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June - 2024

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Texas International College, Kathmandu, Nepal
Research Culture Society

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Venue: Texas International College, Kathmandu, Nepal

Conference Proceedings / Special Issue

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About the organizing Institutions:

International Scientific Research Association is a registered and an esteemed research association working on to provide scientific research services, educational studies and activities at international level, also coordinate with other research organizations for the educational research events. Scientific Research Association as honorary partner of the ‘Research Culture Society’ with MoU – collaboration.

Texas International College, which has been running excellently under Texas Int’l Education Network (2010), is a dynamic educational institution with academic programs in Science, Management, Law and Humanities with outstanding Board Results. Texas has been founded with a set of academicians and entrepreneurs to meet the rising demand for qualified and skilled manpower in the field of Science and Technology, Management along with Hotel Management and Humanities. Since its very inception, Texas remains as an invitation to learning by both theory and practice.

‘Research Culture Society’ (RCS) is a Government Registered International Scientific Research organization. Registered with several United or Government bodies. It is also an independent, professional, non-profit international level organization. RCS-ISRO shall also initiate and setting up new educational and research programs with other international organizations. Society has successfully organized 135+ conferences, seminars, symposiums and other educational programmes at national and international level in association with different educational institutions.

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Objective of the International Conference: is to bring together innovative academics, researchers and industrial experts in the field of Scientific, Multidisciplinary Innovation Studies in Academic Research to a common platform. Another goal is to promote scientific information interchange between researchers, academicians, students and practitioners working in conference country and abroad. The main aim of the conference is to provide a interaction stage for researchers and practitioners from academia and industries to deal with state-of-the-art advancement in their respective fields. The conference will be held in regular interval to make it an ideal stage for people to share views as per themes and scope of conference.

About the Conference :

ICARS-2024 is a good platform to bring together accomplished academicians, scientists, researchers, scholars and students to exchange and share their knowledge, experiences and research results on the aspects of advancements in Science, Agriculture, Engineering, Technology, Business Management, Commerce, Social Sciences, Literature, ELT and Education. This forum can & will spell a scholarly platform to network and discuss the practical challenges encountered and the solutions adopted in their respective domains worldwide. The Conference main Aim is to provide an interaction stage for researchers, students and practitioners from academia and industries to deal with state-of-the-art advancement in their respective fields. The outcome based aim is an ambience that will be instrumental in taking our participants and delegates to the next level of their expertise in their profession. Participants also will visit the city and country as it is a famous tourist attraction.

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- **Track 3 – Business Management.**
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About the Special Issue / Conference Book:

Science, Engineering and Technology cross nearly every facet of modern life and, as problem solvers, engineers are perfectly capable of managing technical activities, mastering innovative ways of science and engineering field, when they spend time and efforts understanding and acting in the field. Scientific and technological innovation, as strategic support to improve social productivity and overall national strength, must be placed at the center for development of any country.

The framework includes engineering and technology as they relate to applications of science. Engineering is used to mean engagement in a systematic design practice to achieve solutions to particular human problems. Technology is used to include all types of human-made systems and processes.

The special issue / conference proceedings / edited book is a collection of peer-reviewed scientific papers submitted by active researchers in the 'International Conference on Advance Research & Studies'. This book can be helpful to understand the various concepts of Science and Technological Innovation to the researchers and academia.



Dear Ladies and Gentlemen!

It gives me much desire to be part of this Organization Committee of two days Conference entitled, “International Conference on Advance Research & Studies” (ICARS-2024) jointly organized by Texas International College, Kathmandu, Nepal, ‘International Scientific Research Association’, and ‘Research Culture Society’ dated on 21-22 June, 2024 in Nepal.

This international Conference forum will encourage participants and academicians to reveal their endeavors, extend professional networks and jointly ascertain the existing and upcoming research instructions/guidelines and innovations at international level. I highly commend that all the presentations in this research conference will be interesting topics with fruitful discussions. It is really helpful to all the researchers to showcase their research outputs and nurture in research and innovation through this platform.

This conference will consider and discuss all the facts, issues, challenges, advanced development and updation in the specified field including Science, Engineering & Technology, Business Management and Education globally and come up with solutions and recommendations that will contribute significantly to be a better world in research development.

My hearty wishes for the bounteous success of this conference.

Thank you!!!

Narayan Pokhrel
Director, Business Development of Texas Education Network,
Texas International College, Kathmandu, Nepal
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Dr. Jessica C.

Founder President, International Scientific Research Association.

Email : scientificresearchassociation@gmail.com



Message

Dear Colleagues !

I am grateful to co-organizing institutions, all the speakers, committee members and presenters of 'International Conference on Advance Research & Studies (ICARS-2024)'. The overwhelming response to the contributors was acknowledged in a very positive manner and it shows that the new age is very much eager to work with technical literature. The rising researcher and scholar from various institutions and in-house participants motivate us to improve ourselves.

We are currently in the era of science and engineering revolution, spearheaded by recent developments in engineering, technology and sciences, providing sustainable solutions to various issues.

Here I am delighted that the series of conference on contemporary issues in computer technology has successfully completed its three folds and entered into the fourth one, it's all due to the valuable efforts of faculty members of computer science and engineering department.

I extend my best wishes for the editorial team of the special issue, at last I hope this technological literature interaction will be a source of inspiration to upcoming educationists, technocrats and stakeholders.

Jessica

ICARS - 2024 Conference Chair
Founder, International Scientific Research Association

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Conflict Management and Employee Commitment among Staff in Nepalese Academic Sector

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Abstract:

Introduction: The academic sector in Nepal faces unique challenges for managing the conflicts. It recognizes that the employee commitment in the academic sector plays the important role in overall strategy for the performance. In Nepal, the unique culture and the organization dynamics has the several challenges as well as opportunities for enhancing the employee commitment with effective conflict management strategies.

Objective: The study aims in explores the impact of leadership approach, training and development programs, organizational policies and communication style on employee commitment among staff on the academic sector of Nepal. This research seeks to provide the insights on improving the conflicts and enhance the employee commitment in academic sector of Nepal.

Design : This research employs the quantitative research design to establish the relationship between the independent and dependent variable. Structured questionnaires are distributed to the academic staff of Lumbini Academic College and G.P Memorial (Community) College. Statistical methods using correlation and multiple regression analysis are used to analyze the data and prove the hypothesis of the study for conflict management variables with employee commitment.

Findings : The findings want to reveal that the significant relationship between the variables. Multiple regression analysis proves the hypothesis and findings are generated through it. The finding shows the transparent and open feedback to improve the commitment among the staff. The factors in the study collectively contribute the harmonious working environment for the employees and reduce the conflicts and promote the sense of loyalty among the staffs.

Practical Implication : This study provides the practical knowledge for the academic sector of Nepal. By the adaptation of leadership practices, training and development programs, implementation of organizational policies and open communication enhances the employee commitment. These strategies improve the employee morale and contribute for the overall success in the academic sector.

Originality/ Value : This research contributes on the body of knowledge on the conflict management and employee commitment in Nepalese academic sector. It provides the valuable insights for the academicians and policy maker to improve the relationship among the employees and effectiveness in the academic sector. The originality of the research is based on the unique perspective from the employees of Lumbini Academic College and G.P Memorial (Community) College in an academic setting.

Key Words: Conflict Management, Employee Commitment, Nepalese Academic Sector, Lumbini Academic College, G.P Memorial (Community) College.



1. INTRODUCTION :

In the dynamic environment of Nepalese academic sector, conflict management has become the primal determinants for harmonious bond in Nepalese academia. Amidst the array of challenges prevailing in contemporary academic sector, employee commitment and adaption can advance the conducive work environment for conflict management (Jha & Dahal, 2023). Organizational cohesion and employee commitment can nourish the better environment for organizational effectiveness (Emmanuel, Charles, & Maureen, 2017). Employee commitment also enhances the productivity and helps in navigation of conflict. The multifaceted dynamics of Nepalese academic sector has endeavor the essential offering insights for effective organizational performance. Research delves the role of employee commitment aiming establishment of proper strategy for conflict management in Nepalese educational institutions. With rapid evolution of Nepalese academic sector, the conflict management has become the critical factor which is directly correlated with organizational performance enhancement. With constant and rapid growth, conflict has raised inevitably in academic sector of Nepal (Neupane, 2023). The sources of conflict in Lumbini Academic College and G.P Memorial (Community) College are basically related with variation of academic thoughts and philosophy, allocation of resources among educational institute and differences in academic decision. These conflicts can only be resolve through sound and harmonious working environment. Thus, conflict management and employee commitment are correlated with perpetual growth of Nepalese academic sector.

2. Objective of the Study :

The objectives of the study on the title **Conflict Management and Employee Commitment among Staff in Nepalese Academic Sector** are listed below:

- To analyze the employee commitment among staff in Nepalese Academic Sector.
- To evaluate leadership approach for conflict management among staff in Nepalese academic sector.
- To assess training and development programs for conflict management among staff in Nepalese academic sector.
- To know the organizational policies and communication style for conflict management tools among staff in Nepalese academic sector.

3. Hypothesis of the Study :

The hypothesis of the study on the title **Conflict Management and Employee Commitment among Staff in Nepalese Academic Sector** is listed below:

H₁: There is significant relationship between employee commitment and leadership approach among staff in Nepalese academic sector.

H₂: There is significant relationship between employee commitment and training and development programs among staff in Nepalese academic sector.

H₃: There is significant relationship between employee commitment and organizational policies among staff in Nepalese academic sector.

H₄: There is significant relationship between employee commitment and communication style among staff in Nepalese academic sector.

4. Literature review :

Array of existing literatures on conflict management and employee commitment has revealed the relevant understanding of subject matter. Through multiple prior studies, it has clearly been stated that employee commitment and conflict management are two side of one coin. In Nepalese context, array



of research explores the theoretical and empirical aspect of conflict management. But rarely, we found any specific research that has provided the insight of Nepalese academic sector and conflict management through employee commitment. Some of the researches that are similar with the topic are explored for better understanding of subject matter as below:

Dependent Variable

The research on Conflict management and employee commitment in Nepalese academic sectors is related with the bonding and attachment of employees towards their academic sector. Consequently, “Employee Commitment” is regarded as dependent variable in this research.

Employee commitment

Employee commitment plays pivot role in overall success of academic sectors. It is correlated with employee’s emotional attachment and dedication towards the organization. Employee commitment is always related with the willingness of employee that ensures the achievement of organizational goals (Khanal & Ghimire, 2024). Employee commitment in Nepalese academic sectors encompasses the array of assertive that directly influences the conflict management system. Some factors that have an impact in employee commitment are managerial style, organizational cultural, work environment and proper reward system (Rai, Budhathoki, & Rai, 2021). Positive work environment, well defined communication channels and employee friendly work culture are strongly correlated with employee commitment (Risal, Devekota, Dhakal, & Paudel, 2023). It is very crucial to enhance the employee commitment in academic sector for fostering proper conflict management system in changing dynamics.

Independent Variable

In this research, dependent variable “Employee Commitment” is closely associated with the factor related to conflict management. Exploring conflict management can provide the deeper insight about the collaboration and attachment of employees towards organization. Conflict management are associated with array of factors such as leadership approach, training and development programs, Organizational policies and communication style which are also correlated with employee commitment towards academic institution i.e. Lumbini Academic College and G.P Memorial (Community) College. Hence, “Conflict Management” is considered as independent variable in this research.

Conflict Management

Conflict is the inherent aspect of organization and academic sector are no difference (Shrestha & Singh, 2023). Effective conflict management can be possible through conductive employee commitment. Employee commitment plays significant role in conflict management, as commitment of employee can provide constructive approach for conflict resolution (Pokhrel, Bhujel, & Pokhrel, 2023). Conflicts are more likely to be managed if employees are more collaborated and committed on achieving organizational goal. High level of organizational commitment can ensure the effective management of conflicts in timely manner. It also reshapes the organization and promotes better organizational culture. Some of the factors that can ensure the employee commitment and conflict management in academic sector of Nepal can be enlisted as follows:

Leadership Approach: Leadership approach of the academic sectors significantly influences the employee commitment (Khanal, Perry, & Park, 2019). Visionary leadership always motivate employee to engage with organization for longer tenure (Bunao & Dura, 2023). On contrary, the shortsighted leadership cannot identify the potential of employee and are more likely to lose charismatic employees. The academic sector, being the eye candy of other sector had to adopt the changes with the ongoing transformation of global context. Hence, transformational leadership is needed for enhancing the performance of academic sector. It is quite common to have the philosophical conflict coax in



educational institution (Ho, Shaari, & Kang, 2023). So, conflict management is essential element for moving ahead in academic sector.

Training and Development programs: Training and development programs are correlated with employee job satisfaction and are the integral part of employee commitment in the academic sector. Training and development are interrelated with academic autonomy, career development and employee commitment (Hosen, et al., 2023). It encourages the employee to put extra effort on their work and is effective tools for resolving conflict (Chaulagain, Pahadi, Bhattarai, & Jora, 2023). Training and development program also provide employee to go beyond the level of expectation to be more peculiar for achieving organizational goals (Jauro, Bello, Garba, & Bature, 2023).

Organizational Policies: Academic sector is sector where committed employees serve for institutional betterment along with sowing knowledge of positivity in society. Employees of academic sector are more likely to engage themselves in their job if they are provided with clear role expectation (Balushi, Thumiki, Nawaz, Jurcic, & Gajenderan, 2022). Therefore, organizational policies of academic institutions have to be drafted and implemented in such a way that academicians pursue their duties without any influence and promote committed engagement in organization (Shrestha & Bhattarai, 2022). Effectiveness of organizational policies can mitigate the conflict and helps in conflict management.

Communication Style: The clear define communication channels are associated with the proper management of conflict in academic sector. Better communication style is linked with higher level of employee commitment ensuring the minimization of conflict in academic sector. Effective communication being the part of positive working culture is likely to enhance the loyalty among employee (Gautam, 2018). Positive communication style also aimed in fostering job satisfaction, providing plentiful of opportunities for employee's aspirations (Alomran, Ahmed, & Kassem, 2024). Understanding communication channel can also help to know the root cause of conflict. Hence, it can be the effective tools for enhancing employee commitment and resolving conflict within the organization (Shrestha & Singh, 2020).

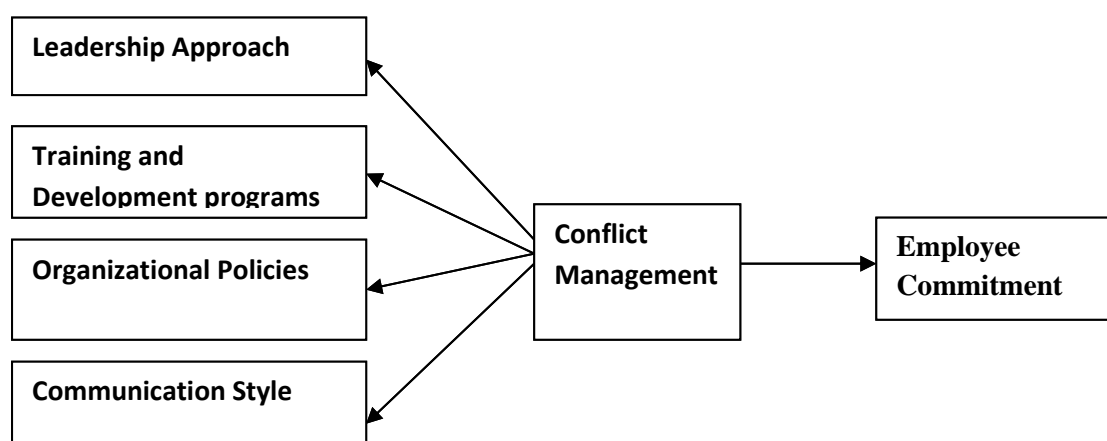


Figure 1: Conceptual Framework of the Study

Source: Aggarwal, Verma & Agarwal (2021). Conflict Management - A Challenge to Resolve through Various Communication Styles. *International Journal of Environment, Workplace and Employment*, 6 (1-2), 40-55.



5. Research Methodology :

Research methodology outlines the research design, method of data collection, and analytical statistical tools and techniques used in this research. The research adopts questionnaire method for collection of data and has adopted the quantitative research design for drawing the conclusion. It has considered the ethical consideration for exploring core subject matter of academic context with response to Lumbini Academic College and G.P Memorial (Community) College. The research has use IBM SPSS 25 software for statistical data analysis. The conclusive decision is drawn after proper interpretation of research objectives.

Population and Sample Size

The convenience sampling research technique is adopted to collect the data from the academic institute i.e. Lumbini Academic College and G.P Memorial (Community) College as it is located in Kathmandu valley which is easy for researcher to collect data. The total number of population is around 350 and 168 sample size is chosen for the study. Privacy concern and ethical consideration are systematically addressed and concern of respondents involved in research is well aware about the research.

Data Collection and Sources

The research uses both primary and secondary data. Primary data is collected through questionnaire method and secondary data is collected through prior studies of various journals and articles. Self-made questionnaire is prepared after proper study of prior research and are distributed to Lumbini Academic College and G.P Memorial (Community) College for collection of primary data. Likert five scale questionnaire i.e. strongly agree, agree, neutral, disagree and strongly disagree are used for gaining the insight knowledge about the academic sector.

6. Data Analysis :

Correlation Analysis

Correlation analysis between dependent variable i.e. Employee commitment and independent variable i.e. leadership approach, training and development programs, organizational policies and communication style are analyzed to know the positive or negative correlation between the variables.

Table 1 Correlation Analysis

		Correlations				
		Employee Commitment	Leadership Approach	Training and Development Programs	Organizational Policies	Communication Style
Employee Commitment	Pearson Correlation	1	.572**	.398**	.523**	.501**
	Sig. (2-tailed)		.000	.000	.000	.000
	N	168	168	168	168	168
Leadership Approach	Pearson Correlation	.572**	1	.363**	.469**	.426**
	Sig. (2-tailed)	.000		.000	.000	.000
	N	168	168	168	168	168
Training and Development Programs	Pearson Correlation	.398**	.363**	1	.559**	.648**
	Sig. (2-tailed)	.000	.000		.000	.000
	N	168	168	168	168	168
Organizational Policies	Pearson Correlation	.523**	.469**	.559**	1	.647**
	Sig. (2-tailed)	.000	.000	.000		.000
	N	168	168	168	168	168
Communication Style	Pearson Correlation	.501**	.426**	.648**	.647**	1
	Sig. (2-tailed)					



	Sig. (2-tailed)	.000	.000	.000	.000	
	N	168	168	168	168	168

** . Correlation is significant at the 0.01 level (2-tailed).

There is positive correlation between employee commitment and leadership approach

The calculation of the correlation shows that the correlation coefficient between employee commitment and leadership approach is 57.2 percent. The p-value is .000 where there is highly significant correlation between employee commitment and leadership approach and is associated with each other. The better the access to employee commitment the better the leadership approach is associated.

There is positive correlation between employee commitment and training and development programs

The calculation of the correlation shows that the correlation coefficient between employee commitment and training and development program is 39.8 percent. The p-value is .000 where there is highly significant correlation between employee commitment and training and development program and is associated with each other. The better the access to employee commitment the better the training and development program is associated.

There is positive correlation between employee commitment and organizational policies

The calculation of the correlation shows that the correlation coefficient between employee commitment and organizational policies is 52.3 percent. The p-value is .000 where there is highly significant correlation between employee commitment and organizational policies and is associated with each other. The better the access to employee commitment the better the organizational policies is associated.

There is positive correlation between employee commitment and communication style

The calculation of the correlation shows that the correlation coefficient between employee commitment and communication style is 52.3 percent. The p-value is .000 where there is highly significant correlation between employee commitment and communication style and is associated with each other. The better the access to employee commitment the better the communication style is associated.

Multiple Regressions Analysis

Multiple regression analyze the relationship between dependent variable i.e. employee commitment and independent variable i.e. leadership approach, training and development program organizational policies and communication style.

Table 2 Multiple Regression Analysis

		Coefficients ^a				
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.414	2.104		-.197	.844
	Leadership Approach	.506	.089	.387	5.690	.000
	Training and Development Programs	.019	.088	.018	.219	.827
	Organizational Policies	.247	.097	.210	2.537	.012
	Communication Style	.217	.101	.189	2.151	.033

a. Dependent Variable: Employee Commitment

Hypothesis 1: There is significant relationship between employee commitment and leadership approach

The significant value between the employee commitment and leadership approach is .000 which is less than p-value .50. Thus, Hypothesis 1: There is significant relationship between employee commitment and leadership approach is accepted.

Hypothesis 2: There is significant relationship between employee commitment and training and development programs



The significant value between the employee commitment and training and development program is .827 which is more than p-value .50. Thus, Hypothesis 2: There is significant relationship between employee commitment and training and development programs is rejected.

Hypothesis 3: There is significant relationship between employee commitment and organizational policies

The significant value between the employee commitment and organizational policies is .012 which is less than the p-value .50. Thus, Hypothesis 3: There is significant relationship between employee commitment and organizational policies are accepted.

Hypothesis 4: There is significant relationship between employee commitment and communication style

The significant value between the employee commitment and communication style is .033 which is less than p-value .50. Thus, Hypothesis 4: There is significant relationship between employee commitment and communication style is accepted.

Table 3 Model Summary

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.658 ^a	.433	.419	3.29528
a. Predictors: (Constant), Communication Style, Leadership Approach, Training and Development Programs, Organizational Policies				

R Value: The correlation on the coefficient in the model summary is 65.8% which shows there is the strong relationship between predictors and other independent variable i.e. leadership approach, training and development programs, organizational policies and communication style. But rest 34.2% is explained by the variables which are not included in this study.

R Square Value: The coefficient of determinants is 43.3% which shows there is the variability between the predictors and independent variable. But 56.7% is explained by other variable which are not included in this study.

Adjusted R Square and Std. Error of the Estimate: It adjust the value of R Square with 41.9% which shows the number of predictors in this model summary. The rest value is 58.1% which is explained by the factors beside this study. The difference between the predictor and unpredicted value is 3.29528.

Summary of the Outcomes of Employee Commitment with Independent Variables

Independent Variables	Correlation Outcomes	Significant Relationship	Hypothesis
Leadership Approach	Positive	Significant	Accepted
Training and Development Program	Positive	Not significant	Rejected
Organizational Policies	Positive	Significant	Accepted
Communication Style	Positive	Significant	Accepted

7. CONCLUSION :

This study explores the conflict management strategies on employee commitment in the Nepalese academic sector. In this quantitative research questionnaire, the study identifies there is positive correlation between employee commitment and four independent variable i.e. leadership approach, training and development programs, organizational policies and communication style. The analysis highlights the knowledge providing the specific insights on conflict management and employee commitment. Training and development is not statistically significant with the dependent variable i.e.



employee commitment. It states that although the training and development programs are essential for the overall growth in Lumbini Academic College and G.P Memorial (Community) College, it is needed to be integrated with the supportive measures for the impact of commitment effectively.

Practical Implication

This research lies on the contextual analysis offering the valuable information to the policymakers to enhance the effectiveness through the improve employee relations with the commitment in the academic sector. The leader can be trained to motivate and inspire the staff through skills and manage conflicts to maintain a high level of employee commitment. Academic sector i.e. G.P Memorial College and Lumbini Academic College should invest in a professional training and development programs from which the job performance level and satisfaction level is directly improved and influenced in their commitment levels.

Future Research Directions

Future researcher can explore the additional variables in the study such as job satisfaction, economic factors and work life balance which might influence the employee commitment on conflict management. Additionally qualitative studies could provide the deeper knowledge on the specific challenges and opportunities on Nepalese academic sector.

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The Impact of Covid-19 on Organizational Development in Banking Industry of Nepal

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Abstract:

Introduction : Covid-19 Pandemic has affected several sectors including the banking industry. This research aims to examine how does pandemic influenced the organizational development in the Nepalese banking sector specially focusing on commercial bank of Nepal. It focuses on adapting the new norms and paradigms in order to solve the challenges in organizational development.

Objective : The primary objective of the study is to examine the impact of Covid-19 on organizational development in banking industry of Nepal. It focuses on the technological adoption, crisis management strategies and regulatory changes and compliance as independent variable to assess the relationship with dependent variable i.e. organizational development.

Research Methods : The research method in this study is quantitative research design where the data is collected through survey. It enables the comprehensive analysis using primary sources of data collection with IBM SPSS software. It investigates how the Covid-19 still has impact in the banking industry of Nepal through dependent and independent variable. Analytical tools i.e. descriptive research and Multiple regression analysis is used for the survey.

Results : The findings indicate the significant and non-significant between the variables. It finds how the technological adoption has accelerated which enhance the operational efficiency. What an effective crisis management strategies are important is maintaining the stability is analyzed to know the continuity of the services in banking sector. The impact of Covid-19 with regulatory changes and compliance are both challenges and opportunities for banking industry in Nepal.

Practical Implication : It provides the valuable knowledge for banking industry and policymakers for implementing the best regulatory changes. It provides the deep understanding on technological adoption, crisis management strategies, regulatory changes and compliance for effective and sustainable organizational growth.

Key Words: Covid-19, Organizational Development, Banking Industry, Technological Adoption, Crisis Management Strategies, Regulatory Changes and Compliance.

1. INTRODUCTION :

The Covid-19 pandemic has inescapably battered the wealth management industry in Nepal, which is in urgent need of reforms and enhancements (Joshi, Mainali, marasini, Prasad, & Adhikari, 2021). Industry discontinuity had already given rise to an effective and adaptable banking department because of a number of huge adjustments that need to be made in organizational structure, communication technique, and innovation (Pandey, 2022). It also hastened the adoption of cutting-edge technology and challenged conventional multi-tier structures. Due to the pandemic in Nepal, the organizational structure and technical infrastructure had to be changed for remote operation of banks in Nepal (Khanal,



2020). These changes encouraged a more flexible business culture, challenging the old hierarchy and digital tools that act as a driving force for digital transformation in the banking industry whose rapid deployment saw the pandemic internet account openings and mobile apps Banks reassess their risk management in light of the gap revealed by crisis and should invest in cybersecurity measures. The pandemic is radically changing Nepal's banking landscape, forcing banks to introduce tailored services and financial advice through digital channels due to changes in consumer expectations and behavior. Going forward, to be successful, banks need to highlight their adaptability, flexibility and customer focus.

2. Literature Review :

Impact of Covid-19 on Organizational Development

Nepalese banks are positioned at a critical place in the country's economy. It is therefore essential for them to undergo growth even during post-Covid-19 period which can be achieved by enhancing digital inclusivity. However, this pandemic has affected their growth in a negative way especially within the context of Nepal where they are considered as one of the most important sectors (Dawadi, Giri, & Simkhada, 2020). In order to survive through these turbulent times caused by COVID-19 crisis management strategies had proved be very vital among different financial institutions worldwide but more so for those operating within this Himalayan nation's boundaries (Marcu, 2021). In fact, according study undertaken on Nepalese banks used various approaches like credit risk assessment and managing liquidity so that they can mitigate adverse effects (Karn, 2021). Consequently, this review paper aims at amalgamating previous research works while at the same time probing into multifaceted impacts of coronavirus disease on organizational development in Nepalese banking industry.

Technological Adoption

The Covid-19 pandemic has not only accelerated the digitization of industries worldwide but has definitely influenced the banking sector in Nepal, which quickly embraced digital technologies in a process of adaptation to the new realities and changing needs of customers (Parajuli, 2021). Other issues that have emerged and pose a barrier to realizing inclusive technology adoption in the banking sector are those related to poor internet connectivity and low digital literacy levels among consumers (Adhikari, 2021). Such challenges underline the need for investment in infrastructure development and digital literacy initiatives for the bridging of existing gaps and accessibility of digital banking services for all (Chhetri, 2023). Studies have shown how complicated it was for banks to adopt digital solutions under the pandemic, bringing up the need for flexibility from regulators and collaboration between policymakers and financial institutions in establishing an enabling environment that fosters digital innovations and technological advancement within Nepal's banking industry (Mulmi, 2023). In other words, the review section addresses the transformative effect of Covid-19 on the adoption of technologies in the banking sector of Nepal, showing the changes that have taken place and the challenges that continue to hound the sector, requiring collaborative efforts toward resilience, sustainability, and inclusiveness of the sector in the digital era (Tamang, Bhaskar, & Chatterjee, 2021).

Crisis Management Strategies

Effective crisis management strategies were developed and successfully implemented by businesses across the globe including banking industry, faced worst crisis in the history of mankind caused by Covid-19 (Dahal & Budhathoki, 2022). Impact of Covid-19 on Nepalese banks effected series of strategic responses and envisaged to provide resilience to organizations and financial stability in Nepalese banks during the unprecedented crisis. The strategic re-alignment in organizations during this period validated the importance of crisis management framework in providing stability and creating trust among stakeholders (Silwal, 2023). Customer centric strategy was one among the vital aspects of crisis management strategies in Nepalese banks. Studies revealed that collaboration and coordination were two prominent aspects in the story of Nepalese bank crisis management (Poudel, 2018). Business continuity plans were reviewed and improved in almost all Nepalese banks during this pandemic period (Dangol, Chitrakar, & Yoo, 2020). Transforming crisis management strategies in Nepalese banking industry in Covid-19 has posed a threat of highly contagious pandemic resulting in global economic downturn. The sudden and unexpected outbreak of Covid-19 has forced organizations including banks and financial institutions to re-align their business strategies. Crisis management strategies in Nepalese



banks need to address the risk aspects, customer centricity, collaboration, customer centric actions and business continuity in reserve.

Regulatory Changes and Compliance

The impact of the Covid-19 pandemic on the banking sector in Nepal has been no less than very strong, forcing a series of swift and much-needed regulatory changes to go through the challenges thrown up by the crisis (Bista, Parajuli, Giri, Karki, & Song, 2022). The study shows how liquidity injections and loan moratoriums helped alleviate the financial strain of banks and borrowers, emphasizing that regulatory agility and adaptability are crucial in times of crisis to instill confidence in the banking sector (Pradhan & Shah, 2019). Due to the operational disruptions caused by the pandemic, banks faced a number of unique challenges in keeping up with regulatory requirements for capital adequacy, asset quality, and liquidity management as they transitioned to work-from-home arrangements and digital banking solutions (Damenshie-Brown & Ofosu-Ampong, 2023). The prior studies outline these challenges, showing the need to strike a balance between ensuring regulatory compliance while fostering innovation and growth in the banking sector for sustainability (Zhang, 2023). Another research accentuates the pivotal role that regulatory interventions play in driving the sector toward inclusive and sustainable growth, especially during adverse times such as the Covid-19 pandemic (Thapa, 2020). In all, the literature review describes the transformative impact of Covid-19 on regulatory changes and compliance within Nepal's banking sector, underlining the important role that adaptive regulatory responses, balanced compliance strategies, and initiatives aimed at advancing financial inclusion and digitalization play in fortifying the sector's stability and resilience in the face of challenges like the Covid-19 pandemic. By acknowledging and adapting to these evolving dynamics, regulatory bodies and financial institutions in Nepal can effectively navigate through uncertainties and propel sustainable growth in the banking sector post-pandemic.

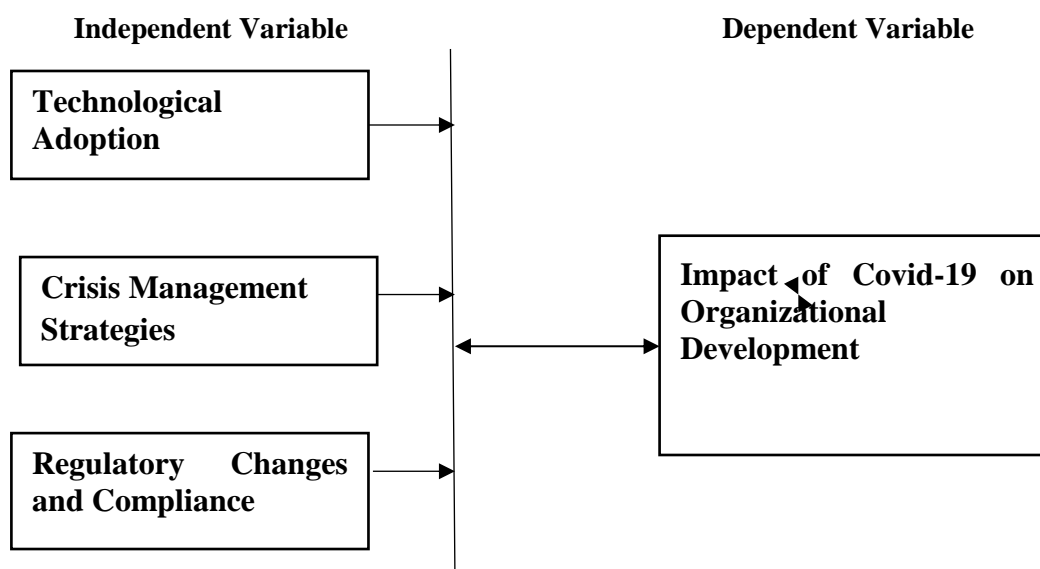


Figure No.1: Research Framework of the Study

Source: Ghani, Ali, Musa & Omonov (2022). The Effect of Perceived Usefulness, Reliability, and COVID-19 Pandemic on Digital Banking Effectiveness: Analysis Using Technology Acceptance Model. *Sustainability*, 14(18). doi:10.3390/su141811248

3. Research Objectives :

The objective of the study on the title **The Impact of Covid-19 on Organizational Development in Banking Industry of Nepal** are:

- To analyze the impact of Covid-19 on organizational development in banking industry of Nepal.



- To examine the technological adoption in banking industry of Nepal.
- To assess the crisis management strategies on banking industry of Nepal.
- To evaluate the regulatory changes and compliance in banking industry of Nepal.

Development of Hypothesis

The hypothesis of the study on the title **The Impact of Covid-19 on Organizational Development in Banking Industry of Nepal** are:

H₁: Impact of Covid-19 on organizational development has significant impact on technological adoption in banking industry of Nepal.

H₂: Impact of Covid-19 on organizational development has significant impact on crisis management strategies in banking industry of Nepal.

H₃: Impact of Covid-19 on organizational development has significant impact on regulatory changes and compliance in banking industry of Nepal.

4. Research Methodology :

A sample size of 150 respondents, strengthening the analysis, covers a wide spectrum of bank employees from employees to top executives, including strict stratified random sampling. The main data collection tool is a questionnaire, which provides the researcher an opportunity to explore different dimensions of organizational development, the incorporation of technology, innovation in processes, and follows significant parameters to be observed. Ethical considerations will be duly considered, from the very important informed consent of the participants to data confidentiality and transparency in all steps of the research process. Researcher uses IBM SPSS 25 software for the management of the data through descriptive statistics and multiple regression analysis. This software has best capability in processing the raw data which are developed through questionnaire data. The close ended questionnaire method is used to explore the relationship between the variables.

Descriptive Analysis

Descriptive Statistics focuses on summarizing the data into mean and standard deviation of dependent variable i.e. impact of Covid-19 on organizational development and independent variable i.e. technological adoption, crisis management strategies and regulatory changes and compliance.

Table 1 Descriptive Analysis

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Impact of Covid-19 on Organizational Development	150	10.00	39.00	26.9933	5.89676
Technological Adoption	150	10.00	39.00	28.0133	6.92141
Crisis Management Strategies	150	10.00	37.00	27.2333	5.54592
Regulatory Changes and Compliance	150	10.00	37.00	25.5600	5.82920
Average	150			26.949975	6.0483225

In the above table, the descriptive statistics describes four different variables. The sample size is 150 for observing the data. The average mean and standard deviation found on descriptive analysis is 26.949975 and 6.0483225. The highest mean is found on technological adoption i.e. 28.0133 and lowest mean is found on regulatory changes and compliance 25.5600.



Multiple Regression Analysis

It is the statistical technique to examine the hypothetical relationship between impact of Covid-19 on organizational development with technological adoption, crisis management strategies and regulatory changes and compliance.

Table 2 Model Summary

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.781 ^a	.611	.603	3.71673
a. Predictors: (Constant), Regulatory Changes and Compliance, Technological Adoption, Crisis Management Strategies				

The R value is 78.1%, R square value is 61.1% and adjusted R square value is 60.3% which indicates the good fit and explains the variability of dependent and independent variable explained by the model. But rest value of 21.9%, 38.9% and 39.7% of R, R square and adjusted R square value are explained by the variable which are not included in this study.

Table 3 ANOVA Test

ANOVA ^a						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	3164.141	3	1054.714	76.351	.000 ^b
	Residual	2016.852	146	13.814		
	Total	5180.993	149			
a. Dependent Variable: Impact of Covid-19 on Organizational Development						
b. Predictors: (Constant), Regulatory Changes and Compliance, Technological Adoption, Crisis Management Strategies						

The p-value is .000 which indicates that the regression model is statistically significant with each other. The F-statistic value is 76.351 which is obtained from the division of 10.54.714/13.814.

Table 4 Multiple Regression Analysis

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	6.575	1.576		4.172	.000
	Technological Adoption	.494	.083	.580	5.973	.000
	Crisis Management Strategies	-.010	.105	-.009	-.091	.928
	Regulatory Changes and Compliance	.268	.078	.265	3.417	.001
a. Dependent Variable: Impact of Covid-19 on Organizational Development						

Multiple regression analysis provides the detail information about the significance value (p-value). The significant value found on technological adoption is .000 which is less than .50, The significant value found on crisis management strategies is .928 which is more than p-value .50. The significant value found on regulatory changes and compliance is .001 which is less than .50. Thus, H₁: Impact of Covid-19 on organizational development has significant impact on technological adoption in banking industry of Nepal is accepted. H₂: Impact of Covid-19 on organizational development has significant impact on crisis management strategies in banking industry of Nepal is rejected. H₃: Impact of Covid-19 on organizational development has significant impact on regulatory changes and compliance in banking industry of Nepal is accepted.



5. RESULTS:

The finding of the research influences the policy makers in Nepal. It provides the knowledge and suggestions to banking professionals. Banking institution formulates the strategies from this research and can enhance the operation efficiency during the unpredictable situation. By comparing the banking industry with other industry in response to Covid-19 can adapt the best practices and find out the areas for improvement.

6. CONCLUSION:

This study aims in analyzing the impact of Covid-19 on organizational development in the banking industry of Nepal. Descriptive analysis finds that there is no technological adoption but found the best result on regulatory changes and compliance. The hypothetical relationship between impact of covid-19 on organizational development with technological adoption and regulatory changes and compliance is accepted. There is no significant impact between impact of covid-19 on organizational development with crisis management strategies.

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A Study on Impact of Accreditation Process on Research & Innovation Ecosystem at the HEIs with respect to Professional Education in India

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Abstract: *The Higher Education Institutes (HEIs) in post independent India have ably promoted Higher Education vis-s-vis the government initiatives to promote formal schooling of the masses. This has produced a remarkable increase in literacy rates and college graduates. As 2011 census report shows, 74.04% (14% increment over 2001 statistics) of literacy rate pan India, it is likely that we might have achieved well over 90% literacy rate by now. However, the GER at HEIs has been modest (24.1% in 2016-17, 27.3 percent in 2020-21, and 28.4% at present ref., All India Survey on Higher Education by Ministry of Education, Govt. of India). This reprimands continued focus on increasing GER at HEIs; covering women and marginal classes. However, there is a concerted voice from academia concerning HEIs to raise quality and not just quantity at our educational institutes. This paper holds the premises that Research & Innovation focus introduces quality at HEIs. The paper checks for a consensus among HEIs about Research and Innovation Ecosystem as a means to achieve relevant qualitative goals. Several colleges and institutes offering Engineering, Management and Teacher Training programs in SPPU, Pune purview are considered for the study. Online questionnaires, consultative discussions and interviews were used to gather primary data from important stakeholders in the Indian HEIs.*

Key Words: *Accreditation, HEIs, Research & Innovation Ecosystem, Quality, Professional Education.*

1. INTRODUCTION:

The Indian subcontinent has a glorious past of harboring academic exchanges, philosophical deliberations and intellectual excellence as back as Gupta Empire era i.e., 3rd – 6th Century CE. Nalanda, which came in to existence as a Buddhist Monastery, fast emerged as a global university drawing its pupils from countries across Asia. However, the legacy of being a global learning center diminished over centuries of foreign invaders and their dynasties promoting their knowledge systems at the expense of indigenous body of knowledge. Later, the Europeans entry in to the subcontinent for trade and eventually the British rule spanning over two centuries introduced modern science, medicines, and western philosophies and completely overhauled the traditional learning centers of Maths and Gurukuls. One striking trend that emerged during the British era in Higher learning, i.e., Higher Education was reduced as a means to secure non-farming livelihood. For many decades, there was a cliché in vogue attributing farming (Krishi) as a best, commerce (Vyapar) as a better and working for others (Naukri) as a worse career options. Thus, youth, who pursued education for the sake of jobs were demeaned in the society throughout 19th century till early 20th century. Interestingly, owing to the gross mistreatment of Indian economy by our colonial rulers as much as the Indian population explosion led to shrinking per capita farm holding and rapidly dwindling farm incomes. This prompted the Indian households to push their children to pursue college education as an occupational transition from farming to cozy



government jobs 1960s. Later, the continued population growth coupled with faster spread of Higher education created intense competition for government as well as private sector jobs. This paved way for large scale youth migration to US and Europe in search of better education and greener pastures. The youth migration for education and opportunities popularly termed as *brain drain* continues in India even today.

The moot point is what is so fascinating about western world for youth emigration. Literature research shows; even after mushrooming centers of higher learning viz., public/private universities and colleges/institutes, increasingly Indian youth are moving to western universities in pursuit of quality education. The researchers, upon interacting with many such youth studying outside, were revealed that accessibility to higher education in India has improved manifold. However, quality higher education is found in only select few campuses such as Institutes of Eminence (IoE), making it fiercely competitive. This drives the able youth to seek relatively easier entry into foreign universities.

Further, the researchers attempted to distinguish an average HEI with IoEs for qualitative differences. As presumed, IoEs excelled in all conceivable parameters. Following ten parameters were identified in in this regard:

1. Academic Excellence
2. **Research and Innovation**
3. World-Class Faculty
4. **State-of-the-Art Facilities**
5. Diverse Student Body
6. Alumni Network
7. Social Impact
8. International Collaboration
9. **Academic Rankings**
10. Career Opportunities

Further deliberations with senior academicians helped the researchers to pinpoint some critical parameters that make western HEIs achieve status of institute par excellence. The researchers adopted the technique of *conjoint analysis* to zero in three critical parameters among them. They are: State-of-the-Art Facilities, Research and Innovation, and Academic Rankings.

We traced evolution of some of the Indian Institutes of Excellence with a historical perspective. The IITs, IIMS, and IISc with a higher level of infrastructure considered as contemporarily best. This coupled with meritorious students coming from all over the country, mentored by world class faculty, could produce some exemplary research output and fostered innovation ecosystem culminating into sparkling examples of academic excellence and/or startup success stories.



Figure 1: Intertwining components of HEIs Excellence



Continuous focus on academic facilities and fostering research and innovation ecosystem has enabled them to set benchmarks and elevate themselves in the national as well as global rankings. Thus, the three critical parameters as shown in Fig.1 share an intertwined relationship and offer synergies when an HEI adopts them as mainstay goals.

2. LITERATURE REVIEW :

2.1. “Revised NAAC accreditation framework and quality enhancement in higher- education”. SUMEDHA Journal of Management, A, J. D. (2022).

This research paper attempts to investigate the role and contributions of NAAC in systematizing assessment mechanism employed accrediting higher education Institutions (HEIs) across India.

2.2. “Impact, added value and relevance of an accreditation process on quality assurance in Architectural Higher Education. Quality in Higher Education”. Acevedo-De-los-Ríos, A., & Rondinel-Oviedo, D. R. (2021).

The aforementioned study looks at the usefulness, impact, and added value of certification as a means of ensuring quality in the field of architecture at a higher education institution. Through the distribution of a survey to employers, teachers, and students, the qualitative effects of accreditation were investigated. Examining academic metrics like pass rate and weighted average year before and after the accrediting procedures allowed for a quantitative assessment. The study looked at a private higher education institution in Peru, but the methodology and findings might be applicable to other research on similar schools in poor nations.

2.3. “Impact of external accreditation on students’ performance: Insights from a full accreditation cycle” Alenezi, S., Al-Eadhy, A., Barasain, R., AlWakeel, T. S., AlEidan, A., & Abohumid, H. N. (2023).

In order to determine how external accreditation affected students' mean grade scores over the course of an accreditation cycle, a retrospective quantitative secondary data analysis using a before-and-after comparison research design was carried out on the undergraduate medical program students at King Saud University (KSU). In addition to confirming the program's competencies, the study was a vital source of support for both students' educational experiences and procedures for quality improvement.

2.4. “The contribution of professional accreditation to Quality Assurance in Higher Education Quality in Higher Education”. De Paor, C. (2016).

The article notes that regardless of a nation's economic standing, access to high-quality education has become essential for everyone in the modern world. The author provides evidence to support the claim that the rate of increase in the stock of knowledge affects economic growth just as much as the expansion of labor and physical capital. The essay proves that access to high-quality education is a need for all colleges, not just those in the developed world. The author issues a warning, stating that "Third-world universities" run the risk of stagnating or worse if they disregard the importance of a quality education or self-evaluation processes. Continuous self-evaluation and the pursuit of internal or occasionally external validation or accreditation are the main strategies that promote quality assurance.

2.5. “Literature review of accreditation systems in higher education. Education Sciences”. Duarte, N., & Vardasca, R. (2023).

This study looks into the accreditation procedures used in higher education in different nations, with a particular emphasis on the length of time and administrative load involved in accrediting new courses. Finding methods to speed up the accreditation procedure for new courses at higher education establishments is the goal. To accomplish this goal, a thorough literature analysis was carried out, looking at the certification procedures in Portugal, Spain, the US, France, China, Japan, Sweden, the UK, India, and Germany. The main conclusions of the study showed that most countries have an efficient certification procedure, with courses getting accredited in a fair amount of time. For



universities offering new or innovative courses or those seeking accreditation for the first time, the procedure might be more intricate and time-consuming.

2.6. “The effect of accreditation on Higher Education Performance Through Quality Culture Mediation: The perceptions of administrative and quality managers”. Iqbal, S., Taib, C. A., & Razalli, Mohd. R. (2023).

Based on the opinions of administrative and quality managers, this study attempts to investigate the direct and indirect effects of accreditation on performance in higher education by using the quality culture as a mediator in the setting of higher education. Design, procedure, and strategy This is a quantitative study that gathered data from a national survey of Pakistani universities using stratified random sampling procedures. The findings offer intriguing new information, such as the substantial relationships between higher education performance and accreditation, as well as the important effects of quality culture on higher education performance and the mediating role of quality culture in these relationships.

2.7. “A comparison of India’s higher education quality accreditation parameters with those of other international accreditation agencies. Evaluating Global Accreditation Standards for Higher Education”. Kapoor, S., Khalique, F., & Khan, N. (2024).

The writers of this article examine the initiatives taken in the past and present by several Indian accreditation bodies and organizations to uphold and improve the standard of instruction in postsecondary educational establishments. Several quality control and education assessment units were formed in India to ensure that students received high-quality instruction and to monitor any deterioration in the provision of higher education. Students are given the tools they need to succeed in their fields thanks to this blend of academic learning and the business world. To give readers a thorough grasp of the quality examination process in Indian higher education, the writers will look at the formation of quality control units, the function of accreditation bodies, and the effect of accreditation on educational standards.

2.8. “Impact of QAUE on higher education institutions: Case studies. Quality Assurance and Institutional Transformation”. Liu, S. (2016).

This book examines how the Quality Assessment of Undergraduate Education (QAUE) has affected the change of the institutions it evaluates through the use of case studies. The results of the three case studies carried out at Beijing Normal University (BNU), Northwest Normal University (NWNNU), and Linyi Normal College (LYNC), respectively, are interpreted in this chapter. The responses from the university and its constituents to the QAUE are shown first in each instance. A picture showing how the QAUE has affected the assessed institutions comes next. The success of the QAUE in producing the desired impact is assessed, and the institutional context-specific elements that helped or hindered change implementation are explored.

2.9. “Higher Education Accreditation, quality assurance and their impact to teaching and learning enhancement.” Makhoul, S. A. (2019).

The purpose of this research is to investigate the connection between improved teaching and learning in academic institutions and accreditation for higher education. Institutions of higher learning are currently focusing on meeting the standards listed by globally renowned accrediting bodies. This essay seeks to determine whether external validation of quality can actually affect an institution of higher learning's internal operations. Will the introduction of accreditation affect the improvement of teaching and learning and lead to changes inside the institution? Design, procedure, and strategy In order to gather information for this study, a qualitative explanatory design was used, and interviews were conducted with individual tenure-track or tenured faculty members at Lebanese universities' business schools.



2.10. “Impact of Accreditation on Quality and Excellence of Higher Education Institutions”. Pradip Kumar, Shukla, B., & Passey, D., March 2021.

Based on an analysis of the literature and empirical research, this paper focuses on the results of accreditation to improve excellence in higher education institutions (HEIs). This assessment of earlier research conducted in a variety of national contexts serves as the foundation for an investigation into the aspects that contribute to the question of whether certification may actually improve HEI excellence.

2.11. “Exploring the Top Universities in India: A Comparative Analysis.” Ramdeo Kumar. (2023, October 27).

The shared traits that set the best universities in India apart from the rest of the higher education field are listed in this article. These universities put a strong emphasis on innovation, research, and academic brilliance, fostering a supportive environment where students can flourish. They have made significant contributions to academia, the economy, and society. The influence of these institutes is felt throughout India and beyond, even though the article doesn't name specific individuals.

3. Research Objectives :

The purpose of the study is to explore if focus on Research & Innovation improves overall quality at HEIs.

To serve the above purpose, the present research paper is built on the basis of following objectives:

- 1 To identify quality parameters relevant to HEIs in the realm of Professional education.
- 2 To study if the accreditation process provides impetus to HEIs in developing Research and Innovation Ecosystem.
- 3 To study whether and extent to which the Research and Innovation Ecosystem at the HEIs influences overall quality.

4. Research Methodology:

Before–After Comparison through retrospective quantitative secondary data analysis

Data collection through Case Studies of various Engineering Colleges, B.Ed., Colleges and Management Institutes for 2018-2023.

Online questionnaires, consultative discussions and interviews were used to gather primary data from important stakeholders in the Indian HEIs.

Convenience Sampling was employed to cover the professional educational institutes / colleges (viz., Engineering Colleges, B.Ed., Colleges and Management Institutes).

Self-Study Reports (SSRs) and of the accreditation and websites of the select institutes/colleges were referred.

Presence of Research & Innovation Ecosystem pre and post accreditation at the select institutions and colleges was studied.

4.1. Research Hypotheses

H1: There is a significant association between State of the art facilities and Research and Innovation Ecosystem.

H0: There is no significant association between State of the art facilities and Research and Innovation Ecosystem.

H2: There is a significant association between presence of Research & innovation Ecosystem and Accreditation Rating.

H0: There is no significant association between presence of Research & innovation Ecosystem and Accreditation Rating.

H3: There is a significant association between presence of Research & Innovation Ecosystem and quality of the HEIs.



H0: There is no significant association between presence of Research & Innovation Ecosystem and quality of the HEIs.

4.2. Research Premises / Model

The researchers have also carried out a comparative analysis of the select Professional Colleges / Institutes (viz., Engineering, Pharmacy and B.Ed., colleges and Management Institutes affiliated to SP Pune University) impact of Accreditation Process on Research & Innovation Ecosystem in two distinct periods viz., the period before Accreditation of the institutes/colleges (starting point of the present research work) and the period after Accreditation Process. This gives an opportunity for the researcher to locate changing trends if any, during the two time periods concerning the presence of Research and Innovation Ecosystem.

4.3. Sample Selection

The study could effectively cover 50 colleges / institutes who have successfully covered one accreditation cycle Case study method was used for exemplary colleges to arrive at the inferences. Management representatives, heads of the institutions and IQAC Head were the targeted respondents for the primary data collection. Following table provides the break up:

Sr. No.	College / Institute Type	No. of Institutes /Colleges studied
1	B.Ed.	10
2	Engineering Colleges	15
3	Management Institutes	15
4	Pharmacy Colleges	10
TOTAL		50

5. Data Analysis and Interpretations :

In this section, the researchers have carried out a comparative analysis of the impact of Impact of Accreditation Process on Research & Innovation Ecosystem in two distinct periods viz., the period before Accreditation (starting point of the present research work) and the period after Accreditation between the years 2018-2023. This gives an opportunity for the researcher to locate changing trends if any, during the two time periods.

5.1. Paired Samples Statistics for the Impact before & after Accreditation Process on Research & Innovation Ecosystem

Research & Innovation Ecosystem		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Research Publications	3.9400	50	.68243	.09651
	Research Publications	4.2000	50	.72843	.10302
Pair 2	Funded Research	3.9600	50	.60474	.08552
	Funded Research	4.2000	50	.63888	.09035



Pair 3	Consultancy Services	1.7800	50	.81541	.11532
	Consultancy Services	2.3200	50	86756	.12269
Pair 4	Incubations / Student Startups	1.3800	50	.49031	.06934
	Incubations / Student Startups	1.5000	50	.76265	.10785

5.2. Interpretation and Inferences

As shown in the previous slide, researcher has used paired sample statistics and calculated mean and standard deviation of before and after impact of Accreditation process on Research and innovation Ecosystem of select HEIs. It is noticed that the average impact on Research Publications before accreditation is 3.9400 and after the accreditation it becomes 4.2000. Indicating that average impact of accreditation process on research Publications is higher. Likewise, average impact of accreditation process on Funded Research before accreditation process is 3.9600 and post accreditation process it has increased 4.2000. Further, average impact accreditation process on Consultancy Services was 1.7800 and post accreditation process it has improved to 2.3200. Similarly, average impact of accreditation process on Incubations and student startups was 1.3800 before accreditation and has elevated to 1.5000 after the accreditation period.

Thus, on all four yardsticks of Research and Innovation Ecosystem, the average impact of accreditation process has substantially increased, demonstrating high impact of Accreditation process on Research and Innovation Ecosystem.

6. Discussion :

- The study reports positive impact of accreditation process on the overall quality
- The accreditation process influence quality through coherence, administrative buy-in, and coordinated quality improvement actions
- A strong association between accreditation process and student/staff engagement was observed.
- Teachers' performance; value addition to curriculum; performance of academic and support staff; and students' quality, satisfaction, and performance were found to improve on account of accreditation process.
- Institutions/Colleges rating in NAAC/NBA accreditation was also found to be closely linked with the standard of Research and Innovation activities.
- Faculty publications, consultancy projects, student involvement in academic research, in-house publications were found to increase on account of accreditation process.

7. CONCLUSION :

Benefits of Accreditation are clearly visible in terms of Research and Innovation Ecosystem in all the institutions of higher learning chosen for the study. There is an increased emphasis on publications in globally indexed journals and publications. However, the tangible benefits of the academic research directly transferring to industry utility or societal benefits were few. Increased frenzy over filing patents among the academic researchers was also found to be devoid of problem solving research outcomes. Engineering and Management campuses under study were found to be putting some efforts in facilitating innovation among student community through Incubations and Entrepreneurship development cells. However, much of these efforts is to create cosmetic changes rather than concrete outcomes.



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कबीर के निर्गुण को आत्मसात करता जनजातीय समाज (वागड़ के संदर्भ में)

राजेंद्र कुमार राणा
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किसी भी परम्परा को काल अनुसार प्रवाहित करने में लोक महत्वपूर्ण भूमिका होती है। वह पूरी सजगता व जागरूकता से उसका निर्वाह करता चलता है। मध्यकालीन क्रांतिकारी संत कवि कबीर की निर्गुण भक्ति भावना व सामाजिक, धार्मिक, सांस्कृतिक व राजनैतिक उपादेयता या प्रासंगिकता क्षीण नहीं हुई बल्कि ओर अधिक प्रज्वलित होकर ठेठ ग्रामीण क्षेत्र में प्रवाहित हुई।

जनजाति वर्ग के लोग भी उस भावधारा से प्रभावित हुये बिना नहीं रह सके। उनमें भक्ति साहित्य का विकास परम्परा से क्रमशः हुआ। वे वैदिक एवं पौराणिक मान्यताओं के अनुरूप आज भी ईश्वर को आराध्य मानते हैं। वे एक मात्र निराकार परमात्मा का गुणगान करते हैं। ईश्वर को घट घट वासी मानकर उसी को पूजते हैं। जनजातियों की अपनी परंपराएँ हैं। वे सूर्य, चन्द्र, तारे, भूमि, जल, अग्नि, आकाश, पवन आदि सभी को देवता मानकर वंदना करते हैं। वागड़ संतो व भक्तों की भूमि है। यहाँ कई महापुरुषों ने जन्म लेकर अपनी करनी से जनजाति भील समुदाय को प्रेरणा दी। इन संतो पर भक्तिकालीन निर्गुण संत कबीर का भी प्रभाव पड़ा है। कबीर ने भक्ति की अलख समाज की तत्कालीन परिस्थितियों को ध्यान में रखकर चलाई थी। वागड़ की भील जनजाति जो अनपढ़ गँवार समझी जाती रही है में कबीर भक्ति का काव्य रचा बसा है। इसे हम लोकभजनों में सुन सकते हैं। काशी में जन्मे कबीर की वाणी सम्पूर्ण भारत में फैल गई। आज प्रत्येक गाँव व ढाणी में कोई भक्त नहीं होगा जो कबीर के दोहे, भजन, पदों का गायन न करता हो।

कस्तुरी कुंडली बसै, मृग ढूँढे बन मांही,
ऐसे घटि घटि राम है, दुनिया देखे नाही।¹

मृग की नाभि में स्थित कस्तुरी का भान न होने से जिस प्रकार वह जंगल में भटकता है, उसी प्रकार ईश्वर का निवास घट घट में है, उसके लिये मंदिर मस्जिद जाने की जरूरत नहीं है। यही विचार भारतीय आध्यात्मिक परंपरा, उपनिषदों का मूल मन्तव्य है।

¹ कबीर ग्रंथावली, श्यामसुंदर दास, पृष्ठ 112



कबीर एवं वागड़ की जनजाति

मध्यकाल के प्रखर कवि एवं समाज सुधारक कबीर के बाद अनेक संतो ने कबीर का आधार लेते हुए अपने विचारों से जनजाति वर्ग को जागृत करने का महत्वपूर्ण प्रयास किया। उनमें गोविंद गुरु, सुरमालदास तथा मामा बालेश्वर का नाम भी लिया जा सकता है। इन सभी की अपनी अपनी शिक्षाओं का सहारा लेकर भील समाज में क्रांतिकारी परिवर्तन लाने का कार्य किया। अपने विचारों के द्वारा उन्होंने जनजाति समुदाय को नेकी का रास्ता दिखाया। जहां तक भक्ति भाव व ईश्वर की मान्यता का सवाल है, वे कबीर के निर्गुण राम से प्रभावित दिखलाई पड़ते हैं। वागड़ की संस्कृति, लोकगीत, कला, लोकनृत्य, दर्शन, धर्म अपने आप में अनूठा जान पड़ता है। यहाँ निर्गुण संप्रदाय में गोविन्द गुरु की भगत परम्परा को दसनामी तथा कबीर भक्त परम्परा को कबीरा पंथी कहा जाता है। जनजाति वर्ग के अनुयायी कबीर के विचारों से अत्यधिक प्रभावित हैं। वे कबीर के बताए मार्ग पर चलते हुए विभिन्न रुढ़ियों एवं समाजिक द्वेष से दूर रहते हैं। कबीर की निर्गुण विचारधारा कूट कूट कर भरी हुई है। ईश्वर की सर्वव्यापकता को वे व्यक्त करते हैं जिसे हम निम्न लोक भजन में देख सकते हैं –

मूल रे आणा मेल मा, गुनपत समरू,
गुनपत संरू राम साहेबा।
हिरदा में समरू, शारदा माता,
अनेक फल राम पाया हो जी।
अमरत प्याला पिदा रे भाईडा ने,
चौरासी नो फेरो, तमे टालो हो जी।
चौरासी नो फेरो, टालो रे भाईडा,
जमरा नो फांद छुडायो हो जी।
जमरा नो फेरो, टालो रे भाईडा,
जनम जनम सुख पाया हो जी।
सेवी लो आणा घट मा, अलख जी ने समरू,
मालिक जी ने चरणा मा रेवु हो जी।
सतगुरु न चरणा मा, विष्णु जी बोलिया,
हरी आमने पार लगावो हो जी।
खोजे चढ़ीया नर आ तो, निर्वाण पाया नी,
सती अमरापुरी पाया हो जी।²

निष्कर्ष :

उपरोक्त अनुसार हम कह सकते हैं कि कबीर के सिद्धांतों का अनुकरण करते हुए जनजाति भील समुदाय आत्मसात किये हैं। कबीर का लक्ष्य वे व्यक्ति रहे हैं या उन्होंने चोट कि जो धर्म, समुदाय,

2. धूलाभाई भगत द्वारा, ग्राम हाथोलिया, बांसवाड़ा



जाति, पंथ, ज्ञान आदि का धोंस जमाकर लोगों में भ्रम पैदा करते हैं। आज के युग में हम चंद्रमा, मंगल आदि पर पहुँच रहे हैं, ऐसे में भी धर्म के नाम पर लोगों को डराया जाता है। धार्मिक वितंडतावाद के कारण स्वार्थी, पाखंडी बाबा अपना स्वार्थ सिद्ध करने में लगे रहते हैं। भारतीय संस्कृति हासोन्मुख हो रही है, ऐसे में कबीर के विचारों की प्रासंगिकता आज बढ़ जाती है। आज नैतिकता को भुलाकर लोक समूह राजनैतिक षड्यंत्र व धार्मिक उन्माद का शिकार हो रहा है। मनुष्य सर्वत्र त्रासदी का शिकार हो रहा है। आज से 525 वर्ष पूर्व अवतरित कबीर ने इसे पहले ही चेता दिया था कि मानव मानव बन के ही सुखी रह सकता है। अन्याय से लड़ सकता है, आत्मिक विकास में ही समाज का विकास संभव है। प्रेम, सदाचार, दया, करुणा, सहयोग, परोपकार आदि के सहारे ही जीवन को सार्थक कर सकता है। वागड़ का जनजाति समुदाय कबीर को जीता है, कबीर को गाता है, कबीर को ही आत्मसात किये हुए है। इससे वह प्रपंच मुक्त होकर सुखी महसूस करता है।

भेंट/ साक्षात्कार :

1. चरणदास कटारा, गांगड़तलाई, बांसवाड़ा
2. डॉ गणेशलाल निनामा, एसबीपी महाविद्यालय, डुंगरपुर
3. मोहनलाल निनामा, आनंदपुरी, बांसवाड़ा



स्नातक स्तर की छात्राओं में आत्म सम्प्रत्यय तथा समायोजन का सहसम्बन्धात्मक अध्ययन

¹ विवेक आर्या, ² प्रो. अनीता जोशी

¹ मनोविज्ञान विभाग, पी.एन.जी. राजकीय स्नातकोत्तर महाविद्यालय,

² राजकीय स्नातकोत्तर महाविद्यालय, चम्पावत, उत्तराखण्ड, भारत

रामनगर, नैनीताल/ कुंमाउं विश्वविद्यालय, नैनीताल, उत्तराखण्ड, भारत

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प्रस्तावना : आत्म सम्प्रत्यय - आत्म सम्प्रत्यय का तात्पर्य उस तथ्य से है, जिसमें व्यक्ति यह समझता है कि वह कौन है तथा क्या है? वास्तव में आत्म सम्प्रत्यय एक तरह का दर्पण प्रतिमा होता है जो व्यक्ति की भूमिकाओं, दूसरों के साथ सम्बन्धों तथा उसके प्रति दूसरों के द्वारा किए गए प्रतिक्रियाओं द्वारा मूलरूप से निर्धारित होता है। आत्म सम्प्रत्यय व्यक्तित्व का सार भाग होता है जिससे व्यक्ति सीधे प्रभावित होता है। जैसे यदि व्यक्ति का आत्म सम्प्रत्यय धनात्मक होता है तो व्यक्ति में आत्म विश्वास, आत्म सम्मान और अपने आपको यथार्थपूर्ण सन्दर्भ में मूल्यांकित करने की क्षमता विकसित होती है जिसके परिणामस्वरूप व्यक्ति में उत्तम सामाजिक समायोजन की प्रवृत्ति विकसित होती है। किन्तु जब आत्म सम्प्रत्यय निषेधात्मक होता है तो व्यक्ति में हीनता व अपर्याप्तता का भाव जाग्रत होता है।

रोजर्स के अनुसार, "आत्मन संगठित, सतत, सम्प्रत्ययात्मक समग्रता है जो 'मैं' या 'मुझे' की विशेषताओं से बना होता है, तथा 'मैं' या 'मुझे' का अन्य एवं जीवन के विविध पक्षों से सम्बन्धों के प्रत्यक्षण एवं इन प्रत्यक्षणों के प्रति सम्बद्ध मूल्यों से निर्मित होता है।"

कोलहोन के अनुसार, "आपका आत्म सम्प्रत्यय आपका मानसिक प्रारूप है। इसमें आपका स्वयं के बारे में ज्ञान, प्रत्याशाएं एवं ज्ञान निहित होता है।"

बर्न्स के अनुसार, "हमलोग अपने बारे में क्या सोचते हैं, दूसरे लोग हमारे बारे में क्या सोचते हैं तथा हम क्या होना चाहते हैं, का एक तस्वीर ही आत्मन कहलाता है।"

आत्म सम्प्रत्यय की विशेषताएं - 1. संगठित एवं सतत स्वरूप

2. स्वयं के बारे में संगठित प्रत्यक्षण

3. स्वयं की प्रत्याशाओं के संदर्भ में ज्ञान

4. स्वयं को मूल्यांकित करने की क्षमता



आत्मन् के विकास के निर्धारक - 1. शरीरगठन एवं शारीरिक प्रतिमा

2. भाषा
3. पर्यावरण से मिलने वाला पुनर्निवेशन
4. उपयुक्त यौन मॉडल के साथ तादाम्य
5. पालन पोषण की विधियां

समायोजन - मनुष्य एक सामाजिक प्राणी है। वह अन्त समय तक समाज में ही रहना चाहता है। वह उसी समय अधिक प्रसन्न दिखायी देता है, जबकि वह स्वयं की रुचि, पसन्द और अभिवृत्तियों वाले समूह को प्राप्त कर लेता है। इस व्यावहारिक गतिशीलता का ही नाम समायोजन है। मनुष्य अपने जीवन को समाज के परिवेश के साथ समायोजित करने का प्रयास करता है और इसके पश्चात वह अपने व्यवहार में सामाजिक स्तर के अनुसार आंशिक अथवा पूर्ण परिवर्तन करता है। अतः जैविक व्यवहार की गतिशीलता को सामाजिक मान्यता या सामाजिक अमान्यता ही उसकी समायोजन एवं कुसमायोजन की द्योतक होती है।

समायोजन दो शब्दों को मिलाकर बना है-सम और आयोजन। सम् का अर्थ है भली-भाँति, अच्छी तरह या समान रूप से और आयोजन का अर्थ है व्यवस्था अर्थात् अच्छी तरह व्यवस्था करना। समायोजन का अर्थ हुआ सुव्यवस्था या अच्छे ढंग से परिस्थितियों को अनुकूल बनाने की प्रक्रिया जिससे कि व्यक्ति की आवश्यकताएँ पूरी हो जाएँ और मानसिक द्वन्द्व न उत्पन्न होने पाये।

समायोजन का अर्थ स्पष्ट करते हुए गेट्स एवं अन्य विद्वानों ने लिखा है कि 'समायोजन' शब्द के दो अर्थ हैं। एक अर्थ में निरन्तर चलने वाली एक प्रक्रिया है जिसके द्वारा व्यक्ति स्वयं और पर्यावरण के बीच अधिक सामंजस्यपूर्ण सम्बन्ध रखने के लिए अपने व्यवहार में परिवर्तन कर देता है। दूसरे अर्थ में समायोजन एक संतुलित दशा है जिस पर पहुँचने पर हम उस व्यक्ति को सुसमायोजित कहते हैं।

गैसा फेयर के अनुसार, "समाजीय व्यक्तियों के लिये जीव का व्यवहार ग्राह्य और अग्राह्य हो सकता है, जिसे समायोजन और कुसमायोजन की संज्ञा दी जाती है। जीव के व्यवहार का परिक्षेत्र समाजीय नियम, स्तर, आदतें और रूढ़ियों एवं व्यवहार के विभिन्न तरीकों से लगाया जाता है।"

समायोजन की आवश्यकता - सर्वांगीण विकास के लिए उसका वातावरण के साथ समायोजन अत्यंत आवश्यक है। इस आवश्यकता को निम्नलिखित बिंदुओं के माध्यम से स्पष्ट किया जा रहा है:

1. मानसिक कष्ट और व्याधियों से अपने को दूर रखने के लिए।
2. अपने मन और मस्तिष्क को व्यर्थ के चिंतन से दूर रखने के लिए।
3. ध्यान की एकाग्रता बनाये रखने के लिए।
4. विभिन्न गतिविधियों और कार्यकलापों में सक्रिय और उत्साहपूर्वक भाग लेने के लिए।
5. पलायन करना, चुनौती देना जैसी कुप्रवृत्तियों को न पनपने देने के लिए।
6. जीवन में शौक पैदा करने के लिए।
7. अपने काम के प्रति स्वस्थ दृष्टिकोण विकसित करने के लिए।
8. जीवन के प्रत्येक क्षेत्र में अधिकतम उपलब्धि प्राप्त करने के लिए।

साहित्य समीक्षा : बरहमंद, उषा ने (2022) में "स्कूल समायोजन, जुड़ाव और शैक्षणिक आत्म अवधारणा: परिवार, बच्चे और स्कूल कारक" नामक शीर्षक पर शोध किया। परिणामस्वरूप पाया गया कि स्कूल समायोजन परिवार की अनुकूलनशीलता/ सामन्जस्य, सामाजिक स्वीकार्यता, स्कूल जुड़ाव और शैक्षणिक आत्म अवधारणा से सकारात्मक रूप से सम्बन्धित था।



पाशा, हदिया सेरवत व मुनाफ, सीमा ने (2013) में "पारम्परिक विश्वविद्यालय के छात्रों में आत्म सम्मान और समायोजन का सम्बन्ध" नामक शीर्षक पर शोध किया। परिणामस्वरूप पाया गया कि आत्म सम्मान का सबसे अधिक सहसम्बन्ध शैक्षणिक समायोजन के साथ था।

त्रिवेदी, पामला ने (1998) में "धार्मिक विश्वास और आत्म अवधारणा: मनोवैज्ञानिक समायोजन के लिए निहितार्थों का मूल्यांकन" नामक शीर्षक पर शोध किया। परिणामस्वरूप पाया गया कि धार्मिक विश्वास का आत्म अवधारणा सकारात्मकता के माध्यम से समायोजन पर एक छोटा, सकारात्मक अप्रत्यक्ष प्रभाव था और ईश्वर सम्बन्धी नियन्त्रण विशेषताओं के माप के माध्यम से एक बड़ा लेकिन नकारात्मक अप्रत्यक्ष प्रभाव था।

उद्देश्य - स्नातक स्तर की छात्राओं में आत्म सम्प्रत्यय तथा समायोजन का सहसम्बन्धात्मक अध्ययन करना।

परिकल्पना - स्नातक स्तर की छात्राओं में आत्म सम्प्रत्यय तथा समायोजन के मध्य कोई सहसम्बन्ध नहीं होगा।

प्रतिदर्श - प्रस्तुत शोध में शहीद राजगुरु कॉलेज ऑफ एप्लाइड साइंसेस फॉर वुमेन, दिल्ली/ दिल्ली विश्वविद्यालय की 30 छात्राओं जिनकी आयु 18-19 वर्ष थी, को यादृच्छिक रूप से लिया गया।

उपकरण - आर.के. सारस्वत द्वारा निर्मित आत्म सम्प्रत्यय प्रश्नावली तथा प्रमोद कुमार द्वारा निर्मित संशोधित समायोजन आविष्कारिका

अंकन - आत्म सम्प्रत्यय प्रश्नावली के लिए अंकन क्रमशः 5, 4, 3, 2, 1 के रूप में अंकन किया गया है।

संशोधित समायोजन आविष्कारिका के लिए 0 व 1 के रूप में किन्तु केवल एकांश संख्या 33 के लिए 1 व 0 के रूप में अंकन किया गया है।

प्रदत्त विश्लेषण - - स्नातक स्तर की छात्राओं में आत्म सम्प्रत्यय तथा समायोजन के मध्य सहसम्बन्ध ज्ञात करने के लिए गुणन आघूर्ण विधि का प्रयोग किया गया है।

परिणाम :

चर	मध्यमान	$\sum x^2 / \sum y^2$	$\sum xy$	r	सहसम्बन्ध का प्रकार
आत्म सम्प्रत्यय	159.16	$\sum x^2 = 6296.16$	1020.32	0.40	पर्याप्त धनात्मक सहसम्बन्ध
समायोजन	19.4	$\sum y^2 = 989.20$			



निष्कर्ष : परिणाम के अनुसार स्नातक स्तर की छात्राओं में आत्म सम्प्रत्यय तथा समायोजन के मध्य पर्याप्त धनात्मक सहसम्बन्ध पाया गया। अर्थात स्नातक स्तर की छात्राओं के आत्म सम्प्रत्यय के अनुसार ही उनका समायोजन निर्धारित होता है। यदि छात्राओं का आत्म सम्प्रत्यय उत्तम होगा तो उनका समायोजन भी उत्तम होगा।

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Analysis of Radiation Pattern for Microstrip Antenna Phased Array with Multibeam at 5G Frequency

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Abstract: The study examines the radiation pattern for the phased array microstrip antenna by calculating the array factor. The analysis starts with determining the array factor for isotropic antenna elements and then plotting the overall radiation pattern for the phased array microstrip antenna with MATLAB software. The array has a broadside pattern with four elements separated by 0.76λ and a phase difference of 1.76 radians between neighbors. The theoretically anticipated array outcomes were compared to the results of an electromagnetic simulation of the same array simulated using CST software. The array was built using the Rogers RT Duroid substrate, which has a dielectric constant of 2.2 and a substrate height of 0.51 mm for frequencies ranging from 25 to 29 GHz. It can be used for a variety of purposes, including 5G. There is a slight variation between theoretical and simulated results since electromagnetics is considered after electromagnetic simulation.

Key Words: Array factor, Gain, Microstrip patch antenna, Multibeam, Pattern multiplication, Phased array

1. INTRODUCTION:

A high-gain antenna array can be formed by arranging many antennas of different geometrical shapes in space [1,2]. A linear or planar array pattern is formed by calculating the appropriate magnetic and phase excitation coefficient values for array members. As a result, array factor synthesis poses a significant problem in antenna design. Several analytical, iterative, and algorithm-based approaches have been proposed [3-5].

The procedure to calculate the array factor for a phased array antenna includes, at first specifying the array structure and then looking at the radiation pattern of a single element. The phase excitations and amplitudes of signals to all elements should be determined, and the array factor is computed and multiplied by the pattern of a single element to produce the array's overall radiation pattern, also known as pattern multiplication. The entire radiation pattern can be used to calculate the array's gain, main lobe, and nulls.

5G is commonly used for high-speed, low-latency communication. 5G wireless communication employs millimeter-wave frequencies [6]. Scientist's inadvertent use of 5G communications has resulted in a 5G wireless grid capable of powering many devices and outperforming any other existing



technology. The current trend is heavily geared toward the Internet of Things, necessitating the deployment of multiple IOT devices.

Around 40 billion IoT devices are expected to be deployed by 2025, necessitating the constant recharge and replacement of many batteries, which will be accomplished primarily through RF energy harvesting. The ITU defines the spectrum for 5G communication as the following bands: 3.4-3.6 GHz, 5-6 GHz, 24.25-27.5 GHz, 37-40.5 GHz, and 66-76 GHz, with the FCC claiming a spectrum of 27.5-28.35 GHz for 5G [7].

This paper first computes the array factor for a linear isotropic array, then assesses the pattern for a microstrip antenna array, then the pattern for a phased antenna array, and finally illustrates the theoretical results obtained from MATLAB calculations. Furthermore, CST Microwave Studio, an electromagnetic simulation software, is utilized to build and model an actual antenna array using the same radiation pattern and other characteristics as described above. In the last phase, theoretical and simulated results are combined.

2. ARRAY FACTOR CALCULATIONS:

Consider the array of N isotropic elements shown in Fig.1, which are arranged along the z -axis. The elements are separated by a distance ' d ' with an inter-element phase difference ' β '. The first element is assumed to be isotropic, with a normalized field of unity. Fig.1 depicts the phase shift factor ' β ', spacing ' d ', and angle ' θ '. The array factor for this N -element isotropic array is provided by [1].

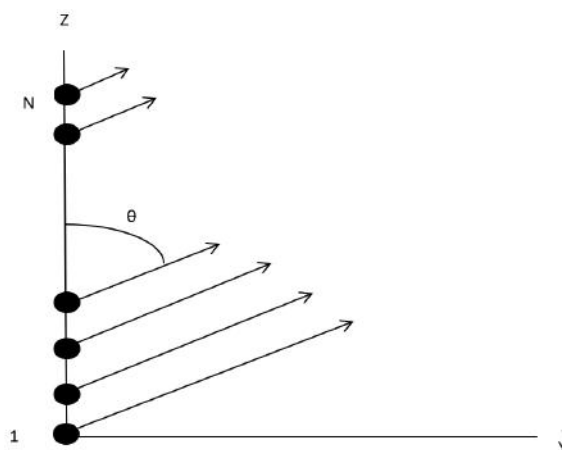


Fig.1 N isotropic antenna elements along the z -axis

$$AF = 1 + e^{j(kd \cos \theta + \beta)} + e^{j2(kd \cos \theta + \beta)} + \dots + e^{j(N-1)(kd \cos \theta + \beta)} \quad (1)$$

$$AF = \sum_{n=1}^N e^{j(n-1)(kd \cos \theta + \beta)} \quad (2)$$

where $k = \frac{2\pi}{\lambda}$ and λ is the operating wavelength

Now it's defined

$$\psi = kd \cos \theta + \beta \quad (3)$$

So, the array factor becomes

$$AF = \sum_{n=1}^N e^{j(n-1)\psi} \quad (4)$$

$$AF = \frac{e^{jN\psi} - 1}{e^{j\psi} - 1} \quad (5)$$



$$AF = \frac{\sin(\frac{N}{2}\psi)}{\sin(\frac{1}{2}\psi)} \quad (6)$$

The maximum value of the above expression is N, so the normalized array factor reduces to

$$(AF)_n = \frac{1}{N} \frac{\sin(\frac{N}{2}\psi)}{\sin(\frac{1}{2}\psi)} \quad (7)$$

To obtain a broadside pattern, the highest radiation occurs when 'θ' equals 90 degrees, implying from (7) that the equation is maximum for ψ =0 degrees. Therefore, β equals zero degrees from (3). The radiation pattern of an isotropic antenna array, whose array factor is defined by (7), is plotted on MATLAB software, demonstrating maximum radiation where 'θ' equals 90 and 270 degrees, as seen in Fig. 2. The number of elements ('N') is set to four.

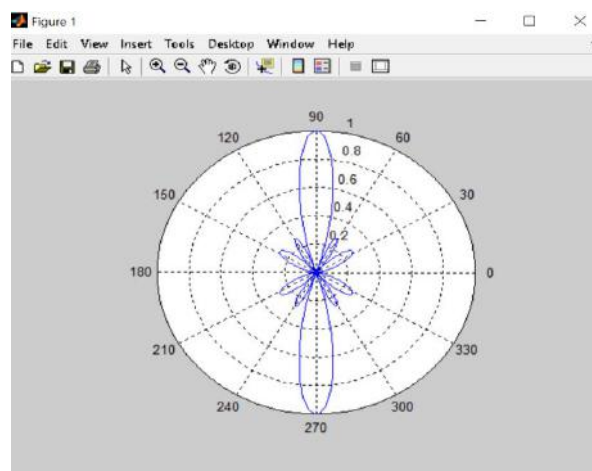


Fig.2 Radiation pattern for isotropic array antenna

3. ARRAY FACTOR OF PHASED ARRAY MICROSTRIP ANTENNA:

The isotropic antenna elements in the preceding section will be replaced by microstrip antenna patches located only along the Z axis. The design technique begins by determining the number of patch antenna elements. Assuming N=4, the spacing between elements is 0.76λ , with no initial phase difference between neighboring elements. The array factor for a single microstrip patch antenna element is given as [1].

$$AF = \sin \theta \frac{\sin(\frac{kh}{2}\sin\theta)}{\frac{kh}{2}\sin\theta} \frac{\sin(\frac{kh}{2}\cos\theta)}{\frac{kh}{2}\cos\theta} \quad (8)$$

h= height of substrate used to take as 0.51 mm

$k = \frac{2*\pi}{\lambda}$ calculated for a frequency of around 28 GHz that is used for 5G applications.

The above equation (8) shows that the maximum array factor is obtained at 'θ' equals 90 degrees which denotes a broadside pattern. Fig. 3 depicts the radiation pattern plot for a single-element microstrip antenna based on the array factor in (8), as plotted using MATLAB. The pattern peaks at 'θ' = 90 degrees, indicating a single-element microstrip antenna layout.

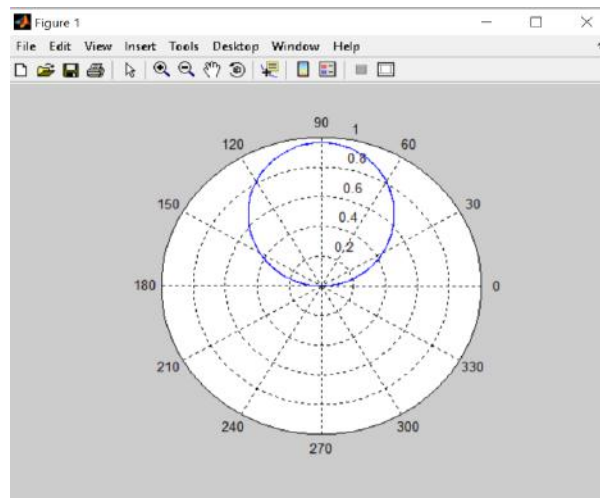


Fig.3 Single-element microstrip antenna pattern

The combined array factor of the microstrip antenna array will be derived as the pattern of a single microstrip antenna element as in equation (8) multiplied by the overall array factor as in equation (7), resulting in

$$(AF)_n = \frac{1}{N} \frac{\sin(\frac{N}{2}\psi)}{\sin(\frac{1}{2}\psi)} * \sin \theta * \frac{\sin(\frac{kh}{2}\sin\theta)}{\frac{kh}{2}\sin\theta} \frac{\sin(\frac{kh}{2}\cos\theta)}{\frac{kh}{2}\cos\theta} \quad (9)$$

The multiplied radiation pattern as obtained for the overall array factor as in equation (9) for the above antenna array as plotted on MATLAB is given as in Fig.4.

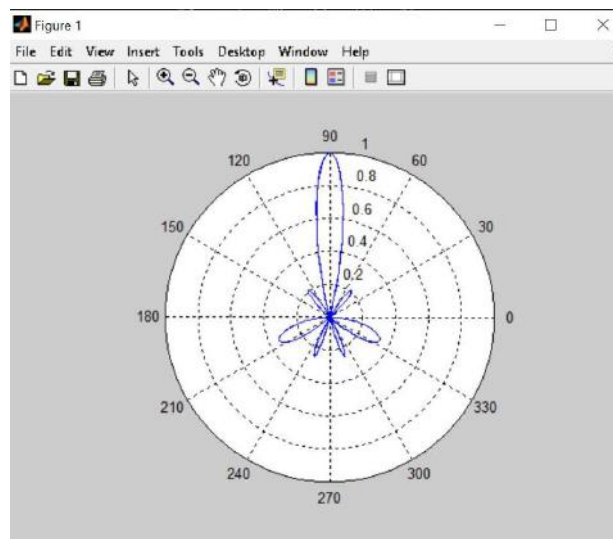


Fig.4 Overall microstrip antenna array pattern

In the provided array, a phase difference of β equals 1.76 radians between the neighboring components is maintained, so the pattern no longer remains broadside. The angle ψ changes and the single beam broadside pattern splits into two multiple beams, as seen in Fig. 5. The array is now a phased array.

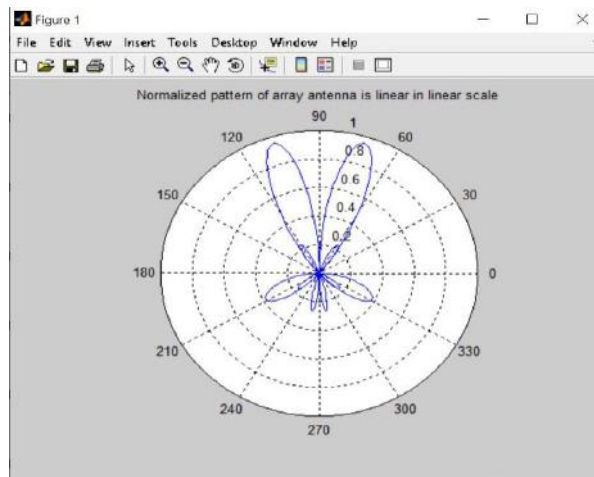


Fig.5 Microstrip antenna Phased array pattern

4. MICROSTRIP ANTENNA DESIGN:

An antenna array is made up of four elements that are fed with the same input phase through corporate feeding. The array was designed for a frequency of 28 GHz with a spacing of 0.76λ between elements. The antenna design is shown in Fig. 6. The rear side is completely copper. There is a 50-ohm feed line that is further separated using quarter wave matching transformers

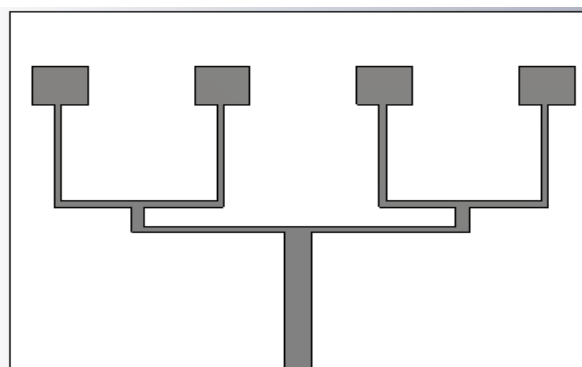


Fig.6 Microstrip Patch antenna array

The substrate utilized in the preceding section was thick, and the size of the feed line became larger than the patch, causing the feed line to radiate. As a result, the substrate was replaced with one that was thinner. Rogers RT Duroid 5880 LZ was used as the design substrate, with 2.2 as the dielectric constant and a height of 0.51mm. The design was simulated, and a graph of return loss and frequency is presented in Fig. 7. The return loss is -32.2 dB, with a frequency of 27.9 GHz. The antenna has an overall dimension of $36 * 25 \text{ mm}^2$

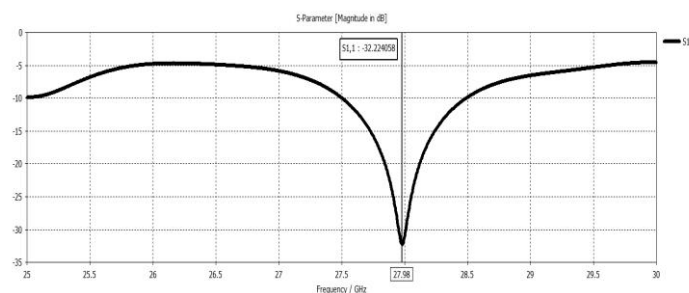


Fig.7 Graph of return loss for Microstrip patch antenna array



Fig. 8 conveys that the pattern is broadside pattern, with a maximum at θ' equals 90 degrees. The pattern is very similar to that obtained in Fig.3 after MATLAB simulation.

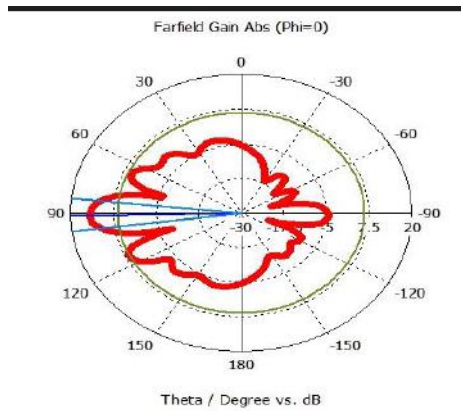


Fig.8 Broadside pattern for patch antenna array

The effect of changing the length of the feed line caused a phase change between the elements. The length difference between two neighboring elements is approximately 2.41 mm, which corresponds to a phase shift of 1.8 radians, as seen in Fig. 9.

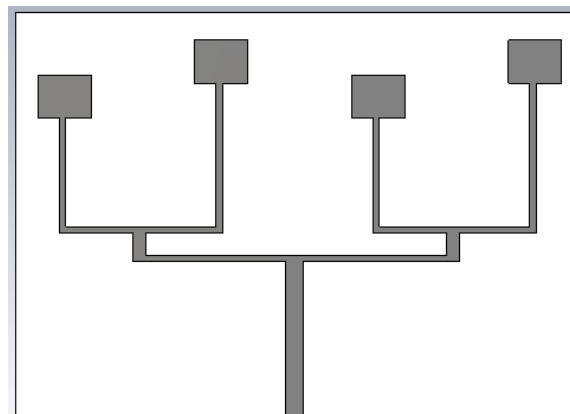


Fig.9 Phased Microstrip Patch antenna array

The current path has a phase difference now and generates two resonant frequencies at 25.1 GHz and 26.4 GHz respectively. Fig.10 depicts a 10 dB impedance bandwidth of 1.8 GHz from the graph of return loss.

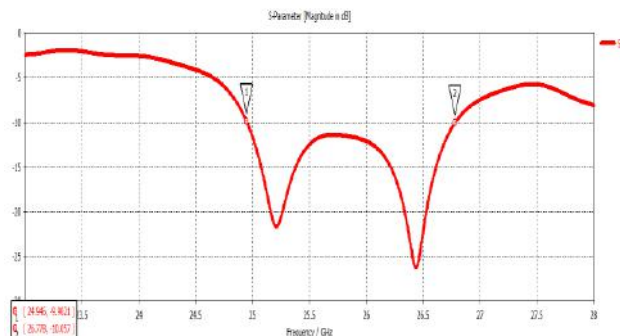


Fig.10 Graph of return loss for Microstrip patch antenna phased array



Fig.11 depicts that the maxima shift from ' θ ' equals 90 degrees and splits in different beams, the pattern is no longer a broadside pattern for the phased array.

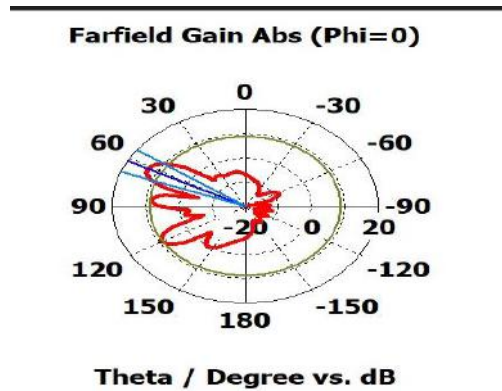


Fig.11 Pattern for phased antenna array

5. COMPARISON OF THEORETICAL AND SIMULATED RESULTS:

The antenna array with the same characteristics was simulated using CST software, with the same array position, number of elements, and spacing, and the radiation pattern was acquired from CST software as in Fig.8. Fig. 12 shows a comparison of the pattern generated from theoretical calculations and the real simulated antenna array, as seen in the comparative plot, both patterns are broadside, with modifications resulting from the theoretical and simulation results.

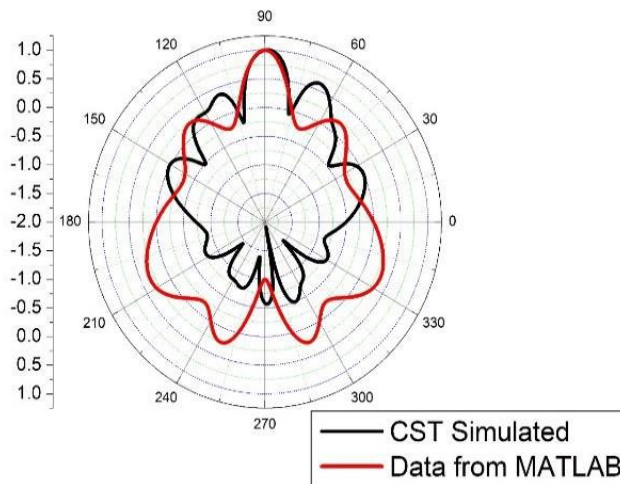


Fig.12 Comparative Patterns from Simulated and Theoretical Results

The phase shift ' β ' introduced in the MATLAB code resulted in the pattern shown in Fig.5 for a phased array antenna. The phase shift between the components was also introduced in the simulated array on CST software by altering the feed line length between the elements, resulting in the pattern seen in Fig. 11. The pattern no longer stays broadside. Fig. 13 depicts a comparative plot of the theoretical and simulation results. According to the ideal MATLAB calculations, two completely symmetrical beams should be obtained; however, in actual simulation, the results vary somewhat but are almost identical to theoretical outcomes.

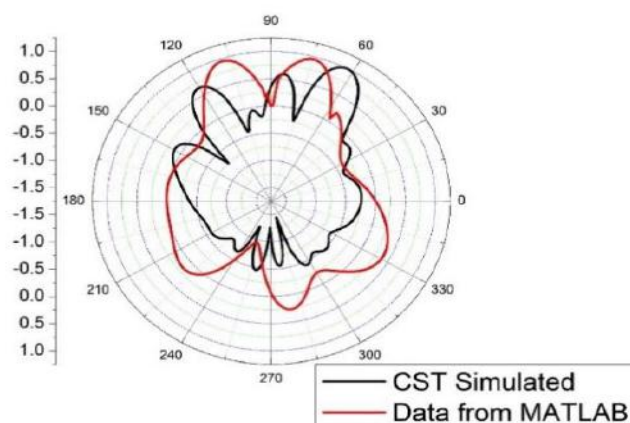


Fig.13 Comparative Patterns from simulated and theoretical results for Phased Antenna Array

6. CONCLUSION:

The radiation pattern of an antenna array is computed by multiplying the array factor by the pattern of a single microstrip antenna, which is referred to as pattern multiplication. The theoretical pattern is generated by designing the MATLAB code, which is then plotted after the relevant calculations have been completed. The same array with the same properties as in theoretical plotting was simulated using CST software while accounting for electromagnetic radiation. The theoretical and simulated results differ significantly because theoretical values are calculated accurately and do not account for electromagnetic wave losses, when there is no phase shift between adjoining elements, the pattern is broadside, however, a phased array causes the main beam to divide into multiples. The patterns created via MATLAB calculations are excellent since they are calculated solely using mathematical equations and pattern multiplication, with no consideration given to the impacts and losses of electromagnetic signals.

The actual simulation on electromagnetic CST software involves actual antenna design, taking into account the return loss, radiation efficiency, and other parameters, and produces a radiation pattern that is nearly identical to the plots obtained after actual calculations on MATLAB, thereby verifying the mathematical equations.

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Effect of Fertility Levels on Growth of *Gmelina arborea* based Silvo-pastoral system in Agroforestry

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ABSTRACT : A field experiment was conducted in Rabi season 2021-2022 and 2022-23 at a farmer's farm village - Gram Para near Rani Avanti Bai Sagar Bargi Dam - Jabalpur (MP) using 4 main treatments with cropping intensities P₀, P_{25%}, P_{50%} and P_{75%} and 4 sub-treatments with nutrient supply T₁ fertilizer, T₂ - vermicompost, T₃ organic fertilizer and T₄ control. The data should be statistically analysed using split plot design in *Gmelina arborea* plantation. The result showed that the growth performance of *Gmelina arborea* with treatment and different level of pruning intensity in GBH in 2021-22 and 2022-23 was significant. Instead, the highest GBH found in P₇₅ (36.85, 40.20 and 38.52 cm) in 2021-22 and (40.20, 43.37 and 41.79 cm) in 2022-23 based on final and combined mean respectively. Although the lowest GBH, P₅₀ was found in 2021-22 (31.43, 34.78 and 33.11 cm) and 2022-23 (34.78, 37.98 and 36.38 cm), evaluating the beginning, end of the second year and with average indicators. For mowing intensity and treatments, non-significant effects were observed for an increase in GBH (cm), but greatest for P₀ T₄, P₂₅ T₁ and P₀ T₁ in the first and second year and pooled mean data.

KEYWORDS: Agroforestry, *Gmelina arborea*, pruning intensity, GBH, vermicompost etc.

1. INTRODUCTION :

Agroforestry comprises of various types of components which develops interaction amongst them and thus, further have influencing effect on one another. The success of any agroforestry system depends upon the way all the constituting woody and non-woody components are put forward. There occurs ecological as well as economical interactions between the different components of the agroforestry system (Lundgren,1982).

Interaction has been defined as the effect of one component of a system on the performance of another component and / or the overall system (Nair,1993). When there occurs intercropping, then it leads to some kind of competition. Competition in an agroforestry system can be for light, water or nutrients. The intensity and nature of components in tree-crop associations is determined by the rate and intensity by which the biophysical resources are distributed amongst them. The overall interactions quantification is done by soil fertility and microclimate changes, resource capture in terms of water, nutrients and light. Soil fertility gets improved under tree-crop association and maintains survival of many beneficial organisms like AMF that protects against striga colonization (Birhane *et al.*,2018). *Gmelina arborea* is an indigenous tree species of India and is found in tropical forest up to 1,100 meters above sea level. *Gmelina arborea* function for its capacity to grow faster and hence, selected as an alternative for timber requirement. The fruit of *Gmelina arborea* is edible and on the some occasion the leaves of *Gmelina arborea* serves as good option for providing fodder to the animals. This investigation shows that the performace of *Geelina arborea* under different fertilizer.

2. MATERIALS AND METHODS :

The field experiment was conducted in a farming village - Gram Para, near Bargi Dam District Jabalpur (MP) during Rabi and Kharif 2021. The climate of the region is semi-humid and humid characterized by hot, dry and cool summers. Summer. , dry winter. According to National Agricultural



Research Programme, it is classified as 'Kymore Plateau and Satpura Hills' agro-climatic region of Madhya Pradesh. The experiment was carried out on the *Gmelina* trees under different fertilizer treatments i.e. T1 - manure, T2 - vermicompost, T3 - organic manure and T4 - control (without application of Fertilizers). This study done on the different pruning levels i.e. P0 - no pruning, P25 - 25% pruning, P50 - 50% pruning and P75 - 75% pruning intensity. The data have analysis through split plot design. The performance of *Gmelina* trees computed based on the girth based increments in the two successive year.

3. RESULT AND DISCUSSION

3.1 Estimation of girth at breath height (GBH) in cm during the 2021-22 and 2022-23

The GBH estimation during the experimental year presented in Table 1 i.e. treatments and different pruning intensity in *Gmelina arborea* found non-significant different in the 2021-22 and 2022-23 first and second year initial to final GBH. Whereas, highest GBH found in the P₇₅ (36.85, 40.20 and 38.52 cm) in the year of 2021-22 and similarly (40.20, 43.37 and 41.79 cm) in the year of 2022-23 in initial, final and pooled mean data of first year respectively. While lowest GBH, P₅₀ found in the 2021-22 (31.43, 34.78 and 33.11 cm) and in the 2022-23 (34.78, 37.98 and 36.38 cm) estimated on initial, final and pooled mean data of second year respectively.

Table 1. GBH during the experimental year

Treatment	2021-22			2022-23		
	First Year initial	First Year Final	Pooled Mean	Second Year initial	Second Year final	Pooled Mean
P₀	31.47	36.83	34.15	36.83	40.14	38.48
P₂₅	33.90	38.23	36.07	38.23	41.53	39.88
P₅₀	31.43	34.78	33.11	34.78	37.98	36.38
P₇₅	36.85	40.20	38.52	40.20	43.37	41.79
Sem±	3.83	3.75	3.75	3.75	3.83	3.79
CD at 5 %	12.25	11.99	11.99	11.99	12.26	12.12
T₁	33.84	37.86	35.85	37.86	41.61	39.74
T₂	35.58	39.10	37.34	39.10	42.45	40.78
T₃	34.85	39.28	37.06	39.28	42.59	40.93
T₄	29.37	33.81	31.59	33.81	36.37	35.09
Sem±	3.35	3.36	3.29	3.36	3.33	3.34
CD at 5 %	11.09	11.12	10.90	11.12	11.04	11.07

3.2 Increment of GBH (girth at breath height) of *Gmelina arborea*.

The increment over the year estimated by the differential variation in the initial data and final data of GBH this are presented in the Table 2

The GBH Increment(cm) was found that under different pruning intensity between P₀(5.36, 3.31 and 4.33 cm), P₂₅(4.33, 3.30 and 3.82 cm), P₅₀ (3.36, 3.20 and 3.28) and P₇₅(3.36, 3.17 and 3.26 cm). However treatments varied in T₁.Fertilizer(4.02, 3.75 and 3.89 cm), T₂-Vermicompost (3.52, 3.35 and 3.44 cm), T₃-Organic manure (4.43, 3.31 and 3.87 cm)and T₄-Control(4.44, 2.56 and 3.50) in the first year, second year and pooled data mean respectively.

The data present pruning intensity and treatments were found non-significant effect on GBH increment but highest P₀ T₄Control, P₂₅T₁-Fertilizerand P₀ T₁-Fertilizer. in the First year, second year and pooled mean data. Wasis and Fathia, 2011 reported that Crop planting *Gmelina arborea* Roxb. tailings in the media with the addition of NPK fertilizer is expected to improve the physical properties, chemical and biological soil tailings as a medium of plant growth in land revegetation efforts. Different

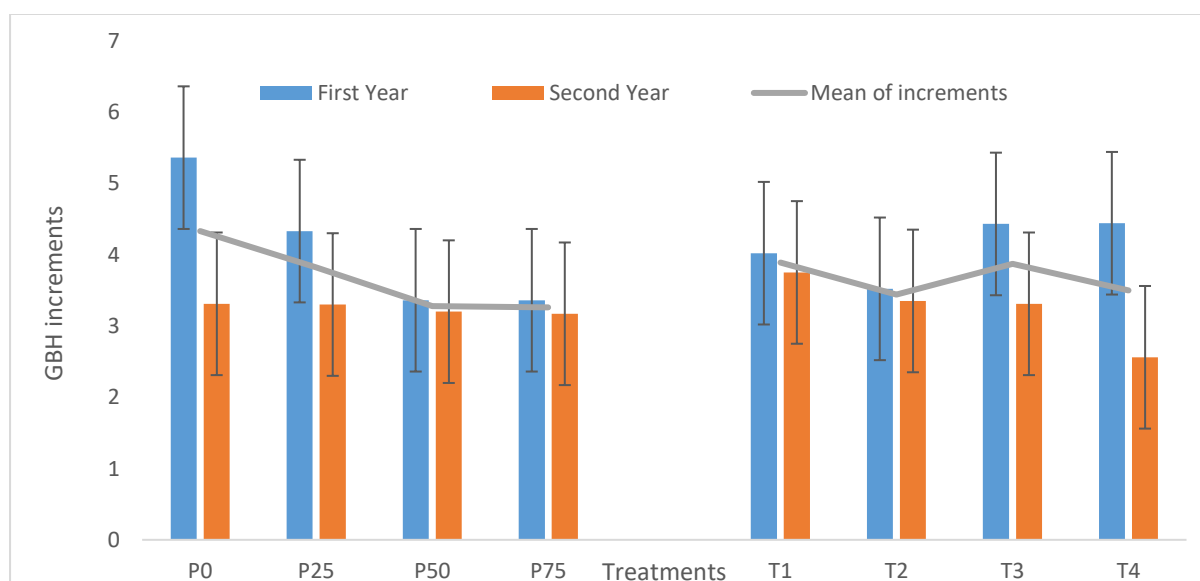


levels of fertilizers influence on the growth of basal area, an volume of *Gmelina arborea* reported by Shah and Bajpai (2022). The height of Gamhar was maximum found in agri-silviculture reported by Kumar *et al.* (2017), Anjum *et al.* (1999), Meyer (2003) and Verma *et al.* (1970).

Table 2 GBH increment during the experimental year

Treatment	First Year	Second Year	Mean
P₀	5.36	3.31	4.33
P₂₅	4.33	3.30	3.82
P₅₀	3.36	3.20	3.28
P₇₅	3.36	3.17	3.26
Sem±	1.10	0.15	0.56
CD at 5 %	3.53	0.49	1.81
T₁	4.02	3.75	3.89
T₂	3.52	3.35	3.44
T₃	4.43	3.31	3.87
T₄	4.44	2.56	3.50
Sem±	1.28	0.15	0.65
CD at 5 %	4.23	0.50	2.15

Fig 1 GBH increment during the experimental



4. CONCLUSION :

From the findings of this study, The data shown non significant but fertilizers have better performance on Zero percent pruning *i.e.* P₀ and application of fertilizer (T₁) have highly influence on the GBH growth of *Gmelina arborea*. Among the four Fertilizers the performance of *Gmelina* was better than others.

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Predictive Power Management for PV-ESS in Microgrids

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ABSTRACT: Renewable energy systems (RESs) have been widely adopted for energy generation in the recent years Photovoltaic systems (PVs) is leading the way in generating and harnessing the renewable energy. However, the limits of conventional control techniques, like cascaded linear control using PID controllers have been made clear by the growing incorporation of PV systems into distribution networks.

we need PV inverters that can regulate power more flexibly to help support. By adjusting the voltage of dc-bus and regulating active and reactive power, MPPC can help maintain the stable voltage of grid. The study is focused towards implementing Model Predictive Power Control (MPPC) approach for controlling a microgrid. A cost function is used to generate the control signals for the inverter and dc-dc converter.

The study demonstrates MPPC's effectiveness in a range of situations. To further assist in times when the PV system output is low, an energy storage system with a 3.0 KAh lithium-ion battery is included. Dc-dc converter was employed for the regulation of battery charging and discharging. The THD on the ac side inverter current is 2.24% when using this MPPC technique, whereas it has been found to be 2.82% when using the conventional MPC approach.

Keywords: RES, MPPC, cost function, THD, Voltage support etc.

1. INTRODUCTION:

Droop control techniques are currently widely used in microgrids to share power, which eliminates the need for long-distance communication links between distributed generators [9], [10]. Traditional droop control, however, has drawbacks, including poor transient performance and incompatibilities between frequency/voltage deviations and power sharing accuracy. Microgrid hierarchical control is gaining popularity as a solution to these issues [6].

It comprises of 3 stages: primary, secondary, and tertiary control. These levels differ in terms of response time and communication bandwidth. As the fundamental layer, primary control quickly distributes the load and stabilizes the system's frequency and voltage. Secondary control then compensates for the deviations in voltage and frequency caused by primary control in order to return them to their rated values under steady state conditions and enable grid connectivity and. Tertiary control, which includes features such as power planning and economic optimization, regulates the flow of power between microgrids or microgrid clusters and the main utility grid. Hierarchical control has several benefits, including upholding the ease in use of droop control, reducing frequency and voltage variations, and directing power flow into and out of the grid.

The cascaded control approach was a popular choice to control PV systems for a long time. This control structure necessitates numerous PWM modulation and feedback loops leading to a significantly slower dynamic response. In real-world PV plants, varying output may result in the continuous variations in the voltage at dc-bus. This can ultimately degrade the quality of power at the ac side. Therefore, conventional cascaded control approach is inefficient at dealing with the fluctuating PV output. A



further issue is flow of power between the utility grid and PV-ESS system. Power flow is typically regulated via grid-tied inverters. Previously, these types of cascaded loops with feedback have been used to control the power electronic converters in the PV system. An inner current control loop is often utilized to adjust the charge or discharge current of an ESS.

Performance of the converter has been enhanced in recent years by using the model predictive control (MPC) approach instead of the conventional PID control. This technique determines the power converter's switching states using a cost function. Active power is the control objective of the bidirectional dc-dc converter, and both reactive and active power flows control the inverter. The MPPC technique has the potential to an effective approach for controlling power flow in a flexible manner between the microgrid and the utility grid. As a result, the PV-ESS system will be able to compensate for voltage and partially support the grid..

2. LITERATURE REVIEW :

In recent years, converter performance has been enhanced by the model predictive control (MPC) approach as opposed to the conventional PID control. This method uses a cost function to decide the switching states of the power converter. It helps to minimize the various environmental effects to generate energy. The sole source of generation of the energy was nature. The incorporation of the green unit and the grid had a volatility problem. The frequency was found to be critical for managing the stable power flow which was connected with the demand and supply management. The load frequency monitoring system was introduced for the reduction of the frequency deviations from the natural state of the system. The efficiency of the control system may be increased by using a reliable ESS. The storage system helped to the load rate, peak rushing, support for the black start, etc. along with the instant response feature and huge energy contribution. The organized aggregate system and the uncoordinated system control scheme were presented in this article [2].

Controlling the storage system of energy with the help of a battery was a very challenging job due to the cost and the benefit it generated in the system. This paper presented the idea for the optimum utilization of ESS. The degradation cost which includes the marginal cost in bulk was considered. It used the nonlinear function to the degradation of the battery which was unsuited to the Model predictive control as the implicit function. To take the proof-of-concept, the proposed function of the cost that relayed a peak shaving on adaptive soft limits through the algorithm was done [4].

3. Research Objectives:

Following are the main objectives of the research work:

- To implement a Model predictive based control strategy for the effective control of power electronic converters in a microgrid.
- To support the grid voltage through the flexible regulation of power flow.

4. Methodology :

4.1 MODEL PREDICTIVE POWER CONTROL (MPPC)

In conventional grid-tied PV-ESS systems, a buck-boost converter smoothens PV output by controlling ESS charging/discharging, and an inverter maintains the main bus DC voltage. This setup limits reactive power regulation. This thesis proposes using the buck-boost converter to regulate bus voltage, enabling bidirectional real and reactive power flow.

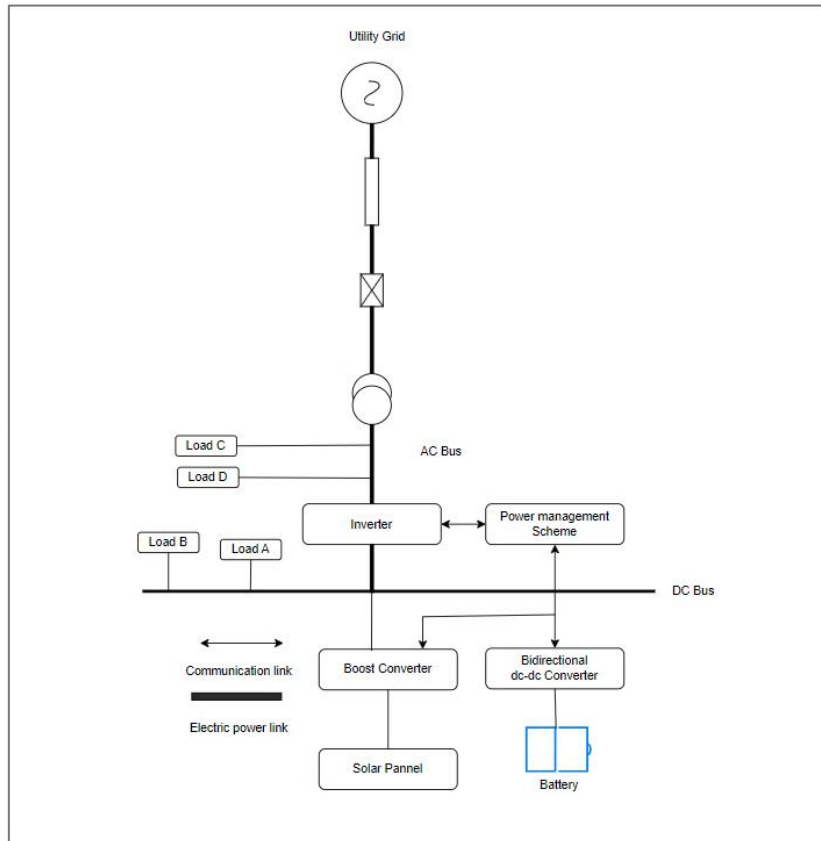


Figure 1: Configuration of a PV-ESS system

Discretization of system parameter may be used for estimating the power needed by ESS for the following instant utilizing the estimated ESS current as follows:

$$P^*_{ESS}(k + 1) = \left| \left[I_{PV}(k) - \frac{1}{N} \left(\frac{C_2}{T_S} (V^*_{dc} - V_{dc}(k)) \right) - I_M'(k) \right] \cdot V^*_{dc} \right| \dots \dots \dots (i)$$

The estimation of the power output of the battery can be expressed as follows, taking into account the fairly slow change in battery voltage and approximating current to the inductor current:

$$P_S(k + 1) = \left| I_S(k + 1) \cdot V_S(k) \right| \dots \dots \dots (ii)$$

The ESS must provide or absorb the necessary power for the ESS in order to maintain power balance. Thus, the MPPC cost function for the ESS can be determined as follows:

$$C = \left| P^*_{ESS}(k + 1) - P_S(k + 1) \right| \dots \dots \dots (iii)$$

Given that $I_S \leq \left| \text{Battery Rating} \right|$ & $SOC_{min} \leq SOC \leq SOC_{max}$

The simultaneous estimate of the battery current $I_S(k + 1)$ by means of the battery voltage, current and actual dc-bus instant voltage yields two possible values for $P_S(k + 1)$ from the equations (v), (vi) and (xii). The buck-boost converter is controlled by determining the best switching states to attain the minimal cost function. Hence the voltage of dc-bus is stabilized as the input for the inverter and shared dc-link for PV-ESS.



4.1.2 Grid-Tied Inverters Control

The ESS's buck-boost converter gives the grid-tied inverter more freedom in control for the grid support by controlling the voltage at dc-bus. Depending on whether the inverter is turned on or off, different output voltage vectors result. The following characterizes their complex forms:

$$V_i = \begin{cases} \frac{2}{3} V_{dc}^* e^{j(i-1)\frac{\pi}{3}}, & (i = 1,2,3,\dots,6) \\ 0, & (i = 0,7) \end{cases} \dots\dots\dots (xiii)$$

The system ac side has been presented in the figure 6. The inverter model mathematical formulation can be carried out using the space phasors as:

$$V_i = V_g + I_f R_f + L_f \frac{dI_f}{dt} \dots\dots\dots (xiv)$$

Where $V_i =$ Converter Voltage Vector, $V_g =$ Grid Voltage Vector, $L_f =$ Filter inductance, $R_f =$ Equivalent resistance & $I_f =$ Inductor Current

5. System Simulation :

The system is simulated in MATLAB's Simulink. The MPPC technique for the DC-DC bidirectional converter and grid-tied inverter is tested. Linear loads A and B are modeled as constant resistances, and loads C and D as constant power types. The MPPC scheme is compared with the conventional PI regulator scheme, using identical converter switching frequencies: 4.0 kHz for the inverter, 3.2 kHz for the DC-DC converter, and a sampling frequency of 24 kHz. "Positive current" refers to discharging from the battery, and "negative current" to charging. positive.

6. Result Analysis and Findings :

6.1 Under variable load

When P_{ref} and Q_{ref} are fixed at 0.9 MW and 0 M_{Var} , respectively, with temperature and irradiance of 25°C and 620W/m² respectively. The implemented MPPC scheme can handle variable load demand, yielding an output power of about 1.55 MW. The ac bus is initially connected to load C, which is an ac load of 0.55 MW. Then in 1 second, load A (0.55 MW load of dc type) is turned on. After that, load B, another dc type load of 1.2 MW is turned on at 2 seconds and turned off at 3 seconds.

Figure show the MPPC's performance under fluctuating load demand. MPPT keeps PV output steady at about 1.55 MW. At the PCC, actual real and reactive power flows match their references. The ESS absorbs excess energy, with PVs and the grid supplying load power. The ESS charging current decreases

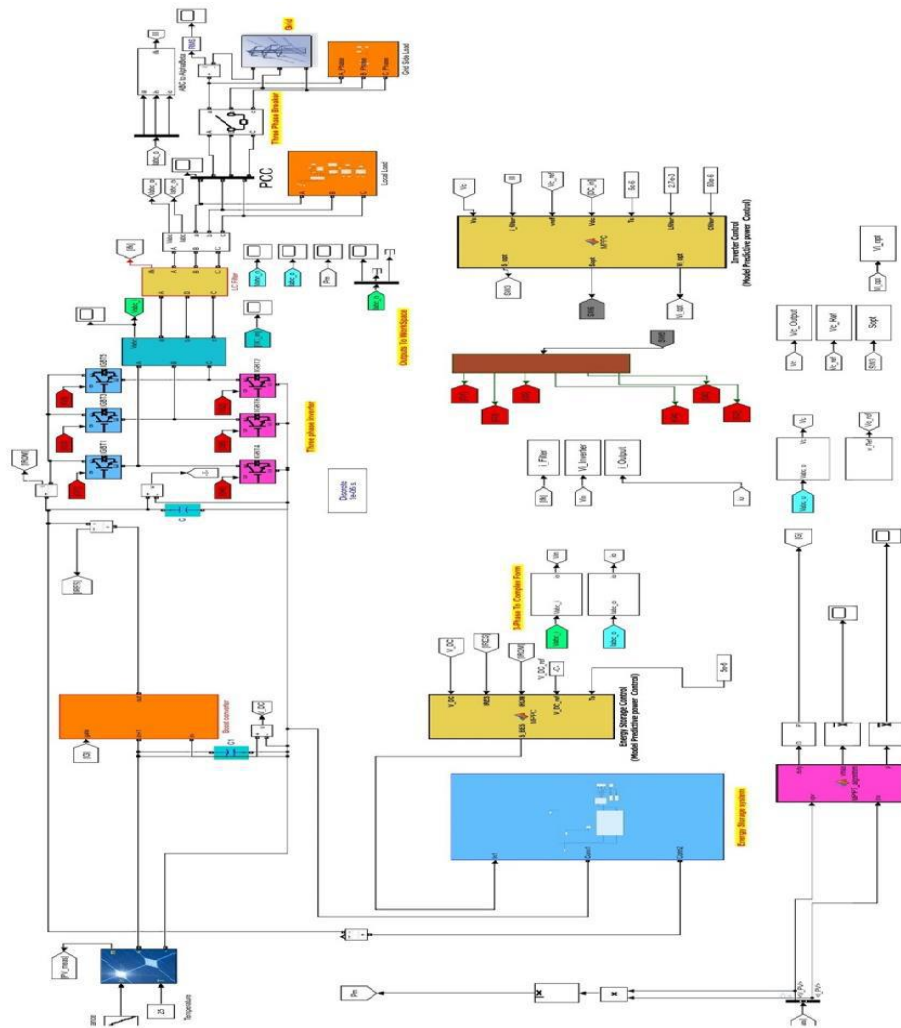


Figure 2 Overall model

as the load increases at 1.25 and 2.5 seconds. The SOC rises as long as the load demand is less than the power generated by the grid and PV. Constant power references control the inverter, ensuring uninterrupted current flow from the grid via the PCC. The DC bus voltage is maintained around the rated value.

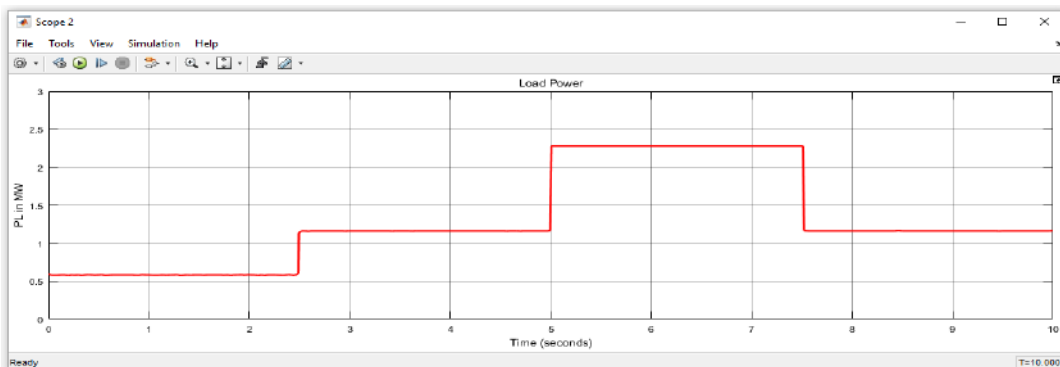


Figure 3: Load Power under variable load demand

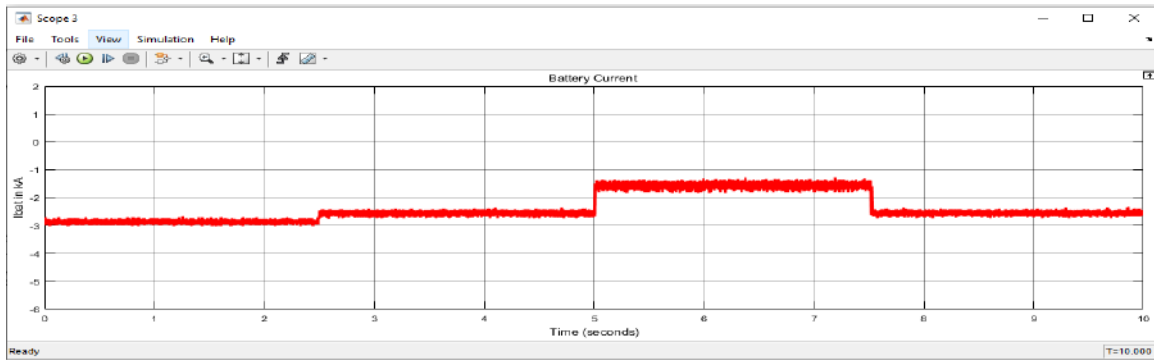


Figure 4: Battery Current under variable load demand

6.2 For fluctuating PV output

The MPPC scheme is tested under varying ambient conditions and extreme photovoltaic output scenarios $Q_{ref}=0$ $Q_{ref}=0$ $MVar$ and $P_{ref}=-0.6$ $P_{ref}=-0.6$ MW . Load variations include activating DC and AC loads sequentially, with the ESS absorbing excess PV power to stabilize the DC bus voltage and maintain ~ 0.55 MW at the PCC. Despite brief voltage surges, stability is maintained, showing the effectiveness of the MPPC strategy (Figure

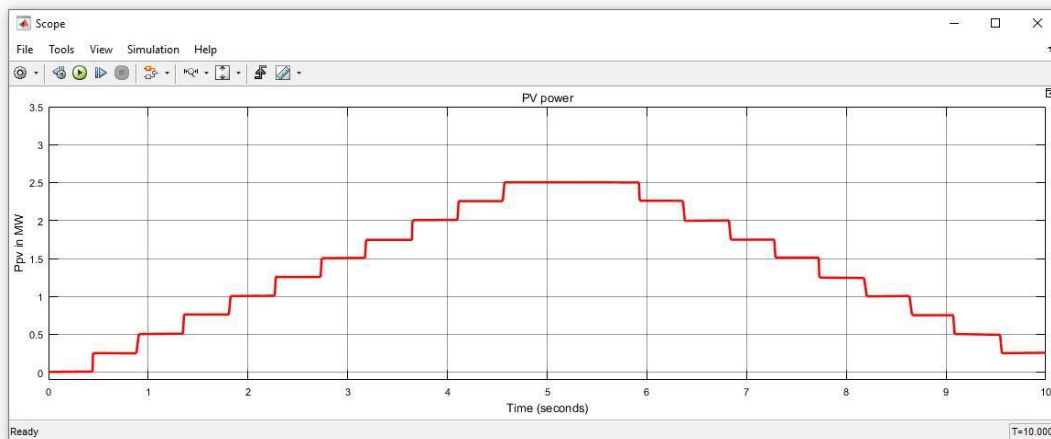


Figure 12: Fluctuating PV output

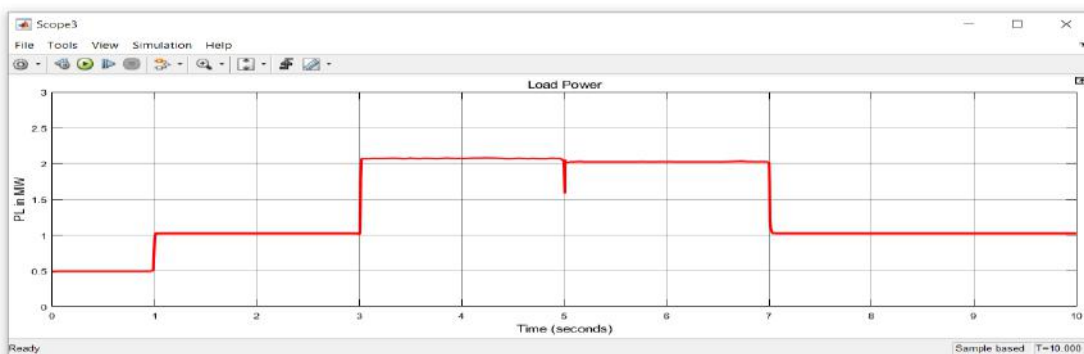


Figure 13: Load power with fluctuating PV output



6.3 For flexible regulation of power

The MPPC scheme's dynamic tracking of power references, maintaining a stable 1.55 MW output under consistent solar conditions (620 W/m^2 , 25°C). Initially, load C (0.6 MW AC) is connected to the AC bus. Power references vary: Q_{ref} is 0 MVar from 0 to 5 seconds, and P_{ref} fluctuates between 0.2 MW to 0.8 MW, stabilizing at 0.8 MW. Q_{ref} varies from -0.02 MVar to 0.3 MVar from 5 to 10 seconds. The system efficiently tracks these references, handling higher positive power flows than negative ones due to its load capacity exceeding generation capabilities.

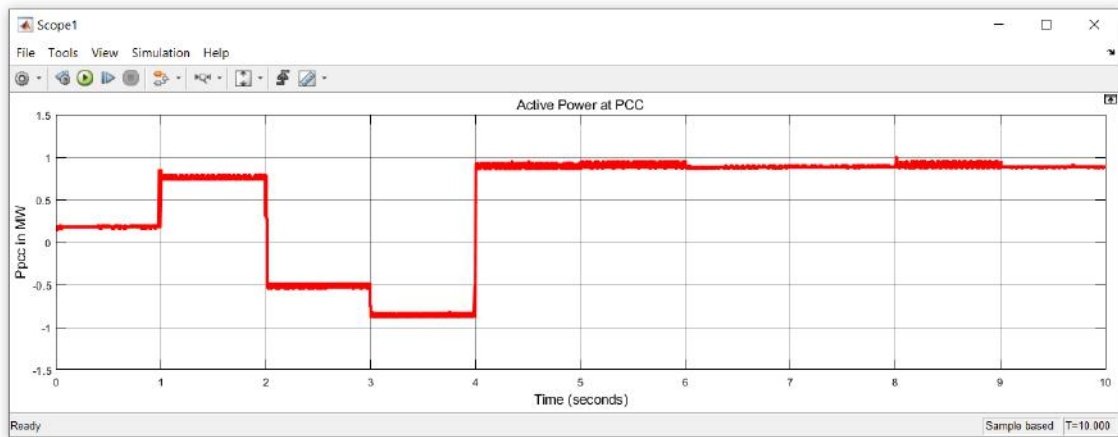


Figure 14: Regulated active power performance

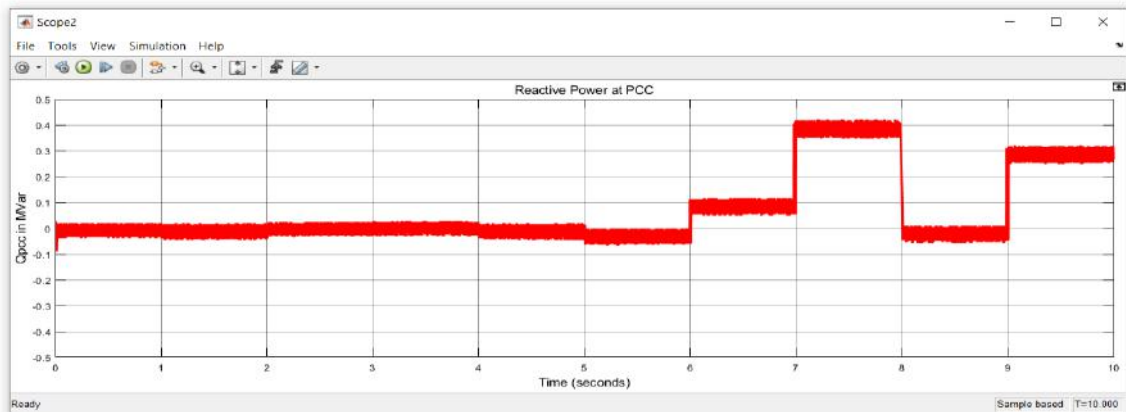


Figure 15: Regulated reactive power performance

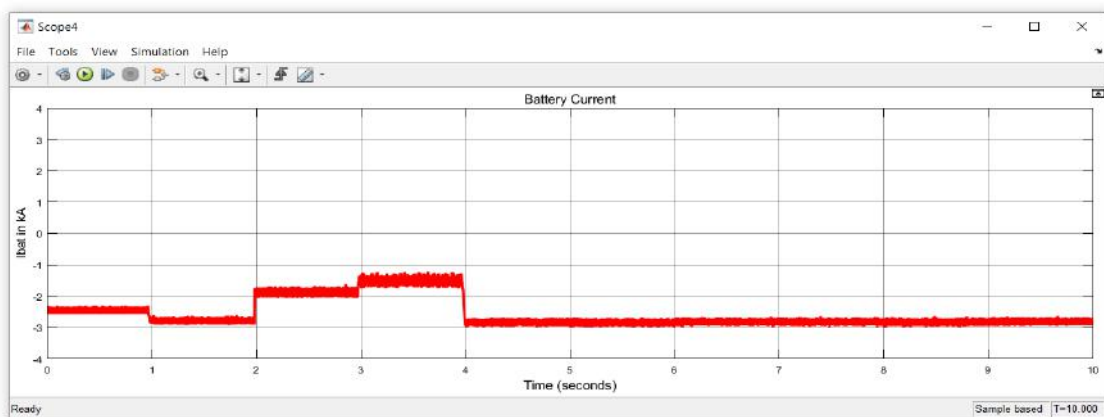


Figure 16: Performance of battery current for flexible power regulation

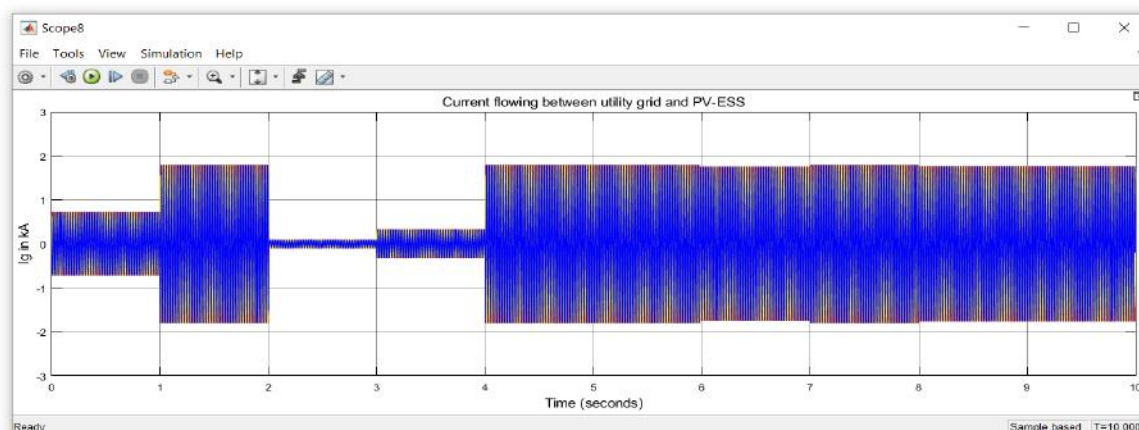


Figure 17: Current flow between system and grid for flexible power regulation

7. CONCLUSION :

This work covers the modeling and execution of an MPPC approach for the effective control and coordination of a microgrid. The MPPC approach for the dc-dc bidirectional converter seeks to achieve a regulated and stable voltage of the dc-bus when it is tied to the grid. Flexibly distributing the power is made possible by stable voltages of both uses i.e. dc and ac, even in the presence of false power tracking. The purpose of a voltage support approach is to reinstate the voltage level to desired value in case of fluctuations brought on by varying loads. The constant power references used to control the inverter allow the current to flow to the system from the utility grid via PCC without interruption.

Following outcomes were found from the result analysis of the undertaken work:

- The proposed MPPC scheme is designed to handle variable load demand, yielding an output power of about 1.55 MW. This approach has been implemented to maintain the PV output in a constant value.
- The ESS absorbs excess energy, while PVs and the main grid provide load power. The ESS's charging current decreases in proportion to the load increase.
- The voltage of the dc-bus is maintained around the rated value of 1 pu.
- The conventional MPC method yields a higher THD value of 2.82% in the AC side output current of the inverter compared to the MPPC approach of 2.24%.

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Exploring Feminine Archetypes in Temsula Ao's 'Aosenla's Story'

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Abstract: *Temsula Ao (1945-2022), a distinguished writer from Nagaland, portrays Ao-Naga identity, culture, tradition, violence, nature and condition of women in her writings. She exemplifies northeast Indian women as seekers of identity, lovers of nature and voices of change but certainly not as helpless. This study explores the feminine archetypes with reference to Temsula Ao's novel 'Aosenla's Story' (2017), which brings out the condition of women in the Northeast region through the protagonist Aosenla. The story revolves the life of Aosenla, a young woman from traditional Naga family and her journey towards self-discovery and independence. The character of Aosenla embodies archetypes such as the maiden, the nurturer, the wise woman and the warrior, each of which reflects the evolving roles and identities of women in Naga culture. Through the lens of feminist theory presented in "The Feminine Mystique" by Betty Friedan, the analysis reveals how Ao's portrayal of the protagonist and other female characters reflect complex, multifaceted roles that challenge and redefine gender norms in Naga society. The finding highlights the evolving roles and identities of women in Naga culture which symbolizing struggles and aspirations of women in Northeast India.*

Key Words: *northeast region - feminine archetypes - self-discovery and independence - voice of identity.*

1. INTRODUCTION:

The eight states of North-East India are Assam, Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Tripura and Sikkim. These North-East states are very distinct from other places of India in ethnic, linguistic and cultural aspects. In India, North-East region has many roots of civilization which get destroyed in this modern generation. Writers of these regions want to establish their identity through their writings. They believe that through their writings they can bring back their cultural values and project the same to the world. Each of these states in North-East region is linguistically and culturally diverse in nature. These regions have many roots of civilization which gets destruction in this modern generation. The vast socio-cultural diversity of the North-East region of India remains a largely unexplored area of academic research.

The people of Nagaland are entirely different from the other regions of India. They have different cultural aspects, ethnic identity, and distinct language. Nagas are one of the important and dominant ethnic groups of the state of Nagaland. Kukis and Kacharis are the other ethnic groups. There are sixteen major tribes of Nagaland. They are Angami, Ao, Chakhesang, Chang, Khiamniungam, Konyak, Kuki, Lotha, Phom, Pochury, Rengma, Sangtam, Sumi, Yimchungru, Zeliang and Kachari.

Northeast writers have focused nature, myth and violence in their writings. They showcase the natural beauty, tribal culture and insurgency of the North-East region. They also try to establish their identity of their region which they believe would preserve their natural circumstances, culture and traditions.



They also focus on violence, bloodshed, conflict and unrest of their region which shows their concerns towards their region. Along with that they write about nature and culture which are deeply rooted in their past.

Some of the women writers of North-East India are Mamang Dai (Arunachal Pradesh), Indira Goswami, Mitra Phukan, Arupa Patangia Kalita (Assam), Maharaj Kumari Binodini Devi, Binalakshmi Nepram, Irom Chanu Sharmila (Manipur), Arundhati Roy, Patricia Mary Mukhim (Meghalaya), Mona Zote (Mizoram), Easterine Eralu, Temsula Ao (Nagaland). Among them, Temsula Ao is identified as a pioneer woman writer who belongs to Ao-Naga community in North-East India.

Temsula Ao (1945-2022) was born in Jorhat, Assam and well known as one of the pioneering women writers from Northeast India. She was a former chairperson of Nagaland State Commission for Women during 2013 – 2016. She was a fictionist, poet and ethnographer, whose literary contributions have been instrumental in bringing the unique cultural and social dynamics of the Northeast Indian region. She was the first woman from Naga tribal community obtained Ph. D in the year 1983. She worked as a Professor of North Eastern Hill University, Shillong and served as a Director in North East Cultural Centre in Dimapur. She was awarded Padma Shri (2007), Governor's Gold Medal from Meghalaya (2009), Sahitya Akademi (2013) and Kusumagraj National Literature Award (2015) for her literary contribution.

In the landscape of literature, the portrayal of female characters has undergone a profound transformation, reflecting the evolving societal norms and values. Temsula Ao's 'Aosenla's Story' stands as a poignant narrative that delves into the complexities of womanhood, presenting a nuanced exploration of empowerment amidst cultural and social constraints. Through the lens of Ao's narrative, this study endeavors to unravel the layers of the "new feminine," shedding light on the themes of agency, resilience, and self-discovery.

2. Literature Review:

Temsula Ao tries to capture traditional way of Ao-Naga life through her writings. Thus, Valiyamattam says: Ao's women are all strong, independent and enterprising, and showcase the diligence, compassion and excellent teaching-learning skills of the Nag women who single-handedly run families and communities. Ao's sympathy for women find little support from family or community in their hard lives is truly admirable. Above all, it is only an accomplished artist like Ao who can delve deep into the psyche of the female artist, an oft sidlined aspect of mainstream Indian history. (Valiyamattam 73)

Waten, Susan in "Weaving a Literary Fabric" discusses the position of Naga women in their family and community and the patriarchal mindset and ideology that surrounds the men's behavior. (Waten, 2009) Zhang's article on "Reimagining Women: Gender and Identity in Temsula Ao's Fiction" (2028) delves into the portrayal of women in Temsula Ao's works, with a specific focus on "Aosenla's Story." The author argues that Ao's depiction of Aosenla challenges conventional gender norms and introduces new archetypes that reflect the evolving roles of women in Naga society. Through a close reading of the text, Zhang highlights the ways in which Aosenla embodies traits of modernity, rebellion, and self-assertion. Singh's analysis explores the tension between tradition and modernity in Temsula Ao's portrayal of female identity, focusing extensively on "Aosenla's Story." The article on "Negotiating Tradition and Modernity: Female Identity in Temsula Ao's Fiction" (2020) examines how Aosenla navigates societal expectations and asserts her autonomy in a patriarchal society. Singh argues that Aosenla represents a new archetype of the modern Naga woman who challenges traditional gender roles and seeks self-realization. Suresh Kohli reviews about Temsula Ao's works that Temsula Ao presents a graphic picture of the Naga society, it also sensitively dwells on the strength and weakness of Naga women's character, and her position in a society grappling with tradition and modernity, between the rural and the urban and the related changes in social behaviour patterns. (194). Chakraborty's research investigates the representation of feminism in contemporary Naga literature, with particular attention to Temsula Ao's works, including "Aosenla's Story." The article on "Voices of Change: Feminism in



Contemporary Naga Literature” (2019) analyzes how Ao's portrayal of female characters, including Aosenla, reflects feminist ideologies and challenges patriarchal structures. Chakraborty argues that Aosenla embodies the voice of change, advocating for gender equality and challenging traditional notions of womanhood.

3. Research Objectives / Aims:

Using feminist archetypes or personalities, the researcher aimed to identify the images of the women, particularly in the novel, “Aosenla’s Story”. Therefore, this study sought to present the female archetypes reflected by the novel’s women protagonist, the interaction of the archetypes in the story, and the implication of these relationships to the context of the story. Further the study aims to investigate how Aosenla’s actions and decisions challenge traditional gender norms.

4. Research Method / Methodology:

The method adopted is Textual Analysis.

The methodology employed in the study is an analysis of Temsula Ao’s text Aosenla’s Story based on the theoretical framework of Betty Friedan’s stance on the “Feminine Mystique” in relation to women.

5. Research Questions:

- How have traditional roles confined women’s identities and societal expectations in Naga Culture?
- How does Aosenla’s journey reflect the feminine archetypes?
- How do traditional artifacts, domestic settings and natural elements reflect the character’s inner struggles and triumphs?

6. Discussion:

Feminine archetypes are universally recognised symbols and themes that represent various aspects of the female experience across cultures and history. By identifying with one or more of these archetypes, women can gain insights into their behaviour, motivations, and desires. In Temsula Ao's "Aosenla's Story," several feminine archetypes are portrayed, reflecting different facets of women's roles and identities within Naga society.

Aosenla as the Dutiful Daughter/Wife:

Aosenla herself embodies the archetype of the dutiful daughter and wife. She is expected to conform to the traditional roles prescribed by her family and society, including obedience, submission, and dedication to household duties. Her internal struggle with these expectations highlights the tension between individual desires and societal norms. As evidenced in the novel, "Aosenla had always known that her duty was to her family, to serve them with unquestioning obedience." (*Page 24*)

In Naga village women were traditionally relegated to domestic chores and child-rearing. However, Aosenla, the protagonist of the story, challenges this norm by pursuing her education and working outside the home. Aosenla's determination to break away from the traditional role of women is evident when she tells her father, "I do not want to get married. I want to study." This declaration is significant because it shows that Aosenla is not content with the traditional role assigned to women in her society. Aosenla is a strong, independent woman who is unafraid to speak her mind and pursue her dreams. She defies societal expectations by rejecting the traditional roles assigned to women in her community and pursuing a career as a teacher.



Aosenla as the Nurturer:

Another significant archetype is that of the nurturer, typically represented by mothers or elder women who take care of their families. This role is central in Naga society, where women are often seen as the backbone of the family, responsible for maintaining the home and caring for children. Aosenla's responsibilities and her expected role in nurturing her family reflect this archetype. Thus, Temsula quoted about Aosenla as "She knew that her place was in the home, caring for her husband and children, ensuring their well-being above all else." (*Page 37*)

The protagonist Aosenla is one such woman who sticks to legal and conventional relationship in her marital life. The ambience and the society in which Aosenla lives prioritizes male children in getting due care and respect from their parents. The patriarchal set up that pervades in the village made Aosenla subside her wishes. Her independence is curbed by her own father and her grandmother who have such a grand narrative imbibed in his mind like people from ages hence that girls' duty is to stay inside home as a dutiful daughter, wife and then mother. The submissive and ignorant Aosenla has taken a new form after the birth of her two girl children. The intimidation of her husband and mother-in-law considering her to be a feeble girl who comes from a middle class background.

Aosenla as the Rebel:

Aosenla's internal conflict and her moments of resistance against societal expectations also position her as a rebel. This archetype represents women who challenge traditional roles and seek to forge their own paths. Aosenla's struggle to assert her identity and autonomy amidst societal pressures showcases this rebellious spirit. Thus, quoted in the novel, "There were times when Aosenla felt a stirring of rebellion within her, a desire to break free from the chains of tradition that bound her." (*Page 58*)

Aosenla's assertiveness and willingness to confront societal norms mark her as a rebel. She questions and defies the patriarchal structures that seek to limit her potential. This rebellious spirit is evident in her interactions with her family and community.

Aosenla as the Sage/Elder:

Aosenla refuses to conform to the traditional roles assigned to women in her community. She challenges the patriarchal norms that limit women's opportunities and asserts her right to pursue her own dreams and ambitions. Here, Temsula Ao represents Aosenla serves as a voice of change, advocating for greater recognition of women's rights and roles within her community. Her character represents the emerging consciousness among Naga women who are increasingly demanding equality and respect. Through Aosenla, Ao highlights the transformative potential of women who dare to envision and work towards a more equitable society. Accordingly, the elder women in the community, who often provide wisdom and guidance, represent the sage archetype. These figures hold considerable influence and help enforce cultural norms and traditions. They also serve as a source of traditional knowledge and societal expectations for younger women like Aosenla. Temsula Ao quoted in her novel as "The elder women, with their years of wisdom, were always quick to remind the younger ones of their place and duties." (*Page 12*).

Aosenla as the Victim:

The victim archetype can be seen in Aosenla's experiences of oppression and lack of agency. Her life is shaped by the decisions and expectations of others, and her suffering and dissatisfaction reflect the broader plight of women who are victimized by patriarchal structures and societal norms. Thus, Temsula represented Aosenla, "In her quiet moments, Aosenla couldn't help but feel like a prisoner in her own home, trapped by the expectations of those around her." (*Page 46*)



Aosenla as the Caregiver:

Beyond nurturing, the caregiver archetype extends to women who provide emotional and practical support to their families and communities. Aosenla's role often involves self-sacrifice and dedication to the well-being of others, showcasing the caregiver's qualities. Hence, it is represented in the novel as, "Her life revolved around ensuring that everyone else was taken care of, even if it meant neglecting her own needs and desires." (Page 53).

Aosenla as the Seeker:

Aosenla's journey to find her own identity and autonomy represents the seeker archetype. This archetype is characterized by the quest for self-discovery, personal growth, and a deeper understanding of one's purpose and desires. Hence, it is proved that, "Aosenla yearned for something more, a purpose that went beyond the roles she was expected to play. She sought an identity that was truly her own." (Page 71).

Therefore, Aosenla's story is one of transformation, where she moves through different stages of womanhood, embodying various feminine archetypes at different points in her life. Her transition from innocence to a nurturing role, and eventually to a wise and resilient figure, showcases her growth and adaptation.

7. Analysis:

Aosenla, the protagonist, faces societal pressure to conform to traditional roles, including marriage and domestic duties. Aosenla grapples with her sense of identity and her desire for autonomy in a society that imposes rigid expectations on women. The story explores her internal conflict and the societal constraints that limit her opportunities for self-actualization.

In Temsula Ao's "Aosenla's Story," the protagonist Aosenla grapples with societal expectations similar to those faced by women in Betty Friedan's "The Feminine Mystique." Both works critique the restrictive gender roles imposed on women, leading to feelings of dissatisfaction and unfulfillment. Aosenla, like the suburban housewives Friedan describes, is confined by traditional expectations that dictate her primary role as a dutiful wife and mother in Naga society. This confinement mirrors the "problem that has no name" Friedan identifies, where women experience an internal conflict between societal roles and personal desires. Both Aosenla's story and Friedan's analysis highlight the psychological toll of these limitations, emphasizing the need for personal autonomy and the pursuit of individual identity. By challenging these restrictive norms, both works advocate for societal change to allow women to achieve true self-actualization and fulfillment.

To recover their lost sense of identity, Friedan insists that women must work. This does not mean that women should simply work to support their families, for that would be another way of remaining in "the trap." Instead, they must find work that fulfills them. She also insists that paid work is best, for it communicates to women that they have value. Friedan explains that many housewives, desperate for some sense of identity, try to find it in sex, which leads to mismatched sexual drives and tension in their marriages. Friedan's book discusses the dissatisfaction of many American housewives in the 1950s and 1960s who felt unfulfilled by their roles confined to domesticity. It challenges the notion that women should find complete fulfillment through homemaking, child-rearing, and supporting their husbands. Friedan argues that women need to pursue their own identities and careers to achieve personal fulfillment. Friedan's book "The Feminine Mystique" and Ao's story both highlight women's search for fulfillment beyond traditional roles. They showcase the desire for personal growth, independence, and the ability to define one's own life path. Both works encourage questioning and challenging societal



norms that restrict women's freedoms and opportunities. They advocate for women's rights to pursue education, careers, and personal interests.

8. Conclusion:

As a Naga woman, Temsula Ao rebuilds the role of women in Ao-Naga society through her writings. Naga women need the society which recognises their own individuality and potentiality. Those women who are portrayed by Temsula Ao in her works, have the tendencies to protect nature, encompass with individuality, brave enough to fight for their liberation and have intelligence to safeguard their men and village.

Temsula Ao's writings explored in the aspects of ecological themes and environmental consciousness, socio-political issues within Naga society, Exploration of gender dynamics and the role of women in Naga society. Further, her works can be analysed in the areas of Colonial and Postcolonial Identity, Subaltern Voice, Environmental and Ecological Perspectives and Translation and Reception.

In the conclusion of "Aosenla's Story," Aosenla, who has suffered greatly due to the socio-political turmoil and personal losses, finds a form of resolution and inner peace. After the death of her husband and the subsequent loss of her child, Aosenla retreats into a quiet life. The story ends on a note of introspection, as Aosenla reflects on her experiences and the resilience she has developed. The conclusion emphasizes her strength and ability to find solace despite the harsh realities of her life. The narrative highlights themes of survival, resilience, and the quest for peace in the midst of conflict. The finding highlights the evolving roles and identities of women in Naga culture which symbolizing struggles and aspirations of women in Northeast India.

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Feminist concern in Arundhati Roy's God of Small Things

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Abstract: *The question of feminine identity is a live issue for women novelists and strikes a sympathetic chord in their hearts. Arundhati Roy exploits the creative extendibility of linguistic code, using unorthodox spellings to suggest a character's accent. For Such purposes, She also makes use of graphological devices of spelling, punctuation and capitalization as well as lexical repetitions of various kinds. She resorts to intra associative meanings of simile and metaphor mingling tactile, auditory and kinesthetic vocabulary. Arundhati Roy discusses issues like homeless and hungry, alcoholism, violence, untouchability, urbanization cultural decadence, marginalization of women, religious institution family relation, influences of Gulf money and sexuality. The vote-bank politics is very active in the contemporary society which she tries to portray.*

Keywords:- *Feminism, responsibilities, identity, society, traditions, uniqueness.*

A common definition of feminism is the fight against all types of sexist patriarchal oppression. It now refers to a movement that upholds the idea that women ought to have the same opportunities and rights as males in the legal, political, social and economic spheres. The book Half The Sky makes mention to it, saying that

By feminism we mean, both the awareness " of women's position in society as one of the disadvantage or inequality compared with that of men, and also a desire to remove those disadvantages".(The Bristol Woman's Studies Group, 1979, p.39)

Feminists work to uncover and eliminate the underlying factors that contribute to women's oppression. They work to alter the social environment so that women are recognised as men's equals in all aspects and are given equal rights, opportunities, and responsibilities throughout the course of human society's progress. Some limit their demands to equal treatment in terms of employment and education ,emphasising financial independence. Some feminists, on the other hand, advocate for a total transformation of society in order to eradicate the deeply ingrained, tradition- bound notions of man's moral superiority over woman. Their goal is to remove gender discrimination in all of its forms, which still exists today. Early feminists envisioned an all feminine society in which males would only play supporting roles. Though it aims to topple the patriarchal structure, modern feminist theory does not oppose sexual dualism. Though it need not be anti-man, feminism is inherently Pro-woman. P. Ramamoorthi succinctly states,

" The attempt to create female enclaves are extremist reactions but the recent trends in feminist literature are an inclination that it is possible for a woman to live in the world where men also live ".(P. Ramamoorthi, Vol.1, p.38)

Simone de Beauvoir's classic observation that a woman, ".... is defined and differentiated with reference to man and not he with her..." ,(Simone de Beauvoir, 1974, p.19) is true of the Indian women despite



different laws and constitutional safeguards pronounced in her favour. She Still continues to be defined with respect to man and to be regarded as subordinate to him. She is still defined in relation to man and is still thought of as his inferior. Nonetheless, the woman's perspective as a unique person has changed somewhat. It is in this context that Indian women writers like Anita Desai, Shashi Deshpande, Kamala Markandaya, to name only a few, depict the anxiety of the educated, independent, middle-class Indian woman searching for a balance between her traditional role as daughter, wife and mother in a predominantly patriarchal society and her new-found sense of self longing freedom and private space.

The Indian quest for feminine identity is primarily a post-independence societal phenomena shaped by the reality-freedom movement, progressive education, social reforms, growing ties to the west and urbanisation. As a result, the issue of female identity has emerged as a genuine, pressing human issue in our culture. The conventional roles of Indian women are beginning to fracture due to a variety of pressures and reasons, and the feminine awareness in India is gradually increasing inside them. The evidence of feminine awakening may be seen in the tensions and conflicts that have permeated the rigid roles traditionally given to women. Since Indian women have historically been limited to their responsibilities at home, these tensions and conflicts have also resulted in the growing positions of women in society, such as that of the social worker, working woman, freedom Warrior and so forth. The inclination to uncover the identities of female characters in a society where males still set social rules is a natural aspects of feminine sensibility, expressed in creative writing and influenced by societal factors. As a result, a common topic among many female authors is the investigation of the female identity and her journey towards self-awareness.

Throughout history, women's status in the male-dominated, tradition -bound Indian culture has been appalling. Women were confined to the four walls of the home and treated like nothing more than Puppets. The freedom that males had in many domains of endeavour was seen a masculine Prerogative, depriving women of the same freedom. Because of their wisdom and vision, the British monarchs planted the seeds of freedom by supporting and encouraging women's education. Reformers and leaders such as Mahatma Gandhi, Raja Ram Mohan Roy, Bal Gangadhar Tilak, and many more really contributed to the advancement of women. Women's status in Indian society remained ambiguous in practically every economic, social and cultural sphere even after independence. In the very norm-bound environment they lived in the great majority of women had to deal with a life of humiliation in the form of gender-bias while carrying out their obligations as wives and mothers. The startling reality is that even women with liberal, modern education and an unquenchable desire to rebel against the oppressive social norms that confine women to a subservient role to men frequently find themselves in awkward situations for a variety of reasons. There are many examples of working women with strong economic potential who are unable to avoid the traps set by the traditions-bound Indian society's conventions and beliefs.

Women started to speak out against the injustices, they were subjected to gradually, and this eventually gave rise to the women's Liberation Movement in the early 1970's. Initially, wealthy urban women were lured into the feminist movement, mostly because of their responsibility to expose the various female social groups to the unfair and degrading treatment they endured in this traditionally "male-dominated environment." As time went on and more and more feminists joined the ranks of the movement, Kali for Women- a feminist publishing firm that publishes books written by women-was founded. Women's issues are the main emphasis of the feminist Publication Manushi. In addition to this media campaign, a number of organisations are engaging with women in rural regions to raise awareness of the long-standing issue of sexism in our culture.

As a result of women's persistent assertion of their uniqueness and their range against the demanding customs that men have forced on them throughout history, their status in society is gradually but surely improving. Although more and more women are participating in global affairs, it is still a world run by males. In terms of full equality, they are still a long way from achieving their objective of joining men in their place. A class of male-female identity will always exist as long as gender discrimination persists.



And as long as this conflict continues, our society will be plagued by terrible outcomes like marriages disintegrating and, worse yet, women resorting to suicide. Women's self-respect is negatively impacted by this issue, which remains unsolvable despite decades of reformer, legislative, and other efforts.

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The Spirit of Feminism and Its Benchmark

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Abstract: *This paper tries to analyze the origin and progress of global feminism. Feminism is a mass movement commenced by women of all groups to eradicate all forms of feminist oppressions by men that are prevailing in a patriarchal society. It always fights against all types of oppressions on women. It is a procedure that takes attempts to understand and conceptualize gender roles and advocates for the annexation of women's interests in social organization. It tries to explain the phenomenon of gender inequality. It is considered as a politics to achieve gender equality in all spheres of the society. Feminists support of ensuring equal individual rights and liberties for women and men. This study takes attempts to discuss a comprehensive understanding of feminism, and the different variants of feminism. This paper also tries to highlight the major challenges that the feminists are facing and the future goals of the feminist movement should be.*

Keywords: *Feminism, female movement, patriarchy, exploitation, gender liberation.*

1. INTRODUCTION :

About half of the global human population is women. In every step, all over the world; women face inequality, subordination, and secondary class status. Often they are victim of the oppression, marginalization and exploitation in the patriarchal societies. Before the First Industrial Revolution (IR), the human life was not men dominated, and both men and women contribute equally in the society. The IR began in England in about 1750-1760 that lasted to sometime between 1820 and 1840. The IR dramatically changed the global social order and consequently, a new gender system started worldwide that disadvantaged women (Mohajan, 2019). During this period men started to work in the industries and women were restricted to the domestic sphere. As a result, they remain vulnerable socially, politically, and economically. The industrialization also developed a new class system; aristocratic class (Anderson & Zinsser, 2000). In the 21st century there is no straightforward definition of feminism. At present, there are as many definitions of feminism as there are feminists depending on their own beliefs, history and culture, but gender equality is common to all. Feminism is a women basis socio-political movement and ideology, and supports the idea "women should share equality in society"s opportunities and scarce resources" (Delaney, 2005). Oxford Dictionary defines feminism as "the belief and aim that women should have the same rights and opportunities as men; the struggle to achieve this aim". The feminism is characterized by "the activism for the purpose of challenging and changing women"s subordination to men" (Ferree, 2006).

Feminism is an ideology that demands an equal right of men and women in terms of politics, decision making, career, and having children. It consists of a number of social, cultural and political movements that take attempts for equal rights of men and women (Asnani, 2020). It is considered as a struggle to achieve same rights, opportunities and dignity as men have in the society (Raj & Davidson, 2014). It has raised much in the western upper-class society and the women have fought for women"s suffrage and reproductive rights (Agger, 1998). The rise of feminism in Europe occurred as "women of all classes became increasingly aware of the way in which their sex influenced their life chances and experiences" (Fuchs & Thompson, 2005). It endeavors to see an end to the dominance of men over women, and to provide equal rights between women and men in all fields ranging from household issues



to politics (Kuleli, 2019). Different disciplines, such as sociology, philosophy, economics, and politics, served as distinctive intellectual backgrounds of feminism (Herouach, 2019).

Feminism explains and suggests directions for the change in social and environmental factors; tries to highlight the propose interventions for women"s intrapersonal and interpersonal concerns, and provides a perspective for evaluating social and environmental experiences of groups and individuals, regardless of sex or gender. It has changed the lives of millions of women (Anderson, 2016).

2. Literature Review :

Nyoman Kutha Ratna has realized that feminism is a tool for women to fight for their rights, which is closely related to racial conflicts between weaker groups and stronger groups (Ratna, 2004). Shruti Jain has observed that digital revolution has paved the way for a new iteration of feminism. She has believed that the digital space can become a breeding ground for sexism and misogyny. She also highlights the strengths and deficits of contemporary cyber feminism through postcolonial and postmodern feminist theories (Jain, 2020).

Rowland Chukwuemeka Amaefula has discussed the aspects of African Feminisms to enhance the conditions of African women (Amaefula, 2021). Sofian Herouach has investigated students" attitudes towards the social status of Moroccan women. He has realized that feminism, female activism, and international human rights may influence the cause of women"s liberation. But, some factors, such as religion, patriarchy (an idea about sex differences that institutionalizes male dominance throughout a society), and marriage legislation could stand against the cause of female freedom (Herouach, 2019).

Alison Jagger has defined four theories of feminism; liberal feminism, Marxist feminism, socialist feminism, and radical feminism more clearly for the first time (Jagger, 1983). Bimer Eyayu Enyew and Alemeneh Getaneh Mihrete have analyzed the appropriateness and applicability of liberal feminist theory and strategies that attempt to achieve gender equality and to reduce women oppression and subordination (Enyew & Mihrete, 2018). Ananya Bhardwaj has dealt with the importance of Marxist Feminism in the 21st century. She has also highlighted the struggles of the working class and their revolution within the feminist framework (Bhardwaj, 2021). Silvia Federici focuses on aspects of feminism and gender in Marx"s theory. She has discussed the significance and the importance of Marxism on contemporary feminist theory and feminist movements (Federici, 2018).

Bina Agarwal has given some basic ideas within ecofeminism; i) domination and exploitation of nature has a connection, ii) in patriarchal thought women are closer to nature, but men are closer to culture, iii) the domination and oppression of nature and of women have occurred simultaneously, and iv) the feminist movement and the environment movement collaboration can create a more equitable and just society (Agarwal, 2007). Haradhan Kumar Mohajan has discussed the four waves of feminism, where he stresses that sexism, sexual exploitation, everyday sexism, and sexual discrimination need to be ended off. He believes that feminism challenges various reproductive rights, abortion rights, educational rights, domestic violence, maternity leave, salary equality, voting rights, representation, sexual harassment, gender discrimination, and sexual violence (Mohajan, 2022).

3. Methodology of the Study :

Research methodology is the procedure to perform a research in a systematic and process oriented way that provides a guideline to the researchers to investigate a problem (Abbasi, 2015). In this study, variants of feminism, such as liberal feminism, Marxist feminism, socialist feminism, radical feminism, ecofeminism, cultural feminism, black feminism, and postmodern feminism are discussed in briefly. Reliability and validity are the parts and parcel of a good research, and in this study we have tried following these as far as possible (Mohajan, 2017).

Throughout the study, we have tried to maintain ethical principles properly. This study is a qualitative research method that tries to analyze feminist research (Mohajan, 2018, 2020). To prepare this study we have used the secondary data sources that are related to feminism. We have consulted the



published journal articles, books and handbooks of renowned authors, websites, etc. to complete the paper.

4. Objective of the Study :

The key objective of this paper is to discuss about the feminism and its variants. Feminism is used to describe the political, economy and social equality of the sexes. The other specific objectives of this article are as follows:

- to investigate the categories of feminism,
- to eliminate the women oppression from all nations, and
- to establish gender equality in the society.

5. Feminism :

There is no fixed definition of feminism and it has a variety of meanings and interpretations. Feminists of different fields of life define feminism according to their own social, political, religious, and cultural perspectives. According to Cambridge Dictionaries, feminism can be seen as “the belief that women should be allowed the same rights, power, and opportunities as men and be treated in the same way, or the set of activities intended to achieve this state”. According to the Encyclopedia Britannica, “feminism is the belief in the social, economic, and political equality of the sexes”. It consists of a number of social, cultural and political movements, theories and moral philosophies concerned with gender inequalities and equal rights for women. It is against the abuse of power, and seeks equality and justice under different domains, such as economy, class, caste, race, culture, religion, etc. (Hundleby, 2012).

Therefore, feminism is a diverse, rival and often opposing collection of social theories, political movements, and moral philosophies. It mainly looks social, political, and economic inequalities of women (Adawo et al., 2011). It tries to describe women oppression; searches strategies, causes, and consequences to remove discrepancies from the society. It takes attempts to achieve the objective of equality, dignity, rights, emancipation and empowerment of women (Tong, 2009). Therefore, it is the struggle against sexism, where male supremacy and female oppression are happened. Actually, sexism is not a modern phenomenon and is a form of social oppression (Gimenez, 1975).

Women all over the world are seen lacking access to opportunities, knowledge, skill and even some basic human rights. In every nation women are victim of oppression, suppression; and consequently, they are highly marginalized. From the ancient period human took attempts for establishing gender equality in the ancient society by reducing the discrimination (Freedman, 2002). Plato (427-347 BC), a Greek philosopher, revealed that women possess “natural capacities” equal to men (Scott, 1996). Some scholars believe that the word “feminism” comes from the word “femme” that means woman (Collins Dictionary, 2010). Actually it is originated from the French word “féminisme” and its derivatives are still obscure. Charles Fourier (1772-1837), a French philosopher and utopian socialist, is credited for the coining of this word in 1837. It is a socio-political movement, first occurrences in France centers in 1880s as an activity under forms of demonstrations (Herouach, 2019). Later, the activity is moved to the USA in 1910 (Hilversum, 1994). Feminism began as a political thought when Olympic de Gouges (1748-1793) wrote the “declaration of the rights of women and the female citizen”, in 1791, which demanded equal rights for women based on “The Rights of Man and Citizen” that is published during the French Revolution (Mousset, 2007). Similar thinking has risen in the USA in 1848, in England in 1878, in Russia in 1848, and in China in 1911 (Raj & Davidson, 2014).

Feminist is a person who believes in the social, political, and economic equality of the sexes. The feminist aims to terminate all forms of male domination. Feminist research focuses on gender and tries to establish gender equality in the world (Kaur & Nagaich, 2019). The conservative feminist Genevan philosopher, writer, and composer; Jean-Jacques Rousseau (1712-1778), had argued that men and women are by nature not merely different in kind but different in “natural rank”. She wrote that women are biologically fit to play the roles of wives and mothers, and unable for work in the public



sphere. She revealed that women being weaker physically, intellectually, and emotionally. She tried to establish sexual dimorphism on the logic that men are more rational, and women are more emotional and passionate, and set up complementary roles for men and women (Rousseau, 1754). She and some other social contractualists have not considered women as rational human beings. Although they have conservative beliefs about feminism, and do not think about the gender equality; later English philosopher and physician John Locke (1632-1704), known as the “Father of Liberalism”, had argued that the sexes should receive the same education, share equal rights, and responsibilities (Hirschmann, 2009). Betty Friedan, the first president of the National Organization for Women had published “The Feminine Mystique” in 1963. Although women have the right to vote and hold property, but they spend too much time for polishing and organizing homes that experience boredom and anxiety. She has realized that they need to go outside of the domestic area by entering into public life as a paid employment. She has argued that equality and human dignity are not possible for women if they are not able to earn. Consequently, employment opportunities for women need to be widened, and many discriminatory laws must be abandoned (Friedan, 1963).

Feminism is an umbrella term for a number of cultural phenomena. It tries to acquire freedom for women to work, and make independent economically, and psychologically (Malinowska, 2020). It indicates institutional and grassroots activities to abolish gender-based inequalities from the society. It hopes to discover the hidden reality of male domination, and women subordination and subjugation in the world, and aims to give equal rights to women economically, politically, and socially (Brunell & Burkett, 2019). It supports a broader struggle of freedom for women to make their own decisions related to their bodies, financial independence, freedom to choose their lives and sexual choices, and liberation from all types of oppression (Omvedt, 1990; Learner, 1994).

In the society, women oppression and subordination are different; consequently, different feminist groups have emerged in different times. But the main goal of every group is to achieve gender equality (Tong, 2009). Feminism can be manifested into seven categories as; i) liberal feminism, ii) Marxist feminism iii) socialist feminism, iv) radical feminism, v) ecofeminism, vi) cultural feminism, vii) black feminism, and viii) postmodern feminism (Jaggar, 1983). Each ideology tries to describe women's oppression, explains the causes and consequences, and suggested strategies for women liberation. Feminists support a gender-based view of the state, which is based on the creation of a gender-neutral society (Brunell & Burkett, 2019). On the other hand, they are against the flawed, vague, and illogical procedures of thinking and writing about women (Papa, 2017). Most feminist categories suggest for the elimination of misperceptions, sexual inequalities, restrictions, and oppression faced by women (Bryson, 2007). Feminism seeks to appreciate the ways in which women are oppressed: socially, economically, politically and psychologically to reduce their various oppressions (Bressler, 2007).

Liberal Feminism—Liberalism is a political and economic principle that stresses individual independence, equality of opportunity, and the protection of individual rights. It supports rule of law, civil and human rights, secularism, democracy, freedom of speech, press, religion, and property. It encourages the development of freedoms, particularly in the political and economic spheres (Alterman, 2008). It is a “feminist theory that believes gender inequality is created by lowering access for women and girls to civil rights and allocation of social resources such as education and employment” (Giddens, 2001).

Marxist Feminism—Marxism is a political philosophy, led by left-wing people; inspired and founded by the two great German philosophers, Karl Marx (1818-1883) and Friedrich Engels (1820-1895), and is generally referred to as the economic theory of history. It is a political doctrine that deals in releasing the chains of oppression is applied by the elite class using frames like law, religion, race, and sources of production. Capitalism has created two major social classes: i) bourgeoisie, which is the owner of the means of social production (i.e., owners of capitalist companies), and ii) proletariat, which is the employer of wage-labor (sell labor force in exchange for a wage) having no means of production of their own, subjugated in all affairs of socioeconomic life. The bourgeoisie makes profits from the exploitation (i.e., paying low) to the proletariat (Marx, 1867; Abbasi, 2015).



Socialist Feminism—Socialist feminism is a vibrant intellectual and political current that has come and gone. It has arisen to produce a creative synthesis of debates in the late 1960s about the roots of the oppression of women. It is inspired by Marxism, and is developed for the reaction to liberal feminism, but it does not lead to the abolition of patriarchy in social relations. Marxism is stuck with the complexity of class analysis which socialist feminists consider as gender blind. Socialist feminism is gained popularity in the 1960s and 1970s. It has gradually faded from the 1980s and has abolished after the collapse of communism in the early 1990s (Holmes, 2007; Fraser, 2009).

Radical Feminism—Radical (means root) feminism is a movement founded in the 1960s by the women who had participated in the civil rights and anti-war campaigns, primarily in New York and Boston, then spread to the rest of the USA and Europe; on the basis of the idea that patriarchy is the main cause of discrimination and oppression of women (Millet, 1970; Vukoicic, 2017). It views that patriarchy and sexism are the most fundamental factors in the discrimination and oppression of women and ignore all others forms, such as race, color, age, religion, ethnicity, culture, geographical location, disability, caste, and economic and social classes; patriarchy is based in psychological and biological factors, which is rooted in the society (Nachescu, 2009).

Ecofeminism—Oppression of women and domination of nature are connected and mutually strengthening. In the late 20th century, ecofeminism is emerged with the supports of the fight for women empowerment and sustainable environment. Ecofeminism defines as “the feminist position most explicitly concerned with environmental degradation” (Braidotti et al., 1994). It is much more spiritual than political or theoretical in nature. It contains two major components; ecology and feminine. It believes that women realize and love nature instinctually, and oppose oppression of women and aggression against nature under patriarchy (Zhang, 2021). Ecofeminists Alice Walker, Vandana Shiva, Ivone Gebara, and others deal with the moral basis of human connection to nature (Warren, 1990). There are many movements in the world that are related to ecofeminism, for example, Chipko movement in India, Anti-Militarist movement in Europe and the USA, Green Belt movement in Kenya (Quinby, 1990).

Cultural Feminism—Cultural feminism mainly describes about “female nature or female essence” that attempts to revalue and redefine attributes ascribed to the feminine character. This female essence includes a greater emphasis on cooperation, relationships, and peace; also referred to as an ethic of care. The cultural feminism tries to find differences between men and women, based on biological differences in reproductive capacity. It seeks to validate feminine attributes that have been systematically undervalued within a patriarchal society. It also highlights the conflict between women and men, but reflects the variation of culturally created rather than biologically innate (Lewis, 2021; Ghodsee, 2004).

Black Feminism—Black feminism has emerged in the 1970s to produce social thought for opposing oppression (Collins, 2008). It is an intellectual, artistic, philosophical, and activist practice grounded in black women's lived experiences. It is a political struggle to combat oppression faced by any women of color. It provides the idea that “black women are inherently valuable, that [black women's] liberation is a necessity not as an adjunct to somebody else's but because our need as human persons for autonomy” (Combahee River Collective, 1978). It has many terminologies, such as Black Canadian feminism, African-American feminism, African feminism, etc. (Wane, 2004). Black feminism is formed to empower Black women towards fighting for their unique cause for social justice. In 1989, scholar Kimberlé Crenshaw (1959-) coined the term “Black Feminism” in her doctoral thesis, where she argues that a Black woman have to deal with the concept of the “double bind” which refers to being Black and being a woman (Crenshaw, 1989).

Postmodern Feminism—Recently the impact of postmodern thinking on feminist theory and politics has created substantial debate. After the development of “The Women Liberation Movement and Black Liberation Movement”, worldwide divorce rate has increased alarmingly; consequently, increases the miseries of the children of the divorced families, and also STDs and HIV/AIDS have spread globally. In this stage, feminists face the new dilemma, and begin to rethink male and female



relations. They have allowed the feminist movement to protect social rights and interests of women, and side by side they have questioned those feminists who are trying to subvert the traditional family model (Fan, 2017). In this movement, there is a great change of the previous debates within feminism and feminists reveal that language is what constructs gender.

6. CONCLUSION :

Globally women are oppressed, abused, marginalized, and deprived from their legal rights because of their gender. From the ancient time, feminism has always existed but its organized form has seen around the 17th century in England. During the second wave of feminism giving rise to several political ideologies, such as liberal feminism, Marxist feminism, socialist feminism, radical feminism, and ecofeminism are raised to protest against the sexist ways of men to the private lives of women. Liberal feminists have stressed for equal rights and benefits both for men and women. Radical feminists think that patriarchy is the basis of women oppression. Marxist feminists consider that capitalism and patriarchy are the root causes of women oppression, which is analyzed only through the class paradigm, and housework should be valued in society. Socialist feminists stress on socialism, and both class and gender factors to be taken into account; patriarchy and capitalism should be articulated. Ecofeminism views patriarchy, and focuses ecology and feminism into one point. Later, during the third wave for a global recognition, some new ideologies, such as cultural feminism, black feminism, and postmodern feminism are presented. Cultural feminism refers to a philosophy that men and women have different attitudes, and tries to create of women-only spaces. Black feminism is emerged to empower black women toward fighting for their unique cause for social justice. Postmodern feminists think heterosexual society with male dominance is a source of women oppression.

All the feminism's basic slogan is creation of a just society, the protection of freedom and liberty, the creation of a class-less society, and the creation of a gender-neutral society respectively. At present, educational equality is accepted in many nations and females have gained many societal responsibilities worldwide. But they have not gained same advantages globally as like males to play a vital role in the courts and public administration. We hope that in near future the justice, freedom, liberty and gender equality will be established in all societies.

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The Rise and Progression of International Environmental Law

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Abstract: *The evolution of international environmental law reflects the global community's growing awareness and response to environmental challenges that transcend national borders. The variant perspective underscores the progressive nature of international environmental law and its increasing relevance in global governance. The role of international organizations and institutions is also pivotal in shaping, promoting, and enforcing international environmental laws, and their contributions are critically assessed. This research work provides a comprehensive examination of the development of international environmental law, tracing its historical roots, exploring key principles and agreements, and analyzing the roles of various international organizations. It aims to offer a detailed understanding of how international environmental law has evolved, its current framework, and future prospects. The work ultimately emphasises the dynamic nature of international environmental law, highlighting its critical role in addressing global environmental challenges and promoting sustainable development.*

Keywords: *International Environmental Law, Sustainable Development, Environmental Treaties, Environmental Governance, Global Cooperation.*

1. INTRODUCTION:

Our planet faces a multitude of environmental encounter from climate change to biodiversity loss and addressing these issues involves international cooperation.. International Environmental Law (IEL) is a commitment of the International Community towards addressing these issues and challenges . IEL is a relatively young field that has grown significantly in recent decades. The 1960s marked a turning point. Growing public awareness of environmental threats, fueled by Rachel Carson's influential book "Silent Spring" and the iconic "Earthrise" photograph, spurred calls for international action (Experience, 2019). This culminated in the landmark 1972 United Nations Conference on the Human Environment (Stockholm Conference). The Stockholm Conference is considered a pivotal moment in IEL's development. It produced the Stockholm Declaration, a non-binding but highly influential document that established key principles like state responsibility for environmental protection. In this research study the comprehensive understanding of how international environmental law has evolved, its current framework, and future prospects. It emphasises on the dynamic nature of international environmental law, highlighting its critical role in addressing global environmental challenges and promoting sustainable development.

2. The Progression of International Environmental Law :

The development and progression of international environmental law is a complex journey marked by significant milestones and evolving principles. This journey can be categorized into three distinct phases: from the Stockholm Conference to the Rio Conference, from the Rio Conference to the Rio+20 Conference, and from the Rio+20 Conference to the present day.



2.1 From the Stockholm Conference to the Rio Conference

The Stockholm Conference in 1972 was a pivotal event in the history of international environmental law. This conference marked the beginning of a global recognition of environmental issues and laid the foundation for future environmental governance. The final statement of the Stockholm Conference introduced several important principles of environmental law, which have since been incorporated into various regional and international conventions and treaties. One of the key outcomes of the Stockholm Conference was the establishment of the United Nations Environment Programme (UNEP) and the Environment Fund. These institutions have played crucial roles in the development of international environmental law. The conference also emphasized the responsibility of governments to avoid causing environmental harm, a principle that has become a cornerstone of international environmental standards today. Another significant event during this period was the adoption of the Universal Charter of Nature by the United Nations General Assembly in 1982. This charter had a major impact on international environmental law, influencing subsequent conventions and treaties, such as the Convention on the Protection and Conservation of Southeast Asian Resources and the Rio Declaration of 1992. This period also saw the structural transformation of international environmental law. The establishment of UNEP and other international organizations with environmental mandates marked a shift towards more organized and collaborative efforts in environmental protection. Several key international conventions were established, including the Convention on International Trade of Endangered Species of Wild Fauna and Flora (CITES) in 1975 and the United Nations Convention on the Law of the Sea (UNCLOS) in 1982 (Jalali, 2018).

2.2 From the Rio Conference to the Rio+20 Conference

The Rio Conference in 1992, also known as the Earth Summit, was another landmark event. It brought together representatives from 176 countries, including 116 heads of state, to discuss sustainable development and environmental protection. Two significant legal documents were introduced at this conference: the United Nations Framework Convention on Climate Change (UNFCCC) and the Convention on Biological Diversity (CBD). The Rio Declaration on Environment and Development, adopted at this conference, highlighted the differences between developed and developing countries and aimed to guide the development of international environmental law. Principles such as the right to development, the elimination of poverty, and the greater responsibility of developed countries in protecting the environment were emphasized. The Rio Conference also underscored the need for governments to integrate environmental protection into their economic development plans and to recognize the role of social groups, institutions, and non-governmental organizations in environmental protection. This period was characterized by the realization, comprehension, and reform of international environmental law, as well as the emergence of conflicts between different countries regarding environmental issues (Jalali, 2018).

2.3 From the Rio+20 Conference to Current scenario

The Rio+20 Conference, held in 2012, aimed to review the achievements of the Rio Conference and address the increasing environmental challenges faced by the global community. The conference focused on promoting a green economy to reduce poverty and adopted the Comprehensive Charter for Sustainable Development. This charter outlined the principles for achieving sustainable development and emphasized the importance of international cooperation. The final document of the Rio+20 Conference, titled "The Future We Want," encouraged governments to incorporate its provisions into their national laws to achieve sustainable development. The conference also highlighted the need for strong and efficient international institutions capable of advancing environmental objectives and accelerating the process of environmental protection (Jalali, 2018).



3. Principles and concepts in International Environmental Law :

The various principle and concepts have a vital role in the development and progression of IEL, as discussed herein;

3.1. The Precautionary Principle

The Precautionary Principle stands as a cornerstone in environmental law and policy, advocating for proactive measures to safeguard both the environment and human health in the face of scientific uncertainty. Originating from the German concept of *Vorsorge* in the 1970s, it gained global recognition through pivotal agreements like the Rio Declaration in 1992, emphasizing the imperative of action despite incomplete scientific certainty. Its incorporation into international treaties and national policies underscores its legal and ethical significance, aligning with the principles of sustainable development. Across various sectors, from food safety to environmental law, the principle guides decision-making by prioritizing caution, anticipatory action, and public participation. In contrast to the traditional assimilative capacity approach, it represents a paradigm shift towards preventive strategies, urging thorough risk assessment and consideration of alternatives. Notably, the Precautionary Principle's influence extends to judicial decisions worldwide, reaffirming its legal standing and role in upholding environmental rights. Ultimately, its application underscores a commitment to responsible governance and underscores the imperative of safeguarding our planet for future generations, making it an indispensable component of contemporary environmental governance (The Precautionary Principle, n.d.).

3.2 Polluter Pay Principle

The Polluter Pays Principle (PPP) represents a fundamental shift in environmental policy, aiming to assign accountability for environmental harm and pollution. Emerging in response to escalating global environmental concerns in the latter part of the 20th century, the principle gained traction through key international conferences such as the United Nations Conference on the Human Environment in Stockholm in 1972 and the Rio Earth Summit in 1992. At its core, the PPP asserts that entities responsible for environmental degradation should bear the financial burdens associated with remediation, cleanup, and prevention efforts. Here, we delve into the origins, application, challenges, and international context of the Polluter Pays Principle, examining its role in balancing economic development with environmental protection. The origins of the PPP can be traced back to the heightened awareness of environmental issues that emerged in the latter half of the 20th century. As industrialization expanded and technological advancements accelerated, so too did pollution and environmental degradation. Recognizing the need for a paradigm shift in environmental governance, policymakers and scholars began advocating for principles that would hold polluters accountable for the consequences of their actions. The concept of the PPP crystallized during landmark international environmental conferences, where discussions centered on the imperative of incorporating environmental considerations into economic decision-making processes.

International agreements and conventions, such as the Basel Convention on Hazardous Wastes, underscore the importance of the PPP in addressing transboundary environmental issues and promoting global cooperation in environmental governance. Notable case studies, including oil spills such as the Exxon Valdez and Deepwater Horizon disasters, highlight the role of the PPP in holding corporations accountable for environmental harm and ensuring that polluters bear the costs of cleanup and restoration efforts (Zahar, n.d.).

3.3 Sustainable Development

On December 22, 1992, the United Nations General Assembly sanctioned the formation of a high-level Commission on Sustainable Development to ensure the implementation of "Agenda 21". This Commission is composed of 53 members. Subsequently, on February 12, 1993, the Economic and



Social Council officially established this 53-member Commission to track the progress of "Agenda 21", a comprehensive action plan adopted during the U.N. Conference on Environment and Development (UNCED) held in Rio de Janeiro in June 1992. As a functional body of the Economic and Social Council, the Commission is also responsible for overseeing the integration of environmental and developmental objectives across the U.N. system. Starting its operations in May 1993, the Commission aimed to consider organizing high-level ministerial meetings to provide political support for the commitments and resolutions made during the Earth Summit

4. Major Environmental Agreements and Conventions :

4.1. Stockholm Declaration, 1972

The United Nations Conference on the Human Environment, held in Stockholm from June 5 to 16, 1972, recognized the necessity for a shared vision and guiding principles to help preserve and enhance the global environment. It declared that humans are both products and architects of their environment, which sustains them and facilitates their intellectual, moral, social, and spiritual growth. The rapid advancement of science and technology has given humans unprecedented power to alter their surroundings, necessitating the protection of both natural and man-made environments for well-being and basic human rights. Protecting and improving the environment is a critical global issue affecting well-being and economic development, a duty shared by all governments. Humans must continually innovate and advance; used wisely, human capabilities can benefit all and improve life quality, but misused, they can cause significant harm, evident in pollution, ecological imbalance, resource depletion, and unhealthy living conditions. In developing countries, environmental problems are often due to underdevelopment, with many living below decent standards. These countries must focus on development while protecting the environment, and industrialized nations should help reduce this disparity, as their environmental issues are mainly linked to industrialization. Population growth presents challenges for environmental preservation, necessitating appropriate policies and measures. People are crucial for social progress, wealth creation, and environmental transformation. Humanity must now act with greater care for environmental consequences to prevent irreversible damage; with better knowledge and actions, a better life in a healthier environment can be achieved. Achieving environmental goals requires responsibility from individuals, communities, enterprises, and institutions at all levels, with local and national governments bearing primary responsibility for large-scale policies, though international cooperation is also essential to support developing countries. The conference urged governments and people to unite in preserving and improving the human environment for the benefit of current and future generations (Declaration of the United Nations Conference on the Human Environment, n.d.).

This Declaration proclaimed that Humans have the right to a quality environment that supports dignity and well-being and the responsibility to protect and improve it for future generations, condemning policies promoting oppression and discrimination. Earth's natural resources, including air, water, land, flora, fauna, and ecosystems, must be preserved through careful planning and management. The earth's capacity to produce vital renewable resources must be maintained and enhanced, and humans must protect wildlife and habitats by integrating conservation into development planning.

4.2. Rio Declaration and Agenda 21

The Rio Declaration, a milestone in sustainable development, originated from the 1992 United Nations Conference on Environment and Development (UNCED), also known as the Earth Summit, in Rio de Janeiro. Initially intended to be named the Earth Charter, the title was changed to the Rio Declaration to address concerns from developing countries that the original name overemphasized the earth and nature over human and developmental aspects. The declaration comprises twenty-seven principles designed to steer global sustainable development. Although concise, it was the center of intense debate over its phrasing, ultimately gaining signatures from almost every nation, including the United States, which expressed reservations about possible misinterpretations.



One significant feature of the Rio Declaration is its human-centered approach. Principle 1 asserts that human beings, entitled to a healthy and productive life in harmony with nature, are at the heart of sustainable development concerns. This highlights a prioritization of developmental needs with environmental conservation as a secondary consideration. The document also underscores the disparity between developed and developing nations. Principle 7 addresses "common but differentiated responsibilities," acknowledging the greater environmental impact of developed countries and their obligation to lead sustainable development initiatives.

Focusing more on human welfare than non-human nature, the Rio Declaration's environmental ethics encountered resistance from developed countries to proposals addressing the lifestyles of the affluent as a path to sustainable development. This revealed underlying tensions regarding responsibility for environmental harm. Criticism of the declaration includes its mild stance on population growth, a topic fraught with ideological and religious objections. Despite this, the Rio Declaration introduced crucial themes into environmental law, such as the polluter-pays principle, intergenerational equity, and public participation. Disappointment with the Rio Declaration fueled ongoing efforts to draft an Earth Charter, completed in 2000 in The Hague. While the Earth Charter has not been formally endorsed by the United Nations General Assembly, it has garnered support from thousands of organizations and UNESCO (III, 2009).

Agenda 21, a comprehensive action plan resulting from the 1992 Earth Summit (United Nations Conference on Environment and Development) in Rio de Janeiro, Brazil, aims to address environmental challenges on global, national, and local levels. Developed by the United Nations and endorsed by 178 governments, Agenda 21 seeks to achieve sustainable development by the 21st century through collaboration among UN organizations, governments, and various major groups. The plan is divided into four main sections: Social and Economic Dimensions, which focuses on poverty reduction, health promotion, sustainable population levels, and informed decision-making for human settlements; Conservation and Resource Management, which addresses deforestation, biodiversity conservation, pollution control, and biotechnology management; the Role of Major Groups, highlighting contributions from children, youth, women, NGOs, local authorities, and indigenous communities; and Means of Implementation, covering science, technology transfer, education, and financial mechanisms.

Since its unveiling at the Earth Summit in 1992, Agenda 21 has seen uneven progress, as noted during the 1997 UN General Assembly review (Rio+5), influenced by globalization, income inequality, and environmental degradation. Globally, Agenda 21 encourages local governments to develop their localized versions, promoting sustainable development through integrated policies that emphasize social equity, economic growth, and environmental protection. At the local level, Agenda 21 emphasizes grassroots action, recognizing the crucial role of local governments in implementing its principles through strategies like land-use planning, waste management, and community engagement.

The plan advocates for integration across sectors, urging the development of holistic policies that address interconnected challenges, such as simultaneously considering environmental conservation, economic growth, and social well-being in urban planning. Involving diverse stakeholders, including governments, NGOs, businesses, and citizens, is vital, and local Agenda 21 initiatives engage communities in decision-making, fostering public participation, ownership, and commitment to sustainable practices. Education is seen as a crucial driver of change, with Agenda 21 calling for environmental education, capacity-building, and awareness campaigns to cultivate informed citizens who are more likely to adopt sustainable behaviors.

Despite its aspirations, Agenda 21 faces criticism for its lack of enforceability and reliance on voluntary compliance, with some viewing it as an overreach of global governance into local affairs. Balancing economic growth with environmental protection remains a significant challenge. Nevertheless, Agenda 21's legacy endures, influencing subsequent sustainable development goals, including the 2030 Agenda for Sustainable Development, which builds on its principles. Adapting and innovating remain as global challenges (Spangenberg, 2002).



4.3. Kyoto Protocol, 1997

The Kyoto Protocol, adopted in 1997 in Kyoto, Japan, is a significant international treaty designed to combat climate change by mandating reductions in greenhouse gas (GHG) emissions. It is an extension of the United Nations Framework Convention on Climate Change (UNFCCC) and focuses on curbing global warming by setting legally binding targets for industrialized nations. These targets are based on reducing emissions below 1990 levels and vary by country, considering their historical emissions and economic capabilities. The protocol introduced innovative market-based mechanisms such as Emissions Trading, the Clean Development Mechanism (CDM), and Joint Implementation (JI), allowing countries to trade emissions allowances, invest in emission reduction projects in developing countries, and collaborate on such projects, respectively. Despite its groundbreaking nature, the protocol faced challenges, including the non-ratification by major emitters like the United States, limited scope covering only certain countries and sectors, and its expiration after the first commitment period in 2012. Nevertheless, the Kyoto Protocol laid a foundational framework for future climate agreements and highlighted the principle of "common but differentiated responsibilities," acknowledging historical emissions and influencing subsequent global climate policies (Böhringer, 2003)

4.4. Paris Agreement, 2015.

The Paris Agreement, adopted on December 12, 2015, during the Paris Climate Change Conference, is a landmark accord in the global effort to combat climate change. This agreement emerged from a series of laborious meetings and negotiations by the Ad Hoc Working Group on the Durban Platform for Enhanced Action (ADP), highlighting the urgent need for a cohesive international strategy. Since 1992, parties to the United Nations Framework Convention on Climate Change (UNFCCC) have aimed to stabilize greenhouse gas concentrations to prevent dangerous interference with the climate system, as recommended by the Intergovernmental Panel on Climate Change (IPCC).

The Paris Agreement departs from previous treaties by requiring all countries, including developing nations, to set and report their climate targets through Nationally Determined Contributions (NDCs), which must be updated every five years to reflect increased ambition. Additionally, the agreement introduces a global stocktake every five years to assess collective progress and a transparency framework to ensure accountability. It also emphasizes the importance of adaptation and addresses loss and damage from climate impacts, urging parties to enhance resilience and reduce vulnerability. While the adoption of the Paris Agreement marked a significant achievement, it also underscored the challenges ahead, particularly in mobilizing financial and technological support for developing countries. The future success of the agreement will depend on sustained political will and international cooperation, with upcoming global stocktakes playing a crucial role in maintaining momentum. Ultimately, the Paris Agreement provides a foundation for meaningful progress in addressing climate change, representing a new beginning in the global effort to tackle this pressing issue.

The Paris Agreement stands out for its inclusive approach, which contrasts with the Kyoto Protocol's focus on binding emission reduction targets primarily for developed countries. By requiring all nations to participate and set their own climate goals through Nationally Determined Contributions (NDCs), the Paris Agreement seeks to foster a more comprehensive and cooperative global effort. This inclusivity is crucial, given the disparity in countries' capacities to address climate change and the varying levels of impact they experience. The agreement's requirement for NDCs to be updated every five years ensures that nations continually enhance their commitments, striving for greater reductions in greenhouse gas emissions over time.

A key feature of the Paris Agreement is its robust transparency framework, designed to provide clarity and build trust among parties. This framework includes mandatory reporting and review processes, which help verify that countries are meeting their commitments and provide opportunities for learning and improvement. By enhancing transparency, the agreement aims to hold parties accountable and foster a culture of mutual trust and shared responsibility.



5. Role of International Organisations :

International organizations have played a crucial role in the growth and development of international environmental law through various mechanisms. One significant contribution lies in their facilitation of global conferences. The United Nations Environmental Programme (UNEP), for instance, has been pivotal in organizing major global environmental conferences. These gatherings serve as platforms where states, non-governmental organizations (NGOs), and experts convene to discuss pressing environmental issues. Consequently, landmark treaties such as the Rio Declaration and the Kyoto Protocol have emerged from these conferences, laying the foundation for international environmental agreements.

Moreover, international organizations serve as forums and negotiation platforms for the development and implementation of environmental agreements. Bodies like UNEP and the World Meteorological Organization (WMO) provide spaces where nations can negotiate and collaborate on addressing transboundary environmental challenges. Through these platforms, multilateral environmental agreements (MEAs) are crafted, which are crucial for fostering collective action on environmental issues. Specialized agencies within international organizations further contribute to environmental governance. These agencies often have sector-specific mandates that complement broader environmental initiatives. For instance, the International Maritime Organization (IMO) focuses on preventing pollution from ships, while the World Health Organization (WHO) addresses health conditions linked to environmental factors. These specialized agencies play a vital role in addressing specific environmental challenges with targeted solutions.

6. The relevance and significance of International Environmental Law :

The importance of international environmental law lies in its ability to provide a structured and cooperative approach to addressing environmental issues that no single nation can solve alone. These laws and agreements are crucial for several reasons:

- **Global Coordination:** Environmental issues such as climate change, ozone depletion, and biodiversity loss are inherently transboundary. International environmental law facilitates cooperation among nations to tackle these problems collectively. Agreements like the Kyoto Protocol and the Paris Agreement exemplify such coordinated efforts to combat climate change through internationally agreed-upon targets and mechanisms.
- **Standard Setting:** International environmental laws establish norms and standards that countries must adhere to, ensuring a consistent approach to environmental protection. These standards help to mitigate the "race to the bottom" phenomenon, where countries might otherwise lower environmental regulations to attract economic activities.
- **Environmental Protection and Conservation:** By providing frameworks for conservation and sustainable use of natural resources, international environmental laws help protect ecosystems and biodiversity. The Convention on Biological Diversity (CBD) is a key treaty that aims to conserve biological diversity, promote sustainable use of its components, and ensure fair sharing of benefits arising from genetic resources.
- **Human Health and Safety:** Environmental degradation can have severe impacts on human health, such as air and water pollution leading to respiratory and waterborne diseases. International environmental law addresses these issues by regulating pollutants and promoting clean technologies and practices, thereby safeguarding public health.
- **Economic Stability:** Environmental degradation can lead to economic losses through reduced agricultural productivity, damage to infrastructure from extreme weather events, and loss of tourism revenue. International environmental laws contribute to economic stability by promoting sustainable development practices that balance economic growth with environmental protection.
- **Conflict Prevention:** Scarcity of natural resources and environmental degradation can lead to conflicts both within and between nations. International environmental law helps to mediate these



issues by providing legal frameworks for resource management and dispute resolution, promoting peace and security.

7. Conclusion :

International environmental law has evolved significantly from its nascent stages in the mid-20th century to its current status as a comprehensive and multifaceted legal framework. This progression has been driven by a growing recognition of the interconnectedness of global ecosystems and the necessity for collective action to address environmental challenges. Early milestones, such as the Stockholm Conference in 1972, laid the foundation by establishing fundamental principles and raising awareness about the global nature of environmental issues. Subsequently, landmark agreements like the Montreal Protocol and the Paris Agreement have demonstrated the potential for international cooperation to address specific environmental problems effectively.

The development of international environmental law has been characterized by an increasing sophistication in both scope and implementation mechanisms. Initially focused on specific issues such as wildlife conservation and pollution control, the legal framework has expanded to encompass broader concepts like sustainable development and climate change mitigation. This evolution reflects an understanding that environmental protection must be integrated with economic and social development to achieve long-term sustainability. Additionally, although challenges remain in ensuring universal adherence and effectiveness, the establishment of various international institutions and compliance mechanisms has strengthened the enforcement of environmental laws.

8. Suggestions :

International environmental law is progressing forward with ongoing challenges. These include issues of compliance and enforcement, disparities in capabilities and resources among countries, and the need for more ambitious and inclusive agreements to address emerging threats like biodiversity loss and plastic pollution. The dynamic nature of environmental issues requires continuous adaptation and innovation in legal approaches, as well as robust political will and international cooperation.

To further enhance the effectiveness of international environmental law and address the pressing environmental challenges of our time, several key strategies should be considered:

1. *Strengthening Compliance and Enforcement Mechanisms*: One of the critical areas for improvement is the enforcement of existing international environmental agreements. Strengthening compliance mechanisms through more robust monitoring, reporting, and verification processes can enhance accountability. Additionally, providing technical and financial support to developing countries can help bridge the gap in enforcement capabilities.

2. *Promoting Inclusivity and Equity*: Environmental justice must be a central tenet of international environmental law. This involves ensuring that the voices and needs of vulnerable and marginalized communities are heard and addressed in the formulation and implementation of environmental policies. Equitable access to resources and technology transfer is crucial for enabling all countries to participate effectively in environmental protection efforts.

3. *Enhancing Cooperation and Coordination*: Effective environmental governance requires coordinated efforts across multiple sectors and scales. Strengthening international cooperation through enhanced collaboration between governments, international organizations, civil society, and the private sector can lead to more cohesive and comprehensive strategies. Regional cooperation should also be promoted to address transboundary environmental issues more effectively.

4. *Integrating Environmental and Economic Policies*: Sustainable development should be the guiding principle of international environmental law. Integrating environmental considerations into economic planning and decision-making processes can help achieve a balance between development and



conservation. Encouraging green technologies and sustainable practices through incentives and regulations can drive economic growth while minimizing environmental impact.

5. *Adapting to Emerging Environmental Challenges*: The dynamic nature of environmental issues necessitates continuous adaptation and innovation in legal and policy frameworks. Proactive measures should be taken to address emerging threats such as climate change, biodiversity loss, and plastic pollution. This includes updating existing agreements, developing new legal instruments, and fostering a culture of resilience and adaptability in environmental governance.

6. *Raising Public Awareness and Engagement*: Public awareness and engagement are crucial for the successful implementation of environmental laws. Educational campaigns, community involvement, and transparent communication can foster a culture of environmental stewardship. Empowering individuals and communities to take action at the local level can have a significant impact on global environmental outcomes.

By implementing these strategies, the international community can strengthen the framework of international environmental law and enhance its capacity to address the complex and evolving environmental challenges of the 21st century. Robust and inclusive legal mechanisms, combined with sustained political will and international cooperation, are essential for ensuring a healthy and sustainable environment for future generations.

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Building Resilience and Confidence among Rural Women through Skill Development Training

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Abstract: *This research involved extensive face-to-face discussions with rural Schedule Caste (SC) women to understand their current situation and the challenges they face. Three major hurdles were identified to women's empowerment as a majority of women were homemakers with multiple responsibilities such as managing the domestic responsibilities, lack of incentives to attend the training program as they had to sacrifice their daily wages, and reluctance towards intervention from organizing agencies, in the equipment & machinery provided. In light of these hurdles, the research paper emphasized the importance of designing a training program that addressed the specific needs and challenges of rural women. It explored strategies to overcome these obstacles, including creating flexible training schedules that accommodated women's domestic responsibilities, and ensuring women's ownership and control over the resources and machinery provided. The paper underscores the significance of women's empowerment training in building resilience and confidence among rural women. By equipping them with eco-friendly bag making skills, these women can engage in sustainable income-generating activities, contribute to environmental conservation, and ultimately attain economic empowerment.*

Key Words: *Women Empowerment, Rural Women, Schedule Caste Women, Eco-Friendly Bags, Economic Empowerment, Training Program, Hurdles, Homemakers, Incentives, Ownership, Resilience, Confidence.*

1. INTRODUCTION:

Women empowerment has emerged as a crucial aspect of societal development, encompassing various dimensions such as education, economic independence, social participation, and access to resources. Recognizing the transformative potential of empowering women, efforts have been made globally to enhance their resilience and confidence. This research paper aims to delve into the significance of women empowerment training in building their resilience and confidence. In recent years, there has been a growing recognition of the importance of women's empowerment for achieving economic independence, gender equality and sustainable development. Empowerment training programs have emerged as key interventions that aim to unleash women's potential and enable them to lead fulfilling and empowered lives. This research paper also investigates the significance of empowerment training in facilitating women's economic independence. By exploring the literature on women's empowerment, we can gain valuable insights into the effectiveness and impact of such programs.

According to Singh and Kumari (2022), “mahilaen vikaas ke mahattvapoon sootradhaar hain. ve satat vikaas ke lie aavashyak parivartanakaaree aarthik, paryaavaraneey aur saamaajik parivartanon ko saakaar karane kee disha mein ek utprerak bhoomika nibhaatee hain. lekin kredit, svaasthy dekhahaal aur shiksha tak aparyapt pahunch unake saamane aane vaalee kae samasyaon



mein se ek hai. duniya bhar mein krshi aur aarthik kathinaiyon ke saath-saath jalavaayu parivartan ne sthiti kee gambheerata ko badha diya hai” [1].

2. Literature Review:

According to investigators, women have experienced a range of difficulties, including peer pressure, caste-based discrimination, and other societal limitations such as restricted access to resources, poverty, and less prospects for progress, as well as feelings of helplessness and isolation [2]. One of the author emphasized the importance of skill development programs for women's empowerment in India, highlighting the positive impact on their economic self-sufficiency and confidence [3]. Others analysed the diverse strategies and interventions aimed at empowering women as research underscores the role of education, health, economic opportunities, and social empowerment in promoting women's resilience and confidence [4,5]. He also examined the empowerment initiatives targeted at rural women in India and review highlighted the key challenges faced by rural women [5]. The importance of financial inclusion, education, and awareness programs in nurturing women's confidence and resilience was emphasized in the research [6]. Another aspect of women in domestic contribution is cleaning and waste disposal which helps in sustainable development and disease prevention [7]. Gugalani underscores the transformative impact of education and skill development on rural women's empowerment. The researcher highlighted how these interventions enable women to overcome societal barriers, gain confidence, and build resilience [8].

3. Research Objectives / Aims:

This research paper through a training programme aims to understand the hurdles faced by rural schedule caste (SC) women and how do trainings & skill development programmes could impact their social & economic development.

4. Research Method:

Krishi Vigyan Kendra (Agricultural Science Centre), Pipalia operative under Junagadh Agricultural University in collaboration with NAARM, Hyderabad had organized five days training programme for SC rural women on “Eco-friendly bags making for economic empowerment of rural women” from 03-07 Oct 2022. For the purpose 30 SHGs were contacted randomly from the jurisdiction of KVK and discussed the objective of the training. Those groups who provided their consent were selected for the training. Thus, a total of 50 SC women from 10 SHG were chosen. The whole programme was conducted at Leuva Patel Samaj, Dhoraji. During the whole programme the participants got to know about stitching techniques and different types and shapes of the bags from local experts. The sewing machines were also handed over to the SHG groups for their future endeavours. The training programme has received a funding of Rs. 3,25,750/- by ICAR-NAARM under SCSP scheme. The research aims to assess the effectiveness of women empowerment training program on eco-friendly bags making for rural Schedule Caste (SC) women. A pre-post design with non-randomized SHGs was employed for the research. The study was conducted in eleven (11) villages of Dhoraji and Upleta blocks of Rajkot district in Gujarat, India. The training participants were recruited through purposive sampling and the study sample comprises of 50 rural women from ten different self-help groups (SHGs). Data were collected through the targeted participants from pre-training meetings & discussions, and also after the training gets completed. The data were analyzed using MS Excel 2010.

The SHGs have undergone a 5-day training program on eco-friendly bag making that covers theoretical and practical aspects of the craft. A pre and post-training questionnaire was used to collect data on demographic characteristics, self-efficacy and confidence levels. The training aims to provide knowledge and skill development on eco-friendly bags making, financial literacy and entrepreneurship development. Semi-structured interviews were conducted post-training to gain insights on the actual impact of the training and any challenges faced by the participants.

5. Results and Discussion:

The multiple discussions were taken place with SC rural women before conducting the actual training programme as collated in the Table-I.



Table-1: Details of discussions with SC rural women village wise and SHGs wise

Targeted Villages	Taluka (Block)	KVK Jurisdiction	No. of SC Women Contacted	SHGs Contacted	Finally, Agreed SHGs to Attend Training Prog.
Pipalia	Dhoraji	KVK Pipalia	24	5	2
Patan Vav	Dhoraji	KVK Pipalia	16	2	0
Supedi	Dhoraji	KVK Pipalia	20	3	1
Bhologamda	Dhoraji	KVK Pipalia	37	8	4
Moti Parbdi	Dhoraji	KVK Pipalia	11	1	1
Jamnavad	Dhoraji	KVK Pipalia	8	1	0
Dhoraji	Dhoraji	KVK Pipalia	22	3	2
Nagvadar	Upleta	KVK Pipalia	21	3	0
Moti Marad	Dhoraji	KVK Pipalia	8	1	0
Bhukhi	Dhoraji	KVK Pipalia	8	1	0
Raiydi	Dhoraji	KVK Pipalia	12	2	0
Total			187	30	10

A total of 187 SC women were contacted from 30 self-help groups (SHGs) and finally 10 groups have shown highest interest, willingness and finally agreed to attend the training programme within 30 kilometre perimeter of KVK Pipalia as shown in Figure-1.



Fig-1. Women participation from five villages namely Supedi, Bholgamda, Pipaliya, Moti Parabdi & Dhoraji

Pre-training data analysis

Research found that there were many hurdles for SC rural women to devote whole day in the training programme as they have domestic responsibilities as shown in Figure-2.

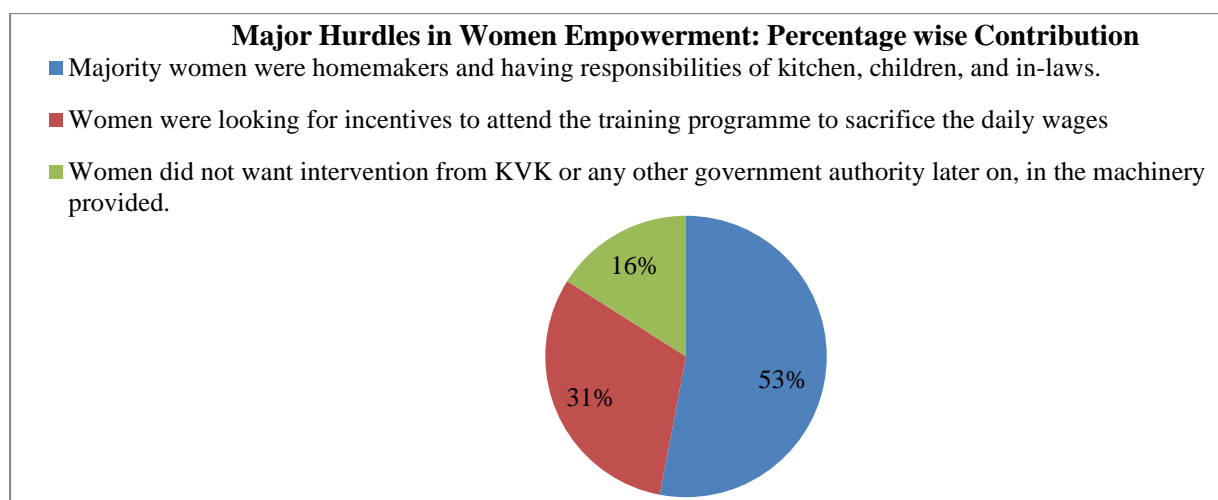


Fig-2: Major Hurdles in Women Empowerment: Percentage wise Contribution

Domestic responsibilities are the major contributor among the other hurdles. In spite of these hurdles, SC rural women have actively participated in the five days training programme on eco-friendly bags making and the results showed that women who did not able to run the sewing machine, could be able to properly run the sewing machine.

Pre and Post training understanding on sewing machine and stitching process

Ten questions were asked before the training programme to the selected participants from ten different self-help groups. The results were analyzed and shown in the Figure-3.

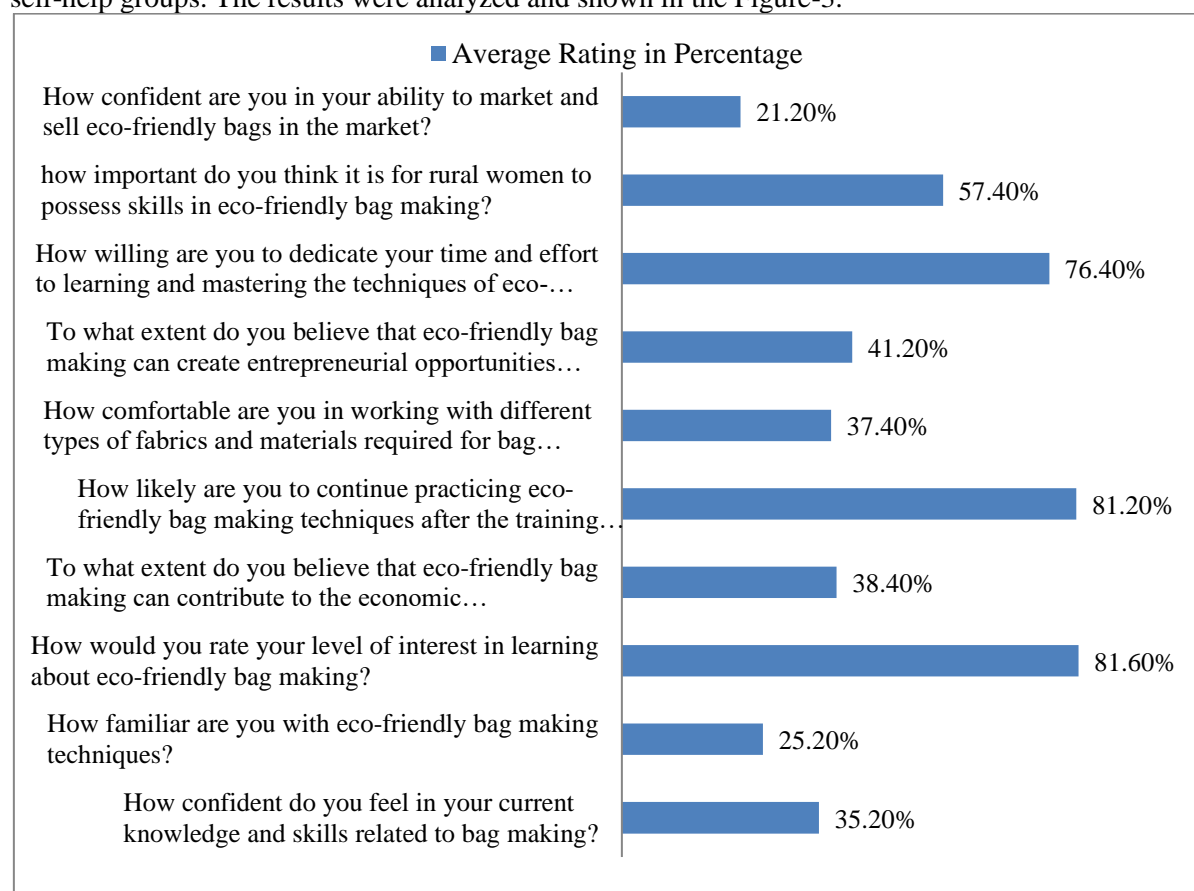


Fig-3: Pre-Training Questions: Average Responses in Percentage



The confidence among the women to market the stitched bags, current knowledge & skills related to bag making, and familiarity about eco-friendly bags making techniques were almost lowest contributors. Women were also not much aware about different fabrics for eco-friendly bags, economics of the eco-friendly bags making & selling, and how these bags stitching & selling could be an entrepreneurial opportunity. The analysis showed the importance and much needed training among the rural women in Rajkot in Gujarat.

Post-Training Questions:

The same questions were asked to the same participants after the training programme was completed and the average responses were analyzed as shown in Figure-4.

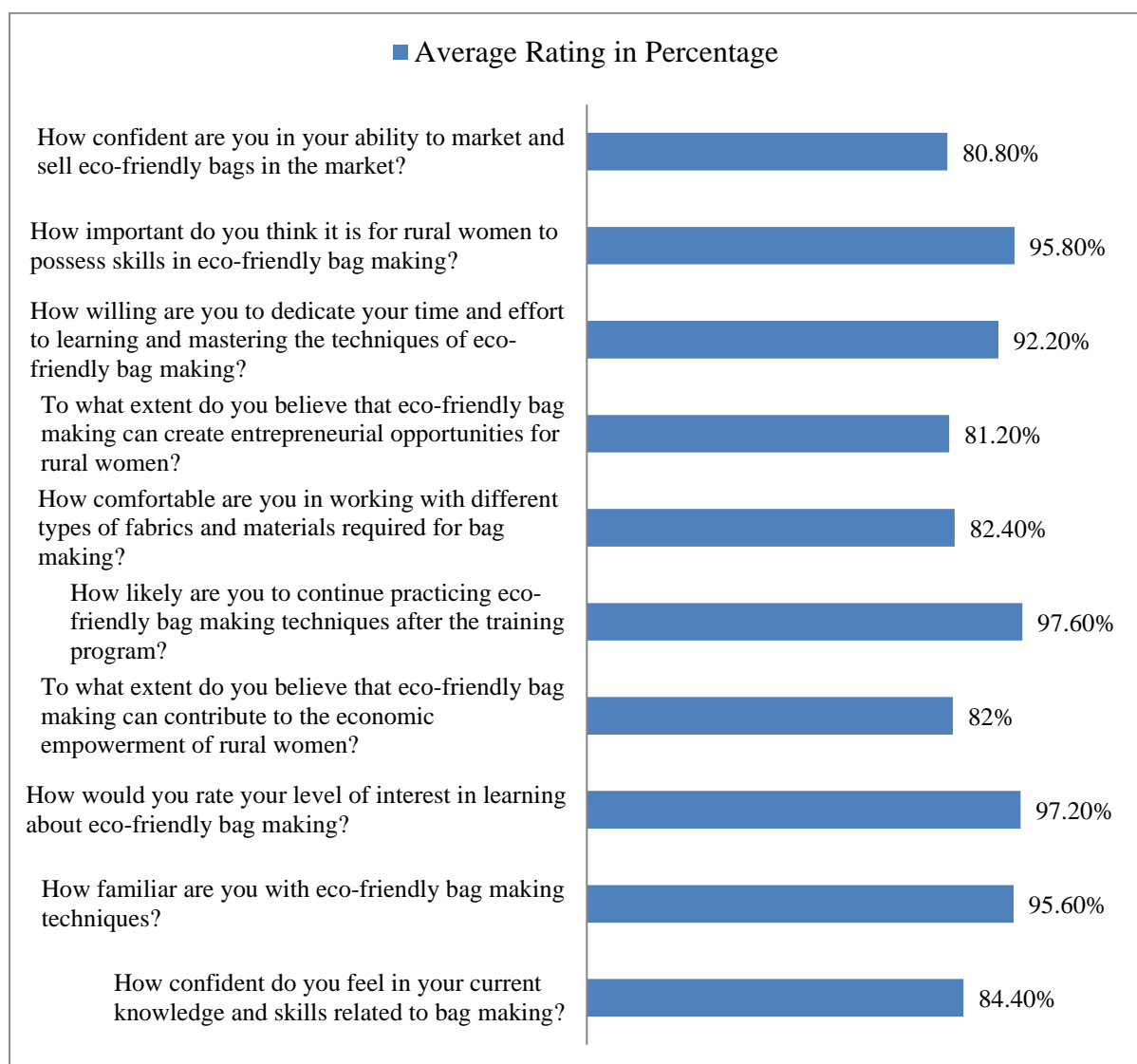


Fig-4: Post-Training Questions: Average Responses in Percentage

Women's marketing confidence, existing bag-making knowledge, skills and acquaintance with environment friendly bag-making methods, all significantly increased in post training programme. Women were also quite knowledgeable about the various eco-friendly bag materials, the economics of creating and selling eco-friendly bags, and how making and selling these bags may be a business



opportunity. The analysis showed that such skill development trainings are much needed among rural women to boost their knowledge, skill and confidence so that they could be self-reliant.

6. CONCLUSION:

Through extensive discussions with rural Scheduled Caste women, it was evident that domestic responsibilities often hindered their ability to engage in skill development and economic independence. The training demonstrated significant positive outcomes. The implementation of the training program witnessed active participation from 50 women belonging to ten self-help groups (SHGs), highlighting the demand and relevance of such initiatives in rural areas. These women gained valuable skills in eco-friendly bag making, which can serve as a sustainable source of income generation and economic empowerment for them and their communities. By equipping rural women with the necessary skills, knowledge, and resources, this training program has contributed to their economic empowerment, fostering resilience and confidence. It has also emphasized the importance of tailoring training programs to address specific challenges faced by marginalized rural communities, ensuring their inclusion and equal participation in various economic activities. Moving forward, it is crucial to sustain and expand such training initiatives, providing continuous support and resources to enable long-term economic empowerment for rural women. By doing so, we can contribute to narrowing the gender gap, fostering economic growth, and promoting overall sustainable development in rural areas.

7. Recommendation / Suggestions (if any):

Women empowerment training programs are essential in fostering resilience and confidence among women. Policymakers and organizations should prioritize investment in such programs to ensure sustainable personal growth, social transformation, and economic independence for women, leading to a more equitable and empowered society. Also, training organizers should incorporate flexible schedules to accommodate women's domestic duties and allow them to participate effectively. Labourer women should be incentivized to compensate for their daily wages as it motivates active participation and mitigates the economic impact on their households.

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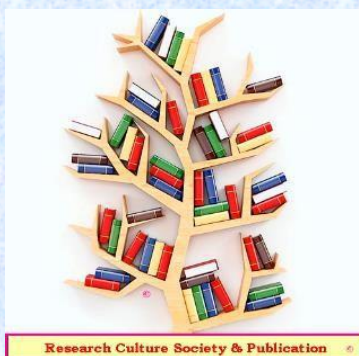
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