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Effects of Community Participation in the Restoration of Rumuruti Forest in Laikipia County, Kenya

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Abstract:

Reforestation is a concerted effort to discover forest formation, biodiversity, and ecosystem practices through tree planting. There is a drive by international organizations to reclaim about 150 million ha of degraded forests by 2030. The Rumuruti Forest is located in the Laikipia County of Kenya. It is a unique and biodiverse forest renowned for its high density of large mammals, including elephants, lions, leopards, and rhinoceroses. The forest is home to several rare species, such as the upright-horned antelope, the black-faced vervet monkey, and the yellow-necked spurfowl. Rumuruti Forest is an expansive 15,378-acre forest located in Laikipia County, Kenya. These benefits had been offset by rapid habitat loss and degradation despite concerted efforts by the Kenyan government to restore as well as maintain this resource. Besides, previous restoration attempts of Rumuruti forest had been ineffective, as indicated by the widespread withering of recently planted seedlings, resulting in a doubling of replanting operations. A descriptive research design was applied to describe the current state of variables that could be identified. The study's specific objective was to investigate the potential socio-economic benefits of Rumuruti forest restoration to community members. A descriptive research design was applied to describe the current state of variables that could be identified. Research took place in Rumuruti town, Laikipia County, Kenya. It is located 40 km due North of Nyahururu. The geographical coordinates of Rumuruti town are 0.25996°N, 36.53633°E, with a population of 31649 people. The target population for this study was 4,800 people. The sample size was 139 households. The study concluded that the community was considerably more eager to work with the government and NGOs to contribute to the restoration of the Rumuruti forest. The community desired to be more involved in the restoration operations, including tree planting, tending, and protection. As a result, effective processes were put in place to maximize the potential to achieve optimal regeneration of the Rumuruti forest.

Keywords: Community participation, Rumuruti forest, and socio-economic benefits of forest

1. Introduction

Reforestation is a concerted effort to discover forest formation, biodiversity, and ecosystem practices through tree planting. There is a drive by international organizations to reclaim about 150 million ha of degraded forests by 2030. Reforestation has several benefits, including improvement of the livelihoods of local communities, provision of clean water, sustainable food production, and reduction of climate change. According to Coll. L et al. (2018), the services provided by a healthy environment have increased in response to the restoration of forests around the world. To ensure sustainable ecosystems, researchers and stakeholders need to recognize community-based benefits from reforestation policies and procedures. The protection and rehabilitation of forests are vital to support human health. However, the social and economic benefits of reforestation have not been fully understood. The present study aimed to determine the effects of community participation in the reforestation of Rumuruti forest in Laikipia county, Kenya.

The Rumuruti Forest is located in the Laikipia County of Kenya. It is a unique and biodiverse forest renowned for its high density of large mammals, including elephants, lions, leopards, and rhinoceroses. The forest is home to several rare species, such as the upright-horned antelope, the black-faced vervet monkey, and the yellow-necked spurfowl.

The forest is also known for its remarkable plant life, which includes a variety of trees and shrubs, many of which are endemic to the area. According to Kiringe. J. et al. (2014), the Rumuruti Forest is also a major source of water for many of the surrounding communities and is home to a number of endangered species, such as the black rhinoceros and the African wild dog.

Rumuruti Forest is an expansive 15,378-acre forest located in Laikipia County, Kenya [1]. It is home to an array of wildlife and vegetation and is a vital part of the ecosystem in the area. According to estimates, the forest has an estimated volume included for Rumuruti Forest [2], although the size of the former division has since changed Njeru J et al., (2017). All in all, the Rumuruti Forest is a vast and diverse area with much to explore and admire.

1.1. Statement of the Problem

Due to its ecological, economic, and social contributions, the Rumuruti forest is considered one of the most important watershed basins in Kenya. Some of its ecological benefits include regulation of river flow, mitigation of floods, storage of water, purification, groundwater refresh, soil erosion reduction and siltation, biodiversity preservation, carbon sequestration, carbon pool, and microclimate regulation, all of which contribute to optimal crop production.

However, these benefits had been offset by rapid habitat loss and degradation despite concerted efforts by the Kenyan government to restore as well as maintain this resource. Besides, previous restoration attempts of Rumuruti forest had been ineffective, as indicated by the widespread withering of recently planted seedlings, resulting in a doubling of replanting operations.

Therefore, investigating the effects of local community participation in restoring the Rumuruti forest was crucial. To the best of my knowledge, no study had been documented on this topic.

1.2. Objective

The specific objective was:

- To investigate the potential socio-economic benefits of Rumuruti forest restoration to community members.

1.3. Scope of the Study

This study was conducted at Rumuruti forest, Laikipia county, Kenya. The following characteristics were measured:

- The existing state of Rumuruti forest,
- Current reforestation rates,
- Current forest conservation measures,
- The number of trees that have been planted as part of previous restoration projects,
- Community participation,
- Forest size,
- Seasons, and
- Climatic conditions

The target population was local community members and stakeholders.

2. Literature Review

2.1. Socio-Economic Benefits of Rumuruti Forest Restoration on the Community

The benefits of forest resources have reached over 1.5 billion people across the world owing to their participation in decision-making and forest management Shaw (2019). People living in the surrounding areas benefited from forest dwellers' participation in forest management. Forest products are used by over 90% of poor people in the tropics for subsistence and livelihood. The net consequence of providing them with options through cooperative economic ventures is a reduction in forest degradation (Mayes et al., 2017). Members of the community forest reap benefits from a variety of activities. In India, the Mendha Lekha group received legal authority to run the forest, including the authority to control bamboo forests (FAO, 2018). Between 2011 and 2014, this resulted in a profit of \$150,000, which was used to develop the area (FAO, 2018). Local communities are allowed to assist in forest conservation if the advantages outweigh the costs and involvement leads to a better quality of life.

Cameroon, Gabon, and Equatorial Guinea have enacted legislation permitting individuals to profit. Regulations benefit everyone. Advantages operate as enticements for participation (Barrow et al., 2016). In Ghana, a person's willingness to participate was correlated with immediate paybacks. Mutune (J. et al., 2015). Timber-related goods contribute to income in developing countries (FAO, 2018). Forest products revenue accounts for over 26% of total household income in West Africa Mutune (J et al., 2015). Members of Ethiopia's communal forest were permitted to feed livestock because of their membership (Bekele et al., 2016).

The community also gained from the sale of poles, butterfly cultivation, timber sales, and medicinal plant value addition (Matiku et al., 2013). These rewards are incentives for forest residents to participate in large water tower conservation efforts (Bastin et al., 2017). According to Kinyili et al. (2014), there are three categories of IGAs:

- Nature enterprise,
- Tree planting, and
- Livelihood diversification

Ecotourism, beekeeping, and other enterprises that rely solely on the existence of forests are examples of nature enterprises. Only when the forest is preserved can there be nature-based enterprises. IGA entails the growing of plants in regions near woodlands, such as: woodlots, medicinal herb production, etc. Despite the importance of forests, these IGAs can exist in locations where there is no forest. Since they operate as a substitute for forest products, these types of livelihoods benefit the forest (alternative sources of forest products). The final option is to diversify one's source of income. This category is not dependent on the forest, yet it does reduce the forest's susceptibility. The forest is not degraded by economically empowered communities (Kinyili et al., 2014). Only if the community shares direct benefits that operate as an incentive for involvement can they participate in CFM (Musyoki et al., 2016).

Participation of the communities in farm forestry should be encouraged. This will provide additional cash to the community while helping to preserve the forest. Farm forests can be used by the community as firewood, livestock feed, etc. (Worku et al., 2014).

According to KFS (2017), forests generate an economy for Kenya. The creation of forest-related jobs has aided the country's economic development. The forest contributes to the country's agricultural development by maintaining climatically favorable conditions (KFS, 2017).

In Rumuruti forest, after the growth of the restored trees to a certain height and width, intercropping them with vegetables was no longer suitable since it could damage tree roots during harvesting. However, alternative methods that did not include cutting trees to benefit the community were proposed, including installing beehives to enhance beekeeping, planting edible plants beneath the trees, planting medicinal species in the restoration site, and harvesting soap spinach and other indigenous vegetables. After the restoration of this forest, the colobus monkey returned after an absence of sixty years, and the bird population quadrupled. Tourists visited Rumuruti Forest more frequently because of this, leading to the opening of the Rumuruti hotel, which offered employment opportunities to the local people. The hotel also acts as a ready market for local produce earning income for the local communities (Shaw et al., 2016).

2.2. Theoretical Framework

The study was influenced by ecological theory around plant-plant interactions, which suggests that pressures from a combination of environmental change and organisms bring changes in natural systems. Plant-plant interactions facilitate the change of environment and its impacts. It also determines the community's response to environmental change and the role the community plays in plant-plant interactions. The theory seeks to explain the challenges facing restoration efforts to establish species-rich forests and selective animal browsing influencing plants. The theory also emphasizes the importance of the integrated system of simultaneous management, a large number of persons, and browse tolerant restoration with a landscape carrying capacity. The study was also guided by Forests for People and Community Rights, which argues that, apart from achieving biodiversity, climate change, and forest status, forest restoration should seek to eradicate poverty and preserve the culture of communities living near the forests.

2.3. Methodology

A descriptive research design was applied to describe the current state of variables that could be identified. The target population for this study was 4,800 people. The sample size was 139 households. A clustered random sampling method was utilized where the population was split into sections, and random methods were used to select respondents from each section. Quantitative data were collected using questionnaires, while qualitative data were collected using interviews. It was found that the forest cover improved dramatically over 10 years.

2.4. Study Area

Research took place in Rumuruti town, Laikipia County, Kenya. It is located 40 km due North of Nyahururu. The geographical coordinates of Rumuruti town are 0.25996°N, 36.53633°E, with a population of 31649 people. The local languages in Rumuruti sub-county are Kikuyu, Samburu, and Turkana, while Swahili and English are also used. Due to low rainfall and warm and temperate climate, most people practice livestock keeping. Maize, beans, and tomatoes are the most prominent crops. The people also started planting trees on their homesteads increasing tree cover. Farmers, artisans, and traders populate the area surrounding the forest. Since crop farming and animal husbandry are prevalent, the area is classified as agro-pastoralism. The most common livestock types include: cattle, goats, chickens, and sheep. Wood carving is a lucrative business among some residents. Farmers account for 78% of the population. Only 10% of the population has regular jobs, while another 12% are self-employed.

2.5. Sample Size

An ideal sample was important to guarantee an adequate representation of the components of the analysis. Therefore, in this study, 10% of the local community was sampled to participate in the study (Kairu et al., 2018). The formula for calculating the size of the sample of fewer than 10,000 people was used as previously described (Mugenda & Mugenda, 2003).

2.6. Sampling Frame Tabulation (Household Survey)

	Tools Utilized	Sample Size	Varied Questionnaires
Community members	Questionnaires	77	76
Non-community members	Questionnaires	62	58
Totals		139	134

Table 1: Sampling Frame Tabulation

3. Findings

After investigating the potential socio-economic benefits of Rumuruti Forest restoration to community member, the findings showed that community members benefit from Rumuruti forest conservation in the following ways.

3.1. Employment

The Rumuruti forest hired some locals to look after the forest and oversee tourist operations. When the PFLI started revitalizing the forest, scouts were hired straight from CFA. People from the community were hired on an *ad hoc* and permanent basis based on their qualifications and the availability of job opportunities.

The results of the researcher indicated that the majority of members were motivated by the benefits they received. The majority stated that involvement in forest management would help them get forest products for direct or indirect consumption. They hoped to gain from money provided by donors. Additionally, they believed that their participation in forest management would provide them a benefit if a job opening in the forest department occurred. Despite the fact that community members expected preferential treatment when it came to working chances, important informers thought they could not get their grievances because of a lack of authorized provision for them and that they were erroneous in their assumptions. While a minority disagreed, the majority of respondents thought that the existence of PFLI reduced their benefits. Key informants claimed that it is impossible to install an electric fence rendered perks like grazing and gathering medicinal herbs.

3.2. Entrepreneurship in the Forest

The majority of the families had tree nurseries. Farmers with tree nurseries benefited from the seedlings. Community members benefit from KFS and PLFI capacity building on paramount ways for starting nurseries and determining the tree species that are more resilient there. Members said they had attended KFS and PLFI sessions.

Rumuruti residents took part in harvesting honey, firewood collection, recreational activities, and ecotourism that provided a source of income.

3.3. Water Provision

The Rumuruti water project benefited some of the local community members. The majority of respondents had piped water from the Rumuruti water project in their homestead. However, some locals opposed the water project proposal, most of whom were from the Tigon area, which had not profited from the project due to its location.

Most responders overwhelmingly agreed that tapping water from the forest for home use was not a problem. However, a number of respondents believed that this project was not sustainable. They argued that extracting excessive amounts of water was to blame for the drying up of rivers in the area.

3.4. Soil Collection for Nurseries

Members were permitted to gather soil from Rumuruti to start a nursery. Because forest soil is particularly fertile and thus suitable for growing seedlings, this boosted the survival rate of seedlings. Although locals were permitted to collect soil for their nurseries, this was done under strict supervision to ensure they were not engaged in illegal activities.

3.5. Training Opportunities

Rumuruti forest members were taught how to plant trees and ensure a high return. KEFRI, PFLI, and KFS were constantly interested in teaching the community about the value of forests and tree planting on their private property. The inhabitants were taught the best farming practices to strengthen their understanding. They were also taught beekeeping techniques to provide them with a source of income. The majority of those surveyed had received training in agroforestry. Moreover, community members had been invited to participate in different types of training at least three times every year since 2012. Trees planted in farm forestry were to evaluate the success of instruction in agroforestry tree planting. Since farm forestry made it possible for people to get forest goods like firewood, timber, charcoal, etc., it was one of the cornerstones of forest conservation.

4. Conclusion

According to autocorrelation studies, the Rumuruti forest's forest cover was significantly impacted by factors contributing to forest cover change. The community benefited from jobs in the forest, the establishment of forest-based businesses, access to tap water, and the collection of fertile soil for nurseries from the forest. These benefits, however, were independent of CFA membership. However, no exclusive advantages were provided to CFA members, which led to a steady decline in CFA membership.

In summary, the Rumuruti forest was highly restored and required sustainable plans to ensure its protection. The forest is highly valued by the locals who directly benefit from the forest, which is important to Kenya as a whole.

According to the survey, the community was considerably more eager to work with the government and NGOs to contribute to the restoration of the Rumuruti forest. The community desired to be more involved in the restoration operations, including tree planting, tendering, and protection. As a result, effective processes were put in place to maximize the potential to achieve optimal regeneration of the Rumuruti forest.

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