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OPTIMIZATION OF THE AGRICULTURAL EXTENSION CENTER AS A CYBER EXTENSION INFORMATION TECHNOLOGY CENTER IN CENTRAL LAMPUNG REGENCY

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Abstract. *Various institutions in agriculture are currently experiencing weaknesses in their implementation so they need to be improved and optimized as roles and functions as they should. The purpose of this study is to analyze the influence of BPP characteristics on the use of cyber extension and find out various ways to optimize the role and function of BPP in Central Lampung. Cyber Extension is expected to be an optimization of the current BPP through BPP Kostratani which makes BPP a data and information center. The location of research was carried out in Central Lampung Regency in four sub-districts. The total respondents were 40 people divided into 4 districts in Central Lampung, namely Mount Sugih, Seputih Raman, Trimurjo, and Elephant City. The analysis used is multiple linear regression analysis methods and descriptive analysis. The results showed that there was no significant influence between the characteristics of the Agricultural Extension Center on the use of cyber extension, as well as ways to optimize the role and function of BPP starting from compiling extension programs, implementing extension programs that have been prepared, and optimization in providing various agricultural data and information (cyber extension).*

. **Keywords**: *Agricultural Extension Center and Cyber Extension*

1. INTRODUCTION

Development that moves in community life, directs all optimizations in various aspects that exist in the community itself. Development is carried out sustainably with the hope that various parties can feel a good impact on this sustainable development. Living in the era of revolution 4.0 helps the development process more quickly and efficiently, especially with the emergence of information technology intelligence such as cyber extensions in agriculture. Existing development in agriculture is part of development that must be carried out optimally, especially because it is entirely culpable development not only from large industries in the city area. Rural areas are one of the places for the implementation of sustainable development from the development of farming communities, village development, and of course better development, which is sustainable. The implementation of Pancasila, agricultural development is all efforts to utilize the wealth of natural resources, human resources, capital, and science and technology (Science and Technology) efforts to produce agricultural production and industrial primary raw materials (Hamadal & Adil, 2019).

Activities carried out in agriculture can certainly be carried out as well as possible not only through information technology, of course, but also because, there is an agricultural institution itself, especially institutions at the field level directly. The Agricultural Extension Center is such an institution, located near and directly to farmers and field agricultural extension workers. BPP is the core location and center of various activities on the farm itself. BPP is expected to be a strategic institutional part of the implementation of various agricultural activities, this is implemented by BPP itself which is currently developed into BPP Kostratani (Agricultural Extension Center of the Strategic Command for Agricultural Development) through optimizing the role and function of agricultural institutions from the sub-district level. This BPP optimization is also a

manifestation of the creation and implementation of increasing rice production in the community. According to (Hariadi, 2015), BPP functions as an activity center for independent and private agricultural extension workers, so it is very important in increasing agricultural production. The purpose of BPP is to improve the welfare of farmers and food self-sufficiency is the focus of its development (Yunita et al., 2018).

The Agricultural Extension Center (BPP) is the "home base" for agricultural extension groups and assisted villages, which make direct contact with farmers. Extension workers as functional staff at the Agricultural Extension Center (BPP), occupy a central position in actualizing their various roles and are part of the government apparatus organization. Various activities of the Agricultural Extension Center (BPP) are sought to actively participate in providing services to the community for the mandate they are responsible for (Mokhtar, 2001).

The Agricultural Extension Center is expected to become various center of activity in agriculture itself. The most prominent roles and functions of BPP today are, data and information centers, centers for agricultural development movements, learning centers, agribusiness consulting, and partnership networks. Various tasks of BPP such as carrying out various coordination and synergy of agricultural development activities, mentoring, partnership development, implementation and preparation of various extension program implementations, and so on are expected to be the most optimal performance in agricultural activities themselves. According to (Eastwood, C., Margaret, A., Ruth, N., & Brian, 2019), efforts to increase the use of IT in agriculture can help farmers and allow them to understand their agricultural systems for the better. The shift in farmer culture from an experience-based to a data-based management approach is strongly influenced by digitalization or the use of information technology, especially in terms of information technology which is used as a data and information center tool (Klerkx, L., Emma, J., & Pierre, 2019).

Data and information center is the main role and function of BPP, because by becoming a data and information center BPP is expected to help in advance the various needs of farmers on all matters related to agriculture, especially agricultural information. Cyber extension is one part of the implementation of BPP as a data and information center. Through cyber extension, BPP is expected to provide data and information to farmers quickly and in accordance with the current times. According to (Pakpahan, T. E., Makruf, W., & Qorimah, 2021), BPP employs an information technology specialist who is tasked with assisting extension workers in accessing agricultural information, completing administrative tasks, printing extension tools, and utilizing other information and communication technology so that they can carry out their responsibilities in disseminating agricultural information easily (Pertanian et al., 2022).

The weak characteristics of BPP, especially information technology facilities, and infrastructure, must be implemented immediately so that through cyber extension, BPP can optimally carry out its roles and functions, especially as a data and information center. Central Lampung Regency is one of the districts in Lampung Province that has sufficient information technology facilities and infrastructure, only from the implementation of human resources that are not optimal, namely extension workers. Central Lampung Regency is one of the districts in Lampung Province that has sufficient information technology facilities and infrastructure, only from the implementation of human resources that are not optimal, namely extension workers. These various things lead to the purpose of this study, namely analyzing the influence of BPP characteristics on the use of cyber extension and knowing various ways to optimize the role and function of BPP in Central Lampung.

2. LITERATURE REVIEW

2.1. Characteristics of the Agricultural Extension Center

The "home base" for agricultural extension groups and assisted villages, which interact directly with farmers, is the Agricultural Extension Center (BPP). As functional

staff at the Agricultural Extension Center (BPP), extension workers are integral to the structure of the government apparatus and play a central role in carrying out their various responsibilities. As functional staff at the Agricultural Extension Center (BPP), extension workers are integral to the structure of the government apparatus and play a central role in carrying out their various responsibilities. According to (Mokhtar, 2001), various activities of the Agricultural Extension Center (BPP) are intended to actively participate in providing community services for their mandate.

The following are some of the characteristics of the Agricultural Extension Center: activities, infrastructure, human resources, and operational management (Okriani, 2015)

a. Infrastructure. Infrastructure is everything that provides the primary support for the implementation of a process, while facilities are everything that is used as a tool to achieve meaning and objectives.
b. Human Capital
   Human resources are one of the most crucial aspects of any organization—institutions or businesses alike—that cannot even be separated.
c. Administration of Operations
   By converting inputs into outputs, operational management develops into a series of activities that generate value in the form of goods and services.
d. Things to do
   BPP performs a series of activities known as activities.

2.2 Information technology or cyber extension

Among the characteristics of information technology that are utilized as benchmarks are: the quality of the system, information, service, and user satisfaction. According to (Tri L. U, Y Tomo, 2017), the convenience provided by this technology encourages individuals to become individualists; consequently, it is essential for all users, particularly agricultural extension workers, to make prudent use of it.

A collection of tools that assist a person in activities like communication is what information technology becomes. BPP is one of the agricultural industries that make use of information technology. The Horticultural Expansion Place (BPP) is a supporting unit for the execution of farming whose organization, guidelines, executives, and usage are the obligation of the region/city nearby government with the execution is PPL. BPP's agricultural extension staff assists agricultural extension institutions in carrying out their responsibilities (Elizabet, T. P, Wicaksono, 2021).

3. RESEARCH METHODS

The research was conducted in Central Lampung Regency, namely in four purposively selected sub-districts, namely Kota Gajah, Seputih Raman, Trimurjo, and Gunung Sugih. Respondents in this study amounted to 40 respondents taken from all PPLs in the four BPPs. The research was conducted from December 2021-January 2022. The analysis method used in this study is a simple linear regression analysis, namely the influence of BPP characteristics on the use of the cyber extension. This analysis was chosen because it looks at the influence between one variable and another. This multiple linear regression analysis has a simple regression model, namely: $Y = a + bX + e$. The description is a constant value and e is an error value. In addition to this simple linear regression analysis, researchers also use descriptive analysis to describe how to optimize the role of BPP.

4. RESULTS AND DISCUSSION

4.1 Characteristics of Respondents

1. Age of Respondent

Table 1. Distribution of respondents by age group.

Age level classification	Class interval (year)	Entire PPL	
		Sum	(%)
Young	27-37	5	12,5
Keep	38-48	22	55
Old	49-59	13	32,5
Sum		40	100
Average	45	Keep	

Source : Data processed

This study shows that the distribution of respondents based on age is dominated by groups (38-48 years) with as many as 22 respondents with a percentage of 55 percent with an average of 45 years. This shows that the age of respondents is included in the productive age with a medium category. This vulnerable age is a good age vulnerable to carry out the process of activities in increasing productivity, one of which is the use of information technology by Field Agricultural Extension Workers.

2. Length of Work of Respondents

Table 2. Distribution of respondents based on length of work

Classification of length of work	Class interval (year)	Entire PPL	
		Sum	(%)
New	1-12	17	42,5
Keep	13-24	19	47,5
Old	25-38	4	10
Sum		40	100
Average	14,7	Keep	

Source : Data processed

Table 2 shows that as many as 40 PPLs have experience working in the medium category with a percentage of 47.5 percent, while a small number of PPLs of four PPLs with a percentage of 10 percent fall into the old category. This shows that the average PPL has a moderate work experience of 14.7 years. The length of work of this PPL shows how long an extension worker is just beginning to become an extension worker until the time of conducting the research.

3. Respondent Education

Table 3. Distribution of respondents by education level

Education Level Classification	PPL	
	Sum	(%)
High School / Vocational School	12	30
D3/D4	8	20
S1/S2	20	50
Sum	40	100
Average	S1/S2 (Higt)	

Source : Data processed

Based on Table 3, most respondents have education at the S1 / S2 level, which is the level of education with the largest number of respondents, namely 20 people with a percentage of 50 percent, then the lowest is D3 / D4 as many as eight people with a

percentage of 20 percent. This shows that most respondents already have experience in receiving formal education, so respondents are quite capable of obtaining information. Decision making from respondents is also influential based on the level of knowledge gained by respondents through education that has been taken, especially in jobs in the agricultural sector. The education of their agricultural extension workers also shows that they have competence both technical and managerial competencies (Setiana et al., 2021). Demand competent extension workers for agricultural extension, which According to (Huda, 2011), an extension worker is considered competent if he has technical and managerial competence as well as socio-cultural competence. is part of the non-formal education process in agriculture.

4.2 Analysis of the Effect of BPP Characteristics on the Utilization of Cyber Extion.

The characteristics of BPP in this study are seen from the infrastructure, human resources, operational management, and activities carried out by BPP itself (Okriani, 2015). It is expected that the various characteristics of BPP can support the use of existing information technology, namely cyber extension. It is expected that the various characteristics of BPP can support the use of existing information technology, namely cyber extension. The following results of the analysis of the influence between the characteristics of BPP on the use of cyber extension in Central Lampung Regency are presented in Table 4 below.

Table 4. Results of the effect of simple linear regression analysis between characteristics BPP towards the use of the cyber extension.

Coefficients[a]						
		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	46804.670	10076.144		4.645	0.000
	Characteristics of BPP	0.001	0.020	0.005	0.032	0.975
a. Dependent Variable: Utilization of Cyber Extension						

Source : Data processed

Based on the results of the simple linear regression analysis above, it shows that there is no influence of BPP characteristics on the use of cyber extension itself with a significant value of more than 0.05, namely (0.975) and the value of $t_{calculate} < t_{table}$, namely (0.032) < (2.022), which can affect if the significant value is less than 0.05 and $t_{calculate} > t_{table}$. The absence of this influence is also due to the implementation of cyber utilization not only from BPP but must complement the skills and knowledge of human resources in utilizing cyber, as well as the importance of the characteristics of good information technology from BPP itself. This is by research (Tri L. U, Y Tomo, 2017) which shows that the use of cyber or information technology is entirely on the characteristics of information technology itself (cyber extension) such as system quality, information quality, service quality, and user satisfaction. Not entirely from the characteristics of BPP (Tri L. U, Y Tomo, 2017).

The characteristics of BPP that are assessed in this study are such as infrastructure, namely, everything that is used as part of measuring instruments to achieve certain goals (facilities) whereas, (infrastructure) is everything that supports the implementation of a process. Facilities at BPP such as extension aids, administrative equipment, transportation equipment, books or publication hail, as well as meubelair. Infrastructure at BPP building infrastructure, pilot infrastructure, programmatic infrastructure, teaching aids infrastructure, and administrative infrastructure. Human resources in BPP include farmer institutions, outstanding/reliable farmers, extension workers (PNS and THL, TB-PP), and outstanding/reliable extension workers. Operational management is a series of activities that generate value in the form of goods and services by converting inputs into

outputs. BPP organizational structure, division of tasks and functions, training schedule, visit schedule, and supervise the schedule. While the last characteristics of BPP are the activities carried out in various activities carried out at BPP, conveying and disseminating information, learning process facilities for main actors and business actors, conducting studies/studies/actions/pilots, developing agricultural models, recommendations, and access to technology resources, cooperation facilities (researchers, extension workers, main actors, and business actors), carrying out coordination and deliberation farmer crumb, etc. (Okriani, 2015).

Various characteristic indicators in BPP are also things that support of course, agricultural extension workers. According to (Sumardjo dan Mulyandari RSH., 2011), the ability of extension workers to disseminate extension information through social media in the current digitalization era requires creativity. This disseminated information that utilizes information technology is certainly an implementation that can create effectiveness and efficiency from various implementation activities in BPP. Central Lampung Regency itself in its four BPPs, namely BPP Gunung Sugih, Kota Gajah, Trimurjo, and Seputih Raman, not all have a website from their BPP, even though this website will provide optimization of data and information dissemination and support the success of BPP Kostratani. This event is by research (Kurniasih et al., 2021) that there are still many BPPs that do not have websites that are used as data and information centers, lack of knowledge of information technology and conventional agricultural extension workers are one of the biggest obstacles in utilizing cyber extensions properly in various BPPs (Kurniasih et al., 2021).

4.3 Optimization of the role and function of BPP

The district/city government is in charge of organizing, regulating, managing, and utilizing the Agricultural Extension Center, which functions as a supporting unit for agricultural implements. By the direction of the Minister of Agriculture, the Agricultural Extension Center plays a crucial role: BPP is a coordination node post (post) or the Agricultural Extension Center is a place for area-based agricultural development by 03 Permentan/SM.200/1/2018 concerning Guidelines for the Implementation of Agricultural Extension (Yoyon, 2022).

The basis for the implementation of agricultural extension services in the smallest unit, the sub-district, is the Agricultural Extension Center. According to the Power Database Agricultural Extension Workers (Simluhtan, 2023), as many as 25,247 civil servant extension workers, 16,070 THLTBPP extension workers, 103 private extension workers, and independent extension workers reached a total of 25,402 people for energy extension before 2018. In addition, the information also refers to that in 6,998 sub-districts in Indonesia, there are only 5,643 BPP units. Nevertheless, 1,355 BPPs have built more than one sub-district. This shows a discrepancy between the number of BPPs in the target sub-districts and the number of extension workers needed to meet the 1,355 BPPs mentioned earlier (Wahyuni et al., 2019).

The Agricultural Extension Center (BPP) is a supporting unit for the implementation of agriculture whose administration, regulation, management, and utilization are the responsibility of the district/city local government. Various main operational activities, arrangement, management, and utilization are part of the responsibility as well. The Agricultural Extension Center (BPP) to support the implementation of agricultural extension services must be based on the provisions or decisions of the regent/mayor. Rangkai supports the tasks and functions of agricultural extension institutions that required human resources, namely: Field Agricultural Extension Officers (PPL), infrastructure, funding, and strong institutional status. The Agricultural Extension Center (BPP) becomes, an institution close to the community. BPP also has a very large role and function in efforts to empower rural communities (Mokhtar, 2001).

The manifestation of the implementation of agricultural development, which was mentioned by the Ministry of Agriculture, was carried out starting from the Agricultural Extension Center (BPP). BPP in this case becomes an institution in agriculture whose

position is leading in the field, as well as in the sub-district. Agricultural Extension Centers (BPP) in their respective sub-district locations are divided into agricultural extension work areas by their auth. These various things make BPP must be able to carry out and strengthen the functions and roles of BPP itself. The roles and functions of BPP include:

1. Develop an Extension Program at the sub-district level in line with the District/City extension program
2. Carry out counseling based on the extension program.
3. Provide and disseminate information on technology, production facilities, financing, and markets (cyber extension) (Pusluhtan Kementan, 2019).

The results of the Decree of the Minister of Agriculture No. 13 of 2020, stated the role and function of BPP Kostratani, namely carrying out functions as a Data and Information Center (Cyber Extension), as a Center for the Agricultural Development Movement, as a Learning Center, Agribusiness Consulting Center, and Partnership Network Development Center. Kostratani (Strategic Command for Agricultural Development) is an agricultural renewal movement starting from the Agricultural Extension Center in the sub-district to optimize its tasks, functions and roles in realizing the success of agricultural development. It is hoped that the implementation of Kostratani must be a leading program in implementing various main programs of the Ministry of Agriculture. The various programs implemented are certainly in order to strengthen the capacity of BPP and Agricultural Human Resources.

If the role and function of the BPP has been carried out optimally, it can certainly support the success of the BPP Kostratani, especially in its main target, namely as a data and information center. Through cyber extension, it is expected that the movement of the implementation of data centers and information from cyber will be increased in BPP. Data and information collection is carried out in BPP sub-district, of course, by accessing from cyber extensions. BPP here is part of various activities in accessing information which is certainly based on information technology applications that connect information at the center with information from local stakeholders, as well as part of information derived from the agricultural information system guide (Cahyono, B., R. Setyowati, 2020). The Agricultural Extension Center is expected to be maximal and good in making extension workers active and efficient in working, such as utilizing existing information technology for Kostratani, RDK, RDKK and can improve the performance of extension workers in managing operational funds as part of the agricultural extension center (Sapar et al., 2018).

CONCLUSION

The conclusions that can be drawn from this study are:

1. There is no significant influence between BPP characteristics on the use of the cyber extension. The value of the existing analysis results is a significant value of more than 0.05, namely (0.975), and the calculated value of the ttable <, namely (0.032) < (2.022). Some things that make the characteristics of BPP not significantly influential because in the use of cyber extension, the most important characteristics in supporting cyber utilization itself are the characteristics of information technology itself such as system quality, service quality, user satisfaction, and information quality. So that the characteristics of BPP are expected to be improved and optimized starting from infrastructure, human resources, operational management, and various activities in BPP itself in the implementation of activities by utilizing cyber extension.
2. Optimizing the role and function of BPP can be implemented from
    a. Develop an Extension Program at the sub-district level in line with the District/City extension program.
    b. Carry out counseling based on the extension program.
    c. Provide and disseminate information on technology, production facilities, financing, and markets (cyber extension) (Pusluhtan Kementan, 2019).

Through cyber extension, it is expected that the movement of the implementation of data centers and information from cyber will be increased in BPP. Data and information collection are carried out in the BPP sub-district, of course, by accessing cyber extensions.

REFERENCES

Cahyono, B., R. Setyowati, dan H. I. (2020). Adopsi Cyber Extension oleh Penyuluh Pertanian Lapangan (PPL) dan Faktor yang Mempengaruhi. *Jurnal Penyuluhan*, *16*(2), 240–249. https://doi.org/10.25015/16202028362

Eastwood, C., Margaret, A., Ruth, N., & Brian, D. R. (2019). Making Sense In The Cloud: Farm Advisory Services In A Smart Farming Future. *Jas-Wageningen Journal of Life Sciences*, *1*(1), 90–91. https://doi.org/10.1016/j.njas.2019.04.004

Elizabet, T. P, Wicaksono, dan M. H. Q. H. (2021). Peran Balai Penyuluhan Pertanian sebagai Pusat Data Informasi Pertanian dalam mendukung Program Kostratani. *Jurnal Agribisnis Terpadu*, *14*(1), 47–49.

Hamadal, R., & Adil, M. (2019). Peran Dan Fungsi Lembaga Penyuluhan Pertanian (Perkebunan) Terhadap Pebangunan Pertanian Di Kabupaten Bulukumba Provinsi Sulawesi Selatan. *Journal Competitiveness*, *8*(2), 211–224. https://jurnal.unismuh.ac.id/index.php/competitiveness/article/view/4440

Hariadi, S. S. (2015). Kelembagaan penyuluhan pertanian problem dan solusi untuk swasembada pangan. *Paper Dipresentasikan Dalam Seminar Nasional Hasil-Hasil Penelitian Sosial Ekonomi Pertanian*.

Huda, N. (2011). Pengembangan kompetensi personal penyuluh pertanian dalam pendidikan tinggi terbuka dan jarak jauh (PTTJJ). *Paper Presented at the Seminar Nasional Matematika, Sains Dan Teknologi, Tangerang Selatan.*, *2008*, 223–242.

Klerkx, L., Emma, J., & Pierre, L. (2019). A review of social science on digital agriculture, smart farming and agriculture 4.0: New contributions and a future research agenda. *Njas - Wageningen Journal of Life Sciences*, *1*(1), 90–91. https://doi.org/10.1016/j.njas.2019.100315

Kurniasih, D., Kurnia Illahi, A., Sari, D. A., & Karmaita, Y. (2021). Pemanfaatan Media Penyuluhan Pertanian Audio Visual di BPP Kecamatan Harau Kabupaten Lima Puluh Kota. *Seminar Nasional Pengabdian Fakultas Pertanian UNS Tahun 2021*, *1*(1), 367–373.

Mokhtar, S. . (2001). *Kinerja Lembaga Penyuluhan Pertanian dan Adopsi Inovasi Kedelai serta Implikasi pada Pelaksanaan Otoda di Kab. Kotawaringin Timur*. UGM.

Okriani, A. (2015). *Keberhasilan BP3K Kecamatan Raman Utara Kabupaten Lampung Timur dalam lomba prestasi tingkat provinsi tahun 2015*. Universitas Lampung.

Pakpahan, T. E., Makruf, W., & Qorimah, H. (2021). Peran Balai Penyuluhan Pertanian Sebagai Pusat Data Informasi Pertanian Dalam Mendukung Program Kostratani. *Jurnal Agribisnis Terpadu*, *14*(1), 46-67.

Pertanian, D., Kostratani, P., Padi, A., Di, S., Barebbo, K., Bone, K., Pratiwi, R. D., Salman, D., & Mujahidin, I. (2022). *Digitalization of Agriculture through the Kostratani Program on Rice Field Agribusiness in Barebbo District, Bone Regency*. *April*, 277–292. https://journal.unhas.ac.id/index.php/jsep

Pusluhtan Kementan. (2019). *Penguatan Peran dan Fungsi Balai Penyuluhan Pertanian (BPP)*. Published on Cyber Extension - Pusluhtan Kementan. cyberextension@gmail.com.

Sapar, S., Munarka, A. H., & Bustami, L. (2018). Kelembagaan Penyuluhan Pertanian Dalam Peningkatan Produksi Pertanian Kakao Di Kabupaten Luwu. *Prosiding Seminar Nasional*, *3*(1), 266–274. https://journal.uncp.ac.id/index.php/proceding/article/view/860/745%0Ahttps://journal.uncp.ac.id/index.php/proceding/article/view/860

Setiana, L., Nuskhi, M., & Hidayat, S. (2021). Kompetensi Penyuluh Pertanian Dalam Revolusi Industri 4.0 Menuju Pertanian Modern. *Prosiding Seminar Teknologi Agribisnis Peternakan (Stap) Fakultas Peternakan Universitas Jenderal Soedirman*, *8*(16), 602–607. http://jnp.fapet.unsoed.ac.id/index.php/psv/article/view/1225

Simluhtan. (2023). *Sistem Informasi Manajemen Penyuluhan*. Pertanian

Sumardjo dan Mulyandari RSH. (2011). Pengembangan Sistem Informasi Berbasis Teknologi Informasi untuk Pemberdayaan Petani Sayuran. *Proseding Hasil Pertanian IPB 2011*, 472–480.

Tri L. U, Y Tomo, dan N. S. (2017). Pengaruh Kualitas Sistem, Kualitas Informasi, Kualitas Layanan, dan Kepuasan Pengguna Sistem Informasi Akademik Universitas Merdeka Malang. *Jurnal Teknologi Dan Manajemen Informatika*, *3*(2), 150.

Wahyuni, S., Helmi, H., Tanjung, H. B., & Oktavia, Y. (2019). Peran Balai Penyuluhan Pertanian (Bpp) Dalam Penyuluhan Komoditi Pangan (Studi Kasus Di Kabupaten Tanah Datar). *Jurnal AGRISEP: Kajian Masalah Sosial Ekonomi Pertanian Dan Agribisnis*, *18*(2), 235–248. https://doi.org/10.31186/jagrisep.18.2.235-248

Yoyon, Y. S. (2022). Efektivitas Peran Balai Penyuluh Pertanian Terhadap Produksi Padi Kecamatan Siabu Kabupaten Mandailing Natal. *Jurnal Publikasi Manajemen Informatika*, *1*(3), 108–113. https://doi.org/10.55606/jupumi.v1i3.462

Yunita, F., Satmoko, S., & Roessali, W. (2018). Implementasi Peran dan Fungsi Balai Penyuluhan Pertanian (BPP) di Kabupaten Magelang. *Prosiding Seminar Nasional Fakultas Pertanian UNS*, *2*(1), E-109-E116.