The role of Farmers' social networks in adopting Climate Smart Agriculture: Case of Horticultural Farmers in Nyeri County, Kenya

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Keywords

Farmers' Social Networks; Conservation Agriculture; Centrality Measures

Purpose

This paper aimed at depicting how farmers use their informal networks to share information on climate smart agriculture especially on conservation agriculture.

Methodology/Approach

The study used social network analysis (SNA) in UCINET to depict the pattern of information sharing on conservation agriculture among individual farmers and farmers groups.

Findings

The study identified the structural importance of various actors in the farmers' social networks. Power and centrality measures of various farmers were identified. Values for ego between coordinator and gatekeeper brokerage roles were normalized so that differences in network sizes were accounted for. The study identified several farmers who were identified to be critical in information sharing among horticultural farmers in Nyeri County.

Practical Implications

Farmers' social networks were found to play a pivotal role in the dissemination of information with key farmers identified as central actors in the network.

Theoretical Implications

Social network theory examines social structure from the perspective that relationships between two parties or more are partly influenced by the external ties possessed by each other with the degree of influence varying among the actors.

Originality/ Value

This research demonstrates the need for agricultural research institutions to identify and liaise with actors with high degree of centrality in the jurisdiction of information and resource dissemination to guarantee maximum adoption of new technologies by the target groups.

According to Kabubo & Kabara (2018), agricultural production in Kenya has been on the decline from 2015 to 2018 due to erratic weather conditions during the period. With declining production juxtaposed by an exponentially growing population, food security and household welfare of farmers are adversely affected. According to the Ministry of Agriculture, Livestock and Fisheries (MoALF), about 98% of Kenya's agricultural activities are rain-fed and therefore highly susceptible to climate change and climate variability (MoALF, 2018).

Climate Smart Agriculture is a recent occurrence in Kenya that was launched in 2017 by the MoALF with an aim of building an agricultural system that will sustainably increase productivity, adapt and build resilience to the likely effects of climate change and reduce/or remove greenhouse gas emissions without compromising productivity (MoALF, 2018). This will be achieved through; access to and use of adaptive technologies, increase area under efficient irrigation, value addition and products development, competitiveness and markets access for climate smart products and coordinated food storage and distribution (MoALF, 2018).

With the effects of global warming evident in Kenya, agricultural sector has become sensitive and highly vulnerable to climate change and variability in terms of prolonged dry spells, droughts, floods and other extreme events. Due to the high dependency on rain fed agriculture amongst farmers in Kenya, Recha et al. (2016) found that agricultural productivity has decreased by 1% in the last decade due to climate related adversities. According to the study, smallholder farmers in Kenya, oblivious of their actions, are gradually adopting sustainable agricultural practices as a reflex action towards the impacts climate change.

This study conceptualized climate smart agriculture as an activity or process that horticultural farmers in Kieni exercise with a view of ensuring sustainable agriculture. With the adoption of climate smart and ecologically sustainable production methods along the agricultural value chain, agricultural productivity, food security and household income will be sparked across the country. These methods include among others; minimum tillage, crop rotation, crop diversification, water harvesting and irrigation.

Materials and Methods

The sample unit for this study consisted of smallholder horticultural farmers drawn from Kieni administrative constituency in Nyeri County. First, Nyeri County was purposively selected because of the large number of small-scale horticultural farmers. Within the County, Kieni Sub-County was also purposively selected because this is where intensive horticultural farming is done. Two sub-locations were also purposively selected from this sub-county. Households were randomly selected within the sub-locations to yield a sample size of 100 farmers who acted as the egos where alters' networks were generated. These sub-locations were selected based on their similar rural classification, close proximity to each other and their similarities in terms of livelihood activities, which predominantly are horticultural farming areas

Structured questionnaires were prepared to collect quantitative data for the study. Primary data sources for the study were the sampled farm households, both male and female heads. The developed questionnaires were pretested to evaluate for consistency, clarity and to avoid duplication. Network interviews were conducted as part of the household survey during the fieldwork. A person-based data collection strategy was employed within the household survey questionnaire and from this; a set of indicators, each referring to different aspects of social networks, were constructed.

A name generator approach was employed when the interviewed household heads (egos) were asked to name people from whom they get information from. The first step was whether from extension officers, radio, television or from fellow farmers. Those who indicated to get information from fellow farmers (alters) qualified for network mapping and therefore a follow up question was to list alters names and attributes.

Alters' names were recorded in response matrices which were later coded during the analysis. Further questions were posed concerning attributes of the network partner (sex, age and geographical locations), the nature of the relationship between network partner and household heads and multiple role relationships. This data formed the 'interaction' network of the household head.

Results

From the 100 sampled farmers, each farmer (henceforth referred to as ego) was probed to identify the contacts they rely on to source information (henceforth referred to as alters). Each ego was to identify utmost three contacts from which they get information on climate smart agriculture. The egos were coded numerically from 1 to 100 while each ego's alters were coded as the numerical number of the ego with alphabets A, B and C representing the first to the third alter chronologically. The multiplier effect was a net of 293 actors.