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Assessing forest-based rural communities' adaptive capacity and coping strategies for climate variability and change: The case of Vhembe district in south Africa

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Abstract

In this study, various coping strategies used by forest-based rural communities in Vhembe District of South Africa in response to climate variability and change challenges were investigated. The effect of community socio-demographic characteristics on the adaptive capacity and choice/effectiveness of coping strategies was examined. Household level data were collected from 366 respondents selected from 21 rural communities using the proportionate random sampling procedure. The Pearson Chi-square test was used to analyse the coping strategies. The effects of household and community socio-demographic characteristics on choice and effectiveness of coping strategies were determined using the binary logit model. It was observed that the respondents used diverse coping strategies, depending on the nature of climate variability and extreme weather events they were confronted with. Rainwater harvesting was the most popular strategy that the respondents in Makhado (90%), Mutale (96.3%), and Thulamela (50%) used to cope with erratic rainfall. Tree planting around houses and on farmland were the most popular strategies (90-100%) to counter the effects of extreme temperature. Furthermore, household and community demographic characteristics in particular education and skills levels, and forest products, institutional services and infrastructure available in the communities such as markets, and water supply facilities significantly ($p < 0.05$) influenced the choice of households' coping strategies. Therefore, it can be hypothesized that efforts that enhance the household's capacity and community infrastructural development might be viable and sustainable ways of improving rural communities' resilience to climate change and variability challenges.

Keywords: Climate variability and change, community resilience, coping strategy, livelihood, adaptation, adaptive capacity

1.0 INTRODUCTION

Forest-based rural communities in Africa are increasingly becoming the focal point in climate change discourse, mainly due to their vulnerability to climate variability and change challenges (Coulibaly et al., 2015). This is due to their high level of dependence on forests and natural resources for livelihood (Robledo et al., 2012; Coulibaly et al., 2015). Prolonged impact of climate change might result in increased poverty and unsustainable rural development (Boon and Ahenkan, 2012; Hammil et al., 2013). Thus, there is a growing need to address vulnerabilities of rural people to climate change (Helgeson et al., 2013).

The 2015 Paris agreement, which is aimed at advancing and fostering international cooperation towards implementation of programs that might accelerate transition towards a low-carbon economy and climate-resilient society (Sebastian et al. 2015), added impetus to the many national and multilateral commitments, actions and initiatives that seek to address climate change through capacity enhancement (Viljoen, 2013). For many developing countries, particularly in Africa, this represents a unique opportunity for international cooperation and attracting technical and financial support towards establishment of an improved modality for reducing the vulnerability of communities facing climate

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