Information System Better-iS

IUW - Output

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Summary:

This paper investigates the scale of small-scale farmers' tree cultivation in rural Tanzania and the role of future expectations for their investment decisions. Three questions are addressed: (1) Which factors determine the intensity of tree cultivation (trees per acre)? (2) Does the rate of time preference play a significant role? (3) Which factors determine the rate of time preferences? The analysis is based on cross-sectional data of 314 households from Tanzania. The results showed significant that the intention to generate firewood being the most vital factors for using agroforestry in Tandai. In addition, farmers with higher future expectations were found to cultivate significantly more trees although of lower significance. The rate of time preference is positively driven by the child-parent ratio, male headed households and young farmers.

Title:

Future Expectations of Small-scale Farmers and the Investments in Agroforestry

Problem and Objective:

Agroforestry – in particular tree planting – is a promising option for meeting households' energy demand. On the one hand, it would lead to firewood being generated and on the other hand, soil erosion could be alleviated. However, trees need a certain period of time to grow before they can be cut for firewood, provide food, and develop roots that reduce the occurrence of soil erosion. Although the benefits from agroforestry accrue in the future, the investments in seeds, seedlings and fertilizer have to be made in the present. Hence, the investments in trees may depend on a persons' rate of time preference by which that person discounts future results. Due to the benefits accompanied by agroforestry, the question arises which factors have an impact on the decision of Tanzanian smallholders to adopt agroforestry? In addition, there is the question whether there is a

nexus among long-term farm investments like tree planting and the rate of time preference of smallholders in Tanzania. Finally, the question is addressed which factors influence smallholders' rate of time preference?

Method:

A regression model is run to determine the dependency of the smallholders' decision to apply agroforestry on specific criteria given by the explanatory variables, in particular the present value indicating the future evaluation. In Tandai, tree planting is already spread and trees are grown by the majority of the inhabitants. Indeed, only ten out of 314 households of the sample do not grow any trees. In five out of these ten households the lack of tree planting is due to the fact that no household member works on the farm at all. In those households at least one of the household members has full employment off the farm, for instance as a teacher, in construction or as a shopkeeper. Therefore, a logistic regression on a binary variable that becomes 1 if trees are grown and 0 otherwise, would not deliver meaningful results on the factors, which influence the smallholders' decision to grow trees. Instead, a classical linear regression model, solved by the method of ordinary least squares (OLS), is performed on the tree density as a proxy variable for the acceptance of agroforestry. Compared to the tree number the tree density is more suitable to capture the acceptance of agroforestry. A generalized least square model is applied to estimate the determinants influencing the rate of time preference.

Results:

The empirical analysis resulted that the intention to alleviate yield losses and the intention to generate firewood being the most vital factors for using agroforestry in Tandai, but also the gender of the household head plays a significant role. Male-headed households cultivate significantly more trees compared to female-headed households. In addition, the availability of credit enhances the application of agroforestry remarkably, which indicates that a lack of liquidity to buy tree seedlings may often restrain the smallholders from applying agroforestry. Finally, the utilization of agroforestry is more intense if the present value stated by the respondents is higher and, thus their rate of time preference is lower. This implies that smallholders, who put compared to other smallholders a lower emphasis on consumption today instead of in the future, plant more trees. As a result, the hypothesis that the smallholders' rate of time preference is vital for long-term investments like tree planting is difficult to confirm but not rejected. The rate of time preferences itself is positively driven by the child-parent ratio, male-headed households and age.

Lessons learnt:

For research:

Time preferences are an important factor in the investment decision related to natural resources such as trees, and other measures to mitigate soil erosion. A derived question is which kind of programs might increase future expectations for example of woman headed households to further promote long term investments.

Policy recommendations :

Disadvantaged groups such as female-headed households should be included in for example training programs to promote the participation in tree investments.

References:

http://www.better-is.com/files/Kohlhase_2010_Master_Thesis_-_Environmental_farm_investments_and_agroforestry.pdf

Faße 2012: Sufficiency and sustainability (abstract): http://ageconsearch.umn.edu/handle/126666

Participating institutions: International Food and Policy Research Institute (IFPRI), Institute for Environmental Economics and World Trade IUW, World Agroforestry Centre ICRAF, Wuppertal Institute for Climate, Environment and Energy, Leibniz-Centre for Agricultural Landscape Research (ZALF e.V.), Association for Strengthening Agricultural Research in Eastern and Central Africa. Associated partners: SOKOINE University of Agriculture, Ministry of Agriculture, Food security and Cooperatives Tanzania, Ministry of Energy and Minerals, Tanzania.

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