

ABSTRACT

As the multiple challenges of climate change intensify, forest conservation and enhancement of forest cover have become the central focus as arguably the most efficient and cost-effective approach to mitigate or reverse the climate change crisis. Following this premise, there is a global consensus that conventional forest policy approaches of 'command and control' should be supplemented with livelihood-focused and incentive-based mechanisms, mainly through Payment for Environmental Services (PES). The 'command and control' approaches are not new in the forest sector, but incentive-based mechanisms such as PES are relatively new and largely untested, both at spatial and temporal scales. Furthermore, the greater part of the literature investigating the forest-livelihood nexus treats forest users as homogeneous, with limited attention to the diverse needs, actions, and interests that drive forest degradation and deforestation, and the uneven impact of, for example, forest protection interventions, including PES. Unlike most of the literature on forest - livelihoods which deals with de facto open-access forests or state-protected areas where harvesting is restricted, the study focuses on natural foresters on private land, where forest law enforcement is relatively weak. Conceptually, the study makes a distinction between survival-led and opportunity-led environmental reliance and approaches these issues by drawing the data from a PES programme that was piloted in Hoima and Kibale districts of Uganda from 2011 to 2013; using a sample of 268 households of former PES recipients and non-recipients, to address three questions. 1) Is reliance on forest and other environmental income sources a survival-led livelihood strategy for income and asset-poor households, or an opportunity-led strategy for income and asset-rich households? 2) Does forest protection through PES reduce deforestation, and are the forest conservation practices sustained after the PES programme end? 3) Does forest protection through PES induce agricultural land shortage, leading to agricultural intensification? For the first question, the study conducts quantile regressions of environmental income and reliance (measured as the share of total household income from the environment) on different household and contextual variables. Results show that the most environmentally reliant households are driven by necessity, particularly low levels of agricultural farmland and other household assets, but there is limited evidence of opportunity-led environmental reliance. For the second question, the before-after-control-intervention (difference-in-difference) approach is employed to estimate the PES programme outcome on their privately owned forests. PES is associated with less deforestation during the operational period, but the link has vanished four years after the termination of the programme. The study labels this, weak permanence, i.e., PES recipients abandon the induced practices soon after the programmes ended, but the gains (relatively higher forest cover) during the operational period are maintained. For the second question, the double hurdle and Tobit models are employed. The results show limited evidence of PES inducing land shortage leading to agricultural intensification, but fertilizer

input was associated with more natural forest conservation. These results have practical implications for forest policy formulation. The study suggests that environmental policy interventions should be differentiated: in areas where environmental income is a major source of livelihood, law enforcement programmes that regulate environmental extraction need to be complemented with alternative income sources. Small farm size is a major push factor into environmental reliance and forest clearance, hence enhancing land productivity and farm income is a potential policy for the most reliant households. Agricultural intensification through fertilizer use shows land-saving effects and may be a suitable strategy for enhancing both farm income and reducing deforestation from farmland expansions. In PES programmes, this would include integrating PES with farm income enhancing climate-smart agriculture, for more permanent deforestation reductions