# **Educational Administration: Theory and Practice**

2024, 30(5), 1475-1485 ISSN: 2148-2403 https://kuey.net/

**Research Article** 



# Awareness & Impact Of Green Marketing As A Protection Tool For Prevention Of Global Warming- A Study Of Millennials

Dr. Beena John Jiby<sup>1\*</sup>, Dr. Yashswini Varde<sup>2</sup>, Dr. Sangeeta Rajput<sup>3</sup>, Dr Nalini Dixit<sup>4</sup>, Dr Samrat Ray<sup>5</sup>

- 1\*Associate Professor, IIMHRD(W), Pune
- <sup>2</sup>Assistant Professor, IIMS, Pune
- <sup>3</sup>Professor, IIMS, Pune
- <sup>4</sup>Assistant Professor, SBES, India
- <sup>5</sup>Dean and Head of International Relations, IIMS, Pune, India, s.ray@iimspune.edu.in

<u>Citation:</u> Dr. Beena John Jiby, et al (2024 Awareness & Impact of green marketing as a protection tool for prevention of global warming- A study of millennials, *Educational Administration: Theory and practice* 30(5), 1475-1485
Doi: 10.53555/kuey.v30i5.3106

#### **ARTICLE INFO**

#### **ABSTRACT**

Purpose:Consumers today are more mindful of their influence on the environment because of the impending environmental disaster. As a result, they seek for products by companies who address environmental issues and employ sustainable practises. The global environmental problems of pollution, global warming, forest loss, green cover loss, etc., on the rise, there is a huge danger of a disastrous event.

According to the International Energy Agency, energy-related CO2 emissions reached a record high in 2021, increasing to 36.3 gigatons. The ecological footprint is a measurement of how much energy and other elements of nature are used by people to go about their daily lives. For scientists and academics today, reducing this footprint is a critical subject.

Research Design:It is a descriptive analytical study and sampling design non probability purposive sampling

Originality/Value: The study helps to recognize the green marketing products on prevention of global warming on millennials in India. The descriptive empirical study tries to identify the demographic profile and the reasons for buying the green products and their global warming concerns.

This study on green marketing can help policy makers, business, government, and academicians to advance the consumer consciousness about sustainability and their importance for future generations. The purchasing decisions environmental impact identification helpsto persuade customers to make greener decision choices that could lessen all pollution, and reduce the detrimental environment impact.

**Keywords:** green marketing; global warming; concerns, sustainability, millennials

# **Introduction:**

Today, after facing an environmental crisis due to the climate change, customers are informed better and are taking more mindful decisions to reduce the environmental impact on earth and aims to employ sustainable practices for environmentally consciousness (Boztepe, A. (2012). To achieve this goal of sustainability, many Indian organizations have adopted green marketing initiatives to warrant that consumers have a positive perception brands along with mindful consumption (Mishra, P., & Sharma, P. (2010), which is achieved by multiple marketing activities, like making products, processes, packaging and even advertising changes, to ensure that the products are environmentally perceived safe.

The Green Marketing goal is to increase brand awareness and ensure that the brand has a influence on the environment which is positive. The following strategies are used:

☐ Produce environmentally friendly products
☐ Use environmentally benign or non-recyclable packaging
Reduce environmental impact

 $\square$  Invest in environmentally friendly initiatives in line with corporate social responsibility philosophies ( CSR )

The threat of global environmental disasters is imminent, with increasing problems such as pollution, biodiversity loss, global warming, and deforestation. This makes consumers more environmentally conscious who are prepared to spend extra money to buy environmentally friendly goods so many have begun creating green products. This green marketing initiatives is forcing companies to transform their marketing and supply chains activities to achieve environmental sustainability. As Indian brands are attracting more individuals with their green products many consumers have become mindful of their purchases and are aware of the environmental impact that can change with their buying behavior (Panchasara, D.S. (2022).

Green marketing is focused on marketing goods based on their benefits and impact to environment. It includes producing eco-friendly products by adopting sustainable practices by implementing eco-friendly packaging, along with increasing environmental awareness of its products (Veeralakshmi, M. (2020). The costs of this kind of marketing can be high, but it is defended by the organization and societal impact which is derived in this type of effort. According to Bain report Indian consumers (60%) are enthusiastic to buy sustainable products and 52% of Indian cities expected to rise their spending on these brands in subsequent years as Sustainability is becoming increasingly important to Indian consumers, Research shows that Indian consumers (20%) are social environmental conscious and health conscious (49%). The Environmental concerns have directed Indian consumers to select sustainable products compared to all substitute and competitive products available in the market.

The Importance of Green Marketing is as follows:

- 1. Green marketing raises awareness and inspires consumers to make sustainable product adoptions.
- 2. By promoting environmentally friendly goods and processes, businesses can distinguish among competitors and request consumers who are progressively demanding environmentally friendly goods.
- 3. It helps companies to promote products that reduce carbon footprint and diminish environmental impact.
- 4. Green companies can benefit due to improved customer retention rates and improved brand reputation.
- 5. Businesses can contribute by their marketing campaigns and sustainable practices .

There are many strategies that helps to create and build a green sustainable brand. Solihin, F. (2019). Green Marketing Benefits:

Increased brand loyalty and profitability, reaching new markets and reducing overhead. Few companies advocate for green marketing practices. Customers expect honesty from brands that follow this sustainability path.

Companies using Green Marketing to support Green Initiatives are working with organizations that share their goals includes: IKEA, Timberland, The Body Shop, Hersheys, Levi's, Coca-Cola, BMW etc. Everyone should have an understanding of green marketing influence and how it impacts the world.

Due to less research on consumer attitudes towards green products in developing nations, the current study attempts to inspect the Awareness & Influence of green marketing as a protection cover for prevention of global warming.

#### **Literature Review**

Introduction to green marketing.

Green marketing has helped several businesses balance their commercial operations with environmental preservation as a long-lasting strategy and focuses on selling goods features created on environmental advantages and sustainability.

Green marketing strategies is increasingly becoming more important to organizations following triple-bottom line performance evaluation who seek to recognize the role of "green" as a strategy (Grant, J. (2008). The firms, and governments not able to implement is due to the failure of consumers to accept new systems thinking, where macro-marketing viewpoints are included in various decisions. The real transformative green marketing does not occur as the natural world anthropocentric view is disregarded and are not embraced with environmental issues (Duncan, M.E. (2022). From a theoretical viewpoint of marketing theory is that green marketing should acquire from conventional marketing and discover other means other than labelling alone to promote green products and explore new determinants of green marketing practices (Rivas, A.A. (2022); Solihin, F. (2019) in India Panchasara, D.S. (2022). Four strategic routes are niche greening, passive greening, muted greening, and collaborative greening and explore select socio-demographic variables and capture the variations in consumers environmental consciousness (Crane, A. (2000).

Green marketing dissociated from practical action is considered to be perceived as greenwashing by consumers (Schmuck, D., Matthes, J., & Naderer, B. (2018). In the large body of green marketing research (Peattie, K., & Crane, A. (2005); (Dangelico, R. M., & Vocalelli, D. (2017); (Santhosh, V. (2020), there is less work on greenwashing consumers insights and its related significances (Bergeson, L. (2008). Other influential work includes (Szabo, S., & Webster, J. (2021); (Schmuck, D., Matthes, J., & Naderer, B. (2018); (De Jong, M. D., Harkink, K. M., & Barth, S. (2018).

Green product market segmentation if it is implemented well will subsequently lead to determination of the right strategic marketing measures (Jaiswal, D., et al (2020); (Garg, A. (2015). In various sectors it is a competitive advantage when analysed for their company websites, advertisements, and sustainability reports

, describe why companies are implementing it as it is the future of green marketing (Moravcikova, D. et al (2017), and green marketing is continuously growing in Practice and demand (Mishra, P., & Sharma, P. (2010); Kurisu, K. (2019). The emerging field of green marketing management helps to idnetify the important associations in marketing strategy and their impact in macroeconomic and marketing environment. The numerous green initiatives of green marketing, green innovation green supply chain management, etc. results in the push-pull impacts on business, environment, consumer and sustainable development. (Soogun, A.O. (2021); Yang, S. (2017).

A green product and its marketing helps in preventing ozone layer depletion and global warming (Makhdoomi, U., & Nazir, U. (2016) provide arguments for what has yet to be addressed. Green product market segmentation is subsequently used to determine the strategic marketing measures. The contribution of green concepts consists of functional program, additional capacity of services, marketing strategies describe the various associations in perceived benefit, green consumption behavior, their beliefs, control attitude, moral responsibility, subjective norms, behaviour control, etc (Boztepe, A. (2012).

The subject is to examine, with a descriptive level, the influence of green marketing for prevention of global warming-in Indian millennial consumers.

#### **Introduction to Global warming**

Global warming is a very vast term and this leads to 'climate change' since the pre-industrial era (between 1850 and 1900) warming of the Earth's surface is observed due to human activity, hich increase the level of greenhouse gases that trap heat in. Scientists study more about the effects of global warming, and they receive new evidence that global warming will have devastating effects on people and the planet. Climate change-related heatwaves, droughts and floods are becoming more frequent and intense, afflicting communities, and increasing death tolls.

The global-warming scenario suggests that reducing global warming may have many benefits including economic social etc. A content analysis of publications on the journal sites reveals the significance of global warming and their reduction (Kemper, J.A. (2018).

A substantial body of research reveals a modest but persistent gender disparity in beliefs relating to these topics. Typically, women tend to hold stronger pro-climate attitudes and are slightly more worried about the environment than males.. Different gender socialisation and resulting value systems (such as altruism and compassion) have been suggested as explanations by scholars.

#### **Research Methodology**

This study examines consumer awareness and global warming protection using empirical data.

Method for sampling: Primary and secondary data are used to support the current research. Many research journals, and other pertinent academic and non-academic sources were used to gather the secondary data. With the aid of questionnaires, the fundamental data is gathered via survey methodology. The goal of the survey was to learn how consumers felt about green marketing strategies, specifically whether they saw them as a means of preserving the environment or not. Using closed-ended questions, the survey's questionnaire was designed to gather information. Convenient Sampling Technique used to pick the respondents. The city of Pune has served as the study's research site.

To confirm the appropriateness of the measurements, data cleaning was done prior to data analysis. Cronbach's alpha was computed to guarantee the scale's dependability. For a scale to be considered dependable, Nunnally (1978) stated that the alpha value must be higher than 0.70. According to the study's findings, the scales are adequate for the study. The suitability of data distribution was assessed prior to data analysis for analysing relationships.

### **Hypotheses**

The hypotheses for this study are as below

Ho1: There is no relationship between gender and global warming concerns

Ho2: There is no relationship between gender and health concerns due to global warming

Ho3: There is no relationship between that Environmental protection Responsibility and enhance the quality of life

Ho4: There is no relationship between enhance the quality of life and Environmental protection Responsibility

Ho5: There is no relationship between Potential increase of product value and enhance the quality of life

Ho6: There is no relationship between Getting personal satisfaction and Emerging awareness.

Ho7: There is no relationship between Emerging awareness and Potential increase of product value

DATA ANALYSIS AND INTERPRETATION: The data is analysed by statistical tools and the software used was SPSS 22 windows version for statistical analysis, other statistical test, and testing of the research hypotheses.

# **Objectives of The Study:**

• To find out the eco-friendly product usage and intention among the customers.

- To study the consumers' awareness for green marketing.
- To know the reason for buying green products.
- To understand the various concerns regarding global warming

#### **Results**

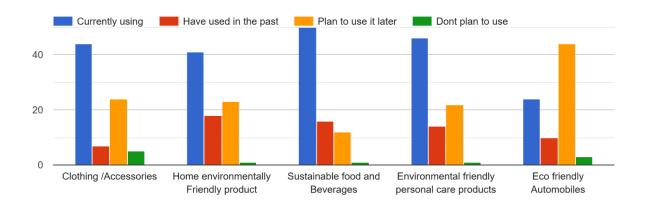
Table: 1 Demographic profile of respondents

		Frequency	Percent	Valid Percen	Cumu	lative Percent					
Age 2	20-25	83	48.3	48.3		48.3					
2	26-30	38	22.1	22.1		70.3					
5	31-35	29	16.9	16.9		87.2					
3	6 -40	22	12.8	12.8		100.0					
,	Total	172	100.0	100.0							
Educati	on C	Fraduate	58	33.7	33.7	33.7					
	I	Post Gra	114	66.3	66.3	100.0					
		Total	172	100.0	100.0						

		Frequency	Percent	Valid Percent	Cumulative Percent
Gender	Female	95	55.2	55.2	55.2
	Male	77	44.8	44.8	100.0
	Total	172	100.0	100.0	

It is inferred from the Table 1, that Demographic factors do impact buying frequency of green product. Gender has a significant impact as females are more imprudent buyers and are captivated more to new products.

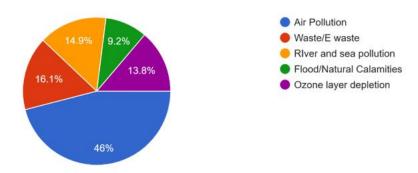
What kind of green products are you using?



The production and consumption habits are changing the environment as a result of expanding markets and rising consumer volumes. Environmental sustainability and consumer personal conscience are identified as motivating elements for buying various green products, The above analysis shows the usage pattern of millennials for various green products. The purchase intention describes whether a customer intends to

purchase a good or service in the future. The likelihood of buying increases with an increase in purchase intention and a buyer would acquire a particular product or service to fulfil his environmental needs. Consumers who are satisfied with a brand's image are more likely to be satisfied and plan to buy it in their future purchase decisions .

### **Global warming concerns**



The effects of human-caused global warming are already present, cannot be undone and will continue if greenhouse gases is released into the atmosphere. The production and consumption habits are severely harming the environment as a result of expanding markets and rising consumer volumes.

The global climate change and its various problems has already occurred due to the increased emissions of greenhouse gases which cause significant effects on the environment and climate. The above analysis shows the views of the respondents relating to global warming concerns and shows air pollution is viewed as a main danger and concern.

Table:2 -T test for Global warming concerns

				_	~.		10	2.5
	Gender	Ν		F	Sig.	t	df	Mean Difference
which of the following concern you the most	Female	95	Equal variances assumed	33.772	.000	1.258	170	.306
	Male	77	Equal variances not assumed			1.299	168.319	.306

There are numerous factors individual, social, and cultural aspects that affect the general public's awareness of the subject on global warming impact perspectives. The above analysis tries to examine how men and women hold different perspectives on global warming concerns.

Closing gender gaps in knowledge and understanding is important. Although same percentage of men and women believe that global warming is occurring and that it is being caused by humans, study shows that women continuously perceive a greater danger that anthropogenic climate change would hurt them personally and future generations. The finding is that women regard climate warming as dangerous compared to male. In order to further engage consumers in climate issues, the issue should therefore receive more focus in global warming education and outreach initiatives.

Table: 3 Think health is affected because of Global warming issues

	Gender	N		Std. Deviation							
							F	Sig.	t		Mean Difference
Is health affected because of global warming issues	Female	95	4.07	.912	Equal assumed	variances	4.969	.027	1.663	170	.281
	Male	77	3.79	1.00	Equal not assum	variances ied			1.626	144.850	.281

When addressing climate change, women perception is different on various global warming issues on the Likert scale where 1 is less affected and 5 is highly affected. The raising educational attainment of women shows their difference in opinion towards significant health impact caused by global warming

Table: 4-The reason for buying green marketed products.

		Std. Deviation		Environmental protection Responsibility	enhance the	Potential	Getting	Emerging awareness
Environmental protection	0.65	901	Pearson Correlation	1	.751**	.628**	.424**	.661**
Responsibility	3.67	.831	Sig. (2- tailed)		.000	.000	.000	.000
enhance the quality of life		.832	Pearson Correlation	.751**	1	.732**	.519**	.624**
	3.49	.032	Sig. (2- tailed)	.000		.000	.000	.000
Potential increase of product value	3.41	.759	Pearson Correlation	.628**	.732**	1	·447**	.719**
			Sig. (2- tailed)	.000	.000		.000	.000
Getting personal satisfaction	3.76	1.111	Pearson Correlation	.424**	.519**	·447**	1	.674**
			Sig. (2- tailed)	.000	.000	.000		.000
Emerging awareness	3.61	.931	Pearson Correlation	.661**	.624**	.719**	.674**	1
			Sig. (2- tailed)	.000	.000	.000	.000	

The above Table 4 shows that Environmental protection Responsibility and enhance the quality of life is positively correlated (r = .751, p< .01) and significant. hence there is a statistically significant correlation between the two and is statistically significant.

The above analysis illustrates that r>.751 which means there is a relationship between enhance the quality of life and Environmental protection Responsibility value is strong. Between both. Both variables move positively in same direction. Thus, it is concluded that there is a correlation relationship which is significant between the quality of life and Environmental protection Responsibility.

The analysis confirms r>.732 that the relationship between Potential increase of product value and enhance the quality-of-life value is strong. Both variables move positively in same direction. The Sig. (2-tailed) value is .000. and hence concluded that there is a significant correlation among the two.

The analysis confirms r>.674 that the relationship between Getting personal satisfaction and Emerging awareness value, Both variables move positively in same direction. The Sig. (2-tailed) value is .000. The correlation relationship is significant between the two.

The analysis confirms r>.719 that means the relationship between Emerging awareness and Potential increase of product value is strong relating to both. Both variables move positively in same direction. and, hence concluded that there is a significant relationship correlation between the two.

The Table 4 confirms the variable means are above average. The average score of 3.588, on the Likert scale where 1 is strongly disagree and 5 is strongly agree. This is more than the neutral score of 3, which implies their views for the reason to buy green marketed products which is positive.

Table:5

				Change Statistics	Change Statistics				
R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change	Durbin-Watson
.791ª	.625	.616	.518	.625	68.016	4	163	.000	1.935

## Table:6

#### ANOVAb

M	odel	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	73.061	4	18.265	68.016	.000a
	Residual	43.773	163	.269		
	Total	116.833	167			

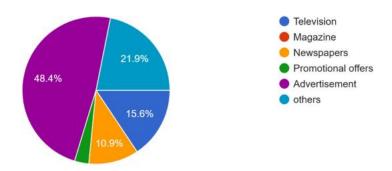
a. Predictors: (Constant), [Emerging awareness], [enhance the quality of life], [Getting personal satisfaction], [Potential increase of product value]

b. Dependent Variable: [Environmental protection Responsibility]

The above Table 5 shows the R2 value, Environmental protection Responsibility. The (.625) R square or (62.5%) of the variation is in Environmental protection Responsibility as explained by large inducing factors, and their predictor's accounts for the variables difference.

The Table 6, the regression analysis analyses about the accounted variation. The table evidence indicates that the model is good enough in predicting the independent variables significantly as P< .05 with F-value of 68.016.

#### **Awareness Of Green Products**



The extent to which consumers know about green products influences their decision to purchase them. In this study most respondents have good knowledge of green products and Advertisement is increasing the awareness of green products.

#### Discussion

The number of consumers who care about the environment has shifted their preferences from conventional to green goods and has significantly increased during the past decade. According to customer attitudes towards green products and the study's findings identified eco-conscious customers that have a favourable perspective on eco-friendly green goods and emphasised the attitudes of consumers, and attitudes between the categories were discussed.

# **Implications**

Considering the analysis, it is crucial for academics and marketers to comprehend the idea, characteristics, and full picture of green consumers who are conscious of global warming and their action consequence.

The educated people, are actively involved in environmental causes and supports sustainable living by being the biggest consumers of these goods and encourage others as well.

The aim of this study is to make the green product to be environmental safe. It comprises of a variety of marketing actions, such as alterations to the product, process, packaging, or even advertising.

Several green marketing techniques can aid in creating a sustainable and eco-friendly product.

- 1. Sustainable Design: To assure the use of most ethically and sustainable raw materials with least amount of waste generation by altered process in all areas of production, marketing supply.
- 2. Accountability: If green marketing chosen as brand strategy, it must be demonstrated by its seriousness to redefine the brand to reflect its responsibility.
- 3. Green selling: Due to the methods used, green items can be made available at less price.

#### **Conclusion**

Businesses who aim to satisfy consumer demand are making products sustainable for the environment. In order to become more environmentally sensitive, green marketing encourages companies to modify every step of their marketing and supply chain process. When firms set an example consumers purchasing decisions are altered due to their new purchasing habits.

When done effectively, green marketing can be very powerful to improve the environment. Its aspects include integrating new packaging methods, developing eco-friendly products, embracing sustainable company practises, and more. Although they can be expensive, they are justified by the benefits businesses can get from this form of marketing.

Limitations and future research

The results cannot be generalized to all because it was conducted among Millennials in a single city. Other emerging nations should carry out similar research. More cross-cultural research can be done to compare customer attitudes, awareness towards green products and global warming. The investigation of the relationship between customer attitudes and actual behaviour may also be expanded in further studies.

#### Reference

- 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). 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. Ray, S. (2020). How COVID-19 changed dimensions of human suffering and poverty alleviation: economic analysis of humanitarian logistics. Вестник Астраханского государственного технического университета. Серия: Экономика, (4), 98-104.
- 10. 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.
- 11. 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.
- 12. 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.
- 13. Sajja, G. S., Jha, S. S., Mhamdi, H., Naved, M., Ray, S., & Phasinam, K. (2021, September). An investigation on crop yield prediction using machine learning. In *2021 Third International Conference on Inventive Research in Computing Applications (ICIRCA)* (pp. 916-921). IEEE.
- 14. 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.
- 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. 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.
- 17. 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.
- 18. Shukla, S. (2017). Innovation and economic growth: A case of India. *Humanities & Social Sciences Reviews*, *5*(2), 64-70.
- 19. Soham, S., & Samrat, R. (2021). Poverty and financial dearth as etiopathogen of psychotic and neurotic diseases. Заметки ученого, (4-1), 568-578.
- 20. 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.
- 21. Роков, А. И., Дубаневич, Л. Э., & Рэй, С. (2021). Повышение экономической эффективности труда за счет изменения системы оплаты. *E-Scio*, (9 (60)), 53-62.

- 22. Ray, S. (2021). How Emotional Marketing can help better understand the Behavioral Economic patterns of Covid-19 pandemic: Economic Judgments and Falsifications from India Samrat Ray-Alagappa University, Tamil Nadu, India. samratray@ rocketmail. com. Вестинк МИРБИС, (2), 26-34.
- 23. Ravi, S., Kulkarni, G. R., Ray, S., Ravisankar, M., krishnan, V. G., & Chakravarthy, D. S. K. (2023). Analysis of user pairing non-orthogonal multiple access network using deep Q-network algorithm for defense applications. *The Journal of Defense Modeling and Simulation*, 20(3), 303-316.
- 24. 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.
- 25. Ray, S., & Leandre, D. Y. (2021). How entrepreneurial university model is changing the Indian COVID—19 Fight?. Путеводитель предпринимателя, 14(3), 153-162.
- 26. 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).
- 27. 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.
- 28. 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).
- 29. 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 Scientific Conference on Innovations in Digital Economy* (pp. 22-34). Cham: Springer International Publishing.
- 30. 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.
- 31. 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.
- 32. 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.
- 33. 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.
- 34. 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.
- 35. 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.
- 36. Samajpaty, S., & Ray, S. (2020). Innovation strategies in health economics: a force that makes blood move and game of gravity in it-futuristic economic plans. *Московский экономический журнал*, (9), 397-409.
- 37. Nikam, R. U., Lahoti, Y., & Ray, S. (2023). A Study of Need and Challenges of Human Resource Management in Start-up Companies. *Mathematical Statistician and Engineering Applications*, 72(1), 314-320.
- 38. 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.
- 39. 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.
- 40. 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.
- 41. 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.

- 42. Pallathadka, H., Tongkachok, K., Arbune, P. S., & Ray, S. (2022). Cryptocurrency and Bitcoin: Future Works, Opportunities, and Challenges. *ECS Transactions*, 107(1), 16313.
- 43. Li, Y. Z., Yu, Y. H., Gao, W. S., Ray, S., & Dong, W. T. (2022). The Impact of COVID-19 on UK and World Financial Markets. *Jundishapur Journal of Microbiology*, 373-399.
- 44. Samrat, R., Elkadyghada, E. G., Rashmi, N., & Elena, K. (2022). UPSKILLING AND RESKILLING FOR A GREENER GLOBAL BUSINESS ECOSYSTEM: WEB 4.0 PERSPECTIVE. Журнал прикладных исследований, 1(11), 49-60.
- 45. Ray, S. (2022). Fraud detection in e-Commerce using machine learning. *BOHR International Journal of Advances in Management Research*, *1*(1).
- 46. Samrat, R. (2021). WHY ENTREPREUNERAL UNIVERSITY FAILS TO SOLVE POVERTY ERADICATION?. Вестник Тувинского государственного университета.  $N^0$  1 Социальные и гуманитарные науки, (1), 35-43.
- 47. Ray, S. (2021). Are Global Migrants At Risk? A Covid Referral Study of National Identity. In Трансформация идентичностей: опыт Европы и России (pp. 26-33).
- 48. Saravanan, A., Venkatasubramanian, R., Khare, R., Surakasi, R., Boopathi, S., Ray, S., & Sudhakar, M. POLICY TRENDS OF RENEWABLE ENERGY AND NON RENEWABLE ENERGY.
- 49. Varma, A., & Ray, S. (2023). The case of amazons E-commerce digital strategy in India.
- 50. Ray, S. (2023). Can Change Management Be Disrupted Through Leadership Stretegies?: Evidence From Start-Up Firms in Asia. In *Change Management During Unprecedented Times* (pp. 100-127). IGI Global.
- 51. Al Noman, M. A., Zhai, L., Almukhtar, F. H., Rahaman, M. F., Omarov, B., Ray, S., ... & Wang, C. (2023). A computer vision-based lane detection technique using gradient threshold and hue-lightness-saturation value for an autonomous vehicle. *International Journal of Electrical and Computer Engineering*, 13(1), 347.
- 52. Nayak, N. R., Kumar, A., Ray, S., & Tamrakar, A. K. (2023). Blockchain-Based Cloud Resource Allocation Mechanism for Privacy Preservation (No. 9700). EasyChair.
- 53. Ray, S. (2023). XA-GANOMALY: AN EXPLAINABLE ADAPTIVE SEMI-SUPERVISED LEARNING METHOD FOR INTRUSION DETECTION USING GANOMALY IN GLOBAL ECONOMIC DYNAMIC SHIFTS©. ЭКОНОМИЧЕСКАЯ СРЕДА, 4.
- 54. Zamani, A. S., Rajput, S. H., Bangare, S. L., & Ray, S. (2022). Towards Applicability of Information Communication Technologies in Automated Disease Detection. *International Journal of Next-Generation Computing*, 13(3).
- 55. Korchagina, E. V., Barykin, S. E., Desfonteines, L. G., Ray, S., Shapovalova, I. M., & Repnikova, V. (2022). Digitalisation of Ecosystem-Based Management and the Logistics Potential of the Arctic Region. *Journal of Environmental Assessment Policy and Management*, 24(03), 2250034.
- 56. Zamani, A. S., Rajput, S. H., Bangare, S. L., & Ray, S. (2022). Towards Applicability of Information Communication Technologies in Automated Disease Detection. *International Journal of Next-Generation Computing*, 13(3).
- 57. Ray, S., Korchagina, E. V., Druzhinin, A. E., Sokolovskiy, V. V., & Kornev, P. M. (2022, April). Emergence of the New Start Up Ecosystem: How Digital Transformation Is Changing Fintech and Payment System in Emerging Markets?. In *International Scientific Conference "Digital Transformation on Manufacturing, Infrastructure & Service"* (pp. 621-638). Cham: Springer Nature Switzerland.
- 58. Wagh, S., Nikam, R., & Ray, S. (2022). Exploration of the Higher Education System's Mechanism and Impact on More Than Just the Effective Growth of the Indian Economy. *Globsyn Management Journal*, 16(1/2), 85-91.
- 59. Ray, S., Korchagina, E. V., Druzhinin, A. E., Sokolovskiy, V. V., & Kornev, P. M. (2022, April). Emergence of the New Start Up Ecosystem: How Digital Transformation Is Changing Fintech and Payment System in Emerging Markets?. In *International Scientific Conference "Digital Transformation on Manufacturing, Infrastructure & Service"* (pp. 621-638). Cham: Springer Nature Switzerland.
- 60. Chakraborty, T., & Ray, S. (2022). STRATEGIES OF CYBERLOAFING AND PHUBBING WHICH AFFECT WORKPLACE DIGITAL TRANSFORMATION. Московский экономический журнал, (10), 430-446.
- 61. Ray, S., & Pal, R. P. (2022). IMPORTANCE OF ENTREPRENEURSHIP AND INNOVATION IN THE HEALTHCARE INDUSTRY DURING THE COVID-19 PANDEMIC. *Beneficium*, (2 (43)), 85-93.
- 62. Samrat, R., Pratap, P. R., & Korchagina, E. V. (2022). WORLD ECONOMY AND INTERNATIONAL СООРЕКАТІОN: МИРОВАЯ ЭКОНОМИКА И МЕЖДУНАРОДНОЕ СОТРУДНИЧЕСТВО.
- 63. Ray, S., & Pal, R. P. (2021). ARE WE TRANSFORMING OUR PAYMENT THROUGH INNOVATION IN FINTECH AND THE DIGITAL ECONOMY? PERSPECTIVES FROM ASIAN DRAMA IN FINTECH INNOVATION©.
- 64. Samrat, R. (2021). NEUROMARKETING EVIDENCES FROM THE ECONOMICS OF BOOKSELLERS ON THE STREETS: COVID-19 PERSPECTIVES AND IMPLICATIONS ON LUXURY BRANDS GLOBALLY. Экономика и управление инновациями, (2), 83-90.

- 65. Korchagina, E. V., & Ray, S. (2021). TRIPLE HELIX CONCEPT IN INNOVATIVE UNIVERSITY DEVELOPMENT MODEL.
- 66. Ray, S., & Pal, R. P. (2021). ARE WE TRANSFORMING OUR PAYMENT THROUGH INNOVATION IN FINTECH AND THE DIGITAL ECONOMY? PERSPECTIVES FROM ASIAN DRAMA IN FINTECH INNOVATION©.
- 67. Самрат, Р. (2021). НЕЙРОМАРКЕТИНГ В ЭКОНОМИКЕ КНИЖНЫХ МАГАЗИНОВ НА УЛИЦАХ: ПЕРСПЕКТИВЫ ГЛОБАЛЬНОГО ВЛИЯНИЯ COVID-19 НА ЛЮКСОВЫЕ БРЕНДЫ. ЭКОНОМИКА И УПРАВЛЕНИЕ, (2), 83-90.
- 68. Ray, S., Muhammad, G., & Adnan, M. The administrative role of principals: Insights and implication in secondary schools of.
- 69. Pradhan, D., Ray, S., & Dash, A. A Critical Review on Sustainable Development of Green Smart Cities (GSCs) for Urbanization. *communities* (Fig. 1), 13, 15.
- 70. Van Minh, N., Huu, N. N., & Ray, S. Responses of varied quinoa (Chenopodium quinoa Willd.) genotypes grown in Central Highlands, Vietnam.
- 71. Ray, S., Nikam, R., Vanjare, C., & Khedkar, A. M. Comparative Analysis Of Conventional And Machine Learning Based Forecasting Of Sales In Selected Industries.
- 72. Ray, Samrat, Sumitra Roy, and Anil Varma. "Impa
- 73. ct of innovative marketing strategy behind Balaji wafers brand profitability in Pune city." *World Journal of Advanced Research and Reviews* 20.1 (2023): 1240-1250.
- 74. Hamid, Zeeshan, et al. "Value Investing: From Perspective of Interpretivism." *Journal of Informatics Education and Research* 3.2 (2023).
- 75. Varma, Anil, and Samrat Ray. "Green Solution??-The Case of Electric And Hybrid Vehicles." (2023).
- 76. Varma, A., & Ray, S. (2023). Revolutionizing the Indian market through eco-friendly sustainable products: The rise of vegan beauty inspired by nature. *Int. J Res Marketing Manage Sales*, *5*(2), 18-26.
- 77. Rajput, Sangeeta, and Samrat Ray. "How digital marketing evolved over time: A bibliometric analysis on Scopus database." *World Journal of Advanced Research and Reviews* 21.3 (2024): 1546-1560.
- 78. Varma, A., Varde, Y., & Ray, S. (2024). Reinventing the retail experience: The case of amazon GO. *World Journal of Advanced Research and Reviews*, 21(3), 1123-1133.
- 79. Islam, M., Shehzad, F., Ray, S., & Abbas, M. W. (2023). Forecasting the population growth and wheat crop production in Pakistan with non-linear growth and ARIMA models. *Population and Economics*, 7(3), 172-187.
- 80. Ray, S., Jain, K., Birru, P., & Mohata, R. (2024). A case study of BYJU'S failure. World Journal of Advanced Research and Reviews, 21(3), 674-689.
- 81. Tiwari, S., Sapra, R., & Ray, S. (2023). Cryptocurrency Market Contagion: Market Uncertainty, Complexity, And Dynamic Portfolios. *Journal of Namibian Studies: History Politics Culture*, 35, 5295-5318.