

# Revitalising the function of agricultural extension in Indonesia to support rice self-sufficiency

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**Abstract.** The role of agricultural extension workers is very much needed to guide farmers so they can adopt technology and facilitate the growth and development of farmer institutions. However, agricultural extension institutions have faced uncertainty and have even lost direction since the Regional Government issued Law No. 23/2014. Agricultural extension workers no longer have an agricultural extension-coordinating agency; therefore, supervision and guidance do not function properly. As a result, the performance of agricultural extension experiences stagnation. This study aims to formulate alternative agricultural extension policies after the issuance of Presidential Regulation No. 35/2022 on Strengthening the Function of Agricultural Extension. The analysis method used a literature review approach. Based on the study results, it is necessary to derive policies that provide synergy between the centre and regions to support strengthening agricultural extension toward national rice self-sufficiency. If agricultural extension activities run according to their duties and functions, they can increase rice productivity by 29–33%. Recommended policy alternatives: (1) strengthening coordination between the Ministry of Agriculture and agricultural extension institutions at the provincial, district/city, and sub-district levels; (2) refocusing agricultural extension programs and activities; and (3) strengthening the agricultural extension budget through an assistance task mechanism.

## 1 Introduction

Agricultural extensions contribute to the success of agricultural development in Indonesia. Various extension methods can improve farmers' knowledge, skills, and attitudes, thereby increasing their adoption of agricultural innovation and technology [1]. As the main actors in agricultural extension, extension workers act as facilitators in transferring technology from research results to farmers. Agricultural extension workers also build communication with various parties, making it easier for farmers to learn and make decisions [2,3]. Mentoring and assisting farmers has influenced national rice production achievements [4]. Agricultural extension is the key to successful food self-sufficiency, in addition to other factors such as optimising agricultural resources, applying advanced and location-specific technology,

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supporting production facilities and capital, and food price guarantees that provide production incentives.

Regulatory support is needed to strengthen agricultural extension activities. However, since the implementation of Law No. 22/1999 on Regional Government, which was the starting point for the regional autonomy period, then revised with Law No. 32/2004 and Law No. 23/2014, the role and existence of agricultural extension workers at the regional level have been increasingly weakening and losing direction. Based on the principle of concurrency and the absence of agricultural extension regulations in Law No. 23/2014, diverse interpretations have been created regarding the need and existence of agricultural extension institutions at the provincial, district, and city levels [5]. The previously existing extension institutions, the Extension Coordinating Agency (Bakorluh) at the regional level, the Extension Implementing Agency (Bapeluh) at the district/city level, and the Sub-district Agriculture, Fisheries, and Forestry Extension Center (BP3K) at the sub-district level, have lost their existence. Currently, part of the extension function at the provincial and district/city levels is in the regional technical implementation unit, whereas the other part is only in the field/section of the department that handles agricultural/food affairs.

Presidential Regulation No. 35/2022 issuance concerning Strengthening the Function of Agricultural Extension to provide steps to resolve the problem of implementing agricultural extension from the central to regional levels. Therefore, it is necessary to formulate alternative agricultural extension policies so that agricultural extension activities can contribute to supporting national rice self-sufficiency.

## **2 Methodology**

This study used a literature study method (literature review). The literature review is a description of the concepts, findings, and other research materials obtained from reference materials to serve as a basis for research activities. Data and information from literature relevant to the substance of the study, whether sourced from journals, regulations, or research reports. The primary importance of selecting contacts is related to agricultural extension policies.

Data and information were analysed descriptively. A descriptive analysis was carried out on three main topics. First, a historical review of the agricultural extension system. Second, a review of regulations and the role of agricultural extension workers in achieving rice self-sufficiency. Third, the formulation of policy recommendations for an extension system that is adaptive to changes in the strategic environment.

## **3 Results and discussion**

### **3.1. Historical overview of agricultural extension systems**

Agricultural extension has experienced quite a long, dynamic historical development, with various objectives and adjustments to activities. The result of agricultural extension in Indonesia cannot be separated from the agricultural development policies implemented at that time, from the Dutch colonial period to the reform period, which was characterised by the implementation of regional autonomy. Agricultural extension in Indonesia since its inception in the early 1970s has experienced at least three stages of system transformation, which include: (1) Era of Mass Guidance (Bimas), (2) Era of Law No. 16/2006, and (3) Era of Agricultural Development Strategy Command (Kostratani) [6].

### 3.1.1. *Bimas Era*

The Bimas era was a heyday for agricultural extension. In this era, Indonesia succeeded in achieving rice self-sufficiency. The level of government support for agricultural extension is indicated by legislative approval, such as Presidential Instruction No. 4/1973 on Village Units and Presidential Regulation No. 95/1969 on the Bimas Control Body, which shows the government's total commitment to strengthening extension institutions. This era was also marked by the integration of agricultural extension activities from the centre to the sub-district level so that coordination could run effectively.

The decline in agricultural extension began in 1991, marked by the publication of the Joint Resolution Letter (SKB) of the Minister of Home Affairs and the Minister of Agriculture No. 65/1991 and No. 539/1991, where the duties and authority of agricultural extension are not the responsibility of the Department of Agriculture but are handed over to regional governments according to their monovalent task areas. The change in the organisation and role of instructors from polyvalent to monovalent gives rise to the sub-sectoral ego in its implementation. This situation was corrected by issuing a Joint Resolution Letter (SKB) of the Ministry of Internal Affairs and the Minister of Agriculture No. 54/1996 and No. 301/1996 on Guidelines for Implementing Agricultural Extension. Agricultural extension workers can play different roles and integrate between subsectors to regain their identities. However, the implementation of the SKB has yet to meet expectations due to the reality that there are still dominant subsector interests compared to the integration of all subsectors. The dynamics of agricultural extension policies continued after the 1998 reform until the enactment of Law No. 32/2004 on Regional Government (Pemda), which adds uncertainty to the future of agricultural extension because the organisation and management of extension falls under the authority of regional governments. In addition, the organisation and management of agricultural extension varies according to the needs of local governments.

### 3.1.2. *The era of Law No. 16/2006*

The government attempted to restore the central role of agricultural extension by issuing Law No. 16/2006 on Agricultural, Fisheries, and Forestry Extension Systems. Under this regulation, agricultural extension institutions entered a new phase, providing detailed guidelines for local governments to form extension institutions. Farmer groups and farmer group associations began to grow and develop in this era, indicating that the system was starting to work well. However, in the end, the already running system had to be readjusted to the issuance of Law No. 23/2014 concerning the Regional Government.

Juridically, Law No. 23/2014 is expected to strengthen the existence of agricultural extension institutions because it aligns with Law No. 16/2006 [7,8]. However, agricultural extensions need to have the right position. With the issuance of Law No. 23/2014, agricultural extension is the authority of all levels/regions in a concurrency manner, namely, under the rule of regional governments, both provincial and district/city. This differs from fisheries extension, where authority is returned to the centre, while forestry extension has authority at the provincial level. On the institutional side, changes have also occurred where extension institutions, such as Bakorluh at the provincial level and Bapeluh at the district/city level, have been abolished. Agricultural extension institutions are no longer independent; their authority lies in one area or even a section of agricultural or food services (Table 1). Succinctly [9] summarised agricultural extension institutions into four categories: (1) at the provincial level, there are 12 fields, 11 section units, 8 Service Technical Implementation Units (UPTD), and 3 Functional Position Group units (KJF); (2) at the district/city level, there are 205 sector units, 230 section units, 6 UPTD units, and 73 KJF; (3) at the sub-district

level, there are 5,762 Agricultural Extension Centres (BPP) from 7,252 sub-districts throughout Indonesia; and (4) at the village level, there are 16,710 units of Village Extension Posts (Posluhdes) and 1,273 units of Self-Help Agricultural and Rural Training Centers (P4S).

**Table 1.** Agricultural extension institutions in Indonesia, 2023.

No	Province	Number of institutions					
		Province		District		Sub-district	Village
		Bakorluh	Office	Bapeluh	Office/ others	BPP	Posluhdes
1	Aceh	-	1	-	25	275	870
2	Bali	-	1	-	9	57	178
3	Banten	-	1	-	8	108	400
4	Bengkulu	-	1	-	10	109	451
5	DI Yogyakarta	-	1	-	5	56	46
6	DKI Jakarta	-	1	-	6	6	32
7	Gorontalo	-	1	-	6	75	168
8	Jambi	-	1	-	11	132	387
9	West Java	-	1	-	27	492	2,006
10	Central Java	-	1	1	34	551	2,345
11	East Java	-	1	-	38	589	2,930
12	West Kalimantan	-	1	-	14	154	146
13	South Kalimantan	-	1	-	13	133	428
14	Central Kalimantan	-	1	-	14	116	41
15	East Kalimantan	-	1	-	10	85	79
16	North Kalimantan	-	1	-	5	25	7
17	Bangka Belitung	-	1	-	7	39	60
18	Riau Islands	-	1	-	7	21	-
19	Lampung	-	1	-	15	211	1,382
20	Maluku	-	1	-	11	106	23
21	North Maluku	-	1	-	10	97	5
22	West Nusa Tenggara	-	1	-	10	116	396
23	East Nusa Tenggara	-	1	-	22	317	427
24	Papua	-	1	-	29	149	93
25	West Papua	-	1	-	13	65	2
26	Riau	-	1	-	12	129	186
27	West Sulawesi	-	1	-	6	61	34
28	South Sulawesi	-	1	-	24	291	1,061
29	Central Sulawesi	-	1	-	13	169	127
30	Southeast Sulawesi	-	1	-	17	210	299
31	North Sulawesi	-	1	-	15	169	421
32	West Sumatera	-	1	-	20	165	641
33	South Sumatera	-	1	-	17	197	1,079
34	North Sumatera	-	1	-	33	356	241
	<b>Total</b>	-	<b>34</b>	<b>1</b>	<b>516</b>	<b>5,831</b>	<b>16,991</b>

Source: Simluhtan (2023)

This change in extension institutions has impacted the implementation of agricultural extensions. Efforts to empower and educate farmers through the extension process are weakening because regional governments' attention to implementing agricultural extensions varies. The main indication of weak regional government attention is the small portion of the budget allocated to implementing agricultural extensions in line with the short-term orientation of obtaining regional income targets [10].

### 3.1.3. Kostratani era

Presidential Regulation 35/2022 issuance concerning Strengthening the Function of Agricultural Extension is expected to create synergy between the centre and the regions. This regulation is based on (1) efforts to increase the availability, access, and quality of food consumption; (2) increasing agricultural production and productivity so that it is necessary to strengthen agricultural human resources and implement appropriate, effective, and efficient agricultural technology innovations carried out through agricultural extension; and (3) agricultural extension is not yet fully functional, so it is necessary to strengthen the function of agricultural extension itself. In this regulation, there are seven policies to strengthen the function of agricultural extension: (1) strengthening work relations, (2) strengthening sub-district and village agricultural extension institutions, (3) providing and increasing the human resource capacity of extension workers, (4) agricultural extension materials, (5) utilisation of information and communication technology, (6) guarantee of the availability of infrastructure and facilities, and (7) guidance and supervision.

On 21 June 2023, the Minister of Agriculture Regulation No. 27/2023 on the Implementation of Presidential Regulation 35/2022 was launched. The Minister of Agriculture Regulation primarily outlines Article 9, Article 14 paragraph 10, Article 20 paragraph 4, and Article 26 of Presidential Regulation No.35/2022 on strengthening the function of agricultural extension. The relationship between Presidential Regulation No. 35/2022 and Minister of Agriculture Regulation No. 27/2023 can be seen in Table 2. Efforts to strengthen the function of agricultural extension, as regulated by the Minister of Agriculture Regulation No. 27/2023, are conducted by enhancing working relationships. This policy requires synergy in implementing agricultural extension between the centre, provinces, districts/cities, and sub-districts. This synergy is implemented through the Operationalisation of Agricultural Extension (OPP) by the Ministry of Agriculture through planning, coaching, monitoring control, and monitoring and evaluating agricultural extension. This OPP policy is a very strategic first step in strengthening the function of agricultural extension.

**Table 2.** The policy for strengthening the function of agricultural extension based on Presidential Regulation No. 35/2022 and the Minister of Agriculture Regulation No. 27/2023.

No	Policy	Presidential Regulation No. 35/2022	Minister of Agriculture Regulation No. 27/2023	Authority
1	Strengthening working relationships	<ul style="list-style-type: none"> <li>Operationalization of agricultural extension, which is a synergy in the implementation of agricultural extension at the centre, province, district/city, and sub-district</li> <li>Base Administration Unit (Satminkal)/UPTD/Provincial</li> </ul>	<ul style="list-style-type: none"> <li>Further provisions regarding the operationalization of agricultural extension start from planning, fostering strengthening working relationships,</li> </ul>	Minister of Agriculture

No	Policy	Presidential Regulation No. 35/2022	Minister of Agriculture Regulation No. 27/2023	Authority
		and Regency/City Agricultural Extension Substance Sector/Group	monitoring and controlling, as well as synergistic monitoring and evaluation beginning at the central, provincial, district/city, and sub-district levels • Determination of Satminkal by the governor at the provincial level or the regent/mayor at the district/city levels	
2	Strengthening sub-district and village agricultural extension institutions	<ul style="list-style-type: none"> <li>• Establishment, determination, and capacity building of BPP</li> <li>• Growth and empowerment of Posluhdes</li> </ul>		Regent/mayor, sub-district head, and village head/lurah
3	Providing and increasing the capacity of extension workers	<ul style="list-style-type: none"> <li>• Providing and expanding the capacity of civil servants and PPPK extension workers</li> <li>• Technical development and coaching of self-help extension workers</li> <li>• Development of Private Extension Workers</li> </ul>	<ul style="list-style-type: none"> <li>• Further provisions for the development and technical guidance of self-help extension workers</li> <li>• Development of private extension workers</li> </ul>	Minister, governor, regent/mayor
4	Agricultural extension materials	Agricultural extension materials that extension officers will deliver to main actors and businesses		Minister of Agriculture
5	Utilisation of information and communication technology	Using information and communication technology infrastructure from central to sub-district		Minister of Agriculture, governor, regent/mayor
6	Guarantee of the availability of infrastructure and facilities	<ul style="list-style-type: none"> <li>• Infrastructure facilities, namely offices and other facilities</li> <li>• Facilities include information and communication technology equipment, transportation equipment, learning practice tools, and other equipment</li> </ul>		Minister of Agriculture, governor, regent/mayor

No	Policy	Presidential Regulation No. 35/2022	Minister of Agriculture Regulation No. 27/2023	Authority
7	Guidance and supervision	<ul style="list-style-type: none"> <li>• Coaching is done through socialisation, advocacy, training facilitation, technical guidance, assessment, research and development, and awards.</li> <li>• Supervision is carried out through monitoring, evaluation, inspection, and other forms of control.</li> </ul>	Further provisions regarding coaching and supervision	Minister of Agriculture, governor, regent/mayor

The government undertook technical steps to strengthen the agricultural extension function by establishing a Base Administration Unit (Satminkal). Satminkal plays a role in coordinating the implementation of agricultural instructors, developing career patterns, and increasing their competency of agricultural instructors. The formation of Satminkal was entrusted with the regional government. The Governor and Regent/Mayor designate the UPTD in charge of Agricultural Extension at the Provincial Service and Regency/City Service as Satminkal. If there is no UPTD for Agricultural Extension, the Governor and Regent/Mayor must designate one of the Agricultural Extension Substance Sectors or Groups as Satminkal. The Ministry of Agriculture must encourage provincial and district/city governments throughout Indonesia to create derivative regulations as legal and operational bases for forming Satminkal.

The creation of derivative regulations at the regional level, which generally outline strengthening the function of agricultural extension, is the mandate of Law No. 23/2014 on the Regional Government. Regional, provincial, and district/city governments must form Regional Regulations (Perda) as derivative regulations from Presidential Regulation 35/2022. The existence of regional regulations is urgent because they are (a) policy instruments and assistance tasks; (b) accommodating regional specialities and diversity, as well as conveying the aspirations of the people in the region; (c) development tools to improve regional welfare; and (d) implementing higher laws and regulations [11,12].

### 3.2. The Role of agricultural extension in support of rice self-sufficiency

In 1970-1980, rice production in Indonesia was relatively high and stable compared to the following year. The highest increase in production occurred in 1980-1984, amounting to 5.78% per year. In 1984, Indonesia achieved rice self-sufficiency, as recognised by the Food and Agriculture Organization (FAO). This success was thanks to the Green Revolution policies and programs implemented by the New Order Government in a comprehensive, massive, and consistent manner. The impact is a very significant increase in productivity of 4.40% per year. The rate of growth in productivity during that period was also the highest [13]. This achievement occurred during the Bimas era when agricultural extension activities were integrated from the centre to the sub-district level.

After the Bimas period, the rate of productivity increase showed a downward trend. This downward trend shows the levelling off of rice productivity. In the following period, the rise in production increased again until in the 2005-2009 period, it reached 4.49% per year, which was the highest achievement in the era of the Reform Government. During this period, the government implemented the National Rice Production Increase (P2BN) program and the Integrated Crop Management Field School (SL-PTT).

In the following period, production continued to increase significantly. However, the increase in rice production during this period could not be separated from the rise in the harvested area. The massive Special Efforts for Rice, Corn, and Soybeans (Upsus Pajale) program encouraged the growth of the harvested area in the 2015–2017 period by 5.35% [13]. During this period, a regional autonomy policy was implemented in which agricultural activities were a matter of choice, and agricultural extension was handed over to the provincial government. Based on the principle of concurrency, agrarian extension is the authority of each regional government, whether in a province or district/city.

Since the agricultural sector is a matter of choice, coordination, and synchronisation of central and regional development programs must still be considered substantial. In addition, the lack of socialisation of agricultural extension regulations has led to differences in perceptions between provincial governments. The impact is that there are differences in determining the priority scale, including inaccuracies in budget allocation and human resources for agricultural extension workers. Agricultural extension activities through SL-PTT, applied studies, and demfarm have increased rice productivity by 29%–33% (Table 3). The rice production of program participants is higher than that of non-program participants who are not accompanied by agricultural instructors and do not receive production facility assistance packages. The contribution to increasing rice production was due to agricultural extension regulations at that time (Law No. 16/2006 and its derivative regulations), partially (in the provinces of West Java, East Java, Lampung, and South Sulawesi) greatly supporting the achievement of rice self-sufficiency in 2014 [14].

Agricultural extension workers are the main actors in increasing rice production [15]. The role of agricultural extension workers is significantly related to increasing rice farming productivity [16–19]. The part of agricultural extension services (Agriculture Extension Services) can increase rice productivity in Bangladesh. The comparison of rice productivity levels for participants and non-participants is 6.07 tons and 5.09 tons per hectare, respectively [20]. Research conducted in Ghana proved that access to agricultural extension services, in this case about knowledge of fertiliser use, has a positive effect on rice productivity [21]. The role of agricultural extension workers in increasing rice production requires special attention from local governments. Regional governments need to optimise the duties of agricultural instructors with adequate budget allocations so that sustainable self-sufficiency in rice can be achieved.

**Table 3.** Non-participant rice production and program participant farmers supporting food self-sufficiency in research locations, 2012.

No	Program	Production (tons/ha)		Production increase (%)
		Non-participating farmers	Participating farmers	
1	SL-PTT	6.14	7.94	29
2	Applied studies	6.30	8.36	33
3	Demfarm	4.96	6.40	29

## 4 Conclusions and policy recommendations

### 4.1 Conclusions

The revitalisation of Indonesia's agricultural extension function during the regional autonomy era faces serious challenges. Since the publication of Law No. 23/2014 on Regional

Government, agricultural extension institutions have been experiencing a transition. However, the issuance of Presidential Regulation No. 23/2022 on Strengthening the Function of Agricultural Extension is expected to provide new steps to restore the strategic role of agricultural extension. Based on the results and discussion, several important points can be concluded as follows:

1. The lessons learned that can be obtained from the dynamics of agricultural extension regulations are as follows.
  - a. The implementation of Presidential Regulation No.35/2022 and Minister of Agriculture Regulation 22/2023 is predicted to optimise the role of agricultural extension workers in increasing rice production.
  - b. The priority step in Presidential Regulation No. 35/2023 is a policy to strengthen employment relations.
  - c. The policy of strengthening labour relations requires synergy in implementing agricultural extension between the centre, provinces, districts/cities, and sub-districts. This synergy is implemented through the Operationalisation of Agricultural Extension (OPP) by the Ministry of Agriculture through planning, coaching, monitoring, and controlling, as well as monitoring and evaluating agricultural extension.
  - d. Determination of Regional Regulations in support of Presidential Regulation No. 35/2022 is essential to become the basis for the operationalisation of agricultural extension and agricultural extension workers.
2. The agricultural extension program (simultaneously with other programs) can contribute to increasing rice productivity by 29–33%. This achievement was due to the existence of regulations that support agricultural extension activities. The agricultural extension policy in Law No. 16/2006 and its derivative regulations can contribute optimally to achieving rice self-sufficiency in 2014.

## 4.2 Policy recommendations

Revitalising the agricultural extension function during regional autonomy requires synergistic efforts between central and provincial governments. To accelerate this process, the following policy alternatives are recommended.

1. Strengthening coordination between the Ministry of Agriculture and agricultural extension institutions at the provincial, district/city, and sub-district levels. This effort has begun by establishing a strategy that makes the sub-district level Agricultural Extension Centre (BPP) the epicentre of agricultural extension activities in the field. By strengthening coordination, it is hoped that the number of agricultural instructors will be able to meet needs, considering that almost 50% of civil servant extension workers will retire.
2. Refocusing agricultural extension programs and activities. Extension programs and activities are focused on (i) increasing the competency of agricultural extension workers (both civil servant extension workers, private extension workers, and independent extension workers), (ii) increasing the capacity of rice farmers, especially in technology adoption, and (iii) increasing the institutional capacity of farmers and farmer economic institutions to support increased rice production.
3. Strengthening the agricultural extension budget through an assistance task mechanism. The budget allocation for assistance tasks is aimed at BPP as the field's epicentre of agricultural extension activities. The main target of strengthening the budget is to increase rice production by optimising the implementation of extension services and providing the necessary infrastructure.

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