

CAPACITY BUILDING FOR AGRICULTURAL EXTENSIONISTS: A CASE FROM INDONESIA

Sucihatningsih Dian Wisika Prajanti

Universitas Negeri Semarang

Sri Utami*

Universitas Negeri Semarang

ABSTRACT

The purpose of the research is to describe the condition of agricultural extensionists related to capacity building in Indonesia. The informants were selected using purposive sampling technique. Then, data were gathered through observations and supported by relevant documents, audio-visual records and photographs, and agricultural regulation. Further, the results of the indepth interview with frontline extensionists, policy makers of extension agencies and observation of extensionists at work were analyzed. Using qualitative approach analysis, the results indicate that the implementation of the extension institutions in Central Java in the decentralisation era has various condition due to their diverse region characteristics. Hence, the advocacy has not been run well. In January 2009, the data of Bakorluh (Board of Extensionist Coordination) of Central Java province show that there are 10 municipalities which have established *Bapeluh* referring to local regulation (Perda). They are Magelang, Karanganyar, Rembang, Sragen, Purworejo, banyumas, Cilacap, Purbalingga, Batang, and Temanggung.

Keywords: Agricultural extension; Capacity building, Bakorluh, Central Java

Received: 11 October 2017

Accepted: 2 April 2019

1. INTRODUCTION

The lack of food and nutrition has been threatening the health, intelligence, and the survival of approximately 250 million people in developing countries, including Indonesia. While in other developed countries, such condition is also threatening 9 million of people, and 25 million in other transition (FAO, 2007). (Syahyuti, 2003) mention that agricultural sector has become one of strategies to overcome the problem and as a base for real sector. Further, the food policy in Indonesia has always changed. From 1952 to 2008, the era can be classified into five orders namely the old order of post-independence, the old order of the transition period in 1965-1967, the new order, the reformation transition, and the reformation after 2000 (Mears & Moeljono, 1981); (Dharmawan, 2006). The national food policy from the beginning of the independence to the present is illustrated in Table 1.

*Corresponding author: Faculty of Economics, Universiti Negeri Semarang, 50229, Semarang, Indonesia. Tel: +6281226210568, Email: sriutami@mail.unnes.ac.id

Table 1: Indonesia Food Policy in 1952-2009

Era	Government Regime	Food Policy
Old order (post-independence)	Soekarno 1952-1956	Rice self-sufficiency through Kasimo welfare program
	Soekarno 1956-1964	Rice self-sufficiency through <i>Sentra Padi</i> Program
Transition Government 1965-1967		
New Order (Development Order)	Soeharto 'repelita' 1 & 2 1969-1979'	Rice self-sufficiency
	Soeharto Repelita 3 & 4 1979-1989	Food self-sufficiency
	Soeharto Repelita 5 & 6 1989-1998'	Rice self-sufficiency
Reformation: (transisi)	Habibie 1998/1999	Rice self-sufficiency
	Gus dur 1999/2000	Rice self-sufficiency
Reformation (after 2000)	Megawati 2000/2004	Rice self-sufficiency
Post-reformation	SBY 2004-2009	Agriculture revitalization
Post-reformation	Jokowi 2010 - onwards	Nawacita

Source: Mears (1984), Mears and Moeljono (1981), Dharmawan (2008).

Agriculture is the main economic sector in Central Java province in which more than half of the labour force employed in this sector. This province has 3.25 million ha or around 25.04% of the total Java area (1.7% of Indonesia). It consists of 1.00 million hectares (30.80 percent) of paddy fields and 2.25 million hectares (69.20 percent) is not wetland. Currently, Central Java province is the national food supplier. Its rice production reaches 16% of the total national rice production (Board of agriculture for Central Java province, 2017) Central Java province is considered successful in its food production and it won some agricultural and food security reward at the national level. Therefore, it is vital to examine one of important elements in agricultural development in Central Java. One of them is the existence of the agricultural extensionist.

The institution of agricultural extension is regarded as an agent that is responsible for transferring knowledge to farmers in building their capacity. The capacity building process involves giving assistance in finding, creating, and using access in institution- production, distribution, and consumption for agricultural product. It aims to improve the productivity and the income of farmers. The improvement of agricultural extension institution in Indonesia requires better performance of the extensionists. In fact, the role of the agricultural extension (PPL) is to assist farmers in facing their problems by providing information and different perspectives. However, it is found that the agricultural extensionist has not optimally run as expected. According to Abdullah et.al (1998), the improvement of performance is influenced by three important things; the amount of information cost, institution's set up expenses, and appropriate collective decision.

The focus of food security development is the community empowerment which means that it makes them to be independent and have capacity to participate actively in the food provision, distribution, and consumption from time to time (Purwaningsih, 2008). The development of food security system is basically a development focusing on harmonization of some sub-systems including means of resources, food availability, distribution, food consumption, food awareness, diversification, and agribusiness (Susilowati et.al, 2004)

¹ Repelita is a five-year development planning

This research focuses on describing the condition of extension regulation in Indonesia and to what extent it works to assist farmers. Each condition in different era is highlighted to at least give some insightful ideas of existing agricultural extensionists in Central Java province.

Agricultural extension system, as stated in Law No. 16 2006, is defined as a whole set of development capabilities, knowledge, skills and attitudes of the main actors in agricultural activities and entrepreneurs through counseling. It is also stated that the agricultural extension is a learning process of the main actors and businesses so that they are willing and are able to help and organize themselves in accessing market information, technology, capital resources and other resources aiming to improve productivity, business efficiency, income and welfare, and to raise awareness in environment conservation.

During the agricultural extensionists activities, there are other simultaneous process in learning. They are:

1. Persuasive communication process. This process is when the extension facilitates the actors (the main actors and entrepreneurs) and their family to find solution towards the existing problems related to their business development. The process of empowerment means to give power and authority to the main actors and entrepreneurs so that they have equal opportunities to: (a) participate, (b) access technology, resources, market, and capital, (c) control over every decision-making process, (d) benefit from every process and the result of agricultural development.
2. Process of information exchange between extension and the target related to alternative programs to solve the problems during the business development.

According to the Ministry of Agriculture (2009), agricultural extension is a way or rationale derived from ethical moral policy on everything that should be applied in everyday life practice. Agricultural extension program must be based on individual development in society, nation and state. Hence, it is stated that "Agricultural Extension is an effort to assist people so that they can help themselves and improve dignity as human beings".

In terms of helping people to help themselves, there are some main thoughts about the implementation of agricultural extension. Agricultural extension should be based on the needs of the targets or farmers. While agricultural extension should lead to stimulate farmer's independence. It means that the program does not make farmers depend on farmer's extension. Agricultural extension should refer to the improvement of the quality of life and well-being goals instead of physical target that is not beneficial to the improvement of quality of life.

From the above perspectives, there is a notion that agricultural extension must work with the community instead of for the community. Agricultural extension does not create dependency, but to encourage more creativity and independent community. Agricultural extension is supposed to make people capable of creating self-sustained, spontaneous, self-financing and self-management for the implementation of agricultural activities in order to achieve the goals, and expectations as targeted. Agricultural Extension programs which are implemented should always refer to the realization of people's economic welfare improvements and their dignity as human beings.

Counseling is a process of education that aims to improve knowledge attitudes and skills of the farmers. The targets of agricultural extension are all members of society (men, women, including children). Agricultural extension involves teaching people about what they want and how to achieve it. The method applied in agricultural extension is learning by doing and helping farmers to believe in what is seen. Meanwhile, the pattern of communication applied during the learning is a two-way type, mutual respect and trust in the form of co-operation to improve the welfare of the community. Agricultural Extension should be able to make farmers pursue their dream by always thinking creatively and dynamically in doing their activities in the field and make them capable to solve problems they are facing.

The facilitator of Agricultural Extension

The main actors in agricultural extension activities is an agricultural extensionist or also commonly called the Agricultural Extension Workers (In Indonesian it is namely PPL- *Penyuluh Pertanian Lapangan*). Agricultural Extensionists are basically officers or agents who develop agriculture, educators, or mentors who offer farmers, fishermen and their families motivation, guidance and they also encourage farmers and fishermen to develop self-reliance to make a better, happy, and prosperous life. Therefore, agricultural extension programs are required to develop and implement the material in order to maximize the performance extension.

Agricultural extensionist should execute the activities in accordance with the agricultural extension program. The programs are meant to provide materials as the direction, guidance, and as a means to achieve the objectives. As a matter of fact, agricultural extension program consists of agricultural programs for villages, districts, cities, provinces and national (Act No. 16 of 2006). In performing the task, agricultural extensionists provide counseling, motivation and technological innovation needed by the farmers and their families include:

1. Extensionist is as an initiator who always gives farmers new ideas.
2. Extensionist is a facilitator who always offers solution in counseling or learning process, as well as in improving their farming facilities. In the case of facilitating the farmers, the program includes a business partnership, access to market market and capital, and others.
3. Extensionist is a motivator and an educator offering new information for farmers, have the will to learn and have capability.
4. Extensionist is a mediator that conveys aspirations of a farming community and the government.

There are lists required to do and prepare by the extensionists in accordance with the expectations of farmers and their families written in the annual and monthly agricultural extension work plan (RKPP- *Rencana Kerja Penyuluh Pertanian*):

1. Understand the circumstances, and the current expectation of farmers
2. Understand the materials, media and the methods that will be conducted
3. Use adequate facilities and infrastructure
4. Use the right and accurate time

Based on the above discussion, effective agricultural extensionists are those who understand more about the problems of the farmers (main actors and entrepreneurs), prepare alternative solutions that could be applied before performing activities with society. If the counseling is finished, they

would see or evaluate the changes in term of knowledge, skills and attitudes appropriate to be able to adopt and adapt with technological innovations. Counseling should be conducted in a participatory manner so that farmers will be able to express their opinions, and be able to plan activities that benefit themselves, family, and the environment.

The success of counseling, according to the experience of extension, can be seen by whether farmers are pleased with the existence of agricultural extension, and the increase of farmers' income. Farmer's welfare is more prosperous and happy. If this conditions occur, the agents have worked effectively and efficiently in accordance with the rules of extension. Finally, educator or extension is happy and successful.

It seems that the role of communication skill of the extension is very crucial in the planning, implementation, and evaluation. This skill is influenced by the extension's background both individually and in groups. Extensionist should ensure whether his message is in accordance with the need of target group, and also whether the channel or media and method are already precise. But the most important element is that the communication which is well-delivered so that the expected change in behavior can be realised. In agricultural sector, the main points are how the implementation of agricultural extension at the field level is run smoothly, and the expected objective can be achieved.

The phenomenon illustrates that there is still weak agricultural extension process and it is found that one of the reasons is the communication barrier. In the process of communication, the delivery process to farmers matters either either directly or indirectly. This lack of communication should be examined by finding its cause. If a change of behavior as part of the counseling goal has not been achieved, not only target is to blame but also the communicator- that is the extensionist- as a messenger. The causes are examined whether due to unpreparedness of the material to be delivered, or because of inadequate infrastructure, or due to other barriers in the process of delivery.

The failure to communicate often causes misunderstandings, losses, and even disaster. The risk is not only at the individual level, but also at the level of institutions, communities, and even countries. To be an effective communicator, agricultural extension should strive to acquire the skill of communication (verbal and nonverbal) deliberately and also understand the culture of others.

According to Sail (2008), Agricultural extension is defined as an informal education trying to bring changes in knowledge, attitudes and activities of the clients through a participatory approach focusing mainly on the empowerment. The empowerment will make farmers capable to decide whether they want to accept or reject something, for example, new technology. Besides, agricultural extension is aimed to solve existing problem as well as to improve the quality and productivity of agricultural performance. Such definition focuses on the empowerment and potential of the farmers to manage, lead, solve problems, and make decision for the benefit of farmers. This focus is based on the philosophy of the principle of human resource development in which the client's development becomes the main priority before focusing on technology transfer. Furthermore, according to (Sail, 2008) human resource development program should be conducted simultaneously with the transfer of technology.

The current problems faced is some programs for agricultural extension are not accordance with the need of the farmers yet. Further, the implementation of the program does not use the

participative approach principles. Sometimes, it seems to be only a project oriented, and partially implemented. The infrastructure needed for learning process is also limited. Further, the budget for agricultural extension is very limited while the budget from farmers and private actors are quite small.

2. METHODS

The research employed qualitative methods. The primary data were collected from the interviews and the questionnaires distribution to the respondents including the key persons. The questionnaires involve some issues on the institution of the extension existing in new era, reformation era, and the researcher's scenario (in which derived from the strength of the institution capacity model from new era and reformation era). They were 200 farmers and 30 field instructors/extensionists. The descriptive statistics was selected for describing the profiles of the respondents, the performance of the extension agents, and the organizational condition of the extension agents. The transaction cost was utilized to estimate the cost needed to design scenarios of organizational extension revitalization in order to reach the development of the extension agents' capacities. The capacities were expected to be the seminal factor in improving the performance of the agribusiness activities in the research areas.

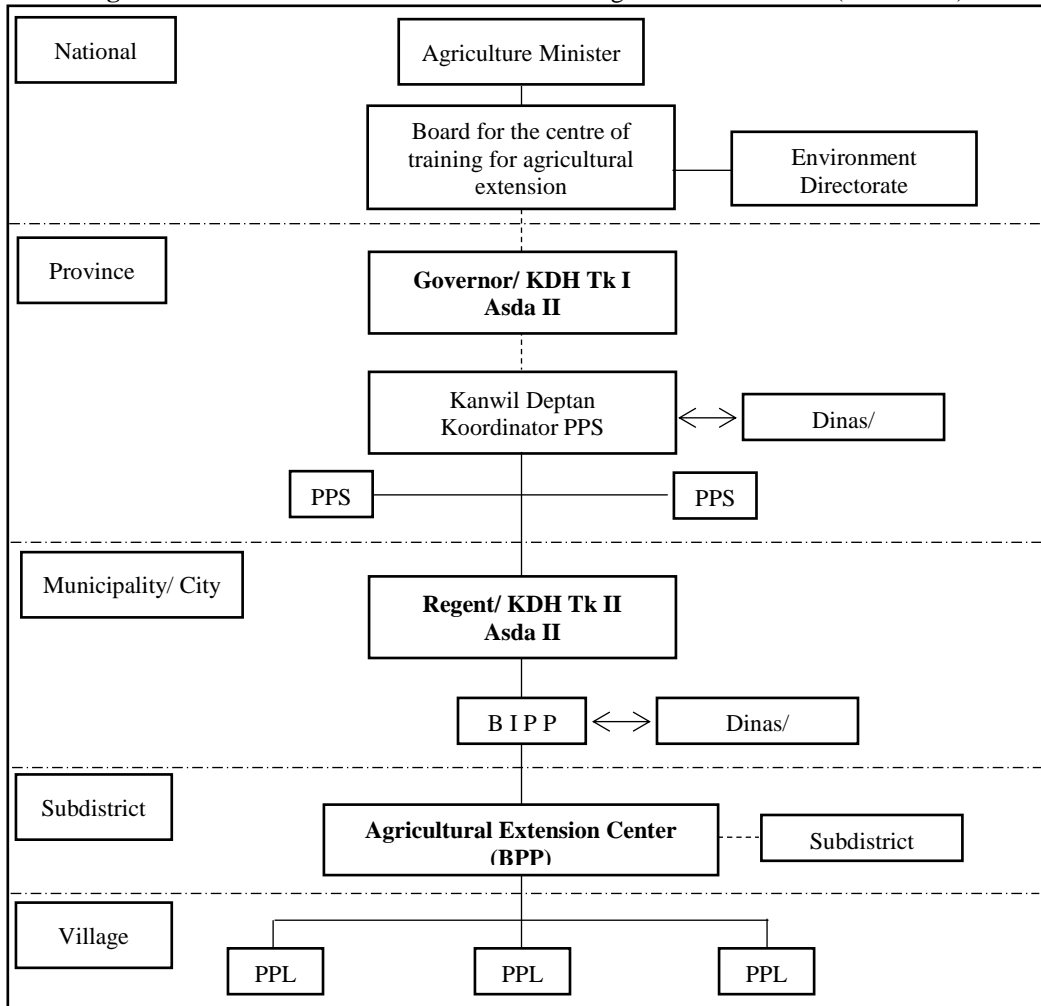
3. RESULTS AND DISCUSSION

The research offered a model aimed to improve the organizational capacity of the extension agents by maintaining the decentralized model, adding the cost of information, making a better behaviour system and improving cooperation between stakeholders. This said, the extension agents are expected to deliver the information related to agribusiness by providing fast and accurate information technology. The information presented were drawn from a data based system in which it is gathered from all related parties, such as the department of the industrial and trade, agricultural bureau, research centers and universities. Furthermore, the database was used to disseminate the information related to the agribusiness such as supply of agriculture products, fertilizer, climate, agribusiness expedition, etc. The up-dated information could be accessed by the farmers, the interested persons and parties, including the extension agents, only by using cell phone or internet. The accessibility of the information could be selected based on the users' need. Moreover, if there are farmers who are not able to access information because of financial constraint to afford internet connection, they would have opportunities to access the updated information by using Short Message Service. The information which could be provided in the database includes the price lists of all of the agricultural products which could become a guidance for farmers in selling their products. Moreover, the extension agents, who have enough educational background and the government infrastructure facilities, can access the information more accurate. This information could be disseminated to farmers. The information about agricultural policy and technology could be transferred to the potential users faster and cheaper. The database could also be accessed by the public so that it would be useful as a reference for policy makers.

The Model for Improving the Institution Capacity of Extension

The result indicates that the farmers' performance is found to be less efficient and the performance of the advocacy is less optimum. Therefore, it is a need to establish a model to improve the extension institution capacity. Remodeling the existing previous approaches, which was used in the New Era, could be executed by relating to the current issues. This model is described in three scenarios. They are centralized extension institution scenario, decentralized existing model scenario, and scenario based on the researcher's view. In Central Java, the third model, suggested by the researcher, is employed because this model is considered possible to apply in Central Java.

The scenario 1 and 2 were collected from the secondary data. It was applied in the previous governmental order. The first scenario focuses on the central government as the central of the ideas, concept, and policy maker for local government. It is a top-down concept in which making farmers as the object of the programs, not as a part of the actors. The model is as in Figure 1.

Figure 1: The Model of Centralized Institution Agriculture Extension (Scenario 1)

Resource: Derived and modified from many resources, 2009

The advantage of centralized institution

The model of centralized institutions for extensions has several advantages:

- 1) The common rules and regulations related to governance, institutions, and local governments.
- 2) Structure and policy of local governments are made by the central governments which are applied by all regions.
- 3) The concepts of the agricultural extensions are standardized
- 4) The system of the advocacy is in the form of training and field visit (LAKU- *Latihan dan Kunjungan*). The system has successfully made Indonesia at the rice self-sufficient level in 1984 (Subandriyo, 2010)The centralization was suitable with the condition of green revolution.

The farmers started to change their traditional technology to the new one based on the modern production infrastructure.

The Disadvantage of the Centralized Agricultural Extension

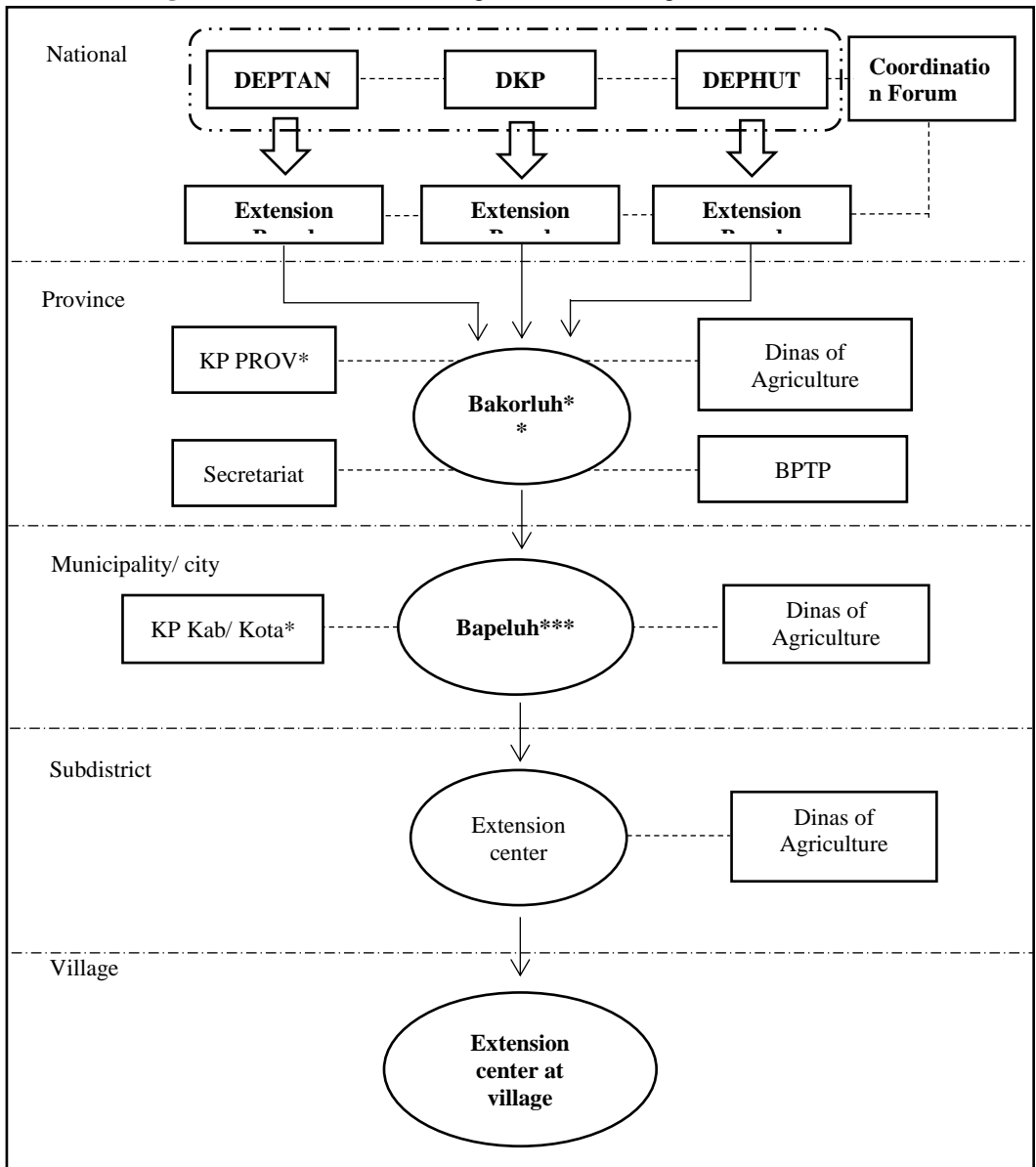
The model of centralized agricultural extension institutions have several disadvantages. They are:

- 1) The existence of the agricultural extension has less assurance. Many of them are moved to structural positions at the local governmental boards. As a result, it is found to be difficult for those who have quite different background of education. This said, Board for Agricultural Extensionists (BPP-Balai Penyuluh Pertanian) has less functions and the LAKU system does not appropriately work (Margono, 2001).
- 2) The agricultural development planning program tends to adopt top-down approach and accomodate the government interest instead of the farmer's.
- 3) There is limited access of information.
- 4) The activities of the extensions are prone to merely establish physical infrastructure and to finish the project. This brings difficulties in implementing the actual needs in advocacy provision (Margono, 2001).

The Model of Existing Decentralized Agricultural Institutions (Scenario 2)

The rules for advocacy in agriculture, fishery, and forestry are meant to strengthen the existing institution and the function of the agricultural advocacy both in the central and local level. The institution of the extension is refunctioned to facilitate the development of the farmers's activities and the business people. Hence, it is expected that the income of the farmers will increase as in figure 2.

Figure 2: The Model of Existing Decentralized Agricultural Institutions



Source: Modified from many sources, 2009

Note: *KP is Extension Comission

** Bakorluh is Extension Coordination Board at provincial level

*** Bapelluh is Extension Coordination Board from 35 municipalities/cities. There are 10 Bapelluh which have been established. The other municipalities that have no Bapelluh yet, the function is executed by Agricultural Board

The implementation of the extension institutions in Central Java in the decentralisation era has various condition due to their diverse region characteristics. Hence, the advocacy has not been run well. In Central Java, the institution consists of one Bakorluh. In fact, there are 10 out of 35 municipalities which have formulated local policy related to extension. It is also recorded that there are 19 rules from regent/mayor, 4 recommendation drafts, and 2 non-institutions. Factually, there are 2.624 extensions out of 8.573 villages in Central Java. Bakorluh, at the provincial level, and the Bapeluh at the municipality level, functions as the management unit. It means that the decentralised agricultural extension model does not offer enough number of extensionists for farmers. The numbers of extensionists are less compared to the number of farmers. It has made the programs difficult to run.

The Advantage of Existing Decentralized Agricultural Extension Model (Existing Model)

The advantages are:

- 1) Accomodating the condition and the potential of the society which are diverse leading to a bottom-up planning approach
- 2) The skill of the extension is polivalen. It means that the extension is expected to master some fields involving grain plantation, horticulture, fishery, forestry, and livestock.
- 3) The existence of the focus of the activities executed by the departments or other governmental institutions. Hence, the budget can be effectively used and developed.
- 4) The mechanism of the budget for the society is found to be effective in benefitting them in reaching the right target group and location.
- 5) There are operational activity systems which are feasible to be executed by the society to meet their needs and capacity (Sumodiningrat, 2000).

The disadvantage of Existing Decentralized Agricultural Extension Model (Scenario 2)

The disadvantages are:

- 1) The institution of the agriculture extension happens to change the transition time. This leads to less functioning PPL and also the unconducive status of their employment.
- 2) Comparing to the needs, the number of PPL and their quality is less. Generally, the education of the extension is at senior high school level. This makes them less capable to support the farmers in facing the agricultural problems which are getting more complex (FGD Grobogan, Klaten and Magelang).
- 3) The agricultural information access (technology, price, work opportunities for farmers, etc), which is available in BPP is limited. Ironically, the newspapers, magazines, and leaflets are available at the agricultural government offices, yet it is not distributed to BPP or villages (Margono, 2001).
- 4) The capacity and the capability of the extention managerial skill are found to decrease. Hence, the frequence of the advocacy is still less. The programs, which are planned by BPP, are mostly used only for the sake of administration. In fact, the implementation of the programs is less than 50% (Sugiyanto, 2009)
- 5) The PPL, the extensionist, is no longer visiting the farmers group. The farmers are reluctant to meet the extensionists. A few who are willing to meet them. This makes the extensionists

have less interest to meet the farmers. According to farmers, they have more knowledge than the extensionists (Marpomo, 2009)

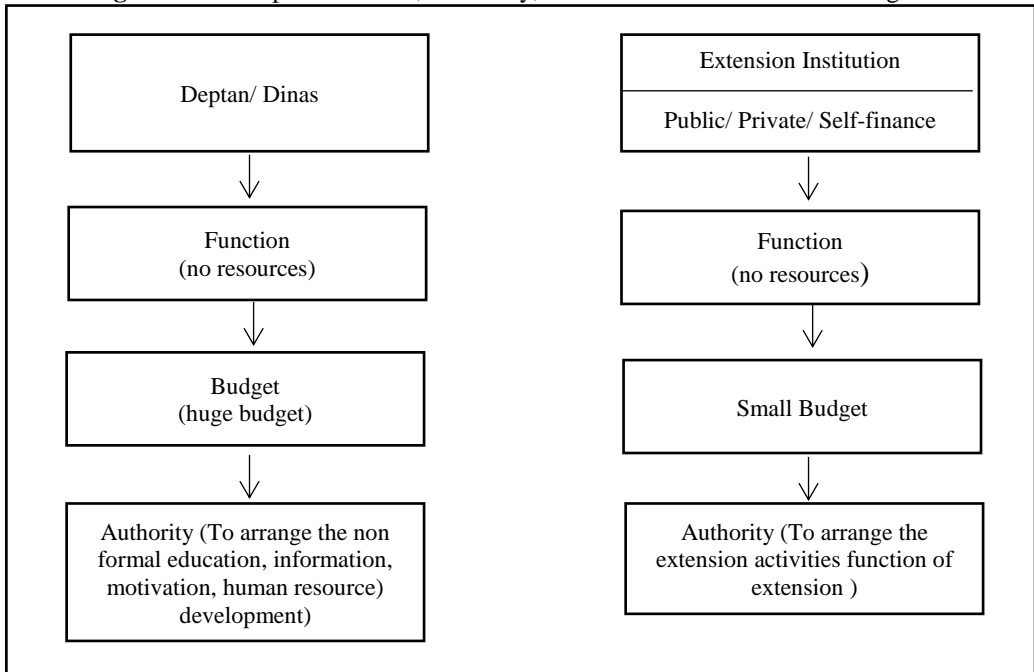
- 6) The existence of *Satpingkal* (post unit) restricts the programs which are conducted by the Dinas since all their programs are technically executed by the extensionists. *Satpingkal* leads to more complex beureaucracy (Nuswantoro, 2009)
- 7) The coordination between the agriculture extensionists and Dinas officers is found to have less synergy. It is proven that there are many municipalities that do not have Bapeluh and the overlapping activities among the agricultural extensions and food production improvement program (Interview with (Harzulli, 2009)

The model of institution for agriculture extension based on the scenario of the researcher (scenario 3)

In autonomy era, in relation to the agricultural extension system development, the Board of Food Security and its related institutions function merely as the coordination forum (Prajanti, 2012). They are not the implementing body. Meanwhile, the implementators are Dinas and other related implementing bodies. It implies that there are duplications which are not necessarily executed. This is weakening the existing work performance. In this scenario, the mindset for developing the agriculture should optimize the local autonomy (Margono, 2001). It means that the activities should refer to the local interest. To make it happen, therefore, the financial support could be gained from the local government. It is believed that there is a need to plan a structural organization and system for agricultural extension advocacy which are nationally standardized. However, the programs should meet the needs of the local people. This is required to have financial support and agriculture extensions which should be part of the local autonomy program. Therefore, the structure and the model for agriculture extension are not necessarily standardized. It should be based on the needs and the situation of the region as well as its competency.

At the decentralisation era, the extension institutions (Bakorluh and Bapeluh) often happen in the overlap of function, authority, and budgeting with agricultural Dinas as in Figure 3:

Figure 3: Overlap of Function, Authority, and Duties of the Extension Program



Resource: Main data, 2016

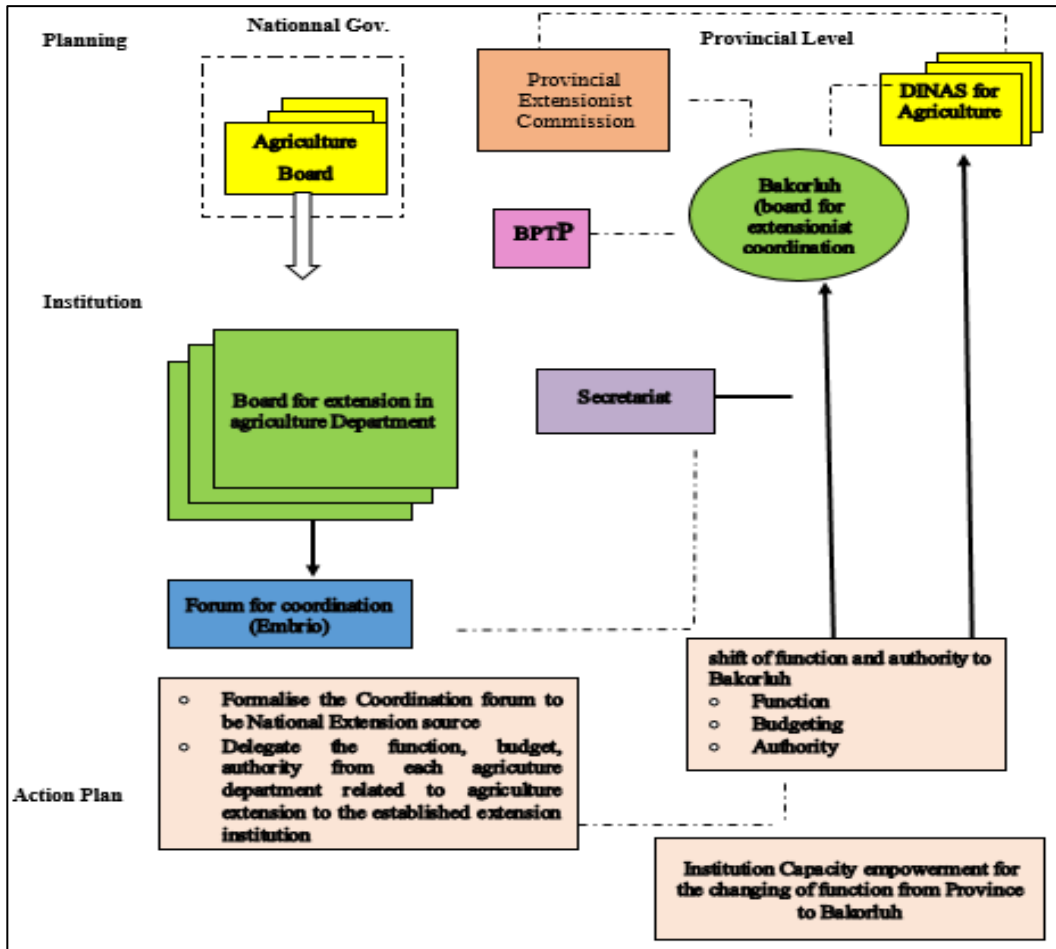
In local autonomy, institutionally, there is a need to clearly group the Bakorluh (or Bapeluh) and Dinas in agricultural subsectors. Hence, the scenario which is suggested in scenario 3 is clustering the responsibilities, function, and finance into one board either in national or local level.

Having said the disadvantages (the scenario 3), it is required to plan a revitalisation program. The steps are:

1. To establish and design a platform for capacity improvement of agricultural extensions from the national, province, municipality, and subdistrict level.
2. To revitalize the organisation which does not function well which is then renew and redesign it to better improve the capacity of the agricultural extension institutions.
3. To plan the actions so that the function proposed in improving the institution capacity for agricultural extension can be applied.
4. To arrange the transaction cost for setting up the agricultural extension institutions in revitalisazing the advocacy.
5. To plan the financial estimation required which is based on in-depth interview with the related parties in all levels (DPR- legislative, Bakorluh, Agriculture Dinas, Bapeluh).
6. Recommend strategic plans focus on management based on its urgency (short and long term plan)
7. Recommend the programs to related stakeholders to involve and support the activities to improve the agricultural extension institution capacity.

The improvement of the agricultural institution extension capacity is meant to a better function, authority, and budgeting for the extension activities in any level of parties offering the consultancy and the board for coordination of extension at national level as in Figure 4.

Figure 4: Model of Capacity Building for Agricultural Extension Institution (Scenario 3)



Source: Primary Data

Based on the discussion, scenario 1 and 2 have weaknesses. Scenario 3 is proposed by taking the good elements in scenario 1 and 2. This involves the control from the government over the activities or the whole program. The control has successfully made the process of capacity building of the farmers in a very good level. The government still plays important roles to keep the program work by formulating programs that can be applied by all regions. Then, making use of the local autonomy, some elements in the scenario 2 are used such as the activities or programs which are proposed refer to the local interest and as inputs for the local and provincial government to be put

in the framework of the policy. Therefore, scenario 3 offers better approach in the implementation by keeping the national and/or provincial governments take control over the standard policy for agricultural extension capacity building. Further, the local interest and needs become the focus of the activities. The bottom-up approach is used to ensure the conducted activities in accordance with the need of the farmers. These approaches are facilitated by the agricultural extensionists. They can work better because of the clustering of the responsibilities, function, and finance are better and it is made into one board either in national or local level.

Estimation of Transaction Cost

Estimation of transaction cost in this research is executed based on 3 scenarios. They are (1) cost estimation for centralized institution, (2) cost estimation for decentralized institution, and (3) transaction estimation cost to revitalize the agricultural extension activities to improve its institution capacity for improving planting performance.

The estimation cost for centralized and decentralized institution uses the information cost, decision-making cost, and operational cost. To estimate the cost based on researcher's scenarios for the sake of revitalizing the institutions which are appropriate with the model of extension, agricultural institution capacity empowerment can be elaborated into information cost, decision making process cost, operational and maintenance cost, establishment cost as well as sustainability cost.

The transaction estimation cost which is aimed to improve the capacity of agricultural extension institution based on scenario 3 is calculated based on the budget which is spent by the government to finance the activities. At the provincial level, government established Barkorluh (the coordination board for extension) based on Perda (region policy) of Central Java province number 10, 2008 of 8 June 2008. Meanwhile, at the municipality level, the condition of the extension institution is various. The data of Bakorluh Central Java, January 2009, there are 10 municipalities which have established Bapeluh based on Perda. They are Magelang, Karanganyar, Rembang, Sragen, Purworejo, banyumas, Cilacap, Purbalingga, Batang, and Temanggung.

To improve the capacity of agricultural extension institution at the improvement of institution capacity (scenario 3), budget is required to finance the establishment of National Extension Coordination Board at the national level. Besides, the provincial, municipality, and district government need an organizational structure and working system (SOTK- *Struktur Organisasi dan Tata Kerja*) and region policy and also the planning to activate the main functions and duties based on the changing of authority from agricultural board to the extension institution to the central or local government.

Transaction cost involves information cost, decision-making cost, and operational cost (Libecap, 1991; Abdullah et.al., 1998; Jahan et.al., 1998). This research modified the transaction cost with the model of improvement for institutional capacity. It describes the information cost, decision making cost, operational and maintenance cost, establishment and sustainability cost. The operational and maintenance cost are the cost required for improving the capacity of the extension institutions. The establishment cost is used for operationalization. It includes the establishment cost for the institutions, and for better work performance. The establishment cost includes the establishment of the coordination board and the change of the *tupoksi*-duty and responsibility.

Sustainability cost is a cost which is used for the continuation of the program. Meanwhile, the proportion cost recapitulation for transaction cost in improving the capacity as in table 2.

Table 2: Recapitulation of Transaction Cost for Institutional Capacity Improvement (%)

Transaction Cost	National	Province	Municipality	District	Percentage (%)
a) Information cost	4.87	6.08	4,59	11.86	6.94
b) Decision making process cost	14.02	1.25	17,71	29.64	15.09
c) Operational and maintenance cost	38.93	83.43	14,42	39.53	46.70
d) Establishment Cost	33.09	0.14	54,19	9.88	22.18
e) Sustainability	9.09	9.09	9,09	9.09	9.09
Total percentage	100	100	100	100	100

Source: Primary data, 2009

Based on Table 2, the recapitulation of the transaction cost is:

a. Central level

At the central level, the highest cost is for operationalization (38.93%) and establishment (33.09%). This is due to the establishment of the National Extension Board.

b. Provincial level

At the provincial level, the highest cost is the operational and maintenance (84.43%). It is due to the Board of Extension Coordination (Bakorluh) has been established. Hence, the operational cost to revitalize the capacity of the institutions is found to be high.

c. Municipality Level

At the municipality level, the highest cost is in the establishment (54.19%). This is due to the cost for establishment of new extension executive board- *Bapeluh*, which is currently only 10 available *Bapeluh* out of 35 municipalities/cities in Central Java province.

d. Subdistrict level

At the subdistrict level, the highest cost is in the decision making process (29.64%) and the operational cost and maintenance (39.53%). It is driven due to there is no formal legality for each subdistrict. And, the plan has just been started.

The extension transaction cost is the cost needed to plan, carry out, and develop the organization of the extension. In order to evaluate the potential of all organizational model of the extension transaction cost, there was a comparative study on centralized organization transaction cost (during the period of 1995 – 1998) and the decentralized organization transaction cost (period of 2006 - 2009). The extension transaction cost included the information fee, the cost for defining the solution of the problem, and the operating cost. The transaction cost was determined based on the time spent by the extension agents. The time spent by the extension agents to carry out their duties and responsibilities in providing advocacy. The operating organization cost in the centralized

organizational model was generally lower than the decentralized organizational model. On the other hand, in the monitoring and evaluation activities, the extension agents had to spend more time. The decentralized organization required the instructors' polyvalent expertise. The required polyvalent expertise, however, forced the instructor to spend more time to execute their duties and responsibilities.

The ideal number of extensionists recommended by the (Department of The Agriculture, 2008) is one village one extension. This means the number of the extension agents in Central Java should be balanced with the number of villages in Central Java. Therefore, the cost of BOP was IDR. 250,000/ person/ month. There are 8573 villages available in Central Java. Hence, the transaction cost for the revitalization of the agricultural extension in Central Java, based on the researcher's scenario, for the next year's budget would be Rp. 16.6 billion. The total cost was stipulated in the Regulation Number 10, the year of 2006. The regulation further implied one village should have at least one instructor and, in regency, there should be one Agricultural Extension office that was organized and managed well. The information cost in each regency was then added with the cost to afford the database in the information technology, which was necessary and important. This data will be needed by the farmers in each district through maintaining the decentralized model by adding the cost of information, applying on the system behavior and improving cooperation between stakeholders.

4. CONCLUSION

The results of the research provided new ideas in the application of using information technology for agriculture extension, especially through mobile phone utilization in which most farmers already have. Assuming that by adding more transaction cost, the extension could be organized effectively and efficiently because the information about the agribusiness development could be updated by the farmers. The research found that the transaction cost for field instructors after reformation era (decentralized model) especially the operating cost should receive more attention. It was particularly to encourage the instructors to carry out their duties in providing information and handling extension program. Moreover, it was also intended to mobilize the instructors in executing their duties and responsibilities. The decentralized organizational model required the instructors' polyvalent expertise.

From this research, we can learn the appropriate method for improving farmers' productivity through capacity building of the extensionist and farmers institution. The program offered to farmers should be adjusted to current condition and need. In such diverse society, the activities should consider the various characteristics of people and the locus. Further, to ease the implementation of the program, local government and extensionists can make use of existing information technology to better benefit the farmers.

REFERENCES

- Abdullah, N. M. R., Kuperan, K., & Pomeroy, R. S. (1998). Transaction cost and fisheries co-management. *Marine Resource Economics*, 13(2), 103-114.

- Board of agriculture for Central Java province. (2017). *the total national rice production*. Semarang.
- Department of The Agriculture. (2008). *The Ideal Number of Extensionists*. Semarang: Department of The Agriculture Central Java.
- Dharmawan, H. A. (2006, November 19-25). Pendekatan-Pendekatan Pembangunan Pedesaan dan Pertanian: Klasik dan Kontemporer. *Apresiasi Perencanaan Pembangunan Pertanian Daerah bagi Tenaga Pemandu Teknologi Mendukung Prima Tani*.
- FAO. (2007). Trade Reform and Food Security . *Conceptualizing the linkages*.
- Harzulli. (2009). The disadvantage of Existing Decentralized Agricultural Extension Model. (Sucihatiningsih, Interviewer)
- Jahan, K. M., Viswanathan, K. K., Abdullah, N. M. R., & Omar, I. H. (1998). *Transaction cost in fisheries co-management at oxbow lake (baor) in Bangladesh*. University Putra Malaysia.
- Libecap, G. (1991). *Contracting for property rights* . Cambridge MA: Cambridge University Press.
- Margono, S. (2001). *Paradigma Penyuluhan Pertanian dalam Era Otonomi Daerah*. Bogor: IPB.
- Marpomo. (2009). The disadvantage of Existing Decentralized Agricultural Extension Model. (Sucihatiningsih, Interviewer)
- Mears, & Moeljono. (1981). *Food Policy*. In : Booth, A. and McCawley, P. (eds) *The Indonesian Economy During The Soeharto Era*. Kuala Lumpur: Oxford University Press.
- Nuswanto. (2009). The disadvantage of Existing Decentralized Agricultural Extension Model. (Sucihatingsih, Interviewer)
- Prajanti, S. D. (2012). *Model Revitalisasi Kinerja Penyuluh Untuk Meningkatkan Daya Saing dan Ketahanan Pangan Provinsi Jawa Tengah dengan Pendekatan Transaction Cost. Laporan Kemajuan Penelitian Strategis Nasional*. Semarang: DP2M.
- Purwaningsih, Y. (2008). Ketahanan pangan: situasi permasalahan, kebijakan, dan pemberdayaan masyarakat. *Jurnal Ekonomi Pembangunan*, 57-68.
- Sail, R. M. (2008). Kompetensi Pengembangan Sumber Daya Manusia dan Transfer Teknologi dan Kaitannya dengan Prestasi Kerja Agen Penyuluhan. *Seminar Pengembangan*. Selangor: Klang.
- Subandriyo, T. (2010). *Pasang Surut Kesejahteraan Petani*. Semarang: Suara Merdeka.
- Sugiyanto. (2009). The disadvantage of Existing Decentralized Agricultural Extension Model. (Sucihatiningsih, Interviewer)
- Sumodiningrat, G. (2000). *Pembangunan ekonomi melalui pengembangan pertanian*. Jakarta: Bina Rena Pariwara.
- Susilowati, I. E. (2004). *Pengembangan model pemberdayaan usaha mikro kecil, menengah dan koperasi dalam mendukung ketahanan pangan di kabupaten dan kota pekalongan*. . Jakarta. Jakarta: RUKK Kantor Meneg Ristek dan LIP].
- Syahyuti. (2003). *Pembangunan pertanian indonesia dalam pengaruh kapitalisme dunia: analisis ekonomi politik perberasan*. Jakarta: Pusat penelitian dan pembangunan sosial ekonomi pertanian.