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Rural Roads Rehabilitation and Households' Wellbeing

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Abstract: *In Kenya, infrastructure development is essential to both the overall well-being of the local populations and the nation's economic progress. Particularly during the rainy season and during dry spells, Kericho County remains impassable. As a result, the study's goal was to look at Kericho County's rural road wellbeing and rehabilitation. The mixed research design and pragmatic philosophical paradigm served as the study's guiding principles. A sample of 382 households was chosen from the target population of 206,036 households in Kericho County, where the survey was conducted. To assess quantitative data, descriptive statistics were used; these included measures of dispersion and central tendency. Utilizing content analysis based on meaning analysis, qualitative data was examined and integrated with quantitative data There was a positive significant effect of rural road rehabilitation on household well-being (R=0.760, P<0.05). Rural road rehabilitation had improved through clearing road bushes on blind spots; however, pavement development and drainage were below average. The study concluded that rural road rehabilitation positive significantly influences household well-being. The study recommended to the County Government to increase paved towns, compensate people in expansion of roads and establish a robust system of monitoring and evaluating road projects.*

Key: *Rural Roads Rehabilitation, Households' Wellbeing, Mixed Research Methods, Kericho County, Kenya.*

I. Introduction

Globally, an approximately one billion people, or about 40% of the rural population served by the International Development Association (IDA), the World Bank's fund for the world's poorest countries, lack reliable access to the road network. As a result, rural road investment is a significant component of government and aid agency budgets. The World Bank alone spends in the region of US$ 1 billion per year on rural roads; this excludes expenditure on main and secondary roads (World Bank, 2017). Despite the importance of the topic, there is some dissatisfaction with the evidence to demonstrate the impact of rural road development. Although there have been quite a number of studies of impact, giving varying results, much of it has been anecdotal and in 2008 one reviewer concluded that there were relatively few studies that had been carried out with proper controls and subject to rigorous analysis and statistical testing (De Walle, 2008).

Rural roads across Africa are inadequate in coverage and quality; they are also usually poorly maintained, rehabilitated and therefore poorly served by low-cost, high-volume transportation providers. In developing countries, particularly in least developed countries (LDCs) like Kenya, the technical knowledge for infrastructure development in rural mountainous regions is still limited, which results in technical shortcomings and significant environmental impact drivers of progress Roads as a priority area for the government of Kenya. Attempts to improve roads access for left behind groups benefit from the fact that road transport is a priority area for the Government of Kenya (Starkey and Hine, 2014; DFID, 2013).

Inadequate rural roads make it hard for farmers to produce more and to transport any surpluses to the market. The roads are inadequate in coverage and quality; poorly rehabilitated and maintained, and therefore poorly served by low-cost, high-volume transportation providers (Pederson, 2010). The road transport infrastructure has over recent years deteriorated to the extents that 47% of the classified road network is currently in a failed condition and requires reconstruction. According to Republic of Kenya (2019) in Kenya the national rural population stands at 32,732,596 people which is 68.9 % of the total population while those living in urban areas are 14,362,838 people which is 27.3% of the total population in the Country.

According KNBS (2019) Kericho County has one of the highest population of people living in rural areas standing at 757,339 people, Nandi 650,684, Bomet 759,580, Nyamira 418, 672 while Kisumu is 459,891 people. Currently in Kericho County some roads are still impassible especially during rainy season and dusty during dry

periods thus hindering free movement of products and services. Generally, the County is well-known in producing tea, coffee, maize and among other food stuffs and cash crops.

According to Kericho County Development Plan 2013-2017) priority has been given to water, ICT, energy, agriculture and road sector which it believes boosts the economic growth of between 20 and 30 percent over the next three years. The County has also made development on roads, which include; 450 kilometers of new murram roads that have been built at a cost of Sh450 million.

II. Literature Review

A study in Peru looked at the impact of rehabilitating trails (non-motorised roads) and engineered, earth feeder roads by comparing household surveys before and after rehabilitation (Escobal and Ponce, 2012). The rehabilitated infrastructure was associated with greater incomes from non-agricultural sources. Incomes and opportunities were greatest on the rehabilitated feeder roads, but the rural residents invested their extra income in livestock. This was interpreted to be due to their assumption that the transport benefits would be temporary as the roads would probably fall into dis-repair again (Escobal and Ponce, 2012). Impact evaluations on agricultural feeder roads in Zambia also showed complex patterns: agricultural production and cotton sales increased and many communities considered improved access was responsible for a better quality of life: but some communities did not consider their lives had improved because of the road project" (Kingombe, 2011).

Mu & Van de Walle (2017) is critical about the impacts of rural roads on market development. She suggests that small road improvement projects could have vastly larger impacts on local market development if they were targeted to places with initially lower market development, and equally important, accompanied by complementary social and economic policies aimed at improving certain attributes (e.g. adult literacy) or reducing the disadvantages of others (policies to reverse the effects of historical discrimination towards ethnic minority groups) that interact with roads to reduce their impacts. In theory, producer prices increase after road rehabilitation due to the lower transport costs which are transmitted to local producers in a competitive transport market. This evidence is supported by RAMP Program however, the theory is also contradicted in a scientific very credible research conducted in Sierra Leone (Casaburi 2013) which shows, that improved roads reduced market prices of local crops. These price effects were stronger in markets that are further from major urban centres and in less productive areas. "

As part of the evaluation, a socio-economic impact study was undertaken to identify whether the Roads 2000 Programme had a measurable impact on community development and the local economy. Fieldwork helped to determine whether the project outcomes of the rehabilitation programme had been achieved, with respect to increased employment opportunities, improved agricultural output and easier access to markets, health, food security, education and other services. During the field surveys, a large volume of qualitative and anecdotal data was collected from eleven communities living along a selection of rural roads in Murang'a and Nyandarua Regions using focus groups and key informant interviews. A key theme of the socio-economic impact survey was to identify the impact of improved access on food security, agricultural production and marketing by comparing the Roads 2000 project roads with a selection of control roads (Hine and Bradbury, 2016).

Road improvements in the rural areas may lead to higher land values and more intensive land use. In addition, the same road infrastructure may also lead to agricultural production, increased and expanded use of modern agricultural tools, machines, inputs, and modes of transportation as well. A rural road infrastructure in Lesotho can increase the access of the rural population to health and education services. A road network is also likely to increase marketing activities, as the new marketing patterns arise with road improvements (Government of Lesotho 2005). All of these activities are intended to create jobs for the rural poor, and thus tackle the problem of poverty.

III. Research Methodology

Concurrent triangulation design was used in the study, which combines two research methodologies, one of which is essentially used to validate or verify the other's findings (Creswell, 2014). Both exploratory and explanatory research designs were used in this study. One of the 47 counties that make up the Republic of Kenya is Kericho County, where the study was carried out. There were 206,036 households in the study's total study population. A sub-county administrator and the chief achiever for each sub-county were also interviewed as part of the target population to gain their perspectives on the development of rural roads and how it affects local welfare, totaling twelve interviews. In addition, a Focus Group Discussion with eight participants was held to provide additional understanding for each sub-county in the study, for a total of six discussion groups. A sample size of 382 houses was chosen, out of a target population of 206,036 households, for 12 interviews and 6 focus groups with 8 participants each. Households and employees of the County's rural roads department made up the study's sample size. Using focus groups, interview guides, and structured questionnaires, data were gathered from rural roads department employees and households. The study employed a structured

questionnaire to gather information from Kericho County household respondents. Key informant interviews were another instrument used in this investigation. Qualitative in-depth interviews with key informants are conducted with individuals who possess firsthand knowledge of on goings within the community. Chiefs, opinion leaders, and employees of the county's rural roads were among those questioned. The study held six focus groups, one in each of the Sub-Counties, to provide more insight into the development of rural roads. Additionally, the researcher supplied village managers and chiefs with information. In order for the qualitative data to either support or contradict the quantitative data, the quantitative data was collected first. To assess quantitative data, descriptive statistics were used; these included measures of dispersion and central tendency. Frequency counts and percentages are included in the descriptive statistics. Statistical conclusions were reached by means of correlation analysis.

IV. Results and Discussions

Rural roads rehabilitation is very key to enhancing the rural household welfare in the community. This ensures that the roads are in good shape to facilitate the movement of goods, services and people from one point to another. The results for rural roads rehabilitation were obtained from questionnaires, interview responses and focus group discussions. The questionnaires were based on agreeability five-point Likert scale which result to mean as the key measure of central location while interview and focus group discussions were examined using content analysis. The results from the questionnaire were presented in Table 1.

Table 1: Rural road rehabilitation

Rural Road Rehabilitation	Strongly Disagree (1)	Disagree (2)	Undecided (3)	Agree (4)	Strongly Agree (5)	Mean
Pavements are developed to improve the road.	74 (19.5%)	105 (27.6%)	23 (6.1%)	162 (42.6%)	16 (4.2%)	2.84
The county government have crated pavements, culverts and drainage in our roads.	66 (17.4%)	75 (19.7%)	74 (19.5%)	131 (34.5%)	34 (8.9%)	2.97
Bridges and water drainage have been improve in our roads to improve its quality.	35 (9.2%)	116 (30.5%)	85 (22.4%)	94 (24.7%)	50 (13.2%)	3.02
The road condition has been improved by the county government by clearing of bushes on blind spots.	16 (4.2%)	84 (22.1%)	54 (14.2%)	165 (43.4%)	61 (16.1%)	3.45

Source: Field Data (2022)

The results in Table 1 showed that majority of rural road had not develop road pavement improve its quality as indicated by 47.1% however, there is also considerable 46.8% respondents who attest that their rural centres are paved. The mean of 2.84 implies that most of rural areas road have not paved. Therefore, the road pavement in the county is still below average in rural areas. The results are contrary with sentiments put across by Escobal and Ponce (2012) in Peru that rehabilitation of non-motorized roads and development of feeder roads contribution to income and opportunities to the rural residents. Similar, results were obtained in the current results where pavement and culverts were constructed to improve the road conditions. Additionally, it is also contrary to Kigombe's (2011) study in Zambia which showed that pavement of roads and rehabilitation of roads have improve access which is associated with better quality of life. According to the interview response to "Are the roads paved? If yes explain", the results indicated that 8(66.7%) agreed and 4(33.3%) disagreed. Most of the road in major rural center are in progress of pavement or has being paved according to the result which have encourage safety among different road users.

The County Government have crated pavements, culverts and drainage to less than half its residents since 43.4% of the respondents agreed and 37.1% disagreed. The mean of 2.97 was obtained which revealed that crated pavement, culverts and drainage is still an issue in Kericho County. The improvement of bridges and culvert opened up more rural areas for agricultural production. This lowed the cost of transportation given local producers a competitive transport to market place. In Sierra Leone a study by Casaburi (2013) showed similar trends in improvement of roads leading to stronger market values of their products. Further, the results of the study are in line with the idea put across by (Kingombe, 2011) that Impact evaluations on agricultural feeder roads in Zambia also showed complex patterns: agricultural production and cotton sales increased and many

communities considered improved access was responsible for a better quality of life: but some communities did not consider their lives had improved because of the road project" This concurs with the interview responses in the current study that it bridges and road rehabilitation had improved significantly the connectivity between villages leading to high productivity in the areas which were once not accessible.

According to 39.7% of Kericho residents believe that the county has not provided proper bridges and water drainage services to the reside, however, 37.9% believe that in their area the county has provided those services. The mean obtained was 3.02 which indicated their county performance in developing proper brides and water drainage were above average. The results of the study are contrary to (Casaburi 2013) idea that producer prices increase after road rehabilitation due to the lower transport costs which are transmitted to local producers in a competitive transport market. This evidence contrary to RAMP Program who noted that improved roads through building bridges and water drainage reduced market prices of local crops. It is further contrary to what Government of Lesotho (2005) acknowledged that Road improvements in the rural areas may lead to higher land values and more intensive land use. In addition, the same road infrastructure may also lead to agricultural production, increased and expanded use of modern agricultural tools, machines, inputs, and modes of transportation as well. A rural road infrastructure in Lesotho can increase the access of the rural population to health and education services. A road network is also likely to increase marketing activities, as the new marketing patterns arise with road improvements. The response to interview question, "Have the county reconstructed drainage to improve quality of the road? Explain" showed that all respondents agreed that the county government has ensured good water drainage. According to the interviewee 11,

> *"Yes, roads are well drainage in Londiani. The roads are well constructed to ensure that the water drains and reduce the potholes by filling in marram."*

In response to, "Is there any bridge construction around your residence? If yes explain what contribution it has given to your community" showed that half of the respondent agreed and half disagreed. Those who agreed pointed that the new bridges in the community assisted in increase connectivity between village separated by rivers. Interviewee 10 answered that,

"Yes, there is a new bridge that have increased connectivity from one village to the other and ease transportation."

A considerable 59.5% of the respondents agreed that the road condition had improved through the county government initiative of clearing of bushes on blind spots, however, 26.3% of the respondents were of the contrary opinion. A mean of 3.45 revealed that the county government has taken a good initiative of clearing the road bushes along blind spots. what Clearing bushes mainly in blind spot as done by county government of Kericho had improved the condition of the roads in rural areas. The results of this study is in agreement with Hine and Bradbury (2016) ideas based on survey data pointed that that road project that enhance the quality of the road has impacted on rural area by improving food security, agricultural production and market. Through clearing of roads accessibility based on increased and expanded use of modern agricultural tools, machines, inputs, and modes of transportation. Further it is supported by Mu & Van de Walle (2017) who acknowledged that rural roads rehabilitation has a great effect on market development and she suggests that small road improvement projects could have vastly larger impacts on local market development if they were targeted to places with initially lower market development, and equally important, accompanied by complementary social and economic policies aimed at improving certain attributes (e.g. adult literacy) or reducing the disadvantages of others (policies to reverse the effects of historical discrimination towards ethnic minority groups) that interact with roads to reduce their impacts.

The focus group discussion respondent to, "discuss whether rural roads were rehabilitated based pavements, drainage reconstruction and bridge reconstruction?" which revealed that most of the road are not yet paved except the major town centers, however, the highway road have proper drainage. The respondents also pointed that the county government has created the pavement and culverts to ease drainage. The road has also been cleared regularly especially near blind sports.

Pearson correlation analysis was used to examine the interrelationship among variables. The results were presented in Table 2;

Table 4.11: Correlation Analysis

		RRM	RRR	HHW
RRR	Pearson Correlation		1	.760**
	Sig. (2-tailed)			.000

	N		380	380
HHW	Pearson Correlation			1
	Sig. (2-tailed)			
	N			380

According to the results in 2, rural road rehabilitation also had high positive correlation with household welfare (R=0.760 respectively). New road construction was among the least with moderately high positive correlation with household welfare (R=0.675). Hence, rural road rehabilitation had positive correlation with household welfare.

$H_0$2: Rural roads rehabilitation does not significantly affect on local households' welfare in Kericho County, Kenya.

The second null hypothesis was rejected which implied that rural roads rehabilitation had significant effect on local households' welfare (R=0.760, P<0.05). This implies that rural roads rehabilitation had significant influence on households' welfare.

Ponce (2012) assessed the impact of rehabilitating trails and engineered, earth feeder roads. The rehabilitated infrastructure was associated with increased incomes from non-agricultural sources, with the most significant impact observed on the feeder roads. However, rural residents invested their extra income in livestock, possibly due to the assumption that the transport benefits were temporary and the roads might fall into disrepair again. Impact evaluations on agricultural feeder roads in Zambia, as noted by Kingombe (2011), revealed complex patterns, with agricultural production and cotton sales increasing in some communities. However, not all communities perceived an improvement in their quality of life due to the road project.

Mu & Van de Walle (2017) critically examined the impacts of rural roads on market development. They suggested that small road improvement projects could have more substantial impacts if targeted to places with initially lower market development, coupled with complementary social and economic policies.

The theory that road rehabilitation leads to increased producer prices due to lower transport costs is supported by the RAMP Program but contradicted by research in Sierra Leone (Casaburi, 2013), which found that improved roads reduced market prices of local crops, especially in more remote and less productive areas.

The Roads 2000 Programme, evaluated by Hine and Bradbury (2016), included a socio-economic impact study to assess its effects on community development and the local economy. Field surveys collected qualitative data from communities along rehabilitated roads in Murang'a and Nyandarua Regions. The study aimed to identify the impact of improved access on food security, agricultural production, and marketing by comparing Roads 2000 project roads with control roads.

Moreover, road improvements in rural areas are recognized to lead to higher land values and more intensive land use. The same infrastructure can also enhance agricultural production, the use of modern agricultural tools, and access to health and education services in Lesotho (Government of Lesotho, 2005). The road network is seen as a catalyst for increased marketing activities, creating job opportunities for the rural poor and addressing poverty-related challenges. Overall, these studies emphasize the multifaceted impact of rural road rehabilitation on various aspects of household well-being, underscoring the need for nuanced and context-specific approaches to maximize positive outcomes.

V. Summary Conclusions and Recommendations

Summary

The results revealed that majority of rural roads in the county have not undergone pavement development to enhance their quality, with 47.1% of respondents indicating this. Conversely, 46.8% attest that their rural centres are paved, resulting in a mean of 2.84, suggesting that overall, road pavement in rural areas remains below average. The county government's efforts in creating pavements, culverts, and drainage are perceived as insufficient by less than half of the residents, with 43.4% agreeing and 37.1% disagreeing, yielding a mean of 2.97. Regarding the provision of proper bridges and water drainage services, 39.7% of respondents believe the county has not delivered, while 37.9% feel the services are adequately provided, with a mean of 3.02 indicating an above-average performance. Additionally, a significant 59.5% of respondents agree that the county government's initiative to clear road bushes on blind spots has improved road conditions, with a mean of 3.45 suggesting a positive impact of this initiative. Therefore, there was a significant effect of rural road rehabilitation on household welfare in Kericho County.

Conclusions

The study concluded that there was positive significant effect of rural road rehabilitee on household welfare in Kericho County. The second objective pointed out challenges in pavement development and drainage infrastructure. While there are perceived inadequacies in pavement development and drainage efforts, the positive impact of initiatives such as clearing road bushes on blind spots. This calls for further attention to pavement development and drainage infrastructure improvement to enhance the effectiveness of these initiatives.

Recommendations

Considering the challenges highlighted in pavement development and drainage infrastructure, the County Government should invest in comprehensive road improvement projects. This includes developing strategies to enhance pavement quality, create effective drainage systems, and construct culverts and pavements. Adequate resources and planning are crucial to overcoming these challenges and ensuring that rural road infrastructure meets quality standards.

Implementing a robust system for monitoring and evaluating road projects is crucial to ensure their effectiveness and identify areas for improvement. The County Government should establish mechanisms to regularly assess the progress and impact of road maintenance, rehabilitation, and construction projects. This includes gathering feedback from residents and making data-driven decisions to enhance the efficiency of road infrastructure initiatives.

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