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# **Transforming Rural Agricultural Systems in Sub-Saharan Africa: What Role do Social Networks Play?**

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**Keywords:** social networks; technology adoption; groundnuts

**Abstract:** A quantitative approach is used to examine the relationship between social network ties and farmers' decisions regarding adoption of improved groundnut varieties. The main findings are that farmers: (a) used external sources (i.e., weak ties) to learn about new improved groundnut varieties; (b) engaged in individual farm trials to gain experience (learning by doing); and (c) use both external sources and close associates (i.e., strong-ties) within their social network to acquire technical information about improved varieties.

## **Background**

Agriculture is a vital activity for the majority of farmers in Sub-Saharan Africa (SSA); employing roughly 60% of the total labor force (Beintema & Stads, 2004). Rapid increases in population growth and declining agricultural returns have challenged poverty reduction strategies (Moussa, 2002). To increase farm productivity, adoption of improved agricultural technologies is essential, creating a need for stronger linkages among farmers, extension agents, and researchers. However, in SSA approaches used to transfer knowledge to farmers have had limited effect in transforming the agricultural sector (Moussa, 2002). Researchers (e.g., Hogset, 2005) argue that social networks are vital in technology adoption (e.g., adoption of improved seed varieties) as the networks serve as information channels and as avenues for learning.

## **Theoretical Framework**

To guide this study on how social networks relate to technology adoption, the researchers used a conceptual framework based on a synthesis of the empirical work done by Monge, Hartwich, and Halgin (2008) on social learning in agricultural contexts, and a model by Genius, Pantzios, and Tzouvelekas (2006) on information acquisition and technology adoption. In social learning, individuals learn by doing (i.e., their own experiences), by observing others (i.e., learning from others), or both (Monge et al., 2008; Hogset, 2005). A need exists to determine how social network ties (i.e., strong- and weak ties) influence information transfer, and consequently technology adoption by farmers in SSA.

## **Methodology**

Participants were farmers who planted groundnuts in either or both cropping seasons in 2009 within Kenya ( $N = 249$ ) and Uganda ( $N = 237$ ). The sample was purposefully selected from

a list of farmers who either received research interventions (*research farmers*,  $n = 241$ ), or had no direct research intervention (*non-research farmers*,  $n = 245$ ). Enumerators collected data via face-to-face interviews with farmers and manually recorded their responses on the questionnaire. The authors analyzed the data using descriptive and correlational statistical methods.

### Results

Preliminary findings based on the Uganda data indicate that roughly 89% of the participants had knowledge of at least one of the five improved seed varieties, and 84% experimented with the varieties on their farms in the last 5 years. Knowledge about improved varieties was linked to external sources (e.g., extension agents, researchers, and agricultural exhibitions) for 86% of the participants while 14% mentioned their close associates (i.e., neighbors, group members, and relatives) as sources of information. With regard to influences on their farming success, roughly 49% of the participants cited linkages with external sources (weak-ties), 27% cited close associates (strong-ties), 13% mentioned experience from own farm trials (learning by doing), and 11% related their success to other factors (e.g., market prices, seed availability, and weather). Results indicate a small to moderate effect between adoption of improved varieties and household size ( $r = .13$ ) and land size ( $r = .16$ ). Specifically, farmers who adopted improved varieties tended to belong to an association ( $r = .10$ ), engage on individual farm trials ( $r = .49$ ), and discuss groundnut related issues with close associates or external agents ( $r = .34$ ). Regardless of farmer type, weak-ties played a key role in farmers gaining knowledge about new varieties, but their decision to adopt was impacted by their own experience and technical information acquired through weak- and strong-ties.

### Discussion

These results are generalizable to the setting from which the data was derived but may not be representative of the whole population of groundnut farmers in the region. This results show that farmers acquire knowledge about improved varieties through their ties with external agents, and to a lesser extent through their close associates. However, choices on whether to adopt an improved variety or not are determined by an individual's experience with the varieties over time (learning by doing), or by "free-riding" on other people's experiences (learning from others), or both. In social networks, information about new technologies increases as more farmers adopt a technology; reducing the production cost and in turn increasing the adoption rate. There is need to explore how social ties within a social network are structured to further understand how these informal channels could be used to promote adoption of new technologies and thus increase productivity.

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