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Effects of wildlife resources on community welfare in Southern Africa

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ABSTRACT

This paper demonstrates the importance of wildlife in the portfolio of environmental income in the livelihoods of poor rural communities living adjacent to a national park. The results show that wealthier households use more wildlife resources in total than do relatively poor households. However, poorer households derive greater proportional benefit than wealthier households from the use of wildlife resources. Excluding wildlife understates the relative contribution of environmental resources while at the same time overstating the relative contribution of farm and wage income. Wildlife income alone accounts for about a 5.5% reduction in the proportion of people living below the poverty line. Furthermore, wildlife income has an equalizing effect, bringing about a 5.4% reduction in measured inequality. Regression analysis suggests that the likelihood of belonging to a wealthier category of income increases with an increase in environmental income. As expected, household wealth significantly and positively affects environmental income generated by households. This seems to suggest that wildlife-based land reform also needs to empower poor households in the area of capital accumulation while imposing restraints on the use of capital investments by well-off households to harvest wildlife.

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1. Introduction

There is increasing consciousness among scholars about the importance and value of environmental resources¹ in the livelihoods of poor rural communities in developing countries (e.g., Cavendish, 2000; Dovie et al., 2003; Fisher, 2004; Shackleton and Shackleton, 2004; Lopez-Feldman et al., 2007; Shackleton et al., 2007; Thondhlana et al., 2012; Uberhuaga et al., 2012; Fonta and Ayuk, 2013; Thondhlana and Muchapondwa, 2014; Angelsen et al., 2014; Wunder et al., 2014a, 2014b). Environmental resources sustain human welfare through the provision of both consumptive and non-consumptive goods. Environmental income is widely perceived to act as a safety net to shocks and to provide resources for seasonal gap-filling (Paumgarten and Shackleton, 2009; Wunder et al., 2014b). This realization has led to devolution and decentralization of environmental resource management into the hands of local communities. As a result, enhancing the utilization of environmental resources in the domestic and wider markets might contribute towards conservation and welfare (Wunder, 2001; Wunder et al., 2014a; Balint and Mashinya, 2006).

From the literature on environmental income and welfare, a number of issues stand out. The literature addresses wealth differentiation and unequal resource utilization. Within any given community, it is important to acknowledge socio-economic differentiation when considering policy formulation and management interventions to support rural livelihoods and promote sustainable utilization of environmental resources (McGregor, 1995; Shackleton and Shackleton, 2006; Babulo et al., 2008; Kar and Jacobson, 2012; Thondhlana et al., 2012). Evidence shows that poorer households benefit more than wealthier classes from environmental resource utilization in proportional terms, while richer households use greater quantities of these resources in total (Cavendish, 2000; Shackleton and Shackleton, 2006; Mamo et al., 2007). In addition, wealthier households purchase more environmental resources, while a greater proportion of poor households are actually involved in selling environmental resources (McGregor, 1995; Paumgarten and Shackleton, 2009).

The literature also looks at environmental resource dependence and the contribution of environmental resources to total household income. Evidence reveals that poorer households depend heavily on environmental resources, which contribute between 15% and 50% to their incomes (Vedeld et al., 2007; Mamo et al., 2007; Paumgarten and Shackleton, 2009; Kamanga et al., 2009; Thondhlana and Muchapondwa, 2014; Angelsen et al., 2014). The studies by Vedeld et al. (2007) and Angelsen et al. (2014) are important in that the former used meta-analysis of 51 case studies from 17 third world countries, while the latter is a comparative study of 8000 households from 24 developing countries respectively. Furthermore, the poorest income quintile had the highest environmental income share though absolute income from environmental resources increased with total income (Thondhlana and Muchapondwa, 2014).

There is general consensus about the role of environmental income in reducing rural inequality (Cavendish, 2000; Campbell et al., 2002; Fisher, 2004; Vedeld et al., 2007; Fonta et al., 2011; Thondhlana and Muchapondwa, 2014). Using a sample of 213 households from rural Zimbabwe, Cavendish and Campbell (2002) found that environmental income is strongly and significantly equalizing, bringing about a 30% reduction in inequality. Vedeld et al. (2007) also found that forest environmental income has a strong equalizing effect on local income distribution. Fonta et al. (2011) and Fisher (2004) found that forest environmental income reduces income inequality in rural Nigeria and Malawi respectively. However, there are mixed results with regard to

the effect of environmental income on poverty reduction. Cavendish (1999) reported that environmental income is important in mitigating poverty, but might not be responsible for lifting poor households out of poverty. In contrast, Uberhuaga et al. (2012), Fonta et al. (2011) and Lopez-Feldman et al. (2007) found evidence that environmental income reduces rural poverty in lowland Bolivia, Nigeria and Mexico respectively. The policy implications of these studies are considerable given potential welfare improvements associated with household use of environmental resources.

In light of the policy issues discussed above, a number of questions arise. How does the utilization of environmental resources affect welfare (total income, poverty and inequality) when wildlife is considered? Specifically, we ask: i. Does wildlife income (in the portfolio of environmental income) contribute significantly toward total household income, reduction in rural poverty and reduction in inequality? ii. How does environmental income with or without wildlife resources compare with other sources of income? iii. What determines the different amounts of environmental income (including wildlife) that households generate? The purpose of this study is, therefore, to examine the economic contribution of wildlife resources (as part of the portfolio of environmental income) to household welfare.

This paper considers a case study of the Communal Areas Management Programme for Indigenous Resources (CAMPFIRE) communities around the Gonarezhou National Park in Zimbabwe. CAMPFIRE is a programme that was initiated by the government of Zimbabwe in the 1980s to promote community-based natural resource management (Murumbedzi, 1999; Balint and Mashinya, 2006). Under the CAMPFIRE programme, proceeds from wildlife conservation are shared among participating communities (51%), the Rural District Councils (46%) and the CAMPFIRE Association (3%). Although previous studies on environmental income in the region include bushmeat, fish and other small mammals, most of them were limited to areas where wildlife conservation is not a dominant activity. This study differs by including cash income from safari operators in addition to what is harvested by households.² The paper demonstrates that revenue from wildlife conservation is an important component of environmental income generation for CAMPFIRE communities; indeed, they are organized around wildlife income.

Our study is organized as follows. Section 2 discusses data issues, defines key variables and gives an outline of the research methods, analytical framework and empirical model specifications. Section 3 presents the results. We then proceed to discuss the results in Section 3 and end with conclusions and policy implications in Section 4.

2. Research Methods

2.1. Study Area

The data for the analysis was drawn from a household survey conducted in June/July 2013 with local communities living adjacent to the Gonarezhou National Park in Zimbabwe. The park forms part of the Great Limpopo Trans-frontier Park linking Gonarezhou with the Kruger National Park in South Africa and the Limpopo National Park in Mozambique. It has approximately 5053 km² of conservation land and is the country's second largest game reserve after Hwange National Park. The park is located in natural region V, which is very dry with very low agricultural potential. The mean annual rainfall for the area is about 499 mm with average maximum monthly temperature ranging from <25.9 °C in winter to over 36 °C in summer, while the average monthly minimum temperature ranges from 9 °C to 24 °C in winter

¹ We define environmental resources in this paper as goods (biotic resources) that are freely provided by nature, accessible to everyone in the community, and which community members can collect without incurring any other cost except their own time, tools and transport (Cavendish, 1999).

² CAMPFIRE communities invest the cash income from safari operators in public infrastructure such as electricity, grinding mills, schools and clinics. Wildlife revenue is used communally, while individuals make decisions over how much wildlife to poach and non-wildlife resources they harvest.

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