

Research Application Summary

**Farmers' willingness to invest in improved soil and water conservation technologies in semi arid districts of Uganda**

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**Abstract**

One of the adaptation strategies to climatic change effects is use of soil and water conservation technologies. Studies in Uganda have revealed a variable significant adoption level of soil conservation practices across the country. However, soil productivity in semi arid districts of Uganda continues to decline and this is a threat to food security for population in these areas. There is limited information on farmers' willingness to invest or pay for improved soil and water conservation technologies in Uganda. The objectives of the study will be; to characterise households according to their willingness to pay for improved soil and conservation practices; to estimate the cost of various improved soil conservation practices relative to what farmers are willing to pay; to determine factors that influence farmers willingness to pay for improved soil and water conservation technologies. This study will use cross sectional data to establish the determinants of farmers' willingness to invest in improved soil conservation practices in semi arid districts of Eastern Uganda (Soroti and Pallisa). The results of this study will provide a benchmark for policy makers on factors for consideration while planning soil conservation projects that will win acceptance by the smallholder farmers in Uganda.

**Key words:** Adaptation, soil conservation, willingness to invest/pay

**Résumé**

L'une des stratégies d'adaptation aux effets du changement climatique est l'utilisation des technologies de conservation des sols et de l'eau. Les études menées en Ouganda ont révélé un niveau important d'adoption des variables des pratiques de conservation des sols à travers le pays. Cependant, la productivité des sols dans les districts semi arides de l'Ouganda continue à décliner et cela constitue une menace à la sécurité alimentaire pour la population dans ces régions. Il existe peu d'informations sur la volonté des agriculteurs d'investir ou de payer pour les technologies améliorées de conservation des

sols et de l'eau en Ouganda. Les objectifs de l'étude seront : de caractériser les ménages en fonction de leur volonté de payer pour les pratiques améliorées de conservation des sols et de l'eau; d'estimer le coût des diverses pratiques améliorées de conservation des sols par rapport à ce que les agriculteurs sont prêts à payer; de déterminer les facteurs qui influencent la volonté des agriculteurs à payer pour les technologies améliorées de conservation de l'eau et des sols. Cette étude utilisera les données transversales pour établir les déterminants de la volonté des agriculteurs à investir dans les pratiques améliorées de conservation des sols dans les districts semi- arides de l'Est de l'Ouganda (Soroti et Pallisa). Les résultats de cette étude constitueront une référence pour les décideurs politiques sur les facteurs à considérer lors de la planification des projets de conservation des sols qui vont gagner l'acceptation par les petits exploitants agricoles en Ouganda.

Mots clés: adaptation, conservation des sols, volonté d'investir / payer

## Background

Climate change, in combination with the expanding human population, presents a food security challenge world. Population growth and the dynamics of climate change exacerbates desertification, deforestation, erosion, degradation of water quality, and depletion of water resources, further complicating the challenge of food security (Delgado *et al.*, 2011). Smallholder farmers in sub-Saharan Africa whose livelihoods entirely depend on rain-fed agriculture have always devised strategies to avert the adverse effects of climate change on food production at farm level. The common strategy used by smallholder farmers in East Africa is autonomous soil and water conservation (Gebremedhin, 2004). FAO (2008) reported that climate change results into food insecurities, particularly for the resource poor developing countries who cannot meet food requirements through market access. Communities must protect themselves against the possibility of food-shortage emergencies through appropriate use of resources in order to preserve livelihoods as well as lives and property. In Uganda, serious climate change effects are prone to communities in semi-arid districts and many studies reveal a significant rate of adoption of soil and water conservation technologies to prevent the adverse effects (Turton and Boyd, 2000; Ellis-Jones, 1999; Fungo *et al.* 2011; Nkonya, 2002). Despite adoption of some conservation practices, low soil productivity and food insecurity is still prevalent in some parts of the country. New and improved soil conservation

technologies are required to support the traditional SWC and these may include use of infield measures that can improve soil moisture and nutrients availability (Ellis-Jones, 1999). This study seeks to establish determinants of farmers' willingness to invest in different improved soil and water conservation practices. Investment shall be looked at in form of cash payment and labor contribution. The findings of past studies on the adoption of soil conservation measures, the existing theoretical explanations, and the researcher's knowledge of the farming systems of the study area will be used to select explanatory variables and structure the working hypotheses.

### Literature Summary

According to Amarasekara *et al.* (2009), and Ulimwengu and Sanyal (2011), willingness to invest in soil conservation measures increases with farm income, level of awareness and ownership security of land. Studies have also revealed that investment in soil conservation technologies is practical only if prolonged pay-off is expected. Farmers' perception of soil degradation factors and how to prevent them is a necessary condition but not sufficient for farmers' investment in conservation technologies. The conservation practices must offer both short term and long term benefits and profit (Gebremedhin and Swinton, 2001). Teklewold and Gunnar (2010) reported that farmers' level of risk exposure to the effectiveness of soil conservation practice is an important factor that influences the willingness to invest or pay for improved soil conservation practices. The study established that reduced risk exposure can be achieved through improved land tenure security, promoting access to extension services and education and developing off-farm activities that generate income. Birhanu (2003), Linderhof *et al.* (2006) reported that farmers who adopted improved soil conservation technologies owned slightly larger farm sizes and used more hired labor. The non-adopters and adopters did not differ in household size, livestock ownership, age, literacy status, and access to credit. The study did reveal exactly factors that influence a farmer to invest in improved soil conservation practices.

A study conducted by Loeffen *et al.* (2008) on uptake of new technologies to improve soil productivity revealed that user households had a larger work force, more educated members, owned more land, livestock and agricultural equipment, and had more cash income and consumable assets than non-users.

## Study Description

The study will cover two districts in the semi-arid eastern Uganda districts of (Soroti and Pallisa. The sample of 100 respondents will be randomly selected from four sub-counties distributed equally per district. Cross-sectional data will be collected using pretested questionnaires. Descriptive statistics and econometrics methods will be used to analyse data. Contingent valuation method and the logistics distribution function (logit model) will be used.

## Research Application

The opportunities for enhancing climate adaptive capacity through improved soil conservation technologies among local farmers will be identified and knowledge spread on factors that influence smallholder farmers' willingness to pay or invest in improved soil conservation technologies. The information generated will be used to inform policy in Uganda and the Eastern African region at large.

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