). Benzene rings don't give this test, so it must be given by the allyl group of EUG.

Figure 5

IR diagram of EUG sample



In IR analysis, the broad absorption peak around 3503.24 cm^{-1} regions indicates stretching of both OH and hydrogen attached to sp^3-carbon. The sharp absorption at 1511.8 cm^{-1} indicates that the compound has a benzene ring. Further, the absorption in the range of 1121.35 cm^{-1}–1265.6 cm^{-1} seems to be C-O stretches, which must be ether. So, all the information from IR spectrum implies the conformation of eugenol.

Anti-microbial activity of EUG

From the bar diagrams given below, we can clearly see that the anti-microbial activity of EUG is great. According to Khalil et al. (2017) eugenol, a polyphenol found in clove oil, has been shown to have strong antibacterial properties against a variety of strains of both gram-positive (*Enterococcus faecalis, Staphylococcus epidermidis, Streptococcus pyogenes, Staphylococcus aureus, Streptococcus pneumonia, Listeria monocytogenes, Bacillus cereus, Bacillus, and Bacillus subtilis*) and gram-negative (*E. coli, Proteus valgaris, Salmonella choleraesuis, Salmonella typhi*). In gram-negative and gram-positive bacteria, eugenol destroys the cell membrane and cell wall, causing cell lysis and the release of intracellular fluid along with the lipid and protein contents. Studies on biofilms conducted in vitro and in vivo show that eugenol has a potent eradicative and inhibitory effect. In the case of biofilms generated by methicillin-resistant *Staphylococcus aureus* (MRSA) and methicillin-resistant susceptible *Staphylococcus aureus* (MSSA) strains, 50% inhibition was seen at a concentration of 0.5× MIC (minimum inhibitory concentration).

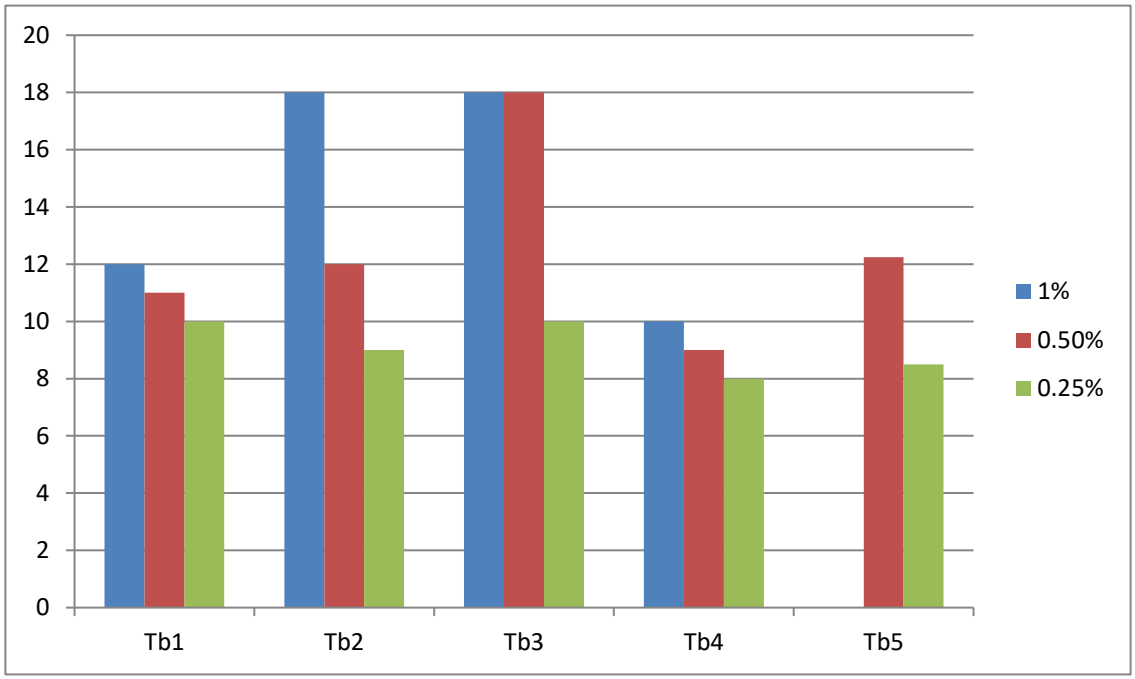
According to Silva et al. (2018) Eugenol was found to have a MIC of 1200 g/ml against S. aureus bacteria, which is consistent with the 1000 g/ml MIC found in the current study. Eugenol exhibits inhibition halos with diameters of 9.25 mm and 7.75 mm, respectively, for strains of *E. coli* and *S. aureus*. To identify the minimum inhibitory concentration (MIC), which prevents the bacteria from growing visibly, microdilution tests were performed on the derivatives previously indicated to have inhibition halos larger than 6mm.

Action of EUG on Gram-negative bacteria

A significant amount of anti-bacterial effect can be seen in the case of gram-negative bacteria in general.

Figure 6

Action of eugenol at three different concentrations on gram-negative bacteria



Where y-axis represents the inhibition zone's diameter in mm and 1%, 0.5% and 0.25% are concentration of EUG in dimethyl sulfoxide (DMSO)

Tb1: *Escherichia coli*, Tb2: *Salmonellatyphi*,

Tb3: *Pseudomonas aeruginosa*

Tb4: *Klebsiellapneumoniae*, Tb5: *Shigellasonnie*

At a concentration of 1000 g/ml, eugenol has been shown to suppress the development of *P. aeruginosa*. At 2000 g/ml, the whole inhibitory effect against these bacteria is visible (Nejad et al., 2017). The actions of EUG on Tb1 at these concentrations don't have a very significant difference, which show 0.25% EUG is equally effective as 1%. But the effectiveness of 1% EUG is much higher in the case of Tb2 than in the other two concentrations. In the case of Tb3, both 1% and 0.5% have

equally high effectiveness compared to 0.25%, where the anti-microbial action of eugenol is on Tb4 among these gram-negative bacteria, but action is significant in all three concentrations. No anti-bacterial action was seen at 0.25% concentration in the case of Tb5, but there was a significant effect at 1% and 0.5% in the same bacteria.

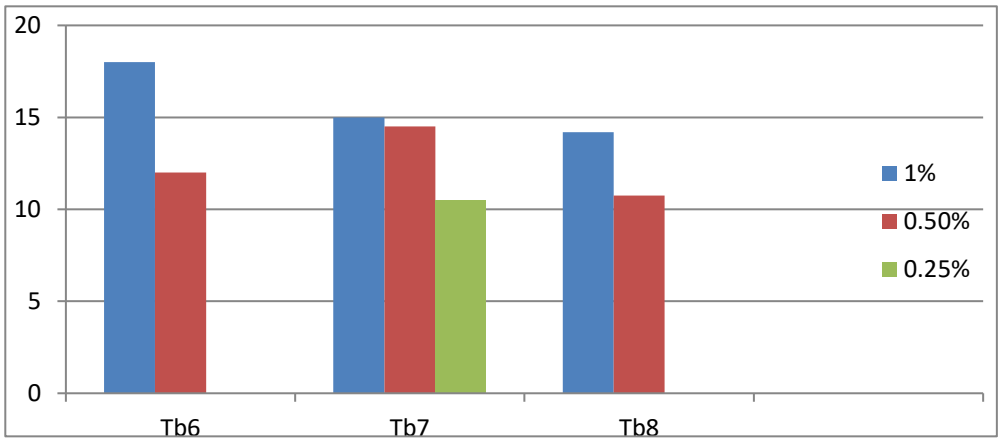
In a comparative study on these five bacteria, the anti-bacterial effect of eugenol can be seen in the case of 1% on Tb2 and both 1% and 0.25% on Tb3.

Action of EUG on Gram-positive bacteria

Significant amount of anti-bacterial effect can be seen in case of Gram-positive bacterial in general.

Figure 7

Action of eugenol at three different concentration on gram-positive bacterias



Where the y-axis represents the inhibition zone's diameter in mm and 1%, 0.5%, and 0.25% are concentrations of EUG in DMSO,

Tb6: *Bacillus*; Tb7: *Streptoccus pyogenes*; Tb8: Methicillin-resistant *Straphylococcusaureus* (MRSA).

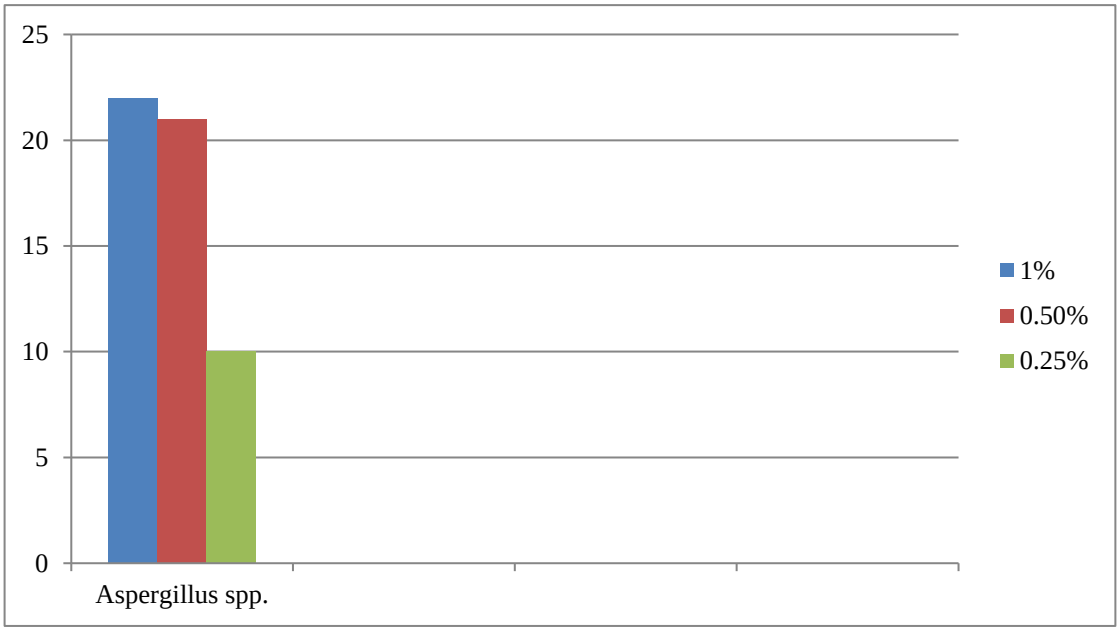
The most significant anti-bacterial effect can be seen at 1% on Tb6, but nil at 0.25%. In the case of Tb7, it is affected by all 1%, 0.5%, and 0.25%, as can be seen. Similarly, Tb8 is affected by both 1% and 0.5% but not by 0.25%.

Action of EUG on fungus

Clove oil has a powerful antifungal effect. Aspergillusflavus and *Aspergillusparasiticus* are foodborne fungi that produce the poisonous secondary metabolite aflatoxin (Nurdjannah & Bermawie, 2012). At 0.6 mg/ml, clove oil exhibited inhibitory activity against *A. parasiticus's* ability to produce aflatoxin. All isolates of the fungi *Eurotium spp., Aspergillus spp.,* and *Penicillium spp*. that frequently contaminate bakery goods showed some antifungal activity when exposed to clove oil. Significant amount of anti-fungal effect can be seen in case of *Aspergillus spp.*

Figure 8

Action of eugenol on fungus



Where the y-axis represents the inhibition zone's diameter in mm and 1%, 0.5%, and 0.25% are concentrations of EUG in DMSO. This result shows that it is also affected by EUG at all three concentrations, where it is badly affected by 1% solution and both 0.5% and 0.25% solutions, so EUG is also effective against this fungal species.

Value of MBC and MFC

From table no. 3, we can say that the MBC values of Tb4 and Tb5 lie in the range of 1% to 0.0078% EUG. We can also say that all others lie outside the test range of EUG concentrations. Eugenol displayed a broad range of antibacterial activity against the test pathogens, with MIC values ranging from 0.0312 to 8 g/ml (Jeyakumar & Lawrence, 2021). The EUG had a 2-4-fold higher matching MBC. The MIC values of *Stapgylococcusaureus* (ATCC 6538) and MRSA were established accordingly at 0.1 mg/ml and 0.1 to 0.15 mg/ml, respectively (Apolonio et al., 2014).

In an in vitro investigation, clove oil and eugenol had MBCs of 40 and 25 g/ml for *Bacillus cereus*, respectively, and also, according to this study, the inhibitory action of eugenol against *E. coli, Salmonella, P. aeruginosa, and L. monocytogenes* (Hu et al., 2018). The MIC value for the fungus *Aspergillusniger* is greater than 2000 g/ml (Filocamo et al., 2015).

Conclusion

From the results of experiment, it is clear thateuginol is an effective anti-microbial phytochemical. This can affect the microbes, i.e., bacteria as well as fungus. It is found that EUG in different concentrations shows inhibitory activity towards different human pathogenic bacteria as well as fungi to a variable extent. The test microbial organisms were both gram-positive and gram-negative bacteria as well as fungi. Gram-negative bacteria were *E. coli, Salmonella typhi, Pseudomonas aeruginosa, Klebsiellapneumoniae, and Shigellasonnie*. Gram-positive bacteria were *Bacillus spp., Streptococcus pyogenes*, and methicillin-resistant *Staphylococcus aureus* (MRSA), and one fungal species, *Aspergillus spp.*, was taken. In this test, Gram-negative bacteria were badly affected by all three concentrations of eugenol, but Gram-positive bacteria Tb6 and Tb8 were affected by only two higher concentrations. From this result, we can say that EUG is more effective against gram-negative bacteria to gram-positive bacteria.

Also, it is an amazing anti-fungal phytochemical; in this experiment, Aspergillus was badly affected.

Finally, it can be concluded that clove bud is a source of eugenol which is costly. The cost of EUG becomes Rs. 50 per ml without adding the cost of extraction and purification. Clove buds contain about 13% clove oils by weight, and from these oils, about 49% eugenol can be recovered. The phytochemical research has opened up a new perspective in pharmaceutical research, and it can be used for the development of potential novel anti-microbial agents for the treatment of bacterial as well as fungal diseases. The incorporation of this eugenol into drugs as well as food formulations is urgent. The biopharmaceutical industry is in need of eco-friendly alternatives as well as antibiotic-resistant alternatives for the treatment of diseases caused by human pathogenic bacteria and fungi. So, it could be a prospective source of alternative antimicrobial agents and may play an important role in the discovery of new drugs.

Acknowledgement

We are thankful to Sukuna Multiple Campus and Central Campus of Technology, Hattisar Dharan for providing laboratory help during experiment. Especially we would like to thanks Mrs. Bijaya Laxmi Maharjan (assistant professor of Central Campus of Technology, Hattisar Dharan) for guiding me during antimicrobial test and providing IR data of sample using Amrit Science Campus chemistry department.

References

Apolonio, J., Faleiro, M.L., Miguel, M.G., & Neto, L. (2014*). No induction of antimicrobial resistance in Staphylococcus aureus and Listeria monocytogenes during continuous exposure to eugenol and citral*. FEMS Microbiology let.

Filocamo, A., Bisignano, C., Mandalari, G. and Navarra, M. (2015). *In vitro antimicrobial activity and effect on biofilm production of a white grape juice (Vitisvinifera) extract*.hindawi.

Guilfoile, P.G. (2006). *Antibiotic-resistance bacteria.* Chelsea house.

Hu, Q., Zhou, M. & Wei, S. (2018). *Progress on the Antimicrobial activity research of clove oil and Euginol in the food antisepsis field*. Journal of food science.

Jeyakumar, G.E., & Lawrence, R. (2021). *Mechanism of bactericidal action of euginol against Eschericha coli*. Journal of herbal medicine.

Kamatou, G.P., Vermaak, I., & Viljoen, A.M. (2012). Eugenol--from the remote Maluku Islands to the international market place: a review of a remarkable and versatile molecule. *Molecules*. Jun 6;17(6):6953-81. doi:10.3390/molecules17066953. PMID: 22728369; PMCID: PMC6268661.

Khadka, N.M., Gautham, S.D., & Yadav, P.N. (2018). *A core experimental chemistry.* Heritage publishers and distributors Pvt. Ltd.

Khalil, A.A., Rahman, U., Khan, M.R., Sahar, A., Mehmood, T., & Khan, M. (2017). *Essential oil eugenol: source, extraction techniques and nutraceutical perspectives*. The Royal Society of Chemistry.

Levy, S.B., & Marshall, B. (2004). *Antibacterial resistance worldwide: Cause, challenges and responces.* Nature Medicine.

Levy, S.T. (2005). *Antibiotic resistance: the problem intensities.* ScienceDirect.

Nejad, S.M., Ozgunes, H., & Basaran, N. (2017). *Pharmacological and Toxicological properties of Eugenol.* Turk J Pharm Sci.

Nurdjannah, N., & Bermawie, N. (2012). *Coves*. Wood head publishing limited.

Patra, A.K. (2012). *An overview of antimicrobial properties of different classes of phytochemicals*. Dietry phytochemicals and microbes.

Silva, F.F., Monte, F.J., Lemos, T.L., Nascimento, P.G., Costa, A. K., & Paiva, L.M. (2018). *Eugenol derivatives: synthesis, characterization, and evalution of antimicrobial and antioxidant activities*. Chemistry Central Journal.

Xu, J.G., Liu, T., Hu, Q. P., & Cao, X.M. (2016). *Chemical composition antibacterial properties and mechanism of action of essential oil from clove buds against Staphylococcus aureus.* Molecules.

Appendix

Table 2

Zone of inhibition in mm against test bacteria

Sample concentration(v/v)	**Gram-negative bacterias**					**Gram-positive bacterias**		
%	Tb1	Tb2	Tb3	Tb4	Tb5	Tb6	Tb7	Tb8
1%	12	18	18	10	13	18	15	14.2
0.5%	11	12	18	9	12.25	12	14.66	10.75
0.25%	10	9	10	8	8.5	0	10.5	0

Tb1: *Escherichaicoli*, Tb2: *Salmonellatyphi*,
Tb3: *Pseudomonas aeruginosa*, Tb4: *Klebsiellapneumoniae*,
Tb5: *Shigellasonnie*, Tb6: *Bacillus*,
Tb7: *Streptoccuspyogenes*, Tb8: MRSA

Table 3

Zone of inhibition in mm against test fungus

Sample concentration (v/v) %	**Fungus (Tf_1)**
1%	22
0.5%	21
0.25%	10

Table 4

The value of MBC & MFC in the range of 1% to 0.0078%

Gram-negative Bacteria	Concentrations							
	1 %	0.5 %	0.25 %	0.125 %	0.0625 %	0.0312 %	0.0156 %	0.0078 %
Shigellasonnei								
Salmonella typhi								
Pseudomonas aeruginosa								
Klebsiella pneumoniae								
Escherichia coli								
Gram-positive Bacetria								
Bacillus spp.								
Streptococcus pyogenes								
MRSA								
Fungus								
Aspergillus								
	Yellow colour means no any grown microbes Black colour means fully grown microbes							

Academic Journal of Sukuna – AJoS, A Peer-reviewed Interdisciplinary Journal
Volume 5 (Issue 1) 2025 July (2082 Ashad), Pp. 180 – 205, ISSN 2594-3138 (Print)
Research Management Cell (RMC – Sukuna), Sundarharaincha, Morang

पर्याप्रेमको गुञ्जनमा पर्यावरणीय चेतना

Doi: https://doi.org/10.3126/ajos.v5i1.81993

एकनारायण पौड्याल, विद्यावारिधि[१]

[१]सहप्राध्यापक, वीरेन्द्र बहुमुखी क्याम्पस, चितवन

Email: enpaudyal@gmail.com

लेखसार

यस अनुसन्धानात्मक लेखमा कृष्ण बाउसेको कवितासङ्ग्रह पर्याप्रेमको गुञ्जनमा सङ्गृहीत कविताहरूको पर्यावरणीय चेतनाका दृष्टिले अध्ययन गरिएको छ । पर्यावरणीय चेतना साहित्यमा पर्यावरणको चित्रण के कसरी गरिएको छ भन्ने कुराको खोजसँग सम्बन्धित अवधारणा हो । यो सिद्धान्त प्रकृतिको संरक्षणसँग जोडिएको छ । यस अध्ययनमा पर्याप्रेमको गुञ्जनलाई विश्लेष्य कृतिका रूपमा लिइएको छ र यो प्राथमिक सामग्रीका रूपमा रहेको छ । पर्यावरणीय चेतनाका सम्बन्धमा लेखिएका लेख तथा पुस्तकहरू द्वितीयक सामग्रीका रूपमा रहेका छन् । गुणात्मक प्रकृतिको यस अध्ययनमा व्याख्यात्मक तथा विश्लेषणात्मक विधि अवलम्बन गरिएको छ । कविताको अध्ययनबाट प्राप्त तथ्यका आधारमा पर्यावरणीय चेतनाका प्रकार निर्धारण गरिएकाले यहाँ आगमनात्मक विधि प्रयोग भएको छ । जुन कवितामा जुन प्रकारको पर्यावरणीय चेत देखाइएको छ त्यसको पुष्टिका लागि कविताबाट साक्ष्य प्रस्तुत गरिएको छ । प्रस्तुत सङ्ग्रहका कवितामा पर्यावरणीय चेत केकस्तो देखिन्छ भन्ने मुख्य समस्याको समाधानमा केन्द्रित यस अध्ययनमा दूषित पर्यावरणको सर्वत्र असर परेकामा चिन्ता, प्रकृति र मानवका बिच सहअस्तित्वको अपेक्षा, प्रकृति विनाशकप्रति व्यङ्ग्य, पर्याप्रेम र पर्यावरण संरक्षणप्रतिको प्रतिबद्धता एवं मानवेतर प्राणीसँगको सहअस्तित्वबोधको चेत पाइने र यिनका आधारमा हेर्दा कृति पर्यावरणमा नै केन्द्रित रहेको अनि पर्यावरणीय चेतनाका दृष्टिले

प्रभावकारी तथा उल्लेखनीय भएको निष्कर्ष निकालिएको छ । यसका साथै सङ्ग्रहका कविताहरूले समस्याको मुख्य कारक मानिस भएको र यसको समाधान पनि मानिसले नै गर्न सक्ने भएकाले मानिस सकारात्मक भएर पर्यावरण संरक्षणमा लाग्नुपर्ने सन्देश दिएको कुरालाई पनि निष्कर्षका रूपमा देखाइएको छ ।

शब्दकुञ्जी : गुञ्जन, चेत, पर्यावरण, पर्यावरणवाद, वातावरणीय ।

विषयपरिचय

कृष्ण बाउसे (२०१३) बहुमुखी व्यक्तित्व भएका स्रष्टा हुन् । उनका *प्रेरणाका गीतहरू* (२०३९, गीतसङ्ग्रह), *यस्तो उद्घोष गर्छु* (२०५७, कवितासङ्ग्रह), *देशको खबर* (२०६२, मुक्तकसङ्ग्रह), *नानीको रहर* (२०६७, बालकवितासङ्ग्रह) आदि दर्जनाधिक कृति प्रकाशित छन् । यी कृतिहरूले बाउसेलाई मूलतः कविका रूपमा चिनाएका छन् । उनी नेपाली साहित्यमा कविका साथै बालसाहित्यकारका रूपमा परिचित छन् । समसामयिक परिवेश समेटेर सरल भाषामा कविता रचना गर्ने बाउसे युगबोधी चेत भएका स्रष्टा हुन् । त्यसैको एउटा प्रमाणका रूपमा *पर्याप्रेमको गुञ्जन* (२०८०, कवितासङ्ग्रह) रहेको छ । यसमा जम्मा बाउन्नवटा कविता रहेका छन् र ती सबै कविताहरू वर्तमान समयमा एक जटिल समस्याका रूपमा रहेको विषय पर्यावरणसँग जोडिएका छन् ।

पर्यावरण दिनानुदिन बिग्रँदै गइरहेका कारण वर्तमान समयमा पर्यावरण जोगाउनु विश्वलाई नै एउटा चुनौतीको विषय भएको छ । यस कार्यमा पर्यावरणविद् र विभिन्न सङ्घसंस्था लागिपरेका छन् । यसका साथै साहित्यकारहरूले पनि विभिन्न विधाका रचनामा पर्यावरणलाई विषय बनाई लेखेका छन् । यसक्रममा उनीहरूले वातावरण दूषित बन्नाका कारणहरू र प्राणी तथा विश्वजगत्का यावत् वस्तुमा त्यसको असर परेको कुरा चित्रण गर्नाका साथै समाधानका उपायसमेत सुझाएका छन् । बाउसेको *पर्याप्रेमको गुञ्जन* पनि तिनै कृतिहरूमध्ये एक उल्लेखनीय कविताकृति हो । कृतिभित्रका सबै कविता पर्यावरणकेन्द्री

भएकाले सङ्गृहीत सबै कविता पर्यावरणीय समालोचनाका आधारमा विश्लेषणीय देखिन्छन् र यसो गर्दा कृतिको कथ्यप्रति न्याय हुने देखिन्छ । यसअघि पेशल पोखरेल (२०८१) ले 'पर्यासाहित्यमा चासो राख्नेहरूका लागि लोभलाग्दो मार्गदर्शन पर्याप्रेमेमको गुञ्जन' शीर्षकको लेखमा यस कृतिलाई पर्यावरणसँग जोडेर हेरेका छन् तापनि यो छोटो लेख पुस्तकपरिचयका रूपमा रहेको छ । यसरी नै *साहित्य पोस्ट, १२ खरी* आदि विद्युतीय पत्रिकामा पनि परिचयात्मक लेख प्रकाशनमा आएका पाइन्छन् तर अनुसन्धान गरी विस्तृत रूपमा विश्लेषण गरी लेखिएका लेख-समालोचना पाइँदैनन् । यसरी पर्यावरणीय साहित्यका दृष्टिले प्रस्तुत कृति महत्त्वपूर्ण भइकन पनि यसअघि गहन अध्ययन नभएकाले यो कृति चयन गरिएको हो र विश्लेषणका लागि पर्यावरणीय समालोचनालाई आधार बनाइएको हो । यस कृतिमा पर्यावरणीय समस्यालाई के कस्तो रूपमा देखाइएको छ भन्ने मुख्य समस्या र यसको प्राज्ञिक समाधानमा केन्द्रित यस अध्ययनबाट पर्यावरणीय साहित्य र त्यसको विश्लेषण गर्ने ढाँचाका बारेमा जोकोही इच्छुक व्यक्तिलाई केही न केही आधार प्राप्त हुनेछ भन्ने विश्वास लिइएको छ ।

विधि र सामग्री

यस अनुसन्धानमा प्राथमिक र द्वितीयक दुवै स्रोतका सामग्री प्रयोग गरिएको छ । गृहीत सामग्रीहरूमध्ये विश्लेषित कवितासङ्ग्रह *पर्याप्रेमको गुञ्जन*लाई प्राथमिक सामग्रीका रूपमा लिइएको छ भने पर्यावरण र पर्यावरणीय समालोचनासँग सम्बन्धित सामग्रीलाई द्वितीयक स्रोतका रूपमा ग्रहण गरिएको छ । गुणात्मक प्रकृतिको यस अध्ययनमा व्याख्यात्मक तथा विश्लेषणात्मक र आगमनात्मक विधि अवलम्बन गरिएको छ । विश्लेषणका क्रममा पाठबाट साक्ष्यका रूपमा कवितांश उद्धरण गरी सोदाहरण प्रस्तुत गरिएको छ ।

सैद्धान्तिक पर्याधार

पर्यावरणलाई आधार बनाएर सिर्जना गरिने साहित्यलाई पर्यावरणीय साहित्य भनिन्छ भने पर्यावरणका कोणबाट रचनाको अध्ययन गर्ने समालोचना पद्धतिलाई पर्यावरणीय

समालोचना भनिन्छ । पर्यावरणीय समालोचना भन्नाले साहित्य र भौतिक वातावरणका बिचको सम्बन्धको अध्ययन भन्ने बुझिन्छ (बेरी, सन् २००२, पृ.२४८) । अझ स्पष्ट रूपमा भन्दा "प्रकृतिलाई नै एउटा पुस्तकका रूपमा लिई प्रकृतिमा रहेका मानवेतर प्राणी तथा निर्जीव पदार्थबिचको सम्बन्धको अध्ययन गर्ने समालोचनालाई पर्यावरणीय समालोचना भनिन्छ" (त्रिपाठी, २०८०, पृ.७१) । यसलाई मानव र मानवेतर जगत्का बिचको अध्ययन भनेर पनि बुझिन्छ (चाइल्डस् र फोउलर, सन् २००८, पृ.६५) । पर्यावरणीय समालोचना अङ्ग्रेजी इकोक्रिटिसिज्मको नेपाली रूपान्तर हो । यो समालोचना हरित अध्ययन, वातावरणीय समालोचना आदि नामले पनि चिनिन्छ । प्रकृति र प्राकृतिक तथा भौतिक वातावरणलाई विषय बनाएर साहित्य लेख्ने परम्परा धेरै पुरानो भए पनि प्राकृतिक वस्तुको संरक्षण र वातावरणमा शुद्धता कायम हुनुपर्ने मान्यता राखेर सिर्जना गर्ने वा समालोचना लेख्ने कार्यको थालनी भने सन् १९८० को दशकतिरबाट भएको हो (पौड्याल, २०७०, पृ.११४) । यसले मानव र मानवेतर सबै जीव र वनस्पतिको समान अस्तित्वमा जोड दिन्छ ।

पर्यावरण शब्दले सन्दर्भअनुसार फरक फरक अर्थ दिए पनि सामान्यत: प्रत्यक्ष वा परोक्ष रूपले प्रभाव पार्ने आसपासको अवस्था वा परिस्थिति भन्ने जनाउँछ । यो मनुष्यद्वारा निर्मित र प्राकृतिक गरी दुई प्रकारको हुन्छ । निर्मित पर्यावरणअन्तर्गत सामाजिक, आर्थिक, सांस्कृतिक आदि विषयक्षेत्र पर्दछन् भने प्राकृतिक पर्यावरणअन्तर्गत हिमाल, पहाड, जलवायु, पशुपक्षी, आदि पर्दछन् (गौतम, २०६४, पृ.२४६) । पर्यावरणीय समलोचनाले यही दोस्रो प्रकारको वातावरणसँग सम्बन्ध राख्दछ । सामाजिक पर्यावरणवादले पहिलो पर्यावरण ठिक भए मात्र दोस्रो स्वच्छ हुने मान्यता राख्दछ र यसले पनि सामाजिक, राजनीतिक आदि वातावरणमा सुधार नआउँदासम्म जैविक वा प्राकृतिक पर्यावरणमा सुधार नआउने धारणा राख्दछ तथापि यसले प्राकृतिक पर्यावरणलाई नै मुख्य रूपमा हेर्दछ । पर्यावरणवाद अर्थात् वातावरणवाद पर्यावरण विनाशको खतराबाट उत्पन्न प्रतिक्रियास्वरूप जन्मेको हो (केरिड्ज्, सन् २००६,

पृ.५३२) र यसले पर्यारणविज्ञानको सहायता लिएर प्राणी वा जीवित वस्तुहरूको पर्यावरणसँगको सम्बन्धअध्ययनगर्दछ।

पर्यावरणवाद सुरुमा वनजङ्गल विनाशका पृष्ठभूमिमा सुरु भएको आन्दोलन भए पनि पछि यो मानव र पर्यावरणबिचको सम्बन्ध र पर्यावरणले समस्त मानवजीवन तथा प्रकृतिमा पार्ने प्रभावको पनि अध्ययन गर्ने विषय वा चिन्तनका रूपमा देखापऱ्यो साथै वर्तमान समयमा धरतीको रक्षा गर्ने मानवीय अभियानका रूपमा स्थापित भयो (भट्टराई, २०६५/०६६, पृ.१५७) । यसैले पर्यावरणीय समालोचना पर्यावरणवादसँग सम्बन्धित छ । दुवैले पर्यावरणको अध्ययन गर्ने भए पनि पर्यावरणवादले विज्ञानका सहायताबाट धुवाँको तह, धूलकणको मात्रा, हावा र पानीमा रासायनिक पदार्थको असर आदि कुराका साथै खतराको तह र विश्वतापमान कसरी बढ्दै छ भन्नेजस्ता कुराको अध्ययन गर्दछ (भट्टराई, २०६४, पृ.२०२) भने पर्यावरणीय समालोचनाले मुख्यत: पर्यावरणीय काव्यशास्त्रले बताएअनुसार पर्यावरणलाई ध्यानमा राखेर लेखिएका साहित्यिक कृतिको वातावरणीय कोणबाट अध्ययन, विश्लेषण र मूल्याङ्कन गर्दछ । यसबाट के कुरा बुझिन्छ भने मानवीय संस्कृति र समाजको प्राकृतिक जगत्सँग केकस्तो सम्बन्ध छ भनेर प्रस्ट्याउने साहित्यिक र सांस्कृतिक अध्ययन नै पर्यावरणीय समालोचना हो (गौतम, २०६४, पृ.३२५) ।यसले प्रकृतिसँगको असल र खराब दुवै किसिमको सम्बन्ध हेर्दछ ।

पर्यावरणवादले वन र उर्वरभूमि विनाश गरी बस्ती बसाउने, नदीनालाहरूमा उद्योगका दूषित पदार्थ र ढल मिसाउने, मापदण्ड पूरा नगरेका उद्योग र यातायातका साधनले वायुमण्डल दूषित बनाउने, डढेलो लगाउने, सिकार खेल्ने, हरेक कुरामा विषादिको प्रयोग गर्नेजस्ता कार्यबाट मानव, अन्य प्राणी तथा प्रकृतिलाई नै नोक्सान पुग्ने भएकाले यसको विरोध गर्दछ अनि पर्यावरणीय साहित्यले पर्यावरणवादकै सहायताद्वारा यसको सुरक्षा वा विनाशलाई देखाउँछ भने पर्यावरणीय समालोचनाले कृतिमा पर्यावरण अनुकूल वा प्रतिकूल कुन रूपमा चित्रित छ भनी हेर्दछ । वातावरणको प्रतिकूलता मापनका लागि विज्ञान, सूचनाप्रविधि आदिको सहयोग लिने हुँदा

यो अत्याधुनिक र वस्तुगत समालोचनाका रूपमा देखिन्छ । पर्यावरणीय साहित्यले पर्यावरणवादले जस्तै जैविक विविधताको ह्रास, विभिन्न जाति प्रजातिका प्राणी र वनस्पतिको लोप, ओजन तहको क्षय, भूक्षय, अनावृष्टि, अतिवृष्टि, खण्डवृष्टि, बसाइँसराइ, भोकमरी र महामारीसमस्या, अति शीत वा उष्ण तापक्रम, ज्वालामुखी, सुनामी, बाढी, पहिरो आदि वातावरणीय असरका पक्षहरूलाई देखाउँछ । यिनका अतिरिक्त पर्यावरणीय साहित्यमा ग्राम्यता र अप्रदूषित परिवेश, जलवायु परिवर्तन, जैविक विविधता, वन्यजन्तु चोरीसिकारी, पर्यावरणसँग आदिवासीको साइनो, पर्यानारीवाद, धर्मशास्त्र र पर्यावरणीय चेत, पर्याराजनीति आदि विषयका रूपमा आउन सक्दछन् (हितान, २०८०, पृ.५०-५२) ।पर्यावरणीय समालोचनाले कृतिभित्र यिनै कुरा केकति र कसरी व्यक्त गरिएको छ भनी हेर्दछ । यसको सम्बन्ध कृतिका बाह्य पक्षसँग नभई आन्तरिक पक्षसँग हुन्छ । यसले नारीवाद र मार्क्सवादले जस्तै राजनीतिक चेतनाका आधारले हाम्रो पर्यावरण र प्राकृतिकताको विश्लेषण गर्दछ र यसमा विज्ञान र सामाजिक, सांस्कृतिक, राजनीतिक, नैतिक, कानुनी आदि सबै चेतना जोडिन्छन् (भट्टराई, २०६४, पृ.१९७-१९८) । अतः यो महत्त्वपूर्ण समालोचनाका रूपमा मान्य छ ।

प्रकृतिलाई सौन्दर्य र मानवीय हितसँग जोडेर साहित्य लेख्ने परम्परा धेरै अघिदेखि चलेको पाइन्छ । कालिदासका *शाकुन्तलम्, मेघदूत* आदि काव्य यसका नमुना हुन् । यसरी पहिला पनि प्रकृतिलाई विषय बनाएर लेखिएको देखिन्छ तथापि उहिले र अहिलेको उद्देश्यमा फरक रहेको छ । पहिला मानवीकरण गरेर र मानवकेन्द्री दृष्टिबाट प्रकृतिलाई हेरिन्थ्यो र त्यो दृष्टि मानववादी एवम् स्वच्छन्दतावादी थियो । आजभोलि प्रकृतिलाई उसैको स्वतन्त्र सत्ता स्वीकार गरेर लेखिन्छ । आज प्रकृतिले मानवलाई कति सहयोग पुऱ्याएको छ भन्ने मात्र नहेरी मानिसले उसको हित वा अहित के गरेको छ भनेर पनि हेरिन्छ (पौड्याल, २०७०, पृ.११७) । आजभोलि मानिसलाई नभई प्रकृतिलाई केन्द्रमा राखेर उसको सुरक्षार्थ लेखिनुपर्ने कुरामा जोड दिइन्छ (सुब्बा, २०८०, पृ.५९) । यसरी प्रकृतिजगत्लाई केन्द्रमा राखेर गरिने अध्ययनको सिद्धान्त नै पर्यावरणीय समालोचना हो ।

साहित्यिक कृतिदेखि बाहिरका सन्दर्भमा पर्यावरणको अध्ययन गर्ने कार्य पर्यावरण विज्ञान, जलवायु विज्ञान, स्वास्थ्य विज्ञान आदि शास्त्रले गर्दछन् भने कृतिमा वर्णित पर्यावरणको अध्ययन गर्ने कार्य पर्यावरणीय समालोचनाले गर्दछ । यसलाई पर्यावरण अर्थात् वातावरणदर्शनको पनि सहयोग प्राप्त छ । प्रकृति वा वातावरणले मानिसलाई नियन्त्रण गर्दछ, मानिस प्रकृतिको नियामक हो र मानिस एवम् प्रकृति सहयात्री हुन् भन्ने वातावरणदर्शनका तीनवटा मान्यता रहेका छन् (गौतम, २०६४, पृ.२४९-२५०) । अघिल्ला दुई मान्यता अतिवादी देखिन्छन् भने तेस्रो मान्यता समवन्यवादी देखिन्छ र पर्यावरणीय समालोचनाले यही तेस्रो मान्यतामा जोड दिन्छ । पुनर्जागरण कालदेखि अठारौँ शताब्दीको बुद्धिवादी युगसम्म आइपुग्दा मानिसले कलकारखाना, उद्योगधन्दा, औपनिवेशिकता आदिमार्फत प्रकृतिमाथि विजय प्राप्त गऱ्यो भने उन्नाइसौँ शताब्दीको स्वच्छन्दतावादी युगसँगै विज्ञानको विरोध र प्रकृतिको स्वायत्तताको उदय भए पनि पर्यावरणविनाशको विरोध र प्रदूषणको नियन्त्रण गर्नेतिर चासो राखेन । द्वितीय विश्वयुद्धपछि र अझ खासगरी बिसौँ शताब्दीको अन्तिम दशकतिरदेखि प्रकृतिसित सामञ्जस्य राखेर मात्र समाजको स्वस्थ विकास हुन्छ भन्ने मान्यताले स्थान पाएको हो (गौतम, २०६४, पृ.३२५) । यसै पृष्ठभूमिमा पर्यावरणीय समालोचनाको जन्म भएको हो ।

पर्यावरणीय चेतनाको विकास दोस्रो विश्वयुद्धपछि लगत्तै सुरु भएको मानिए पनि सन् १९६२ मा प्रकाशित रचेल कार्सनको *साइलेन्ट स्प्रिङ* कृतिमा यसको स्पष्ट स्वरूप देखिएको हो । यो काव्यात्मक शैलीमा लेखिएको कल्पित कथा हो र यसमा रचेलले डिडिटीका प्रयोगले भविष्यमा हुन सक्ने विनाशको सम्भावनालाई देखाएकी छन् (भट्टराई, २०६४, पृ.१९६-१९७) । यसरी दोस्रो विश्वयुद्धदेखि नै पर्यावरणीय चेतनाको थालनी भए पनि सन् १९७० को दशकसम्म इकोलोजी र इकोक्रिटिसिज्म साहित्यमा त्यति सार्थक नदेखिएकामा पछि तिनलाई पुनर्जीवित गर्दै समालोचनामा समाहित गर्ने काम चेरिल ग्लोट्फेल्टीले गरेकी हुन् (बेरी, सन् २००२, पृ.२४९) । यस समालोचनाको प्रारम्भ अमेरिकामा सन् १९८० र बेलायतमा सन्

१९९० को दशकदेखि भए पनि खास गरी नब्बेको दशकदेखि अमेरिकाबाट विकासशील एक बौद्धिक आन्दोलनका रूपमा देखापरेको हो (बेरी, सन् २००२, पृ.२४८)। लरेन्स ब्युलको *द इन्भारमेन्टल इमाजिनेसन* (सन् १९९५) वातावरणीय समालोचनाको मानक ग्रन्थ मानिन्छ र यसमा उनले प्रकृतिको इतिहासभित्रै मानवइतिहास अन्तर्निहित हुने अर्थात् मानव र मानवेतरको भेद नरहने, मानवबाहेक अरूका पनि इच्छा हुन्छन् भन्ने स्वीकार गर्नुपर्ने, वातावरणलाई मानवका लागि प्रदत्त वस्तु नसम्झेर परिवर्तनशील र संरक्षण खोज्ने अस्तित्व हो भन्ने सम्झनुपर्नेजस्ता अनेक धारणा राखेका छन् (भट्टराई, २०६४, पृ.२०४-२०५)। यसरी दोस्रो विश्वयुद्धपछि पृष्ठभूमि तयार भई असी र नब्बेका दशकदेखि अमेरिका र बेलायतबाट विकसित यो समालोचना एक्काइसौँ शताब्दीको पहिलो दशकदेखि अझ विस्तारित भएर अन्यत्र पनि फैलिएको छ। यसका खास खास कार्य वा मान्यताअन्तर्गत कृतिहरूको वातावरणीय दृष्टिकोणबाट तिनमा रहेका प्राकृतिक पक्षलाई ध्यानमा राखी पठन गर्नु, प्रकृतिलाई मुख्य पृष्ठाधार बनाएर लेखिएका कृतिको पठनमा जोड दिनु, प्राकृतिक स्रोतसाधनको उपयोग मानवका लागि मात्र नभनेर तिनीहरूको स्वतन्त्र अस्तित्व स्वीकार गरी कृतिभित्र त्यसको खोजी गर्नु, स्थापित परम्परा कसरी, किन र कुन कारणले विस्थापित हुँदैछ भन्ने कुरा हेर्नु, मानव, अन्य प्राणी, वनस्पति र प्रकृतिका विविध वस्तुलाई मानव व्यवहारबाट केकसरी र केकति बाधा पुऱ्याइएको छ भनी अध्ययन गर्नु, पर्यावरणीय दृष्टिले कति उपयोगी र अनुपयोगी छ भनी विश्लेषण र मूल्याङ्कन गर्नु आदि कुराहरू पर्दछन्। प्रस्तुत अध्ययनमा पर्यावरणीय समस्यासँग सम्बन्धित 'दूषित पर्यावरणको सर्वत्र असर परेकामा चिन्ता', 'प्रकृति र मानवका बिच सहअस्तित्वको अपेक्षा', 'प्रकृति विनाशकप्रति व्यङ्ग्य', 'पर्याप्रेम र पर्यावरण संरक्षणप्रतिको प्रतिबद्धता' अनि 'मानवेतर प्राणीसँगको सहअस्तित्वबोध' गरी पाँचवटा चर निर्धारण गरी गृहीत कवितासङ्ग्रहको अध्ययन गरिएको छ।

नतिजा र छलफल

कृष्ण बाउसेद्वारा रचित कविताहरूको सङ्ग्रह *पर्याप्रेमको गुञ्जन* पर्यावरणमा केन्द्रित कविताकृति हो । यसमा फूलको प्रश्न, पर्याप्रेमको गुञ्जन, उत्पीडित संसारको बेहोस मान्छेसँग, मलाई आरक्षित गरिराख, विकासको जहर !, विनाशविरुद्धको सङ्कल्प, शोषण र आतङ्क, जूनमायाको हाँसो, उसले आकाशमा विष घोलिरहँदा, परिवेशको जवानी !, पृथ्वीको चिन्ता आदि बाउन्नवटा कविता सङ्गृहीत छन् । यी सबै कविता पर्यावरणीय विषयसँग जोडिएका छन् । सङ्गृहीत कविताहरूमा पर्यावरण दूषित बनाउने तत्त्व धेरै भए पनि यसको मूल कारक मानिस नै भएको बताइएको छ र अब यसको संरक्षणमा पनि मानिस नै लाग्नुपर्ने भाव व्यक्त गरिएको छ । पर्यावरण दूषित भएबाट जमिन, जल र वायुलाई मात्र असर नपरी समस्त प्राणी र वनस्पतिलाई समेत प्रतिकूल असर पर्ने भएकाले यस दिशामा सबैले विशेष ध्यान दिनुपर्ने समग्र कविताहरूको निष्कर्ष रहेको छ । कवितामा पर्यावरणका दृष्टिले निम्नलिखित किसिमका विशेषता पाइन्छन् :

दूषित पर्यावरणको सर्वत्र असर परेकामा चिन्ता

प्रस्तुत कवितासङ्ग्रहमा रहेका बाउन्नवटा कविताहरूमध्ये सबभन्दा धेरै कविता दूषित पर्यावरणका कारण सबै क्षेत्रमा प्रतिकूल असर परेको छ भन्ने भावसन्दर्भमा केन्द्रित छन् । कवितामा सबै क्षेत्र प्रदूषणबाट प्रभावित भइरहेका कारण गहिरो चिन्ता प्रकट गरिएको छ । भौतिक सुख र उन्नतिका नाममा जेजस्ता कार्य भइरहेका छन् तिनबाट प्राकृतिक सुन्दरता विनष्ट भइरहेको, जमिन, जल र वायुमण्डल प्रदूषित हुँदै गइरहेको र विश्वमा भइरहेका युद्धबाट पनि पर्यावरणमा असर परिरहेको धारणा व्यक्त गरिएको छ । कवितामा प्राकृतिक सुन्दरताको विनाश भइरहेकामा यसरी चिन्ता प्रकट गरिएको छ :

भिरालो नै ठिक छु म
उकालो ओरालो नै ठिक छु म

म त साङ्ग्रिलादेश !

म त आफैँभित्र रमाएको खप्तडको लेक !

ए बुलडोजर !

ए धृतराष्ट्र !

ए साहुकार !

सम्बन्ध नै तोड बरु

तर, मेरो परिवेशलाई नधमिल्याऊ !

कृपया मलाई

तिम्रो कथित विकासको जहर नपिलाऊ ! (विकासको जहर, पृ.३१)

नेपालको अधिकांश जमिन हिमाली र पहाडी क्षेत्रले ओगटेका कारण यहाँ तराईबाहेक जता गए पनि उकाली, ओराली, देउराली र भन्ज्याङ पाइन्छन् । उब्जाउका दृष्टिले तराई-फाँटको पनि आफ्नै प्रकारको सौन्दर्य छ । प्रकृतिले दिएको यस सौन्दर्यलाई मानिसले ठुला ठुला यन्त्रद्वारा विनाश गरिरहेका र यसबाट पृथ्वीको सौन्दर्य गुम्नाका साथै धेरै हानि पनि भएकाले मानिससँग पृथ्वीको पुकार छ कि म जेजस्तो छु त्यसैमा खुसी छु । यसकारण मेरो सुन्दर परिवेशलाई विकासका नाममा ध्वस्त नपार । यो एकप्रकारको विष हो । मलाई आफैँभित्र रमाउन देऊ । यसरी पृथ्वीले मानिससँग आफ्नो प्राकृतिक सुन्दरता बिग्रेकामा दुःख पोखेको भाव व्यक्त भएको पाइन्छ । यसरी नै हावा र पानी दूषित बनाइएकामा पनि यस किसिमको प्रश्न गरिएको छ :

उडाएर कालो धुवाँ धरती र आकाशमा
उद्योगले हावालाई विष बनाइदिन्छ किन ?
ऐँसेलुको झाङमुनि जन्मथलो भए पनि
त्यही नदी सहरमा ढलमती हुन्छ किन ? (म नै मेरो दुष्ट भएँ, पृ.१४१-१४२)

उद्योग तथा कलकारखानाका विकासले केही हदसम्म भौतिक सुखसुविधा भएको देखिए पनि यसले धरती र आकाशको वातावरण बिगारेको छ । पहाडबाट स्वच्छ र सफा रूपमा बग्दै आएका नदीनाला सहरमा आएपछि ती खोला वा नदी नदीजस्ता स्वच्छ र सफा नदेखिई ढलजस्ता देखिन थालेका छन् । यसकारण मानिसको मात्र होइन अन्य प्राणी र वनस्पति आदि प्राकृतिक वस्तुको जीवनचक्र पनि खतरामा परेको छ । नेपालमा डढेलाले पनि उत्तिकै रूपमा वन्यसम्पदा र जङ्गली जनावर तथा पक्षीको विनाश गरिरहेको छ । यस कुरालाई कवितामा यसरी चित्रण गरिएको छ :

“डढेलो नलगाऊ !” भन्दाभन्दै थकित भैसकिन् प्रकृति ।
“धुवाँ नबढाऊ !” भन्दाभन्दै थकित भैसकिन् प्रकृति ।
“पहाड त हो भनेर मेरो आङमा
जथाभावी घाउ नलगाऊ !” भन्दाभन्दै
थकित भैसकिन् प्रकृति ।
.... मान्छे हुनुको अर्थ लगाउँदालगाउँदै
थकित थकित भैसकिन् प्रकृति । (विनाशको वृत्तचित्र, पृ.१६३-१६४)

यसरी डढेलो, धुवाँ, अनावश्यक रूपमा पहाडको ध्वस्तता आदि कारणले पर्यावरण बिग्रिएको र सचेत प्राणी मानिएको मानिसलाई यस्ता विषयबारे सम्झाउँदासम्झाउँदै प्रकृति थकित भइसकेको जनाइएको छ । यो एक किसिमको मानिसप्रतिको व्यङ्ग्य पनि हो । यस्तै अर्को कवितामा प्लास्टिकले पारेको असरलाई यसरी देखाइएको छ :

टाउकोमा हात राखेर
पछुतो गरिरहेको छु यस बेला-
गाउँकै लतिकालाई लत्याएर
वनकी लतिकालाई नपत्याएर

किन हुरुक्कै भएँछु उसबेला

मरेको यतिका वर्षपछि पनि पीडा बल्झाइरहने । (पीडा बल्झाइरहने मायालुसँग, पृ.१०३-१०४)

प्रस्तुत कवितामा समयमै ख्याल नगर्दा प्लास्टिकले दीर्घकालसम्म कति असर पुऱ्याउँछ भन्ने देखाइएको छ । प्लास्टिक जलाएर वा टुक्रा टुक्रा पारेर जमिनमुनि गाडे पनि त्यो गल्दैन र त्यसले धेरै वर्षसम्म माटाको उत्पादन क्षमतामा ह्रास ल्याउँछ । यसैले कवितामा प्लास्टिक मरेको धेरै वर्ष भइसक्दा पनि त्यसको असर रहेकाले टाउकामा हात राखेर पछुतो गरिरहनुपरेको र पहिला गरेका गल्तीको पीडा अहिले बल्झिरहेको बताइएको छ । पर्यावरण दूषित हुँदाको असरबारे वर्णन गरिएको निम्नलिखित कविता पनि उल्लेखनीय रहेको छ :

हराएका छन्

तपाईंहरूले रोपेका नीम, तितेपाती र मेवा ।

प्लास्टिकका टुक्राले छोपिएका छन्

सयपत्री, घिउकुमारी र यार्चागुम्बा ।

धुवाँको तातोले

ओइलाएका छन् अम्बक, कागती र सजिवनका बोट ।

रासायनिक मल र कीटनाशकको आतङ्कले

फुलौँ कि नफुलौँ भएका छन्

तोरी, सूर्यमुखी र सयपत्रीका फूल । (परिवेशको जवानी !, पृ.४७)

यसरी प्लास्टिकका टुक्रा, धुवाँको तातो, रासायनिक मल, कीटनाशक विष आदिका आतङ्कले निम, तितेपाती, मेवा, सयपत्री, घिउकुमारी, यार्चागुम्बा, अम्बक, कागती, सजिवन, तोरी, सूर्यमुखी र सयपत्रीका फूलमध्ये कुनै छोपिएका छन्, कुनै ओइलाएका छन् र कुनै आतङ्कित छन् । पर्यावरण बिग्रिएका कारणयी प्राकृतिक वस्तुहरू सङ्कटमा परेका छन् ।

माथि चर्चा गरिएका बाहेक लिगलिगकोटको नयाँ दौड, आत्मघातको भेलबाट, फलको दुखेसो, सडक बालक, वर्तमानको ध्वाँसे ऐना, उल्टो डुङ्गा खियाइरहेको माझी, बादलको मृत्यु भएको क्षण, भुमरीमा फँस्दै गएको डुङ्गा, प्लास्टिकको घाँस, डाइनोसरको भजन ! र मरभूमिको त्रास कवितामा पनि यस किसिमको भाव पाइन्छ ।

प्रकृति र मानवका बिच सहअस्तित्वको अपेक्षा

प्रस्तुत कवितासङ्ग्रहमा पर्यावरण विनाशका कुरामात्र नभई प्रकृति र मानवका बिच सहअस्तित्व स्थापना गर्नुपर्ने अपेक्षा गरिएका कविता पनि रहेका छन् । यिनमा खासगरी मानवले प्रकृतिको संरक्षणमा ध्यान दिनुपर्ने कुरा बताइएको छ । ध्वंस गर्ने पनि मानिस र चेतनशील प्राणी पनि मानिस नै भएकाले उसले सहअस्तित्व स्वीकार गरी सङ्ग्रहभित्र प्रकृतिको संरक्षणमा लाग्नुपर्ने भाव भएका कविता एक दर्जनभन्दा बढी रहेका छन् । यहाँ प्रस्तुत विचारका दृष्टिले महत्त्वपूर्ण केही कविताहरूको उद्धरणसहित चर्चा गरिन्छ । सर्वप्रथम तेस्रा क्रममा रहेको कविताबाट एक अनुच्छेद जस्तै : ए मान्छे !

त्यहाँ पुग्ने चाहना त पक्कै होइन होला तिम्रो ।
त्यसोभए
त्यागिदेऊ अब
संसारलाई सबैको साझा हुन नदिने चाहना !
त्यागिदेऊ अब
संसारलाई तिम्रै मात्र पेवा बनाउने तिर्सना !
त्यागिदेऊ अब
संसारलाई बाँदरको हातको नरीवल बनाउने
आत्मघाती योजना । (उत्पीडित संसारको बेहोस मान्छेसँग, पृ.२४)

कविताको पूर्वप्रसङ्गअनुसार त्यहाँ पुग्ने चाहना छैन होला भन्नाले भविष्यमा एक दिन त्यस्तो आउनेछ जुन दिन संसारमा खुब महत्त्वाकाङ्क्षी र स्वार्थी मानिस पनि थियो र ऊ कसैको भलो नचिताउने रोगले थलिएर मऱ्यो भन्ने दिन भनेर बुझिन्छ । यसैले मानिसलाई भनिएको छ कि यदि त्यस्तो दिन नआओस् भन्ने चाहना राख्ने होभने संसार मेरोमात्र हो भन्ने स्वार्थपूर्ण सोच त्याग गर्नुपर्ने भाव व्यक्त गरिएको छ । कवितामा संसारलाई आफ्नो पेवा ठान्ने मानिसको प्रवृत्ति आत्मघाती भएकाले सुन्दर संसारलाई बाँदरको हातमा नरिवल नबनाउन पनि आग्रह गर्दै संसारलाई मानिसले सबैको साझा चौतारी ठानोस् भन्ने अपेक्षा गरिएको छ । अर्को एक कवितामा पनि प्रकृतिको संरक्षण गर्नुपर्ने भाव व्यक्त भएको छ, यथा :

कुरै नबुझी
पतकर जलाएको भन्दै
वनमा डढेलोको आतङ्क मच्चाइरहेछौ ?
पानी खन्याएर निभाऊ त त्यसलाई
तिम्रो आत्मालाई कति शीतल हुन्छ ! (डढेलोको आतङ्क, पृ.६४)

प्रस्तुत कवितांशमा पनि मानिसलाई प्रकृति बचाउन र उसको सहअस्तित्व स्वीकार गर्न अनुरोध गरिएको छ । ख्यालख्यालमा लगाइएको डढेलाले प्राणी र वनस्पतिको विनाश गर्ने भएकाले यस्तो आतङ्क नमच्चाउन आग्रह गर्दै प्रकृतिको विनष्ट हुने काम रोक्दा मनलाई पनि शान्ति मिल्ने र सबैको हित हुने भएकाले मानिसलाई प्रकृतिमैत्री व्यवहार गर्न अनुरोध गरिएको छ । यस्तै अर्को एउटा कविता :

मुखले मात्र ठिक्क नपारी
मनैले आमा मानेर
नदीलाई सफा पार्नु छ ।
फोहोर नपारी, धुँवा-धुलो नउडाई

हामी सबै

सधैँ मिलेर बाँच्नु छ ।

हामी सबै

फूल भएर हाँस्नु छ ।

हामी सबै नटराज भई नाच्नु छ । (हामी बाँच्नु छ, पृ.१४७-१४८)

यसरी प्रस्तुत कवितामा भनिएको छ कि पर्यावरण संरक्षणका लागि केवल भाषण वा सैद्धान्तिक चर्चामात्र गर्नु भनेको मुखले ठिक्क पार्नुजस्तै हो । अत: मनैदेखि आमा मानेर नदी सफा राखौँ र यस धर्ती तथा आकाशमा धुलो एवं धुँवा नउडाई हामी सबै हाँसीखुसीका साथ मिलेर हाँसौँ, बाँचौँ र नाचौँ । यसरी कवितामा प्रकृति र मानव मिलेर बसौँ भन्ने भाव व्यक्त भएको छ । यस्तै भावको अर्को एउटा कविताबाट केही हरफ जस्तै :

क्या गजबको सृष्टि !

सृष्टि भएरै जन्मेको हो हाम्रो दृष्टि

दृष्टि भएरै देखिएको छ यो अनुपम सृष्टि ।

तर यसबेला

यसअघिभन्दा अझ बढी

मान्छेको सम्यक् दृष्टि खोजिरहेको छ सृष्टिले ।

जल होस् कि थल

जीव होस् कि जङ्गल

आकाश होस् कि अन्तरिक्ष

सबैको अस्तित्व सुरक्षित हुनैपर्छ । (सामूहिक चिहानको त्रास, पृ.१५८)

सृष्टि र दृष्टि अर्थात् प्रकृति र मानवजीवनका बिच निकट सम्बन्ध देखाइएको यस कवितामा दुवैको समान अस्तित्व स्वीकार गरिएको छ । सृष्टि भएकाले मानवजीवन प्राप्त

गरिएको हो र दृष्टि भएकाले यति सुन्दर सृष्टि हेर्न पाइएको हो भन्दै कवितामा सृष्टिले मानिसको अझ सम्यक् दृष्टि खोजिरहेको बताइएको छ साथै जल, थल, जीव, जङ्गल, आकाश आदि सबैको अस्तित्व सुरक्षित हुनैपर्ने भाव व्यक्त गरिएको छ । यसप्रकार प्रस्तुत कविताले सहअस्तित्वमा जोड दिएको छ ।

माथि चर्चा गरिएका कविताका अतिरिक्त सहअस्तित्वको चेत, रुख भएर बाँच्न पाए, आत्महत्याको हिसाब, मान्छेको परिभाषा, म त सधैँ पात बनेँ, कृत्रिम बौद्धिकताको भविष्य-यात्रा, काल चित्रण आदि कवितामा पनि प्रकृति र मानिसको सहअस्तित्व कायम हुनुपर्ने र यसका लागि मानिसले नै सबै क्षेत्रमा पहल गर्नुपर्ने भाव व्यक्त भएको पाइन्छ ।

प्रकृतिविनाशकप्रति व्यङ्ग्य

प्रस्तुत सङ्ग्रहका कवितामा विभिन्न प्रकारले पर्यावरण दूषित बनाउने व्यक्तिप्रति व्यङ्ग्य प्रहार गरिएको छ । जमिनको भत्काइ, प्लास्टिकको प्रयोग, शुद्ध पानीमा ढल मिसावट, डढेलो, उद्योग-कारखाना आदिबाट उत्पन्न धुवाँका कारण वायुमण्डल प्रदूषण इत्यादि कारणबाट विश्वको पर्यावरण बिग्रँदै गइरहेको छ र यसको मुख्य कारकका रूपमा मानिस नै रहेको छ । यसबाट अन्ततः बढी असर बेहोर्ने पनि मानिस नै हो । यसरी मानिसले आफू पर्ने खाडल आफैले खनेकामा व्यङ्ग्य प्रहार गरिएको छ । यसको उदाहरणका लागि छोटो कवितांश जस्तै :

मै किन जानुपर्‍यो र !
धेरै तयार छन् तिम्रो जन्ती जान ।
मलाई आरक्षित गरिराख
तिम्रो मलामीको रूपमा ।
जब तिमी
आफ्नो मलामी बनाउँछौ कसैलाई

तबमात्र

तिमी आफ्नो दानवीय रूपबाट मुक्त भएका हुन्छौ । (मलाई आरक्षित गरिराख, पृ.२५)

यसरी कवितामा पर्यावरण विनाशकलाई दानवीय चरित्रका रूपमा उभ्याउँदै त्यस्ता व्यक्ति जब मर्दछन् तबमात्र दानवीय रूपबाट मुक्त हुने भाव व्यक्त गरिएको छ । नमर्दासम्म त्यस्ता व्यक्ति सच्चिन नसक्ने र अरूलाई मलामी बनाएपछि अर्थात् मरेपछि मात्र दानवीय रूपबाट मुक्त हुन्छन् भन्ने भनाइ तीक्ष्ण व्यग्ययुक्त भनाइ हो । यस्तै अर्को कवितामा पनि प्रदूषक व्यक्तिप्रति यसरी व्यङ्ग्य गरिएको छ :

म गाई हुँ
तिमीहरू जुकाको रूपमा
युद्ध-पिपासाले जन्माएका
निषिद्ध जैविक हतियार हौ ।
पानी बिटुल्याउँछौ
हावा रोग्याउँछौ
मलाई चुस्छौ
ढाडिन्छौ
र खस्छौ । (शोषण र आतङ्क, पृ.३७-३८)

यसरी प्रकृति वा पृथ्वीले आफूलाई सुधो गाईका रूपमा उभ्याउँदै जल र जमिनको दोहन गर्ने र वायु प्रदूषण गर्ने मानिसलाई जुकाका रूपमा हेरेको भाव प्रस्तुत कविताबाट अभिव्यञ्जित भएको छ । युद्धको भोकतिर्खाले छटपटिएका त्यस्ता व्यक्तिलाई निषिद्ध जैविक हतियारका रूपमा लिइएको छ । त्यस्ता मानवहतियारबाट पानी, हावा आदि सबै प्रदूषित भएको र पृथ्वीको दोहन गर्ने त्यस्ता व्यक्तिले एक दिन ढाडिएका जुकाको नियती बेहोर्नुपर्ने

भनी व्यङ्ग्य गरिएको छ । सङ्ग्रहभित्र नवौँ क्रममा रहेको निम्नलिखित कवितामा पनि यस किसिमको भाव पाइन्छ :

आफू पनि घर नबनाउने
र
अर्काको घर पनि भत्काइदिने प्राणीको
वंशवृक्षको नयाँ पुस्ता हो ऊ ।
तर अचम्म !
उसैले घोषित गरेको छ आफूलाई
जगत्को 'सर्वश्रेष्ठ प्राणी' !
जब कि
उसको कृत्यको मूल्याङ्कन गर्ने जसले पनि
उसलाई भन्नैपर्ने हुन्छ - प्राणीको नाउँमा कलङ्क ! (उसले आकाशमा विष घोलिरहँदा, पृ.४५)

यहाँ मानिसलाई साङ्केतिक रूपमा बाँदरका दर्जामा राखिएको छ । यहाँ मानिसलाई बाँदर नै नभने पनि बाँदरको नयाँ पुस्ताका भनिएको छ जो बाँदरले जस्तै सबै कुरा लथालिङ्ग र भताभुङ्ग गर्न उद्यत छ । कविताका अनुसार मानिसले आफूलाई संसारको सर्वश्रेष्ठ प्राणी ठाने पनि व्यवहारले ऊ संसारको सबभन्दा खराब प्राणीका रूपमा रहेको छ र उसले गरेका कार्यका आधारमा भन्ने हो भने ऊ मानवको मात्र नभई प्राणीहरूको नै कलङ्क हो । यसरी उद्धृत कवितामा मानिसको पर्यावरणविरोधी व्यवहारप्रति तीव्र व्यङ्ग्य प्रहार गरिएको छ । यसरी नै भनाइ र व्यवहारमा फरकपन देखाउनेप्रति पनि व्यङ्ग्य गरिएको छ, जस्तै :

कालो धुवाँ उडाउँदै
सिंहदरबार छिर्दै छन् मन्त्रीजी ।

फूल र अबिरले भरिएको

प्लास्टिकको झोला वाग्मतीमा सेलाएर

सफाइ दिवसको नेतृत्व गरिरहेकी छन् मन्त्राणी । (प्रदूषणको झाँकी, पृ.१०९)

एकातिर जसले पर्यावरण स्वच्छ राख्नुपर्ने हो उनै व्यक्ति कालो धुवाँ उडाउँदै सिंहदरबार छिर्ने गरेका छन् भने अर्कातिर मन्त्राणी प्लास्टिकको झोला नदीमा फालेर सफाइ दिवसको नेतृत्व गरिरहेकी छन् । यसप्रकार प्रस्तुत कवितामा सरकारका जिम्मेवार व्यक्तिको गैरजिम्मेवारीपना र विरोधाभाषी चरित्रका कारण त्यस्ता व्यक्तिप्रति तिखो व्यङ्ग्य प्रहार गरिएको छ । उपर्युल्लिखित कविताहरूबाहेक पृथ्वीको चिन्ता, हिउँदको स्वागतमा प्लास्टिकको धुवाँ, स्वर्गजस्तो वनका दुर्नाम यन्त्रवानरहरू, ब्ल्याक होलको एजेन्ट आदि कविताहरूमा पनि विध्वंशकारी मानिसप्रति व्यङ्ग्यवाण प्रहार गरिएको छ ।

पर्याप्रेम र पर्यावरण संरक्षणप्रतिको प्रतिबद्धता

प्रस्तुत सङ्ग्रहका कवितामा प्रकृतिविनाशक तत्त्वको मात्र उल्लेख नभई पर्यावरणप्रतिको प्रेमभाव र पर्यावरण संरक्षणप्रतिको प्रतिबद्धता पनि व्यक्त भएको पाइन्छ । यसखाले कवितामा मानिस प्रकृति तथा समस्त प्राणीप्रति जिम्मेवार भएको पाइन्छ । कवितासङ्ग्रहको शीर्षकका रूपमा रहेकोकवितामा पर्याप्रेमको भाव यसरी प्रकट भएको छ :

मेरा प्रथम गुरु !

तैपनि

एउटा संकल्प चाहिँ गर्दै छु म अहिल्यै-

बाँचेको स्वाङ पारिरहनुमा

कुनै आनन्द नहोस् मलाई

म आफैँ

एकाकार नहुन्जेल

तपाईंको अन्तरहृदयको पर्याप्रेमको गुन्जनमा ! (पर्याप्रेमको गुन्जन, पृ.२१)

यसरी प्रकृतिलाई प्रथम गुरुका रूपमा स्वीकार गर्दै विगतका दिनमा जेजस्तो भुल वा त्रुटि गरिएको भए पनि आगामी दिनमा पर्याप्रेममा लागिरहने प्रतिबद्धता प्रकट गरिएको छ । देखावटी किसिमले नभई वास्तविक रूपमा नै प्रकृतिप्रति एकाकार भाव राख्ने अठोट व्यक्त गरिएको छ । यसप्रकार मपात्रद्वारा आफ्नो कर्म र दायित्वबोध गरिएको छ । अर्को एक कवितामा पनि अर्काका भुलभुलैयामा लागेर सूर्य तथा आकाशमण्डलको स्वच्छताप्रति बेवास्ता गरेकामा पछुताउँदै आगामी दिनमा पर्यावरणीय स्वच्छताका लागि सङ्कल्प गरिसकेको भाव यसरी प्रस्तुत गरिएको छ :

मलाई राम्ररी थाहा भइसकेको छ-
खनिज इन्धनको विकल्पमा
स्वच्छ ऊर्जालाई नै
आफ्नो भाग्यनिर्माता बनाउन गरेको सङ्कल्पलाई
अब मैले
व्यवहारमा परिणत नगरी भएको छैन, सूर्यदेव ! (सूर्यलाई सम्बोधन, पृ.६१)

यसप्रकार विगत र वर्तमानमा समेत पर्यावरण बिग्रिएको कुरा बोध भएको छ र अन्य क्षेत्रमा जस्तै ऊर्जाका क्षेत्रमा पनि वातावरणलाई नकारात्मक असर पुऱ्याउने खनिज इन्धनका विकल्पमा स्वच्छ ऊर्जा प्रयोग गर्ने सङ्कल्प गरिएको छ साथै त्यसलाई व्यवहारमा परिणत गर्ने अठोट व्यक्त गरिएको छ । अर्को कविता आशाको दुर्व्यसनमा पनि पर्यावरण संरक्षणको भाव यस किसिमबाट व्यक्त भएको पाइन्छ

मलाई चुपचाप देखेर बोल्यो ऊ-
आमा-कसम !
अब खनजोत गरेर

बाँझा रहेका आँठा र पाटाहरूमा

छर्नेछु बिउ

अनि

फलाउनेछु कोदो

पहेँलपुर फुलाउनेछु तोरी

रोप्नेछु विरुवा, बनाउनेछु रुख

सफा गर्नेछु नदी, फेर्नेछु धराको स्वरूप । (आशाको दुर्व्यसन, पृ.१५०)

जमिन बाँझो राख्नु आर्थिक, सामाजिक, वातावरणीय आदि कुनै पनि दृष्टिले उपयुक्त हुँदैन । यसैले यहाँ आमाको कसम खाएर अन्न उत्पादनमा लाग्ने बताइएको छ । अन्नमात्र नभई विरुवा रोप्ने, नदी सफा गर्ने र पृथ्वीको स्वरूप नै परिवर्तन गर्ने अठोट व्यक्त गरिएको छ । यसरी अन्न उत्पादन गरेर मानिस र वातावरणका क्षेत्रमा सहयोग पुऱ्याउने कुराका साथै नदी र जमिनलाई पनि स्वच्छ पारी सुन्दर बनाउने प्रतिज्ञा गरिएको छ । यसरप्रकार प्रस्तुत कवितामा प्रर्याप्रेम र संरक्षण दुवै किसिमको भाव व्यक्त भएको पाइन्छ । यसै गरी निम्नलिखित कवितामा पनि जल, जमिन र वायुमण्डलको स्वच्छतामा लागिपर्ने भाव व्यक्त भएको छ :

अबदेखि

आफैँ अबुझ भएर

मित्रलाई शत्रु बनाउँदिन म ।

आफैँलाई टेक्ने आधार दिने माटोलाई नै

अजैविक फोहरले छोपेर

बन्जरभूमिमा परिणत गराउँदिन म ।

अबदेखि

कालो ब्याट्री र सेतो पारोलाई नदीमा सेलाउँदै
निर्दोष जलचरहरूलाई
आँसुको दहमा डुवाउँदिन म । (विनाशविरुद्धको सङ्कल्प, पृ.३३)

यस कविताको कुनै अंशमात्र नभई पूरा कविता नै वातावरणीय स्वच्छताप्रतिको प्रतिवद्धतामा केन्द्रित छ । प्रकृतिको संरक्षण भएमा मानिसको पनि हित हुन्छ तर आजसम्म यस कुरामा ध्यान नदिई मानिस प्रकृतिको दोहन गर्नमा लागिपऱ्यो । यस कुराको बोध भएकाले अबदेखि यसको संरक्षणमा लाग्ने भाव यस कवितामा व्यक्त भएको छ । अबदेखि माटो र पानीको स्वच्छतामा ध्यान दिई तिनमा आश्रित मानिस र समस्त प्राणीको हित गर्ने कुरा जनाइएको छ । यसरी नै रगतको खोलोमा नौकाविहारको आनन्द !, बारुदको गन्ध !, धुवाँ रानी !, स्वच्छ ऊर्जाको पक्षमा, धुवाँ भर्ने उद्यम, हरियाली संसारको पुनर्निर्माण आदि शीर्षकका कवितामा पनि पर्यापे्रम र संरक्षणप्रतिको प्रतिबद्धता व्यक्त गरिएको छ ।

मानवेतर प्राणीसँगको सहअस्तित्वबोध

प्रस्तुत सङ्ग्रहभित्र मानिसले अन्य प्राणीलाई आफ्नो स्वार्थका लागि प्रयोग गरेका सन्दर्भका कवितामात्र छैनन् मानवेतर प्राणीसँगको सहअस्तित्व स्वीकार गरेका कविता पनि छन् । जुनमायाको हाँसो शीर्षकको कविता यसको एउटा उदाहरण हो । भूकम्पका कारण उनी पाल टाँगेर बसेकी छन् । वासस्थानमा सम्पन्नता नभए पनि उनका मनमा सम्पन्नताको भाव छ । भावमात्र होइन, उनको व्यवहार पनि परोपकारी छ, जस्तै :

बारीको एक कुनामा
पाल टाँगेर बनाएकी छिन् उनले आफ्नो दरबार ।
मस्काउँछिन् त्यहाँ उनी
मनकारी डोल्माले
उपहारमा दिएको कोदोको पिठो मुछेर

चौरासी व्यञ्जनलाई जित्ने ढिँडो ।

जहाँ सहभोज चल्छ उनको

बेघर कुकुर र भोका परेवाहरूका साथ।

एक्लै त खानै सक्तिनन् जूनमाया !

एक्लै त बस्नै सक्दिनन् जूनमाया ! (जूनमायाको हाँसो, पृ.४१)

यसरी कवितामा मानिसलाई मात्र नभई मानवेतर प्राणीलाई पनि मायाममता दिइएको छ । भूकम्पका कारण आफ्नै वास र गासको अभाव भइरहेका अवस्थामा पनि डोल्मा अर्थात् जूनमायाको मन यति उदार छ कि उनले बेघर कुकुर र परेवाहरूलाई खाना दिएर प्राण रक्षा गरेकी छन् । उनले कोदाको पिठोलाई नै चौरासीव्यञ्जन सम्झेकी छन् र त्यो कुकुर, परेवा आदि प्राणीलाई बाँडेर खाएकी छन् । अरूको सेवा नगरी एक्लै बस्न र खान उनका मनले मान्दैमान्दैन । यसरी जूनमायामार्फत कवितामा मानवताभन्दा पनि माथिल्ला तहको विश्वप्रेमको भाव प्रकट गरिएको छ । अर्को एक कवितामा मानिस र अन्य प्राणीका बिचको सहसम्बन्धलाई यसरी प्रस्तुत गरिएको छ :

अध्यात्म भन्छ-

सारा प्राणीहरू एउटै परमेश्वरका सन्तानहरू हुन् ।

जीवविज्ञान भन्छ-

अनेकौं पदार्थ बिचको

अन्तरसङ्घर्ष र अन्तरघुलनको परिणामस्वरूप

निर्मित प्राणतत्त्व एउटै हो

केवल प्राणीका जाति र प्रजातिहरू छुट्टिएका हुन् ।

अनि मेरो लाटो मनले भन्छ-

जुनसुकै प्राणी किन नहुन्

यही पृथ्वीको
हावा, पानी, प्रकाश र माटो मुछेर
प्राणको सेचन गर्दै
प्रकृतिको एउटै अलौकिक हातद्वारा बनाइएका
आआफ्नै पाराका सुन्दर मूर्तिहरू हुन् । (वधशाला, पृ.५७)

यस कवितामा अध्यात्मवादी तथा भौतिकवादी दुवै दृष्टिकोणबाट मानिस र अन्य प्राणीका बिचको सम्बन्धबारे व्याख्या गरिएको छ । यहाँ मानिस र अन्य प्राणीका बिच कुनै भेद नरहेको र केवल जाति र प्रजाति छुट्ट्याउने क्रममा कसैलाई मानिस, कसैलाई बाघ, भालु, गाई आदि जनावर तथा पशु र कसैलाई सुगा, मैना आदि पक्षी भनेर वर्गीकरण गर्ने गरिएको भाव अभिव्यञ्जित छ । अध्यात्मले सबै प्राणीहरू एउटै परमेश्वरका सन्तान हुन् भन्नु र जीवविज्ञानले अनेकौँ पदार्थबिचको अन्तरसङ्घर्ष र अन्तरघुलनको परिणामबाट निर्मित प्राणतत्त्व एउटै हो भन्नु सारतः एउटै कुरा हो । दुवै मतको निष्कर्ष प्राणी प्राणी सबै बराबर भन्ने रहेको छ । सबै प्राणी यही पृथ्वीको हावा, पानी, प्रकाश आदिबाट बाँच्ने भएका कारण पनि सबै समान हुन् । यसरी कवितामा सबै प्राणीलाई एकै रूपमा हेरिएको छ । यहाँ दार्शनिक आधारसमेत प्रस्तुत गर्दै मानिस र अन्य प्राणीको सहअस्तित्व स्वीकार गरिएको छ ।

सङ्ग्रहका सबै कवितामा धेरथोर रूपमा पर्यावरणलाई विषय बनाइएको छ । अधिकांश कवितामा पर्यावरण बिग्रिएकामा चिन्ता प्रकट गरिएको छ भने कतिपय कवितामा विगतमा जेजस्तो भए पनि आगामी दिनमा यसको संरक्षणमा जुट्नुपर्ने सन्देश दिइएको छ । केही कवितामा भने मानिस, अन्य प्राणीको समान अस्तित्व रहेको भाव व्यक्त गरिएको छ । कतिपय कवितामा प्राणी र प्राकृतिक वस्तुका बिचको सम्बन्ध चक्रीय वा एकअर्काका बिच परिपूरक किसिमको रहेको समेत जनाइएको छ ।

निष्कर्ष

साहित्यका क्षेत्रमा कृष्ण बाउसेको व्यक्तित्व कविताका उपविधाहरूमा विस्तार भएको देखिन्छ । दर्जनाधिक कृतिका सर्जक बाउसेको *प्रर्यप्रेमको गुन्जन* अन्य कृतिभन्दा फरक रहेको पाइन्छ । यसमा बाउन्नवटा कविताहरू रहेका छन् र तिनमा पर्यावरणलाई विषय बनाइएको छ । वर्तमान समयमा जल, जमिन र वायुमण्डल मानिसका कारण प्रदूषित बन्दै गइरहेको छ र यसको असर प्राणी, वनस्पति, जलवायु र स्वयं मानिसलाई पनि परिरहेको छ । यस तथ्यलाई दृष्टिगत गरी एकातर्फ पर्यावरणवादीले यसको सुधारका लागि विभिन्न किसिमका अभियान सञ्चालन गरेका छन् भने अर्कातर्फ साहित्यकारहरूले पनि यस समस्यालाई विषय बनाई विभिन्न विधाका कृतिहरू रचना गरेका छन् साथै पर्यावरणलाई विषय बनाई लेखिएका रचना वा कृतिको विश्लेषण गर्ने पर्यावरणीय समालोचना सिद्धान्त पनि स्थापना गरेका छन् । यस समाचोनाका दृष्टिले बाउसेको प्रस्तुत कृतिको अध्ययन गर्दा दूषित पर्यावरणको सर्वत्र असर परेकामा चिन्ता, प्रकृति र मानवका बिच सहअस्तित्वको अपेक्षा, प्रकृति विनाशकप्रति व्यङ्ग्य, पर्याप्रेम र पर्यावरण संरक्षणप्रतिको प्रतिबद्धता एवं मानवेतर प्राणीसँगको सहअस्तित्वबोधको चेत पाइन्छ । प्रस्तुत अध्ययनको मुख्य समस्या पर्यावरणीय समस्यालाई के कस्तो रूपमा देखाइएको छ भन्ने रहेको थियो र सो समस्याको समाधान खोज्ने प्रयास गर्दा कृतिभित्रका कविताले मानिसका कारण पर्यावरणीय सन्तुलन बिग्रिएको हो र मानिसले संसारका सबै वस्तु, पदार्थ, जीव आदिको अस्तित्व स्वीकार गरेर अघि बढेका खण्डमा समस्यालाई उसले नै समाधान गर्न सक्छ भन्ने सन्देश दिएका छन् । प्रस्तुत कवितासङ्ग्रहको विषयवस्तु पर्यावरणमा नै केन्द्रित रहेको देखिन्छ र पर्यावरणीय चेतनाका दृष्टिले सङ्ग्रह महत्त्वपूर्ण रहेको पाइन्छ ।

सन्दर्भसूची

गौतम, कृष्ण (२०६४), *उत्तरआधुनिक जिज्ञासा*, भृकुटी एकेडेमिक पब्लिकेसन्स ।

त्रिपाठी, गीता (२०८०), समकालीन नेपाली कवितामा पर्यावरण, *पर्या साहित्य सिद्धान्त र सिर्जना*, गोविन्दराज भट्टराई र विजय हितान (सम्पा.), सम्पूर्ण किताब, पृ. ६९-११२ ।

पोखरेल, पेशल (२०८१ चैत्र २५ गते), पर्यासाहित्यमा चासो राख्नेहरूका लागि लोभलाग्दो मार्गदर्शन पर्याप्रेमको गुञ्जन, *एटुजेट समाचार डट कम* (अनलाइन पत्रिका), https://a2zsamachar.com/316649/

पौड्याल, एकनारायण (२०७०), *समालोचनाको स्वरूप र पद्धति*, विमर्श नेपाल ।

बाउसे, कृष्ण (२०८०), *पर्याप्रेमको गुञ्जन*, स्वदेश प्रकाशन प्रा. लि. ।

भट्टराई, गोविन्दराज (२०६४), *उत्तरआधुनिक विमर्श*, मोडर्न बुक्स ।

भट्टराई, रमेशप्रसाद (२०६५/०६६), पर्यावरणीय समालोचना, स्वच्छन्दतावाद र देवकोटा, *कुञ्जिनी*, १६(१३), पृ. १५६-१६७ ।

सुब्बा, देवचन्द्र (२०८०), हरित आध्यात्मिकता, *पर्या साहित्य सिद्धान्त र सिर्जना*, गोविन्दराज भट्टराई र विजय हितान (सम्पा.), सम्पूर्ण किताब, पृ.५७-६८ ।

हितान, विजय (२०८०), पर्यावरण साहित्य आजको आवश्यकता र महत्त्व, *पर्या साहित्य सिद्धान्त र सिर्जना*, गोविन्दराज भट्टराई र विजय हितान (सम्पा.), सम्पूर्ण किताब, पृ.४७-५६ ।

Barry, P. (2002). *Beginning theory*, 2nd ed., Manchester University Press.

Childs, P. & Fowler, R. (2008). *The Rougtledge dictionary of literary terms*. Rougtledge Taylor and Francis Group.

Kerridge, R. (2006). Environmentalism and ecocriticism. In P. Waugh (Ed.), *Literary theory and criticism*, pp. 530-543. Oxford University Press.

Academic Journal of Sukuna – AJoS, A Peer-reviewed Interdisciplinary Journal
Volume 5 (Issue 1) 2025 July (2082 Ashad), Pp. 206 – 219, ISSN 2594-3138 (Print)
Research Management Cell (RMC – Sukuna), Sundarharaincha, Morang

'संयोग' कथा सङ्ग्रहमा अभिव्यक्त यथार्थता

Dio: https://doi.org/10.3126/ajos.v5i1.81991

गणेशराज अधिकारी, विद्यावारिधि[१]

[१]उपप्राध्यापक, महेन्द्ररत्न क्याम्पस, ताहाचल, काठमाडौँ

इमेल : lionganesh2017@gmail.com

लेखसार

प्रस्तुत लेख संयोग कथा सङ्ग्रहमा अभिव्यक्त यथार्थताको अन्वेषण गर्ने विषयमा केन्द्रित छ । उक्त सन्दर्भमा समाजको समसामयिक अवस्थाको जस्ताको तस्तै यथार्थ र दुरुस्त चित्रण संयोग कथा सङ्ग्रहका कथाले गरेका छन् । कथा सङ्ग्रहमा समाजको सामाजिक अवस्था, संस्कार, संस्कृति, सभ्यता, प्रकृति, मानवीय भाव, राजनीतिक अवस्था, आर्थिक विभेद र असमानताजस्ता पक्षहरु प्रमुख विषय बनेर आएका छन् । विवेच्य सङ्ग्रहका कथाले समाजलाई केन्द्र बनाएर यथार्थताको अभिव्यक्ति दिएका छन । समाजका यथार्थ पक्षलाई देखाउन यस लेखमा पुस्तक पठन विधिको प्रयोग गरेर तथ्यहरू सङ्कलन गरिएको छ । सङ्कलित सामग्रीको विश्लेषण गर्दा वर्णनात्मक विधिको अवलम्बन गरिएको छ । गुणात्मक पद्धतिको सहयोग लिएर प्राथमिक सामग्रीका रूपमा कथाकार लामिछानेको 'संयोग' कथा सङ्ग्रहलाई मूल स्रोत मानेर अध्ययन तथा विश्लेषण गरिएको छ । सैद्धान्तिक एवम् अन्य विषयको उपयोगका लागि द्वितीयक सामग्री प्रयोग गरिएको छ । अतः निर्दिष्ट कथामा यथार्थताको खोजी गरिएकाले प्रस्तुत लेख पठन र अन्तर्पठनका दृष्टिले तथा सरोकारवाला पाठक तथा यथार्थताको अध्ययन गर्ने जो कोही अध्येताका लागि समेत उपयोगी रहेको छ ।

शब्दकुञ्जि : आञ्चलिक, ढप, स्फुट, यथार्थ, सम्पदा

विषयपरिचय

समाजको यथार्थ अभिव्यक्ति हुने एउटा माध्यम साहित्य हो । साहित्यभित्र दृश्य, श्रव्य र पाठ्य भेद रहन्छ । पाठ्य र श्रव्य भेदका रूपमा रूपकइतरका विधा रहन्छन् । साहित्यलाई अनेक विधाको समष्टि मानिन्छ । साहित्यभित्र काव्यजस्तै आख्यान पनि एउटा भेद हो । कथा र उपन्यासलाई समष्टिमा आख्यान भनिन्छ ।

कथा विधाको विकास गद्य शैलीका रूपमा भएको हो । गद्य ढाँचामा रहने कथालाई साहित्यिक विधाको गद्य ढाँचामा रहने विधा मानिन्छ । पूर्वीय तथा पाश्चात्य दुवै जगतमा कथाको आ-आफ्नै खालको मान्यता स्थापित भएको पाइन्छ (श्रेष्ठ, २०६०) ।

गद्यशैलीका रूपमा कथा विधाको विकास तथा जन्मसमेत भएकाले पुराऐतिहासिक र प्राक्ऐतिहासिक कालीन पुराकथा, परम्परा आरम्भ भयो । पौराणिक तथा लोककथा परम्पराको विकास पनि यसैगरी भएको हो (श्रेष्ठ र शर्मा, २०५९) । सोही सन्दर्भमा मानव जीवनको विशिष्टताको अध्ययन गर्न सहयोग पुग्ने कथा आयामका दृष्टिले एक बसाइमा पढेर सकिने विधा हो । यसको आयाम छोटो हुन्छ । पन्ध्र-बिस मिनेटमा पढेर सकिने यस विधामा कथात्मक तत्व क्रियाशील भएको हुन्छ । पद्य रचनामा झैँ कथामा पनि रचना विधानसँगै रुपविन्यासले पनि कथामा कथात्मकता थपेको हुन्छ । कथाको आयाम उपन्यासका तुलनामा निकै कम हुन्छ । कथा सँगालोका रूपमा रहेको यस कथा सङ्ग्रहमा रहेका सबै कथाहरू स्फुट कथाको शृङ्खलाका रूपमा रहेका हुन्छन् ।

कथाकार यादवप्रकाश लामिछाने वि.सं. २०११ असोजमा नेपालको पूर्वी क्षेत्र धनकुटा जिल्लाको छुम्लिङमा जन्मेका हुन् । उनले मानविकी तथा शिक्षाशास्त्र दुवै सङ्कायबाट नेपाली विषयमा स्नातकोत्तर गरी विद्यावारिधिसमेत गरिसकेका छन् । त्रिभुवन विश्वविद्यालयबाट सेवा निवृत्त भएका प्राध्यापक लामिछाने हाल नेपाल संस्कृत विश्वविद्यालयको उपकुलपतिका रूपमा कार्यभार सम्मालिरहेका छन् । प्राध्यापक लामिछानेका पाठ्यक्रम निर्दिष्ट पाठ्यपुस्तकहरू र समालोचना तथा सिर्जनाका पुस्तकहरू समेत प्रकाशित छन् । उनलाई चिनाउँदै एटमले (२०८०) ले 'संवादको आधिक्य, संस्मरणको प्रयोग, पात्रका सूक्ष्मतामा पुग्ने सामर्थ्य उनका कथाका सबलता हुन्' (लामिछाने, २०८०, पृ. ख बाट उद्धृत) भनेर उल्लेख गर्नुले कथाकार लामिछानेका कथाका प्रवाह र प्रभावको आँकलन गर्न सहयोग गर्दछन्।

कथाकार लामिछानेको *'संयोग'* कथा सङ्ग्रह फुटकर कथाहरूको सँगालो हो । यसमा आधुनिक कालका कथाकारका समसामयिक कथात्मक प्रवृत्तिको प्रभाव पाइन्छ । गुरुप्रसाद मैनाली, रमेश विकल, श्यामप्रसाद शर्माजस्ता सर्जकका सामाजिक, यथार्थ, आदर्श र प्रगतिवादी चेतले कथाकार लामिछानेलाई पछ्याएका छन् । समाजको रूपान्तरण चाहने लामिछाने समाजको यथार्थताका अतिरिक्त आदर्श मानवतावादी चेतसमेत प्रकट गर्दछन् । 'संयोग' कथा सङ्ग्रह यस्तै फुटकर कथाहरूको सँगालो हो । यस सँगालोभित्र १२ वटा कथाहरू समेटिएका छन् । कथाक्रममा रहेको पहिलो कथा '*फ्यासव्याक*'

'शब्दाङ्कुर' (२०७६) आश्विनमा प्रकाशित भएको तथ्य *'संयोग'* कथासङ्ग्रह (२०८०) ले पुष्टि गर्दछ (लामिछाने, २०८०, पृ.१-८) ।

दोस्रो क्रमको '*द्विविधा*' कथा शब्दसंयोजन २०७६ कार्तिकमा प्रकाशित भएको छ । 'संयोग' कथा सङ्ग्रहभित्रको 'संयोग' कथा '*शब्द संयोजन'* २०७७ वैशाखमा प्रकाशित भएको फुटकर कथा हो । 'शुभकामना' कथा 'हिमाली गुराँस' २०७६ मा प्रकाशित छन् । *'सँधियार'* कथा आलेख २०७६ पौषमा प्रकाशित कथा हो । त्यस्तैगरी *'सुनौलो किरण'* कथा हिमाली गुराँस २०७७ मा नै प्रकाशित भएको छ ।

कथाकार डा.यादवप्रकाश लामिछानेको *'अन्तरपीडा'* कथा *शब्दसंयोजन* २०७७ पौषमा छापिन्छ । '*. अल विदा ! ढेना दाइ अलविदा* !' कथा सुलेख २०७७ श्रावणमा प्रकाशित हुन्छ । कथाकार लामिछानेको '*मुर्मा टप'* कथा '*नवप्रज्ञापन'* २०७७ श्रावणमा छापिन्छ । त्यस्तै 'अविरल यात्री' कथाको रचनाकाल पनि २०७७ साल भनेर उल्लेख भएको छ । सर्जक लामिछानेको *'ऐँठन'* कथा *'आलेख'* २०७८ पौषमा प्रकाशित हुन्छ । त्यस्तै यस सङ्ग्रहमा भएको अन्तिम कथा *'अन्तद्वन्द्व'* २०७८ वैशाखमा रचना भएको तथ्य *'संयोग'* कथा सङ्ग्रहबाट पुष्टि हुन्छ (लामिछाने, २०८०, पृ.९८) । कथाकार लामछिानेको 'संयोग' कथा सङ्ग्रहमा समेटिएका सबै कथाहरू फुटकर कथाका दर्जामा पर्छन् भन्ने तथ्य विवेच्य सँगालोले नै पुष्टि गर्दछ ।

कथाकार लामिछानेका अनेक व्यक्तित्व प्रकाशित छन् । उनमा आन्तरिक तथा बाह्य व्यक्तित्व प्रखर रूपमा प्रकट भएको पाइन्छ । उनमा सार्वजनिक र भाषिक व्यक्तित्वसमेत प्रखर रूपमा प्रकटित भएको छ । सम्पादक एवम् भूमिका लेखक व्यक्तित्व उनको अर्को गुण हो । समालोचकीय एवम् चिन्तक व्यक्तित्व उनको अर्को छुट्टै गुण हो । समालोचकीय एवम् चिन्तक व्यक्तित्व चाहिँ उनको पहिचानलाई फराकिलो पार्ने गुण हो (अधिकारी, २०७६) ।

'संयोग' कथा सङ्ग्रहलाई आधार मान्दा यो कथा सँगालोबाट कथाकार लामिछाने मूलतः यथार्थ सामाजिक घटनालाई जीवन्त बनाउन सफल देखिएका छन् । उनका कथामा सामाजिक यथार्थता प्रखर रूपमा देखिएको छ । कथामा यथार्थभित्र आदर्शको सङ्केत यथास्थान भएको पाइन्छ । कथामा कतै आदर्शको झल्को पाइन्छ त कतै सुधारको सङ्केत भेटिन्छ । नीतिचेतनाको अभिव्यक्ति पनि छिटफुट रूपमा पाइन्छ । तराईली समाजका खास गरेर सतार जातिको यथार्थ अवस्था चित्रण छ । अन्धविश्वास, रुढिग्रस्त चेत, जात्रा तथा पर्वका नाममा गरिने अनावश्यक ढाँचा ढर्राले परिवारको थातवास नै उठेको अवस्था पनि सजीव रूपमा चित्रित भएको पाइन्छ । आर्थिक दुरावस्थाको सजीव प्रस्तुति छ । निम्न वर्गका पक्षमा वकालत गरिएको भेटिन्छ । गरिब र असहायलाई सहयोग गर्नु

आदर्शवादी चेतमात्र नभई मानवतावादी भावसमेत मुखरित छ । प्रवासी जनजीवनका सरल जटिल दुवै भावलाई कथाकार लामिछानेले डायस्पोरिक शैलीमा पस्केका छन् । समाज प्रेम र मानव प्रेमको भाव कथामा यथार्थ भएर अभिव्यक्त भएको छ ।

'संयोग' कथा सङ्ग्रहमा अभिव्यक्त यथार्थ नै यस अनुसन्धानको विषय हो । सर्जक यादवप्रकाश लामिछाने रचित 'संयोग' मा अभिव्यक्त यथार्थको खोजी गर्नु यस अनुसन्धनात्मक लेखको मूल प्रयोजन हो । यथार्थको खोजी गर्ने क्रममा वैचारिक सामाजिक यथार्थ कसरी र कुन रूपमा प्रस्तुत भएको छ ? यसको खोजी गरी तथ्य पुष्टि गर्नु पनि अनुसन्धान वा खोजको विषय हो । यथार्थ अभिव्यक्त गर्ने क्रममा सर्जक लामिछानेले नेपाली सामाजिक परिवेश, सरल ग्रामीण नागरिकहरू र उनीहरूको स्वाभाविक उपस्थिति र व्यवहारका बिच रहेको यथार्थलाई पस्केका छन् । 'संयोग' कथा सङ्ग्रहमा रहेको यथार्थ अभिव्यक्तिको पहिचान गर्ने र अभिव्यक्ति प्रयोगको तरिकाको अध्ययन गर्नु यस अध्ययनको समस्याकथन हो ।

कथाकार यादवप्रकाश लामिछानेका कथामा पाइने यथार्थताको पहिचान गरी विश्लेषण गर्नु यस लेखको उद्देश्य रहेको छ । साथै प्रस्तुत अध्ययन कथाकार लामिछानेको 'संयोग' सङ्ग्रहमा अभिव्यञ्जित यथार्थको खोजीमा केन्द्रित छ । कथामा विविध प्रकृतिका यथाथ यथार्थको प्रस्तुतिका दृष्टिले विवेच्य कथा सामाजिक, नैतिक, आर्थिक, प्राकृतिक, राजनीतिक, आदर्श अभिव्यक्तिजस्ता प्रस्तुतिका दृष्टिकोणले औचित्यपूर्ण छ । त्यसैगरी अनुसन्धान तथा खोजमा लाग्नेहरूका लागि यो अध्ययन औचित्यपूर्ण रहेको छ । स्वअध्ययनमा लागेर ज्ञान विस्तार गर्नेका लागि समेत यसको औचित्य छ । जो कोही शोधार्थी वा सामान्य लेख पढमा लाग्नेका लागि समेत यस अनुसन्धानात्मक लेखले जो कसैलाई थप ज्ञान र सिप लिन र सिक्न योगदान गर्ने छ । 'संयोग' सङ्ग्रहमा अभिव्यञ्जित यथार्थ खोजी गर्नेका लागि त यो अध्ययन थप सहयोगी र सार्थक रहने छ ।

यस लेखले कथामा अभिव्यञ्जित यथार्थको अध्ययनका सन्दर्भमा स्थानिक, सांस्कृतिक, शोषण दमन र चरम स्वार्थ जस्ता पक्षलाई मात्र आधार बनाइएको छ । उक्त आधारमा मात्रै सकथासङ्ग्रहको विश्लेषण गरिएको छ ।

साहित्य र ज्ञान विज्ञानका क्षेत्रमा पुनर्जागरण कालको उदयसँगै यथार्थवादी चेत देखा परेको हो । यो ईशाको लगभग १६ औँ शताब्दी सेरोफेरोको समय हो (श्रेष्ठ, २०७८) । वस्तुगत सत्य नै यथार्थ हो । जे छ वा देखिन्छ, त्यही भन्नु वा बताउनु नै यथार्थ हो । आफ्ना अगाडि जे देखिएको वा भेटिएको छ त्यही सत्य हो र त्यही नै यथार्थ हो । यथार्थले आफूले देखेको वस्तुगत कुरामा विश्वास राख्छ ।

यसको सम्बन्ध यथार्थवादसँग रहेको हुन्छ । जे देखिन्छ त्यो प्रकृतिमा हुने भएको हुँदा प्रकृति र प्रकृतवाद पनि यसका सहयोगी बन्न पुग्छन् ।

प्रस्तुत कथा सङ्ग्रहमा यथार्थ पक्ष तथा आयामलाई अध्ययनको मूल आधार बनाइएको छ । समाज र मानवका बिचको सम्बन्धले देखाउने वास्तविकतालाई 'संयोग' कथा सङ्ग्रहमा दुरूस्त उतारिएको छ । समाज र हाम्रा बिच भएको यथार्थतालाई वस्तुगत आँखाले हेरेरे त्यसलाई यथार्थवादी साहित्यका रूपमा ग्रहण गर्ने हाम्रो परम्परा रहेको छ ।

यथार्थताको अध्ययन निरपेक्ष हुँदैन । यो साहित्यमा खोजिने विषय हो । यथार्थ पक्षको अध्ययन गर्दा न्यूनतम रूपमा समाजको अध्ययन गरिन्छ । समाजको अध्ययन गर्दा समाजको सामाजिक पक्ष, सामाजिक परिवर्तन, सत्यम् , सुन्दरम्जस्ता प्रभावकलाई विशेष ध्यान दिइन्छ । 'वस्तुको यथार्थ प्रकृतिबाट कलाको सिर्जना हुँदैन भन्ने मान्यता यथार्थवादको छ । वस्तु जस्तो छ, त्यस्तै प्रस्तुति यथार्थतावादको मान्यता हो' (अधिकारी र अन्य, २०७९) ।

यथार्थताको बाह्य पक्षसँग समाजको भौतिक पक्ष प्रत्यक्ष रूपमा जोडिएको हुन्छ । समाजसँग सम्बन्ध जोडिने पक्षमा राजनीति, अर्थनीति, वर्गनीति, लिङ्ग नीतिजस्ता प्रशस्त पक्षको सजीव संयोजन भएको हुन्छ । यसरी संयोजन भएर प्रस्तुत भएको वस्तुगत सत्य नै सामाजिक पक्ष हो । समाजमा परिवर्तन चाहनु त्यहाँका नागरिकको स्वाभाविक पहिचान हो । मान्छेका इच्छाअनुसार समाजमा फेरवदल हुन सक्छ । समाजमा भएको यही फेरबदल नै परिवर्तन हो । वस्तुगत यथार्थमा भौतिक वा बाह्य जीवन जगत वस्तु यथार्थ हो । साहित्यिक यथार्थले भने सामाजिक यथार्थलाई अँगाल्दछ (आचार्य, २०६७, पृ. १९४) । यसरी परिवर्तन हुने अवस्थाको सम्बन्ध यथार्थतासँग रहेको हुन्छ । समाजको सामाजिक व्यवस्थामा आउने फेरबदललाई सामाजिक परिवर्तनका रूपमा अध्ययन गरिन्छ । यस किसिमले हुने परिवर्तन समाजको संरचनामा भएको परिवर्तन हो ।

समाज भन्ने बित्तिकै यसका अनेक संरचना र संयन्त्र हुन्छन् । वर्गीय, लैङ्गिक, आर्थिक, राजनैतिक आदि यस्तै संयन्त्र हुन् । यी र यस्तै संयन्त्रका योगले समाजको स्वरुप खडा भएको हुन्छ । समाजका यस किसिमका पक्षहरूको वस्तुगत चरित्रलाई यथार्थतासँग जोडेर अध्ययन गर्ने गरिएको छ । प्रस्तुत अध्ययनमा समाजका यथार्थ सामाजिक पक्षलाई 'संयोग' कथा सङ्ग्रहसँग जोडेर विश्लेषण गरिएको छ ।

विधि र सामग्री

कथाकार यादवप्रकाश लामिछानेबाट रचित 'संयोग' कथा सङ्ग्रहमा वि.सं.२०७६ देखि २०७८ को सेरोफेरोसम्मका फुटकर कथाहरू समेटिएका छन् । उक्त कथाहरू त्यस समयका विभिन्न पत्रपत्रिकामा छापिएका छन् । यस कथा सङ्ग्रहमा १२ वटा कथाहरू रहेका छन् । कथा सङ्ग्रहका १२ वटा कथा नै प्राथमिक स्रोत हुन् भने अध्ययनका सन्दर्भमा अपनाइएका सैद्धान्तिक प्रकृतिका सामग्री नै द्वितीयक स्रोतका रूपमा प्रयोग भएका छन् । साथै पुस्तकालयलाई आधार बनाएर मूल सामग्रीको सङ्कलन गरिएको छ । यसरी सङ्कलन गरिएका आधिकारिक सामग्रीलाई आधार बनाएर अध्ययन तथा विश्लेषण गरिएको छ । प्राथमिक स्रोतका सामग्रीलाई केन्द्र बनाएर तिनको अध्ययन गरी विश्लेषण गर्दै निचोड निकालिएको छ । व्याख्यानका क्रममा कथाकार लामिछानेको 'संयोग' कृतिलाई विविध यथार्थको प्रस्तुतिका लागि मूल दृष्टान्त बनाइएको छ ।

कृतिको समीक्षा गर्दा मूल कृति बाहेकका सामग्री पनि सङ्कलन गरिएको छ । कृति समीक्षार्थ सन्दर्भ पुस्तक, शोध सामग्रीसमेत सङ्कलन गरिएको छ । अध्ययन तथा विश्लेषण गर्दा प्राथमिक मानक सामग्रीलाई पहिलो अनिवार्य सर्तमा राखिएको छ । गुणात्मक विधिका माध्यमबाट कृति विश्लेषण गरिएको छ ।

नतिजा र छलफल

यस लेखमा कथामा व्यक्त भएका यथार्थका विभिन्न अवस्थालाई पृथक् पृथक् उपशीर्षक बनाएर समीक्षा गरिएको छ । यस क्रममा कथाकार जिम्मेवार भएर समसामयिक सामाजिक अवस्था र उक्त अवस्थाका माध्यमबाट यथार्थ कथा व्याथाको सन्दर्भ प्रस्तुत गरेका छन् । कथामा सामाजिक, सांस्कृतिक, राजनीतिक, नैतिकजस्ता पक्षलाई स्वाभाविक ढङ्गले उठाइएको छ ।

कथा सङ्ग्रहमा उठाइएका विषयले सामाजिक राजनीतिक स्थितिको दृश्यावलोकन गराउँछन् । समाजको यथार्थ अवस्थालाई सर्वाङ्ग रूपमा चित्रण गर्दछन् । कथाका पात्र मानसिक रूपमा असन्तुलित देखिन्छन् । आन्दोलित भावना पाइन्छ । परिवेश चित्रण स्वाभाविक छ । यात्री, आत्मीयता, हार्दिकता, गरिबी, अभाव, समस्या, भोकमरी, अन्धविश्वास, आञ्चलिक उपस्थिति, भौगोलिक विकटता, मानवीय संवेदनाजस्ता पक्षहरू कथामा सजीव भएर आएका छन् । मनमा राष्ट्रिय भाव र तनमा आर्थिक सुख सुविधाका लागि अमेरिका आदि मुलुकमा जानेहरूको मनोभावनाको कलात्मक चित्रण छ । 'संयोग' कथा सङ्ग्रहमा अभिव्यक्त यथार्थलाई विभिन्न उपशीर्षकको निर्माण गरी व्याख्या गरिएको छ ।

स्थानिक परिवेश

'संयोग' कथा सङ्ग्रहका सर्जक यादवप्रकाश लामिछानेका कथामा स्थानिक परिवेशको यथार्थ चित्रण भएको पाइन्छ । कथा व्यवहृत स्थानीयताको चित्रणले नेपाली परिवेशलाई जस्ताको तस्तै उतारेका छन् । केही दृष्टान्त निम्न छन् :

पश्चिमतर्फ ताडी र खजुरका होचा अग्ला देखिने रुखैरुखै । उत्तर दक्षिण बगेको चिसाङ खोला (लामिछाने, २०८०, पृ. १) ।

मोरङ जिल्लाको उत्तरी क्षेत्रको राजमार्गसँगै रहेको वनजङ्गल र दक्षिणतिर रहेको आवादी वस्तीलाई यसले चित्रण गरेको छ ।

शुक्रबार लाग्ने दलेली हाट र तराईको झल्को दिने सुन्दर बजार छ, नजिकै कानेपोखरी रङ्गेली सडकमै । ठुलो पशुहाट दोमना बजारको उल्लेख छ । सवारी साधनमा साइकल र गोरु तथा राँगा गाढा छन् (लामिछाने, २०८०, पृ.२) ।

"धनकुटा जिल्लाका रातमाटे, भदौरे, बन्नेटार, मुगाली गाउँ, जलजले, लाटे भन्ज्याङजस्ता ठाउँको चर्चा छ (लामिछाने, २०८०) । यस्तै मोरङको पथरी र मैनाबारीको पनि चित्रण गरिएको छ ।

'अविरल यात्री' कथामा कोटेश्वरको सेरोफेरो र काठमाडौँली परिवेशको चित्रण छ । त्यस्तै देशका विभिन्न स्थानका रूपमा चैनपुर, भोजपुर, चन्दनपुर, सन्दकपुर, गौरीगञ्ज, वीरगञ्ज, विराटनगर, कृष्णनगर, पशुपतिनगरजस्ता स्थानको सजीव चित्र कोरिएका छन् । त्यस्तै गरी बेलटार, रुम्जाटार, भेडेटार, तुमिलङटार, रामेछापको साँधुटारजस्ता स्थानहरुको स्वाभाविक प्रस्तुति छ (लामिछाने, २०८०) । पाल्पाको मदन पोखरी, धनकुटाको महामाया, लक्ष्मी र लेगुवा खोला, अरुण किनारको च्यावा बेँसी, मुगुको रारा, बाग्लुङको खर्बाङ, पाँचथरको फिदिमसम्मको जीवन्त चित्रण छ । यी तथ्यले स्थानिक परिवेशलाई यथार्थ चित्रण गरेका छन् । स्थानीय परिवेशको सजीव चित्रणमा 'अविरल यात्री' कथा स्मरणका शैलीमा रचिएको मार्मिक आञ्चलिक कथा हो । यस कथाले हरि वैरागी दाहालको राजनीतिक तथा सामाजिक अभियानलाई सबल ढङ्गले चित्रण गरेको छ ।

संस्कृति चित्रण

यादवप्रकाश लामिछानेको प्रस्तुत 'संयोग' कथा सङ्ग्रहमा परेको पहिलो कथामा सतार समुदाय र संस्कृतिको चित्रण छ । यहाँ झाँगडहरूको बस्ती पनि छ । सतारहरू कालीको पूजा आराधनाका लागि मोरङ जिल्लाको रंगेलीमा रहेको कालीथानसम्म पुग्छन् ।

कथा सङ्ग्रहभित्र व्यावहारिक भावका अतिरिक्त सांस्कृतिक कर्ममा पनि सहभागिता जनाएको देखिन्छ । 'जन्ती' जान पनि भ्यायो । मलामी पनि गयो (लामिछाने, २०८०, पृ. ७८) । माथिका तथ्यले संस्कार र संस्कृतिलाई यथार्थ रूपमा प्रस्तुत गरेका छन् ।

बेइमानी, चरम स्वार्थ, धोका

केही टाठाबाठाहरूले तराईका सतार, झाँगड, राजवंशी समुदायका सदस्यको कमजोरीको फाइदा उठाएर उनीहरूको उठिबास लगाएका यथार्थ घटनालाई कथामा सजीव बनाएर प्रस्तुत गरिएको छ । केही नमुना यस्ता छन् :

जाँड रक्सीको कुलतमा लाग्दाको फाइदा उठाएर टाठाबाठा पहाडेहरूले केही सस्तोमा र केही किर्ते जालसाजी गरी घरबास उठाएका नमिठना घटना पनि ताजै छन् (लामिछाने, २०८०, पृ. २) । प्रस्तुत तथ्यले मान्छेले गर्ने बेइमानी र धोखाको चित्रण गरेको छ । यो यथार्थ सामाजिक घटना हो । यसले समग्र नेपाली समाजको चित्रण गर्दछ ।

'ऐँठन' कथामा कथाकार लामिछाने मान्छेको स्वार्थी प्रवृत्तिलाई चित्रण गर्दछन् । मान्छेले मान्छेलाई गर्नुपर्ने मानवीय सहयोग गर्नुको सट्टा उल्टै परपर भाग्छन् भन्ने यथार्थ एउटी कृषक महिला आफ्नो पतिलाई सरकारी सुरक्षाका मान्छेले लिएर गएपछि चित्रित भएको यथार्थ चित्रण भएको छ । कथाकार उक्त अवस्थालाई यसरी प्रस्तुत गर्दछन् :

मान्छेको जात ! सहयोग गर्नु के छ ? कसो छ ? के भएको हो ? किन आएकी ? भनेर सोध्नु त कता हो कता किन पर पर भाग्छन् ? मनमनै सोची (लामिछाने, २०८०, पृ. ८९) ।

शोषण, दमन र समाज रूपान्तरण

कथाकार यादवप्रकाश लामिछानेका कथा शोषण र दमनलाई प्रत्यक्ष अनुभूत गर्न सक्ने गरी प्रस्तुत भएका छन् । शोषण, दमनको यथार्थ चित्रण गर्नु कथाकारको मूल प्रवृत्ति पनि हो । तराईली समाजमा सतार, झाँगड, मुसहर, राजवंशी शोषण र दमनका मारमा परेका छन् । कथाकार लामिछानेले शोषण र दमनको रूप यसरी प्रस्तुत गरेका छन् :

'त्यो धेरै पापी छ ।'

बहुत खराब आदमी छ ।

'अपराधी छ ।'

कसरी नि ?

के भयो ?

मेरो जिज्ञासा थियो ।

'हामी त गरीब आदमी छ हुजुर, फेरि हाम्रो घरबास उठाइलिन्छ यसले'

(लामिछाने, २०८०, पृ. ४) ।

शोषण दमनको अर्को दृष्टान्त यस्तो छ :

जेठा बा ! तिमीले सकेको गर । सक्छौ भने अझ शोषण गर (लामिछाने, २०८०, पृ. ८०) । समाजमा हुने शोषण र दमनले समाजको रूपान्तरणको बाटो खोल्दछ । समाजको रूपान्तरणका लागि सामाजिक कर्म, सांस्कृतिक कर्म, आर्थिक कर्म आवश्यक छन् । मानिसलाई विभिन्न काम र पेसामा लगाउन र स्वरोजगार बन्ने अवस्था सिर्जना गर्न सक्ने बनाउने कामले समाजको रूपान्तरण हुन्छ (लामिछाने, २०८०) ।

यौन दुर्व्यवहार र बलात्कार

समाजका विषाक्त पात्रलाई कथाकार कतै यौन दुर्व्यव्यवहारको सङ्केत गरेर चित्रण गर्दछन् त कतै बलात्कारमा उत्रेको अवस्थाबाट बताउँछन् । यी दुवै समाजका रोग हुन् । यो यथार्थ कथाकार लामिछानेका कथामा पाइन्छ । यसले हाम्रो समाजको अवस्था के छ ? स्पष्ट पार्दछ । 'अन्तरपीडा' कथाभित्रका अनुका पीडा कसले बुझ्ने ? अनु त एउटी प्रतिनिधि पात्र मात्र हो । यस्तो घटना हाम्रो समाजमा छ्यास्छ्यास्ती छन् । बाहिर प्रकट मात्र नभएका हुन् वा हुन नसकेका हुन् । एउटी नारी घर परिवारभित्र नै असुरक्षित छ भने अन्यत्रको के कुरा भयो र ? 'फ्यासब्याक' कथामा लामिछाने यसरी यौन दुर्व्यवहारको सन्दर्भ प्रस्तुत गर्छन् :

'हाम्रो परिवारमाथि आइलाग्ने, छोरीमाथि नराम्रो काम गर्ने अनि बहुमाथि आँखा लगाइ लिने' (लामिछाने, २०८०, पृ. ७) ।

अन्तरराष्ट्रिय आञ्चलिक परिवेश चित्रण

कथाकार लामिछानेका कथा स्वदेशदेखि विदेशसम्मको सीमामा फैलिएका छन् । कथाकार लामिछानेका कथाका विषयले राष्ट्रिय आञ्चलिक परिवेशका अतिरिक्त बाह्य विदेशी भूमिसमेत कथाको कार्यस्थल बनाएका छन् । खाडी मुलुक र मलेसियाको सन्दर्भ पनि कथामा आएको छ । स्टुडेन्ट भिसामा युएस उडेको कथा छ । विदेश प्रवासिएकाहरूको दु:खद कथाको मार्मिक चित्र लामिछानेका कथाले बताउँछन् । पढ्न भनेर विदेश गएका पात्र पढ्न त कता हो कता राम्रोसँग बस्न समेत पाउँदैनन् ।

कोठा सेयर गरेर बस्नुपर्ने बाध्यताले कैयौँलाई निकै अप्ठ्यारोमा पार्छ भन्ने कुरा 'द्विविधा' कथाले स्पष्ट्याउँछ ।

डायस्पोरिक चेतना

पात्रहरू आफ्नो थातथलो छोडेर अन्यत्र जान बाध्य हुन्छन् । स्वदेशभित्र पनि ग्रामीण पहाडी भेग छोडेर तराई, तराई छोडेर सुविधा सम्पन्न स्थान देशको राजधानीमा आएर बसोबास गर्दछन् । यसले पनि मानिसका मनमा आफ्नो जन्मस्थलप्रतिको सम्झना र मोह देखिन्छ । अझ देशै छोडेर प्रवास पस्नेका लागि त आफ्नो जन्मस्थल, आफ्नो देश, आफन्तका सम्झनाले सताइरहन्छ । उनको तनमात्र विदेशमा हुन्छ । कठोर श्रम गरेर आर्जन गरेको रकम आफ्ना र आफन्तका लागि जोहो गरेर हर्दम देशको आफ्नो सभ्यता, संस्कार, संस्कृतिको मोहमा डुबेको हुन्छ । विदेशी भूमिमा मनाइने चाडपर्व, उत्सव र मेलामा सहभागी भए पनि उसको मन भने स्वदेशमा रमाइरहेको हुन्छ (लामिछाने, २०८०) । यही यथार्थलाई कथाकार लामिछानेले प्रस्तुत गरेका छन् ।

राजनीतिक अवस्थाको चित्रण र सांस्कृतिक विचलन

सर्जक लामिछानेका कथामा राजनीतिको सग्लो चित्र कोरिएको पाइन्छ । समाजमा राजनीतिक रूप अनेक आयामबाट घटित भइरहेको सन्दर्भलाई कथाकार लामिछाने कुशलतापूर्वक उद्घाटन गर्न सक्छन् । राजनीति र यसको सेरोफेरोमा रहेको संस्कृति अनि सांस्कृतिक विचलनलाई पनि उनले यथार्थ रूपमा प्रस्तुत गरेका छन् । केही दृष्टान्त यसरी प्रस्तुत गर्न सकिन्छ :

'तरहरा आमगाछीदेखि तपाईको कोठासम्मको यात्रामा भने मैले तपाईलाई चिनेँ (लामिछाने, २०८०) ।

'किन नचिन्नु नि, सेल्टर दिने मान्छेलाई' (लामिछाने, २०८०, पृ. २०) ।

आवरणमा मास्टरी अनि भूमिगत रूपमा अर्कै काम गर्नुहुँदो रहेछ' (लामिछाने, २०८०, पृ. ४१) ।

'सङ्घम शरणम् गच्छामि' भन्यो र सङ्गठन गर्दै राजनीति गर्न सिकायो (लामिछाने, २०८०, पृ. ८०) ।

'चैनपुरको टुँडिखेलको आमसभामा जनता, जनजीविका, मानवअधिकार, स्वतन्त्र अभिव्यक्त तथा मार्क्सवादको सिर्जनात्मक प्रयोग मार्फत् मौलिक विचारको विकासमा लाग्नुपर्ने हाम्रो कार्यभार हो' (लामिछाने, २०८०, पृ. ८१) । 'खोई आफन्त, नातागोता केही छैनन् । कोही आवतजावत छैन त ? यसो कहिलेकाँही नातागोता कहाँ जाने आउने र आफ्ना बोलाउने गर्दा हुँदैन ?' (लामिछाने, २०८०, पृ. ३१) ।

यस तथ्यले राजनीतिक र सांस्कृतिक विचलनको यथार्थ चित्रण गरेको छ ।

राष्ट्रियता, राष्ट्रप्रेम र राष्ट्रवादको प्रस्तुति

कथाकार लामिछाने आफ्ना कथामा राष्ट्रप्रेमको अनुपम भाव प्रस्तुत गर्दछन् । उहिले नालापानीको लडाईमा नेपालीहरू राष्ट्रका लागि लडेका थिए भन्ने सन्दर्भ जोड्दै अहिले नेपालीहरु छिमेकीका कुदृष्टिलाई असफल पार्न लागेको बताउँछन् (लामिछाने, २०८०) ।

राष्ट्रवादी भाव व्यक्त गर्दै 'सँधियार' कथामा कथाकार यसो भन्छन् 'खोलै फर्काउँछु भन्ने भावलाई राष्ट्रवादी चेतका रूपमा कथाकारले प्रस्तुत गरेका छन् (लामिछाने, २०८०) । 'पूर्वपश्चिम फैलिएको मेरो जग्गाको साँध सिमाना राति नै मेरोतिर सारेछ (लामिछाने, २०८०, पृ. ३७) ।

सीमा समस्याको प्रस्तुति

'सँधियार' शीर्षकको कथामा कथाकार लामिछाने थेत्तरो र नकच्चरो सँधियारको सन्दर्भका माध्यमबाट नेपालको भारततर्फका सीमा क्षेत्रमा देखिएका सीमा सम्बद्ध ज्वलन्त समस्यालाई दुरुस्त चित्रण गर्दछन् । सीमा नाकाबाट म तँलाई तेल दिन्न भन्ने घुर्की लगाउँछ भनेर नेपालको पूर्व, पश्चिम र दक्षिण, सीमाको छिमेकी भनेको र बेलाबेलामा नाकाबन्दी समेत गरेको घटना स्मरण गराउँछन् (लामिछाने, २०८०) । पूर्वपश्चिम फैलिएको मेरो जग्गाको साँध सिमाना लगाएको ढुङ्गो राति नै मेरैतिर सारेछ । त्यति मात्र हो र ? प्राकृतिक सीमा यो होइन भन्दै कृत्रिम साँध सीमा लगाउन पनि पछि परेन (लामिछाने, २०८०, पृ. ३७) ।

प्राकृतिक सम्पदा र सुन्दरता

कथाकार लामिछाने आफ्ना कथामा देशको सुन्दरता, सम्पन्नता, विविधता र सम्पदा पक्षलाई यथार्थ ढपमा प्रकाशित गर्दछन् । कथाकार मेरो हिमाली सौन्दर्य भनेर वकालत गर्दछन् । प्राकृतिक सम्पदाका दृष्टिले विश्वको ध्यान यतैतिर केन्द्रित छ (लामिछाने, २०८०) । सर्जक लामिछानेले नेपालको मुगु जिल्लाको रारा तालको सौन्दर्य चित्रणमा मुर्मा टपको प्रसङ्ग जोडेका छन् । हिमाल, पहाड र तराईको विविध सौन्दर्यको यथार्थ चित्रण गरेका छन् ।

यथार्थवादी आदर्शको प्रस्तुति

कथाकार लामिछाने 'अन्तरपीडा' कथामा हाम्रो यथार्थतालाई आदर्श बनाएर अगाडि बढ्नुपर्ने कुरा बताउँछन् । अब सच्चा जीवन जिउनुपर्छ । जीवनमा केवल अँध्यारो पाटोमात्र छैन झलझली घाम लागेको पनि देख्न सकिन्छ (लामिछाने, २०८०) । कथाकार 'अविरल यात्री' कथामा यथार्थभित्रको आदर्श चरित्र यसरी प्रस्तुत गर्दछ, -'निहुरेको देखियो तर झुकेको देखिएन । सिँढी उक्लियो तर दम्भ उक्लिएन ।

लोकप्रियता चुलियो । घमण्ड चुलिएन । स्वार्थ देखिएन । आकाङ्क्षां थियो तर महत्वकांक्षा थिएन (लामिछाने, २०८०, पृ. ७७) । उपर्युक्त तथ्यले कथाकार लामिछाने आफ्ना कथामा समाजका विविध यथार्थलाई दुरुस्त चित्रण गर्दछन् भन्ने पुष्टि गर्दछ ।

समाज मनोविज्ञान र संवेदनाकको प्रस्तुति

सर्जक लामिछानेका कथामा समाजको मनोदशा सजीव भएर प्रस्तुत भएका छन् । समाजलाई प्रस्तुत गर्दा कथाकार लामिछाने लैङ्गिक दृष्टिलाई जस्ताको तस्तै प्रस्तुत गर्दछन् । 'अन्तरपीडा' कथाले समाज मनोविज्ञानलाई सजीव बनाएर प्रस्तुत गरेको छ । समाजमा नारी र पुरुषका सन्दर्भलाई विषय बनाएर कथाकार यसरी आफ्नो कथात्मक भाव प्रस्तुत गर्दछन्, जबसम्म पुरुष मानसिकताले ठाउँ पाउँछ नि तबसम्म नारीले नारी भएर बाँच्न पाउँदिन (लामिछाने, २०८०, पृ. ५४) । यहाँ व्यक्त भावले समाजको मनोविज्ञानलाई दुरुस्त चित्रण गरेको छ ।

कथाकार लामिछाने 'ऐँठन' कथामा समाजकका मानिस अर्को सदस्यलाई आइपर्ने दुःख, पीडा र संवेदनाको भावलाई प्राथमिकता दिदैनन् भन्ने तथ्य यसरी प्रस्तुत गर्दछन्- 'भीडमा पनि उसले आफूलाई एक्लो ठानी । मान्छेको व्यवहार देखेर बोलीचाली गर्नु, मित्रता बढाउनु केवल ढाँग मात्र हो भन्ने सोची' (लामिछाने, २०८०) ।

परिवर्तन, उन्नति र प्रगति

कथाकार आफ्ना कथामा परिवर्तनले उन्नति र प्रगति ल्याउनुपर्छ भन्ने मत राख्छन् । यो समयको प्रवाह र अन्तरालमा आउने स्वाभाविक प्रक्रिया पनि हो । अजय र अनुको संवाद कथनमा कथाकार अब समाजका गलत मनोविकारको जरै उखेल्नुपर्छ भन्छन् (लामिछाने, २०८०, पृ. ५५) । कथाकार 'संयोग' शीर्षक सङ्ग्रहको अन्तिम कथामा परिवर्तन प्राकृतिक कुरा भएकाले हामी पनि समयअनुसार स्वतः परिवर्तन हुनुपर्छ भन्ने मत राख्छन् । जीवन भनेको परिवर्तन नै हो । यो पोखरीझैं जम्ने होइन, नदीझैं बगिरहने हो (लामिछाने, २०८०) ।

सकारात्मक आशावादी सोच

कथाकार लामिछानेका कथा सकारात्मक सोच र आशावादी स्वरले सुसज्जित छन् । कथाकार स्वयम् पनि सकारात्मक सोचका खानी छन् । उनले यो भाव आफ्नो जीवनमा दुरुस्त उतारेका छन् । एउटा दृष्टान्त गद्यांशबाट यसलाई प्रस्तुत गर्न सकिन्छ :

'अजय ! तिमीले मात्र अन्तरपीडालाई बुझ्न सक्छौं । हामी दुवैको प्रयासले सार्थकता पाउनुपर्छ, सार्थकता (लामिछाने, २०८०, पृ. ५५) ।

धार्मिक सांस्कृतिक भाव

हाम्रो सामाजिक परम्परा बहुसांस्कृतिक छ । हामी सबै आ-आफ्नो संस्कृति, संस्कार र धार्मिक विश्वास तथा मतबाट चल्छौं । कथाकारले तराईका सतार जातिको सांस्कृतिक-धार्मिक चेतलाई जस्ताको तस्तै दुरुस्त बनाएर प्रस्तुत गरेका छन् । 'एउटा त्यस्तो दृष्टान्त यस्तो छ :

'कालीको आराधरामा ज्यादै लाग्थे । साथीभाइका कुरा मान्दथे । काली पूजामा रङ्गेलीको काली मन्दिर जान छुटाउँदैनथे (लामिछाने, २०८० : ५७) ।

प्रस्तुत दृष्टान्तले सतार समुदायका ढेना दाइका माध्यमबाट तराईली र सतार समुदायको चित्रण गरेका छन् ।

सामाजिक, आर्थिक विषमताको चित्रण

कथाकार लामिछानेले नेपालको पूर्वी तराईको मोरङ जिल्लालाई केन्द्र बनाएर सामाजिक आर्थिक विभेद र विषमतालाई केलाएका छन् । सतारबस्ती भएका खास खास क्षेत्रलाई प्राथमिकता दिएर त्यहाँको जीवन भोगाइको चित्रण गरेका छन् । मैनावारी, होक्लाबारी, विसनपुर र निशानथानको विशेष चित्रण गरेका छन् । ऋण लिने र तिर्ने बेलासम्म ऋणको भारले खेतै बुझाउने आर्थिक मारमा परेका सतार समुदायको यथार्थ चित्रण गरेका छन् (लामिछाने, २०८०) । सामाजिक आर्थिक विभेदको दृष्टान्त बताउने यो यथार्थ नमुना हो ।

सतार जातिमा अन्धविश्वासले गहिरो जरा गाडेको तथ्य कथामा प्रस्तुत छ । ढेना दाइ पखाला लागेर ग्रस्त हुँदा जीवनजल पानी खान र खुवाउन नदिएको प्रसङ्ग यथार्थ छ । कथाकार स्वयम् पनि उक्त अवस्थामा अवाक् बन्न पुग्दछन् । काठमाडौँमा दयावीर सिंह कंसाकारले यही रुढिग्रस्त चिन्तन र अन्धविश्वासले पखाला लागेर आफ्नी आमा गुमाएको सन्दर्भ पनि यहाँ तुलनीय देखिन्छ ।

माओवादी विद्रोहको चित्रण

कथाकार यादवप्रकाश लामिछानेले 'संयोग' कथासङ्ग्रहमा विद्रोहलाई दुरुस्त चित्रण गरेका छन् । विद्रोही पक्ष माओवादीले गरेको विद्रोह राज्यमा सकारात्मक परिवर्तनका लागि भएको सङ्केत गरेका छन् । गाउँबस्तीमा उनीहरूका सबै परिवारका सदस्य यही घटनाका कारण पलायन भएका छन् भन्ने सन्दर्भ प्रस्तुत गर्दछन् ।

'ऐँठन' कथामा प्रस्तुत भएको समाज र समाजका सदस्यको अवस्थालाई कथाकार यसरी प्रस्तुत गर्दछन् । 'दोहोरो मारमा कतिञ्जेल बाँच्ने । कहाँ जाने ? निल्नु न ओकल्नु भो गाउँको बसाइ । बसौँ त

कतिबेला बढेका हुर्केका छोराछोरी हामी लैजान्छौँ भन्दै आउने । उता जङ्गलीलाई भात ख्वाइस ? भनेर राज्य पक्षले धरपकड गर्ने (लामिछाने, २०८०) ।

प्रस्तुत भएका तथ्यले माओवादी विद्रोही र सरकार पक्षीय सेना दुवैको मार खानुपरेको यथार्थ पीडा प्रस्तुत भएको छ । फन्दामा एउटा सरल कृषक पर्छ र कृषक पत्नी प्रताडित बन्छे । यो त एउटा प्रतिनिधि घटना हो । यस्ता घटना अवर्णनीय छन् ।

निष्कर्ष

कथाकार यादवप्रकाश लामिछानेका 'संयोग' कथासङ्ग्रहभित्रका कथाहरूले समाजका यथार्थको अभिव्यक्ति दिएका छन् । विवेच्य कथा सङ्ग्रहमा रहेका १२ वटा कथा ९८ पृष्ठमा समेटिएका छन् । यथार्थ विषय प्रस्तुत हुनु र तिनले समाजलाई जस्ताको तस्तै प्रस्तुत गर्नु कथा सँगालोको प्राप्ति तथा उपलब्धि हुन् । कथा सङ्ग्रह २०७६ देखि २०७८ सम्म प्रकाशित भएका कथाहरू समेटेर २०८० मा प्रकाशमा आएको छ । कथा सङ्ग्रहमा नेपाली भूगोलका मुगुदेखि धनकुटा, मोरङसम्मका क्षेत्र समेटिएका छन् । विवेच्य कथा सङ्ग्रहमा स्थानीय परिवेश, संस्कृति, आर्थिक सामाजिक विषमता, बेइमानी, शोषण, दमनका विषय यथार्थ रूपमा प्रस्तुत भएका छन् । राष्ट्रियता, सीमा समस्या, प्राकृतिक सम्पदा, मानवीय संवेदना, विद्रोह, परिवर्तन, उन्नतिजस्ता पक्षको दुरुस्त चित्रण गरिएको छ । वेथिति र विचलनका विषय पनि कथामा जस्ताको तस्तै आएका छन् । यथार्थ प्रस्तुतिका दृष्टिले कथासङ्ग्रह सफल बन्नु यसको उपलब्धि तथा प्राप्ति हो । समाजलाई हुबहु प्रस्तुत गर्न सक्नु कृतिको सफलता मान्नुपर्छ । कृतिको सफलतासँगै कृतिकार पनि सफल सर्जकका रूपमा दरिएका छन् ।

सन्दर्भसूची

अधिकारी, गणेशराज (२०७६), *सिर्जना र साधनाको सौगात,* भुँडीपुराण प्रकाशन ।

अधिकारी, गणेशराज, गौतम, वासुदेव र ढुङ्गेल, वासुदेव (२०७९), *साहित्यशास्त्र र नेपाली समालोचना,* भुँडीपुराण प्रकाशन ।

आचार्य, कृष्णप्रसाद (२०६७), *साहित्यशास्त्र र नेपाली समालोचना,* क्षितिज प्रकाशन ।

लामिछाने, यादवप्रकाश (२०८०), *संयोग,* विद्यार्थी पुस्तक भण्डार ।

श्रेष्ठ, दयाराम (२०६०), *नेपाली कथा भाग-४* (दोस्रो संस्क.), साझा प्रकाशन ।

श्रेष्ठ, दयाराम (२०७८), *यथार्थवाद र नेपाली कथा परम्परामा आधुनिक कालको प्रणयन,* शिखा बुक्स ।

श्रेष्ठ, दयाराम र शर्मा मोहनराज (२०५९), *नेपाली साहित्यको सङ्क्षिप्त इतिहास* (छैटौँ संस्क), साझा प्रकाशन ।

Academic Journal of Sukuna – AJoS, A Peer-reviewed Interdisciplinary Journal
Volume 5 (Issue 1) 2025 July (2082 Ashad), Pp. 220 – 241, ISSN 2594-3138 (Print)
Research Management Cell (RMC – Sukuna), Sundarharaincha, Morang

'मातृत्व' कथामा लैङ्गिकताको प्रयोग

Doi: https://doi.org/10.3126/ajos.v5i1.81994

बालकृष्ण गौतम* र सोमा बस्नेत

शिक्षकहरू, सुकुना बहुमुखी क्याम्पस, सुन्दरहरैंचा, मोरङ

*Email: balkrishnagtm123@gmail.com

लेखसार

प्रस्तुत आलेख कथाकार भागीरथी श्रेष्ठद्वारा रचित सामाजिक विषयवस्तुमा आधारित 'मातृत्व' कथामा प्रयोग भएको लैङ्गिकतालाई लैङ्गिक अध्ययन तथा समालोचनाका आधारमा मूल्याङ्कन गरिएको छ । लैङ्गिक अध्ययनले साहित्यिक कृतिमा नारी, पुरुष तथा अन्य लिङ्गीहरूको सामाजिक र सांस्कृतिक अवस्थाको खोजी गरी सामाजिक न्याय र समता स्थापना गर्ने ध्येय राख्दछ । यस कथामा नारी पात्र ममता र पुरुष पात्र सुबोध बिच लैङ्गिक विभेद देखिएको छ । यही अनुसन्धेय समस्यामा केन्द्रित भई प्रस्तुत कथामा पाइने पितृसत्ताको अवस्था, चरित्र तथा जैविकता, यौनिकता, लैङ्गिक हिंसा, लैङ्गिक चेतना र लैङ्गिक परिणितिको अध्ययन विश्लेषणलाई उद्देश्य बनाएको छ । पुस्तकालय कार्यबाट सोद्देश्यमूलक नमुना विधिबाट प्राथमिक र द्वितीयक स्रोतका सामग्रीहरू सङ्कलन गरिएको छ । प्राथमिक स्रोतमा मातृत्व कथा र यसभित्रका तथ्यपरक सन्दर्भ र उदाहरणहरू समावेश भएका छन् भने द्वितीयक स्रोतमा लैङ्गिक समालोचनासम्बद्ध लेख, पुस्तक, शोधपत्र र समालोचनाहरू रहेका छन् । पाठ विश्लेषणमा आधारित भई कथाका चयनीय वाक्यहरूको विश्लेषण गरी अर्थ निर्धारण गरिएकाले गुणात्मक अध्ययन पद्धतिको उपयोग गरिएको छ । यसका लागि लैङ्गिक

समालोचनाको स्वरुप तथा मान्यताहरूका सैद्धान्तिक ढाँचा अवलम्बन गरिएको छ । यस कथामा समाजमा नारी र पुरुषको सामाजिक भूमिका, निर्णयशक्ति र जिम्मेवारी निर्धारण गर्ने पितृसत्तावादी सोच हावी रहेको, लैङ्गिकता कै कारण पुरुष प्रभुत्व कायम रहेको, नारीमाथि विभेद र शोषण गरिएको, पुरुष शोषणबाट मातृत्वका लागि नारी विद्रोह गरी लैङ्गिक चेतना अपरिहार्य रहेको निष्कर्ष निकालिएको छ ।

शब्दकुञ्जी : उत्पीडन, पितृसत्ता, लैङ्गिक हिंसा, लैङ्गिक समालोचना

विषयपरिचय

प्रस्तुत आलेखको विषय भागीरथी श्रेष्ठद्वारा लिखित 'मातृत्व' कथालाई लैङ्गिक चेतनाका दृष्टिकोणबाट विश्लेषण र मूल्याङ्कन गर्नु रहेको छ । समाज र संस्कृतिबाट निर्मित पुरुष र महिला बिचको सामाजिक, सांस्कृतिक, आर्थिक तथा मनोवैज्ञानिक स्थिति र भूमिकालाई नै लैङ्गिकता (जेन्डर) भनिन्छ । लैङ्गिकताका आधारमा गरिने विभेद र अन्यायपूर्ण व्यवहार एवम् परम्परित मान्यताबाट निर्माण गरिएका लैङ्गिक भूमिकाहरूमा समान तथा न्यायपूर्ण अवस्थाको खोजी गर्नु नै लैङ्गिक चेतना हो (खनाल, वि.सं. २०७५, पृ. ०१) । समाजमा पुरुषले नारीमाथि र नारीले पुरुषमाथि गर्ने विभेदको अन्त्य गर्नुपर्ने विचार लैङ्गिक चेतना हो तथापि पितृसत्तात्मक समाजमा खासगरी पुरुषहरूबाट नै नारीहरू शोषित पीडित र उपेक्षित भएका छन् । यी दुवैको सहअस्तित्वको खोजी लैङ्गिक चेतनामा गरिन्छ । यो चेतना नेपाली साहित्यमा नवीन विचारका रूपमा देखापरेको छ । लैङ्गिक चेतनाको अध्ययन लैङ्गिक समालोचनाअन्तर्गत गरिन्छ । अङ्ग्रेजी भाषाको 'जेन्डर क्रिटिसिजम'को नेपाली रूपान्तरण नै लैङ्गिक समालोचना हो । लैङ्गिक समालोचना पुरुष र महिलाको सम्बन्ध, समाजमा तिनको भूमिका तथा सामाजिक, आर्थिक, सांस्कृतिक संरचनामा पुरुष र महिलाको हस्तक्षेपको अध्ययन हो (भट्टराई, वि.सं. २०७६ पृ. २६०)। यसले सामाजिक तथा

सांस्कृतिक दृष्टिले महिला, पुरुष तथा अन्य लिङ्गी (तेस्रो लिङ्गी) हरूका विचमा कुनै किसिमको भिन्नता हुनु हुँदैन भन्ने मान्यता राख्दछ । लैङ्गिक समालोचनालाई लैङ्गिक अध्ययनको विशिष्ट क्षेत्रअन्तर्गत राखिएको छ (अब्राम्स र हार्फम, सन् २००५, पृ. ११३) । समाजका राजनीति, धर्म, शिक्षा, संस्कृति, घरपरिवार आदि कुनै पनि क्षेत्रमा हुने विभेदको अन्त्य गरी लैङ्गिक दृष्टिले न्यायमूलक एवम् समतामूलक समाज निर्माणको ध्येय राख्नु लैङ्गिक अध्ययनको खास उद्देश्य हो । लैङ्गिक दृष्टिले साहित्यिक कृतिको समीक्षण र मूल्याङ्कन गर्ने कार्य लैङ्गिक समालोचना हो ।

लैङ्गिक अध्ययनको आधारभूमि नारीवादलाई मानिन्छ । नारीवादी दृष्टिकोणको विकास मार्क्सवादी चिन्तनबाट आरम्भ भएको हो । सिमोन र बुआको 'द सेकेन्ड सेक्स' (सन् १९४९) को प्रकाशनपछि नारीवाद र लैङ्गिक अध्ययनले प्राज्ञिक र बौद्धिक महत्त्व प्राप्त गर्यो भने साहित्यका क्षेत्रमा नारीलेखन र लैङ्गिक भिन्नतालाई प्रष्ट पार्न ऐतिहासिक, जीववैज्ञानिक, मनोवैज्ञानिक र सांस्कृतिक व्याख्याहरू प्रस्तुत गरिए र महिलाहरू कसरी दोस्रो दर्जाका नागरिक वा भूमिकाका दृष्टिले कम महत्त्वका रहेका छन् भन्ने कुराको व्याख्यात्मक अभिलेख पनि प्रस्तुत गरियो (टोलान, सन् २००६, उद्धृत : भट्टराई, वि.सं. २०७६, पृ. २६२) । नारीवादी आन्दोलनले सन् १९६० पछि लैङ्गिक अध्ययन तथा लैङ्गिक भूमिकालाई समेटेर अघि बढ्ने क्रममा लैङ्गिक अध्ययनको जन्म भएको हो (उप्रेती, वि.सं. २०६८, पृ. २४१) । सन् १९८० को दशकपछि लैङ्गिक अध्ययनमा उत्तरसंरचनावादको प्रभाव पर्न थालेपछि फुकोको लिङ्ग र सङ्कथन, लकानको मनोविश्लेषणको अध्ययन, डेरिडाको भिन्नताको राजनीति आदिको प्रभावले नारीवादी तथा लैङ्गिक अध्ययनमा रुचि बढायो (भट्टराई, वि.सं.२०७६ पृ. २६३) । यसै समयमा लैङ्गिक समविकासको आधारमा लैङ्गिक अध्ययन विकसित हुन थाल्यो ।

वर्तमान सन्दर्भमा लैङ्गिक अध्ययन साहित्यको विश्लेषण र मूल्याङ्कन गर्ने महत्त्वपूर्ण सिद्धान्तका रूपमा स्थापित भएको छ ।

समाजमा कानुनी रूपमा नारी र पुरुषको समान अधिकार रहेपनि व्यावहारिक रूपमा लैङ्गिक विभेद कायमै छ तसर्थ नारी र पुरुष विचको समता अझै पनि देखिँदैन । समाजमा लैङ्गिक विभेद शक्ति, सामर्थ्य तथा स्वामित्वमा पुरुषकै प्रभुत्वका कारण सिर्जित छ । समाजमा उत्पादनका साधनमा पुरुषकै वर्चस्व कायम हुनु एवम् नारीले पैतृक सम्पत्तिको नैसर्गिक उपभोग गर्ने वातावरण नहुनाले लैङ्गिक विभेद रहेको पुष्टि गर्दछ । समाजमा नारी र पुरुष व्यावहारिक रूपमा किन समान छैनन् ? सामाजिक लिङ्गले नारी र पुरुषको भूमिकालाई के कसरी निर्धारण गर्दछन् जस्ता पक्ष यस आलेखको क्षेत्र बनेको छ । यसै सन्दर्भमा मातृत्व कथामा के कस्तो लैङ्गिक चेतनाको प्रयोग गरिएको छ भन्ने मूल जिज्ञासा तथा समस्याको विश्लेषणमा प्रस्तुत अध्ययन केन्द्रित छ । मातृत्व कथामा पितृसत्ता, चरित्र/जैविकता, यौनिकता, लैङ्गिक हिंसा, लैङ्गिक चेतना र लैङ्गिक परिणति पनि के कस्तो रहेको छ ? भन्ने अनुसन्धानत्मक प्रश्नमा केन्द्रित भई यिनै पक्षहरू सो कथामा के कसरी प्रयोग भएका छन् भनी शल्यक्रिया गर्नु नै यस आलेखको मुख्य उद्देश्य हो ।

सांस्कृतिक समालोचनाको एक नवीन शाखा लैङ्गिक समालोचना हो । यसले परम्परागत समालोचना प्रणालीभन्दा फरक ढङ्गले पाठ वा सङ्कथन विश्लेषण गर्दछ । लैङ्गिक समालोचनाका आधारमा कृति विश्लेषणको ढाँचा बनाई मातृत्व कथाको विश्लेषण गरिएको छ । कथा र साहित्यका अन्य विधामा लैङ्गिक चेतनाको प्रयोगसम्बन्धी अध्ययन भए पनि मातृत्व कथामा अध्ययन नभएकाले लैङ्गिकताको अनुशीलन आवश्यक देखिएको छ । यसबाट प्रस्तुत कृतिमा भेटिने लैङ्गिक चेतनासम्बद्ध ज्ञानमाथि वस्तुगत रूपमा मौलिक ढङ्गले प्रकाश पारिएको छ । त्यसैले यो अध्ययन महत्त्वपूर्ण बनेको छ । लैङ्गिक चेतनालाई नै

केन्द्रबिन्दु बनाएर मातृत्व कथाको परिशीलन नगरिएकाले यो अध्ययन नै लैङ्गिक समालोचनाका दृष्टिले मूल्याङ्कन गरिएको पहिलो आलेख हो । यसर्थ पनि यसको औचित्य उच्च रहेको ठहरिन्छ । विश्लेषणीय विषयवस्तु र यसबाट प्राप्त हुने ज्ञान सम्बद्ध विषयका जिज्ञासु, अध्येता, शोधार्थी, पाठ्यक्रम निर्माता तथा पठनपाठनमा संलग्न व्यक्तिहरूका लागि समेत उपयोगी हुने भएकोले प्रस्तुत अध्ययन औचित्यपूर्ण रहेको छ । पठन संस्कृति कम हुँदै गएका सन्दर्भमा प्रस्तुत अध्ययनले पाठकहरूमा पठन संस्कृतिको विकासमा उत्प्रेरणा पनि प्रदान गर्दछ । प्रस्तुत आलेखले मातृत्व कथामा लैङ्गिक समालोचना अध्ययनको आरम्भिक मार्गनिर्देशको गोरेटो पनि निर्माण गर्ने भएकाले प्रस्तुत अध्ययन अत्यावश्यक ठानिएको छ । अत: मातृत्व कथाको लैङ्गिक समालोचनाको गोरेटोको निर्माण गरी लैङ्गिक समविकासमा जागरण र उत्प्रेरणा समेत प्रदान गर्नेछ त्यसैले लैङ्गिक अध्ययनसम्बद्ध जिज्ञासुहरूका लागि प्रस्तुत आलेख उपलब्धिमूलक र औचित्यपूर्ण ठानिन्छ ।

मातृत्व कथालाई नै आधार बनाएर लैङ्गिक अध्ययन भएको पाउन कठिन छ । यस कथासँग सम्बन्धित भएर अन्य आधारमा चाहिँ केही अध्ययन र समीक्षण भएको देखिन्छ । श्रेष्ठ (वि.सं. २०४५) ले नेपाली कथाका समकालीन सन्दर्भहरूमा नेपाली कथाका समसामयिक सन्दर्भहरूको विवेचना गर्ने क्रममा भागीरथीलाई हार्दिक अनुभूतिको तहबाट समाज र जीवनको अन्तर निरीक्षण गर्ने कथाकारका रूपमा चिनाएका छन् । लामिछाने (वि.सं.२०७२) ले नेपाली कथा र उपन्यास सिद्धान्त र समीक्षा पुस्तकमा भागिरथी श्रेष्ठले परम्परागत सोचाइ भएका पुरुषहरूका क्रियाकलापबाट नारीहरूले भोग्नु परेका समस्या, व्यथा, पीडा र विवशतालाई अभिव्यक्त गरी लैङ्गिक विभेद हटाउनुपर्ने सन्देश दिइएको उल्लेख गरेका छन् ।

लुइटेल (सन् २०११) ले आख्यानकार भागीरथी श्रेष्ठ शीर्षकको लेखमा कथाकार श्रेष्ठको जीवनी र कृतित्वका बारेमा सटिक चर्चा गरेकी छिन् । उनले भागीरथी श्रेष्ठका कथामा दाम्पत्य जीवनका विविध पाटाहरू, सन्तानविहीन परिस्थितिमा मानिसले भोग्नुपर्ने पीडा, मातृत्वको पीडा र महत्त्व, आर्थिक असमानताले उत्पन्न गरेको पीडाजन्य परिस्थिति, वैधव्यको पीडा, नारीले भोग्नुपरेका सामाजिक तिरस्कार, पुरानो र नयाँ पुस्ताका विचमा देखापर्ने सङ्कटग्रस्त मूल्यहरू जस्ता विविध विषयवस्तुबाट कथाकार श्रेष्ठले कथाको संरचना निर्माण गरेकी छिन् भन्ने विचार अभिव्यक्त गरेकी छिन् । यसबाट मातृत्व कथामा लैङ्गिक अध्ययन गर्न सकिने सङ्केत फेला पर्दछ । पौडेल (सन् २०२१) ले मृगतृष्णा कथामा लैङ्गिक चेतना शीर्षकमा अध्ययन गरेका छन् । उनले मृगतृष्णा कथामा प्रयोग भएको लैङ्गिक चेतनाको अवस्था पत्ता लगाउने, जैविक लिङ्गका कारणले पात्रको सामाजिक भूमिकामा पार्ने प्रभाव तथा लैङ्गिक विभेद र शोषणको अध्ययन गर्ने उद्देश्य राखी समाजमा पितृसत्तावादी सोच हाबी भएको, सामाजिक लिङ्गकै कारण पुरुष प्रभुत्व कायम रहेको, नारीमाथि शोषण दमन हुने गरेको, पितृसत्ताका आधारमा हुने शोषण विभेदबाट मुक्तिका लागि नारी विद्रोह अपरिहार्य रहेको तथा लैङ्गिक समविकासका लागि नारी पुरुष परिपूरक बन्नुपर्ने निष्कर्ष निकालेका छन् । खनाल (सन् २०२२) ले निद्रा कथामा लैङ्गिकता शीर्षकको लेखमा लैङ्गिकताका आधारमा निद्रा कथाको विश्लेषण गरेका छन् । उनले लैङ्गिक अध्ययनको सैद्धान्तिक अवधारणा प्रस्तुत गर्दै निद्रा कथामा लैङ्गिक प्रतिनिधित्व र पहिचानको चित्रण गर्ने र लैङ्गिकताका दृष्टिले पात्रको भूमिका निरूपण गर्ने उद्देश्य राखी नारी पात्रहरू आफ्नो अस्तित्व रक्षा र पहिचानका लागि निर्भीक देखिएको निष्कर्ष निकालेका छन् ।

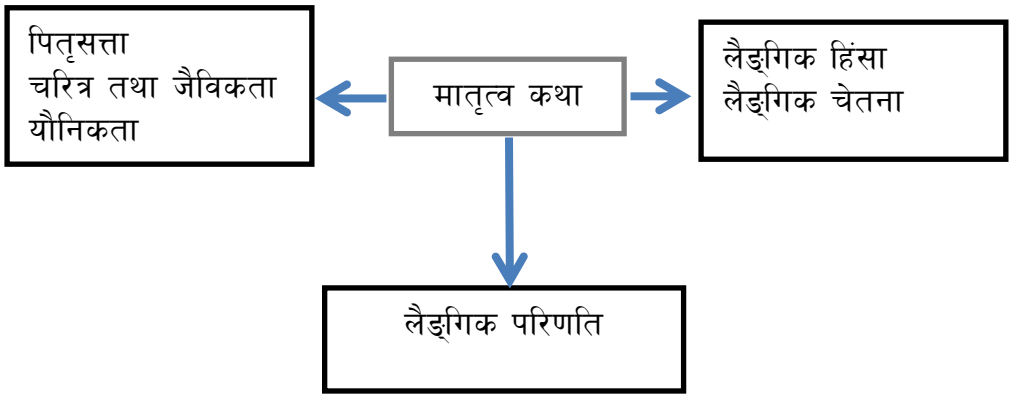
लैङ्गिक अध्ययनकै सन्दर्भमा कायस्थ (वि.सं. २०७८) ले विश्वेश्वरप्रसाद कोइरालाका कथामा लैङ्गिकता शोध प्रबन्धमा विश्वेश्वरप्रसाद कोइरालाका कथामा लैङ्गिक, वर्गीय र जातीय

शक्तिसम्बन्ध र पहिचानको विश्लेषण गर्ने तथा वर्गीय शोषण र लैङ्गिक उत्पीडनको स्वरूप निरूपण गर्ने उद्देश्य राखी गरिएको विश्लेषणमा नेपाली समाजमा व्याप्त लैङ्गिक विभेद र उत्पीडन तथा पितृसत्तात्मक वर्चस्वले नारी र पुरुषका सम्बन्धमा पारेको प्रभाव कोइरालाका कथामा विशिष्ट रूपले देखिन्छ भन्ने चर्चा गरेका छन् ।

प्रस्तुत आलेखलाई वस्तुगत रूपमा परिशीलन गर्न लैङ्गिक समालोचना सिद्धान्तको सैद्धान्तिक ढाँचा अवलम्बन गरिएको छ । मातृत्व कथामा प्रयोग भएको लैङ्गिकतालाई निम्न अवधारणात्मक ढाँचामा समीक्षण गरिएको छ :

चित्र १

अवधारणात्मक ढाँचा



प्रस्तुत आलेखमा तथ्याङ्क विश्लेषणको मुख्य सैद्धान्तिक आधार लैङ्गिक समालोचना सिद्धान्त हो । प्रस्तुत कथामा प्रस्तुत भएको विषयवस्तु तथा कथावस्तुका आधारमा नै सैद्धान्तिक पर्याधार निर्माण गरिएको छ । साहित्यिक कृतिलाई लैङ्गिक दृष्टिकोणले समीक्षण र मूल्याङ्कन गर्नु नै लैङ्गिक समालोचना हो । यसमा कृतिभित्र महिला र पुरुषका सम्बन्ध र त्यसले निर्धारण गरेका सामाजिक निर्मितिको अध्ययन गरिन्छ । लैङ्गिक दृष्टिले साहित्यको

विश्लेषण र मूल्याङ्कन गर्ने कार्यलाई लैङ्गिक समालोचना भनिन्छ (खनाल, २०७५ पृ. १)। लैङ्गिक समालोचनाका आधारहरू खनाल (२०७५) ले पितृसत्ता, नारीवाद, पुरुषत्व, यौनिकता, लैङ्गिक समानता र समता, लैङ्गिक भूमिका, लैङ्गिक विभेद, लैङ्गिक हिंसा, लैङ्गिक सशक्तीकरण, लैङ्गिक भाषा र जैविक लिङ्ग उल्लेख गरेका छन्। त्यसैगरी भट्टराई (२०७६) ले लैङ्गिक समालोचनाका सैद्धान्तिक आधारहरू नारीवाद, पितृसत्ता, सामाजिक लिङ्ग, लैङ्गिकता, पुलिङ्ग, सामाजिक लिङ्गभेद र शरीर राजनीति प्रस्तुत गरेका छन्। कृति समालोचनाका यी सम्पूर्ण आधारहरू बृहत्तर आयामका रूपमा रहेका छन् तसर्थ प्रस्तुत मातृत्व कथामा प्रयोग भएको लैङ्गिकतालाई पितृसत्ता, जैविकता, यौनिकता, लैङ्गिक हिंसा र लैङ्गिक चेतनाका आधारमा अनुशीलन गरी लैङ्गिक परिणति तथा निष्कर्ष निकालिएको छ।

विधि र सामग्री

प्रस्तुत आलेखमा सामग्री सङ्कलन पुस्तकालय अध्ययन कार्यबाट गरिएको छ। यस सन्दर्भमा प्राथमिक र द्वितीयक स्रोतको उपयोग गरिएको छ। प्राथमिक स्रोतका रूपमा कथाकार भागीरथी श्रेष्ठद्वारा लिखित मातृत्व कथालाई लिएको छ भने द्वितीयक स्रोतका रूपमा मातृत्व कथाका बारेमा लेखिएका सामग्रीहरू, अनुसन्धानात्मक लेख, समीक्षण, पुस्तक, शोधपत्रहरू र लैङ्गिक अध्ययन तथा समालोचनासँग सम्बन्धित सन्दर्भ ग्रन्थहरूको उपयोग गरिएको छ। यसरी सङ्कलित सामग्रीलाई वर्णनात्मक र विश्लेषणात्मक विधिद्वारा विश्लेषण गरी निष्कर्षमा पुगिएकाले यो अध्ययन गुणात्मक प्रकृतिको रहेको छ।

प्रस्तुत आलेखमा तथ्याङ्क विश्लेषणको मुख्य सैद्धान्तिक आधार लैङ्गिक समालोचना सिद्धान्त हो। यस सिद्धान्तका आधारमा मातृत्व कथालाई विश्लेषण गर्दा उक्त कथामा प्रस्तुत कथावस्तुका आधारमा नै सैद्धान्तिक पर्याधार निर्माण गरिएको र लैङ्गिक समालोचना पद्धतिका स्थापित मान्यताका सापेक्षतामा व्याख्या तथा विश्लेषण गरिएको छ। यसअन्तर्गत स्थापित

विभिन्न प्रतिमानहरूमध्ये पितृसत्ता, जैविकता, यौनिकता, लैङ्गिक हिंसा, लैङ्गिक चेतना र लैङ्गिक परिणतिका आधारमा उक्त कथाको विश्लेषण गरिएको छ । यी बाहेकका अन्य कथा र अन्य आधार एवम् अन्य दृष्टिकोणबाट मातृत्व कथालाई अध्ययन नगर्नु यस आलेखका सीमा हुन् ।

नतिजा र छलफल

कथाकार भागीरथी श्रेष्ठ (वि.सं.२००५) द्वारा लिखित 'मातृत्व' कथा मनोवैज्ञानिक पृष्ठभूमिमा रचित सामाजिक यथार्थवादी कथा हो । यो कथा प्रथमतः 'गरिमा' (वि.सं. २०४०) पत्रिकामा प्रकाशित भएको र पछि 'क्रमश (वि.सं. २०४३) कथा सङ्ग्रहमा सङ्कलित लैङ्गिक समस्यामूलक कथा हो । यस कथाका पात्रहरू म (ममता), सुबोध, ममताको छोरो र छोरी चन्द्रमा एवम् चन्द्रमा दुर्घटना परेको खबर सुनाउने भाइ रहेका छन् । हवाईजहाज दुर्घटनाबाट पति गुमाएकी प्रमुख नारी पात्र ममताका मनोभावहरू, पीडा, अभाव, निराशा र मातृत्व भावलाई चित्रण गरिएको यस कथामा नेपाली समाजमा नारीले भोगेका समस्या र हिंसालाई प्रस्तुत गरी पितृसत्तात्मक समाजमा विद्रोह गरी समस्याको समाधान गर्नुपर्ने विचार मुखरित गरिएको छ । एकल जीवन बिताइरहेकी ममतालाई पतिको साथी सुबोधले सान्त्वना दिई उनको मन जितेपछि ममता र सुबोध जीवनमा सहयात्रा गर्ने निर्णय गर्दछन् ।

ममतालाई आफ्नो बसमा पारेपछि सुबोध उनका छोराछोरीलाई हेप्ने र गाली गर्ने गर्दछन् । यतिसम्म कि छोराछोरीलाई राखिदिएको सुजीको हलुवा बच्चाहरूलाई अरु दिए हुन्छ नि भन्दै आफै खानु, छोरी चन्द्रमा हराउँदा पनि प्रहरीले भेटेपछि खबर गरिहाल्छ नि भन्दै बेवास्ता गर्नु, चन्द्रमा दुर्घटनामा परेर अस्पतालमा भएको थाहा पाउँदा समेत पेट दुखेको बहाना बनाई अस्पताल नजानु जस्ता अत्यन्त गैरजिम्मेवार र क्रुर व्यवहारबाट ममता अत्यन्तै पीडित र विदीर्ण हुन्छिन् । सुबोधसँगको सहयात्रामा रहँदा आफूसहित छोराछोरीको जीवन अन्धकार हुने

देखेर छोराछोरीको सुनौलो भविष्यका लागि सुबोधलाई परित्याग गर्दछिन् । छोराछोरीका लागि आमा सबथोक हो भन्ने मातृत्वभावको सन्देश दिँदै कथा अन्त्य भएको छ । अतः कथावस्तु र घटनाक्रमका प्रासङ्गिक सन्दर्भहरूलाई साक्षी राखी प्रस्तुत 'मातृत्व' कथामा देखिने लैङ्गिकताको प्रयोगलाई निम्नअनुसार विश्लेषण गरिएको छ :

पितृसत्ता

समाजमा पुरुषको वर्चस्व कायम रहनु नै पितृसत्ता हो । घर, परिवार र समाजमा पुरुषको प्रभुत्व कायम रहनु नै पितृसत्ता हो (भट्टराई, वि.सं. २०७६ पृ. २५१) । धर्म, संस्कृति, शिक्षा, मनोरञ्जन एवम् महिलाको यौनिकता, प्रजनन्, श्रम, सम्पत्ति तथा उत्पादनमा पनि पुरुषकै अधिकार निर्णायक रहन्छ । महिलामाथि पुरुषले दमन र हैकम राखेकाले नै पितृसत्ता र पुँजीवादी समाजमा पुरुषको हैसियत उच्च र महिलाको हैसियत कमजोर रहेको हुन्छ । यसमा पुरुषले आफूलाई शक्तिशाली ठान्दै त्यसैअनुसार व्यवहार प्रदर्शन गर्दछ ।

प्रस्तुत 'मातृत्व' कथामा कथाको खलनायकीय भूमिकामा देखापर्ने सुबोधले प्रभुत्ववाद र हैकमवादी व्यवहार प्रदर्शन गर्दछ । एकल जीवन बिताइरहेकी कथाकी प्रमुख पात्र ममता र उनका छोराछोरीहरूलाई समेत आफ्नै नियन्त्रण र अधिकारमा राखेर सुबोधले पितृसत्तात्मक हैकम प्रदर्शन गरेको छ । ममताको विवशतामा प्रवेश गरी सहयोगको बहानामा आफ्नो यौन पिपासु स्वार्थ पूरा गर्न उद्यत सुबोध निर्दयी र कामवासनाबाट ग्रस्त स्त्रीलम्पट पात्र हो । ममता र उनका छोराछोरी समेत पितृसत्ताबाट पीडित छन् भन्ने प्रसङ्ग कथामा यसरी वर्णन गरिएको छ :

भाषा प्रयोग १ : मम्मी ! सुबोध अङ्कल मन पर्दैन मलाई । ..... तपाईं नहुँदा हामीलाई कस्तो हपार्नुहुन्छ, गाली गर्नुहुन्छ, बुबाले जस्तो माया गर्नुहुन्न । आमा ! अबदेखि सुबोध अङ्कललाई हामीकहाँ नआउनू भन्नुस् न सुवेदी र चौलागाईं, २०६५ पृ. २१०) ।

भाषा प्रयोग २ : हलुवा साह्रै मिठो बनाइछ्यौ । पुगेन । बाँकी छ भने अलिकति थपिदेऊ न ममता ! छोराछोरीका लागि मात्र छ । ..... बच्चाहरूलाई अरु दिए हुन्छ नि । यही देऊ न मलाई (पृ. २१३) ।

भाषा प्रयोग ३ : मम्मी ! ममी खानेकुरा दिनुस् । मम्मी ! भोक लाग्यो । ..... बच्चाहरूले डिस्टर्ब गरेको मन पर्दैन मलाई । पैसा दिएर बाहिर खान जाऊ भन (पृ. २१४) ।

भाषा प्रयोग ४ : ढोका लगाइदेऊ ममता ! ..... अरु कुरा थाहा छैन । खुरुक्क ढोका लगाएर यहाँ आऊ (पृ. २१५) ।

उपर्युक्त भाषा प्रयोगमा सुबोधको पितृसत्तात्मक चिन्तन र क्रियाकलाप प्रदर्शन भएको छ । छोराछोरीलाई उपेक्षा गरी गाली गर्नु र हपार्नु, उनीहरूका लागि राखिदिएको हलुवा खाजा मागीमागी सबै खाइदिनु र पैसा दिएर बाहिर जबर्जस्ती खान पठाउनु, ममताको इच्छा विपरीत ढोका लगाएर कोठामा सँगै बस्न दबाब दिनु जस्ता घटनाक्रमले पुरुष सत्ताकै हैकम र नारीलाई भोग्या वस्तु ठान्ने पुरुषको भोगवादी प्रवृत्ति रहेको पुष्टि गर्दछन् ।

चरित्र तथा जैविकता

आख्यान र यसका विशेषतालाई अगाडि बढाउन कथामा प्रयोग गरिएका मानवीय वा मानवेतर वस्तु नै चरित्र हो । यस्ता वस्तु मूलतः प्राणी तथा जीवसँग सम्बन्धित हुने भएकाले यसलाई जैविकता पनि भनिन्छ । जुन तत्त्वका सहयोग र माध्यमबाट घटनाहरू घटित हुन्छन् तथा विकसित हुन्छन्, तिनीहरू नै चरित्र हुन् (खनाल, वि.सं. २०७५ पृ.४४) । चरित्र पुरुष, स्त्री, प्रमुख, सहायक, स्थिर, गतिशील, यथार्थ, आदर्श, गोलो, चेप्टो, बद्ध, मुक्त आदि विविध प्रकृतिका हुन्छन् ।

प्रस्तुत 'मातृत्व' कथामा म पात्रका रूपमा रहेकी ममता नारीवादी विचार राख्ने पात्र हुन् । ममतामा बलियो लैङ्गिक चेतना र आधुनिकतालाई आलोचनात्मक स्वीकार गर्ने प्रवृत्ति

छ । प्रेम र मातृत्वको द्वन्द्वमा परी मातृत्वको विजय गराउने ऊ साहसी र कर्तव्यपरायण नारी हुन् । कथाकारका विचारलाई बोकेर हिँड्ने प्रमुख मुख पात्र नै ममता हुन् । उनले समाज र सुबोधप्रति विद्रोह गरेकी छिन् । पतिको मृत्युपछि समाजका चुनौतीहरूलाई सामना गर्ने हिम्मतका साथ ममताले दोस्रो पतिका रुपमा सुबोधलाई अपनाउने निर्णय गरेकी छिन् । "लोग्ने हुँदा हाम्रो जिन्दगी कति मनमोहक थियो । लोग्ने मेरा लागि सर्वस्व हुनुहुन्थ्यो । उहाँपछि आफ्नो र छोराछोरीका लागि सहारा र माया खोजेँ त के बिराएँ मैले ? परम्परा र बन्धनलाई तोडेर के अपराध गरे मैले ? समयको माग पनि यही हो" (पृ. ९७) । समाजले एकल नारीलाई सधैंभरि विधवाकै रुपमा राख्ने कुप्रथाप्रति विद्रोह गरी आफ्नो मृतपतिको साथी सुबोधलाई पतिका रूपमा स्वीकार्ने निर्णय गर्नु स्वाभाविक मानिन्छ । पछि सुबोधको यौन पिपासु व्यवहारबाट आजित भई नारी स्वतन्त्रताका पक्षमा आवाज उठाई मातृत्व भावलाई सर्वोपरि ठानेकी छिन् । "मलाई कसैको सहारा जरुरत छैन । मलाई छोडिदिनुस् मलाई मुक्ति दिनुस्" (पृ. १०४) भन्ने भनाइले यसैलाई पुष्टि गर्दछ । परपुरुषसँग सम्बन्ध राखी दोस्रो पति स्वीकार्ने निर्णय गर्ने ममता व्यक्ति पात्र हो । नेपाली नारीहरूको स्वभावलाई प्रतिनिधित्व नगर्ने हुनाले ममतालाई व्यक्ति पात्रका रुपमा लिइन्छ । ऊ आफ्नो विचारमा अडिक नदेखिएकाले परिवर्तनशील पात्र हो । ऊ मञ्चीय र बद्धपात्र भएकाले कथाबाट निकाल्न सकिँदैन ।

सुबोध पितृसत्तात्मक समाजको प्रतिनिधित्व गर्ने पात्र हो । कथाको सहायक पुरुष पात्र ऊ कामवासनाबाट ग्रस्त स्त्री लम्पट र नारीलाई भोग्या वस्तु ठान्ने भोगवादी प्रवृत्ति भएको प्रतिकूल पात्र हो । ममताका छोराछोरीलाई दया, माया, प्रेम र सद्भाव नगर्ने निर्दयी, स्वार्थी र कठोर पात्रका रूपमा रहेको सुबोध एकल नारी ममताको विवशतामा प्रवेश गरी सहयोग गर्ने बहानामा आफ्नो स्वार्थ पूरा गर्न उद्यत खराब पात्र हो । यसले पुरुष प्रवृत्तिको प्रतिनिधित्व गरेको छ । त्यसैले वर्गीय चरित्रको पात्र हो । ममतालाई यौन हिंसा गर्ने र लैङ्गिक विभेद गर्ने

सङ्कीर्ण मानसिकता बोक्ने सुबोधको विचार कथाको आरम्भदेखि अन्त्यसम्म परिवर्तन नभएकाले स्थिर पात्र हो र कथामा कथालाई सहयोगी रूपमा अगाडि बढाउन महत्त्वपूर्ण भूमिका खेलेको मञ्चीय एवम् बद्धपात्र हो । ममतालाई ढोका बन्द गर्न कडा निर्देशन दिनु तथा ममताका छोराछोरीले डिस्टर्ब गरे भनी रिसाउनु जस्ता प्रसङ्गले सुबोध खलनायकको भूमिकामा रहेको देखिन्छ ।

ममताका छोरा र छोरी चन्द्रमा बालसुलभ हृदयका पात्र हुन् । बालबालिकाहरू रुखो व्यवहार नसहने प्रवृत्तिका हुन्छन् । सुबोधले हप्काएको र ठूलो स्वरले बोलेको मन पराउँदैनन् । छोराछोरीमा सुबोधप्रति घृणा भाव छ । सुबोध दिनदिनै आफ्नो घरमा आएको छोरालाई मन नपर्नु, सुबोधले हपार्ने र गाली गर्ने तथा आफ्नो बुबाले जस्तो माया नगर्ने कुरा गर्नु (पृ. ९५) जस्ता सन्दर्भ बाल संवेदनाका उपेक्षाभाव हुन् । छोरो बालपात्र, आम नेपाली बालकहरूको प्रतिनिधित्व गर्ने वर्गीय पात्र, सुरुदेखि अन्तिमसम्मका विचारमा परिवर्तन नआउने स्थिर पात्र, कथावस्तुमा प्रत्यक्ष देखिने मञ्चीय र बद्धपात्र हो । छोरी चन्द्रमा बाहिर खेल्न निस्किँदा मोटरसाइकलले धक्का दिई दुर्घटनामा परेकी छन् । उनको दाहिने हात भाँचिएर प्लास्टर गरिएको छ (पृ. १०३) । यिनी पनि छोरा जस्तै स्थिर र वर्गीय चरित्रकी पात्र हुन् । कथामा देखिएका अर्का पात्र एक युवक जसलाई भाइ भनिएको छ । उनले पनि चन्द्रमा घाइते भएको खबर ममतालाई सुनाई ममतासँगै ट्याक्सीमा बसेर अस्पताल आउँछन्। तसर्थ यी पात्र मानवीय गुणले भरिएका असल पात्र हुन् । सुबोध जस्तो अमानवीय पात्र होइन किनभने चन्द्रमा घाइते हुँदा पनि सुबोध बेमतलबी भई आफ्नै कामवासना र स्वार्थमा डुबेको छ । लैङ्गिक दृष्टिले हेर्दा यस कथाका सम्पूर्ण पात्रहरूको भूमिका सान्दर्भिक छ भने सुबोधको भूमिका अस्वाभाविक र सङ्कीर्णतावादी रहेको छ ।

यौनिकता

व्यक्तिको यौनिक सम्बन्धलाई यौनिकता भनिन्छ । यौनिकता समलिङ्गी वा विपरीत लिङ्गी पात्रहरूको यौन क्रियाकलाप, चाहना, यौन शक्ति, हाउभाउ र व्यवहार हो । जैविक रूपमा यौनका सम्बन्ध तथा स्वरूपहरू शारीरिक र संवेगात्मक पक्षहरूलाई यौनिकतासँग सम्बन्धित गर्न सकिन्छ (खनाल, वि.सं. २०७५ पृ. १८) । यौनिकतामा पनि विपरीत लिङ्गी यौनिकता, समलिङ्गी यौनिकता, द्विलिङ्गी यौनिकता, परिवर्तित लिङ्गी यौनिकता र अन्तरलिङ्गी यौनिकता जस्ता पक्ष रहेका छन् । 'मातृत्व' कथामा विपरीत लिङ्गी यौनिकता प्रबल रूपमा फेला पार्न सकिन्छ । यस कथामा विपरीत लिङ्गी यौनिकता, जैविक आवश्यकता र यौनको अभिव्यक्ति भएको देखिन्छ । कथामा महिला पात्र ममतामा भन्दा बढी यौनिक प्रवृत्ति पुरुष पात्र सुबोधमा भेटिन्छ ।

'मातृत्व' कथा यौनिक पक्षमा केन्द्रित छ । यस कथामा यौनिकताका सन्दर्भहरू कतिपय यौनिक हिंसाजन्य व्यवहारका रुपमा र कतिपय विपरीत लिङ्गी यौनिक सन्दर्भहरू मनोयौनिक स्वाभाविक ढङ्गले प्रस्तुत गरिएको छ । ममताले भ्यालमा बसेर सुबोधको पर्खाइमा बाटो हेर्नु, आफ्नो छोराले सुबोधलाई मन नपराउँदा पनि ममताले "उहाँले तिमी हामी सबैलाई माया गर्नुहुन्छ ।" भन्नु, "उहाँ राम्रो अङ्कल हुनुहुन्छ ।" (पृ. ९५) भन्ने अभिव्यक्तिमा ममताको सुबोधप्रतिको मनोयौनिक व्यवहार र सन्दर्भ प्रकट भएको छ । लोग्नेको मृत्युपछि शून्यता र रिक्तताले मरुभूमि भएको जीवनमा लोग्नेकै साथी सुबोध आश्वासन र माया दर्साउन आउँदा टेक्ने हाँगो पाएको महसुस गरी ममताले सुबोधलाई माया र सम्मान गर्न थालेको प्रसङ्ग निम्नानुसार आएको छ :

"लाग्थ्यो, संसारमा एउटा कोही त माया गर्ने पुरुष चाहिन्छ, जुन माया शारीरिकभन्दा मानसिक रुपमा ज्यादा होस् । यसैको चाहनाले च्यापेर अनायास म सुबोधलाई बढी माया र

सम्मान गर्न थालेथैं । उहाँ त हुनुहुन्थ्यो मेरो दुःख र सुखमा साथ दिनुहुने र मकहाँ बराबर सहानुभूति देखाउन आउनुहुने" (पृ. ९६) ।

यसरी ममतामा आत्मिक प्रेमका साथ यौनिक सम्बन्धको चाहना अवचेतन र अर्धचेतन मनमा रहेको प्रष्ट देखिन्छ । सुबोधले आवेशपूर्ण तरिकाले ममतालाई अँगालोमा बाँध्नु (पृ. ९७) तथा अँगालो जिन्दगीभर नफुक्ने र पानीको फोकाझै नफुट्ने अभिव्यक्ति सुबोधले व्यक्त गर्नु यौन आशक्ति हो । सामाजिक र धार्मिक परम्परा र बन्धनलाई तोडेर ममताले सुबोधको माया र सुरक्षा खोज्नु मनोयौनिक सङ्केतका रेसाहरू हुन् । यौनिक सम्बन्ध र परम्परागत विवाह संस्कृतिका बिचमा कथाकारले नयाँ विचार प्रस्तुत गरेकाले प्रस्तुत कथाको यौनिक सन्दर्भ थप प्रभावकारी बन्न पुगेको छ । यस कथामा प्रस्तुत भएका सुबोधका यौनिक सन्दर्भहरू अस्वाभाविक छन् भने ममताका यौनिक सन्दर्भहरू स्वाभाविक छन् ।

लैङ्गिक हिंसा

कुनै पनि एक व्यक्ति तथा समूहले अन्य व्यक्ति तथा समूहप्रति गर्ने जुनसुकै दुर्व्यवहार नै हिंसा हो । अरुको स्वतन्त्रतामा बाधा उत्पन्न गर्नु वा मौलिक अधिकारबाट वञ्चित गर्नु हिंसा हो (खनाल, वि.सं. २०७५ पृ. २९) । यस्तो हिंसा शारीरिक, मानसिक, वैचारिक, यौनिक एवम् मनोवैज्ञानिक आदि प्रकृतिका हुन्छन् । कुनै पनि पुरुषले महिलालाई वा महिलाले पुरुषलाई गर्ने विभिन्न दुर्व्यवहारहरू लैङ्गिक हिंसा हुन् । 'मातृत्व' कथामा पितृसत्तात्मक कुसंस्कारमा हुर्किएको सुबोधले एकल महिलामाथि शारीरिक, यौनिक, वैचारिक र मनोवैज्ञानिक हिंसा गरेको तथ्य यसरी फेला पार्न सकिन्छ :

"ढोका लगाइदेऊ ममता ! छोराछोरी आइपुग्छन् । आज सन्च पनि छैन । धेरै बहाना नगर । आजकल तिमी निर्जीव जस्तो लाग्छ कति सजीव भइराख्ने त ? जिउले पनि ख्याल गर्नुपर्छ ।

समयको पनि ध्यान दिनुपर्छ । अरु कुरा थाहा छैन । खुरुक्क ढोका लगाएर यहाँ आऊ" (पृ. ११०) ।

उपर्युक्त सङ्कथनमा ममताको इच्छा विपरीत कामवासना शान्त पार्न खोजेकाले सुबोधको आक्रमणकारी स्वभाव र हिंसा देखापर्दछ । सुबोधले ममताका छोराछोरीलाई समेत मानसिक र वैचारिक हिंसा गरेको छ । ममतासँगै बसेर शारीरिक यौन क्रीडामा रमाउन खोज्दा छोराछोरीले डिस्टर्ब गरे भनी रिसाएर ममतालाई सिनेमा हेर्न जाने निर्देशन दिँदा छोराछोरीले एक्लै घरमा नबसी सिनेमा हेर्ने चाहना राख्दा सुबोध छोराछोरी सिनेमा हेर्न नगई घरमै बस्नुपर्ने थप निर्देशन दिन्छ :

"आज सिनेमाको कार्यक्रम राखेको छु । तयार होऊ । बच्चाहरूलाई घरमै छोड । .... होइन हामी घर बस्दैनौँ । हामी पनि सिनेमा हेर्न जाने । .... हुँदैन । तिमीहरू घरमै बस्नुपर्छ ।" (पृ. १०१) । ममताकी छोरी चन्द्रमा दुर्घटनामा पर्दासमेत सुबोध बेवास्ता गर्ने प्रसङ्गले ममतामा मानसिक पीडा बोध भई सुबोधप्रति घृणा भाव उत्पन्न भएको छ । "मलाई साह्रै पेट दुखेको छ । चन्द्रमालाई धेरै चोट लागेको रहेनछ । सँगै ल्याऊ" (पृ. १०३) । यस अंशबाट सुबोधको ममताप्रति दुर्व्यवहार र हिंसा रहेको पुष्टि हुन्छ ।

लैङ्गिक चेतना

लैङ्गिक रूपमा पश्चगामी भएका व्यक्तिलाई अग्रगामीमा ल्याउने जागरण नै लैङ्गिक चेतना हो । लैङ्गिक परिचय र पहिचानका कारणबाट वा पितृसत्तामुखी समाजका कारणबाट कुनै पनि लैङ्गिकता र यौनिकता भएका स्त्री पुरुष वा अन्य लिङ्गी गुण भएका व्यक्तिहरूलाई समस्याबाट माथि उठाउने सोचाइ वा जागरणलाई लैङ्गिक चेतना भनिन्छ (खनाल, वि.सं. २०७५ पृ. ४६) । यसलाई नारीवादको एक अंश मानिन्छ । लैङ्गिक रूपमा समता कायम गराउने र नारी स्वतन्त्रता र अधिकारलाई प्रत्याभूत गराउने अवधारणा नै

लैङ्गिक चेतना हो । यसले नारीलाई समाजका सामाजिक, आर्थिक, राजनैतिक, सांस्कृतिक क्षेत्रहरूमा प्रत्यक्ष नेतृत्वदायी सहभागिता र भूमिका स्थापना गर्ने उद्देश्य राख्दछ । 'मातृत्व' कथामा लैङ्गिक चेतना प्रखर रूपमा अभिव्यक्त भएको छ ।

'मातृत्व' कथा नेपाली समाजका लैङ्गिक समस्याहरूको उद्घाटन गरी ती समस्याहरूको सचेतनापूर्वक निराकरण गर्ने विचार सघन रूपमा प्रकट गरिएको नारीवादी वैचारिक कथा हो । ममताले पतिको मृत्युपछि सामाजिक र सांस्कृतिक मान्यतालाई चुनौती दिँदै पतिकै साथी सुबोधसँग जीवन बिताउने निर्णय गर्नु, समाजसँग विद्रोह गर्ने आँट गर्नु एवम् सुबोधसँग खटपट भएपछि सुबोधलाई त्यागेर आफ्नो र छोराछोरीको सुन्दर तथा स्वतन्त्र भविष्यका लागि बाँकी जीवन बिताउने निर्णय गर्नु जस्ता घटनाहरू लैङ्गिक चेतनाका नमुना हुन् । "छोराछोरीका लागि सहारा र माया खोजेँ त के बिराए मैले ? परम्परा र बन्धनलाई तोडेर के अपराध गरे मैले ?" (पृ. ९७) भन्ने सोचाइ राख्दै ममताले सुबोधलाई पतिका रूपमा स्वीकार गर्नु समाजप्रति विद्रोह हो । सामाजिक परम्पराले विधवा नारी विधवाकै रुपमा रहनुपर्ने तथा रातो रङको साडी लगाउन नहुने परम्पराका विरुद्ध विद्रोह गरी सेतो र पहेँलो साडी नलगाई कलेजी, बैजनी र प्याजी रङको साडी लगाउनु (पृष्ठ ९८) लैङ्गिक चेतनाकै उपज मानिन्छ ।

प्रस्तुत कथामा एकल महिलाहरूको सामाजिक अवस्थाको चित्रण गरी उनीहरूको सङ्घर्षपूर्ण जीवन भोगाइ र मातृत्वप्रतिको उदार भावलाई केन्द्रीय कथ्य विषय बनाइएको छ । आफूले मन पराइ सधैँ माया गरी देवतासरह ठानेको व्यक्ति सुबोधले आफ्नो रगतका छोराछोरीलाई घृणा गर्ने र बारम्बार उनीहरूलाई त्यागिदिन दबाब दिएका कारणबाट अन्ततः ममताको धैर्यको बाँध फुट्न गएको छ । सुबोधको गैरजिम्मेवारीपूर्ण व्यवहारबाट ममता आक्रोशित र विद्रोही बन्न बाध्य भएकी छिन् । छोरी चन्द्रमा हराउँदा पनि सुबोधको व्यवहार

प्रतिकूल रहेको छ । यी सन्दर्भका कारण ममताको मनोलोकमा पतित्व र मातृत्वको मानसिक द्वन्द सृजना भई मातृत्वका पक्षमा बलियो रुपमा उभ्याएकी छिन् । सुबोधसँग रहँदा सुन्दर र सुखी परिवार नहुने निर्णयमा पुगी सुबोधलाई परित्याग गरेर आफ्ना सन्तानका साथ बाँकी जीवन बिताएकी छिन् । ममताको लैङ्गिक चेतनाको चरमोत्कर्ष यसरी मुखरित भएको छ : "तपाईंको हस्तक्षेप र अधिकारभित्र बाँच्न चाहन्नँ । दुईटा छोराछोरीलाई आफ्नो जीवन आधार मानेर बाँच्नेछु । मेरा छोराछोरीको माया नै ठूलो हो र सम्पूर्ण छ । मलाई कसैको सहारा अब जरुरत छैन । मलाई छोडिदिनुस् । मलाई मुक्ति दिनुहोस् ।" (पृष्ठ १०४) ।

उपर्युक्त दृष्टान्तमा पुरुषको आश्रयविना पनि नारीहरू आफ्नै क्षमता र पौरखले आत्मनिर्भर भएर बाँच्न सक्दछन् भन्ने कुरा ध्वनित भएको छ । यसरी पितृसत्ताप्रतिको विद्रोही चेत, नारी स्वतन्त्रता र अस्तित्व तथा अधिकारप्रतिको सचेतना र मातृभावको महत्तालाई प्रष्टाइएको छ । नारीवादी विद्रोही चेतना व्यक्तिएको यस कथामा नारीको स्वतन्त्र आत्मनिर्भर र जीवनयापनको अधिकारमा पुरुष बाधक बन्न नहुने वैचारिकता प्रकटीकरण गरिएको छ ।

लैङ्गिक परिणति

कथाको आस्वादनपश्चात् प्राप्त हुने मूल कथ्य विषय तथा समष्टि प्रभाव नै परिणति हो । परिणतिका माध्यमबाट निश्चित विचार र दृष्टिकोण प्रस्तुत हुन्छ, त्यो नै सन्देश हो । (खनाल, वि.सं.२०७५ पृष्ठ ४८) । स्रष्टाको उद्देश्य तथा मनसाय पात्रको चरित्र तथा कथानकबाट प्रस्तुत गरिएको हुन्छ । लैङ्गिक सन्तुलन कायम भई लैङ्गिक विचार प्रकट भएका कथा शक्तिशाली र सफल मानिन्छन् भने लैङ्गिक समस्या हुने तर समाधानका वैचारिक पक्ष तथा उपाय नभएका कथाको परिणति स्थिर वर्णनात्मक प्रकृतिको हुने गर्दछ । 'मातृत्व' कथा लैङ्गिक दृष्टिले प्रभावशाली मानिन्छ ।

'मातृत्व' कथा ममताको जीवनलाई केन्द्रबिन्दु बनाएर उसले भोगेका भोगाइका सापेक्षतामा विभिन्न सन्दर्भहरूलाई प्रस्तुत गरी लैङ्गिक चेतनाको परिणतिमा पुगेको कथा हो । पितृसत्तात्मक सोचाइ भएको यौन पिपासु असत् चरित्र सुबोधको पराजय र मातृत्वको पक्षमा बलियो उभिएको सत् चरित्र ममताको विजय देखाएर लैङ्गिक स्वतन्त्रता र अस्तित्वको खोजी गरिएको छ । परम्परागत पितृसत्तात्मक सामाजिक संरचनामा आधारित मूल्य मान्यताका विरुद्धमा सुबोधलाई दोस्रो पतिका रूपमा स्वीकार गरी आफ्नो मरुभूमिमय जीवनलाई मायाको सङ्घालो नदीको छहारीमा ओत लाग्ने निर्णय ममताले गर्नु (पृष्ठ ९७), कलेजी, बैजनी तथा प्याजी रङको साडी लगाउनु एवम् सुबोधले नारीलाई भोग्या र मनोरञ्जनको साधन मात्र ठान्ने कुरा ममताले बुझेपछि सुबोधको हस्तक्षेप र अधिकारभित्र नबाँची आफूलाई छोडिदिन र मुक्ति दिन (पृष्ठ १०४) विद्रोह गरी छोराछोरीका साथ स्वतन्त्र जीवन बाँच्नु जस्ता प्रसङ्गले यो कथा सक्षम नारीको सगर्व सफलतामा केन्द्रित रहेको देखिन्छ । यस कथाका हरेक निष्कर्ष सापेक्ष र सफल छन् । आत्मीय पवित्र प्रेम र लैङ्गिक स्वतन्त्रता कायम गरी मातृत्व भावको विजयको परिणति निकै उत्कृष्ट मानिन्छ ।

प्रस्तुत 'मातृत्व' कथाले लैङ्गिक समस्यालाई सघन विश्लेषण गरी लैङ्गिक विभेद र अन्यायको अन्त्य हुनुपर्ने सन्देश दिएको छ । ममताले गरेका निर्णयहरू हेर्दा पुरुषप्रधान समाज र त्यसका हिमायती सुबोध जस्ता चरित्रसँग निरन्तर सङ्घर्ष र विद्रोह गरी वैचारिक दृढता र जीवनप्रतिको अगाध श्रद्धाले नारी अस्तित्व स्थापना गर्न सकिने निष्कर्ष यस कथाले निकालेको छ । यसबाट वैचारिक सफलता र व्यावहारिक सन्तुष्टि प्राप्त गर्न सकिने कथ्यगत परिणति प्राप्त भएको छ तसर्थ लैङ्गिक चेतना र अस्मिताका सान्दर्भिक पक्षहरूलाई उठाउँदै तिनीहरूको स्वाभाविक व्यवस्थापन गर्न सकिने सन्देश दिएकाले प्रस्तुत कथा लैङ्गिक दृष्टिले उपयुक्त र सफल रहेको निष्कर्ष निकाल्न सकिन्छ ।

निष्कर्ष

लैङ्गिक समालोचनाले साहित्यिक कृतिलाई नारी, पुरुष र अन्य लिङ्गी दृष्टिकोणबाट अध्ययन र मूल्याङ्कन गर्दछ । साहित्यिक सिर्जनाभित्र रहेको पितृसत्ता, लैङ्गिक भूमिका, यौनिकता, लैङ्गिक हिंसा, लैङ्गिक स्वतन्त्रता र अस्तित्वसम्बन्धी विचार नै लैङ्गिकता सम्बन्धी चिन्तन हो । 'मातृत्व' कथामा प्रयोग भएका पात्रहरू ममता, सुबोध, छोराछोरी र एकजना भाइ रहेका छन् । कथाकी प्रमुख पात्र ममता र सहायक पात्र सुबोध रहेका छन् । कथामा एकल महिलाको सामाजिक अवस्था र जीवन भोगाइलाई चित्रण गरिएको छ । हवाईजहाज दुर्घटनाबाट पति गुमाएकी ममताले आफ्ना दुई छोराछोरीका साथ एकल जीवन बिताइरहेका अवस्थामा पतिकै साथी सुबोधले सान्त्वना दिएर उनको मन जितेपछि ममता र सुबोध दुवै जनाले जीवनमा सहयात्रा गर्ने निधो गर्दछन् तर सुबोधले छोराछोरी र आफूलाई गरेको बारम्बारको दानवीय व्यवहारबाट उनी अन्ततः सुबोधलाई परित्याग गरी छोराछोरीका साथ स्वतन्त्र जीवन बिताउँछिन् । नारीवर्ग आफ्ना सन्तानका लागि जुनसुकै कुरा पनि त्याग गर्न पछि नपर्ने तथा मातृत्व शक्तिका अगाडि वासनामय भौतिक प्रेम तुच्छ हुने लैङ्गिक सचेतना दिन कथा सफल छ ।

प्रस्तुत 'मातृत्व' कथामा पितृसत्ता तथा परम्परागत सङ्कीर्ण समाजप्रति विद्रोह र नारी स्वतन्त्रता र स्वअस्तित्व पहिचानका विचारलाई केन्द्रमा राखिएको छ । यस कथाकी नारी पात्र ममता नारी हुनुकै कारणले पुरुष पात्र सुबोधबाट पीडित र अधीनस्थ छिन् । सामाजिक संरचनाबाट निर्मित पुरुष वर्चस्व कायम रहनाले सिङ्गो समाज नारी वर्गका लागि अनुदार छ भने पुरुष वर्गका लागि तुलनात्मक रुपमा उदार र स्वाधीन छ । पितृसत्ताकै शिकार भएर एकल महिला ममता जीवनभर विधवाकै रूपमा रहनुपर्ने सोच राख्नु, छोराछोरीलाई राखिदिएको सबै खाजा सुबोधले खाइदिनु, छोराछोरीले डिस्टर्ब गरे भनी मन नपराउनु,

ममताको इच्छा विपरीत जबर्जस्ती यौनवासनामा बाध्य पार्नु, छोराछोरीलाई छोडेर ममतालाई कडा आदेश दिई सिनेमा हेर्न लैजानु, छोरी चन्द्रमा हराई दुर्घटनामा परेर अस्पतालमा हुँदासमेत सुबोधले वेमतलब गर्नु जस्ता घटनाहरू सामन्तवादी पितृसत्ताकै उपज हुन् । अन्ततः ममताले सुबोधसँग विद्रोह गरी खुसी जीवन बाँच्ने निर्णय गर्नु साहसिक कार्य हो र लैङ्गिक चेतना तथा सशक्तीकरणको उत्कृष्ट नमुना हो ।

निष्कर्षतः नेपाली समाजमा परम्परागत पितृसत्ता, लैङ्गिक हिंसा र विभेद, सामाजिक लिङ्ग भेद, महिलाको शरीरमाथि आफ्नो प्रभुत्व कायम नहुने अवस्था आदिले धेरैजसो नारी उत्पीडित र शोषित छन् तसर्थ नारीहरूले आफ्नो हक अधिकारको प्राप्ति र उपयोगका निम्ति पुरुषप्रधान समाजसँग सङ्घर्ष र विद्रोह गर्नुपर्ने विचार यस कथामा प्रस्तुत गरिएको छ । नारीले स्वतन्त्र किसिमले निर्णय लिने र जीवनयापन गर्ने अधिकारमा पुरुष बाधक बन्नु हुँदैन बरु लैङ्गिक समविकासका लागि नारी र पुरुष दुवै उदार र परिपूरक भई सहयात्रा गरेमा लिङ्गीय समतामूलक समाज निर्माण हुने तथ्य विवेच्य कथामा ध्वनित भएको निष्कर्ष निकालिएको छ ।

सन्दर्भसूची

उप्रेती, सञ्जीव (२०६८), *सिद्धान्तका कुरा,* अक्षर क्रियसन ।

कायस्थ, रमण (२०७८), *विश्वेश्वरप्रसाद कोइरालाका कथामा लैङ्गिकता,* [अप्रकाशित दर्शनाचार्य शोधपत्र], नेपाली केन्द्रीय विभाग, त्रिभुवन विश्वविद्यालय ।

खनाल, राजेन्द्र (२०७५), *लैङ्गिक समालोचना सिद्धान्त र प्रयोग,* सनलाइट पब्लिकेसन्स ।

खनाल, लोकचन्द्र (सन् २०२२), निन्द्रा कथामा लैङ्गिकता, *अवधारणा, ७* (१), पृ. २४-३२ ।

पौडेल, टीकाप्रसाद (सन् २०२१), मृगतृष्णा कथामा लैङ्गिक चेतना, *त्रियुगा ऐकेडेमी जर्नल, २* (२), पृ. ११६-१२४ ।

भट्टराई, रमेशप्रसाद (२०७६), लैङ्गिक समालोचना, *रत्न बृहत् समालोचना (सैद्धान्तिक खण्ड)*, राजेन्द्र सुवेदी र लक्ष्मणप्रसाद गौतम (सम्पा. दो. संस्क.) रत्नपुस्तक भण्डार, पृ. २५९-२७३ ।

लामिछाने, यादवप्रकाश (२०७२), *नेपाली कथा र उपन्यास सिद्धान्त र समीक्षा*, विद्यार्थी पुस्तक भण्डार ।

लुइटेल, लीला (सन् २०११), आख्यानकार भागीरथी श्रेष्ठ, *समकालीन साहित्य*, पृ. १ –१४ ।

सुवेदी, धनप्रसाद र चौलागाईं, प्रेम (सम्पा.), (२०७८), *अनिवार्य नेपाली कक्षा बाह्र*, पाठ्यक्रम विकास केन्द्र ।

श्रेष्ठ, दयाराम (२०४५), *नेपाली कथाका समकाली सन्दर्भहरू*, नेपाल प्रज्ञाप्रतिष्ठान ।

Abhram, M. H. & Harfam, G. G. (2005). *A glossary of literary terms* (8th ed.). Wadsworth Cengage Learning.

021-547617, 021-547717, 9852045617
info@sukuna.edu.np
sukunamc2048@gmail.com
rmcsukuna1@gmail.com
www.sukuna.edu.np.