

Role of Extension Worker on Increasing Households Food Diversification: The Case of Bogor District

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ABSTRACT— this study aims to (1) analyze the effect of the role extension worker towards public perception in terms of food diversification; (2) analyze the role of extension influence on the level of food diversification of household; (3) formulate extension strategies to improve household food diversification. This research uses the census method. The population is every women who are members of a group of women farmers residing in Dramaga District, Cibungbulang District and Ciomas District, Bogor regency. The respondents are 105 people. The data was collected in February 2013 to June 2013. Analysis of the data in this study include (1) a descriptive analysis; frequency distribution, Mann Whitney differential test, and (2) the inferential analysis: stepwise multiple regression. Results showed (1) the role of extension which has real impact towards the public perception of the role of diversification is a role as communicator and motivator, (2) the role of extension variables did not affect the level of diversification of household, (3) need to change food diversification extension strategy.

Keywords— role of extension worker, food diversification, food security, perception

1. INTRODUCTION

Global Food Security Index 2013 place Indonesia as the country 66th of 107 countries in the world ranking of food security, It shows Indonesian food security inferiority. Food insecurity becoming a majorly sensitive issue in the dynamics of social and political life of Indonesia, therefore it is essential for Indonesia to achieve the food security either its national, regional, household even individual, on the basis of the provision of domestic food self-sufficiency (Ariani 2010).

The Government of Indonesia in order to improve the knowledge, skills and attitudes change community food diversification program had launched accelerated diversification of food consumption (P2KP). The program aims to encourage increased food consumption patterns are varied, nutritious, balanced, and safe which is reflected by a minimum score of PPH national average was 88.1 in 2011 and 95 in 2015.

Bogor district is one of the district program managing P2KP. The program involves extension Executive Agency of Agriculture, Fisheries and Forestry (BP4K) as program implementers. BP4K do extension in an effort of accelerating and diversifying the food consumption. 15 outreach activities extension at women farmers (KWT).

In order to direct the efforts to increase people' s behavior, the agricultural extension as government officials are expected to have basic skills in the execution of their duties. These capabilities not only oriented to increase agricultural production, but also to the degree of diversification of household food consumption. Given this fact raises the question of how to influence the public perception role extension in terms of diversification? How the role of extension influencing the level of diversification of household? And how to form appropriate extension strategies to improve household food diversification?

The purpose of this study was (1) to analyze the influence of the role of extension towards public perception on the role of extension in terms of diversification, (2) analyze the role of extension influence on the level of diversification of household, (3) formulating extension strategies to improve household food diversification. This research is expected to provide input for consideration to the government institution that has the mandate to formulate policy diversification and government agencies that have the mandate to implement the extension.

2. ROLE OF EXTENSION

Agricultural extension is the task of those who gave encouragement to the farmers to be willing to change the old way of thinking, ways of working and that the old way of life to the new ways that are better suited the times and the development of more advanced agricultural technologies (Kartasapoetra, 1994). Padmowihardjo (1994) explained that agricultural extension is a wizard that guides farmers, businessmen and traders to discover science and technology they need to solve their problems. In the guiding process, farmers, businessmen and agriculture traders is not a disciple but the learning partners which include in the learning process. The result expected is that farmer, businessman and agricultural traders will qualify as human learners, human researchers, human of agribusiness organizers, human leaders, and the man guiding other farmers, entrepreneurs or traders. Farmers stimulated to learn in order to be empowered to solve their own problems.

According to Rogers (2003), the agent is a person who on behalf of the government or education institutions obliged to influence the decision-making process undertaken by the target extension to adopt the innovation. Referring to these definitions, Mardikanto (2009) said that the role of the counselor is not just limited to delivering innovation and influence the decision-making process by the target extension, but an instructor that bridging the government and education institutions represented by the target communities, both in terms of delivering innovations and policies that must be accepted and implemented by the target communities, and to provide feedback or responses from the public to the government or the extension in question.

According to Mosher (1987), any extension must be able to perform the four roles. As: (a) teacher; to change the target community's behavior, (b) analyzer; to observe the situation and the problems and needs of the target communities, followed by an analysis of the alternatives solving the problem; (c) advisory; by giving consideration to the target community in selecting the appropriate alternative, and (d) organizer; able to establish good relations with all levels of society, able to raise an awareness and mobilize community participation, able to initiate the creation of the changes and mobilize resources, directing and foster activities and develop effective institutional.

According to Kurt Lewin (Mardikanto, 2009), there are three kinds of agents whose role consists on the following activities. Those are: (1) disbursement to the target communities, (2) mobilize the community to make changes, and (3) strengthening relationships with target communities. To be more professional, it should act as an extension; an information carrier, a good listener, motivator, facilitator of the process, agency liaison, forming ability, teacher skills, work helper, program managers, worker groups, boundary guard, promoters, local leaders, consultants, protector and body shapers (Lionberger and Gwin, 1982).

According to Lippitt et al. (1958), the role of renewal agent that will contribute in the process of change is to: (a) bridge and stimulate new relationships within the client system; (b) recount his experience in delivering new techniques; (c) rise the power from within; (d) creates a particular environment; and (e) provide support for the changes to take place.

3. FOOD DIVERSIFICATION

The concept of diversification is not a new thing in terms of agricultural development policy in Indonesia, therefore the concept has been formulated numerous times and interpreted by experts in accordance with the objective. Kasryno, et al (1993) considering diversification as an effort that is closely related to human resource development, agricultural development in the field of food and nutrition community. Diversification is covering aspects of production, consumption, marketing, and distribution. From the production aspect, diversification means expanding spectrum of food commodities, both in terms of the expansion of resource utilization, exertion and development of commodity production of food commodities. Therefore from the aspects of production, diversification includes the notion of horizontal and vertical diversification. In terms of consumption, food diversification includes aspects of behavior that constituted both by economic considerations such as income and commodity prices, as well as non-economic such as habits, tastes and knowledge. The encounter between the production and consumption sectors cannot be detach from the role of marketing and the distribution of food commodities. Similarly Suhardjo (1998) mentions that diversification basically covers three interrelated scope definition, namely (1) diversification of food consumption, (2) diversification of food availability, and (3) diversification of food production.

Soetrisno (1998) defines a narrower diversification (in the context of food consumption) in an effort to diversify the types of food consumed, include sources of food energy and nutrients, so as to meet the need for food and nutritional adequacy in accordance with the terms of both quantity and quality. More forceful, Pakpahan and Suhartini (1989) states in the context of Indonesia diversification / diversity of food consumption is often interpreted as a reduction in the consumption of rice which is compensated by addition of non-rice food consumption. According to Suhardjo Martianto (1992) the more diverse the food consumption of food quality consumed, the more favorable it become. Therefore

diversification dimension is not limited to the diversification of staple food consumption only, but also complementary foods.

In this research the definition of diversification is used in an effort to diversify the type of food consumed, including sources of food energy and nutrients, so as to meet the need for food and nutritional adequacy in accordance with the terms of both quantity and quality, therefore the diversification dimensions is not limited to the diversification of staple food consumption only, but also complementary foods.

4. METHODOLOGY

4.1 The research approach

The study was conducted on Februari until June using census method. The unit of analysis in this study is a member of a group of women farmers (KWT) as research respondents. The study population was a member of a group of women farmers (KWT) is located in the sub district Dramaga, Cibungbulang as P2KP program participants and members of women farmers residing in District Ciomas as respondents were not derived from program participants P2KP. The number of respondents were 105 people, 50 people with the details of the group participants and 55 people from the group of non-participants P2KP program.

Facts on the field is that the group of women farmers categorized as P2KP program participants are, women farmers which being targeted at the extension program to accelerate diversification through diversification of food consumption (P2KP), while a group of women farmers categorized as non-P2KP program participants are, a group of women farmers who have been in the community, get extension and assessed as achiever by extension but not the target of acceleration through program extension diversification of food consumption (P2KP). Group selection is done intentionally or purposive sampling.

4.2 Source of data

Primary data were collected directly from respondents through interviews, using a questionnaire that has met the requirements of validity, dependability (reliability), and accountable (Kerlinger, 2000; Nawawi, and Hadari, 2006). Data from other sources (key informants) were obtained through in-depth interviews recognized as supportive data or verification data.

4.3 Data analysis

The data were analyzed qualitatively and quantitatively. Quantitative analysis with descriptive and inferential statistics. Descriptive statistics consisted of frequency distributions, Mann Whitney differential test, while the inferential statistics used to determine the effect among variables using stepwise multiple regression analysis with SPSS 17.0 software. In this study the data were transformed into ordinal scale interval data (which has the same characteristics of numerical distance) using the Method of Successive Interval (MSI) (Muhidin and Abdurahman, 2007). In data processing, the program use to transform the data from ordinal to interval is Microsoft Office Excel 2007.

5. RESULTS AND DISCUSSION

5.1 The level of household food community diversification for program participants and non participants

Level of household diversification in this study measured by PPH score (food pattern expectations). Food pattern expectations is the expectation food composition of the food groups that are based on the contribution of both absolute and relative energies that meet nutritional needs in terms of quantity, quality, and diversity by considering the social, economic, cultural, religious and taste. PPH score is a value that indicates the varied quality of food consumption, nutritionally balanced and safe, which is calculated based on the method of PPH. The average score in the PPH group of program participants and non-participants P2KP program can be seen in Table 1.

Table 1 The average score on the PPH program implementers group and not implementing the program P2KP

No	Food group	Score ideal PPH	Score PPH		T test
			Respondents program participants	Respondents were not program participants	
1	Rice grain	25	40.02	40.93	0.087
2	Root tubers	2.5	0.35	0.02	0.000**
3	Animal food	24	14.54	14.20	0.911
4	Nuts	10	7.65	6.53	0.524
5	Vegetables and fruit	30	6.26	3.41	0.033*
6	Oily seeds	1	0.19	0.23	0.744
7	Fats and oils	5	3.20	3.10	0.885
8	Sugar	2.5	0.03	0.02	0.851
9	Others	0.00	0.00	0.00	
Total		100	70.90	68.47	

Table 1 shows the average score of PPH in the group implementing a new program group reached 70.90 while 69.87 for group which not implementing the program when the PPH ideal score is 100. PPH per food group score either in program participants groups and non-program participant groups are still far from the ideal score. For grains, its PPH score very high, far exceeding the ideal PPH score, which is supposed to be a 25. This shows the high consumption of rice in program participants groups and non-program participant groups, while for the other food group score lower than ideal PPH score. The results are in line with the BPS data which states that the population of Indonesia is the world's largest rice consumer. Indonesian residents rice consumption rate is 154 kg per capita per year (BPS, 2013), this figure is far above the rice consumption in China which only at 90 kg per capita per year, India 74 kg per capita per year, Thailand 100 kg per capita per year, the Philippines 100 kg per capita, and Malaysia amounted to 65 kg per capita per year (BPS, 2013).

PPH scores on program participants groups that have reached 70.90 is only slightly better than the non-program participants groups. Participation factor can only slightly increase PPH scores compared to those who did not get the direct intervention of P2KP Program. PPH scores in program participants groups and non-program participant groups both located on the triangular criteria of bronze or lowest criteria. Proved the rice consumption is still very difficult to press. P2KP intervention, only increase the consumption of vegetables, fruits, nuts and a little bit of tuber. Fundamental problems found in the field is, the lack of support from other family members, especially the husbands to reduce the rice consumption. The results shows that 93.33% of the respondents did not get the support from the husband to do household diversification, especially in terms of reducing the consumption of rice. Woman or wife, was assigned to cook at home, but the food or dish that will they consume, are also greatly influenced by the desire for other family members, while the diversification of household extension through P2KP program is only addressed to women or wife in a household.

The results obtained differed with Arumsari and Rini (2008), which states that the position of women in the household was essential in efforts to diversify the food and food security. Woman or wife is involved in the consuming process, but the preference of food that will be consumed or cooked within a household, determined and influenced by the desire of other family members. This shows the importance of diversification extension is also done for the other family members.

To determine differences in the level of diversification of household between the program participants and non-participants T test is perform. T test showed that there was no significant difference in the level of diversification of household between the between the program participants and non-participants. This result is evidenced by the p-value $0.674 > 5\%$. The insignificantly different household level diversification between the program participants with non-participants caused by several factors, (1) extension diversification strategy undertaken in implementing the group program has not been effective and less on target, (2) the majority of respondents either on group between the program participants and non-participants, located in the lower income categories.

5.1 Effect of the Role of the Extension Worker towards the Public Perception in Terms of Food Diversification

The role of extension which has a real impact on peoples perception in terms of diversification is the role as role as a communicator and motivator, while the role of the extension as consultant and facilitator had no significant effect. Regression equation is: $Y_1 = 3.19 + 0.956_{X_{2,1}} + 0.696_{X_{2,3}}$.

The regression equation illustrates that the better the role of extension as communicators, will lead to the better public perception towards diversification, and the better role of the instructor as motivator play, the better public perception towards diversification. Influence of the role of extension towards public perceptions in terms of food diversification, shown in Table 2.

Table 2 Effect of the Role of the Extension Worker towards the Public Perception in Terms of Food Diversification

Sub-variable	Regression coefficients	T	Sig.
<i>Constant</i>	3.187	6.173	0.000
Communicator	0.956	4.320	0.000**
Consultants	0.130	1.643	0.104
Motivator	0.696	3.934	0.000**
Facilitator	0.062	0.790	0.432

Note: ** significant at $\alpha = 0.01$

The role of extension as a communicator and a real positive effect on public perception in terms of food diversification, this is due to good communication capabilities extension education in explaining the material so that the respondents are interested to listen and understand the material presented extension.

The role of extension as a motivator has a real positive effect towards public perception in terms of diversification, it is due to the encouragement and enthusiasm and demonstration extension given to the respondent that resulted in the respondents open mind to understand food diversification and high motivation to continue to attend meetings with extension worker.

The results showed the role of extension as consultant and facilitator did not significantly affect food diversification, this is due to the weakness of the field extension capabilities in both areas this role. Extension also recognizes rarely provide a special time to give respondents the opportunity to consult in depth on food diversification.

Training provided to extension still have not been able to strengthen the ability of the aspects of the role as a consultant and facilitator, this is rarely done because in addition to the training, as well as the lack of adequate special training aimed at strengthening capacity to undertake extension skills food diversification. Another factor is that to do extension experience is still lacking.

5.3 Effect of the Role of the Extension Worker Against to the level household food diversification

Test results influence the role of extension to the level of diversification of household, shown in Table 3

Table 3 Influence the role of extension to the level of diversification of household

Sub-variable	Regression coefficients	T	Sig.
<i>Constant</i>	75.653	6.229	0.000
Communicator	2.403	1.099	0.275
Consultants	-1.844	-1.120	0.307
Motivator	1.173	0.687	0.494
Facilitator	6.279	1.572	0.119

The results showed that, only the internal characteristics that affect the level of household food diversification, while the role of the extension does not affect the level of household food diversification significantly. This is due to the poor performance showed by the extension. Extension rarely attends group meetings which should be conducted at least twice a month. Training on food diversification towards the extension is also poorly done, so that the competence of the extension in terms of diversification is also poor. However, even has not been optimally done, the respondents have benefited from diversification counseling. Respondents acknowledged that the extension is very useful towards the knowledge of food and nutrition diversification. Respondents comprehend the importance of eating vegetables and other nutritious food; they were also trained to utilize their yards either individually or in groups. Respondents who participated in the P2KP program having a better comprehension compared to non-program participant respondents, that high rice consumption is unhealthy and neglecting the efforts of national food security. It can be concluded that, even though the maximum extension diversification has not been done, however, is able to change the perception of respondents in a positive direction toward diversification, and they getting a better knowledge and skills in terms of nutrition and food diversity.

The essential factor that also causes low levels of household diversification is the lack of support from other family members, especially husbands to diversification program. The results showed 93.33 % of the respondents did not have the support of the husband to perform the food diversification. Woman or wife was assigned to cook in the household, but the food they consume will also greatly influenced by the desire for other family members, while the diversification extension through P2KP program only applied to woman or wife in a household, this led to ineffective the role of extension in the context of improving household food diversification.

5.4 Extension strategies to improve household food diversification

Numerous study results indicate that national food sufficiency does not guarantee the accomplishment of regional households and individuals food security. The data shows that the proportion of households malnutrition in each province is still prominent. In this regard, food diversification becomes one of the main pillars in transforming food security towards food sovereignty and independence. In terms of physiological, in order to live healthily, actively and productively human beings require more than 40 types of nutrients found in a variety of foods, since no single type of food having a full nutrients other than breast milk (Deptan, 2013).

Food diversification rate is influenced by a complex factor, so synergy handling between one and other factor is necessary. The extension effect that carried out during the program is only extent to the perception of food diversification after the program, but has not managed to mobilize the community in raising the level of diversification of food. That is, because the extension worker does not fully understand the important aspect of the diversification, ultimately in the aspect of nutrition to the measurement of the households food diversification level, so it cannot independently evaluate the household or group it is guiding. Instructor that come from different discipline, does not equipped with adequate knowledge and skills in terms of food, nutrition and food diversification itself. From interviews with extension workers, finding shows that the extension is only equipped with knowledge about P2KP program gotten during 1 day of training and not every extension worker attend the training.

Communication, formal education and motivation are factors that giving positive and significant effect on the perception of the community in regard of food diversification, while income is also giving real and positive impact on the level of household food diversification. To achieve the ideal level of diversification, the government should not only rely on the counseling alone, but also the effort of the revenue-raising, but the extension as an effort to change behavior cannot be ignored, as proved throughout the poorly performed extension alone can positively influence public perception of diversification itself.

Based on the study result, we could say that in order to achieve the ideal level of diversification for the sake of maintaining food security, education is one of the important instruments to be strengthened and maximized so that the food security by the means of food diversification efforts could be achieved, so that the extension food diversification strategies need to be changed in five ways as the following. These are : (1) extension through the P2KP program should be well prepared. Extension worker required to retake the maximal training and all extension are required to attend the training; (2) diversification extension should also be addressed to the husband, not only to the mother or woman in the household, as shown in this study, support the husband is essential for the implementation of diversification; (3) key capabilities need to be developed and strengthened by the diversification extension workers is the ability to mobilize people through the role as a communicator and motivator, build networks , and a real model for the community , and act as a facilitator and provider of intellectual input; (4) P2KP program should become the needs for that groups or communities so that the existence and development will be sustainable and not be limited to project-based; (5) extension diversification should be focused on the extension of staple food diversification, given the fact on the very high level rice consumption. Diversification of staple food, rice consumption replaced with other staple food containing carbohydrates, such as cassava, sweet potato and taro in Bogor. It can be done despite the low incomes, community couldve plant individually, the market prices for those commodities are relatively affordable to the community with low rate economy.

6. CONCLUSION

The role of extension which giving the real impact towards peoples perception in terms of diversification is the role as a communicator and motivator, meanwhile the role as a consultant and facilitator had no significant effect. Regression equation is: $Y_1 = 3.19 + 0.956x_{2.1} + 0.696x_{2.3}$. The regression equation illustrates that the better the role of educators as communicators, will lead to the better public perception towards diversification, and the better the role of the instructor as motivator lead to the better public perception towards diversification.

The role of extension variables do not affect the level of household diversification, This is due to the poor performance showed by the extension. Extension rarely attends group meetings which should be conducted at least twice a month. Training on food diversification towards the extension is also poorly done, so that the competence of the

extension in terms of diversification is also poor. However, even has not been optimally done, the respondents have benefited from diversification counseling. Respondents acknowledged that the extension is very useful towards the knowledge of food and nutrition diversification. Respondents comprehend the importance of eating vegetables and other nutritious food; they were also trained to utilize their yards either individually or in groups. Respondents who participated in the P2KP program having a better comprehension compared to non-program participant respondents, that high rice consumption is unhealthy and neglecting the efforts of national food security. It can be concluded that, even though the maximum extension diversification has not been done, however, is able to change the perception of respondents in a positive direction toward diversification, and they getting a better knowledge and skills in terms of nutrition and food diversity.

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