

# Factors Influencing Community Participation in Forestry Management in Chiradzulu District, Malawi

Charles Chiwaya, Maureen Kapute Mzuza\* 

Department of Geography and Environmental Studies, The Catholic University of Malawi, Limbe, Malawi

Email: \*maureenmzuza@yahoo.com, \*mkapute@cunima.com

**How to cite this paper:** Chiwaya, C., & Mzuza, M. K. (2022). Factors Influencing Community Participation in Forestry Management in Chiradzulu District, Malawi. *Open Journal of Forestry*, 12, 177-184.

<https://doi.org/10.4236/ojf.2022.122010>

**Received:** January 19, 2022

**Accepted:** March 22, 2022

**Published:** March 25, 2022

Copyright © 2022 by author(s) and Scientific Research Publishing Inc.

This work is licensed under the Creative Commons Attribution International License (CC BY 4.0).

<http://creativecommons.org/licenses/by/4.0/>



Open Access

## Abstract

Community participation in forestry management is a good approach to protecting forests and woodlands. This study was carried out to assess factors affecting community participation in forestry management in Chiradzulu District. The study employed a mixed-method approach where qualitative and quantitative data were collected. Results showed that there is an almost equal percentage of female and male respondents who participated in forestry management. The Logit model analysis shows that education variables are positive and statistically significant proving that education influences participation in forestry management and hence education is an important variable in determining households' participation in forestry. Only the age group of 45 - 59 years was significant but had a negative coefficient with a moderate marginal effect at 59% ( $r = 0.59$ ) implying that many people in this age group participated in forestry activities than other age groups. When the size of household land ownership was used as a proxy to indicate household wealth and then correlated with participation in forestry activities, a positive and significant correlation between households that owned 1 - 2 acres and 3 - 5 acres of land and their participation in forestry activities was observed. It can be concluded that the size of land owned is one of the key factors that determine households' participation in forestry management. Furthermore, a connection between land size distribution and effects on environmental resources was evident.

## Keywords

Age, Education, Land Size, Woodlands, Soil Erosion

## 1. Introduction

Forests and woodlands contribute significantly to the economy of every country

but have been destroyed everywhere (Suarez et al., 2021; Armstrong et al., 2021; Koehn et al., 2021). Forests and woodlands provide multiple environmental, economic, social, and political benefits which can provide opportunities for poverty alleviation and economic development (Johansson et al., 2021; Guida-Johnson et al., 2021). Forests and woodlands also play an invaluable role in meeting the cultural and spiritual needs of adjacent communities (Sanz-Hernández, 2021; Zhu et al., 2021; Lamptey, 2021). In addition, forests and woodlands keep the land productive by conserving soil and water because soil nutrients and water catchment areas are provided (Lamptey, 2021). Forests and woodlands also serve as water catchments that recharge rivers and dams which supply water for domestic use and hydroelectric power (Chilagane et al., 2021; Mussa, Mjemah, & Machunda, 2021).

The world's forests and woodlands are increasingly under pressure from the growing human population and many are shrinking as a result of human-induced deforestation. Forests are designated as protected areas that host game parks and forest reserves and make contributions to the national economy by supplying renewable sources of energy in the form of wood fuel and charcoal (Chilagane et al., 2021). The majority of community-based organizations are formed on the basis of common interest to conserve the forests as well as to improve the livelihoods of their members (Mussa et al., 2021); (Agnoletti et al., 2022; Song et al., 2021).

Community-Based Forest Management (CBFM) has been implemented in Africa since the 1980s, since a lot of forests and woodlands have been destroyed (Moyo et al., 2021; Axelsson & Grady, 2022). CBFM is enhancing community engagement in forest management, reducing rural poverty, and promoting forest resources conservation. CBFM frameworks in Sub-Saharan Africa (SSA) and CBFM schemes' contribution to selected sustainable development goals relevant to the forestry sector. Five SSA countries, Ethiopia, Kenya, Cameroon, Uganda, and Tanzania were chosen for the study because of their long-term engagement in CBFM (Gichuki, 2014).

In Malawi, forests and woodlands have been destroyed rapidly like other countries in the world (Gondwe et al., 2021; Skole et al., 2021). Malawi's government has been making strides to stop further destruction of forests by communities by imposing some policies but without success (Gondwe et al., 2021; Skole et al., 2021). The government later embarked on participatory forest management a shift from the conventional management system. Participatory Forest Management recognizes the need of involving communities in forest management, as co-workers, alongside the government and other stakeholders. The major problem in Malawi that encourages forest and woodland destruction is high population pressure, escalating poverty situation, conflicts, poor land-use practices, inadequate laws, policies, and institutional framework, poor education, and inadequate involvement of community participation.

In the Chiradzulu hill forest, southern Malawi, there are also threats that are

occurring such as deforestation, soil erosion, and extinction of wild lives. Other threats are invasive species, land degradation, and pollution occasioned by poor land-use practices. Although a number of studies focusing on policy and management of forests are available, no study has been conducted in Chiradzulu District concerning factors influencing community participation in forestry management which formed the basis for the present study. Factors that influence community participation in forestry management around Chiradzulu forest were determined by defining political factors that influence community participation in forestry projects, examining social/economic factors that influence participation in forestry projects among the members, and lastly, determining the environmental factors that influence participation in forestry projects among the members.

## 2. The Conceptual Framework

The concepts discussed in this study include political factors, environmental factors and social-economic factors that might affect community participation in forest management (Figure 1). All the three independent variables have effects on the dependent variable (Figure 1).

## 3. Materials and Methods

The study used a simple random sampling technique to determine the sample. The data was collected by using questionnaires for interviews and key informant checklists where telephone calls were made. Internet was also used as a tool in this study. Data were analyzed using Statistical Package for the Social Sciences (SPSS) and Excel to draw graphs and tables.

## 4. Results and Discussion

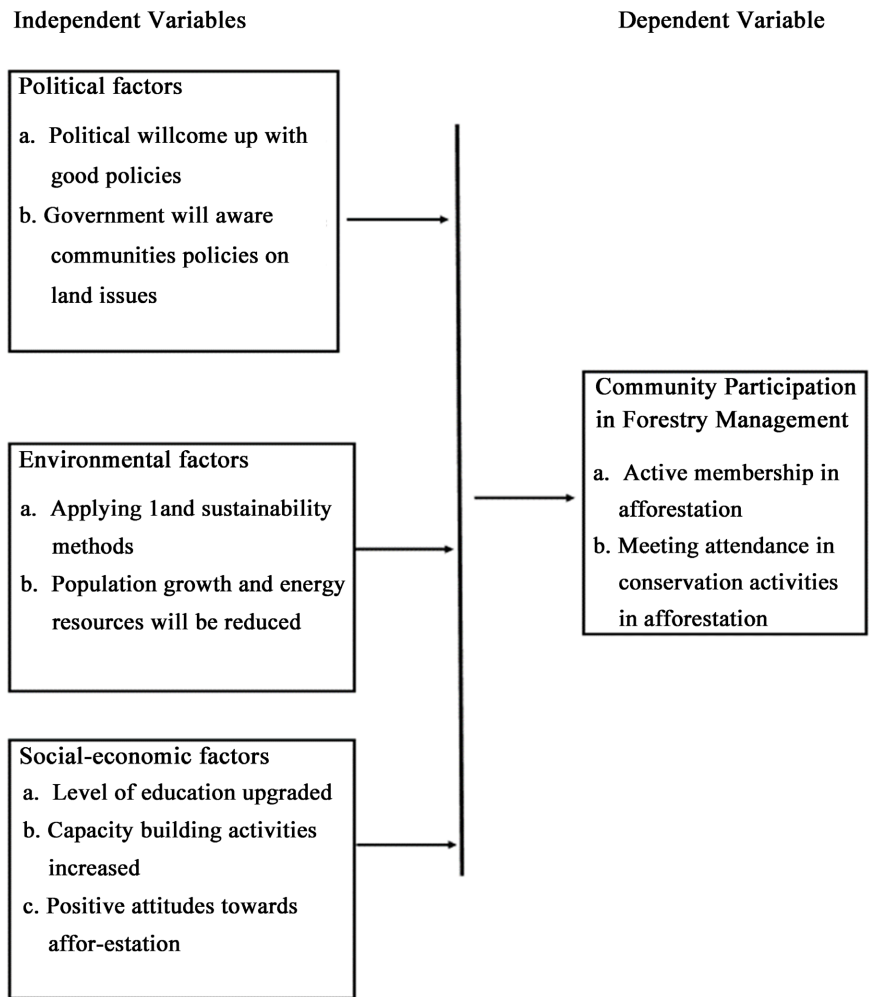
Results showed that more men actively participate in forestry management percentage (28.4% out of 72.8%) than female respondents (10.4% out of 27.2%) suggesting that men are active in forestry management than women (Table 1).

Men in Africa usually dominate many activities (Table 1) including forest management activities (Killian & Hyle, 2020). This tendency consequently weakens the women's participation in forest management activities.

### Social-Economic and Environmental Factors Affecting Participation in Forest Management

Level of education had a positive and statistically significant influence on the level of participation of people in forestry management (Table 2).

This implies that education is a critical variable in determining households' participation in forestry. The results also showed that the marginal effects of households' participation in forestry activities increased with the levels of education (Table 2). For instance, respondents with tertiary education had a high marginal effect of 0.824 than secondary and primary education which had a



**Figure 1.** Conceptual framework of the study.

**Table 1.** Respondent’s demographic.

Gender	% Response	% Participating in forestry management
Female	72.8	28.4
Male	27.2	10.4

**Table 2.** Logit model analysis of the influence of level of education on forestry management.

Explanatory variables	Coefficients	Z statistic	Marginal effects (r)
Primary education	1.246	2.50	0.498
Secondary education	1.394	2.51	0.556
Tertiary education	1.640	1.99	0.824

moderate marginal effect of 0.556 and 0.498 respectively. These results agree

with a study conducted in Kochi prefecture, Japan (Nakagawa et al., 2019) which aimed at designing and establishing a deliberative experiment to test whether the acquisition and experience of intergenerational retrospective viewpoints as one way of projecting future events affect individual preferences for forest management policies. This shows that level of understanding of things matters in decision making, where one can decide to participate in forest management or not (Table 2).

The size of household land ownership was used as a proxy to indicate household wealth and then correlated with participation in forestry activities and a positive and significant correlation between households that owned 1 - 2 acres and 3 - 5 acres of land and their participation in forestry activities (Table 3) was observed.

On this basis, it can be concluded that the size of land owned is one of the key factors that determine households' participation in forestry activities. However, the marginal effects of the size of land owned by households in the categories 1 - 2 acres and 3 - 5 acres are low (0.361 and 0.436) (Table 3), although their coefficients were positive. On the other hand, 6 - 8 acres of land did not show any significant coefficient but had a moderate marginal effect of 0.689. The analysis further indicated that the probability of a household participating in forestry increased with an increase in the size of land owned (Table 3). Therefore, it is concluded that a household that owned more than five acres of land is likely to participate in forestry management activities compared to those with less size of land. These findings were earlier reported in a study which was conducted in the North-Western, Copperbelt, and Eastern Province of Zambia (Kazungu et al., 2021).

Using four age group categories, the likelihood of age influencing households' participation in forestry activities varied (Table 4).

**Table 3.** Relationship between size of land owned and participation in forestry management.

Variable	Explanatory variables	Coefficients	Z statistic	Marginal effects (r)
Land size	1 - 2 acres	0.941	2.61	0.361
	3 - 5 acres	1.847	2.24	0.436
	6 - 8 acres	1.338	1.94	0.689

**Table 4.** Age vs. participation in forestry management.

Variable	Explanatory variables	Coefficients	Z statistic	Marginal effects (r)
Age	30 - 44 years	-0.315	-1.03	0.305
	45 - 59 years	-2.199	-3.72	0.590
	60+ years	0.048	0.09	0.539

In all the age group categories, only age group of 45 - 59 years was significant but had a negative coefficient with a moderate marginal effect at 59% ( $r = 0.59$ ) implying that more people in this age group participated in forestry activities than people in the other age groups around Chiradzulu forest (**Table 4**). Age group category of 60 years and above did not have a significant influence but had a moderate marginal effect on households' participation ( $r = 0.539$ ) while age group category of 30 - 44 did not have a significant influence and had a low marginal effect ( $r = 0.305$ ) thus the age group has low participation in forestry activities. This observation is realistic because the younger members of the households (people below 45 years) tend to be occupied with education or development of career opportunities after completing secondary and tertiary education. At the same time, they would not have adequate business development skills and generally lack start-up capital or resources to invest in forestry-related enterprises. In contrast, older people are knowledgeable about the local area, they tend to be more conscious, business-minded, and more likely to take risks and invest in forestry enterprises. Our results agree with a study which was conducted in Western Kenya (Mbeche et al., 2021) examining factors that support or limit forest-dependent people's participation in a Participatory Forest Management program. However, these observations should not be interpreted to mean that the youth should be excluded or their roles minimized in the forest management and conservation of protected areas. The youth play crucial roles which ensure the sustainability of protected areas and forestry. Gichuki (2000) and Wulandari & Inoue (2018) reported that young people have become increasingly more positive about conservation because of their education and environmental awareness. One of the most achievable strategies for ensuring local communities' participation in forestry has always been equitable sharing of benefits. According to Wulandari & Inoue (2018), local communities use shared benefits as a precondition to participating in tourism activities. At the same time, local communities can benefit from forestry by engaging in the production of food and hand-crafts sold to tourists besides employment benefits-referred to as participation by material incentive.

## 5. Conclusion and Recommendation

Participation in forestry management increased with an increase in the level of education. It is concluded that the environment can be conserved once the people have enough land because they can have a certain portion of land for growing trees hence people will be able to use those trees rather than destroy the reserved forests and woodlands. The results have shown that the participation of men and women are almost the same.

Forestry development and community participation need to be integrated if they are to benefit from the existence of forestry resources and ensure their sustainability.

The socio-economic factors that influence local communities' participation in

forestry such as education, income and occupation, need to be considered when planning for local communities' participation in forestry management. Considering that community-based forestry enterprises increase opportunities for households to participate in forestry, there is a need to strengthen the existing and encourage the formation of new community-based forestry enterprises owned and managed by community members. This will enhance their access to forestry opportunities that can influence their participation.

### Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

### References

- Agnoletti, M., Piras, F., Venturi, M., & Santoro, A. (2022). Cultural Values and Forest Dynamics: The Italian Forests in the Last 150 Years. *Forest Ecology and Management*, 503, Article ID: 119655. <https://doi.org/10.1016/j.foreco.2021.119655>
- Armstrong, K. N., Broken-Brow, J., Hoye, G., Ford, G., Thomas, M., & Corben, C. (2021). Effective Detection and Identification of Sheath-Tailed Bats of Australian Forests and Woodlands. *Australian Journal of Zoology*, 68, 346-363. <https://doi.org/10.1071/ZO20044>
- Axelsson, E. P., & Grady, K. C. (2022). Symphony for the Native Wood (s): Global Reforestation as an Opportunity to Develop a Culture of Conservation. *People and Nature*, 1-12. <https://doi.org/10.1002/pan3.10299>
- Chilagane, N. A., Kashaigili, J. J., Mutayoba, E., Lyimo, P., Munishi, P., Tam, C., & Burgess, N. (2021). Impact of Land Use and Land Cover Changes on Surface Runoff and Sediment Yield in the Little Ruaha River Catchment. *Open Journal of Modern Hydrology*, 11, 54-74. <https://doi.org/10.4236/ojmh.2021.113004>
- Gichuki, C. M. (2000). Community Participation in the Protection of Kenya's Wetlands. *Ostrich*, 71, 122-125. <https://doi.org/10.1080/00306525.2000.9639886>
- Gondwe, M. F. K., Geldenhuys, C. J., Chirwa, P. W. C., Assédé, E. S. P., Syampungani, S., & Cho, M. A. (2021). Tree Species Composition and Diversity in Miombo Woodlands between Co-Managed and Government-Managed Regimes, Malawi. *African Journal of Ecology*, 59, 225-240. <https://doi.org/10.1111/aje.12799>
- Guida-Johnson, B., Villagra, P. E., Alvarez, L. M., Rojas, F., & Alvarez, J. A. (2021). Finding Woodlands in Drylands: Bases for the Monitoring of Xeric Open Forests in a Cloud Computing Platform. *Remote Sensing Applications: Society and Environment*, 22, Article ID: 100528. <https://doi.org/10.1016/j.rsase.2021.100528>
- Johansson, M. U., Abebe, F. B., Nemomissa, S., Bekele, T., & Hylander, K. (2021). Ecosystem Restoration in Fire-Managed Savanna Woodlands: Effects on Biodiversity, Local Livelihoods and Fire Intensity. *Ambio*, 50, 190-202. <https://doi.org/10.1007/s13280-020-01343-7>
- Kazungu, M., Zhunusova, E., Kabwe, G., & Günter, S. (2021). Household-Level Determinants of Participation in Forest Support Programmes in the Miombo Landscapes, Zambia. *Sustainability*, 13, 2713. <https://doi.org/10.3390/su13052713>
- Killian, B., & Hyle, M. (2020). Women's Marginalization in Participatory Forest Management: Impacts of Responsibilization in Tanzania. *Forest Policy and Economics*, 118, Article ID: 102252. <https://doi.org/10.1016/j.forpol.2020.102252>

- Koehn, C. R., Petrie, M. D., Bradford, J. B., Litvak, M. E., & Strachan, S. (2021). Seasonal Precipitation and Soil Moisture Relationships across Forests and Woodlands in the Southwestern United States. *Journal of Geophysical Research: Biogeosciences*, *126*, e2020JG005986. <https://doi.org/10.1029/2020JG005986>
- Lamprey, A. M. (2021). Tourism, Ecosystems, Biodiversity and Threats. In *The Blue Economy in Sub-Saharan Africa* (pp. 35-48). Routledge. <https://doi.org/10.4324/9780367822729-2>
- Mbeche, R., Ateka, J., Herrmann, R., & Grote, U. (2021). Understanding Forest Users' Participation in Participatory Forest Management (PFM): Insights from Mt. Elgon Forest Ecosystem, Kenya. *Forest Policy and Economics*, *129*, Article ID: 102507. <https://doi.org/10.1016/j.forpol.2021.102507>
- Moyo, H., Slotow, R., Rouget, M., Mugwedi, L., Douwes, E., Tsvuura, Z., & Tshabalala, T. (2021). Adaptive Management in Restoration Initiatives: Lessons Learned from Some of South Africa's Projects. *South African Journal of Botany*, *139*, 352-361. <https://doi.org/10.1016/j.sajb.2021.03.016>
- Mussa, K. R., Mjemah, I. C., & Machunda, R. L. (2021). Natural Groundwater Recharge Response to Climate Variability and Land Cover Change Perturbations in Basins with Contrasting Climate and Geology in Tanzania. *Earth*, *2*, 556-585. <https://doi.org/10.3390/earth2030033>
- Nakagawa, Y., Kotani, K., Matsumoto, M., & Saijo, T. (2019). Intergenerational Retrospective Viewpoints and Individual Policy Preferences for Future: A Deliberative Experiment for Forest Management. *Futures*, *105*, 40-53. <https://doi.org/10.1016/j.futures.2018.06.013>
- Sanz-Hernández, A. (2021). Privately Owned Forests and Woodlands in Spain: Changing Resilience Strategies towards a Forest-Based Bioeconomy. *Land Use Policy*, *100*, Article ID: 104922. <https://doi.org/10.1016/j.landusepol.2020.104922>
- Skole, D. L., Samek, J. H., Mbow, C., Chirwa, M., Ndalowa, D., Tumeo, T., Kamangadazi, F. et al. (2021). Direct Measurement of Forest Degradation Rates in Malawi: Toward a National Forest Monitoring System to Support REDD+. *Forests*, *12*, 426. <https://doi.org/10.3390/fl2040426>
- Song, C., Kim, W., Kim, J., Gebru, B. M., Adane, G. B., Choi, Y. E., & Lee, W. K. (2021). Spatial Assessment of Land Degradation Using MEDALUS Focusing on Potential Afforestation and Reforestation Areas in Ethiopia. *Land Degradation & Development*, *33*, 79-93. <https://doi.org/10.1002/ldr.4130>
- Suarez, D. R., Rozendaal, D. M., De Sy, V., Gibbs, D. A., Harris, N. L., Sexton, J. O., Herold, M. et al. (2021). Variation in Aboveground Biomass in Forests and Woodlands in Tanzania along Gradients in Environmental Conditions and Human Use. *Environmental Research Letters*, *16*, Article ID: 044014. <https://doi.org/10.1088/1748-9326/abe960>
- Wulandari, C., & Inoue, M. (2018). The Importance of Social Learning for the Development of Community Based Forest Management in Indonesia: The Case of Community Forestry in Lampung Province. *Small-Scale Forestry*, *17*, 361-376. <https://doi.org/10.1007/s11842-018-9392-7>
- Zhu, G., Cao, X., Wang, B., Zhang, K., & Min, Q. (2022). The Importance of Spiritual Ecology in the Qingyuan Forest Mushroom Co-Cultivation System. *Sustainability*, *14*, 865. <https://doi.org/10.3390/su14020865>