



ASSESSMENT OF THE IMPACT OF LEVEL OF ENVIRONMENTAL AWARENESS ON PUBLIC HEALTH SERVICES IN MANDERA WEST SUB- COUNTY, MANDERA COUNTY, KENYA

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ABSTRACT

Environmental awareness plays a pivotal role in sustainable development and public health improvement globally. This study examines the impact of environmental awareness on public health services in Mandera West Sub-County, Mandera County, Kenya. The research underscores the relationship between heightened environmental awareness and enhanced public health outcomes, revealing that communities with greater environmental consciousness exhibit better waste management practices, reduced exposure to pollutants, and lower incidences of waterborne diseases. In Mandera West, the harsh climatic conditions, coupled with inadequate infrastructure and limited access to clean water, exacerbate public health challenges. Despite efforts by governmental and non-governmental organizations, the region continues to face high rates of waterborne diseases and poor sanitation. This study identifies a significant gap in the integration of environmental awareness into public health strategies. Utilizing a mixed methodology approach, the research incorporated both quantitative and qualitative methods, involving 141 participants from various levels of the Mandera Sub-County departments of Environment, Energy, Climate Change, Natural Resources, Water Safety, and Public Health. The findings highlight the critical need for enhanced environmental education and awareness programs to improve public health services. The study advocates for targeted educational initiatives and public awareness campaigns to foster a culture of environmental responsibility among stakeholders. By addressing the root causes of health issues through increased environmental awareness, this research provides actionable insights for policymakers, health practitioners, and educators to develop interventions that enhance both environmental and public health outcomes in Mandera West Sub-County. The study contributes to the existing literature by demonstrating the importance of environmental education in achieving sustainable public health improvements.

Keywords: Environmental Awareness, Public Health Services, Mandera West Sub-County, Sustainable Development, Environmental Education

BACKGROUND OF THE STUDY

Environmental awareness is crucial for sustainable development and public health improvement worldwide. The relationship between environmental awareness and public health services has been extensively studied, with findings indicating that higher levels of environmental awareness contribute significantly to better health outcomes (World Health Organization, 2020). This relationship is underpinned by the fact that environmental awareness influences individual and collective behaviors towards environmental conservation, which in turn impacts public health (United Nations Environment Programme, 2019). Globally, efforts to increase environmental awareness have been integrated into public health policies to mitigate environmental hazards and promote healthier communities (Organization for Economic Co-operation and Development, 2021).

In Africa, environmental challenges such as pollution, deforestation, and inadequate waste management are prevalent, exacerbating public health issues (World Health Organization Africa, 2021). The level of environmental awareness among populations in various African countries has been linked to the effectiveness of public health services. Studies in regions such as West Africa have shown that communities with higher environmental awareness tend to have better health outcomes due to more effective waste management practices and reduced exposure to pollutants (Ndiaye, Tall, & Seck, 2018). Despite these findings, many African countries still face significant challenges in raising environmental awareness due to factors such as limited educational resources and socio-economic constraints (Adams & Boateng, 2020).

Kenya, like many other African nations, faces critical environmental and public health challenges. Mandera West Sub-County in Mandera County is a representative area where these challenges are particularly pronounced. Environmental awareness in this region directly impacts the effectiveness of public health services, with lower levels of awareness often correlating with poorer health outcomes (Muthoni, Kariuki, & Ngugi, 2019). Research in Kenyan contexts has emphasized the need for increased environmental education and awareness programs to improve public health services (Njuguna & Wanjiku, 2020). In Mandera West, efforts to enhance environmental awareness could potentially lead to significant improvements in public health services, including better management of waste, reduced incidences of waterborne diseases, and improved overall community health (Okeyo & Gachanja, 2018).

STATEMENT OF THE PROBLEM

Mandera West Sub-County, located in the arid and semi-arid regions of Mandera County, Kenya, faces significant environmental and public health challenges. The sub-county's harsh climatic conditions, coupled with inadequate infrastructure and limited access to clean water, exacerbate these challenges (Government of Kenya, 2020). Despite ongoing efforts by governmental and non-governmental organizations to address public health issues, the region continues to experience high rates of waterborne diseases, poor sanitation, and inadequate waste management (UNICEF Kenya, 2019).

A critical factor influencing the effectiveness of public health services in Mandera West Sub-County is the level of environmental awareness among its residents. Environmental awareness encompasses knowledge about environmental issues, understanding the impact of

human activities on the environment, and adopting practices that contribute to environmental sustainability (Muthoni et al., 2019). In Mandera West, low levels of environmental awareness have been linked to poor waste management practices, unsafe water consumption, and inadequate sanitation facilities, all of which have detrimental effects on public health (Njuguna & Wanjiku, 2020).

The current public health initiatives in Mandera West Sub-County have not sufficiently addressed the root cause of many health issues, which is as a result of the lack of environmental awareness. Without a significant increase in environmental education and awareness programs, the region is unlikely to see substantial improvements in its public health services (Okeyo & Gachanja, 2018). This situation presents a pressing need to investigate the extent to which environmental awareness impacts public health services in Mandera West Sub-County.

The problem, therefore, lies in the insufficient integration of environmental awareness into public health strategies, leading to suboptimal health outcomes. This study seeks to explore the relationship between environmental awareness and public health services in Mandera West Sub-County. It aims to identify specific areas where increased environmental awareness could lead to improved public health services and outcomes. By addressing this gap, the study intends to provide actionable insights that can guide policy makers, health practitioners, and educators in developing targeted interventions to enhance both environmental awareness and public health in the region. This research will fill a critical gap by highlighting the need for enhanced environmental education and its potential to transform public health practices and outcomes in this underserved area.

Significance of the study

This study will provide valuable insights into the relationship between environmental awareness and public health services in Mandera West Sub-County, Kenya, filling a significant gap in the literature by integrating these two crucial areas (Muthoni, Kariuki, & Ngugi, 2019). The findings will guide policymakers in designing more effective health strategies that incorporate environmental education programs, leading to better waste management, improved sanitation, and enhanced health outcomes (UNICEF Kenya, 2019). Healthcare providers, educators, and community leaders can develop educational programs based on the study's recommendations, empowering residents with knowledge and skills for sustainable environmental practices (Njuguna & Wanjiku, 2020). By raising environmental awareness, the study aims to foster a sense of responsibility and proactive behavior among community members, contributing to sustainable development and long-term health improvements (Okeyo & Gachanja, 2018). Furthermore, the study will serve as a foundation for future research in environmental health and public health services, offering a model for exploring similar issues in different contexts and informing subsequent studies. Improved public health through enhanced environmental awareness can lead to healthier, more productive communities with lower healthcare costs, contributing to the overall economic development of Mandera West Sub-County (Government of Kenya, 2020).

CONCEPTUAL DEFINITION OF TERMS

Environmental Awareness: Environmental awareness refers to the recognition and understanding of environmental issues, including the knowledge of environmental protection and conservation practices. It involves being conscious of the impact human activities have on the environment and the importance of sustainable practices to mitigate negative effects.

Public Health Services: Public health services encompass a range of services provided by government and non-government organizations aimed at protecting and improving the health of the community. These services include disease prevention, health education, sanitation, vaccination, and other measures to promote and maintain public health.

Impact: Impact in this context refers to the effect or influence that the level of environmental awareness has on the provision, quality, and effectiveness of public health services. It involves assessing how changes in environmental awareness among the population can lead to improvements or challenges in public health outcomes.

Mandera West Sub-County: Mandera West Sub-County is an administrative division within Mandera County, located in the northeastern region of Kenya. It is characterized by its unique geographical, cultural, and socio-economic attributes which influence local public health dynamics.

Mandera County: Mandera County is one of the 47 counties in Kenya, situated in the northeastern part of the country. It borders Somalia to the east and Ethiopia to the north, and it is known for its arid climate, pastoralist lifestyle, and challenges related to health service delivery and environmental management.

THEORETICAL FRAMEWORK

The theoretical framework for assessing the impact of the level of environmental awareness on public health services in Mandera West Sub-County is grounded in the Health Belief Model (HBM) and the Social Ecological Model (SEM). The HBM posits that individuals' health behaviors are influenced by their perceptions of the severity and susceptibility to health issues, the benefits of taking preventive actions, and the barriers to taking such actions (Jones et al., 2015). In the context of environmental awareness, the HBM suggests that if individuals in Mandera West Sub-County perceive environmental issues as significant threats to their health, and they recognize the benefits of engaging in environmentally conscious behaviors, they are more likely to adopt practices that promote better public health outcomes. This model is particularly relevant in understanding how awareness and perceptions drive health-related behaviors and the uptake of public health services in the community.

The SEM offers a broader perspective by considering the multiple levels of influence on health behaviors, including individual, interpersonal, community, organizational, and policy levels (Golden & Earp, 2012). This model is essential for understanding the complex interplay between environmental awareness and public health services in Mandera West Sub-County. It highlights how individual knowledge and attitudes are shaped by interactions with family, peers, and community members, as well as by the broader socio-economic and political environment.

For instance, public health initiatives in Mandera West can be more effective if they address not only individual behaviors but also community norms, organizational practices, and supportive policies that promote environmental sustainability and public health (Schneider & Stokols, 2017). By integrating both the HBM and SEM, this study provides a comprehensive framework for analyzing how environmental awareness influences public health services and identifies multi-level strategies for improving health outcomes in Mandera West Sub-County.

Research Methodology

The study adopted a mixed methodology approach, incorporating both quantitative and qualitative methods.

Research Design

The study adopted a descriptive research design. A descriptive survey enabled the researcher to describe the characteristics of the variables of interest.

Target Population

For this study, the unit of observation comprised 700 employees at various levels—strategic, tactical, and operational—in the Mandera Sub-County departments of Environment, Energy, Climate Change, Natural Resources, Water, Safety, and Public Health. This included natural resource technicians and specialists, meteorologists, GIS specialists, water and sewage specialists, environmental health and safety officers, microbiologists, and environmental health and safety specialists. Specifically, there were 70 employees at the strategic level, 210 employees at the tactical level, and 420 employees at the operational level, as detailed in the Mandera County Public Service Board Human Resource Data (2023).

Table 1: Target Population

Respondents	Population	Proportion (%)
Strategic	70	10.0
Tactical	210	30.0
Operational Levels	420	60.0
Total	700	100

Source: Mandera County Public Service Board Human Resource Data (2023)

Sample Size and Sampling Procedures

The researcher used the Krejcie and Morgan sampling formulae table. The researcher used the Krejcie and Morgan sampling formula table to determine the sample size. According to this table, a target population of 700 requires a sample size calculation using a specific formula. By applying this formula, the researcher determined that the appropriate sample size for a population of 700 is 141. This conclusion was reached by referencing the table, which provides a predefined sample size for various population ranges based on a confidence level and margin

of error. This was at a 95% confidence interval, implying an appropriate margin of error of up to 5%, which is recommended for social studies. Therefore, in this study, the Krejcie and Morgan sampling table ensured that the sample size was relative to the population size for accurate inferences. The final sample is shown in Table 2.

Table 2: Sample Size

Respondents	Population	Proportion (%)
Strategic	14	10.0
Tactical	42	30.0
Operational Levels	85	60.0
Total	141	100

Source: Researcher (2023)

Data Collection Instruments

A semi-structured questionnaire was the primary tool for gathering data from community members. It consisted of sections covering personal information and the study's objectives, with both open and closed questions. Respondents filled out the questionnaires, which were then collected for analysis.

Response Rate

The study had a sample size of 141 participants, out of which 132 replies were obtained, resulting in a response rate of 93.6%. These findings indicate that almost 93.6% of the persons who were asked to participate in the study gave their responses, suggesting a relatively high degree of involvement and willingness to cooperate among the participants.

DEMOGRAPHIC INFORMATION

Gender

The gender breakdown chart shows that out of a total of 132 respondents, there are 56 males and 76 females. 42.4% of the respondents were male, while 57.6% were female. Overall, the data indicates a greater proportion of females in the sample as opposed to males. The disparity between genders is visually depicted in the accompanying pie chart, with the female sector being greater than the male segment, thereby clearly displaying the gender imbalance in the sample.

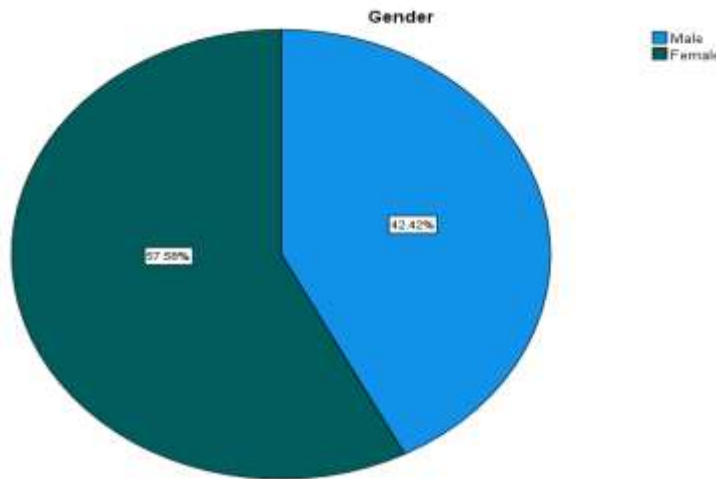


Figure 1: Gender

Age

Figure 2 displays a bar graph that clearly depicts the age distribution of the respondents. Each bar represents a certain age group, and the height of the bar indicates the number of people who responded from that group. The graph illustrates that the age group of 31-35 years exhibits the largest frequency, with 40 respondents. It is followed by the age group of 26-30 years, which has 29 respondents, and the age group of 36-40 years, which has 28 respondents. The age categories with the lowest frequencies are the 21-25 years and 46-50 years groups, each consisting of 6 respondents, while the over 50 years category has just 4 respondents.

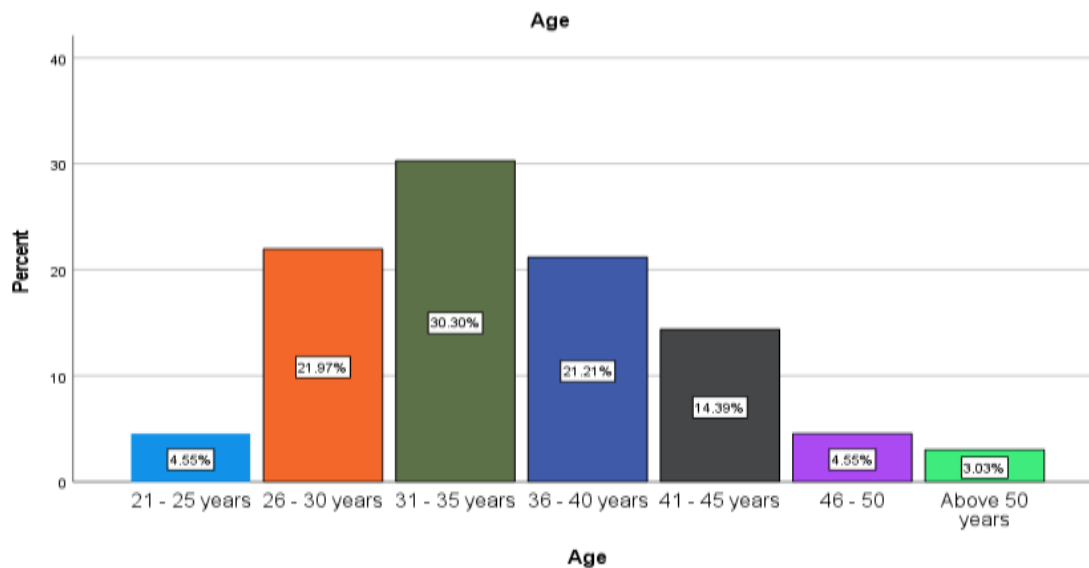


Figure 2 : Age

Descriptives Findings

The table displays descriptive statistics on respondents' awareness and understanding of environmental issues. A total of 132 participants supplied replies for each statement, which were graded on a scale ranging from 1 to 5. The initial statement, "I possess knowledge regarding air pollution, land pollution, water pollution, and the extinction of endangered

animals," elicited responses that varied from a minimum of 1 to a maximum of 5. The average score was 3.1288, with a standard deviation of 1.64575. This indicates a moderate level of consciousness with significant variation across participants. The second statement, "I possess knowledge of significant environmental obstacles confronting my community or county," is rated on a scale of 1 to 5, with an average score of 3.1591 and a somewhat greater standard deviation of 1.66614. This suggests a comparable amount of consciousness as the initial remark, but with a little wider array of reactions. The third statement, "I can identify common pollutants (e.g., carbon dioxide, lead, plastic)," had a mean score of 3.0758 and a standard deviation of 1.64210. This indicates moderate awareness and similar variability. The fourth statement, "I am cognizant of the ramifications of deforestation, climate change, or habitat destruction," had a mean of 3.0833 and the largest standard deviation of 1.69436 among all statements. This indicates that although the overall degree of awareness is modest, there is significant variation in the levels of awareness across the responders. The statement "I am aware of local environmental organizations or initiatives" has a mean score of 3.0985 and a standard deviation of 1.68903. This indicates a moderate level of consciousness with significant variation.

Table 3: Awareness of Environment Governance

	Descriptive Statistics				
	N	Minimum	Maximum	Mean	Std. Deviation
I am aware about air pollution, land pollution, water pollution, and the extinction of endangered animals	132	1.00	5.00	3.1288	1.64575
I am aware of major environmental challenges facing my community or county	132	1.00	5.00	3.1591	1.66614
I can identify common pollutants (e.g., carbon dioxide, lead, plastic)	132	1.00	5.00	3.0758	1.64210
I am aware of impact of deforestation, climate change, or habitat destruction.	132	1.00	5.00	3.0833	1.69436
I am aware of local environmental organizations or initiatives	132	1.00	5.00	3.0985	1.68903
Valid N (listwise)	132				

Source: Field Data (2024)

Summary of Findings

The study conducted a thorough analysis of the participants' awareness of environmental governance and its consequences. Researchers utilized descriptive statistics, correlation analysis, and regression modeling to investigate the connection between individuals' awareness levels and many facets of environmental governance, including adherence to legislation, citizen involvement, and health outcomes. The results emphasized the pivotal significance of consciousness in advancing efficient environmental management and cultivating favorable health consequences. The study emphasized the significance of educational activities and public awareness campaigns in empowering communities to actively engage in environmental stewardship and advocate for sustainable practices.

CONCLUSION

The study emphasized the crucial importance of awareness in supporting efficient environmental awareness practices and cultivating favorable health outcomes within communities. Our analysis has emphasized the significance of focused educational activities and public awareness campaigns in enabling citizens to actively engage in environmental stewardship efforts. In the future, it is important to focus on increasing knowledge and fostering a culture of environmental awareness and responsibility among all parties involved. By promoting a more profound comprehension of environmental awareness matters and cultivating active participation from residents, legislators, and organizations, we may strive to establish healthier and more sustainable communities for both current and future generations.

RECOMMENDATIONS

Enhanced Public Awareness- Implement targeted educational initiatives and public awareness campaigns to enhance understanding of environmental governance issues and foster a culture of environmental responsibility among stakeholders.

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