



SOCIAL EMPOWERMENT AND SUSTAINABILITY FOR WOMEN EMPOWERMENT AND DIVERSITY INCLUSION EQUITY

Dr. Sudeepta Banerjee, Assistant Professor School of Business, Dr. Vishwanath Karad MIT World Peace University, Pune, India ORCID ID: 0000-0002-5778-2045 Sudeepta.banerjee@mitwpu.edu.in Sudeepta2050@gmail.com

> Dr.S.K Srivastava, Dean (Academics) Alard University, Pune

Dr. Kunal Gauray, Professor School of Business, Dr. Vishwanath Karad MIT World Peace University, Pune, India ORCID ID: 0000-0001-8757-9577 kunalgaurav2006@gmail.com

Dr. Amit Ambar Gupta, Assistant Professor School of Business, Dr. Vishwanath Karad MIT World Peace University, Pune, India ORCID ID: 0000-0002-0316-1569 amitambargupta@gmail.com

> Dr. Samrat Ray, Dean, School of Management, Alard University, Pune dean.asbm@alarduniversity.edu.in

Abstract

The empowerment of women is well-known as a valuable factor of sustainable development and social equity, but gender imbalances remain strong forces that restrict the women's involvement and empowerment over the long-term horizons in the social, economic, and institutional spheres. This paper examines how social empowerment and sustainability can be used to enhance sustainable women empowerment in the context of diversity, inclusion, and equity (DEI). The aim of the study is to investigate the role of social empowerment, sustainability awareness, diversity and inclusion practices, and equity and institutional support in sustainable empowerment outcomes of women.

The main quantitative research design was adopted as the survey was carried out online among 259 respondents. Data analysis was performed in SPSS and correlation tests and multiple regression were applied to determine correlation between the study variables. The result shows high positive correlations of all independent variables and sustainable results of women empowerment. The result of the regression analyses suggests that the practices that predict sustainable women empowerment relate most to equity and institutional support and diversity and inclusion, whereas the social empowerment and sustainability awareness practices are less predictive as independent variables. The paper explains the significance of coordinated, equity-based, and inclusive approaches to the realization of long-term women empowerment. The implications of the findings are significant to the policy makers, organisations, and development practitioners because it implies that the empowerment programs must be institutionalised to achieve sustainability and long-term effectiveness.

Keywords

Women Empowerment; Social Empowerment; Sustainability; Diversity and Inclusion; Equity; Institutional Support





INTRODUCTION

Gender equity and women empowerment have been set as the most important pillars to a sustainable, inclusive, and equitable development everywhere. Policies, programmes and international commitments have not succeeded in eradicating stark differences even decades after enactment in the economic, social, political, and cultural spheres. At the same time, the majority of women and girls around the world are still elusive with empowerment, which is defined as a process in which women become empowered, gain agency and voice besides having access to resources. Recent international evaluations indicate that women, on an average, are enabled to reach no more than 60 % of the entire potential and also have a 28 % disparity in the significant areas of human development in relation to men. Fewer than 1 % of women and girls are in countries where the empowerment of women and gender parity are co-opted as high. Moreover, a majority of the female population in the world (approximately 3.1 billion women and girls) are in those countries where there is a wide deficit in women empowerment and wide gender gaps. Such statistics highlight the existence of structural inequalities that are profound in the goals of social empowerment and sustainability (The Guardian, 2025).

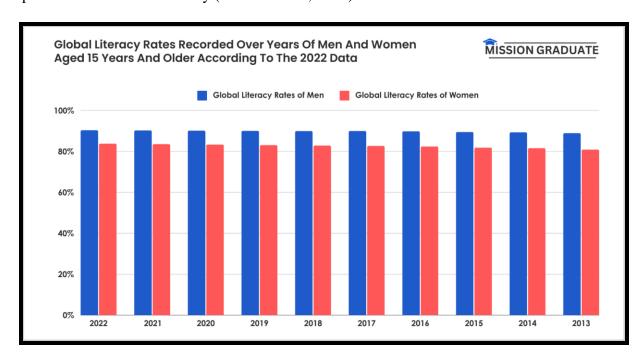


Figure 1: Literacy statistics of US both men and women 2025

(Source: Mission Graduate, 2025)

Social empowerment that is inclusive of education, health, legal rights, economic opportunity and freedom of violence, is a determinant that determines how women live their lives. Nevertheless, women in almost 47% of countries still face legal limitations on occupational opportunities; approximately a quarter of young women (20-24 years old) get married off before 18 years old, which demonstrates the presence of the traditional socio-cultural restrictions and disadvantages in



Vol. 35 Issue 2, 2025, Pages: 721-737



the early years of their lives. In addition, female genital mutilation among other practices impact about 230 million women and girls all over the world, which brings to light practices that are harmful and continue to exist despite international efforts to eradicate them by the year 2030 (Quisumbing *et al.* 2023).

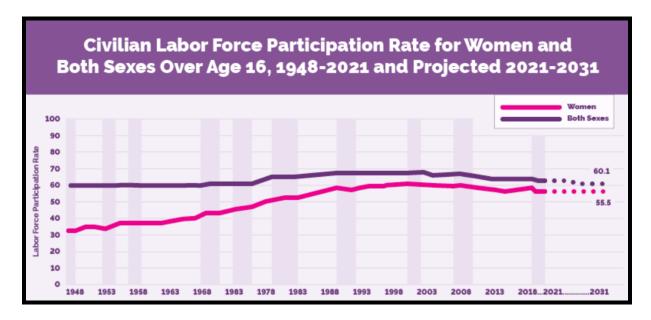


Figure 2: Working women: data from past, present and future

(Source: U.S Department of Labour Blog, 2023)

The particular national and regional trends also depict the skewed character of development. Women representation in politics in India, one of the most populous nations in the world, has remained low (women make up not more than 14.7 % of the national parliamentarians), and malefemale differences in education and in leadership areas also exist (Sharma, 2024). Indicatively, in the past years, only 24.9% of women entered secondary or higher schooling, a number that was lower than that of men, 38.6 percent, and women leadership in management remained constant, at 15.9% (Sustainable Development Goals, 2025). These gaps represent structural deep-seated factors that prevent full involvement of women in social, economic, and political fronts.

Another important aspect of social empowerment is economic empowerment, and gender imbalances are hidden in this area as well (Chikwe *et al.* 2024). The participation of women in labour forces around the world is considerably low compared to that of men and in some countries like India almost 19.6 crore women are not in the labour force thus a huge economic resource that is not utilized. The role of women in the workforce is still small (around 18%) in the context of India, even after policy action to bring about women into the economic activity processes on a large scale (UNDP, 2023).



Vol. 35 Issue 2, 2025, Pages: 721-737



Although there have been considerable provisions of these challenges in the existing literature and international reports that have led to policy action and advocacy, there are still major gaps. Nobody has examined a lot of integrated analysis linking the mechanisms of social empowerment to the outcomes of sustainability (social and environmental) and has explicitly and systematically introduced diversity, inclusion, and equity models (UN Women, 2025). The sustainability in this case does not just apply to environmental aspects, but also applies to the sustainability of gender equity benefits over time and in different socio-economic frameworks.

More systemic issues have also been brought to the fore in recent debates: world development of women rights is either stagnating or retrogressive because of war, dwindling foreign assistance and backlash against gender equality promises which are putting in danger the hard-fought gains in maternal health, education and economic participation (Srivastava, 2024). All these new complications show that gender equity is not a fixed goal, but a dynamic process that needs resolute, culturally specific, and sustainable approaches.

Considering such endemic gaps, this study will attempt to find a holistic way of examining how social empowerment interventions, especially those that resonate with sustainability and those founded on the principles of diversity, inclusion, and equity, can be better designed, applied, and assessed. This includes knowing how social and economic systems and policy systems either facilitate or limit empowerment avenues of various categories of women in varied settings.

Precisely, the research question is:

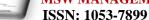
What are the mechanisms of social empowerment with most significant impacts on sustainable outcomes of women empowerment and how can the principles of equity and inclusivity be integrated systematically through interventions?

In that regard, this study has the following hypothesis:

H1: Social empowerment programs that incorporate the ideals of diversity, inclusion, and equity are more effective in ensuring sustainable empowerment impact among women compared to the ones that fail to do so.

H2: Community-based social empowerment strategies that are contextually adaptive lead to increased economic and social resilience in women in comparison to policy strategies that are a one-size-fits-all strategy.

By answering these hypotheses, this research will not only provide the much needed gap in the body of integrated and sustainability research on women empowerment, but also offer practical information to policymakers, practitioners, and other stakeholders of civil societies around the world who wish to seek a lasting and equitable gender transformation.





METHOD

Research Design

The paper was based on a primary quantitative research design to investigate the perceptions and experiences of social empowerment, sustainability, and women empowerment in the context of diversity, inclusion, and equity (DEI). It was believed that a quantitative approach would have been suitable because it would allow gathering standardised data of a rather large sample of respondents, which can be statistically analysed and extrapolated subsequently (Arya and Shukla, 2025). This study employed the cross-sectional research design, where data was gathered at one time.

Population and Sample

This study involved the target population of adult people (age 18 years and above) with a different socio-economic and educational status. The use of a non-probability convenience sampling method was based on the fact that this sampling method is appropriate to work with online data collection and accessibility to the respondents. There were 259 valid answers and these were analyzed in the end. This was deemed to be a sufficient size to carry out a descriptive and inferential statistical analysis in social science research and to draw a significant pattern and relationship between variables.

Data Collection Method

Data collection was done primarily through a web-based survey platform in terms of an online structured questionnaire. The questionnaire items were closed-ended questions to be measured mostly on five-point Likert scales between strongly disagree and strongly agree. The survey tool addressed the major areas of social empowerment, sustainability awareness, empowerment initiatives on women and attitudes towards diversity, inclusion and equity. The questionnaire was first revised on clarity and content validity and slight wording modifications were undertaken so that the respondents could understand the questionnaire better.

Data Analysis Techniques

After data collection had been done, exportation of responses was then done into statistical software where they were analyzed. The characteristics of the respondents and the general trends were summarised using descriptive statistics (frequencies, percentages, means and standard deviations). Correlation and regression analysis, which are inferential statistical tools, were used to test the relationships between social empowerment, sustainability practices, and the outcome of women empowerment. Anova test was used to test the reliability of the scale items so as to achieve internal consistency.

Ethical Considerations

The research process was carried out in strict respect of the ethical principles. Each participation was voluntary and informed consent was given at the start of the survey and anonymity and

Vol. 35 Issue 2, 2025, Pages: 721-737



confidentiality of respondents was encouraged. No personal identifiable information was gathered and the information was displayed merely in academic research.

Research Variables

Independent Variables (IVs)

IV1: Social Empowerment

IV2: Sustainability Awareness and Practices

IV3: Diversity and Inclusion Practices

IV4: Equity and Institutional Support

Dependent Variable (DV)

DV: Sustainable Women Empowerment Outcomes

Survey Questions

- What is your age?
- What is your gender?
- What is your education?
- What is your occupation?

(All items to be measured on a 5-point Likert scale: I = Strongly Disagree to 5 = Strongly Agree)

IV1: Social Empowerment

- IV1.1 Women in my community have access to quality education that enables personal and professional growth.
- IV1.2 Women are encouraged to participate in social and community decision-making processes.
- IV1.3 Social norms in my society support women's independence and self-confidence.
- IV1.4 Women have sufficient access to information and resources to improve their social status.

IV2: Sustainability Awareness and Practices

- IV2.1 Sustainable development initiatives in my society actively consider women's needs and perspectives.
- IV2.2 Women are encouraged to participate in sustainability-related programmes and activities.





IV2.3 Policies promoting environmental and social sustainability contribute to long-term women empowerment.

IV2.4 Awareness of sustainability issues enhances women's ability to make informed social and economic decisions.

IV3: Diversity and Inclusion Practices

- IV3.1 Organisations and institutions promote diversity by ensuring women from different backgrounds are included.
- IV3.2 Women feel respected and valued regardless of their ethnicity, religion, or socio-economic status.
- IV3.3 Inclusive practices in workplaces and communities support women's participation and leadership.
- IV3.4 Diversity initiatives positively influence women's sense of belonging and empowerment.

IV4: Equity and Institutional Support

- IV4.1 Laws and policies in my country promote equal rights and opportunities for women.
- IV4.2 Women have fair access to employment, leadership roles, and economic opportunities.
- IV4.3 Institutional systems effectively address discrimination and inequality against women.
- IV4.4 Government and organisational support plays a crucial role in achieving gender equity.

DV: Sustainable Women Empowerment Outcomes

- DV1.1 Women are able to achieve long-term economic independence and stability.
- DV1.2 Women feel empowered to make decisions that affect their personal and professional lives.
- DV1.3 Empowerment initiatives have led to lasting improvements in women's quality of life.
- DV1.4 Women's empowerment in my society is sustainable and continues across generations.

RESULTS

This part gives the findings of the quantitative analysis performed on SPSS, who were collected by using data of 259 respondents. The research investigates how the four independent variables, which

Vol. 35 Issue 2, 2025, Pages: 721-737



are the Social Empowerment (IV1), Sustainability Awareness and Practices (IV2), Diversity and Inclusion Practices (IV3), and Equity and Institutional Support (IV4) relate to the dependent variable: Sustainable Women Empowerment Outcomes (DV). The results are structured according to correlation analysis, model summary, ANOVA and coefficient analysis in order to make it clear and relevant to the goals of the research.

Correlation Analysis

Table 1: Correlation test result
Correlations

		IV1	IV2	IV3	IV4	DV
	Pearson Correlation	1	.711**	.674**	.665**	.641**
IV1	Sig. (2-tailed)		.000	.000	.000	.000
	N	259	255	259	259	259
	Pearson Correlation	.711**	1	.880**	.844**	.828**
IV2	Sig. (2-tailed)	.000		.000	.000	.000
	N	255	255	255	255	255
	Pearson Correlation	.674**	.880**	1	.905**	.884**
IV3	Sig. (2-tailed)	.000	.000		.000	.000
	N	259	255	259	259	259
	Pearson Correlation	.665**	.844**	.905**	1	.918**
IV4	Sig. (2-tailed)	.000	.000	.000		.000
	N	259	255	259	259	259
	Pearson Correlation	.641**	.828**	.884**	.918**	1
DV	Sig. (2-tailed)	.000	.000	.000	.000	ı
	N	259	255	259	259	259

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

The strength and direction of the relationship between the independent variables and the sustainable women empowerment outcomes were used to make a correlation analysis using Pearson correlation analysis. The findings show that all the independent variables have a positive and significant relationship with the dependent variable at the 0.01 level, which suggests that there are strong correlations in the research framework.



Equity and Institutional Support (IV4) is the strongest positive independent variable that correlates with the outcomes of sustainable women empowerment (r =.918, p <.01). The implication of this is that equal policies, civil rights, and institutionalization are essential in ensuring long-term empowerment of women. Diversity and Inclusion Practices (IV3) are also positively correlated with the dependent variable (r =.884, p<.01) which is important in terms of the need to include women of diverse backgrounds.

On the same note, Sustainability Awareness and Practices (IV2) show a positive relationship with outcomes of women empowerment that is strong and positive (r =.828, p <.01), which means that sustainability-related projects can substantially increase the empowerment processes provided there is the active involvement of women. Although it is a relatively less strong IV1, there is still a strong positive correlation with the dependent variable (r =.641, p <.01), which proves its importance in the empowerment process.

The independent variables were found to have high levels of intercorrelations, especially between IV3 and IV4 (r = .905), which indicates that the dimensions of social empowerment of diversity, inclusion, and equity are intimately related to each other. In general, the correlation analysis has solid initial evidence of the hypothesis of the study that socially empowering, inclusive, and sustainable practices are linked to improved women empowerment outcomes.

Regression Model Summary

Table 2: Model Summary Test output Model Summary

Mode 1	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.928ª	.861	.858	1.77438

a. Predictors: (Constant), IV4, IV1, IV2, IV3

A multiple regression analysis was done to establish the combined predictive strength of the four independent variables on sustainable women empowerment results. The summary table of the model shows a very high overall relationship with a multiple correlation coefficient of R = .928.

The R square of 0.861 indicates that the overall result of 86.1% of the variation in sustainable women empowerment is due to the joint influence of social empowerment, sustainability practices, diversity and inclusion, and equity and institutional support. The adjusted R Square (.858) also supports the strength of the model on the adjustment of the sample size and the number of predictors. The high explanatory power indicates that the chosen variables are very relevant and



combine together to give a cumulative explanation of the sustainability of women empowerment in the context of the research.

The standard error of the estimate (1.77438) is not very high and this means that the model predictions are close to the observed values and hence impacts confidence on the reliability of the regression model.

ANOVA Results

Table 3: ANOVA Test output ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
	Regressio n	4861.855	4	1215.464	386.053	.000 ^b
1	Residual	787.109	250	3.148		
	Total	5648.965	254			

a. Dependent Variable: DV

b. Predictors: (Constant), IV4, IV1, IV2, IV3

The statistical significance of the regression model was tested using the ANOVA test in the overall analysis. The outcomes show that the model is very important as the F-value is 386.053 and the level of significance is p =.000. This confirms that the regression model demonstrates a larger proportion of variance in the outcomes of sustainable women empowerment than a model that does not have any predictors.

The results of ANOVA support the research framework and prove that the independent variables in their combination can have a significant impact on sustainable women empowerment. This justifies the opinion that the outcomes of the empowerment process should be perceived in a complex manner, as opposed to independent variables.



Vol. 35 Issue 2, 2025, Pages: 721-737



Coefficient Analysis

Table 3: Coefficient test output Coefficients^a

	Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		В	Std. Error	Beta		
1	(Constant	.092	.420		.220	.826
	IV1	016	.036	016	460	.646
	IV2	.103	.056	.097	1.830	.068
	IV3	.237	.067	.229	3.551	.000
	IV4	.664	.059	.641	11.176	.000

a. Dependent Variable: DV

The coefficient analysis helps to see the personal contribution of every independent variable to sustainable results of women empowerment. Of all the predictors, Equity and Institutional Support (IV4) comes out as the most powerful variable with a standardised beta value of .641 (p < .001). This shows that equal laws, equal access to opportunities and institutional support are the greatest motivators of sustainable empowerment of women.

It is also found that the statistically significant positive impact on the dependent variable is offered by the Diversity and Inclusion Practices (IV3) (=.229, p <.001), which means that inclusive workplaces and respect of diversity significantly impact the empowerment outcomes of women.

Conversely, Sustainability Awareness and Practices (IV2) can be seen to have a somewhat insignificant effect (B = .097, p= .068). Although such variables are also highly correlated with outcomes of empowerment, the independent prediction power is weaker when considering other factors at the same time, indicating overlapping with equity and inclusion variables.

The independent effect of Social Empowerment (IV1) is not significant (β = -.016, p =.646) and this may mean that the effect is indirect or mediated by other dimensions of empowerment that include institutional support and inclusion.

Summary of Results

On the whole, the findings indicate that institutional support, equity and inclusive practices are the most essential factors of sustainable women empowerment, whereas social empowerment and

Vol. 35 Issue 2, 2025, Pages: 721-737



sustainability awareness are supportive yet indirect. The results are very relevant to the context of the research, which can support the need to include equity-based and inclusive long-term and sustainable women empowerment strategies.

DISCUSSION

This paper has considered the connection between social empowerment, sustainability, diversity, inclusion, equity, and sustainable women empowerment outcomes. The results prove that women empowerment is greatly determined by structural and institutional factors, specifically equity-based policies and practices of inclusion. Out of the four independent variables, Equity and Institutional Support turned out as the most significant predictor of sustainable women empowerment, which implies that legal settings, equitable access to opportunities, and institutional processes have a determinant role in facilitating sustainable empowerment (Akinwale, 2023). This is in line with the previous studies that claim that empowerment programs work best when high governance structures and policy implementation (UNDP; World Economic Forum).

The findings also indicate that the practice of Diversity and Inclusion is also relevant in outcomes of women empowerment. Inclusive cultures that embrace women, despite their socio-economic, cultural and ethnic backgrounds, improve participation and leadership and sense of belonging. The result is similar to the available literature to suggest that inclusive organisational and social cultures empower sustainability by lowering systemic discrimination.

Though Sustainability Awareness and Practices and Social Empowerment had positive correlation with the outcomes of women empowerment, their independent effects had lower strength in the regression model. This implies that awareness and social participation cannot somehow be adequate unless they are incorporated in just and fair institutional settings (Abdulsalam *et al.* 2024). This has been found to be similar in other past gender and development literature that has pointed out that disjointed or symbolic gender empowerment programs of transformation do not produce any lasting effects.

This study has some limitations even though it has made contributions. Convenience sampling and self-reported data can narrow the scope of the generalisability of the results and allow bias in the answers. There is also the limitation of the cross-sectional design as it prevents the possibility of determining causal relationships between variables. These limitations can be addressed in future studies with the help of longitudinal designs, large and more heterogeneous samples, and mixed-method research. Additional research can also be done on the mediating or moderating factors, including cultural norms or economic conditions to gain a better insight into the possibility of sustainable women empowerment being attained in various settings.

CONCLUSION

The research finds that a combination of integrated strategies that give importance to equity, institutional support and inclusion is a key factor in creating sustainable women empowerment. The



Vol. 35 Issue 2, 2025, Pages: 721-737



results indicate that social empowerment and sustainability awareness are significant pillars in that their effects become significant and sustainable only upon being complemented by the equitable policies and institutional structures that are based on diversity. The most impactful factor was found to be equity and institutional support with the highlight being the importance of legal protection, equitable access to opportunities and supportive systems of governance in ensuring the perpetuation of women empowerment outcomes. The research supports the stance that the empowerment of women is not to be perceived as a one-sided measure but a multidimensional process that needs to be integrated into the framework of sustainability and DEI policies. This study is a contribution to the understanding of the way in which long-term empowerment can be reached by proving through empirical means the interrelation between social empowerment, sustainability, diversity and equity. The conclusions provide useful information to policymakers, organisations, and development practitioners who may be interested in designing sustainable and inclusive ways of empowering women that have sustainable social and economic impacts on women.

REFERENCES

References

- [1] Thommandru, A., Espinoza-Maguiña, M., Ramirez-Asis, E., Ray, S., Naved, M., & Guzman-Avalos, M. (2023). Role of tourism and hospitality business in economic development. Materials Today: Proceedings, 80, 2901-2904.
- [2] Voumik, L. C., Islam, M. A., Ray, S., Mohamed Yusop, N. Y., & Ridzuan, A. R. (2023). CO2 emissions from renewable and non-renewable electricity generation sources in the G7 countries: static and dynamic panel assessment. Energies, 16(3), 1044.
- [3] Bhargava, A., Bhargava, D., Kumar, P. N., Sajja, G. S., & Ray, S. (2022). Industrial IoT and AI implementation in vehicular logistics and supply chain management for vehicle mediated transportation systems. International Journal of System Assurance Engineering and Management, 13(Suppl 1), 673-680.
- [4] Rakhra, M., Sanober, S., Quadri, N. N., Verma, N., Ray, S., & Asenso, E. (2022). Implementing machine learning for smart farming to forecast farmers' interest in hiring equipment. Journal of Food Quality, 2022.
- [5] Al Ayub Ahmed, A., Rajesh, S., Lohana, S., Ray, S., Maroor, J. P., & Naved, M. (2022, June). Using Machine Learning and Data Mining to Evaluate Modern Financial Management Techniques. In Proceedings of Second International

Conference in Mechanical and Energy Technology: ICMET 2021, India (pp. 249-257). Singapore: Springer Nature Singapore.

- [6] Pallathadka, H., Leela, V. H., Patil, S., Rashmi, B. H., Jain, V., & Ray, S. (2022). Attrition in software companies: Reason and measures. Materials Today: Proceedings, 51, 528-531.
- [7] Sharma, A., Kaur, S., Memon, N., Fathima, A. J., Ray, S., & Bhatt, M. W. (2021). Alzheimer's patients detection using support vector machine (SVM) with quantitative analysis. Neuroscience Informatics, 1(3), 100012.
- [8] Mehbodniya, A., Neware, R., Vyas, S., Kumar, M. R., Ngulube, P., & Ray, S. (2021).



Vol. 35 Issue 2, 2025, Pages: 721-737



Blockchain and IPFS integrated framework in bilevel fog-cloud network for security and privacy of IoMT devices. Computational and

Mathematical Methods in Medicine, 2021

- [9] Akbar, A., Akbar, M., Nazir, M., Poulova, P., & Ray, S. (2021). Does working capital management influence operating and market risk of firms?. Risks, 9(11), 201.
- [10] Dutta, A., Voumik, L. C., Ramamoorthy, A., Ray, S., & Raihan, A. (2023). Predicting Cryptocurrency Fraud Using ChaosNet: The Ethereum Manifestation. Journal of Risk and Financial Management, 16(4), 216.
- [11] Polcyn, J., Voumik, L. C., Ridwan, M., Ray, S., & Vovk, V. (2023). Evaluating the influences of health expenditure, energy consumption, and environmental pollution on life expectancy in Asia. International Journal of Environmental Research and Public Health, 20(5), 4000.
- [12] Sajja, G. S., Jha, S. S., Mhamdi, H., Naved, M., Ray, S., & Phasinam, K. (2021, International Conference on Inventive Research in Computing Applications (ICIRCA) (pp. 916-921). IEEE.
- [13] Ali, N. G., Abed, S. D., Shaban, F. A. J., Tongkachok, K., Ray, S., & Jaleel, R. A. (2021). Hybrid of K-Means and partitioning around medoids for predicting COVID-19 cases: Iraq case study. Periodicals of Engineering and Natural Sciences, 9(4), 569-579.
- [14] Gupta, S., Geetha, A., Sankaran, K. S., Zamani, A. S., Ritonga, M., Raj, R., ... & Mohammed, H. S. (2022). Machine learning-and feature selection-enabled framework for accurate crop yield prediction. Journal of Food Quality, 2022, 1-7.
- [15] Gupta, S., Geetha, A., Sankaran, K. S., Zamani, A. S., Ritonga, M., Raj, R., ... & Mohammed, H. S. (2022). Machine learning-and feature selection-enabled framework for accurate crop yield prediction. Journal of Food Quality, 2022, 1-7.
- [16] Ma, W., Nasriddinov, F., Haseeb, M., Ray, S., Kamal, M., Khalid, N., & Ur Rehman, M. (2022). Revisiting the impact of energy consumption, foreign direct investment, and geopolitical risk on CO2 emissions: comparing developed and developing countries. Frontiers in Environmental Science, 1615.
- [17] Shukla, S. (2017). Innovation and economic growth: A case of India. Humanities & Social Sciences Reviews, 5(2),64-70.
- [18] Soham, S., & Samrat, R. (2021). Poverty and financial dearth as etiopathogen of psychotic and neurotic diseases. Заметки ученого, (4-1), 568-578.
- [19] Park, J. Y., Perumal, S. V., Sanyal, S., Ah Nguyen, B., Ray, S., Krishnan, R., ... & Thangam, D. (2022). Sustainable marketing strategies as an essential tool of business. American Journal of Economics and Sociology, 81(2), 359-379.
- [20] Ray, S. (2021). How Emotional Marketing can help better understand the Behavioral Economic patterns of Covid19 pandemic: Economic Judgments and Falsifications from India Samrat Ray-Alagappa University, Tamil Nadu,India. samratray@ rocketmail. com. Вестник МИРБИС, (2), 26-34.
- [21] Ravi, S., Kulkarni, G. R., Ray, S., Ravisankar, M., krishnan, V. G., & Chakravarthy, D.



Vol. 35 Issue 2, 2025, Pages: 721-737



- S. K. (2023). Analysis of user pairing non-orthogonal multiple access network using deep Qnetwork algorithm for defense applications. The Journal of Defense Modeling and Simulation,
- [22] Priya, P. S., Malik, P., Mehbodniya, A., Chaudhary, V., Sharma, A., & Ray, S. (2022, February). The relationship between cloud computing and deep learning towards organizational commitment. In 2022 2nd International Conference on Innovative Practices in Technology and Management (ICIPTM) (Vol. 2, pp. 21-26). IEEE.
- [23] Ray, S., & Leandre, D. Y. (2021). How entrepreneurial university model is changing the Indian COVID–19 Fight?. Путеводитель предпринимателя, 14(3), 153-162.
- [24] Inthavong, P., Rehman, K. U., Masood, K., Shaukat, Z., Hnydiuk-Stefan, A., & Ray, S. (2023). Impact of organizational learning on sustainable firm performance: Intervening effect of organizational networking and innovation. Heliyon, 9(5).
- [25] Rajendran, R., Sharma, P., Saran, N. K., Ray, S., Alanya-Beltran, J., & Tongkachok, K. (2022, February). An exploratory analysis of machine learning adaptability in big data analytics environments: A data aggregation in the age of big data and the internet of things. In 2022 2nd International Conference on Innovative Practices in Technology and Management (ICIPTM) (Vol. 2, pp. 32-36). IEEE.
- [26] Elkady, G., & Samrat, R. (2021). An analysis of Blockchain in Supply Chain Management: System Perspective in Current and Future Research. International Business Logistics, 1(2).
- [27] Korchagina, E., Desfonteines, L., Ray, S., & Strekalova, N. (2021, October). Digitalization of Transport Communications as a Tool for Improving the Quality of Life. In International [28] Kumar, A., Nayak, N. R., Ray, S., & Tamrakar, A. K. (2022). Blockchain-based Cloud Resource Allocation Mechanisms for Privacy Preservation. In The Data-Driven Blockchain Ecosystem (pp. 227-245). CRC Press.
- [29] Wawale, S. G., Bisht, A., Vyas, S., Narawish, C., & Ray, S. (2022). An overview: Modeling and forecasting of time series data using different techniques in reference to human stress. Neuroscience Informatics, 2(3), 100052.
- [30] Batool, A., Ganguli, S., Almashaqbeh, H. A., Shafiq, M., Vallikannu, A. L., Sankaran, K. S., ... & Sammy, F. (2022). An IoT and Machine Learning-Based Model to Monitor Perishable Food towards Improving Food Safety and Quality. Journal of Food Quality, 2022.
- [31] Verma, K., Sundararajan, M., Mangal, A., Ray, S., & Kumar, A. (2022, April). The Impact of COVID-19 to the Trade in India Using Digital, IOT and AI Techniques. In 2022 2nd International Conference on Advance Computing and Innovative Technologies in Engineering (ICACITE) (pp. 01-05). IEEE.
- [32] Bangare, J. L., Kapila, D., Nehete, P. U., Malwade, S. S., Sankar, K., & Ray, S. (2022, February). Comparative Study on Various Storage Optimisation Techniques in Machine Learning based Cloud Computing System. In 2022 2nd International Conference on Innovative Practices in Technology and Management (ICIPTM) (Vol. 2, pp. 53-57). IEEE.
- [33] Kiziloglu, M., & Ray, S. (2021). Do we need a second engine for Entrepreneurship? How well defined is intrapreneurship to handle challenges during COVID-19?. In SHS Web of Conferences (Vol. 120, p. 02022). EDP Sciences.
- [34] Nikam, R. U., Lahoti, Y., & Ray, S. (2023). A Study of Need and Challenges of Human



Vol. 35 Issue 2, 2025, Pages: 721-737



Resource Management in Start-up Companies. Mathematical Statistician and Engineering Applications, 72(1), 314-320.

- [35] Yanbin, X., Jianhua, Z., Wang, X., Shabaz, M., Ahmad, M. W., & Ray, S. (2023). Research on optimization of crane fault predictive control system based on data mining. Nonlinear Engineering, 12(1), 20220202.
- [36] Ray, S., Abinaya, M., Rao, A. K., Shukla, S. K., Gupta, S., & Rawat, P. (2022, October). Cosmetics Suggestion System using Deep Learning. In 2022 2nd International Conference on Technological Advancements in Computational Sciences (ICTACS) (pp. 680-684). IEEE.
- [37] Bhaskar, T., Shiney, S. A., Rani, S. B., Maheswari, K., Ray, S., & Mohanavel, V. (2022, September). Usage of Ensemble Regression Technique for Product Price Prediction. In 2022 4th International Conference on Inventive Research in Computing Applications (ICIRCA) (pp. 1439-1445). IEEE.
- [38] Kanade, S., Surya, S., Kanade, A., Sreenivasulu, K., Ajitha, E., & Ray, S. (2022, April). A Critical analysis on Neural Networks and Deep Learning Based Techniques for the Cloud Computing System and its Impact on Industrial Management. In 2022 2nd International Conference on Advance Computing and Innovative Technologies in Engineering (ICACITE) (pp. 325-331). IEEE.
- [39] Pallathadka, H., Tongkachok, K., Arbune, P. S., & Ray, S. (2022). Cryptocurrency and Bitcoin: Future Works, Opportunities, and Challenges. ECS Transactions, 107(1), 16313.
- [40] Li, Y. Z., Yu, Y. H., Gao, W. S., Ray, S., & Dong, W. T. (2022). The Impact of COVID19 on UK and World Financial Markets. Jundishapur Journal of Microbiology, 373-399.
- [41] Ray, S. (2022). Fraud detection in e-Commerce using machine learning. BOHR International Journal of Advances in Management Research, 1(1).
- [42] Saravanan, A., Venkatasubramanian, R., Khare, R., Surakasi, R., Boopathi, S., Ray, S., & Sudhakar, M. POLICY TRENDS OF RENEWABLE ENERGY AND NON RENEWABLE ENERGY.
- [43] Varma, A., & Ray, S. (2023). The case of amazons E-commerce digital strategy in India.
- [44] Olaoye, Olumide O., et al. "Does FinTech Reduce Gender Asymmetry in Access to Finance in Sub-Saharan Africa? Examining the Role of Digital Inclusion." Journal of International Development 37.3 (2025): 718-735.
- [45] Dixit, Nalini, et al. "Avoiding the Limits to Growth: Gross National Happiness in Bhutan as a Model for Sustainable Development."
- [46] Srivastava, Pooja Prakash, et al. "BIBLIOMETRIC ANALYSIS OF DESIGN THINKING TO DECIPHER RESEARCH TRENDS."
- [47] Rajassekharan, Dinesh, et al. "Efficient Temporal Data Mining Technique Using Dynamic Time Warped LSTM for E-Commerce Recommendation Systems." International Conference on Intelligent Systems and Sustainable Computing. Singapore: Springer Nature Singapore, 2024.
- [48] Taunk, Akanksha, and Samrat Ray. "THE ECONOMIC EFFECTS OF CHATGPT TECHNOLOGY IN THE DIGITAL AGE: OPPORTUNITIES AND CHALLENGES." Вестник Института экономических исследований 4 (32) (2023): 72-87.



MSW MANAGEMENT -Multidisciplinary, Scientific Work and Management Journal

ISSN: 1053-7899

Vol. 35 Issue 2, 2025, Pages: 721-737



[49] Tennin, K.L. and Ray, S. eds., 2024. Cases on Economic Crisis Impact on Multinational Corporations. IGI Global.

[50] Natraj, A.A., Viswanath, N.S., Sateeshchandra, N.G. and Ray, S., 2025. Study on Front Office Total Service Quality at Super-Speciality Hospitals in India-A Diagnostic Study. Journal of Management, 2, pp.244-249.

[51] Ray, S., 2024. How to be a Successful Case Writer?.