

Impact of Community Involvement in Environmental Protection in Rwanda

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Abstract

The involvement of local community is crucial in ensuring sustainable protection of environment since the community uses the available resources without thinking of future generations. In developing countries like Rwanda, natural resources and environment are the primary sources of livelihoods; hence their protection is of great importance to community welling and sustainable development as well. This study assessed the impact of community involvement in environmental protection. The authors conducted a pilot study for the project led by the Rural Development Inter-Diocesan Service (RDIS) and considered three sectors (Kibilizi, Kansi and Gikonko) of Gisagara district in the southern Rwanda. The authors randomly selected thirty (30) respondents from the above three sectors. The structured questionnaire helped to collect the study related information analyzed with Microsoft Excel. The results indicated that 77% of respondents were female while 23% were male and more than 60% were aged between 36 and 50. The informants largely (53%) raised the cutting off trees without permission as a cause of environmental degradation. This was attributed to collection of and/or search for firewood mentioned by 67%. However, using of improved cook stoves as the initiative developed, as mentioned by 100% led to the reduction of pressure on woodlands, reduction of indoor air pollution and improvement of the local families' lives. Thus, the RDIS initiatives contributed to protecting environment in this area. However, since the percentage of using improved cook stoves is still low compared to the total population, it is good to continue mobilizing the community to refer to this approach. In addition, more sensitization mainly increasing people's literacy as well as increasing local community's livelihoods would contribute a lot to environmental protection. This study can serve as guiding tool to policy makers while planning environmental protection measures.

Keywords

Community Involvement, Environmental Protection, Gisagara District, Rwanda

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1. Introduction

Sustainable environmental management requires active involvement and engagement of the local community by raising its awareness, change of its behaviour toward environment, and improving its condition of living [1]. However, the understanding of environmental protection that recognizes the engagement of the local communities at local scale is still mistreated in most countries including Rwanda [1].

In Rwanda, the environmental problems are mainly caused by

industrial, commercial, human activities in wetlands as well as deforestation. Deforestation is mostly due to the high demand for fuel wood as a basic source of energy especially in rural areas [2, 3]. These problems are associated with population pressure, serious erosion, pressure on natural resources, massive deforestation, pollution in its various forms, and lack of a strong and coherent political, institutional and legal framework [4]. Rwanda lost 50.2% of its forest and woodland habitat between 1990 and [5, 6]. This however, affects the planned poverty reduction and development initiatives due to the fact that these programs cannot be successful without

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effective and real consideration of the environmental dimension [4, 7]. Therefore, it is good to ensure that people's behaviour in regard to environmental protection is changing through local approach, training and life condition improvement. This calls for people's full engagement for better understanding their role in environmental protection and the associated benefits for both present and future generations [8].

The Rural Development Inter-Diocesan Service (RDIS) is a project that works with local community in environment protection from five years ago. The project operates within both western and southern provinces of Rwanda and it works specifically on Carbon emission reduction through helping population to have access on improved cook stoves, afforestation and community behaviour change [9]. Nevertheless, there is no current research which has been conducted to assess the contribution of RDIS in strengthening people's behaviour and involving the local community in environmental protection, from which policy makers would base while planning future environmental protection measures. Therefore, the authors decided to conduct this preliminary study in order to analyse the extent to which RDIS contributed to environmental protection through community involvement.

2. Methodology

2.1. Description of Study Area

As mentioned above, this was a preliminary study on the contribution of Rural Development Inter-Diocesan Service (RDIS) in environmental protection through community involvement.

RDIS operates in western and southern province since 2014 and works with 644 beneficiaries of its programs and projects. However, the authors chose to employ thirty (30) respondents who were selected randomly in Gisagara district of the southern Rwanda. More details are provided in the section below.

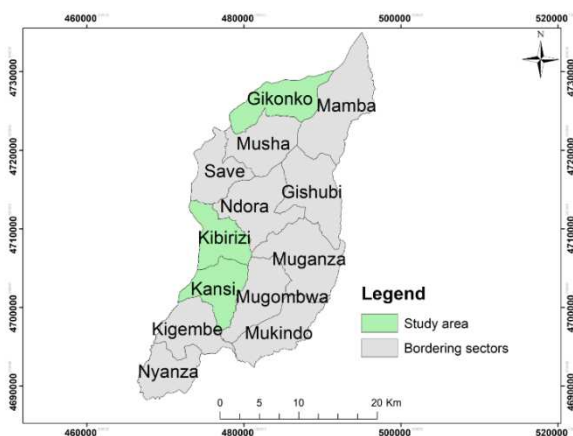


Figure 1. Map indicating the sectors visited and their bordering sectors in Gisagara district.

2.2. Data Collection and Analysis

The study has used mixed methods: qualitative and quantitative methods. The qualitative approach was used to gain the level of local community's awareness to the environmental protection and quantitative approach was used to quantify the obtained data, as well as to measure incidence of various factors. Questionnaires were developed to collect all information regarding the study. The questions were formulated and codified in order to facilitate their analysis. Thirty (30) respondents were selected randomly from three sectors (Kibilizi, Kansi and Gikonko) of Gisagara District. The RDIS field leaders were also involved to facilitate the field introduction in the community. Finally, the collected data were entered and analyzed using Microsoft Excel Software.

3. Results

The current study represents the results obtained from the survey conducted in three sectors of Gisagara District. The respondents were the beneficiaries of RDIS project, those who have been involved in the project activities regarding environmental protection. The total sample was thirty people as this was the preliminary study as we have explained above.

3.1. Description of Respondents

The results in Figure 2 indicated that among the selected respondents, 77 percent of them were female while 23 percent of them were male. This likely expresses that in the visited sectors of Gisagara` district, the majority of respondents were female and that in case on involving residents in environmental protection, much focus should be attributed to women as the majority of respondents.

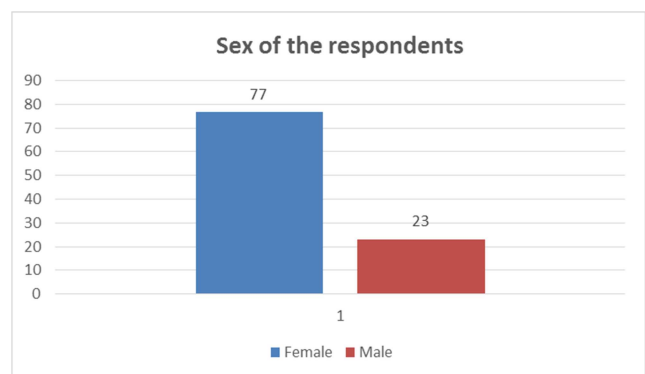


Figure 2. Respondents by sex.

Regarding the age of respondents, as shown in Figure 3, more than 60 percent of them were aged between 36 and 50 years old. This again can be a good indicator of how people in this area experience environmental degradation and protection progress from which relevant policies can be made.

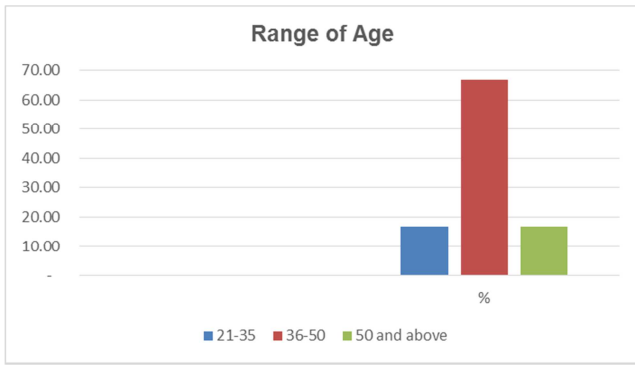


Figure 3. Age range of respondents.

The findings in Figure 4 showed that 87 percent of respondents attended primary schools while 10 percent of them attended secondary schools compared to 3 percent who only attended university.

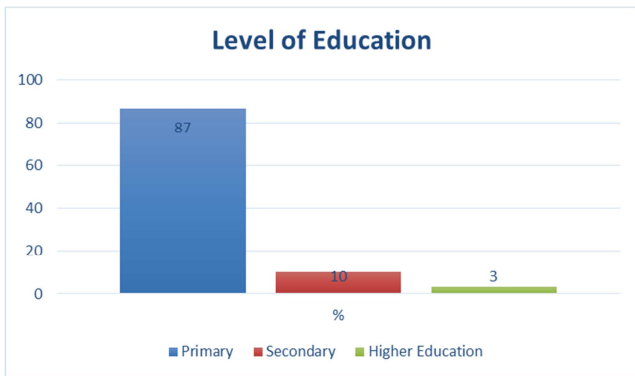


Figure 4. Level of education.

Based on the results in Figure 5, the consulted informants confirmed that they have been living in their respective sectors for a period ranging between 11 and 20 years.

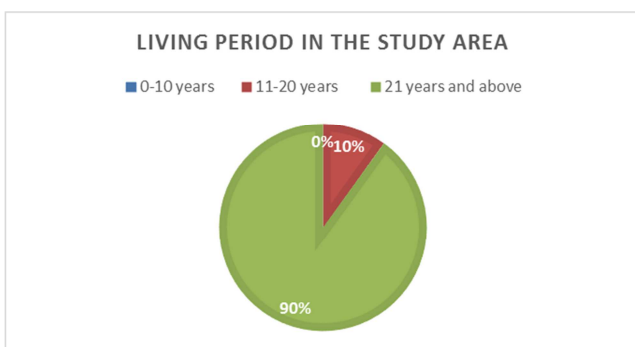


Figure 5. Living period in the study area.

3.2. Community Behaviour Impacting on Environment

The following section describes the results obtained in terms of community behaviour that have negative impacts on the environment in the study area.

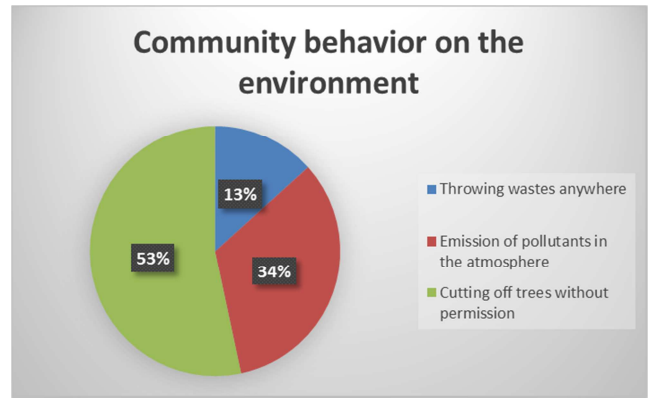


Figure 6. Community behavior impacting on environment.

The results in Figure 6, in Gisagara district, as stated by 53% and 34% of the respondents, cutting off trees without permission and emission of pollutants in the atmosphere are the key community behaviour which affects environmental quality, respectively.

3.3. Cause of Poor Community Behaviour

The results in Figure 7, indicated that collection of firewood (67%) is the major cause of poor community behaviour regarding to the environment especially cutting of trees which lead to the deforestation in the study area.

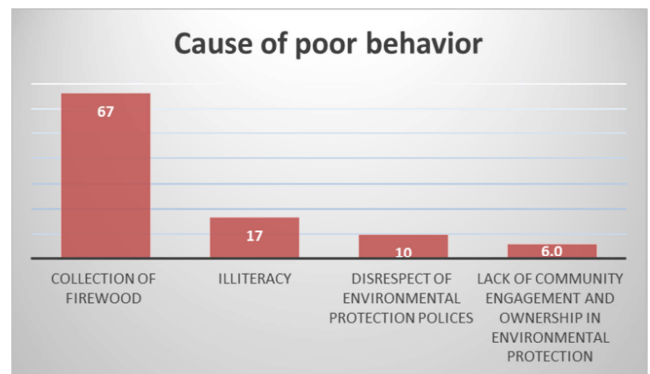


Figure 7. Causes of poor community behavior to the environment.

3.4. Initiated Community Involvement Policies for Protecting Environment

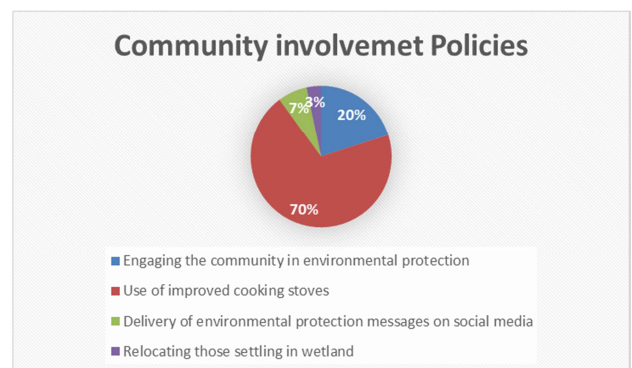


Figure 8. Initiated community involvement policies for protecting environment.

The results in Figure 8, as indicated by 70% of respondents, revealed that the use of improved cook stoves and community engagement (20%) are the major initiated policies in the study area.

3.5. Locally-based Initiatives and Their Contribution to Environmental Protection

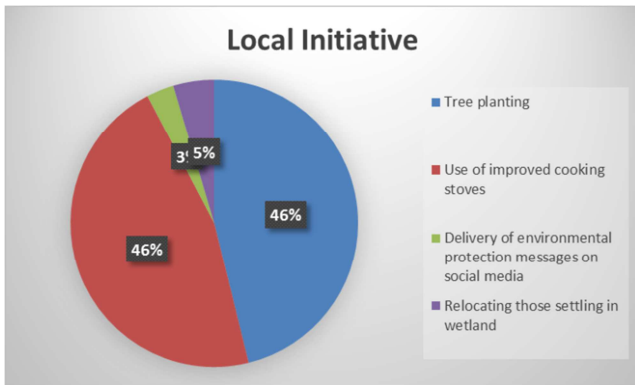


Figure 9. Local initiatives and their contribution to the environment.

According to the results illustrated in Figure 9, it was noted that 46% of respondents pointed out use of improved cook stoves and tree planting as their initiative to give their contribution to environmental protection which expresses that people consider protecting the environment as their concern not that of government only. In addition, there is less indoor air pollution and increase of forest cover, as highlighted.

3.6. Proofs of Environmental Protection Resulting from Local Initiatives

As showed in Figure 10, the respondent indicated the proofs that are like an evidence of their involvement in the environmental protection. Specifically, 100% confirmed to plant trees in their farm and decrease in indoor air pollution through the use of improved cook stoves offered by RDIS are proofs of environmental protection initiatives.

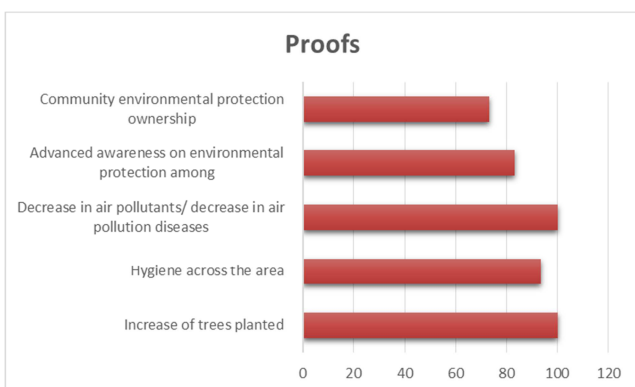


Figure 10. Proofs for environmental protection.

3.7. Ranking

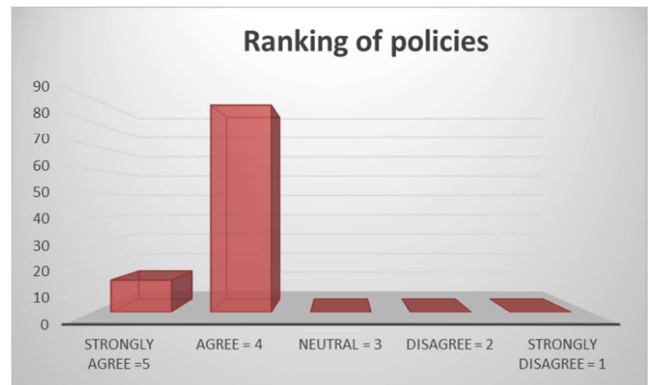


Figure 11. Effectiveness of initiated measures/policies.

With reference to the findings in Figure 11, respondents have shown their appreciation to the initiated measures of the environmental protection in their area. Respondents representing 87% percent of all informants ranked the initiated measures as effective but need improvement while 13% ranked them as highly effective.

4. Discussion of Results

Nowadays, every human has to be aware of the fact that basically almost all of our activities contaminate the environment. Rapid industrialization and urbanization has been the main cause of rapid loss of natural resources, environmental pollution, quality of life and environmental stress [10].

Environmental challenges in Rwanda date back several decades, manifested in the context of poverty and socio-economic development efforts meant to improve the welfare of people [11]. With increasing environmental awareness, the Government of Rwanda undertook strong commitment to understand its current and future environmental challenges such as soil erosion, deforestation, wetland drainage, water resources degradation, climate change and loss of biodiversity [11, 12]. The government recognizes the fact that its environmental protection is a necessary step in the pursuit for sustainable development.

This study was conducted with the aim of assessing the extent to which the local community (environmental users and degraders) involvement can contribute to the protection of environment and sustainable development as well. The results (Figure 2) indicated that 77 percent of informants were female. This can be an opportunity to policy makers in environmental protection since in case on involving residents in environmental protection, much focus would be attributed to women, as those easily transmitting the message to the society as the majority of its members. In addition, it was noted that those aged between 35 and 50 years old recorded high percentage (more than 60 percent) of respondents.

This expresses that people in this area are aware of changes on environmental degradation and protection recorded in their living area. However, it was realized that cutting off trees without permission and emission of pollutants in the atmosphere are the key community behaviour which affects environmental quality, respectively (Figure 6). The collection of firewood highlighted by 67% was the primary driver to poor community behaviour regarding to the environment especially cutting of trees which read to the deforestation in the study area. This is similar to recent studies [5, 13, and 14] on causes of environmental degradation which indicated that the majority of Rwandan use firewood as source of cooking energy and this negatively impacts on environmental protection and sustainability.

Nevertheless, the results in Figure 8 indicated that the initiated policy of using improved cook stoves in Rwanda is contributing to the environmental protection. This was confirmed by 70% of respondents that the use of improved cook stoves is contributing to the reduce pressure on woodlands and wildlife, reduce indoor air pollution and improve the lives of local families. Besides, 5679 tons of CO₂ emissions prevented throughout the three years (2017-2019) as indicated by RDIS report, 2019.

Finally, as illustrated in Figure 11, respondents appreciated the initiated environmental protection policies in their area as effective at 87%. This likely agrees with recent reports on environmental protection REMA [13], Gasana, S-H. F., et al. [15] which indicated that progress has been made from grassroots levels where the community is involved and mobilized to consider environmental protection as the basis of daily lives. However, much is still needed mainly in mobilizing people to utilize improved cook stoves and other energy sources in order to reach the set environmental protection targets.

5. Conclusion

This study assessed the impact of community involvement in environmental protection. The authors conducted the pilot study for the project led by the Rural Development Inter-Diocesan Service (RDIS) and considered three sectors (Kibilizi, Kansi and Gikonko) of Gisagara district in the southern Rwanda. The authors' randomly selected thirty (30) respondents from the above three sectors. These informants were approached and a structured questionnaire was utilized to collect the study related information from them. The results indicated that 77 percent of respondents were female while 23 percent of them were male and those aged between 36 and 50 represented the majority of informants (more than 60 percent). Regarding the cause of environmental degradation within the study area, informants largely (53%)

raised the cutting off trees without permission. This was attributed to collection/ search for collection of firewood mentioned by 67%. However, using the improved cook stoves (asserted by 70 percent, was indicated as the initiative developed toward environmental protection, and this, as mentioned by 100% led to the decrease of pressure on woodlands and wildlife, reduce of indoor air pollution and improve the lives of local families. Therefore, it can be noted that RDIS initiatives contributed to protecting environment in this area. However, since the percentage of using improved cook stoves is still low compared to the total population, it is good to continue mobilizing the community to refer to this approach. In addition, more sensitization mainly increasing people's literacy would contribute a lot in protecting the environment. This study can serve as guiding tool to policy makers in environmental protection. Furthermore, environmental protection efforts should not merely base on protecting the environment, but also, emphasis on enhancing local community's livelihoods would be added since they are the primary beneficiaries.

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References

- [1] Khalili, N. R., & Duecker, S. (2013). Application of multi-criteria decision analysis in design of sustainable environmental management system framework. *Journal of Cleaner Production*, 47, 188-198.
- [2] Mazimpaka, E. (2014). Woodfuel in Rwanda: Impact on Energy, Poverty, Environment and Policy Instruments analysis. *International Journal of Renewable Energy Development*, 3 (1).
- [3] Karamage, F., Shao, H., Chen, X., Ndayisaba, F., Nahayo, L., Kayiranga, A.,... & Zhang, C. (2016). Deforestation effects on soil erosion in the Lake Kivu Basin, DR Congo-Rwanda. *Forests*, 7 (11), 281.
- [4] Andrew G, Masozera M. Payment for ecosystem services and poverty reduction in Rwanda. *J Sustain Develop Afr* 2010; 12: 122-39.
- [5] Moodley, V., Gahima, A., & Munien, S. (2010). Environmental causes and impacts of the genocide in Rwanda: Case studies of the towns of Butare and Cyangugu. *African Journal on Conflict Resolution*, 10 (2).
- [6] Ordway, E. M. (2015). Political shifts and changing forests: Effects of armed conflict on forest conservation in Rwanda. *Global Ecology and Conservation*, 3, 448-460

- [7] Blackie LE, Jayawickreme E, Forgeard MJ, Jayawickreme N. The protective function of personal growth initiative among a genocide-affected population in Rwanda. *Psychological Trauma: Theory, Research, Practice, and Policy* 2015; 7: 333.
- [8] Rubimbura, V. M., Idukunda, C., Nsanzabaganwa, J., Yambabariye, E., Nahayo, L., & Maniragaba, A. (2020). Impact of Community Behavior Change on Environmental Protection in Rwanda. *Journal of Environment Protection and Sustainable Development*, 6 (1), 11-15.
- [9] RDIS, Carbon Emission Reduction for Self Sustainable Environmental Care (CCER), Narrative Report of the Activities carried out from May 2017- December 2019
- [10] Berger, K. and Garyfalakis, E., (2012), Environmental Impact Assessment of road transportation – Analysis to measure environmental impacts of road transportation based on a company case. Master's thesis, Jönköping University.
- [11] Harelimana, V., Gao, Z. J., Nyiranteziryayo, E., & Nwankwegu, A. S. (2020). Identification of weaknesses in the implementation of environmental impact assessment regulations in industrial sector: A case study of some industries in Rwanda, Africa. *Journal of Cleaner Production*, 120677.
- [12] Kabera, T. (2017). Environmental impact assessment in higher education institutions in East Africa: the case of Rwanda. *Environmental Science and Pollution Research*, 24 (8), 7852-7864
- [13] REMA (2014), Rwanda Environment Outlook issue 002 July 2014, managing natural resources for sustainable development, Kigali, Rwanda.
- [14] Bikorimana, G., & Sun, S. (2020). Poverty and environmental degradation nexus in Rwanda: any empirical evidence. *Interdisciplinary Environmental Review*, 20 (2), 136-158.
- [15] Gasana, S-H. F., et al. (2015), Assessment of Environmental Health Impact of ores mining project in Nyaruguru District, RWANDA: A perspective for Sustainable Development.