APPROPRIATE TECHNOLOGY INTERVENTIONS FOR THE SUCCESSFUL OF
KOSTRATANI PROGRAM:
AGRICULTURE EXTENSION OFFICERS' PREDICTIONS

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ABSTRACT

To support the achievement of Kostratani Program, socialization to agriculture extension officers (PPL) had been delivered. Through well understanding on their respective responsibilities, they might able to predict the achievement of the program targets, the factors that support and problem they faced to be overcome to get maximum achievement. To get this information a research had been carried out in three provinces namely, West Java, Lampung, and Central Java in 2021. The respondents were 51, 31, and 34 PPL in BPP from each province. Data were obtained through individual interviews referring to a structured questionnaire on five aspects with 21 indicators. The data ware analyzed based on qualitative analysis and presented descriptively. Results reported by men and women PPL respectively were:1) Socialization was obtained by 67% and 71% ;2) Clarity of the responsibility by 52% and 51%; 3)Their prediction on the Program achievements' targets was 51% and 50%; 4) Access for on-line applications in supporting data and information was received by 47% and 47% and 5) Access for education (training, comparative studies) and incentives (monthly honorarium and internet quota) to run the Kostratani Program was only obtained by 21% of men and 24% of women. Concluded, the main intervention needs to be given to PPLs in the BPP Kostratani Program is the access on education and incentives. Meanwhile, in synergy it is still necessary to continue the socialization about Kostratani to increase PPL's understanding of the clarity of tasks or responsibilities to get maximum achievement of Kostratanis' targets.

***Keyword**s: Kostratani Program, Extension officers, Predictions*

INTRODUCTION

The Agricultural Strategy Command (*Kostratani*) is an agricultural development reform movement based at the sub-district level by optimizing the tasks, functions and roles of the Agricultural Extension Center or *Balai Penyuluhan Pertanian* (BPP) to achieve the success of agricultural development. *Kostratani* was implemented based on MoA No.49 of 2019 with targets to be achieved by BPP as the center for; (1) data and information; (2) the agricultural

development; (3) learning center location; (4) agribusiness consulting; and (5) partnership networks (*Pusat Penyuluhan Pertanian dan Perkembangan Pertanian Menteri Republik Indonesia 2020)* To support BPP's task in achieving these goals, accompaniment/mentoring/facilitation or *pembinaan* have been carried out through 12 steps, namely: (1) Socialization of BPP location; (2) Socialization about *Kostratani* to extension officers, sub-district heads, village heads and other stakeholders at the village and sub-district levels; (3) Procurement of information technology (IT) facilities and infrastructure as well as agricultural data/information management; (4) updating management (e-RDKK and CPCL) of Agricultural Extension System or *sistem penyuluhan pertanian (Simluhtan)*; (5) the management of the main program reporting application of the Ministry of Agriculture; (6) direct assistance to the main program of the Ministry of Agriculture for farmers; (7) preparation of e-RDKK and CPCL; (8) verification of CPCL; (9) monitoring of assistance for agricultural production facilities (*Saprotan*); (10) assisting farmers in implementing the main program of the Ministry of Agriculture;(11) carry out monitoring evaluation (Monev) of the main program of the Ministry of Agriculture); (12) Reporting the results of the main activities of the Ministry of Agriculture periodically to the *Kostrada* in the district, the Kostrawil in the province and the Kostranas at the Ministry of Agriculture every Friday. The implementation of all stages is necessary to be evaluated

socialization about *Kostratani* to PPL is very important since agricultural extension officers are as the spearhead and the frontline of agricultural development. The Ministry of Agriculture (2021) reported the total number of PPL in Indonesia are 69,493 people, consisting of 31,506 government employees (ASN), 12,135 Daily casual labor extension officers THLTB-PP and 25,852 Self-help extension workers (*Penyuluh swadaya*). Meanwhile, beside these category of PPLs, there are another five individuals who assist farmers running the farming (*https://mediaindonesia.com/ekonomi/386929/penyuluh-pertanian-asn-pppk-perkuat-sektor-pertanian, 2021)*, namely : 1) Honorarium staff for agricultural extension assistants who were processed as PPPK (*Pegawai Pemerintah dengan Perjanjian Kerja*) or government Employees with a Work Agreement to help the duty of agricultural extension, 2) Specialist agricultural extension workers (PPS). 3) Plant pest control (POPT). 5) *Kontak Tani Nelayan Andalan* or abbreviated as KTNA or National Outstanding Farmers and Fishermen Association (NOFA) and 5) Farmers assistant (*Mantri Tani*).

The availability of PPLs and individuals who assist farmers prove that the quantity of PPLs should be increase, unfortunately reports that the capacity and quality of PPL still need to be improved were found in various publications, such as Adawiyah et al (2021) reported that there are gaps between the existing conditions and the expectations. The gaps are on the quantity and quality of extension workers, access on information technology and management related to the program that should be implemented from the national level. Meanwhile, Khairunnisa et al. (2021) added the importance of the extension workers, especially in 3 out of the 7 aspects of their role namely as a motivator, educator, and facilitator. Therefore these three aspects need to be improved. This is understandable because these three factors need support from the relevant agencies.

To ensure PPLs' quality, it is necessary to study whether the socialization of *Kostratani* about their responsibility in supporting the success of the *Kostratani* has been well understood. By having the socialization are expected that PPL would be able to understand their responsibilities in supporting the *Kostratani* program. By understanding the target of the program, it is hoped that they can predict the success of *Kostratani* program, the factors that affect the achievement and the problems they faced to be overcome to get maximum achievement.

The objectives of this paper is to provide a basis information for intervention strategy to achieve the maximum goals of the *Kostratani* Program. The information would be derived from the PPLs' predictions on the success of the *Kostratani* program and problem that should be overcome.

RESEARCH METHODS

The location of the research was determined based on the results of discussions with agencies at the central level, namely the Agricultural Extension Agency, the Food Security Service, *Kostratani*-related agencies at the provincial level and the Center for Agricultural Research and Technology (BPPT). Three provinces, namely West Java, Lampung and Central Java were decided.

Data were collected from 51, 31 and 34 PPLs in BPP representing each province through individual interviews, referring to a structured questionnaire related to five aspects with 21 indicators (*Pusat Penyuluhan Pertanian. Badan Penyuluhan dan Pengembangan SDM Pertanian. Menteri Pertanian Republik Indonesia*, 2020[3]), namely: 1) Socialization of the *Kostratani* Program (4 indicators); 2) Clarity of tasks or responsibilities that must be carried out to support the Program (4 indicators); 3) Perception of achievement of program targets (4 indicators); 4) Access of PPL in supporting the Program (8 indicators) and 5) availability of incentives to run the *Kostratani* Program (4 indicators).

The data was processed based on qualitative analysis refer to Busetto et al (2020) on how to use and assess qualitative research method. The information are presented descriptively according to Douglas (2013).

RESULT AND DISCUSSION

Identity of extension officers

Table 1 illustrate that the average age of PPL is 42 years, means that they are in productive age. But were found PPL who are 55 years old, indicate that they almost in retired stage, therefore additional staff should be prepare to anticipate the lack of human resources to address the needs of farmers in advancing their farming. The average education of PPL were 14 years, reflect that they already graduated from high school and some PPLs had graduated from the university. The PPLs average work experience are 24.8 years with status of employment as Government employs 26% while the majority of PPLs (49%) are Agricultural Extension Specialists. This data indicate that the number of PPLs should be increase as reported by Pricylia et al (2018) who emphasized that in agriculture development, besides providing an ideal number of extension workers (1 PPL in 1 village), adequate extension facilities and infrastructure, avoiding pressure and other social problems that affect the mobilization of extension workers are also needed to be improved. Meanwhile Suratini et al (2021) confirmed that there are five characteristics of extension workers factors that are significantly related to the utilization level of social media namely the level of education, the availability of the technology, perception of the extension workers, the ease of access to information, and motivation of the extension workers.

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Table 1. Identity of extension officers by gender in BPP of West Java, Lampung and Central
Java Province in 2021

No	Identity	Province						Average
		West Java		Lampung		Central Java		
		Men (n=50)	Women (n=4)	Men (n=23)	Women (n=2)	Men (n=28)	Women (N=7)	
1	Age (years)							
	Minimum	25	43	23	42	31	46	35
	Average	41	40	41	45	43	43	42
	Maximum	56	54	58	48	60	54	55
2	Education (years)							
	Minimum	12	12	12	12	12	12	12
	Average	14	14	14	14	14	14	14
	Maximum	16	16	16	16	16	16	16
3	Work experience (Years)							
	Minimum	0	0	0	0	3	5	1,3
	Average	10	11	12	12	14	13	12
	Maximum	30	13	38	0	38	30	24,8
4	Employment status (%)							
	Government employ	30	0	22	0	32	71	25,8
	Freelance	24	0	30	0	43	29	21
	Self-help extension	2	0	4	0	7	0	2,1
	Agricultural extension Specialist	34	100	44	100	18	0	49,3

Source: Primary Data (2021)

Socialization of the Kostratani program

Table 2 showed that the Socialization at all levels, from national to sub-district were most received by PPLs in West Java. This is understandable considering that West Java Province is located closest to the central government agency. Based on the report, it is hoped that with the passage of time the socialization in other locations has been carried out. Overall, the average socialization has been received by 67% of Male and 71% Women PPL. However it is very important to know whether from the results of the socialization, PPLs have understood their duties and responsibilities in supporting the success of the *Kostratani* program. To answer this question, the following description present the understanding of PPLs on their tasks since the important of socialization for PPLs according to Rusmono (2017), extension worker has to deal with farmers effectively and optimally to achieve food self-sufficiency in Indonesia as the goals of *Kostratani.*

Table 2. Socialization of the Kostratani program in the Provinces of West Java, Lampung and
Central Java in 2021

No	Level of socialization	Province						Average	
		West Java		Lampung		Central Java			
		Men (n=50)	Women (n=4)	Men (n=23)	Women (n=2)	Men (n=28)	Women (N=7)	Men	Women
1	National	71	92	65	62	33	57	56	70
2	Province	68	69	87	75	11	0	55	48
3	District	74	69	91	87	56	86	74	81
4	Sub-district	87	84	96	87	63	86	82	86
	Average	75	79	85	78	41	57	67	71

Source: Primary Data (2022)

The understanding of PPLs on their tasks

The clarity of the responsibilities that PPL that must be done in supporting the success of the *Kostratani* program on average reported by 52% men and 57% women (Table 3). Specifically,

the lowest score is the lack of clarity about their responsibilities in identifying field school (SL) commodities needs, then identifying specific technology needs for farmers and then identifying commodities and needs for pilot activities. This findings confirmed with the report of Vintarno et al (2019) that Agricultural extension is a learning process for the main actors and business actors (farmers and businessmen) to be independent in their efforts to improve their welfare and keep the sustainability of their environment (as stated in the essence of the Regulation of the Minister of Agriculture Number 03 of 2018). Therefore, the PPLs should not be stop learning to achieve the agriculture developments' goals.

Table 3. The agricultural extension officers understanding on their tasks to support the Kostratani Program in BPP West Java, Lampung and Central Java 2021

No	Understanding on the task	Province						Average	
		West Java		Lampung		Central Java			
		Men (n=50)	Women (n=4)	Men (n=23)	Women (n=2)	Men (n=28)	Women (N=7)	Men	Women
1	Identifying commodities and needs for pilot activities	63	46	65	50	33	71	54	56
2	Identifying field school (SL) commodities needs	68	46	43	12	29	57	47	**38**
3	Identify specific technology needs for farmers	66	46	83	75	41	57	51	59
4	Reporting the implementation of activities	66	54	91	87	48	86	68	76
	Average	66	48	71	56	38	68	55	57

Source: Primary Data (2022)

To achieve the maximum goals, Haryanto et al (2017) stated that it was very determined in the preparation on preparing the extension programs in order to get an accuracy of agricultural extension with the technology needed by farmers. The needs of technology is depand on the commodities, as reported by Hemalius et al (2018) who examined the Effect of Agricultural Extension on Rice Paddy Productivity Levels which concluded that the accuracy of technology was also influenced by the availability of technology for certain commodities.

The PPLs' prediction on the achievement of the Kostratanis Programs' targets

Table 4 shows that according to male PPLs, the prediction of the achievement of the Kostratani Program's targets is 51% and according to women 50% or only half of the goals. This information is very useful as a basis for efforts to achieve the goals of up to 100% by 2024. The action that needs to be prioritized is to fulfillment of on-farm data per commodity per subsector, because it is predicted to be very low, namely 38% and 45% by Male and Female PPLs respectively. Meanwhile, this data is very much needed as a basis for immediate policies in real time. The next priority is reporting data and information using information technology to *Kostrada, Kostrawil*, and *Kostratanas* on-time, this finding supports the previous prediction because the two activities are closely related, if data per sector has not been obtained, of course PPLs cannot submit the

information to *Kostrada, Kostrawil*, and *Kostratanas.* The reports of the PPLs supported by the finding of *Purwatiningsih et al (2018) that* using information technology *is very important and significantly affects the performance of extension-workers. While the performance itself is affected by the internet use, age, formal education, internet perception, duration, and diversity of the accessed internet media.*

Table 4. The agricultural extension predictions' of achievement of the targets of the Kostratani Program in BPP West Java, Lampung and Central Java 2021

No	Targets	Province						Average	
		West Java		Lampung		Central Java			
		Men (n=50)	Women (n=4)	Men (n=23)	Women (n=2)	Men (n=28)	Women (N=7)	Men	Women
1	Fulfillment of on farm data per commodity per subsector	63	69	87	87	44	28	51	61
2	Fulfillment of off farm data per commodity per subsector	39	46	43	62	33	28	38	45
3	Identify and validate data and information needed by farmers and business actors	60	69	83	75	37	28	60	57
4	Distributing data and information using information technology to *Kostrada, Kostrawil,* and *Kostratanas* on-time	45	54	83	75	37	14	55	48
		52	60	74	75	38	25	51	53

Source: Primary Data (2022)

Access of the PPLs toward On-Line Applications

Report of the Extension Officer toward On-Line Applications Supporting Data Sources and information for *Kostratani* goals (Table 5) shows that among eight subjects of On-Line Applications Supporting Data Sources and information there are four subjects which could not be accessed by most PPLs, namely: 1) Access toward Rice Monitoring Information System (*Simotandi)* only accessible for (M=18% and W=12%); 2) Early Warning System (EWS) Program for Male 12% and for women 2,3%.; 3) Agricultural Land Resources Information System (*Sisultan*) only accessed by 16% of male and 12%of women and 4) Data Based of Nutrition only accessed by 37% of male and 48% of women. To improve their access, the Ministry of Agriculture's provide Agriculture War Room AWR. Has been targeted that 5,733 Agricultural Extension Centers (BPP) are connected to the (AWR) in Jakarta (Ministry of Agriculture Number 7 of 2020).

Table 5. Access of the extension officer toward on-line applications supporting data sources and information for Kostratani Program in BPP West Java, Lampung and Central Java 2021

No	Subjects of On-Line Applications	Province						Average	
		West Java		Lampung		Central Java			
		Men (n=50)	Women (n=4)	Men (n=23)	Women (n=2)	Men (n=28)	Women (N=7)	Men	Women
1	Agricultural Extension Management Information System (Sirnluhtan)	81	100	83	87	74	100	79	96
2	Cyber Ertension (cybex.pertalian.go.id)	76	61	83	75	48	57	69	64
3	Rice Monitoring Information System (Simotandi)	18	7	17	0	18	28	18	12
4	Early Warning System (EWS) Program	8	7	17	0	11	0	12	2,3
5	Agricultural Land Resources Information System (Sisultan)	21	23	17	0	11	14	16	12
6	Planting Calendar (KATAM)	89	100	69	75	33	57	64	77
7	Data Based of Nutrition	58	61	39	25	14	57	37	48
8	Agricultural Insurance Information System (SIAP)	68	77	52	62	29	71	50	70
	Average	52	55	47	41	30	48	43	48

Source: Primary Data

Related to the Agricultural Land Resources Information System (*Sisultan*), Zulkifar et al (2018) reported that Farmers' status on land should be noticed because farmers' who have status as land owners perceive that the implementation of extension methods for food crops is appropriate. The wider the farmers' land ownership, the more appropriate the implementation of the technology that is introduced by the extension workers. Beside that, In preparing the extension program, it is important to refer the opinion of Prayoga et al. (2019), that first of all, farmers' should have trust in the extension workers. The way to increase this trust needs to be done by establishing good relations with community leaders (head of farmer groups), informal leaders, or someone who is respected by the farmers' community.

To improve their access, the Ministry of Agriculture has facilitated the Agriculture War Room (AWR) which is connected to all Agricultural Operation Room (AOR) in the Regional and Regional Strategic Reserves Command (*Kostrada)* throughout Indonesia. This AWR is to monitore the *Kostratani* program at local, district, provincial and central governments. By December 2022, was targeted that 5,733 Agricultural Extension Centers (BPP) are connected to

(AWR) in Jakarta (Ministry of Agriculture Number 7 of 2020). Through AWR facilities, the necessary appropriate policies could be immediately release at real-time. Other important aspects in addition to fulfilling the means of communication, PPL needs to pay attention to Prayoga (2018) report, that to obtain optimal results for agriculture development, the penetration of information technology in the transformation of the agricultural extension system in Indonesia should be paid attention to the kinds of cyber extension, the media used, and also the content displayed. While Listiana et al. (2018), specifically examined that beside IT, the ability of extension workers in developing organizations were not optimal and still needed to be improved.

The PPLs' access to education and funding

The availability of access in education (training, comparative studies) and incentives (monthly honorarium and internet quota fee) to run the *Kostratani* Program was obtained by 21% of male and 24% of female PPLs respectively (Table 6). Therefore the main intervention that needs to be given to PPLs in the BPP *Kostratani* Program is the access on education (training and comparative study) and incentives (Honorarium for monthly activities and Budget for internet quota.

Table 6. Extension workers' access to education and funding to support the achievement of the *Kostratani* Program in BPP West Java, Lampung and Central Java 2021

| No | Access to | Province | | | | | | Average | |
| | | West Java | | Lampung | | Central Java | | | |
		Men (n=50)	Women (n=4)	Men (n=23)	Women (n=2)	Men (n=28)	Women (N=7)	Men	Women
1	Training	37	31	56	75	26	43	40	50
2	Comparative study	7	15	0	0	26	43	11	19
3	Honorarium for monthly activities	15	7	13	0	4	14	11	7
4	Budget for internet quota	31	31	26	12	7	14	21	19
	Average	23	21	24	22	16	29	21	24

Source: Primary Data

The key for improving PPLs assessed the quality of extension services including education and incentives (Hemes, 2021) depends on the five main indicators: (1) availability, (2) accessibility, (3) diversity, (4) relevance, and (5) effectiveness.

CONCLUSION

Based on the order of the percentage of "yes" answers reported by PPL towards the 21 indicators to achieve *Kostratani's* goals, the following conclusions and suggestions are proposed. Information in the conclusions would be used to derive some appropriate strategies to maximize the goals of *Kostratani* and proposed as the basis for determining agricultural development policies.

Conclusions

1. The status PPLs as the Government employs were 26% while the majority of PPLs (49%) are Agricultural Extension Specialists.
2. The Socialization at all levels, from national to sub-district were most received by PPLs in West.
3. The clarity of the responsibilities that PPL that must be done in supporting the success of the *Kostratani* program on average reported by 52% men and 57% women. Specifically, the lowest score is the lack of clarity about their responsibilities in identifying field school (SL) commodities needs, then Identifying specific technology needs for farmers and then Identifying commodities and needs for pilot activities. It is hoped that PPLs will also be able to report the difficulties they face so that they are immediately accepted through the Ministry of Agriculture's AWR.
4. The Man PPLs prediction of the achievement of the *Kostratani* Program's targets reported as 51% while the women 50%, it means only half of the goals.
5. The availability of access in education (training, comparative studies) and incentives (monthly honorarium and internet quota fee) to run the *Kostratani* Program was obtained by 21% of men and 24% of women, respectively.

Policy Implication

1. The results indicate that the number of PPLs should be increase through:.
2. The PPLs should be introduces the availability of AWR and Chat Together (*ngobrol bersama* or *ngobras*) which is held every regularly for all PPLs in Indonesia.
3. The action that needs to be prioritized is to fulfillment of on-farm data per commodity per subsector, because it is predicted to be very low, namely 38% and 45% by PPL M and F respectively.
4. Based on the PPLs prediction, efforts to achieve the *Kostratani* goals of up to 100% by 2024. The next priority is reporting data and information using information technology to *Kostrada, Kostrawil, and Kostratanas* on-time.
5. The main intervention that needs to be given to PPLs in the BPP *Kostratani* Program is the access on education (training and comparative study) and incentives (Honorarium for monthly activities and Budget for internet quota. Meanwhile, in synergy it is still necessary to continue the socialization about *Kostratani* to increase PPL's understanding of the clarity of tasks or responsibilities to get maximum achievement of *Kostratanis*' targets.

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