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Agricultural Extension Governance and Services in Responding to Problems of Agricultural Sector and Extension Institutions

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ABSTRACT

Agricultural extension services that are currently following the decentralization era require a participatory extension approach in line with the needs of farmers and resource specific endowments in each region. This mixed-method study was conducted with 35 agricultural extension workers as samples who actively participated in the focus group discussion and filled in the questionnaire provided. This study aims to look at the condition of agricultural extension governance and services at local level which is characterized by agricultural resource based on economic development, namely Purworejo Regency, Central Java Province, in responding to problems in the agricultural sector and extension institutions. The research results show that the governance of extension services in Purworejo Regency faces the issue of lack of capacity building of extension workers with excessive workload and minimal staff. In contrast, extension agents have a pile of tasks that must be done individually, without inadequate support on facilities and sufficient budget to support extension services to farmers. The impact of climate change, such as an increase in pests and plant diseases and water crisis, have become major problems in the agricultural sector. In conclusion, this study found that there is a lack of capacity building for extension workers due to insufficient support from the government. Thus, this study suggests a policy and program to build extension workers' capacity and a more organized governance of extension institutions.

Keywords*: agricultural extension, capacity, extension institution, gap analysis, governance*

BACKGROUND

Agriculture has become the strategic issue in Indonesia, since the pivotal role in guaranteeing and achieving national food security. The success of the agricultural sector itself cannot be separated from agricultural extension services which holds the main responsibility as an information delivery system. To develop agricultural extension services, a bunch of policies has been declared by the central government. As stated by Bingu et al (2016), agricultural extension is the most important element of the agricultural development process. Agricultural extension can push forward the realization of the welfare of farming communities by linking the entire chain of agricultural business activities (Ahmad, 2017). However, several challenges persist within agricultural extension services. Previous research has identified challenges in the South Africa, including criticisms regarding

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inefficacy, resource limitations, insufficient training for extension practitioners, inadequate funding, and a lack of forward-thinking approaches among extension staff (Agwu et al., 2023).

For that, Law of The Republic of Indonesia Number 16 of 2006 on System of Agricultural, Fisheries, and Forestry Extension regulates extension institutions need to be built in province level up to regency/city. Extension institution holds its role to ensure extension activity is effectively carried out, in accordance with the condition of its region (Syahyuti, 2016). This, what we call as decentralization, aims to achieve greater participation of local (city, region, province) government to fully manage the extension services. Decentralization also aims to improve the quality of public services and strengthen as well as realize more effective public control over the local government (Guntoro, 2021).

Regarding the welfare of the farming community as the goal of agricultural extension services, it requires the best approach to do so. In supporting the decentralization system, community empowerment is an approach that leans on local sources. In addition, community empowerment opens an immense space for people to actively participate to manage the sources together. The active participation or active involvement will create an independent community. This kind of approach is what we call a participatory approach, where it aims to grow trust among the community and confidence of its potential (Ahmad, 2017). This study examines to identify barriers within Indonesia's agricultural extension system, especially in Purworejo Regency, where researchers choose to identify and analyze the constraints faced by agricultural extension workers in Purworejo Regency based on a decentralization system, with identifying the existing condition and collecting their expectations.

Combining the decentralization and community empowerment, agricultural extension services in regency level are expected to be able to show up as a regional movement through a specific institution called Agricultural Extension Agency. Agricultural Extension Agency is responsible to carry out agricultural extension services for farmer group in all villages, where it also leads to national development. The existence of the Agricultural Extension Agency as the frontline in agricultural extension services shows a shift from production orientation to agribusiness orientation in the interests of current agricultural development (Dayat, 2017). However, previous research mentioned that there are 4.880 agricultural extension agencies or approximately 74% of total regions in Indonesia, that is 6.621 regions (Rusliyadi et al., 2018). This figure indicates that the number of extension agents in Indonesia does not yet match the requirement of having one extension agent per village. In addition, agriculture extension also has related challenges to the effectiveness of extension management. A case from Nepal, where decentralization of agricultural extension services has also been implemented, enhances the availability of extension institutions, such as NGOs and private sectors have a position to their demands. In addition, farmers in Nepal have bigger opportunities to participate in making budget allocation for their needs of extension services (Burlakoti & Nettle, 2024). Therefore, this study assumes that agricultural extension services in Purworejo Regency have been properly implemented with the support of the regency government. This study will explore deeper the existence of agricultural extension services and institutions in Purworejo Regency, Central Java Province in order to produce a policy or program for improving agricultural extension services. Purworejo Regency is chosen because it has great agricultural potential with a total area of 30.311,89 ha that needs to be developed with local government's support (BAPPEDALITBANG, 2023).

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RESEARCH METHODS

This research applied mixed-method approach with analytical descriptive method. Analytical descriptive method was chosen to explore a social phenomenon through a description from various information (Zellatifanny & Mudjiyanto, 2018). The design of mixed-method approach in this research is the embedded design, where it is an approach that use two kinds of data, one as the primary data and the other is supporting data (Vivek & Nanthagopan, 2021). Qualitative data is the primary data where it will display a lot of descriptive data in seeking deeper understanding related to agricultural extension services. This qualitative data is analyzed by gap analysis. Qualitative data serves as the core data in this research, providing rich, descriptive insights essential for gaining a deeper understanding of agricultural extension services. On the other hand, quantitative data is the supporting data with a descriptive statistic by giving the specific numbers. Quantitative data was calculated by using Microsoft Excel.

Research was conducted in Purworejo Regency, Central Java Province. Based on Purworejo Regency's Statistics, there are 16 sub-districts and 494 villages with a total population of 788.265 people. Based on Agricultural Extension Statistics of 2021-2023, there are only 47 people of government agricultural extension workers (civil servants) in Purworejo Regency. However, in this research, the sample was selected by their attendance in the focus group discussion. Therefore, the sample (informants) of this research are 35 civil servant of agricultural extension workers. Informants were asked several issues about system and regulations of agricultural extension institutions in Purworejo Regency, the duties of agricultural extension workers, system and source about agriculture knowledge, and problems of agriculture in general.

The social phenomenon in this research is collected by focus group discussion and a structured questionnaire. In addition, gap analysis is being used to compare existing and expected condition of agricultural extension institutions. Gap analysis consists of four steps, that are 1) identifying institution's current condition, 2) determining the expected condition, 3) highlighting the gaps, and 4) implementing future plan or policy to fill in the gaps. In specific, this research implemented conformance gap that will indicate a difference between institution's perception regarding to its present behaviour and institution's desire of 'what ought to be' (Kim & Ji, 2018). Gap analysis was conducted by collecting the information needed from all the informants using questionnaire, tabulating the information to find the summary, and making a summary on each number of questions.

RESULT AND DISCUSSION

Purworejo Regency consists of 16 sub-districts and 494 villages with a total population of 788.265 people. Among the number of populations, based on a publication titled "Complete Enumeration Results of the 2023 Census of Agriculture edition 2: Food Crops Individual Agricultural Holdings Purworejo Regency", 19,62% of them are farmers (BPS-Statistics Purworejo Regency, 2024). To facilitate all of the farmers, the government of Purworejo Regency has built an agricultural extension institution, both in regency and sub-district level. Referring to agricultural extension statistics by the Agricultural Extension and Human Resource Development Agency, there is one institution in regency level, called as "*Dinas Ketahanan Pangan dan Pertanian* (DKPP)" or Food Security and Agricultural Agency. Meanwhile, there are 16 Agricultural Extension Centers, one for

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each sub-district (BPPSDMP, 2024). These institutions are strictly organized with Purworejo Regent Regulation Number 88 of 2021. They are responsible for overseeing agricultural extension workers in Purworejo Regency, where there are 287 agents. The graphic (Figure 1.) will give a depiction of the trend of agricultural extension workers in Purworejo Regency.

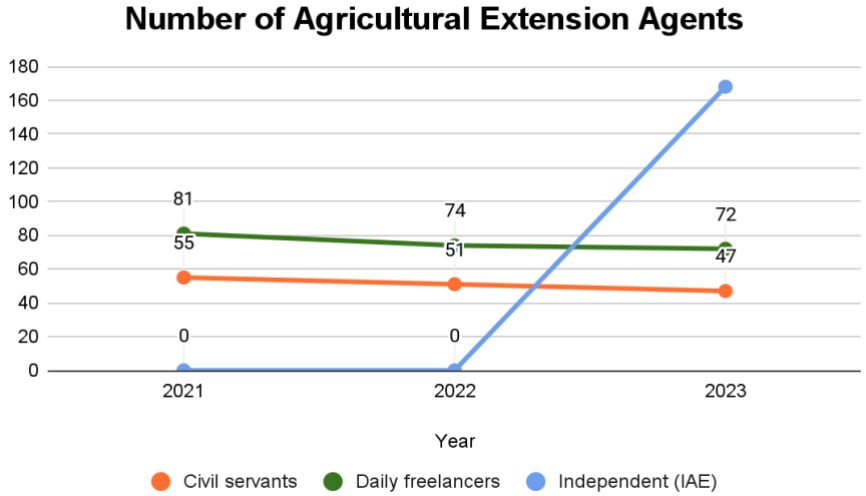

Figure 1. The Trend of Number of Agricultural Extension Workers in Purworejo Regency
Source: compilation of Agricultural Extension Statistics of 2021-2023

The position of agricultural extension workers (AEW) is as implementers of farmers empowerment through agricultural extension activities, especially in regional level which needs to be in line with farmers' condition. Agricultural extension workers are the main actors to assist farmers in achieving their prosperity (Sulistianingsih et al., 2022). Rogers (2003) outlines the critical roles of extension agents in facilitating the dissemination of innovations to farmers, emphasizing their role as influencers capable of driving shifts in farmers' knowledge, attitudes, and practices. Furthermore, Rogers (2003) highlights that extension agents can play a pivotal role in consolidating newly adopted behaviors by delivering reinforcing messages to adopters, thereby contributing to the stabilization of these behaviors. Extension agents are required to have the ability of changing farmers' perception, attitude, and behaviour in order to have more built understanding and skills. Therefore, it is needed to identify the characteristics of agricultural extension workers, especially their education and working experience. These characteristics will show how much knowledge they have and how strong their motivation is (Rosmalah et al., 2023). In this research, we have identified the characteristics of 35 agricultural extension workers that consist of age, education, and working experience. The characteristics can be seen on Table 1.

Table 1. The Characteristics of Agricultural Extension Workers in Purworejo Regency

Category	Maximum	Minimum	Average
Age (years)	58	27	40
Education (years)	18	12	16
Working experience (years)	35	2	13

Source: primary data, 2024

From Table 1, we can see that the age of agricultural extension workers in Purworejo Regency is at a range of 27-58 years old with an average of 40 years old. This age is included in productive

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age (15-64 years old). The formal education level of extension workers is in range of 12-18 years, which it means that the lowest education level is high school and the highest is master's degree. This data only uses to provide an overview of the age range and education level of extension workers who are actively working in Purworejo Regency in assisting farmers. Research by Rosmalah et al (2023) showed that age does not affect the services from extension workers, since they are already aware of their responsibilities as extension workers. Previous research confirmed that the age of extension workers has no connection with their abilities and willingness to improve their capacities as extension workers (Puspaningtyas et al., 2024). Besides that, Puspaningtyas et al (2024) also explained that the education level of extension workers does not show any difference in their readiness to be extension workers in fostering the farmers in their farming business.

In contrast, working experience is the most important characteristic of extension workers. In this research, extension workers' working experience was measured by the length of time in years they have been working as an extension worker in Purworejo Regency. According to Table 1, we can conclude the average of extension workers' working experience is around 13 years, with a minimum of 2 years and a maximum of 35 years. This characteristic leads to an understanding of how agricultural extension workers might give their best services to the farmers and their ability in maximizing the job performance (Prihtanti & Zebua, 2023) to conduct the appropriate extension activity as what farmers need, mainly from their own test or observation through a period of working time (Wulandari, 2015).

Agricultural Extension Institution in Purworejo Regency

Law Number 16 of 2006 on System of Agricultural, Fisheries, and Forestry Extension has defined extension institution as government and community institutions that provide extension services. It is supported by the Agriculture Ministry Regulation (*Permentan*) Number 43 of 2016 where it declares to reorganize extension institution to be central government, provincial, and regency's responsibility. Extension institution is required to be able facilitating the extension workers in empowering farmers to be an independent manager of their own agricultural activities (Dahliani & Karim, 2022). Extension institution also has a main function as an organization of agricultural human resources in organizing extension activities (Pradiana, 2017). In this study, a gap analysis is conducted to seek the gap between the existing condition of agricultural extension institution and the expectations of what should be in Purworejo Regency.

Table 2. Gap Analysis of Agricultural Extension Institution in Purworejo Regency

Indicator	Existing condition	Expectation
Regulation of institution's structure	The absence of written and fixed regulation related to the composition of extension institution's structure, so that there is still a dynamic change and the structure is too large	A fixed and written regulation that can be implemented immediately

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Indicator	Existing condition	Expectation
Human resource management and capacity building	The lack of training for AEW in building their capacity	A scheduled training or workshop or any kind of capacity building programs for AEW, expected once per month
AEW work coverage	Each AEW is responsible in managing and assisting 4-7 villages with hundreds of farmers	Recruit more AEW, civil servant or independent AEW, so that each person can hold 1 village only
Funding of extension activities	Minimum funding that does not cover all the needs of extension activities	An agreement of AEW needs related to funding of extension activities, mainly for conducting the most suitable system and media
Facilities	The quantity of facilities is lacking with inadequate quality, especially motorbike as the main transportation to support extension activities	Increase the quality and quantity of motorbike, so that the risk of travel can be more anticipated
Partnership	The lack of partnership with research centre and education institution	Engage with research centre and education institution, especially university, for better partnership in increasing AEW capacity
Relation between AEW and farmers	Minimum relation with farmers since AEW has time limitation due to more administration work in the office	Shift the administration work to extension services directly to farmers in the field

Source: primary data, 2024

The result of focus group discussion with 35 individuals of AEW in Purworejo Regency (Table 2) highlights the gap between the existing condition of extension institution that they feel and their expectation of what should be. Some of the existing conditions that occur in Purworejo Regency are not something new. It has already been the same issue of agricultural extension institution in various areas within years. For instance, the lack of capacity building for AEW also happened in Pasaman Regency, West Sumatera Province, where research by Zulhendri & Henmaidi (2021) found training or other kinds of capacity building programs for AEW were very rare to be conducted and did not being planned properly, so the material is not in accordance with the needs of the extension workers.

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In addition, in the Hulu Sungai Utara Regency of South Kalimantan, the capacity-building programs specifically focused on equipping extension agents with knowledge and skills related to climate information remain notably limited (Yulianti et al., 2021). Therefore, it shows that the government has not given a lot of attention to the importance of AEW's capacity building. Paginian et al (2021) mentioned several capacities that are needed for AEW's better performance, such as ability to identify and mapping area's potential, analyse social system of farmers community, and design extension strategy. However, these capacities require the awareness of agricultural extension institution itself, both from provincial and regency level, to hold the capacity building program.

Another important issue that we found as a gap is the lack of quantity and inadequate quality of motorbike facilities as the main transportation used by AEW in working. One of the informants, AS (47), stated that he needs a motorbike to ease his mobilization in visiting farmers that are spread in a wide range of areas. Although he has his own motorbike, but he expects there is an official motorbike from the government with better quality. This is in line with research by Putri et al (2016) that said it is the responsible of extension institution to provide any kinds of facility, one of which is motorbike for all the AEW.

Related to the minimum amount of partnership, Tanjung et al (2018) explained agricultural extension institution is required to have partnership in order to build a strong functional interaction with other stakeholders, mainly for developing AEW's knowledge of various innovations. It supports the expectation of AEW in engaging with research centre and education institution (university) through a participatory and communicative learning from their government. Starting from this communication between agricultural extension institution (government) with research centre or university, it might lead to an agricultural development where extension will be used as a coordination hub (Tanjung et al., 2018).

Issues of Agricultural Extension Governance and the Efforts Made

Agricultural extension government must have good governance to be able implementing regulations or rules and build a development priority through interactive correlations between the government itself and community (Muslih et al., 2019). Good governance in a government can affect the government's performance in applicating its rules to the people. In this research, the informants chose the issues of agricultural extension governance based on their experience. The informants were welcomed to choose more than 1 option among 11 options. Later, the discussion is focused on the top five issues that are shown by the level of response in percentage, written on Table 3.

Table 3. Issues of Agricultural Extension Governance in Purworejo Regency

Aspect of issues	Level of Response (%)
Lack of training for AEW	97,14
Difficulty in adapting to digital extension	48,57
Cyber extension is limited	57,14
Difficulty in accessing the internet in area of work	51,43

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Aspect of issues	Level of Response (%)
Absence of printed extension materials	57,14
Lack of extension tools (speaker, projector, etc)	77,14
Difficulty in accessing agricultural field	48,57
Minimum support from region government	80,00
Limited partnership with educational institution	54,29
Too much work coverage	88,57
Lack of extension workers in area of work	88,57

Source: primary data, 2024

Table 3 displays the level of response from 35 AEW civil servants to each aspect of issue related to agricultural extension governance. The largest percentage response rate is shown under "lack of training for AEW". It is in line with the gap that we have found and discussed before. It shows that there is a lack of agricultural extension institutional governance to implement development priority. In contrast, skill and knowledge of agricultural extension workers as human resources in agricultural sector is a fundamental thing to be handled well in order to assist farmers adapt in agricultural's rapid development (Wastutiningsih et al., 2024). Training is essential for AEW to enhance their skills, so they do not fall behind in the ever-evolving agricultural information and technology. These skills are also crucial for disseminating and accessing technological information obtained through various media (Warsana & Sirait, 2020) . Therefore, AEW consider regular training or workshops to be highly important. To deal with this problem, AEW tend to seek more information through other sources, mainly digital platforms, such as Google and Youtube. Karim (2023) notes that AEW are increasingly using the internet, especially Google, to access information. Retnaningtyas *et al.* (2021) add that AEW uses Google to explore new agricultural innovations, helping them share the latest knowledge with farmers. Youtube is also popular among AEW for its audio-visual tutorials and demonstrations, making it easier to learn. In South Kalimantan, the majority of extension workers enhanced their capacity primarily through electronic media, including the Internet and Climate Integrated Expert Systems (Yulianti et al. 2021).

The other issues, such as too much work coverage and lack of extension workers in area of work, are interrelated. AEW in Purworejo Regency is responsible in supervising 4-7 villages per person. This is due to the lack of extension workers, resulting in too much work coverage for each individual. In Purworejo Regency, there are 494 villages with 154.673 people who work as farmers, while the number of AEW (civil servants, independent, and freelancers) is only 287 individuals (BPS-Statistics Purworejo Regency, 2023). It indicates how weak the governance is, since it does not follow the suggestion by Ministry of Agriculture, where it says there must be one person of agricultural extension worker for one village (Rusmono, 2021). It can result in suboptimal extension services and a lack of focus on ongoing agricultural issues. As a consequence, farmers do not receive effective guidance, leading to dissatisfaction with the services provided by the extension workers (Kurnia & Agustina, 2024). The weakness of governance also supports the high rate of response under "minimum support from region government". However, in facing this issue, Purworejo Regency

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government has implemented the recruitment of independent extension workers (IEW) and daily freelancers (THL TBPP) to help government's AEW in carrying out extension activities. We can see it very clearly from the graph in Figure 1, where there is a sharp increase of number of IEW from 2021 to 2023 and the number of THL TBPP is always more than AEW civil servants. This effort is in line with the Law No 16/2006, which states that IEW and THL TBPP are required to be the main partners for AEW civil servants. One of which, Permono et al (2020) highlighted the role of IEW as a catalyst for stronger partnership among AEW civil servants, farmers community, region government, and other stakeholders.

Challenges in Extension Services to Respond Agricultural Sector Problems

Agricultural sector in Indonesia is facing a major problem as an effect of climate change and the rapid changes in extension institution itself. In dealing with these problems, agricultural extension services are needed to meet community demand for best facilitation and supervision. It requires an integrative approach and interconnectivity for extension services might be able to develop the system considering the facts of serious problems, namely the decline of soil sources, land use change, and others (Amanah & Fatchiya, 2018).

Table 4. Agricultural Sector Problems Faced by AEW in Purworejo Regency

Aspect of problem	Level of Response (%)	Rank
Growth of plant pests and diseases	77,14	1
Crisis of water sources	74,29	2
Lack of the capacity of farmers	71,43	3
Negative effects of climate change	62,86	4
Fluctuate price of agricultural goods	57,14	5

Source: Primary data, 2024

The questionnaire provided 5 major problems in agricultural sector nowadays. Informants ranked them from 1 to 5 based on the difficulty of problem to be solved. According to Table 4, it can be seen that the growth of plant pests and diseases becomes the hardest problem with a response rate of 77,14%, followed by a problem of water sources crisis with 74,29% response rate. These top two problems are caused by climate change. As proven by previous research by Megasari & Sodiq (2023), climate change affects the change of planting time, the increase of carbon dioxide, and the fluctuating temperature and humidity, which can trigger plant pests and diseases to grow rapidly.

Other than that, the lack of farmers' capacity becomes another big problem faced by AEW, especially in this disruption era 4.0. As we discussed earlier, era 4.0 with a decentralization system leads to the importance of participatory approach from farmers to involve actively in the extension services. The lack of farmers' capacity in Purworejo Regency is caused by lack of assistance and supervision from AEW, because they spend more time to do administration work at the office, so that they do not have enough time for visiting farmers or being present in farmers group meetings to deliver knowledge. Partini et al (2024) highlighted that extension services need to be adaptive and

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innovative in transferring knowledge to farmers in a disruption era, where it can be done through a little shift of the extension system from lecturing to discussion supported by interesting media.

Regarding the extension services, we learned that AEW faced some challenges in using various kinds of media to support their extension activities. Based on the result of focus group discussion, we can tell that AEW has already understood about the first step in extension activity, that is identifying the potential. The identification of regional potential is arranged to be a guidance for AEW in planning the extension activity to meet farmers' needs (Suryono et al., 2022). However, AEW cannot decide what kinds of media is suitable for their extension services. It is caused by there has never been any training for AEW related to how to make extension materials with several kinds of media. Therefore, the local government should pay more attention to this issue and facilitate the AEW with more training programs, so that the extension services can utilize appropriate media in order to help enhance farmers' motivation to participate actively and increase their capacity.

In addition, the questionnaire also provided 4 kinds of media and informants chose the type of media that is being used by them, where they can choose more than 1 option.

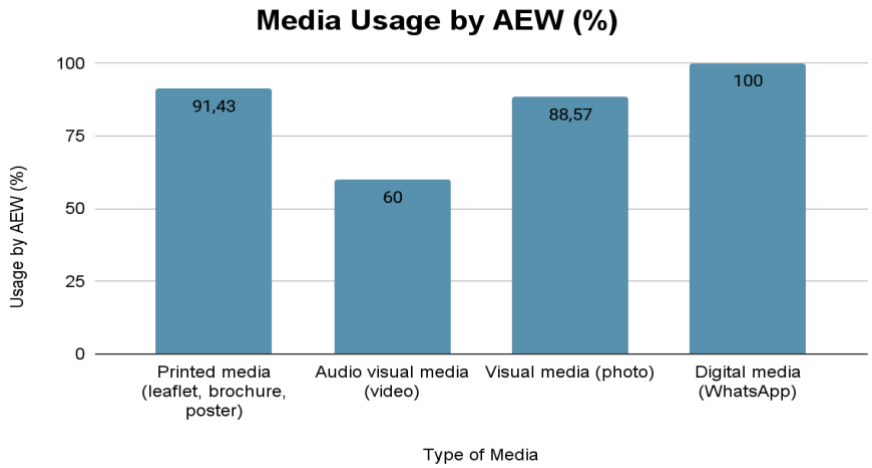

Figure 2. The Usage of Various Types of Media by AEW in Percentage
Source: primary data analysis, 2024

Based on Figure 2, it is known that the smallest use is audio visual media with only 60% of AEW using it. Some of them conveyed the struggle they have to make an audio-visual media, which is inadequate device and lack of technical skill in making video. Although in fact they can use video from other sources, but AEW feels too much time is wasted only to look for the best video. In contrast, all the AEW uses digital media, mainly WhatsApp, to assist their extension services in providing information to farmers. The use of WhatsApp is also encouraged by the limited time of extension workers to directly serve and carry out their responsibilities in supervising and assisting farmers. This shows that the lack of time in conducting extension services directly, combined with a pile of tasks that mainly administrational work, cause AEW cannot give their best performance to solve agricultural sector problems.

The limitation of this research is related to the number of informants, where the informants are only 35 AEW of 47 AEW. This is due to the other 12 AEW did not attend the focus group discussion

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and there were no further interviews for them. The study only focused on those who attend and participate actively in discussion, while giving information needed.

CONCLUSION AND SUGGESTION

This research underlines the main conclusion, which is the insufficient policy and attention paid by the government to agricultural extension institutions. The results of this study, such as the absence of fixed regulation to set the institution's structure, lack of capacity-building programs for agricultural extension workers, and a gap between the actual condition and what it should be in accordance with the rules, imply that agricultural extension services in Purworejo Regency has not been implemented really well with adequate support. Thus, the local government needs to create stronger governance and policy. An unfortunate gap is that the number of extension workers does not match the number of villages in Purworejo Regency, even though the central government has directed local government to provide one extension worker in each village. In region level, the government of Purworejo Regency is also known to be lacking in implementing good institutional governance which leads to the emergence of agricultural extension issues and challenges in extension services.

Therefore, the most important recommendation of this research is to create a legal policy at the local level to regulate good institutional governance. The government also needs to pay more attention to agricultural extension institutions through additional budget for facilities and capacity building programs. According to the informants, they need capacity building programs regularly, for example once in every month. The government should provide special funds from the local government-yearly budget that can support agricultural extension workers in carrying out their duties. The government needs to conduct hearings with agricultural extension institutions, both at the district and sub-district levels, to find out the actual conditions they face and how the government can be involved in solving these problems.

After this study conducted, the next urgency step is policy advocacy through providing recommendations and policy briefs to the Purworejo Regency government to formulate policies and/or institutional designs and development programs of agricultural support resources. Prospective further studies at meso and micro levels could cover the stakeholder synergy in the implementation of extension services, effectiveness extension methods, development of extension worker human resource capacity, development of farmer groups, etc.

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