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## Evaluation of Adoption Potential of Modern Technologies in Potato Value Chain by Smallholder Farmers in Kenya: Nyandarua County Pilot Case Study

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### Abstract

In Kenya, smallholder potato farmers endeavour to increase their production through various approaches, most commonly by expanding areas under production and repeatedly planting potato on the same site, with the latter resulting in build-up of diseases. Compounded with limited access to options to improve productivity, these farmers yield less than 10 t ha<sup>-1</sup>, much below realistic yields of 20 to 30 t ha<sup>-1</sup>. In an attempt to address these constraints, a study in the framework of the pilot project Potato Initiative Africa lead by International Potato Center (CIP) evaluated modern interventions to improve yields and reduce harvest and postharvest losses along the production chain. The study employed a participatory research approach with a set of five smallholder farmers representing the sub counties of Nyandarua and a site at farmer training school in Nyandarua (ATC Njabini), the sites were used for demonstration of these interventions to increase productivity and incomes of the smallholder farmers. Major interventions were evaluated; Potato varieties suitable for processing, fertiliser use, seed quality, mechanisation and crop protection options. The study compared three production packages: i) Modern production technology which included fully mechanised operations, use of fertiliser blend specific for potato (NPK 16:8:22+2MgO+2S), three imported varieties and two improved spray programs ii) National Agricultural Research Station recommended operations using DAP fertiliser (DAP 18:46:0) with farmers preferred variety (Shangi) and manual operations and iii) the farmers' local production practices. The paper reports on the results of soil fertility status of the smallholder farmers' fields, mechanisation options, crop protection, cost benefit analysis, yields, farmers perceptions of the demonstrated interventions, and recommendations on the potential adoptability of these interventions.

**Keywords:** Adoption potential, modern agriculture technologies, potato, smallholder potato farmer