The Popularity of Extension Workers in the Exchange of Information on Yard Utilization

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ABSTRACT

The communication process in extension activities occurs not only between extension workers and farmers but also among extension workers. Communication among extension workers forms a social network. This study aims to analyze the popularity of extension workers within social networks in exchanging information on yard land use. The research was conducted using a qualitative approach and the whole network analysis method using Pajek 5.18 software. The research informants were extension workers in the Yogyakarta Special Region, spread across Sleman Regency, Bantul Regency, Kulon Progo Regency, Gunungkidul Regency, and Yogyakarta City. The results showed that the popular extension workers in each district/city were those from their respective districts/cities. Extension workers are popular because they have the most communication activities (in degree) or receive the most information about yard land use in social networks. Popular extension workers play an important role in social networks, such as having high closeness centrality to accelerate the flow of information and acting as intermediaries for other extension workers to control the flow of information.

Keywords: Popularity, Extension Workers, Information Exchange, Yard Utilization

ABSTRAK

Proses komunikasi dalam kegiatan penyuluhan tidak hanya terjadi antara penyuluh dengan petani, tetapi juga antar penyuluh dengan penyuluh. Komunikasi yang terjalin antar penyuluh akan membentuk jaringan sosial. Penelitian ini bertujuan untuk menganalisis popularitas penyuluh pada jaringan sosial dalam pertukaran informasi mengenai pemanfaatan lahan pekarangan. Penelitian dilakukan dengan pendekatan kualitatif menggunakan metode *social network analysis* software Pajek 5.18 secara *whole network*. Informan penelitian merupakan penyuluh di Yogyakarta Special Region yang tersebar di Kabupaten Sleman, Bantul, Kulon Progo, Gunungkidul, dan Kota Yogyakarta. Hasil penelitian menunjukkan bahwa penyuluh yang popular pada setiap kabupaten/kota merupakan penyuluh dari kabupaten/kota masing-masing. Popularitas penyuluh merupakan penyuluh yang memiliki aktivitas komunikasi in-degree atau menerima informasi mengenai pemanfaatan lahan pekarangan terbanyak dalam jaringan sosial. Penyuluh yang popular akan mempunyai peran penting dalam jaringan sosial seperti memiliki kedekatan yang tinggi dengan penyuluh lain sehingga mampu mempercepat aliran informasi dalam jaringan sosial maupun menjadi perantara bagi penyuluh lain sehingga mampu mengontrol aliran informasi dalam jaringan sosial.

Kata Kunci: Popularitas, Penyuluh, Pertukaran Informasi, Pemanfaatan Pekarangan

INTRODUCTION

Agents of change that are important to the agricultural sector are extension workers assisting farmers. Agricultural extension workers are responsible for serving as a bridge in conveying agricultural information between farmers and information sources such as researchers, the government, and the private sector (Zamasiya et al., 2017). Extension agents are involved in technology transfer and building farmers' awareness of innovation adoption (Kibue et al., 2015). Farmers' awareness to develop is built through extension activities. Extension is an activity that has a strategic role in increasing knowledge for farmers (Ahmad, 2017). The knowledge level significantly and positively influences attitudes and behaviors (Kusumawati & Nugraheni, 2023). Therefore, increasing farmer knowledge will impact changes in farmer attitudes and behaviors.

The success of agricultural extension does not happen instantly but through a continuous process. In this process, communication is an important aspect that needs proper execution. Communication helps extension workers recognize the conditions and needs of farmers (Br Ginting & Kurniawati, 2021). The communication process carried out by extension workers will encourage the implementation of appropriate extension activities. The communication is conducted by extension workers with farmers and other extension workers (Dangnga et al., 2018). Communication with fellow extension workers can encourage social learning that supports the implementation of extension services in their target areas. Extension workers can learn communication strategies carried out by other extension workers.

The dissemination of information among extension workers will form a social network. Social networks are one source of information that will enrich the knowledge of extension workers to support the implementation of extension services. A social network also can be used to confirm information (Wang et al., 2020). Social networks among extension workers give extension workers lots of information and help them get the correct information. Social networks also act as information bridges between sources of information with hard-to-reach targets (Kánská et al., 2012).

Social networks are relationships between individuals with subjective meaning and are associated with something as nodes and ties. Nodes are seen through the individual actors in the network, while ties are the relationships between these actors (Damsar & Indrayani, 2009). According to Eriyanto (2014), social networks describe the relationship of actors (in the form of people, institutions, companies, countries, and so on) with other actors in certain social structures. Social networks are defined as a set of relationships between social actors, where in the network, there are two important parts, namely actors called nodes and relationships commonly called edges. Nodes are depicted with points that are not always individuals (people). At the same time, the relationship (edge) is the relationship between actors. Edge is symbolized by a line connecting the actors. If there is no line between actors, it indicates no relationship. In addition, Eriyanto (2014) also states that social networks can describe the communication process that is formed. Social networks also emphasize the position of actors and the power of actors in the social structure. It helps explain several things, such as attitudes, opinions, and behaviors of social groups.

The social network among extension workers will make it easier for them to transfer technology, such as yard utilization, to farmers. Yard utilization is an activity the government is promoting to make the land around the house more productive. Utilization of the yard is a bridge to realizing family food security. Yard utilization will benefit the fulfillment of family food needs, reduce expenses, and increase family income (Silondae et al., 2021). Utilization of the yard is specifically for women who are members of farmer women's groups. The members of the farmer women's group do not all have a background in agriculture. Therefore, the transfer of innovations regarding the utilization of yard land needs to be delivered appropriately.

Technological developments can be an opportunity for transferring agricultural information to extension workers. In line with Esti et al. (2020), social media such as Instagram effectively transfers information to promote the agricultural sector. In addition, Aliagan et al. (2023) also stated that social media is a viable tool for promoting the agricultural sector. Through social media, extension workers and farmers will be more exposed to innovations in agriculture. The transfer of information through social media does not have to be mass-targeted. Using social media as a communication medium between extension workers will provide a forum for information exchange for extension workers. Irpan et al. (2023) stated in their research that the government's information delivery to extension workers occurs vertically. Directives related to implementing programs for farmers, one of which is yard utilization, tend to be top-down. Therefore, Garbach & and Long (2017) stated that extension

services need to be structured more strategically by incorporating peer-to-peer communication among extension workers or fellow farmers to become a medium for information exchange, provide important, useful information, and avoid different perceptions.

Planning extension activities on yard utilization needs to consider information and social learning from other extension workers through social networks. The social network will determine the intensity of communication between agricultural extension workers. Extension workers who receive more information from other extension workers in the social network are likely to be more popular (Zhu & Smith, 2021). Popularity can indicate a person's credibility and respect (Westerman et al., 2012; X. Zhu & Smith, 2021). A person capable of being sociable tends to be more popular (Jung & Phoa, 2021). The existence of respect causes other extension workers to inform popular extension workers about every piece of information they obtain. On the other hand, a popular extension worker gets information from many sources and can socialize with others. Most popular extension workers can check and filter the information they receive, ensuring it is credible.

This research makes two significant contributions: it enhances the model of information exchange among extension workers and improves the method of analysis used to measure the role of extension workers. Therefore, the importance of this research lies in demonstrating how the popularity of extension workers can reflect their role in their environment. Additionally, the urgency of this research underscores the importance of coordination and collaboration among extension workers to increase their human capacity and enhance their knowledge and skills in alignment with the extension program.

METHODS

This research used a communication network analysis approach along with a descriptive method. The research design was a whole network analysis aimed at determining the connectedness between actors in the communication network. The informants of this research included all agricultural extension workers in Yogyakarta who were civil servants and were known as actors in this research. The number of actors amounted to 344 extension workers located in four districts and one city: Sleman, Bantul, Kulon Progo, Gunungkidul, and Yogyakarta City.

The data were collected through observation, interviews, and literature review. The data collection stage involved interviews using a questionnaire containing a name generator, a question designed to identify the names of extension actors. The names of the extension actors were selected using the Roster method. Each actor chose the names of other extension actors on the list using a free-choice approach. Informants were allowed to choose any extension actor on the list without limiting the number of selections. The context of the data collected was the yard utilization by the 344 informants. Each informant was asked to select names from the provided list of those from whom they sought and to whom they provided agricultural information, including all agricultural extension workers in Yogyakarta.

The collected data was analyzed using Pajek software version 5.18. Data tabulation was conducted based on the relationships between actors. The analysis process used the social network analysis (SNA) method. SNA is a technique that can be used to study relationships within social entities such as communities, families, companies, and other groups (Wu et al., 2018; Zhang et al., 2018). The social entities studied in this research are agricultural extension workers in the Yogyakarta Special Region. Whole network analysis was used to measure centrality between actors, including closeness centrality and betweenness centrality. The analysis is based on the frequency of actors who receive agricultural information from other extension workers (in-degree), which reveals the popularity of actors. Extension workers with communication activities and receiving the most information are considered popular actors in the social network. The popularity of extension workers can also be determined from the in-degree centrality value using the following formula:

$$Cid = \sum \frac{di}{N-1}$$

Where Cid is in-degree centrality, di is the number of relations (communication activities) of other actors, and N is the number of population members. The extension worker with the highest in-degree centrality value is popular in the social network.

RESULT AND DISCUSSION

Social networks are something that humans need as social beings. Through social networks, a person can connect with other people. Social networks are one of the human sources of information. Social networks are also effective information exchange platforms (Yang et al., 2018). According to Slijper et al. (2022), the existence of social networks can increase the exchange of information. The information network of agricultural extension workers will be seen from three things: the activity of extension workers in information exchange, the position of extension workers in social networks, and the popularity of extension workers in social networks.

Activeness of Agricultural Extension Workers in Information Exchange on Yard Utilization

The network structure of information exchange on yard utilization among agricultural extension workers in the Yogyakarta Special Region can be known through the sociogram in Figure 1. According to Gómez et al. (2020), a sociogram is a graph that represents the relationship between members of a social group. A sociogram is a data analysis that focuses on how a social relationship can be built. The sociogram in Figure 1 shows the activity of disseminating and receiving information about the utilization of the yard. The activity can be divided into two things: in-degree and out-degree. In-degree shows actors' activities in receiving information from other actors, while out-degree shows actors' activities in disseminating/giving information to other actors.

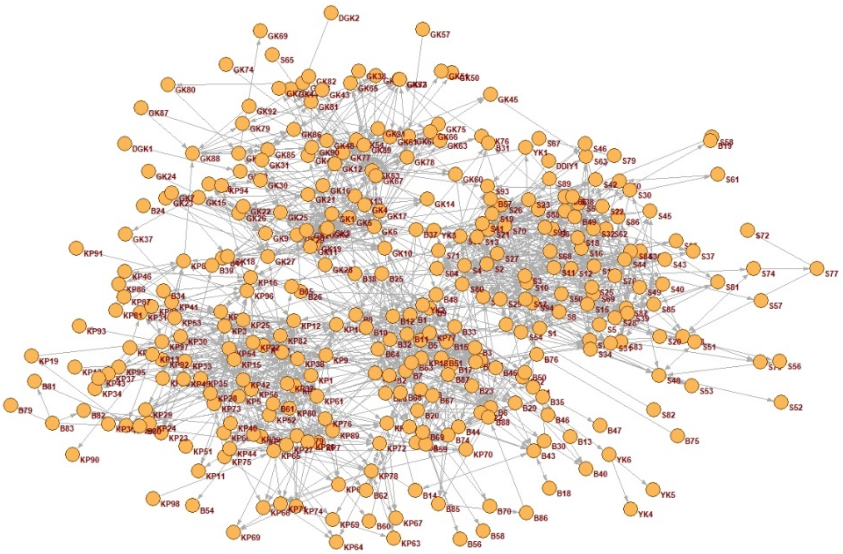


Figure 1. Sociogram of Information Exchange on Yard Utilization in Agricultural Extension Workers
Source: Primary Data Analysis (2024)

The pattern of information exchange on yard utilization among agricultural extension workers in the Yogyakarta Special Region appears to be centralized. The exchange of information was centered at several points and formed four large groups, namely agricultural extension workers in Sleman Regency (code S), agricultural extension workers in Bantul Regency (code B), agricultural extension workers in Gunungkidul Regency (code GK), and agricultural extension workers in Kulon Progo Regency (code KP). The actor code for each district is accompanied by a number code, for example, in Sleman Regency, there are extension workers with actor codes S1, S2, S3, and so on. The number code indicates the actor number in the coding performed. The actor number is done sequentially based on the database of names of extension workers in each regency/city. It showed that the exchange of information on the utilization of yard land was more intensive among extension workers in the same district. The existence of extension institutions at the sub-district level in each district/city in Yogyakarta makes communication between extension workers in the same district easier. Although the pattern of exchange formed is centralized per district, the social network formed is not separated from one district to another. It happens because interactions between extension workers and extension workers outside the district still occur. The institutionalization of extension at the provincial level with extension worker coordination activities that are carried out causes communication between

extension workers outside the district to be formed. The exchange of information can provide a better understanding of agricultural management practices (T. Guo et al., 2023). Hernando-Valdez & delos Trinos (2021) also said that exchanging information with friends has a significant effect on increasing farmers' income. When extension workers exchange information with each other, they gain valuable knowledge and experience that can be used to assist farmers with the proper methods and techniques.

Figure 1 shows that the agricultural extension workers in Yogyakarta City have a less centralized pattern of information exchange compared to other districts. The smaller working area results in a smaller number of agricultural extension workers. As a result, exchanging information on yard utilization becomes more complex, requiring communication with extension workers in other districts. Slijper et al. (2022), state that the wider the social network a person has, the more intense the exchange of information will be. Figure 1 shows that all agricultural extension workers in the social network have information exchange activities in the use of yard land so that no isolated actors are found. However, the number of agricultural extension workers with positions as peripheral actors is still quite large, namely 31 people. Peripheral actors are actors who only have one relationship in the activity of exchanging information on yard land use that takes place in 1 direction or two directions. Therefore, there are other references besides the 31 extension actors in seeking information from other extension workers. The extension workers are not popular on the theme of yard utilization, but they are likely popular or active on other themes in extension activities.

The activity of agricultural extension workers in Yogyakarta in exchanging information on yard utilization can be seen from communication activities carried out among extension workers. Their communication activities are reflected in the social networks they form, which can be measured by the size of the network, the number of relationship lines, the density of the network, and the average relationships in-degree and out-degrees formed. Additionally, the components and cliques formed in the social network also provide insight into their communication activities. Table 1 provides the activity of extension workers exchanging information on yard utilization.

Table 1. Activeness of Agricultural Extension Workers in Exchanging Information on Yard Utilization

No	Activeness Components	Value
1	Size	344
2	Line	1.928
3	Density	0,016
4	Average in-degree	14,33
5	Majority in-degree	1 (13,08%)
6	Average out-degree	14,96
7	Majority out-degree	1 (13,08%)
8	Average degree	11,21
9	Component	87,50%
10	Cliques	121

Source: Primary Data Analysis, 2024

Table 1 shows that the size of the social network formed consists of 344 actors. The size of the social network represents the intensity of communication between actors. The 344 actors conduct information exchange activities by providing or receiving information about yard utilization. Moreover, 1.928 lines of communication activities were formed among these actors. It means that out of the 344 actors in social networks, 1.928 communication activities or relationships were formed. These communication activities could be in the form of providing or receiving information about yard utilization. The more lines formed, the more the intensification of communication exchanges will be impacted. Guo et al. (2023) state that social networks affect a person's knowledge. Kreft et al. (2023) have found that individuals with larger social networks tend to possess more knowledge within the network. This level of knowledge can impact a person's behaviour, particularly when adopting innovations. Meanwhile, He & Tang (2023) also state that the degree of social networks affects changes in one's will and behaviour.

In theory, the value of social network density ranges from 0 to 1, where the closer to 1 indicates a denser social network (Jiang et al., 2023). The value of social network density in agricultural extension workers exchanging information on yard utilization is 0,016. Therefore, the density of

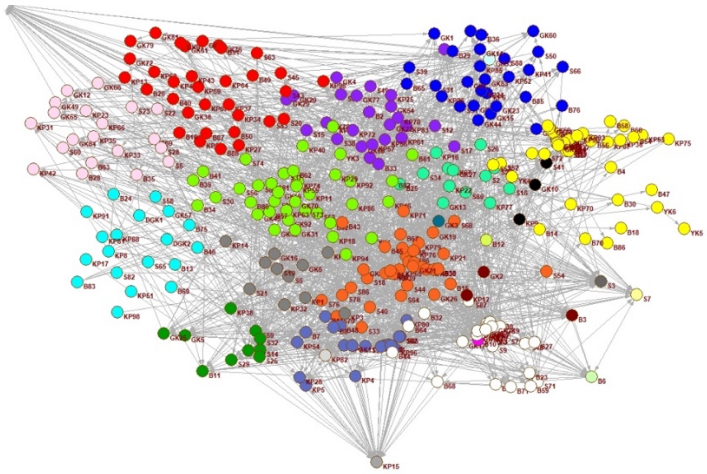
social networks formed in the category is low. According to Mbugua and Nzuma (2020), social networks play a role in information exchange activities. Social network density relates to the interactions between actors in the network. Social network density relates to the interactions between actors in the network (Jiang et al., 2023). These interactions can be information exchange activities between actors and each other in social networks. The low density of social networks indicates that the activity of extension workers in exchanging information on the use of yard land is still relatively low. The low density of social networks formed can be caused by not all extension workers being active in communication activities even though they are part of the social network. Many extension workers still have only one link, either as a recipient of information or an informer. Therefore, it causes the closeness of the relationship between actors to be low.

The communication activities within social networks of agricultural extension workers regarding the use of yard land can be categorized into in-degree (receiving information) and out-degree (sharing information) activities. Table 1 shows that the average in-degree value is 14.33, indicating that, on average, each agricultural extension worker receives information from approximately 14 other workers. However, 13.08% of the agricultural extension workers in the network only receive information from one other extension worker. Similarly, the average out-degree value is 14.96, showing that each worker shares information with about 14 other extension workers. Nonetheless, 13.08% of the workers only share information with one other extension worker. This indicates a lack of extensive communication activities among the extension workers. The level of active communication between extension workers in social networks significantly influences the average degree scores. Aksu et al. (2019) also stated that the size of the network or the number of actors involved in the network also directly affects the average degree of the social network.

The component is a group of social network actors witht least one link or connection (Hertanto et al., 2016). Table 1 shows that the percentage of components formed is 87.50%. This indicates that 87.50% of actors in the agricultural extension workers' social network who exchange information on yard utilization have only one communication link with other extension workers, either receiving or providing information. This implies that most workers have only a single relationship. However, cliques are also formed within these social networks. A clique is a collection of individuals and community members connected through mutual interactions. A clique occurs because there are at least three relationships among several individuals and their communities. (Kurniawan et al., 2020). Table 1 also shows that 121 cliques were formed. It shows that 121 smaller social networks were formed on social networks to exchange information on yard utilization among agricultural extension workers in Yogyakarta. According to Khomami et al. (2022), What is interesting about a clique is that it represents a community or small group within a social network that shares more intuitive and closer relationships. The cliques formed will significantly affect the flow of information exchange. Since the number of actors involved in a clique is relatively small, the relationships between clique members are closer. Therefore, if one member of the clique receives information, the information is likely to be quickly shared and received by other members of the clique as well.

The Popularity of Extension Workers in the Exchange of Information on Yard Utilization

Communication activities involve many actors in the context of exchanging information on yard utilization. In the formed social network, there will be depicted actors who are popular in the network. According to Amatulli et al. (2014), Popularity can be measured by the number of connections an actor has with others in a social network. For agricultural extension workers, popularity is indicated by the number of in-degree relationships (receiving information) concerning yard land use. Extension workers with the highest number of in-degree relationships are considered the most popular actors in the network. The popularity of agricultural extension workers in Yogyakarta, as related to land use, is illustrated in Figure 2 and detailed in Table 2.



= Highest in-degree relation

= Lowest in-degree relation

Figure 2. The Popularity of Agricultural Extension Workers in Yogyakarta in the Exchange of Information on Yard Utilization
Source: Primary Data Analysis (2024)

In Figure 2, actor nodes (represented by circles) are shown in different colors. The color of each circle indicates the number of in-degree communication activities (receiving information) for each extension agent. Similar colors among actor nodes signify that these extension workers have the same number of in-degree relationships, reflecting the same level of popularity within the social network. The most popular extension workers are represented by light grey nodes, while the least popular are shown with light blue nodes.

Figure 2 reveals that the most popular extension worker in the network, regarding the exchange of information on yard utilization in Yogyakarta, is actor KP15, with 34 in-degree relationships. Actor KP15 is a prominent figure in the Kulon Progo Regency, engaging with 34 other extension workers to receive information about yard utilization. KP15, a 51-year-old extension worker with 11 years of experience, benefits from a senior status that encourages other workers to share innovations in yard utilization. This extensive communication network ensures that assistance provided to farmer groups is consistent. The yard utilization program, a key initiative of the Yogyakarta Government, necessitates regular coordination at the provincial level. During these activities, KP15 frequently interacts with extension workers from other districts and cities, facilitating the exchange of information on yard utilization.

Furthermore, Table 2 shows the extension workers who are popular in exchanging information about yard utilization in their respective districts/cities. Social networks play an important role in disseminating information that is not written or cannot be accessed directly (Asprooth et al., 2023). The capabilities of extension workers are different due to differences in age, work experience, and ability to use ICT, so the exchange of information in social networks is one of the learning media for extension workers. It aligns with Petersen-Rockney et al. (2021), who state that information exchange can increase a person's capacity to overcome future challenges.

Table 2. The Popularity of Extension Workers in the Exchange of Information on Yard Utilization

District/City	Actor	Number of Relationships (in-degree)
Yogyakarta Special Region	KP15	34
Sleman Regency	S3	32
Bantul Regency	B6	18
Kulon Regency	KP15	34
Gunungkidul Regency	GK53	31
Yogyakarta City	YK2	6

Source: Primary Data Analysis (2024)

Table 2 shows that the popular extension workers in each district come from their respective districts. This indicates strong interaction among extension workers within each district or city. Table 3 highlights that YK2 is a popular extension worker in Yogyakarta City, with the fewest in-degree relationships, having only six. The smaller working area of Yogyakarta City, along with the presence of only one extension institution, results in less intensive communication activities among extension workers compared to other districts. According to Ma & Yang (2023), the size of a social network affects an individual's cognition or level of knowledge due to its relation to communication intensity. Extension workers who are popular in social networks for exchanging information on yard utilization occupy significant positions within the network, characterized by high closeness and betweenness centrality. This demonstrates that the more communication activities an extension worker engages in, the more influential their position in the social network becomes.

The number of in-degree relationships owned by S3, B6, KP15, GK53, and YK2 actors compared to other extension workers certainly has a role in the use of social media. Social media now makes it easier for extension workers to communicate and coordinate with other extension workers. Social media can also facilitate communication with extension workers outside the district/city. Technological developments have a positive impact and support the implementation of the duties of agricultural extension workers. According to Wang et al. (2020), social media, the internet, and mobile technology, such as cell phones and smartphones, have become communication tools capable of connecting people around the world. The existence of social media such as WhatsApp, Facebook, and others allows agricultural extension workers to exchange information about yard utilization easily. The existence of WhatsApp groups owned by extension workers in each sub-district or district allows extension workers to receive information from other extension workers easily. The ease of obtaining this information when properly utilized by the extension workers will make the extension workers rich in information. Internet technology will make information exchange more accessible and more accurate (Khan et al., 2020).

A popular extension worker is characterized by engaging in numerous in-degree communication activities (receiving information) related to yard utilization. This popularity indicates that the extension worker has access to a substantial amount of information. The volume of information possessed by extension workers significantly impacts their ability to perform their tasks, such as sharing information with farmers and fellow extension workers. Table 3 illustrates the relationship between extension workers' in-degree and out-degree communication activities.

Table 3. Matrix of In-degree and Out-degree Communication Activities Carried Out by Agricultural Extension Workers in the Exchange of Information on Yard Utilization

		Out-degree		Total
		Low Out-Degree	High Out-Degree	
In-degree	Low In-Degree	291 (95,1%)	15 (4,9%)	306 (100%)
	High In-Degree	18 (47,4%)	20 (52,6%)	38 (100%)
Total		309 (89,8%)	35 (10,2%)	344 (100%)

Source: Primary Data Analysis (2024)

It is important to note that the amount of information a person possesses significantly influences their communication activities. Table 3 shows that actors with low in-degree communication activities tend to have low out-degree activities as well. The in-degree activities of agricultural extension workers impact their knowledge acquisition. The more information an agricultural extension worker receives, the more potential they have to share information with other extension workers. In line with Sherman et al. (2019), relationships and reciprocal interactions facilitate communication and information dissemination activities. However, Table 3 also indicates that 4.9%, or 15 extension workers, have low in-degree communication activities but high out-degree communication activities. This suggests that information exposure for these workers can be obtained from sources other than their colleagues. The era of information technology has significantly impacted the information exchange activities of extension workers. Technical guidance provided by the Agricultural Human Resource Development Center also serves as a valuable learning resource, encouraging communication among extension workers. Therefore, a lack of in-degree relationships with other

extension workers does not necessarily imply that they have less information. Many extension workers effectively utilize the internet and maintain communication with their peers.

Table 3 shows that the majority of out-degree communication activities (disseminating information) on yard utilization are conducted by extension workers with high in-degree relationships (receiving information). Having strong in-degree relationships allows extension workers to accumulate more information, enabling them to share it with others. However, Table 4 reveals that 47.4% of extension workers, despite having high in-degree relationships, are still reluctant to engage in out-degree communication with their peers. Most extension workers primarily participate in in-degree communication activities related to yard utilization information exchange. As seen in Table 3, 89.8%, or 309 extension workers, fall into the low category for out-degree communication activities (disseminating information). According to Zhao et al. (2016), information exchange behavior requires self-efficacy to share information with others. Many extension workers do not share information because the Yogyakarta government's yard utilization program leads them to believe that all extension workers have the same understanding of yard utilization. This assumption results in limited out-degree communication, as workers are hesitant to appear patronizing. Out-degree communication that does occur is typically initiated by extension workers seeking information from their colleagues.

A person's communication activities will affect the amount of information received. Table 4 shows whether in-degree communication activities of extension workers affect out-degree communication activities.

Table 4. Correlation of In-degree and Out-degree Communication Activities

	Value	Sig
Pearson Chi-Square	84,258	0,000
Contingency Coefficient	0,444	0,000

Source: Primary Data Analysis (2024)

Table 4 indicates a significant relationship between in-degree and out-degree communication activities among extension workers, as evidenced by the sig value on the Pearson Chi-Square, which is 0.000 ($p < 0.05$). This suggests that there is a strong association between the two variables. Similarly, Table 5 presents a sig value of 0.000 ($p < 0.05$) for the Contingency Coefficient, indicating that the number of in-degree relationships positively correlates with the number of out-degree relationships. Extension workers with numerous in-degree relationships tend to possess more information obtained from their peers, motivating them to share it with others. As stated by El Said (2015), the intention to disseminate information or knowledge is closely linked to an individual's willingness to share the information they acquire or create.

The number of in-degree communication relationships contributes to the popularity of extension workers within social networks. This popularity, especially concerning yard utilization, influences the ability and confidence of extension workers to convey information to their peers. Extension workers' popularity within social networks results from their proactive communication activities with other extension workers. In-degree communication represents a reciprocal relationship wherein extension workers actively seek information from their peers, indicating that communication activities do not solely rely on others providing information. Instead, communication can also commence with extension workers seeking information from their colleagues regarding yard utilization. Effective communication with other extension workers necessitates strong communication skills, a trait often exhibited by popular extension workers in social networks. Good communication is essential for interacting with fellow extension workers and for receiving information shared by them.

Popular extension workers will also have an important position in the social network. Popular extension workers can be in high proximity to other extension workers on social networks. It aligns with Ataei et al. (2019), who state that the main actor in a social network will have high centrality in the social network. The proximity allows the extension workers to accelerate the flow of information in the social network. It is needed in terms of implementing innovations or policies to be delivered to farmers. Popular extension workers are also able to become intermediary actors in communication between extension workers in the social network. Extension workers who act as intermediaries can control the flow of information on the information network. In this case, the role of competent intermediary extension workers is certainly needed so that incoming information can be discussed so that other extension workers in the network can receive it well. Intermediary extension workers are also able to filter information that enters the social network.

Position of Agricultural Extension Workers in Information Exchange on Yard Utilization

The position of agricultural extension workers in Yogyakarta in the exchange of information on yard utilization can be determined through the centrality of actors in the social network structure. According to Epskamp et al. (2018), measuring the centrality of a network structure can be used to assess the importance of nodes (actors) in the network. Three things can be used to measure network centrality, namely degree centrality, closeness centrality, and betwenness centrality. In this study, two things will be seen, namely closeness and betwenness centrality in Table 5.

Table 5. Position of Agricultural Extension Workers in Information Exchange on Yard Utilization

District/City	*Closeness Centrality*	*Betweenness Centrality*
Yogyakarta Special Region	KP82	GK53
Sleman Regency	S3	S3
Bantul Regency	B6	B12
Kulon Regency	KP82	KP15
Gunung Regency	GK53	GK53
Yogyakarta City	YK2	YK2

Source: Primary Data Analysis, 2024

Closeness centrality measures the proximity of the relationship between a node (actor) and other nodes in the social network (He & Su, 2023). Network members with high closeness centrality are considered to have good connections with other members in the network. It shows that the actor has easy access to information or sources of influence (Muller & Peres, 2019). According to Salavati et al. (2019), closeness centrality is a commonly used method to identify influential actors in disseminating information in social networks. On the other hand, betweenness centrality will measure the strength of actors in a network. Betweenness centrality will see how many actors are connected to other actors in the network while other actors are not connected (Zhu et al., 2010). According to Cope et al. (2018), nodes (actors) that play an important role in transferring information with other nodes (actors) on social networks will have high betweenness centrality. Gan et al. (2018) also stated that high betweenness centrality indicates that the actor has an important position in the network, acts as a mediator, or can play a role in reducing communication barriers.

Table 5 illustrates that extension workers with the highest closeness centrality and betweenness centrality in each district are predominantly from their respective districts. This can be attributed to the shared working environment, resulting in higher centrality between extension workers within the same district compared to those in different districts. The frequent interactions among district extension officers facilitate extensive information exchange. In Sleman Regency, extension worker S3 exhibits high closeness and betweenness centrality, while in Yogyakarta City, extension worker YK2 demonstrates the same characteristics. These findings suggest that S3 and YK2 serve as key information intermediaries, maintaining strong relationships with other extension workers in their respective districts or cities. With 27 and 34 years of work experience, respectively, S3 and YK2 have accumulated extensive professional networks. S3's prolonged interaction with other extension workers in Sleman Regency positions them as a communication intermediary not only within the district but also beyond. Such intermediary roles are crucial for facilitating the flow of information and knowledge exchange across various groups (Skaalsveen et al., 2020).

In Bantul and Kulon Progo districts, extension workers B6 and KP82 exhibit high closeness centrality. Despite their young age (below 40 years), B6 and KP82 actively engage in communication with other extension workers within their districts. Their consistent communication efforts have fostered close relationships with fellow extension workers. Additionally, KP82 holds the highest closeness centrality in the communication network of agricultural extension workers in Yogyakarta. With 13 years of work experience, KP82's communication networks extend beyond Kulon Progo Regency to other districts. Their youthful age also enables them to effectively utilize social media for communication with extension workers outside their district boundaries.

Furthermore, in the districts of Bantul and Kulon Progo, extension workers B12 and KP15 demonstrate high betweenness centrality. With over ten years of work experience, B12 and KP15 have established extensive communication networks with numerous extension workers. Their

frequent interactions allow them to serve as communication intermediaries for other extension workers. It is in line with Lai et al. (2024), who state that betweenness centrality is the power of actors (people, institutions, and others) to act as bridges in social networks.

In Gunungkidul Regency, extension worker GK53 stands out with the highest closeness and betweenness centrality. Additionally, GK53 holds the highest betweenness centrality in the broader social network of agricultural extension workers in Yogyakarta. Aged 54 and holding PPPK status, GK53 faces challenges in staying updated on yard utilization information due to their seniority. Consequently, GK53 actively cultivates relationships with extension workers both within and outside Gunungkidul Regency to access information. The more relationships GK53 establishes, the more information they acquire, fostering closer ties with other extension workers in the region. Moreover, GK53 serves as a communication intermediary for extension workers within Gunungkidul Regency and beyond due to their extensive communication network.

Effective information exchange plays a pivotal role in enhancing the human resource capabilities of extension workers in their respective agricultural areas. Coordinated efforts through agricultural extension programs ensure ongoing coordination among extension workers. Knowledgeable and skilled actors within the program serve as reference points, guiding its implementation. Meanwhile, other extension workers collaborate as activists, disseminating the program under the guidance of capable and popular extension workers. By leveraging the network of agricultural extension workers, active and popular individuals can be identified to ensure effective coordination and collaboration during program implementation.

CONCLUSION

Based on the conducted research, it is concluded that in-degree communication activities (receiving information) regarding yard utilization significantly influence the out-degree communication activities (disseminating information) conducted by extension workers. The number of in-degree communication activities possessed by extension workers determines their popularity within the social network of fellow extension workers, indicating that active communication initiatives contribute to their popularity. The popularity of agricultural extension workers in each district/city of Yogyakarta stems from their respective localities, highlighting the impact of their communication efforts.

Moreover, extension workers' popularity correlates with their capacity enhancement, reflecting their adept communication skills and influential positions within the social network, characterized by high closeness or betweenness centrality. Extension workers occupying such pivotal positions in social networks can serve as communication intermediaries for effective policy implementation. Policy implementation in each district/city necessitates tailored adjustments to local conditions, underscoring the importance of regional coordination to ensure the seamless execution of programs across all regencies of the Yogyakarta Special Region.

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