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## Potential Impact of New Groundnut Production Technology on Welfare of Smallholder Farmers in Northern Ghana

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### Abstract

This study was conducted to assess the potential welfare impact of applying higher groundnut planting density among smallholder farmers in northern Ghana. We used data from on-farm experiments (N=35), focus group discussions (N=22), and a household survey (N=542 farmers). We followed three steps in our analysis. First, we conducted cost-benefit analysis and risk analysis. Second, we predicted the potential maximum adoption rate and the time to reach the maximum adoption using the Adoption and Diffusion Outcome Prediction Tool. Third, using the results of the first and the second steps, we estimated the potential impact of the technology on poverty at household level using methods such as economic surplus model, econometric model, and the Foster-Greer-Thorbeck method. Results show that gross margin would increase by about 258 % for every 15 cm reduction in inter-row planting from 75 cm (farmers' practice) through to 30 cm. Prediction results show that a maximum of 62 % of groundnut farmers in the study areas are expected to adopt the best plant spacing; this peak rate will take about 10 years to be reached from the initial adoption time. This level of adoption will reduce the incidence of extreme poverty by about 3.6 % if farmers have access to the international groundnut market. The intervention will also reduce poverty gap and poverty severity which means that poor households would be closer to the national poverty line and their inequality would decline as compared to the base case. While the impact on welfare remains positive if farmers rely only on domestic markets, the magnitudes are not as high as when they get access to the international market. This implies that strategies which could improve farmers' access to the international market including trade negotiations with importing countries on tariff and non-tariff barriers and actions targeted to improve the quality of groundnut grain to meet the phytosanitary standards of importing countries will increase the rate of poverty reduction among groundnut growers in northern Ghana.

**Keywords:** Adoption, Ghana, groundnut, impact, poverty, prediction