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Simulated Willingness of Farmers to Adopt Fertiliser Micro-Dose and Rainwater Harvesting Technologies in Semi-Arid and Sub-Humid Farming Systems in Tanzania

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Abstract

As a continent which is full of potential and abundant natural resources, Africa is in a better position to feed its people. Productivity of African agriculture falls below the global average mainly due to limited use of productivity enhancing technologies. In Tanzania, smallholder farmers are operating without fertiliser on fragile soils in rain-fed areas. Nutrient mining and soil-moisture stress are the main limiting factors of increased crop productivity in the semi-arid and sub-humid dry-land areas of Tanzania. Fertiliser micro-dosing (MD) and rainwater harvesting through ridges (RWH) appear to be appropriate technologies to replenish the nutrients and improve the soil moisture for increased crop production. It nonetheless remains unclear whether these technologies can themselves easily be adopted by smallholder farmers in Tanzania. Our findings raise important issues as to whether these technologies are really adoptable to poor smallholder farmers.

There have been very limited efforts to make predictions about adoption and diffusion of new technologies in agriculture. This study attempts to assess the willingness of farmers to adopt MD with and without ridges RWH. Data and information used was obtained from a baseline study, participatory *ex-ante* impact assessments and simulation exercises. Our cross-section analysis mainly relies on the use of ADOPT (Adoption and Diffusion Outcome Prediction Tool) and Scala-FS for understanding sustainability, prioritising and sequencing as far as technology adoption is concerned.

The simulation reveals the *ex-ante* impact of selected technologies, the peak adoption rates, the likelihood for reaching peaks and the possible time for reaching those adoption peaks. Our findings propose the best ways to be opted by technologies users, while considering factors affecting adoption during research planning, implementation and testing of the farm level technologies.

Keywords: ADOPT, adoption, farm innovation, fertiliser micro-dosing, prediction, Tanzania