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Home Garden Utilization for Family's Food Diversification

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Abstract

A home garden plays a crucial role in providing various foodstuffs to meet family's need, and if it is well developed it can increase family's income. The objective of this study was to analyze factors related to food diversification generated from a home garden. The study was conducted from March to December 2015 in Bitung City and Minahasa Regency, North Sulawesi Province. The sample size was 267 people. The data were analyzed using Rank Spearman correlation test. The results showed that the continuity of food supply in a home garden was significantly correlated with education level, non-formal education, time devotion, availability and relevance of information, availability of production facilities, perception of the functions and benefits of a home garden, perception of food diversification, technical competence and managerial competence. The contribution of a home garden to the provision of family's food was related to the availability and relevance of information, availability of production facilities, socio-culture, family support, group roles, extension, perception of the functions and benefits of a home garden, perception of the importance of healthy food, technical, managerial and social competence. The contribution of a home garden to family's income was significantly related to the availability and relevance of information, availability of production facilities, socio-culture and family's support, group roles, extension, perception of the functions and benefits of a home garden, perception of the importance of healthy food, and competence.

Keywords: food diversification; home garden.

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1. Introduction

Efforts to increase household's food security can not be separated from the food diversification aspects, where the development of food products is not solely dependent on one kind of foodstuff. Krisnamurthi [1] states that food diversification has two main dimensions; first, diversification of food consumption menu pattern since there are many kinds of food ingredients available to meet the nutritional needs of good-quality and balanced diet (carbohydrates, proteins, vitamins); second, diversification of food sources for each type of nutrient needed (protein from animals, fish, plants). Both dimensions are very closely related and mutually influencing. Diversification plays a very important role in realizing food security at household level because the quality of food consumption viewed from the indicator scores of the national food expectation pattern (PPH) is still low. [2] showed that the average national calorie consumption in the past eight years tended to decline, from 2014.91 calories (2007) to 1859.30 calories (2014). Similarly, in the protein consumption, there was a decline from 57.66 gr (2007) to 53.91 gr (2014). Also, the average calorie consumption in North Sulawesi in 2007 was 2099.11 and it went down to 1918.04 in 2014. For the protein consumption, it decreased from 56.98 gr in 2007 to 55.59 in 2014. Nutritious food does not have to be expensive, but it should be quite diverse and balanced. In addition, the food should be safe in a sufficient quantity and composition. In terms of nutrients, several kinds of food consumed daily complete each other. That is why it is very important to include different kinds of food in one's diet. To realize a food diversification program, optimizing the use of a home garden as a source of local food becomes very important to be implemented at household level. The role of a home garden as a supplier of the family food has in recent years been raised by the Indonesian government in response to the increasing threat of food crisis due to global climate change, unstoppable population growth and continuous land conversion. People's awareness of the importance of nutritional balance and the need to provide healthy food for their family has also encouraged the efforts to re-function home gardens as a source of food. Utilization of home gardens as a food provider for the family is basically one form of the community's increased participation in realizing food self-sufficiency. The government's commitment to engaging households in realizing food self-sufficiency through local food diversification and conservation of food crops for the future must be actualized by reviving the culture of growing plants in the home garden both in urban and rural areas. [3] says that one of the efforts to increase food security and family nutrition is through the utilization of available resources that are provided by the environment. This study aimed to analyze the factors related to food diversification involving home garden utilization.

2. Research Method

The study was conducted from March 2015 to December 2015 in Bitung City and Minahasa Regency, especially in several villages. The research sites were the locations where the Program of Acceleration of Food Consumption Diversification and Model of Sustainable Food House Area were taking place. The research population comprised 803 housewives who utilized their home gardens to follow the Program of Acceleration of Food Consumption Diversification and Model of Sustainable Food House Area. The number of samples was determined based on the Slovin formula as many as 267 people. The data collected consisted of primary data and secondary data. The primary data were obtained from direct observations, interviews, and in-depth interviews. The secondary data were obtained from the existing research results and the literature review

relevant to food diversification. The instrument used was in the form of questionnaires as a guide in conducting interviews. The data processing and analysis to see the relationship level among the existing variables used a Rank Spearman correlation test. The variables measured were Characteristics of housewives (X1), Accessibility to information (X2), Environment (X3), Group roles (X4), Extension (X5), Perception of housewives (X6), Competence of housewives (X7), and Food Diversification (Y1).

3. Results and Discussion

A housewife's education level was significantly correlated ($\alpha = 0.05$) with the continuity of food provision in her home garden. The higher her formal education level, the better her competence in managing the home garden to make it more productive and sustainable. Reference [4] states that, household's food security is influenced by the level of education. In general, the education level of housewives in Minahasa Regency and Bitung City was in the category of high (SMA). They found it easier to understand the contents of the information on the home garden utilization program and could better absorb the technology of home gardening, where they were able to choose profitable food crops. Reference [1] stated that the main factor that influenced housewife's understanding level on nutrient and diversification level of rural household's food consumption was housewife's education.

Table 1: Correlation between housewife's characteristics and food diversification

Characteristics of housewives	Food Diversification (n = 267)					
	Continuity of Foodstuff		Contribution to Food		Contribution to Income	
	r_s	P	r_s	P	r_s	P
Formal education	0.134*	0.029	0.071	0.245	0.038	0.535
Non formal education	0.238**	0.000	0.058	0.349	0.042	0.495
Number of family members	0.094	0.124	0.002	0.972	-0.002	0.972
Family income	0.077	0.213	-0.033	0.592	-0.116	0.059
Time devotion	0.145*	0.018	0.052	0.394	0.045	0.464
Motivation	0.049	0.427	0.073	0.237	0.090	0.141

Note: **. Significant correlation on α=0.01 *. Significant correlation on α= 0.05

Non-formal education was significantly correlated ($\alpha = 0.01$) with food continuity in the home garden. This showed that the more often housewives attended counseling and training on home garden utilization and food processing, the better their ability to grow food crops in their home garden in a sustainable manner. Activities of utilizing a home garden had been done by housewives prior to the programs of P2KP and MKRPL. However, the types of food crops grown at that time were still limited, and they did not do it seriously. Through extension activities, housewives' knowledge and skills about the cultivation of crops and livestock in the home garden would increase, including how to select types of commodities that have economic values. Time devotion to the home garden activity was significantly correlated ($\alpha = 0.05$) with the continuity of home garden productivity.

Taking good care of a home garden requires sufficient time allocation. Therefore, to be successful, housewives should spare enough time for their home gardening activities such as preparation of planting media, determination of plant type, determination of plant layout, plant care, post harvest and yield processing. The more time the housewives devote to their home garden, the more productive their home gardens, and the more food they produce.

Table 2 shows that the availability of information was significantly correlated (α= 0.05) with the continuity of food productivity in the home garden. It was very significantly correlated (α = 0.01) with the contribution to foodstuff and income creation. It can be said that the more information on home garden utilization and food processing obtained by housewives, the better their ability in keeping the continuity of food production in their home gardens. The availability of various information on agricultural technology will accelerate the progress of agricultural enterprises [5]. The application of innovation was determined by the accessibility to the innovation information, the availability and credibility of information sources, and information-accessing facilities [6]. Information on home garden and food processing in the two study sites was categorized as available. The availability of the information on technology made it easier for housewives to develop their home garden business. The number and types of commodities available for the home garden will affect the contribution level of the home garden in meeting the family's food need, contributing to the family's additional income as well, since the excess of the food produced can be sold.

Table 2: Correlation between accessibility to information and food diversification

Accessibility to information	Food diversification (n = 267)					
	Continuity of Foodstuff		Contribution to Food		Contribution to Income	
	r_s	P	r_s	P	r_s	P
Information availibility	0.142*	0.021	0.216**	0.000	0.202**	0.001
Suitability of the information received	0.231**	0.000	0.290**	0.000	0.182**	0.003
Credibility of a person / informant	0.039	0.524	0.041	0.508	-0.019	0.753

Note: **. Significant correlation on α=0.01 *. Significant correlation on α= 0.05

Technological innovation will be applied by the users only if the information is in accordance with their need. To know the relevance level of information required by housewives, there were a number of parameters used: how often the information obtained is applied; what benefits obtained from the information received, how relevant the application of information technology obtained in accordance with the availability of production facilities, how relevant the information obtained in line with the objectives to be achieved. Table 2 shows that the information suitability was very significantly correlated (α = 0.01) with the continuity of foodstuffs in the home garden, and significantly correlated with the contribution of the home garden to foodstuffs and income. The more appropriate the information obtained, the more able the housewives to choose the appropriate types of home garden commodities that have benefits, especially for the fulfillment of family food and nutrition, and that have economic value to be developed. The greater the number and types of business commodities in the

home garden, especially food commodities, the greater the contribution to the sufficiency of the family's food. The quantities and types of business commodities in the home garden was significantly correlated with its contribution to the family income. The surplus of the home garden production can be sold to get additional income. The correlation test results indicated that the more appropriate the information received by housewives about the utilization of a home garden and the food processing, the better ability the housewives have to ensure the continuity of food crop in the home garden production, increasing its contribution to family food and income. Production facilities in the utilization of a home garden include seeds, fertilizers, pesticides, planting media, technology, capital, and labor. Table 3 shows that the availability of production facilities is very significantly (α= 0.01) correlated with the continuity of food production in a home garden. The use of production inputs in accordance with the existing technology can be optimized to achieve the desired production objective, namely maximum profit levels. The production facilities that are easily obtained can help achieve the purpose of the land use for home gardens. The socio-cultural factor was significantly correlated with the contribution of a home garden toward the food production and income creation. The descriptive results showed that the socio-cultural conditions prevailing in both research sites supported the home gardening activities by housewives and members of their groups. Selection of business commodities for a home garden was carried out by considering the fulfillment of food and nutrition needs of the family and the possibility of commercial development. Types of crops and livestock in a home garden should be business commodities that have economic values, so that the production surplus can be sold. The types of commodities grown or raised by housewives in their home gardens were gedy leaves, basil, lemongrass, chili, eggplant, tomato, ginger, celery, spring onion, pumpkin, squash, cassava leaves, pakcoi, cauliflower, cassava, calamondin, banana, soursop, poultry and pigs. The correlation value obtained indicated that the more suitable the existing socio-cultural condition, the higher the contribution of a home garden to the food production and income creation.

Table 3: Correlation between environment and food diversification

Environment	Food Diversification (n = 267)					
	Continuity of Foodstuff		Contribution to Food		Contribution to Income	
	r_s	P	r_s	P	r_s	P
Size of home garden	0.028	0.646	-0.063	0.308	-0.030	0.630
Availability of production facilities	0.242**	0.000	0.265**	0.000	0.171**	0.005
Socio-culture	0.103	0.092	0.267**	0.000	0.220**	0.000
Family support	0.105	0.088	0.198**	0.001	0.181**	0.003

Note: **. Significant correlation on α=0.01 *. Significant correlation on α= 0.05

Family support for the success of a home garden was significantly correlated (α = 0.01) with the home garden contribution to family's foodstuffs and income. This indicates that the higher the family support enjoyed by housewives in conducting home garden utilization activities, the higher the contribution of the home garden to food production and income creation. Women have a dominant role in the management of a home garden, both

in terms of arrangement of a home garden, selection of commodities, home garden management, and decision-making related to the home garden management [7]. Reference [8] states, that women are the key to the development of home gardens. According to [9], the main challenge for household's food security comes from the dual role of women in providing food for the family. Women serve as a motor of change and the center of food production [10]. As a motor of change to a better direction, women need support from their family. Family support in the diversification of food is given through direct involvement in the activities of the utilization of the home garden. Basically, the activities of the home garden utilization do not require a lot of manpower. The home garden business may involve labor from the outside in such activities as land clearing or weeding. The source of labor for the utilization of the home garden can be fulfilled if all family members are involved in it. Each of the family members gets the task to conduct the activities of the home garden utilization. The group formation in the two research sites was not due to the government program, including Food Consumption Acceleration Program and the model of Sustainable Food House Area. The existing women farmer groups were due to religious and social activities (women's church group and women's Islamic study group). The role of the groups as a class of teaching and learning was very significantly correlated (α= 0.01) with the contribution to the foodstuffs and income creation. The housewives groups who utilized their home gardens had to seek information to increase their knowledge and skills about the cultivation of various commodities, including food processing. The learning class was accompanied by agricultural extension aimed at changing the behavior of housewives in order to be able to carry out activities in the utilization effort of their home garden. With this in mind, the problems about physical aspects such as land (land carrying capacity and land area), climate, water availability, and social aspects (the availability of labor, tradition / culture, technology and household economy) can be properly handled by them. Reference [11] states, that there is a positive connection between members' perceptions and group roles. This means that group members have great expectations for the group as a forum for interaction of group members in the development of farming, in which there is a group atmosphere that is familiar to each other, mutual respect for different opinions, and mutual cooperation. The correlation value indicated that the higher the role of the group as the class of learning and teaching, the higher the contribution of their home garden to the food production and income creation.

Table 4: Correlation between group roles and food diversification

Group Roles	Food Diversification (n = 267)					
	Continuity of Foodstuff		Contribution to Food		Contribution to Income	
	r_s	P	r_s	P	r_s	P
Class of teaching and learning	0.039	0.524	0.189**	0.002	0.280**	0.000
Production unit	0.025	0.686	0.145*	0.017	0.226**	0.000
Means of cooperation	-0.017	0.777	0.254**	0.000	0.369**	0.000

Note: **. Significant correlation on α=0.01 *. Significant correlation on α= 0.05

Table 4 shows that the role of the group as a unit of production was significantly correlated (α = 0.05) with the

contribution of foodstuffs and it was very significantly correlated ($\alpha = 0.01$) with the income gerenated from the home garden. The correlation value obtained showed that the higher the role of the group as a unit of production, the higher the contribution of the home garden to food and income creation. The utilization of the home gardens which were carried out by each member of the group as a whole was seen as a unit of production to be developed to achieve an economic scale with an agribusiness oriented. The development of a home garden business requires the support of production facilities and the relevant technological innovation in accordance with the condition of the home garden owned by each member of the group. The greater the role the group plays in facilitating the procurement of production facilities, the application of technological innovations, and the marketing of the yields by the group members, the higher the profits of the home garden business obtained by the housewives as members of the group. The group will also grow into a business group, so that in the future the home garden business will not only be sufficient for family food, but it can be a reliable business in increasing family income. The role of the group as a means of cooperation was very significantly correlated ($\alpha = 0.01$) with the contribution of the home garden to foodstuff production and it was also very significantly correlated ($\alpha = 0.01$) with the home garden contribution to income. As a platform for cooperation, women farmer groups can strengthen cooperation among fellow members in groups and between groups, as well as with others aimed at increasing the productivity and income of the group members. In addition, the groups can also as assist the members in facing threats, challenges, obstacles and disruptions in the farming activities. Therefore, the role of the group management is very important and should be able to create a conducive atmosphere within the group, enabling and encouraging all group members to participate actively. With increased cooperation, cohesiveness, and active participation within the group, it is expected that the productivity of the home garden utilization will increase as well. The correlation value obtained as shown in Table 4 indicated that when the role of the group increased, the contribution of the home garden to food and income creation would also increase. Extension and training were conducted on various aspects of the utilization of a home garden to improve the ability of human resources. According to [12], extension is basically an effort to improve the quality of the behavior of a person or individual that includes cognitive, affective and psychomotor so as to have individuality (human capital is not individualistic) ready to realize the welfare of family and society. Extension as an education for farmers and their families should use the working philosophy to increase the potential and ability of farmers and their families, so that they can overcome their own shortcomings and meet their own needs without having to depend on others [13].

Table 5 shows that the extension material was significantly correlated with the home garden contribution to foodstuffs and it was also significantly correlated with the contribution of the home garden to income creation. The materials or messages communicated must be innovative, able to change or encourage a behavior change, so that improving the quality of life of individuals and the entire community can be realized [14]. According to the housewives, the material given had been suitable viewed from the content of the material, the relevance to the business and the purpose of the utilization of the home garden, the suitability of the time allocation, the order of the material presentation, and the time arrangement between theory and practice. Nevertheless, according to them, the material was still more directed to the production technology, not to the integrated home garden technology. In addition, such topics as harvesting technology, processing, and market opportunities had not received any attention from extension workers.

The three-decade extension material was dominated by technology transfer, oriented to program / project interests to achieve the production target [15]. It should be noted that the programs of KRPL and P2KP were a policy designed by the Ministry of Agriculture which was applied nationally. In the preparation of agriculture extension programs, the extension workers just follow the policy from "the top", and have not considered the need for targeted extension activities. Therefore, the coverage of extension material needs to be revisited, no longer limited to production technology, but it must pay attention to such technologies as harvesting technology, processing, packaging, transportation, price information and market information, so that the home garden business can be profitable and sustainable.

Extension method, according to [16], is a systematic way of delivering information material so that the extension material can be understood and accepted by the target community. Table 5 shows that the extension method was significantly correlated (α= 0.05) with the contribution of the home garden to the foodstuffs, and it was also significantly correlated (α = 0.05) with the home garden contribution to income. This correlation means that the more appropriate the extension methods, the higher the contribution of the home garden to foodstuffs, generating more income. The extension method in the implementation of the home garden utilization was in form of a field school, namely by doing a plot demonstration. The housewives considered that the method employed by field officers had already been appropriate. Through applying the field school extension method in the activities of home garden utilization, housewives can see directly the steps of cultivation techniques which are good and correct, so that the knowledge obtained can improve the productivity of the home garden business. As the home garden production increases, the income obtained from it will also increase.

The extension intensity is the frequency of housewives having face-to-face counseling with extension workers to discuss matters related to their home gardern business. Table 5 shows that the extension intensity was significantly correlated (α = 0.01) with the home garden contribution to foodstuffs and income creation. Reference [17] stated that the extension intensity had a positive and significant influence on the type of innovation adoption. The results of the research [18] indicated that, the extension intensity had an effect on the effectiveness of SLPTT study of rice field.

This correlation indicated that the increased intensity of counseling would increase the contribution of the home garden production and income. Agricultural extension worker's competence is a skill based on knowledge, skill and attitude supported by the availability of adequate supporting facilities system, so that he is able to perform his duty in empowering housewives in making use of their home gardens. Table 5 shows that extension worker's ability was significantly correlated with the home garden contribution to foodstuffs and income.

The competence of extension workers affected farmers' learning intensity [19]. Additionally, the aspects of the extension worker's competence that influenced the intensity of learning were the ability of the extension worker to analyze problems, improve the capacity of farmers and develop technical insight of farmers. References [20,21] stated that the extension workers' competence positively affected their performance.

The correlation indicated that the higher the extension worker's ability in conducting counseling, the higher the contribution of the home garden to food and income.

Table 5: Correlation between extension and food diversification

Extension	Food Diversification (n = 267)					
	Continuity of Foodstuff		Contribution to Food		Contribution to Income	
	r_s	P	r_s	P	r_s	P
Material	0.028	0.647	0.250**	0.000	0.399**	0.000
Method	0.066	0.279	0.154*	0.012	0.144*	0.018
Intensity	0.043	0.488	0.255**	0.000	0.329**	0.000
Extension worker's ability	0.025	0.687	0.261**	0.000	0.340**	0.000

Note: **. Significant correlation on α=0.01 *. Significant correlation on α= 0.05

Respondent's perception about the functions and benefits of a home garden was significantly correlated (α = 0.05) with the continuity of food production; it was very significantly correlated (α = 0.01) with the home garden contribution to foodstuff; and it was very significantly correlated (α= 0.01) with income generation. This correlation means that the higher the respondent's perception on the functions and benefits of a house garden. the better they will improve all components of the assessment of food diversification. The housewives' perception of the functions of a home garden in producing food in the regecies of Minahasa and Bitung was in a high category. Table 6 shows that housewives' perception of food diversification was significantly correlated (α = 0.05) with food production continuity in the home garden. The higher the housewives' perception of food diversification, the higher the continuity of food production in the home garden. The perception level of housewives about food diversification in this study was in a high category. According to them, food diversification is important to do. They are aware that diverse food consumption can meet the nutritional needs of their families in addition to replacing the source of carbohydrates derived from rice with tubers or corn. The housewives' perception of healthy food was significantly correlated with the contribution of home gardens to foodstuffs and the additional income of the family. This correlation means that the higher perception of housewives on the importance of healthy food, the greater the contribution of home gardens to food and income. The perception level of housewives about healthy food was in a high category. They agreed that a healthy diet was determined by the nutritional composition present in the diet. Eating healthy food should become a lifestyle, which, in this case, can be obtained from the home garden.

Table 6: Correlation between Food Perception and Diversification

Perception	Food Diversification (n = 267)					
	Continuity of Foodstuff		Contribution to Food		Contribution to Income	
	r_s	P	r_s	P	r_s	P
Function and benefit of home garden	0.134*	0.029	0.284**	0.000	0.269**	0.000
Food diversification	0.136*	0.026	-0.016	0.796	-0.050	0.420
Healthy food	-0.041	0.504	0.122*	0.047	0.167**	0.006

Note: **. Significant correlation on α=0.01 *. Significant correlation on α= 0.05

It is very important to increase the competence of women as a home garden utilizer to support food diversification and provide added value and income for their family. The technical competence of housewives in the activity of the home garden utilization was significantly correlated with the continuity of food crop production in the home garden. This relationship means that when the technical competence of housewives in utilizing home garden gets better, the continuity level of food production from the home garden will also get better. The descriptive analysis result showed that the technical competence of housewives was close to a high category. Based on the technical competence, their ability in maintaning the sustainability of the home garden business will increase. By planting a variety of food crops as well as raising livestock and fish, it will have an impact on increasing the contribution of the home garden to food production and income creation. With food needs being fulfilled by the home garden, it will certainly save housewives' money. The managerial competence of housewives in the utilization of the home garden was significantly correlated with the continuity of food production in the home garden, and this can generate an additional income for the family. This correlation means that the higher managerial competence of housewives, the more possible the continuity of foodstuff production in the home gardens, increasing the household's additional income. The high level of housewives' managerial competence will improve their ability to maintain and take care of their home gardens, contributing to food security and increasing the household's income.

Table 7: Correlation between Food Competence and Diversification

No.	Competency	Food Diversification (n = 267)					
		Continuity of Foodstuff		Contribution to Food		Contribution to Income	
		r_s	P	r_s	P	r_s	P
1	Technical	0.151*	0.013	0.120*	0.050	0.132*	0.031
2	Managerial	0.154*	0.012	0.376**	0.000	0.339**	0.000
3	Social	0.025	0.680	0.243**	0.000	0.351**	0.000

Note: **. Significant correlation on α=0.01 *. Significant correlation on α= 0.05

The social competence of housewives in the activity of home garden utilization was significantly correlated with their contribution to foodstuffs and income creation. This correlation means that the higher the social competence level of the respondents, the greater the contribution of a home garden to the food production and income creation. The high social competence of housewives was measured through: (1) their ability in cooperating with others; (2) their ability to provide help; (3) their ability to build relationships with other parties; (4) their ability to maintain relationships and; (5) their ability in developing relationships.

4. Conclusion and Suggestion

(1) The continuity of food stuffs in the home garden was significantly correlated with the characteristics of housewives (education level, non-formal education, and time devotion), accessibility to information (the availability and relevance of information), environment (the availability of production facilities), perception of the functions and benefits of a home garden, perception of food diversification, and technical as well as

managerial competence.

(2) The contribution of a home garden to food production was significantly correlated with accessibility to information (the availability and relevance of information), environment (the availability of production facilities), socio-cultural condition and family support, group roles, extension (materials, method and counseling intensity), and perception of the functions and benefits of a home garden and perception of the importance of healthy food, technical competence, managerial competence and social competence.

(3) Contribution of the home garden to income creation was positively correlated with accessibility to information, that is, the availability and suitability of information; environment, namely the availability of production facilities, socio-culture and family support; group roles; extension; and the perception of the functions and benefits of a home garden, the perception of the importance of healthy food; and, competence.

(4) The government's support is really required, from the central government to the village government, as well as related parties, including non-governmental organizations, through extension activities on the importance of food diversification obtained from the utilization of home gardens as a source of food for the family in a sustainable manner.

References

[1] Rosihan, A., & Rahmah, B.N. 2010. Understanding Nutrition Analysis Mother Households in Food Diversification. Agriculture Social Economic Journal, 10, pp.1-10. Retrieved from http://agrise.ub.ac.id.

[2] Central Bureau of Statistics. 2014. National Socioeconomic Survey (Susenas) Quarter Quarter I-2013 and I-2014.

[3] Resmayeti. 2012. Performance of Dietary Pattern Household Hope and Empowerment through Vegetable Cultivation in the courtyard in the city of South Tangerang Banten Province.

[4] Permana R. Sarwititi S. Susanto D, Saleh A. 2014. Effectiveness of Communications Optimizing Land courtyard. (Case Program Region Sustainable Food Houses in the village Mulyasari Ciampel District of Karawang district, West Java). Proceedings Based Community Development Social Capital. Yogyakarta.

[5] Suryantini H. 2004. Agricultural Utilization of Information Technology by Agricultural Extension: Case in Bogor, West Java. Agricultural Library Journal, 13 (1): pp.17-23.

[6] Andriaty E, and Setyorini E. 2012. Availability of Resources Agricultural Technology in several regencies in Java. Journal of Agricultural Library. Vol. 21 No. 1 April 2012: 30-35. Data Accessed: http://203.176.181.72/index.php/jpp/article/viewFile/493/pdf

[7] Adenkule, O.O. (2014). The role of home gardens in household food security in Eastern Cape: A case study of three villages in Nkonkobe Municipality. Journal of Agricultural Science, 5(10), 67-76. Retrieved from: http//www.ccsenet.org

[8] Ijinu TP, Anish N, Shiju H, George V, Pushpangadan. 2011. Home gardens for primary health and nutritional security of the rural poor of South Kerala. Amity Institute for Herbal and Biotech Products Development, Peroorkada PO, Thiruvananthapuram, Kerala, India 695 005. Indian Journal of Traditional Knowledge. Vol. 10 (3), July 2011, pp. 413-428

[9] Yamasaki C. 2012. Food Security: The Challenges Faced by Rural Women and The Impact Of Food Insecurity On Women's Personal Security: Human Rights Advocates. Edith Coliver Representing Intern Human Rights Advocates through the University of San Francisco School of Law's International Human Rights Clinic.

[10] Mirjam de Bruijn. 2006. "Gender Equality and Food Security: A Development Myth." African Studies Centre, Leiden, The Netherlands. CODESRIA Bulletin, Nos 1 & 2, 2006 P. 63.

[11] Diarsih EY, Ludivica, Rinda N. 2011. Member Perception of Role in Increasing Farmer's Group Mastery Capability Cultivation Technology Belimbing. Journal of Mathematics, Science, and Technology. 11 (2), September 2010, pp.133-145

[12] Sumardjo. 2010. Transforming Agricultural Extension Model Development Towards Independence Farmers. [Dissertation] Graduate School of IPB. Bogor

[13] Slamet M. 2003. "Strengthening the Agricultural Extension in Indonesia". Shaping Behavior in the Human Development. Editor Ida YUSTINA and Adjat Sudrajat. Bogor: IPB Press.

[14] Mardikanto. 1996. “Extension of Agricultural Development.” Eleven March University Press. Jakarta.

[15] Tjitropranoto. 2005. Understanding the Concept of Self Potential / Readiness Self, and Introduction to Programming. Journal of Extension. 1 (1): pp.62-67.

[16] Ibrahim JT, Sudiyono A, Harpowo. 2001. “Communication and Agricultural Extension.” Malang: Bayu Media Publishing

[17] Safaruddin, M Shawwal, M Arsyad. 2010. Contributions Extension to Increase Production and Farmers Income (Case Paddy Farmers in Luwu Utara). Journal of Post-University of Hasanuddin. Makassar. http://pasca.unhas.ac.id

[18] Slameto, Haryadi FT, Subejo. 2014. Effectiveness of Learning Process Integrated Crop Management Field School Rice by Community Farmers in Lampung. Agro Economic Journal. 32 (1). May 2014: 35-55. Data Accessed http://pse.litbang.pertanian.go.id/ind/index.php/publikasi/jurnal-agro-ekonomi/419-jurnal-agro-ekonomi-vol-32-no-01-2014/2640

[19] Yumi. Learning Development Model 2011. Farmers in the People's Sustainable Forest Management (Case in Gunung Kidul Yogyakarta province and Wonogiri in Central Java Province). Journal of

Forestry Economic and Social Research, 8 (3): pp. 196-210.

[20] Sapar, jahi A, Asngari PS, Amiruddin, Purnaba IGP. 2012. Performance Impact on Agricultural Extension and Competency Four Cocoa Farmers in South Sulawesi region. Journal of Extension, March 2012 Vol. 8 No. 1

[21] Tedy RM. 2009. Factors Affecting Agricultural Extension Performance and Impact Behavior Rice Farmers in West Java. Dissertation. Bogor: The Graduate School of Bogor Agricultural University.