ABSTRACT

Mining is considered one of the essential economic activities contributing to economic progress. Authorities, the general public, stakeholder organizations, and individuals have all expressed concern about the spatial distribution, social, economic, and environmental impacts of mining on affected areas. The study examined Meru County's spatial distribution and social, economic, and ecological impacts on the residents. Cultures are diversifying in a way that mining is becoming an alternative source of income. Agriculture is still being practiced alongside mining. The general objective of this study was to develop a GIS-based spatial distribution of mining site patterns and associated impact zonation map in order to identify risk prone geo-locations in Meru County's Igembe South Sub County. The study also determined the impact of quarry stones on Meru County settlements regarding social, economic, and environmental factors. At a 0.05 level of significance, three hypotheses were evaluated. Ho1: There is no significant spatial distribution of quarry stone mining sites in Igembe South Sub County, Meru County. Ho2: There is no significant relationship between quarry stone mining and social-economic activities in Igembe South Sub County, Meru County communities. Quarry stone mining has no significant environmental impact on the communities in Igembe South Sub-County, Meru County. Other Kenyan counties were not included in the research. Data was gathered from five Igembe South communities. Data was collected from primary and secondary sources. Using PRA methodologies and processes, primary data was collected from participants' notes to detect mining-related problems in the study area, and an informal and formal survey and pair-wise assessment was used. The communities and mines in the Akachiu ward are as follows: Auki, Amwamba, Nceme, Kirindine, and Tiira. Information was obtained from 300 respondents through surveys and interviews. Data gathering was limited by prejudice and reluctance to respond to specific questions. Some of these issues were resolved by segmenting the target population and confirming field observations. Data were analysed using the nearest neighbour analysis method and descriptive means, median, and mode statistics. Further Chi-Square tests were used to generate inferential statistics. Results were then presented using tables, maps, graphs, and pie charts. Results established that mining activities have damaged land in Igembe South Sub-County, reducing food production and agricultural demands and polluting water supplies in the area, including contaminated streams. Pollution and noise are present in the area. It was affirmed that the residents know the environmental consequences of mining. The research demonstrates that mining has an impact on the environment, as well as community social and economic well-being. In light of the County Government of Meru's efforts at restoration and intervention, such as re-afforestation, the mining companies and the County Government of Meru are reviewing their methods of operation and providing alternatives to the affected areas. Mining's environmental impact should be reduced by rethinking the environmental management strategy.