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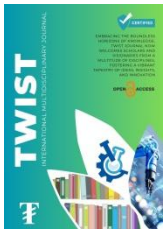

The Relationship Between Communication Networks and Behavior of Vegetable Farmer in Egon Village, Sikka Regency

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Abstract
Vegetable farming is an agricultural business that must be developed because vegetable products have excellent opportunities for marketing. The purpose of this study is to analyze the relationship between vegetable farmers' communication networks and their farming behavior. This research is descriptive and correlational and uses a quantitative approach. Two research variables were observed: communication networks (X1) and farming behavior (Y1). The unit of analysis in this study was the individual level. The results showed a significant relationship between local centrality and plant protection cognition and practices; local centrality had a low but definite relationship with affection, the use of superior varieties, and plant protection, but had a very low relationship with harvest and post-harvest. Global centrality has a low but definite relationship with cognition, affection, fertilization, and plant protection, and has a very low relationship with the use of superior varieties, harvest, and post-harvest. Togetherness has a low but definite relationship with cognition, affection, use of superior varieties, fertilization, and plant protection but is closely related to harvest and post-harvest. Based on the research results, it can be concluded that there was a significant relationship between local centrality and plant protection cognition and practices.

Keywords
Farmers, Global Centrality, Local Centrality, Network

INTRODUCTION

Vegetable farming is an agricultural business that must be developed because vegetable products have excellent opportunities for marketing. The vegetable consumption of the Indonesian population will continue to increase annually, in line with the growth of the population due to the continuous consumption of vegetables. The development of vegetable products is a very good opportunity because it is followed by the dissemination of vegetable production areas. One of the vegetable producers with a large amount of production in the Sikka Regency is Egon Village in Waigette District. Vegetable crops are a type of commodity that has high economic value and plays an important role in meeting the various needs of farmer families. Information about vegetable farming run by farmers in Egon Village through communication with farmers or people in the surrounding environment. Communication is one of the most important skills in daily life. Communication is the center of activity in the development of agricultural systems, but it is often difficult to implement (Cahyono & Agunga, 2016). Farmers usually search for and exchange information, either through interpersonal communication with certain social actors or other farmers around them or through the mass media to affirm their decisions on the innovations offered to them (Swari & Cahyono, 2016; Inggrida et al., 2017). The process of exchanging information forms a patterned social communication relationship in which innovation has the potential to be disseminated among farmers.

According to Rogers and Kincaid (1981), communication networks are relatively stable relationships between two or more individuals involved in the process of exchanging information. Berger and Chaffee (1987) state that a communication network is a pattern of information exchange between individuals in their social systems. Meanwhile, Kadushin (2012) defined a network as a set of relationships between social actors. Furthermore, Eriyanto (2014) states that a network is a set of actors that have relationships with other actors in a certain type of relationship. Furthermore, Scott (2013) stated that communication networks show relationships between individuals, groups, or organizations in generating opportunities and contexts related to social behavior and are useful in visualizing patterns of social interaction. This perspective assumes that individual behaviors are influenced by the structure of interpersonal communication in society (Valente & Rogers, 1995; Fisher et al., 2015).

Rogers and Kincaid (1981) stated that the purpose of communication network research is to understand the general phenomenon of social interaction and identify the communication structures that make up it. Meanwhile, Eriyanto (2014) explained that the purpose of communication network research is to describe the relationship between actors (people, institutions, companies, etc.) in a certain social structure. There are two main topics in communication networks: the first is actors, namely the analysis of communication networks from the micro side (actors); the second is the relationship, which is how these social actors interact with each other. The interaction between actors forms an interpersonal communication structure. Communication structure is an arrangement of different elements that can be recognized through the pattern of communication flows in a system (Rogers & Kincaid, 1981).

Farmers are still engaged in traditional farming, which causes vegetable farming that is carried out not to develop optimally. Traditional farming behavior includes a series of practices and habits that have been passed down from generation to generation, making it a challenge for optimal development in the vegetable cultivation business. Information about vegetable farming obtained by vegetable farmers through the formed communication network can affect the behavior of farmers in running their farms. Therefore, so that behavior is a response or reaction of an individual to a stimulus that comes from outside or from within (Sukarman et al., 2020).

The potential for vegetable commodities can be increased by creating a communication network for agricultural technology information. Thus, all information about innovation in the field reaches farmers so that they can change their behavior in vegetable farming. Therefore, it is necessary to conduct research on the relationship between communication networks and farming behavior of vegetable farmers. The purpose of this study is to determine the relationship between usable behavior and communication networks consisting of local centrality, global centrality, and togetherness.

METHODS

This research is descriptive and correlational and uses a quantitative approach. The selection of quantitative approaches is used to better understand the social facts that are the focus of this study (Singarimbun and Effendi, 2008). The quantitative approach was chosen by the researcher because it looked at the description and explained the relationship between variables in depth, with the unit of analysis being farmers who farm vegetables, so that they could show a clear relationship between variables. Two research variables were observed: communication networks (X1) and farming behavior (Y1). The purpose of this study was to examine the relationship between communication networks and vegetable consumption behavior. The unit of analysis in this study was the individual level.

The research was conducted in Egon Village, Waigettel District, Sikka Regency, and East Nusa Tenggara Province. The location of the study was chosen purposively (intentionally) by considering that this village has a relatively larger vegetable farming area than other areas and needs a supply of information about vegetable farming behavior. The second phase of the research, namely in-depth interviews and focused group discussions (FGD/Focused Group Discussion) was held in August. This method was used to complete the research material.

The unit of analysis in this study was individual vegetable farmers. The determination of respondents in this study used a census method in which research respondents were taken from the entire population. The census method was used because it is communication network research that emphasizes depicting the overall communication structure. This refers to Rogers and Kincaid's (1981) opinion:

"Sampling intact system is particularly advantageous for sociometric measurement: data about the characteristic of both the respondents and the respondent's dyadic contacs are thus available because everyone is interviewed."

The population of this study was all vegetable farmers in Egon Village, Waigette District, Sikka Regency, and East Nusa Tenggara Province, which totals 53 vegetable farmers, so the respondents in this study were 53 vegetable farmers.

Data Collection Methods

Primary and secondary data were used in this study. Primary data were obtained from the main variables studied in the form of communication network factors and farming behavior obtained directly through interviews with respondents using questionnaires and conducting open interviews with several informants. Using instruments in the form of questionnaires. Secondary data were obtained from literature, books, and reports from the Egon Village Office.

Data Processing and Data Analysisi

The research data were collected, categorized, analyzed, and descriptively presented in the form of averages, percentages, and frequency distribution tables. The collected data were processed and analyzed based on research interests. The following data analysis techniques were used in this study:

Spearman rank analysis was conducted to examine the relationship between the communication network variables of vegetable farmers and their farming behavior. Pearson correlation analysis and spearman rank correlation were performed using the SPSS 20.0 for windows program. To analyze the application of farming behavior, indicators consisting of cognition, affection, use of superior varieties, fertilization, plant protection, harvest, and post-harvest were used. The six indicators used three class numbers: high, medium, and low and was assigned the highest score of 3 and the lowest score of 1.

The formula used to measure the level of application of agricultural behavior production technology is:

$$\mathrm{NR} = \mathrm{NST} - \mathrm{NSR\ P1}$$
$$= \mathrm{NR} : \mathrm{JIK}$$

where:

NR : Range Value

NST : NSR's Highest Score

: Lowest Score of JIK

: Number of PI class intervals.

: Interval Length

Relationship affinity is categorized based on the statistical classification of the two category variables expressed by Guilford (1956) as follows:

Table 1 Statistical Classification

Score intervals	Classification
< 0. 20	The relationship is very
0.20 – 0.39	Low but meaningful relationship
0.40 – 0.69	Meaningful relationship
0.70 – 0.90	High, strong relationships.
> 0.90	The relationship was very strong

RESULTS AND DISCUSSION

The Relationship between Communication Networks and Vegetable Farming Behavior

Vegetable farmers in Egon Village form a communication network with other farmers to meet their information needs and increase their farming production. Increasing vegetable farming production is one of the conditions that farmers can achieve if they have good farming behavior and are willing to apply production technology recommended by obligatory or authorized institutions. In this study, the reference for good farming behavior was based on vegetable cultivation methods. The use of superior verietas, fertilizing, protecting plants, and carrying out proper harvesting and post-harvest are recommended by the Agricultural Technology Research Institute (BPTP) of East Nusa Tenggara Province as well as by agricultural extension workers instructed by the local agricultural office. Vegetable farmers who have good farming behavior, according to recommendations, will be able to increase vegetable farming production. If farmers implement good farming behavior and according to automatic recommendations, they will need a good supply of information, and the availability of information sources regarding the application of technology in farming is adequate so that vegetable farmers are able to achieve their goals.

The establishment of a communication network carried out by vegetable farmers in Egon Village will greatly assist network members in meeting the need for information regarding the application of vegetable farming technology. This study was conducted to examine the relationship between the communication networks of vegetable farmers and the behavior of vegetable farming. The wider the communication network owned by vegetable farmers, the higher is the level of vegetable farming behavior. The measurement of communication networks in this study uses three types of measurement: centrality, global centrality, and togetherness. We tested the relationship between local centrality, global centrality, and togetherness and vegetable farming behavior using Spearman rank correlation. Spearman rank correlation analysis was selected because the technology application data variable is ordinal scale data, while the communication network variable data is ratio scale data. The results of the Spearman's rank correlation test for the two variables are shown in Table 2.

Table 2 The relationship between communication networks and vegetable farming behavior in Egon Village

Communication Skill	Cognition	Affection	Varieties Superior	Fertilization	Plant Protection	Harvesting and Postharvest
Local centrality	0.429	0.295	0.249	0.384	0.434	-0.034
Global centralita	0.342	0.387	-0.009	0.380	0.351	0.159
Togetherness	0.334	0.305	0.314	0.272	0.275	0.005

Remarks: Score Range: very low = <0.20; low but definite = 0.20-0.39; enough means = 0.40-0.69; strong= 0.70-0.90; very strong= >0.90

The Relationship between Local Centrality and Farming Behavior

Based on Table 1 regarding the relationship between local centrality and farming behavior, it can be seen that the value of local centrality is quite meaningfully related to farming behavior in plant cognition and protection where, r=0.429 and 0.434, a close relationship is quite significant because many farmers are looking for information about pests and diseases that attack vegetable crops. Farmers in Egon Village have different abilities to protect crops, and there are still some farmers who cannot distinguish crop damage caused by pests or plant diseases, so they cannot provide proper treatment to plants. Farmers who have high values, high local centrality, or the more they are in contact with vegetable farmers in the immediate environment, the higher they are in implementing farming behavior in the field of plant cognition and protection. Local centrality has a low but definite relationship with affection, superior variety, and fertilization. Implementing good farming behavior in the field of fertilization and plant maintenance, one of the parts of vegetable

farming is implemented in accordance with the instructions and recommendations of the parties concerned, such as agricultural extension workers, so that the production of vegetable farming can increase according to expectations. Table 1. showed a very low relationship between local centrality and penen and post-harvest, with a value of r= -0.034. Farmers with a high local centrality value are not even more capable of handling vegetable harvest and post-harvest.

Vegetable farmers use fertilizers and pesticides that are in accordance with the needs of the types of vegetables grown and in accordance with the recommendations of extension workers, and still follow the rules of use in the process of fertilizing and protecting plants. Farmers who have a high local centrality value or who have a position as a star in their immediate environment in the communication network system apply farming behavior in terms of planting and fertilization in accordance with instructions or recommendations from related parties, such as extension workers. This can happen because vegetable farmers are always looking for information from outside the system so that they are cosmopolitan and always involve themselves in the exchange of information about vegetable farming in the immediate environment because they always have more and more appropriate information about fertilization and maintenance than vegetable farmers who are less involved in the communication network. This causes them not to experience obstacles in carrying out or implementing vegetable farming behavior; they always have enough information when they experience problems in vegetable farming, so with a lot of information they can apply good farming behavior to increase vegetable production.

Vegetable farmers who are involved in a communication network system of farming behavior applied by vegetable farmers can change and get better, because in the communication network system, there are vegetable farmers who play the role of opinion leaders or stars, where they are a good source of information for vegetable farmers in vegetable farming. This is in accordance with the results of research by Cindoswari (2012) which states that the existence of the role of an opinion leader or star in a communication network can direct or influence a person's actions because of the communication process patterned in the communication network.

The Relationship Between Global Centrality and Farming Behavior

Based on Table 1 regarding the relationship between global centrality and vegetable farming behavior, the value of global centrality is low but related to vegetable farming behavior in the fields of cognition, affection, fertilization, and plant protection. Global centrality is low in relation to the use of superior varieties and handling in harvest and post-harvest, where the values of r= -.009 and r= .159. Farmers who have a low global centrality value could contact other vegetable farmers who are used as a source of information in a communication network system; thus, the better the behavior of vegetable farming in the field of fertilization and crop protection. The lower the global centrality value, the shorter the distance to contact all individuals in the system. Conversely, the higher the global centrality value, the longer the distance must travel to contact all individuals in the system (Scott, 2000). The shorter the "distance" that vegetable farmers have to go through if they contact all individuals in the system, the higher the level of penetration of vegetable farming behavior carried out by the vegetable farmer. The greater the ability of vegetable farmers to contact all other vegetable farmers in the system, the higher the level of vegetable farming behavior carried out by vegetable farmers.

Global centrality shows the ability of individuals to connect with other individuals in a certain system unit, so that it can play a key role in disseminating information. An individual who plays the role of key information is rich in information that can be disseminated to other individuals. Fertilization and plant protection are part of the farming behavior in the implementation of vegetable farming by providing fertilizer and protecting plants from pests. Vegetable crops are in dire need of fertilizers, fungicides, and cleaning from nuisance plants so that vegetable plants can develop and grow properly. Vegetable farmers who could access all individual farmers in the communication network system will be more intensive or the frequency of information exchange will be higher than other farmers who are only connected to a few individuals in the system.

Vegetable farmers who always discuss and share information with other vegetable farmers will have a lot of knowledge so that they can easily carry out good behavior to be applied by farmers in accordance with their abilities and knowledge, but still in accordance with what has been encouraged. Vegetable farmers with a low global centrality value will have a short distance to reach or contact other vegetable farmers in the system. This situation makes it easier for vegetable farmers to obtain information that is required to implement vegetable farming. Vegetable farmers obtain the information needed to run vegetable farming from sources in the system and from sources outside the system.

The Relationship between Togetherness and Farming Behavior

Based on Table 1 regarding the relationship between togetherness and the level of vegetable consumption, the value of togetherness is low but definitely related to the level of farming behavior in terms of cognition, affection, superior varieties, fertilization, and plant protection. There was a very weak relationship between togetherness and the level of farming behavior in harvesting and post-harvest handling, where rs=.0.05. Farmers who have a high value of togetherness will have better farming behavior in terms of the use of superior varieties, fertilization, and plant protection.

Vegetable farming behavior in the use of superior varieties, fertilization, and plant protection is the stage of activities carried out by farmers in cultivation, but always in accordance with the recommendations of extension workers or related agencies so that they can increase vegetable production. At the stage of using varieties, it is necessary that the seeds are of good quality so that they can grow well and are resistant to pests and diseases. At the fertilization stage, it is important to ensure the optimal availability of nutrients to support plant growth so that an increase in crop yield is obtained. Farmers

protect plants so that plants from threats or disturbances that can damage, harm, or interfere with the development process of vegetable crops in order to increase vegetable crop production.

Vegetable farmers who have a high value of togetherness or act as stars in their immediate environment will apply farming behavior in terms of selecting superior varieties, fertilizing, and protecting plants in accordance with instructions and recommendations. This can happen because vegetable farmers who have a high value of togetherness are cosmopolitan farmers, open to accepting innovations or new ideas about technology in vegetable farming, and farmers are also always involved in exchanging information with other vegetable farmers in the surrounding environment, and always looking for information about vegetable farming outside the system. Farmers also always involve themselves in the exchange of information by conducting discussions in the immediate environment, because they have better knowledge and information on vegetable cultivation and matters related to suhoor farming than other vegetable farmers involved in communication networks.

Vegetable farmers do not experience difficulties in the form of a lack of information in implementing vegetable farming behavior; therefore, with the information they have, they can carry out good vegetable farming so that they can increase their vegetable farming production according to expectations. Vegetable farmers who are involved in a communication network system can change the behavior of farmers in vegetable farming for the better, because in the communication network system, there are vegetable farmers who play the role of opinion leaders or stars, which are a good source of information for vegetable farmers in vegetable farming. This is in accordance with the results of research by Cindoswari (2012) which states that the existence of a role as an opinion leader or star in a communication network can direct or influence a person's actions because of the communication process patterned in the communication network.

CONCLUSION

Based on the results of the analysis of the research on communication networks and farming behavior of vegetable farmers, it was concluded that there was a significant relationship between local centrality and plant protection cognition and practices; local centrality had a low but definite relationship with affection, the use of superior varieties, and plant protection, but had a very low relationship with harvest and post-harvest. Global centrality has a low but definite relationship with cognition, affection, fertilization, and plant protection, and has a very low relationship with the use of superior varieties, harvest, and post-harvest. Togetherness has a low but definite relationship with cognition, affection, use of superior varieties, fertilization, and plant protection but is closely related to harvest and post-harvest.

AUTHOR CONTRIBUTION

The author conducted all research, analyzed the data, and wrote the text.

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DECLARATION OF CONFLICT

The author declares that there is no conflict of interest.

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