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ARTIFICIAL INTELLIGENCE FOR A GREENER FUTURE: CONSUMER PERCEPTIONS ON CLIMATE AND RESOURCES

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ABSTRACT

Climate change and resource depletion are two of the most vital challenges facing the contemporary world. While countries attempt to achieve sustainability objectives and respond to environmental unpredictability, Artificial Intelligence (AI) integration is proving to hold compelling solutions. Machine learning, predictive analysis, and remote sensing AI will continue to be integrated to advance climate modeling, maximize resource efficiency, track environmental consequences, and guide decision-making on policy. Although its potential is increasing, the effective implementation of AI in these fields is not only determined by technological potential but also by the attitudes, awareness, and trust of different stakeholders such as policymakers, scientists, students, and the public. The present study found out and examined the perceptions regarding the use of AI in climate action and natural resource management. A convenience sampling technique was employed to select a sample of 100 consumers from the Erode District. Data were collected using a structured questionnaire designed to capture relevant information regarding the study variables. To analyze the relationships and effects among these variables, regression analysis was conducted, enabling the identification of significant predictors and the strength of their influence on the outcome measures. By analyzing awareness levels, levels of trust, perceived risks and benefits, and adoption barriers, the study aims to identify knowledge gaps among the public and contribute towards more effective, inclusive, and ethically sound deployment of AI technologies. The results should prove useful in policy making, education, and sustainable development planning, with long-term contributions towards the responsible and effective use of AI in tackling environmental issues.

KEYWORDS: *Climate Change, Artificial Intelligence, Perception, Attitude, Public.*

INTRODUCTION

Environmental degradation and climate change are the most urgent global issues of the 21st century. While the world continues to look for efficient and sustainable alternatives, Artificial Intelligence (AI) is proving to be an effective tool to confront climate problems and enhance resource optimization. AI is able to process large volumes of environmental information, predict climatic trends, maximize energy consumption, and aid decision-making in agriculture, water resources, and city planning. Artificial Intelligence for Climate Action and Natural Resource Management is the cutting-edge use of AI technologies like machine learning, data analysis, and predictive modeling to solve the urgent global issues of climate change as well as the sustainable management of natural resources. AI is essential to the maximization of climate action as it makes possible precise climate simulation, prediction of extreme weather patterns, and assisting in carbon footprint tracking and emissions mitigation. At the same time, it supports efficient resource utilization by means of intelligent systems for water conservation, precision agriculture, energy efficiency, and waste minimization. This incorporation of AI in environmental strategies is a paradigm shift towards attaining sustainability, enhancing decision-making, and developing climatic risk resilience.

NEED OF THE STUDY

As the world grapples with intensifying environmental challenges—ranging from climate change, resource depletion, to ecosystem degradation—there is an immediate necessity for novel, data-based, and scalable solutions. Artificial Intelligence (AI) has been a revolutionary force with unprecedented potential to aid the world's climate action and resource management. AI technologies are being used in a wide range of ways, from climate pattern prediction and the optimization of energy networks to increasing agricultural production and water resource management. Nonetheless, the success of these technologies relies not just on their technical potential but also on being perceived, understood, and accepted by stakeholders such as policymakers, scientists, experts, and the public. Knowing the perceptions about AI in such areas is very important for a number of reasons. First, public trust, awareness, and perceived risks or benefits influence greatly the acceptance and use of AI-based tools in environmental applications. Lacking societal backing, even the most sophisticated technologies can prove ineffective. Second, as promising as AI is, issues pertaining to ethical use, data privacy, green cost (e.g., the energy usage of AI systems), and access with equity have to be addressed through participatory dialogue

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and informed decision-making. Thirdly, there is still a lack of empirical research that reflects the way various groups understand the role of AI in climate and resource application, particularly across geographically and socioeconomically diverse settings. The study is thus necessary to determine current levels of awareness, trust, and willingness to adopt AI for climate and resource management. It also aims to determine perceived barriers and enablers that affect the integration of AI into sustainability approaches. In capturing these perceptions, the research hopes to enlighten policymakers, technology innovators, educators, and environmental stakeholders about the social aspects of AI, thereby facilitating more ethical, equitable, and efficient AI deployments to address some of the world's most pressing environmental problems

STATEMENT OF THE PROBLEM

Climate change and natural resource degradation remain important challenges to global sustainability, environmental security, and human health. To counteract them, governments, scholars, and organizations are increasingly looking to cutting-edge technologies—specifically Artificial Intelligence (AI)—to aid climate action and maximize the effectiveness of resource management. AI technologies provide the potential to process large environmental data sets, model climate patterns, improve resource optimization, and enable evidence-based decision-making. Concurrent with the increasing interest and investment in AI solutions, there is a critical knowledge gap in knowing how these technologies are viewed by multiple groups of stakeholders, such as professionals, policy-makers, students, and the broader public. The successful embedding of AI for climate and resource management is not just dependent on technical innovation but also on the social, ethical, and perceptual aspects of technology uptake. Misunderstandings, ignorance, suspicion, or moral issues might hamper the deployment and adoption of AI solutions, especially in societies whose technology uptake is still in development. In addition, varying degrees of exposure to AI by regions, levels of education, and occupations might bring with them uneven attitudes that impact policy support, funding allocation, and user uptake. Thus, the issue this research seeks to solve is the lack of appropriate understanding of existing views, awareness, trust, and concerns towards the application of AI in climate efforts and resource management. Without this, attempts at promoting, developing, or applying AI-powered environmental solutions could fail, be ineffectual, or be resisted. This research aims to bridge that gap by investigating the attitudes and perceptions of multiple stakeholders to ensure that AI technologies are not only scientifically valid but also socially acceptable and responsibly deployed.

REVIEWS OF LITERATURE

The use of Artificial Intelligence (AI) for climate action and natural resource management is becoming a central area of inter-disciplinary study. AI technologies like machine learning, deep learning, and data analytics have large potential in mitigating environmental issues by facilitating more intelligent monitoring, forecasting, and decision-making (Pandey et al., 2023). Pandey et al. (2023) carried out an extensive bibliometric overview of how AI, machine learning, and big data have been applied in diverse fields such as soil examination, water quality assessment, and crop management. Their research highlighted the growing use of AI tools in maximizing resource effectiveness and environmental sustainability. When it comes to infrastructure, Akomea Frimpong et al. (2023) critically reviewed the application of AI in addressing climate risks in public–private partnership (PPP) projects. Based on their research, they found tools like remote sensing, fuzzy logic, and Building Information Modeling (BIM) as useful in hazard identification and mitigation planning in climate-risk areas. Verdecchia et al. (2023) were interested in the idea of "Green AI" that encourages the creation of energy-efficient algorithms. Based on their systematic review, it was concluded that AI systems, if not optimized, can be hungry for huge computational resources, indirectly causing carbon emissions. This underlines the need to create sustainable AI models for environmental use. Amnuaylojaroen (2025) discussed the potential of AI models in assisting with climate resilience in urban planning. The research highlighted enhancements in accuracy of prediction and infrastructure flexibility but also indicated problems like data quality and explainability of the algorithms, impacting deployment at scale. Mehryar et al. (2024) assessed the contribution of AI to climate resilience policymaking, highlighting the merits of exposure and vulnerability estimation but also reporting a deficiency of incorporation into wider resilience planning and local community-based planning models. From a more general sustainability outlook, Kumar et al. (2022) conducted a review of 287 studies under a PRISMA framework and concluded that AI enables circular economy, smart energy systems, and resource efficiency. They also emphasized the importance of inclusive policy for access to AI technologies so that it is accessible for all. Cullen-Knox et al. (2020) considered the ethical and governance ramifications of AI in environmental decision-making. They contended that excessive dependence on AI without human control might have unforeseen effects, and stressed the need for trust, transparency, and stakeholder engagement.

OBJECTIVE OF THE STUDY

To know the consumers' perception on artificial intelligence in climate action and resource management in Erode District.

METHODOLOGY

A convenience sampling technique was employed to select a sample of 100 consumers from the Erode District. Data were collected using a structured questionnaire designed to capture relevant information regarding the study variables. To analyze the relationships and effects among these variables, regression analysis was conducted, enabling the identification of significant predictors and the strength of their influence on the outcome measures. The following perception variables were used in the study.

1. AI has great potential to support climate change monitoring and projection.
2. AI technologies enhance the effectiveness of natural resource management (water, energy, agriculture).
3. Application of AI to climate action has greater advantages than drawbacks.

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4. Development of AI applications in environmental management must be a policy priority.
5. I am confident that AI systems will make the right and ethical judgments in environmental situations.
6. There is adequate public awareness regarding the function of AI in climate issues.
7. AI can optimize the use of energy and lower greenhouse gas emissions.
8. Incorporation of AI in climate policies will result in more climate-friendly development.
9. I am worried about the environmental footprint of the energy used to operate AI systems.
10. Governments and organizations are already doing as much as they should to advance AI for environmental sustainability.

RESULTS AND DISCUSSIONS

As the international urgency for action against climate change grows stronger, Artificial Intelligence (AI) has become an agent of change in climate action and sustainable resource utilization. From energy consumption optimization to predictive modeling of natural disasters, AI-based solutions increasingly find their way into the fold. But whether these technologies are successful is highly dependent on public acceptance and attitudes. This research uses multiple regression analysis to investigate the intricate linkages between different socio-demographic, psychological, and informational variables and consumers' view of the role of AI in climate action and resource management.

TABLE 1
CONSUMERS PERCEPTION ON ARTIFICIAL INTELLIGENCE IN CLIMATE ACTION AND RESOURCE MANAGEMENT MULTIPLE REGRESSION ANALYSIS

Variables	Coefficient	SE	't' value	'p' value
(Constant)	36.488	5.324	6.853	.000
Gender	-1.726	1.647	-1.048	.298
Age	-.774	.652	-1.187	.239
Location of residency	-.944	.781	-1.208	.230
Occupation	-1.195	.618	-1.934	.056
Marital status	3.396	1.273	2.667	.009*
Monthly income	2.909	2.280	1.276	.205
Awareness of climate issues	-.428	1.319	-.325	.746
Family size	-2.265	1.770	-1.280	.204
Type of family	1.652	.773	2.138	.035**
Educational qualification	-.119	.615	-.194	.847
Use of AI technologies	.448	.950	.472	.638
Ownership of resources	1.195	.570	2.096	.039**
Access to technology	.455	.799	.569	.571
R Value	0.486			
R^2 Value	0.237			
F Value	2.049**			

*** - Significant at 1% level; ** - Significant at 1% level.**

The results of the multiple regression analysis reveal that the model explains approximately 23.7% of the variation in consumers' perception of artificial intelligence in climate action and resource management (R^2 = 0.237), with an overall statistically significant model fit (F = 2.049, $p < 0.01$). Among the independent variables, marital status (p = 0.009), type of family (p = 0.035), and ownership of resources (p = 0.039) emerged as significant predictors of consumer perception, indicating that individuals who are married, belong to specific family structures, and possess more resources are likely to have more favorable views on the use of AI in environmental management. Other variables such as gender, age, residency, income, and education did not show a statistically significant impact on perception, suggesting that demographic factors alone may not fully explain variation in attitudes toward AI in this context. The findings highlight the importance of socio-familial and resource-based factors in shaping public perception of AI's role in sustainability efforts.

RECOMMENDATIONS AND CONCLUSION

The research examined consumers' attitudes towards Artificial Intelligence (AI) in climate action and resource management, employing a standard questionnaire and multiple regression analysis on data obtained from 100 respondents in Erode District. The results of regression reveal that though the total model was statistically significant, few socio-economic indicators—i.e., marital status, family type, and resource ownership—had a significant role in shaping perception. This indicates that consumers' individual and household situations, as opposed to broad demographics such as age or income, are more significant in determining their attitudes towards the contribution of AI to environmental sustainability. While climate concerns were well-recognized across the population, awareness and consumption of AI technologies were not significant predictors, suggesting a possible mismatch between technological access and public interest. The results underscore the necessity of increased outreach, education, and inclusive

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approaches to enhance consumer comprehension and trust towards AI-powered environmental actions.

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