

Affecting Factors the Capacity of Freelance Extension Agents and Its Impacts on Farmers

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Abstract

Over the next decade, most of the civil servant extension agents will retire, thus it is necessary to prepare reliable freelance extension agents called THL extension agents. However, the capacity building process of extension agents faces many obstacles, therefore, the right solution is required by appropriate utilization of information technology (IT). This study aimed to determine the relationship between the satisfaction level of the farmer and the capacity of THL extension agents using spearman correlation analysis and to study the factors that influence the capacity of extension agents by IT utilization using path analysis. Respondents in this study amounted to 172 THL extension agents and assisted farmers in facilitated BPP (Agricultural Extension Agency) of Lampung Province. The results showed that farmers' satisfaction level of extension activity was low, THL extension agents' capacity was in a high category, and there was a significant relationship between farmer satisfaction and THL extension agents' capacity level. Factors that directly influence extension agents' capacity level are IT utilization, availability of non-cyber IT, and support of extension agencies.

Keywords: *THL extension agents, farmers' satisfaction, capacity building*

1. Introduction

As stated by the Minister of Agriculture of Republic of Indonesia at the time of declaration of modern technology in Tanggamus Regency, the problems of agriculture in Lampung Province are: condition of damaged irrigation (around 52%), seeds and fertilizers are often late and problematic, and the limited availability of agricultural machinery and agricultural extension agents (DetikCom 2015). These agricultural problems impact on the low productivity of rice in Lampung, in which BPS data (2016) reported that rice productivity in Lampung was only 5.14 tons/ha (still below the national rice productivity of 5.34 tons/ha). Hence, efforts to increase rice productivity require qualified and high-capacity extension agents in conducting extension activities. According to Law no. 16/2006 on Agricultural, Fisheries, and Forestry Extension Systems, the extension agents' capacity is a series of competencies that capable to facilitate; able to seek easy access to information resources, technologies, and other resources; have leadership, managerial, and entrepreneurial capabilities; able to develop its organization; capable to analyze and solve problems; able to preserve the ecology; and able to institutionalize values. Those capacities involve character to implement the extension agent roles with high dedication to promoting the farmers welfare and reach farmer's satisfaction.

Efforts to improve the capacity of extension agents in accordance with the function of Law no. 16/2016 in Indonesia faced many obstacles and more complicated by the condition of Indonesia which dominated by the ocean with the limitations of facilities and infrastructure of transportation and communication. In addition to the problem caused by the geographical conditions, the infrastructure facilities have also remained un-optimal. The results of Damanik and Tahitu (2011) research revealed that extension agents often have difficulty accessing the information needed for the extension activities.

This is supported by the research results of Koswara and Maria (2004) which showed that Indonesia as an archipelagic state which covers a wide area is considered important to use the cyber extension as an information technology to provide education for the community. Freelance extension agents or called THL extension agents are those who are required to be able to perform various activities, as the spearhead of agricultural development, they are also required to increase their capacity. Efforts to increase extension agents' capacity can be done by encouraging extension agents to utilize information technology. However, currently, the extension function does not play a role as a driver of "technology transfer" and in practice seems to be the supervisor of government programs"; whereas according to Law no. 16/2006 extension agents have very large functions with a high capacity requirement. Therefore, a capacity building strategy for extension agents is needed. Previous studies (Subagio *et al.* 2010; Fatchiya 2010; Lemos *et al.*, 2014; Haniza *et al.*, 2013; Sucihatiningsih *et al.* 2010; Yunita *et al.*, 2012; Suwardi 2011; Seran *et al.* 2011; Anantanyu 2011; Sudarko 2012) have not clearly studied about extension agents' capacity. Prior research regarding capacity focused on farmer capacity, group capacity, community capacity, institutional capacity, and household capacity. Therefore, this study aimed to: (1) analyze the factors that influence the extension agents' capacity (2) analyze the relationship of the extension agents' capacity and the farmer's satisfaction level and (3) determine the appropriate strategy to increase the capacity of THL extension agents.

2. Method

This study is an explanatory research, a research attempts to answer whether a variable is related to other variables and tests the previously formulated hypothesis. The variables used were: individual characteristics of extension agents (X1); availability of information technology (X2); support of extension agencies (X3); support of other institutions (X4); availability of conventional media (X5), utilization rate of information technology (Y1); capacity of extension (Y2); and farmers' satisfaction level (Y3). The research was conducted in Lampung Province, it administratively included Bandar Lampung City, Pesawaran Regency, Tulang Bawang Regency, Lampung Timur Regency, Mesuji Regency, and Way Kanan Regency. Data collection was conducted from August 2016 to March 2017. Respondents in this study were 172 THL extension agents served in BPP facilitated by internet and 172 assisted farmers. Determination of the number of respondents by a census, all THL extension agents in BPP facilitated by internet facilities. The collected data were quantitative data which supplemented by qualitative information and furtherly analyzed using path analysis to assess the contribution by path coefficient on each path diagram of the causal relationship between variables X1, X2, X3, X4, and X5 to Y1 and its impact on Y2. Path analysis is a technique for analyzing the causal relationships within multiple regression of which the independent variables directly or indirectly affect the dependent variable (Retherford 1993).

3. Result and Discussion

3.1 Characteristics of THL Extension Agents

3.1.1 Age

The number of THL extension agents with age above 51 years is less than eight percent, while more than two-thirds aged under 40 years. The age of THL extension agents who are mostly young and productive potentially answer the problem of reduced extension of the civil servant who enters retirement. Overall, the average age of THL extension agents is 37 years ranging from 21 to 60 years. Based on the age maturity, a person will affect the mindset and behavior of individuals in carrying out their duties. This means that the average age of THL extension agents in the study sites is in the productive age. In an economic perspective, productive age is defined as the level of willingness, enthusiasm and ability to perform higher tasks with greater responsibilities. Rachmat (2007) state that the older group will show an action that is definitely different with the young group. In addition, age can also describe the experience of a person that affects the diversity of actions based on the age. Although some regent appoints extension agents with a maximum age limit of 50 years, some THL extension agents with age over 51 years started to be impermanent THL extension agents with the regent decree, they are expected to be experienced in extension activities.

Tabel 1 Distribution of individual characteristics of THL extension agents in Lampung, 2017

No	Individual Characteristic	Category	Number (n=172)	Percentage	Average	
1	Age	Very young	21 – 30 years	40	23,3	37 years
		Young	31 – 40 years	91	52,9	
		Adult	41 – 50 years	27	15,7	
		Older	51 – 60 years	14	8,1	
2	Formal Education	Very low	High school	53	30,8	
		Low	Diploma	52	30,2	
		Middle	Bachelor	67	39,0	
		High	Master	0	0	
		Very High	Doctor	0	0	
3	Non Formal Educ.	Very Low	<3 days/year	59	34,3	2 days
		Low	3 – 4 days/year	99	57,5	
		Middle	5 – 7 days/year	14	8,2	
		High	8 – 10days/year	0	0	
		Very High	>10 days/year	0	0	
4	Work Experience	Very low	< 10 years	152	88,4	8 years
		Low	10 – 19 years	5	3,0	
		Middle	20 – 29 years	7	4,0	
		High	30 – 39 years	8	4,6	
		Very High	>39 years	0	0	

3.1.2 Formal Education Level

Formal education is one of the efforts to increase knowledge and change the mindset of individuals as well as to help extension agents to increase their career. Almost half of THL extension agents have received higher education at Diploma (D3) and undergraduate (S1) levels, but no THL extension agents have attended post-graduate education. In addition, there are still THL extension agents (more than a quarter) only educated at the senior high school level. The level of formal education owned by extension agents may affect their ability in carrying out their duties. The high number of extension agents who have not received an education in college will affect the level of knowledge and mindset. Extension agents who have higher education, in general, will more quickly master and apply the technology received compared to those with a low formal education background. Extension agents with low education levels are due to reluctance to continue their education to higher levels and also because of the unfavorable economic conditions with a considerable number of dependents. In addition, the location of the residence which is far from the capital regency and from the provincial capital causes extension agents are reluctant to continue their study to a higher level. Formal education followed by extension agents will make it easier in improving career ladder. Most extension agents perceived that education can add insight and experience of learning as a provision in life including provisions to raise career ladder. In addition, extension agents' capacity tends to be related to external factors (extension agents' role, farmers contact' role, and nature of innovation).

3.1.3 Non-Formal Education Level

The opportunity for THL extension agents in attending training remains low with average participation in training less than two days a year. In fact, most extension agents attended the training program less than two days of training a year, besides non-formal education to overcome the needs and conditions of extension agents can be an alternative to disseminate information regarding the growing number of agricultural innovations. Non-formal education can be done by involving extension agents in various training, it aims to enrich the extension agents' knowledge of the latest information and technologies that farmers need. The non-formal education that has been followed by extension agents ranges from 0-10 days per year, with one day to 8 hours of a lesson, during 4 days training (Table 1), however, the average non-formal education attended by THL extension agents classified in a very low category.

This is because not all extension agents have the same opportunity to attend training or internship due to the limited budget for extension activities.

3.1.4 Period of Service/Work period

Almost all THL extension agents were working less than ten years, the THL extension agent was still relatively new, however, about 4.5 percent of THL extension agent shave service period more than 30 years. The THL extension agent experience varies, ranging from one year to 38 years. THL extension agents were relatively young with low work experience, it is calculated from the time of the THL extension's appointment decree, however, some extension agents come from progressive farmers who stayed in the agricultural extension activity for a long time. Fortunately, the experience of extension agent can be used as a knowledge or lesson to carry out their duties properly. This might be in line with the statement that someone who experienced many issues impact to form and influence the appreciation of the social environment and work environment. Moreover, work experience is something passed, lived, felt, and perceived by extension agents in carrying out their duties by mobilizing their power, mind, and body to achieve their goals. In this study, work experience was measured by service period (year) of extension agent, calculated from the start period of appointment as a civil servant or as THL extension agents until this research conducted. In addition, experience in extension activities has a great impact for extension agents to convince farmers of the materials and information presented, thus, extension agents with long work experience tend to gain more trust from farmers than new extension agents. Distribution of individual characteristics of THL extension agents is shown in Table 1.

3.2 Capacity of THL Extension Agents

Most of the capacity of THL extension agents in implementing their extension role is categorized as a high category, however, some extension agents are still in the low category. This is in line with that reported by Hernanda *et al.* (2015) that the performance of good agricultural extension agents in South OKU regency was able to increase farmers' satisfaction using extension activities. The satisfaction of the farmers to the main extension services will be determined by the meet of farmers needs by extension activities (Tahitu 2013). However, good capacity is not enough for extension agents, they should continue to improve and develop their capacity to achieve farmers' satisfaction through extension programs.

In this study, the extension agents' capacity includes extension activities in carrying out and implementing extension functions based on Law no. 16/2016 which aims at changing the characters of farmers to be prosperous farmers. In addition, the extension agents' capacity is a set of competencies possessed by extension agents for performing their roles. Meanwhile, according to Law No. 16 of 2006, the extension is a system that implies the whole set of skills development, knowledge, skills, and attitude of the main actors and business actors through extension activities. The extension agent's capacity was measured based on the ability to perform the extension roles listed in Law no. 16/2006, the distribution of extension agents' capacity is presented in Table2.

Table2. Distribution of respondents based on the capacity of THL extension agents in Lampung Province, 2016

Classification	Capacity of THL Extension Agents		Mean
	Number	(%)	
No capacity(0 – 20)	1	0.6	69.5
Very low (21 – 40)	1	0.6	
Low (41 – 60)	56	32.5	
High (61 – 80)	83	48.2	
Very High (81 – 100)	31	18.0	
Total	172	100.0	

3.3 Factors Influencing the Capacity of THL Extension Agents

The capacity of THL extension agents is mainly influenced by the high motivation of the extension agents, the low availability of conventional media, the weakness of the utilization of information technology and not optimal support of extension agencies. This indicates that the THL extension agent is increasingly marginalized. The availability of cyber information technology is quite good, however, it does not directly affect the capacity building of the extension agents.

In fact, cyber technology can increase the capacity of extension agents only when they capable to use it well. This is in line with the results obtained by Listiana (2017) that the formal education pursued by individuals (farmers) does not have a significant relationship with farmers’ capacity.

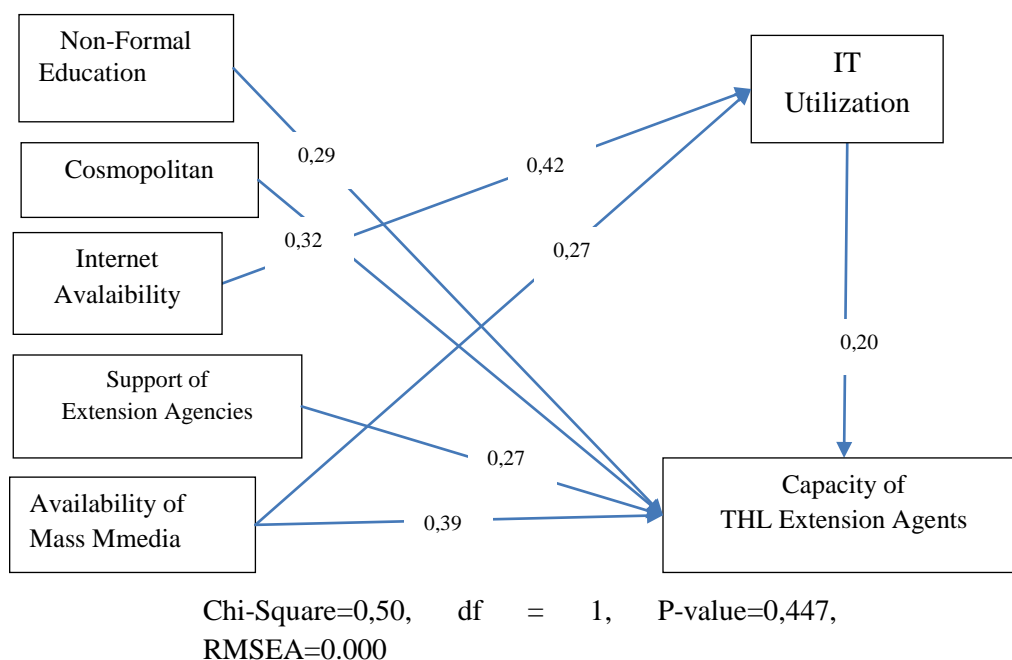


Figure 1 Path

analysis of factors that affect the capacity of THL extension agents

The result of hypothesis testing shows that the factors that directly influence THL extension agents’ capacity are: non-formal education, cosmopolitan level, conventional media availability, extension agencies support, and utilization of information technology, while internet availability indirectly influences THL extension agents’ capacity through IT utilization. This indicates that the internet availability will affect extension agents’ capacity only if THL extension agents utilize the internet availability appropriately to their work performance.

Table3. Direct and indirect influences of research variables

Influence of Variables		Coefficient of Influence			
Independent Variables	Dependent Variables	Direct	Indirect by IT Utilization	Total	R ²
Cyber Availability	IT utilization Level	0,42	0	0,42	0,28
Avalaibility of mass media		0,27	0	0,27	
Non-formal education	Capacity of Extension Agents	0,29	0	0,29	0,35
Cosmopolitan Level		0,32	0	0,32	
CyberAvalaibility		0	(0,42)(0,2)	0,084	
Extension support		0,27	0	0,27	
Avalaibility of mass media		0,39	0,078	0,47	
IT utilization level		0	0,20	0,20	

3.3.1 Availability of Conventional Media

The availability of adequate mass media will be able to increase the capacity of THL extension agents, of which the mass media is the most powerful variable affecting the extension agents’ capacity. Agricultural information can be information related farming technical method (planting, space of planting, seed varieties, etc.), crop prices, fertilizer prices, and information on the result of agricultural research (van den Ban and Hawkins 1999). The availability of mass media is defined as an instrument of communication that able to reach as many people as possible in the widest area.

The availability of mass media has a significant positive influence on extension agents' capacity as the conventional media in BP3K (Extension Agency for Agriculture, Fisheries, and Forestry) BPP is media specialized in agriculture (agricultural newspaper and magazine). By repeatedly reading newspapers and magazines, it directly increases the knowledge of THL extension agents and furtherly impact on the delivery of information during the extension activities. Obstacles faced by THL extension agents in accessing conventional media are limited funds to subscribe to print media thus impact on the limited availability of newspapers and magazines, the tabloid of *Sinar Tani* (media subscription) is often come late.

3.3.2 Cosmopolitan Level of THL Extension Agents

Another variable that significantly affects the extension agents' capacity is the cosmopolitan level of extension agents. The cosmopolitan level of THL extension agents tends to be high, as most of them are younger with a highly interesting on a challenge of traveling outside of their social system. Based on the results of the study, most extension agents travel out of their social environment at least once a month. The trip is done by visiting BP4K (Executive Agency for Agricultural, Fisheries and Forestry Extension) located in the Capital Regency. However, there are some extension agents who have never traveled outside the region to find information that can support their work performance. Extension agents who rarely or never visit out of the social system (the area) is not because of the lazy, but because the location of the working area or residence far from the capital Regency (6 sd 7 hour road trip), more than 10 hours to the capital city of the province, besides during the rainy season the road conditions are very bad to pass by. Cosmopolitan level of the extension agents is the extent of the relationship (interaction) with the external environment outside the social system (frequency of extension agents to seek information). Cosmopolitan properties were measured by frequency of visits to BP4K, *Bakorluh* (Coordinating Agency for Extension), related agencies or institution, BPTP (Assessment Institute for Agricultural Technology), agricultural companies, and colleges as well as contacts with others outside of their social systems. This is done to find information that can support the performance of extension agents, and also find solutions to overcome agricultural problems faced during the last six months.

3.3.3 Non-Formal Education

Non-formal education has a significantly positive influence on the capacity building of extension agents. The higher opportunity for THL extension agents to attend training activities, the higher their capacity. However, the low intensity of formal education attended by THL extension agents impact on the low capacity of THL extension agents, whereas regular training activities are held by *Bakorluh* more than four times a year. However, it has not been able to touch all extension agents in the work area, which numbered to 1,095 civil servants and 698 THL extension agents (*Bakorluh*, 2016). This is because in training activity one BP3K / BPP represented only a few extension agents, even one BP3K / BPP represented only by one extension agents. According to Suhardiyono (1992), non-formal education is systematic teaching organized outside the formal education system for a group of people to meet the specific needs in the form of training and courses.

3.3.4 Support of Extension Agencies

The support of the extension agency (*Bakorluh*) has a significant effect on the extension of the extension agents' capacity. The existence of *Bakorluh* and BP4K that routinely organize training of information technology as well as providing information technology facilities and extension fund is significantly influential on the capacity of extension agents. The results of the research indicate that the support of extension agencies is the high category, which means the extension agency at the regional level has been supporting the capacity building of THL extension agents. This is might be because one of the institutional functions of counseling according to Law No. 16/2006 on extension system is to increase the capacity of the civil servant extension agents, progressive farmers, and freelance extension agents. Based on the sub-variables, the implementation of information technology training categorized as the low category, which means training activities especially on IT is still rarely implemented. However, the implementation of IT training affects the extension of the extension agents' capacity, the more frequently and evenly of extension opportunities for IT trainers will increase the capacity of THL extension agents. In facts, in addition to obstacles occurred, THL extension agents also have the opportunity to follow the training activities. Extension THL may get training opportunities if training activities are for all extension agents, but if the training participants are limited, the opportunity to follow the training is obtained by the civil servants.

In addition, funds for extension are also categorized as low. Some extension agents consider that the extension funds provided nowadays are not able to support the extension activities to increase the capacity of THL Extension agents. However, sub-variables for support of extension material availability was in the high category. Currently, extension agents get the extension material from BP4Ks and *Bakorluh* for extension activities, and also often hold programs from the agricultural services. If the availability of these three sub-variables is improved and further adapted to the extension agents needs, thus the extension agents' capacity is possible to increase. This is in contrast to Prawiranegara *et al.* (2015) who reported that the support of extension agencies with research, training, input-output institutions, and policies has no significant effect on the role of farmer institutions in improving the innovative capability of farmers based on information and communication technology. This is due to the limited number and low capacity of THL extension agents.

Some THL extension agents considered that vertical coordination among extension agencies was quite good of which extension agents can be networked well, however, not all duties can be realized. The relationship of extension agencies with other related institutions is less synergic, moreover, the coordination also needs to be intensified. The incorporation of extension agencies into the agricultural Department get a positive response from THL extension agents, they expected the better coordination and hoped the alignments from the agricultural department to THL extension agents.

3.3.5 Utilization Level of Information Technology

Utilization level of information technology is one of the factors that influence extension agents' capacity. Path analysis results show that the utilization rate of information technology has a positive effect on the extension agents' capacity, which indicates that the higher the utilization level of information technology, the higher the capacity level of THL extension agents. Nevertheless, the level of utilization of information technology remains low. The low utilization of IT of extension agents might be caused by some obstacle such as (1) low signals or networks especially in remote areas; (2) limited funds to buy printed media (Agricultural megazine and newspaper); (3) Internet is available in some BP4Ks, but difficult to access due to password inquiries that often change by many users; (4) Personal internet quota is limited due to limited budget; (5) In some locations internet network unavailable; facilities in BP3K is poor (there is no wifi, no internet modem, and no office operating costs for the procurement of Internet quota); (6) Sinar Tani Tabloid as subscribe magazine often came late, even some BP3Ks did not subscribe to agricultural magazine; (7) in some BP3Ks, the information material of subscribed magazine is not in line as needed; (8) The availability of electricity facilities is also inadequate such as frequent ups and down voltages, frequent power outages; (9) the searched website address is often no longer connected; and (10) lack of training on internet usage.

In addition to network and infrastructure constraints, there are still extension agents who have not mastered to use the IT facilities. This is in line with research finding by Sumardjo *et al.* (2011), it stated that barriers in the application of information and communication technology to support sustainable agriculture development are: (1) Inadequate and expensive telecommunication infrastructure. Even if all facilities exist, the price is still relatively expensive; (2) Places of information access using information technology applications are very limited; and (3) Capacity of human resource in application of information and communication technology, particularly at extension agents agricultural level or village level facilitators as accompaniment motor of agricultural development executor in remote area still very limited.

3.3.6 Internet Availability

Internet availability affects the utilization level of information technology. The level of internet availability is defined as the existence of tools that are able to access technology and information through the internet network required by extension agents to support extension activities. Internet availability is related to Internet network and virtual reality, further Hearn and Tanner (2009) argue that internet can provide various information about almost all economic development topic. There are many specialized data services that provide information on topics of interest to economic development, even the public and private sectors as data sources can provide information and data directly through the internet. Based on Table 3, it can be concluded that the availability of cyber IT has an indirect effect on extension agents' capacity through the utilization of information technology. The result of path analysis showed that coefficient value of the influence level of internet availability was positive. This means that the level of internet availability has a positive effect on the capacity of THL extension agents through the utilization of information technology, thus the availability of internet in agriculture is very important to support extension activities.

The availability of the internet is a growing agricultural innovation among extension agents. Sumardjo *et al.* (2010) suggests that agricultural innovation is anything produced through research activities and agricultural assessments to foster agricultural development in general such as products (seed varieties), knowledge (knowledge), and tools and agricultural machinery. Mulyandari (2011) revealed that a cyber extension is a form of innovation in agricultural communication, so it can be said that the information technology is not only an innovation but also the carrier of innovation.

3.4 Relationship Between Extension Agents' Capacity and Farmers' Satisfaction

Low capacity of THL extension agents tends to affect the low level of farmer satisfaction (Table 4) and there is a very significant relationship between THL extension agents' capacity and farmers' satisfaction level ($\alpha = 0.01$; $R_s = 0,303^{**}$). The farmers are not satisfied with the extension activities as the farmers perceives the extension activities are not able to meet the information needs of farmers. In addition, the problems faced by farmers have not been fully addressed by extension agents which impact on the low productivity of agricultural products and resulted in low income of farmers.

Table 4. Distribution of respondents by farmers' satisfaction in Lampung, 2017

Classification	Score	Farmers' Satisfaction		Mean of score
		Number	(%)	
Not satisfied	0 – 20	4	2,3	50,6
Very Low	21 – 40	36	21,0	
Low	41 – 60	66	38,4	
High	61 – 80	51	29,7	
Very High	81 – 100	15	8,7	
Total		172	100	

Good extension activities will increase farmers' satisfaction on their need for extension information (Tahitu 2013). The results of this study revealed that farmers' satisfaction on extension activities was low, farmers assessed that extension agent is not been able to meet the information needs of farmers as well as agricultural problems faced by farmers are not fully addressed by extension agents and impact on not optimal agricultural production and farmers income does not increase significantly. The result of this research is in line with the results obtained by Tahitu (2013) that farmers' satisfaction level toward the accuracy of services and performance of extension agents is low, the extension service is perceived not sufficient in assisting the needs of farmers, especially when the farmers face a problem that really needs to assist by extension agents.

4. Conclusion and Recommendation

4.1 Conclusion

The capacity of THL extension agents in Lampung Province is categorized as high in performing its functions based on the standard of Law No.16 / 2006. The extension agents' capacity is influenced by the availability of mass media, the cosmopolitan level, the frequency to attend a training, and the level of IT utilization. Internet availability has an indirect effect on THL extension agents' capacity by IT utilization. Farmers' satisfaction of extension activities conducted by THL extension agents remains low. This is due to the intensity of meeting between extension agents and farmers are low since the number of extension agents is not proportional to the number of assisted villages thereby affecting the assisted area by each extension agent is too large. The low level of THL extension agents' capacity is closely related to farmers' satisfaction on extension activities. The loss of extension agencies at the regency and provincial levels has resulted in the weakening of extension agents' capacity which has a significant impact on farmer satisfaction.

4.2 Recommendation

The capacity of THL extension agents may be improved by (1) increasing the cosmopolitan level of THL extension agents by facilitating and increasing the extension budget thus THL extension agents may freely seek information outside their social systems to support their work performance; (2) providing Agricultural and Farming Tabloid in every BP3K regularly and on time; (3) providing IT and technical trainings to extension agents especially THL extension agents; (4) creating government regulations that strengthen government extension agencies as the government's commitment to the existence of extension agencies that already exist in Law no. 16/2006 (5) improving the quality and intensity of extension activities by reducing the assisted area and increasing the number of THL extension agents.

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