

## ABSTRACT

Potato (*Solanum tuberosum* L.) is a major staple and source of household income security in eastern Africa, particularly the highland areas. Potato production systems are characterized by a spiral of nutrient depletion, with its attendant low potato yields and quality. In order to increase potato production, farmers have expanded the area of land under cultivation by destroying soil conservation structures, and encroaching on marginal areas. This has further escalated land degradation, in the form of soil nutrient exhaustion and erosion on the hill-slopes.

Baseline studies conducted in the highlands of south-western Uganda (2002) linked poor soil fertility management in potato-grown fields to two major factors: (i) farmers' low revenues due to lack of or weak linkages with profitable potato markets that are able to incentivize investment in soil fertility management; and (ii) limited knowledge in soil fertility management and conservation. These perceived potato production bottlenecks were addressed by the Allied Research and Development Project titled "Enabling Rural Innovations - ERI" under the auspices of the International Center for Tropical Agriculture (CIAT).

The objectives of the present study were to: (i) determine the extent to which the exposure of potato farmers in the highlands of south-western Uganda, to profitable urban markets influenced their level of investment in soil nutrient management and conservation measures; (ii) determine the influence of facilitation of potato farmers in the highlands of south-western Uganda with linkage to profitable urban markets, on soil nutrient balances in potato-grown fields; and (iii) determine the influence of exposure of potato farmers in the highlands of south-western Uganda to knowledge and skills of soil fertility management and conservation innovations on soil nutrient balances in potato-grown fields.

The study was conducted in the same sub County (*Kamungaguzi*) which hosted the ERI-project. There were three parishes in *Kamungaguzi* sub County (*Kicumbi*, *Katenga* and *Buranga*) with potato growing households that were involved in urban market linkages. Three other parishes (*Mayengo*, *Kyasano* and *Kasheregyenyi*), also in *Kamungaguzi* sub County, which were not involved in the ERI-project were used for comparison. The soils in all the parishes were characterized by low acidity (pH5.6-5.9); and low in total N and Bray-1 extract soil P.

The study was executed at three levels; namely (i) focus group discussions, (ii) face to face household interviews, and (iii) physical potato-grown field visits and collection of samples for the nutrient balance determinations. Potato-growing households associated with the ERI-project (codenamed "urban market linked") were 120, but only 68 households were considered for the present study on the basis of consistently producing potato for the urban market for approximately five consecutive years, and participated in group meetings and trainings. On the other hand, potato-growing households, which were not associated with the ERI-project (codenamed "non-urban market linked") were 227 households, though only 46 were considered because they consistently produced potato for five consecutive years. Farmers in Wealth Category I (WC I) predominated in the potato production, regardless of the type of market linkages.

The study revealed that there was a marked effect of farmer-training on the use of soil fertility inputs by the target farmers. However, that knowledge acquired did not necessarily translate into significant increase in investments in use of soil fertility management and conservation innovations as originally envisaged. This was due to: (i) difficulty in accessing fertilizer inputs, (ii) high costs of mineral fertilizers, and (iii) lack of access to farmer-friendly agricultural credit. The effect of farmer-linkage to profitable potato markets did not necessarily lead to significant farmers' investments in soil fertility management and conservation in potato-grown fields. Reasons provided by farmers include: (i) lack of capacity to purchase soil fertility inputs (revenues generated from potato sales are apparently insufficient to cover domestic priority needs as well as purchase soil inputs); (ii) interest rates on scarcely available credit were bottlenecks to investments in soil fertility management and conservation; (iii) access to suppliers of fertilizers was a limitation because they are located in urban centers far away from potato farmers; and (iv) application of farm yard manure in potato grown fields was limited only to fields close to homesteads or areas of manure concentration.

In light of the above challenges, there is need to (i) extend farmer-friendly, but conditional credit tied to soil fertility improvement; (ii) encourage or advocate for the establishment of soil fertility input stores in rural potato-growing communities; and (iii) revisit community soil conservation bye-laws with a view to making them user-centered.