Original Research Article

PERCEPTION OF FARMERS ON THE PERFORMANCE OF EXTENSIONIST IN THE PASTURE AGROECOSYSTEM OF TIMOR TENGAH UTARA DISTRICT

ABSTRACT

This study aims to determine the perception of farmers on the performance of extensionist in the pasture agroecosystem of Timor Tengah Utara District. Determination of the sample of farmers as respondents from the population is determined purposively by the number of respondents 51 farmers. Primary data was obtained through interviews using a questionnaire. Data processing method uses a Likert Scale, then analyzed descriptively qualitative. Indicators to measure the performance of livestock extensionist based on extensionist performance, materials and methods, procurement of activities, availability of teaching aids and intensity of extension activities. The results of the study showed that the farmer's perception of the performance of farmer extensionist in the agree category if the farmer in charge in their area was a skilled extensionist, mastered the material, creative and innovative, as well as discipline in starting activities. Then the farmer's perception of the material and method is in the agree category if the teaching aids used are in accordance with the activities, the material delivered is in accordance with the needs of the farmer, and the methods used are in accordance with the activities. While the procurement of activities is in the category of agree if the objectives of the activity are clear to understand, and the purpose of the activities to support the personal goals of the farmer. Availability of activity teaching aids, most (62.75%) use more than two kinds of teaching aids with activity intensity more than 1 time a year. In general, the perception of farmers in the good category on the performance of livestock extensionist in the pasture agroecosystem of Timor Tengah Utara District.

Key Words: perception of farmers, extensionist

INTRODUCTION

Farming extensioning is non-formal education for farmers and their families which aims to improve the welfare of farmers with a focus on changes in knowledge, attitudes and skills. Thus the task of a Livestock Extensionist is to eliminate the obstacles faced by a farmer by providing information and providing views about the problems at hand (Sucihatiningsih and Waridin 2010; Sapar et al. 2012; Sawita et al .; Sajow et al. 2014).

The livestock extensioning system in Indonesia is regulated in the Law of the Republic of Indonesia Number 16 of 2006 about Agricultural, Fisheries and Forestry Extensioning System, which state that one of the main roles of the extension system is to facilitate the learning process of the farmers. Thus the role of livestock extensionist is as educators and as facilitators in facilitating the level of success of learning farmers. The role of educator is assessed from the performance of farmer extensionist to provide good knowledge, skills and methods of raising livestock to farmers who are assessed on the skills of livestock extensionist, mastery of materials, delivery of material, mastery of learning principles, and motivation. While the role of facilitator is assessed from the suitability of the material and method, and the purpose of providing extension activities. The suitability of the material and method was assessed from the role of the livestock extensionist creating conducive learning activities for farmers with the suitability of the teaching aids in the activities carried out, the material with the problems faced by the farmers, and the method approach held to the farmers. While the purpose of providing extension activities is assessed from the clarity of information so that it is understood by farmers, activities to support the personal goals of farmers, provision of learning facilities, and the intensity of the frequency of extensioning held.

The performance of livestock extensionist in Indonesia is still very low, because of several aspects, namely: (1) extensionist performance which consists of skills, mastery of material, motivation / attitude of the farmer extension, and discipline when the farmer extension activities are still lacking; (2) the suitability of the material and method, namely the suitability of teaching aids with extension activities, the suitability of the material with the problems faced by farmers, and the methods held in the activities have not supported the knowledge needs of farmers; and (3) procurement of activities, such as the purpose of extension activities and

the objectives of activities that support the personal goals of farmers have not been carried out properly (Sapar et al. 2012; Yunasaf and Tasripin 2012).

The low profile of farmer extensionist in Indonesia is caused by (1) the knowledge and skills of extensionist are still low and tend not to match the needs of farmers; (2) low extensionist education and training for capacity build, and if farmer extensionist are trained, the training tends to be irrelevant to the needs of farmers in their working area; and (3) extensionist often late information from the farmers they serve (Sucihatiningsih and Waridin 2010; Sapar et al. 2012; Yunasaf and Tasripin 2012). This condition can explain that the performance of livestock extensionist also plays a role in the slow development of the livestock sub-sector in Indonesia, especially beef cattle.

One of the centers of beef cattle production in Indonesia is East Nusa Tenggara Province (NTT) which contributes to domestic beef needs, where 60% of national beef needs are concentrated in Jakarta, West Java and Banten. Bali cattle contribute around 26.92% to the supply of beef cattle in the domestic, and one of the highest Bali cattle suppliers to cut is NTT (Ditjen PKH 2016). The center of Bali cattle production in NTT is Timor Island with the distribution of cattle population of 65.97%, of which 593,408 cows are spread on the island from the total cattle population in NTT totaling 899,577 tails. Timor Island consists of 6 (six) autonomous regions, where one of the autonomous regions of cattle suppliers from Timor Island is Timor Tengah Utara District (Tonbesi et al.2009; Suardika et al.2015; Priyanto 2016). But in this region the system of farming is still traditional with low production inputs (Wirdahayati 2010; Mahbubi 2015). It is expected that the management and input production of Bali cattle farms can be improved from the aspect of the involvement of livestock extensionist in the area.

So far there has been no information and data that can provide an overview of livestock extension performance in pasture agroecosystems in TTU District, NTT Province. Therefore, a study is needed that can provide a profile of the performance of livestock extensionist so that it can be information in improving the performance of extensionist that have an impact on improving the welfare of Bali cattle farmers.

MATERIALS AND METHOD

This research was conducted in Timor Tengah Utara District, East Nusa Tenggara Province for 2 months, namely May-June 2018. Location determination was based on 4 (four) criteria, namely: (1) the type of cattle owned by farmers was Bali cattle (local cattle) ; (2) the location of cattle grazing is pasture; (3) the number of cattle ownership ≥ 10 per household of farmers; and (4) cattle breeders are members of a breeder group at the research location and have participated in livestock extensioning activities in the past 1-2 years. The type of data in the study consisted of primary data and secondary data and data collection was carried out through observation, interviews and recording.

The population farmers in this study was 10% of the total Bali cattle farmers who met the criteria for determination the location of the study. Determination of the sample using purposive sampling technique. Based on this technique, the respondent population of available livestock farmers is 51 farmers from the total population of farmers as many as 510 people. The variable observed in this study is the perception of livestock farmers with the indicators measured are the performance of farmer extensionist, suitability in extension methods, procurement of extension activities, avaibility of teaching aids, and intensity of extension activities.

Data processing uses a Likert scale, which is an activity to measure attitudes, opinions and perceptions of a person or group about social events or symptoms. The use of this Likert scale connects the variables to be measured by being translated into indicators that can be measured, as in table 1. Then described in descriptive qualitative based on grouping, simplification, and presentation of data such as the use of frequency distribution tables and measurements.

Table 1. Research Variables about Perception of the livestock farmers to extensionist profile

Variable		Indicators
Perception	Extensionist Profile	- Skilled extensionist
		- Extensionist understand the material
		- Innovative and creative extensionist
		- discipline extensionist in start in activities
	Material and Method	- Suitability of teaching aids with activities
		- Suitability of material with farmers' problems
		- Suitability of method with the activities held
	Procurement of activities	- The procurement of the activity is clear and understandable
		- The procurement of activities to support the personal goals of farmers

Each answer is related to the form of an attitude statement expressed in categorized words, namely: (a) Strongly agree (5); (b) Agree (4); (c) Quite agree (3); (d) Disagree (2); and (e) Strongly disagree (1). The

measurement of each research indicator uses the basic assumptions of class intervals and class ranges as follows:

Maximum value = Highest score x number of samples x number of questions

Minimum value = Lowest score x number of samples x number of questions

$$\text{Class ranges} = \frac{\text{Maximum value - Minimum value}}{\text{Number of question}}$$

Assuming the basic class intervals and class ranges can be made as follows.

Table 2. Category and range of Likert scale classes measuring farmer perceptions

No.	Category	Class Range			
		Extension Workers Performance	Material and Method	Procurement of activities	Overall Perception
1	5. Strongly agree	856,9-1020	642,7-765	428,5-510	1927,9-2295
2	4. Agree	693,7-856,8	520,3-642,6	346,9-428,4	1560,7-1927,8
3	3. Quite agree	530,5-693,6	397,9-520,2	265,3-346,8	1193,5-1560,6
4	4. Disagree	367,3-530,4	275,5-397,8	183,7-265,2	826,3-1193,4
5	5. Strongly disagree	204-367,2	153-275,4	102-183,6	459-826,2

RESULT AND DISCUSSION

Perception of farmers to extensionist profile

Extensionist profile is the power of performance of an extensionist in carrying out a role and function to achieve the objectives of livestock extensioning effectively and efficiently. Indicators of the assessment of extensionist profile are the skills of extensionist, mastery of material, creative and innovative, and discipline. Data on farmer perceptions of farmer to extensionist profile performance can be seen in table 3.

Table 3. Perception of farmers to extension workers performance

No.	Indicators	Value Score	Σ Respondents	Σ Score	%
1.	Skilled extensionist	5	5	25	9,80
		4	36	144	70,59
		3	9	27	17,65
		2	1	2	1,96
		1	-	-	-
	Total 1			**198**	**100,00**
2.	Extensionist understand the material	5	3	15	5,88
		4	26	104	50,98
		3	20	60	39,22
		2	2	4	3,92
		1	-	-	-
	Total 2			**183**	**100,00**
3.	Innovative and creative extensionist	5	3	15	5,88
		4	22	88	43,14
		3	23	69	45,10
		2	2	4	3,92
		1	1	1	1,96
	Total 3			**177**	**100,00**
4.	discipline extensionist in start in activities	5	2	10	3,92
		4	29	116	56,86
		3	14	42	27,45
		2	5	10	9,80
		1	1	1	1,96
	Total 4			**179**	**100,00**
	Total 1+2+3+4			**737**	**Agree**

Perceptions of farmer to extensionist profile based on skills indicators of extensionist, a number of 80.39% of respondents said they agreed and strongly agreed, and a number of 17.65% of respondents said they were quite agree that the extensionist in their area were skilled. Then a number of 1.96% of respondents said that the extension workers were unskilled. The skills possessed by an extensionist are believed to be because they have competencies. The better the competency possessed by an extensionist, the better the performance of the extensionist. Competence is a process and effort to combine the power of knowledge, skill, and attitude that

a person has in achieving the desired performance goals (Sapar et al. 2011; Saswita et al.2013; Mujiburrahmad et al. 2014; Rohaeni and Hartono 2014; Gidoi et al.2015; Polohindang et al.2016).

Furthermore, as many as 56.86% of respondents said they agreed and strongly agreed, a number of 39.22% of respondents said they were quite agreeable, and a number of 3.92% of respondents said they did not agree that the extensionist understood the contents of the material. This percentage difference in the mastery of the material of the extensionist is believed because there are differences in the characteristics of the farmer in understanding and accepting the contents of the material. Rintjap (2015) states that the content of material / information conveyed in the form of images, sound, and text is strongly influenced by the intellectual ability of the recipient of the material.

Creative and innovative extensionist in extension activities is needed because generally the procurement of limited activities such as teaching aids, materials and methods, and budgeting in extension activities (Yunasaf and Tasripin 2012; Makatita et al. 2014; Talibo et al. 2017; Lamarang et al.2017). The data in table 3 about creative and innovative extensionist showed 49.02% of respondents said they agreed and strongly agreed, as much as 45.10% of respondents said they agreed enough, and a number of 5.88% of respondents said they did not agree and strongly disagreed that the extensionist serving in their area creative and innovative. The difference in the value of this category is believed to be due to differences in communication effectiveness towards the interests and needs of the community with the creativity and innovation carried out by extensionist. Abdullah and Ibrahim (2014) and Alpianor et al. (2017) states that extension activities will be effective if they always refer to the interests and needs of the community, and if farmers consider that farmer extensionist have credibility, the creativity and innovation delivered or shown will be adopted. While high creativity and innovation in livestock extensionist may be caused by extension agents having information sources for strengthening their capacity through non-formal education that is followed. Non-formal education has a significant effect on extensionist performance through creativity and innovation in achieving Bali cow development programs (Saswita et al.2013; Abdullah and Ibrahim 2014; Ediset and Jaswandi 2017). This is because the formal education does not affect the creativity and innovation model of the extensionist. Usually the knowledge and work experience possessed by extensionist is still low rank (Abdullah and Ibrahim 2014).

The discipline of time in initiating extension activities is very important because the extension activities can increase farmers' knowledge about the Bali cattle management and business. In addition, it also considers the activities of farmers to work to look for grass or manage cows in cages, and so forth. The data in table 3 about the time discipline in starting the activity shows 60.78% of respondents said they agreed and strongly agreed, a number of 27.45% of respondents said they agreed, and 11.76% of respondents said they did not agree and strongly disagreed with the statement that the activities began on time. The difference in category values is believed to be due to in extension activities, usually starting with ceremonial / ceremonial events.

In general, the extensionist profiles in Table 3 shows the value of the farmer perception category to performance of the extensionist is to agree with the total score of 737. This explains that the farmer agrees if the extensionist in their area is a skilled extensionist, mastering extension material, creative and innovative, and discipline to start activities. The profile of extensionist can be a capital to encourage farmers to improve their learning desires and needs because extensionist have provided examples of motivation. Motivation is the process of growing motives or encouragement so that farmers are consciously willing to learn and change their behavior. The existence of motivation, the extension activities will be directed and earnest in preserved activities (Yunasaf and Tasripin 2012; Talibo et al.2017; Ediset and Jaswadi 2017).

Perception of farmers to material and method

The extensioning material is the application of the education function from extensionist about everything that is communicated to the education target by considering how to deliver the material to the target, the relevance of the material to the target needs, the ability of the extensionist in explaining the material, completeness of the material and attention to the farmer's mental readiness, as well as the repetition of the method do. While the method is a collection of various ways the extensioning process can be applied so that it becomes more effective and efficient. Data on farmer perceptions of material and extension methods are presented in table 3a.

Table 3a. Perception of farmers to material and method

No.	Indicators	Value Score	Σ Respondents	Σ Score	%
1	Suitability of teaching aids with activities	5	3	15	5,88
		4	21	84	41,18
		3	25	75	49,02
		2	2	4	3,92
		1	-	-	-
	Total 1			**178**	**100,00**
2	Suitability of material with farmers'	5	5	25	9,80

	problems	4	28	112	54,91
		3	16	48	31,37
		2	2	4	3,92
		1	-	-	-
	Total 2			**189**	**100,00**
3	Suitability of method with the activities held	5	3	15	5,88
		4	26	104	50,98
		3	16	48	31,37
		2	5	10	9,81
		1	1	1	1,96
	Total 3			**178**	**100,00**
	Total 1+2+3			**545**	**Agree**

The data in table 3 shows a number of 47.06% of respondents said they agree and strongly agree, a number of 49.02% of respondents said they agreed enough, and a number of 3.92% of respondents said they did not agree that the teaching aids were in accordance with the activities. The difference in categories is believed to be due to differences in receiving information from demonstration activity or education process. The availability of teaching aids is needed for the development of farmers skills because the power of receive information from each farmer is different. The role of teaching aids in an activity is very important because it, can facilitate the delivery of information, avoid misperceptions, clarify information, facilitate understanding and facilitate communication at all sensory capture levels (Sapar et al.2012; Saswita et al.2013; Sajow et al.2014; Mujiburrahmad et al.2014).

The suitability of material with farmers problem is an attraction for farmers so that them will always be present at each extensioning held (Makatita et al. 2014; Rintjap 2015; Mangare et al.2016). The data in table 3 about the suitability of the material with activities shows a number of 64.70% of respondents said they agreed and strongly agreed, as much as 31.37% of respondents said they agreed enough, and a number of 3.92% of respondents said they did not agree. This difference in perception is believed to be due to the ability to receive clarity on the material information presented can not same (Rintjap 2015) so that the material or message conveyed should be adjusted to the needs of the farmers and the benefits can be felt immediately (Makatita et al. 2014; Mangare et al.2016), and some the technology or innovation delivered is not a solution to the problems faced by farmers (Sajow et al. 2014; Alpianor et al.2017; Talibo et al.2017; Sumner et al.2018). The extensioning material is must be gives or brings economic benefits and the problem farmers finished.

Furthermore, the farmer's perception of the appropriateness of the method with the activities held in table 3 shows a number of 56.86% of respondents said they agreed and strongly agreed, a number of 31.37% of respondents said they agreed enough, and a number of 11.76% of respondents said they disagreed and strongly disagreed. The most common types of methods are lecturing and discussion. The difference in the value of respondents' perception category is believed because the selection of the method done is not the same as the situation and condition of the respondent's breeders. In general, the respondent farmers accept the existence of the method used in extensioning. Talibo et al. (2017) and Alpianor et al. (2017) states that the benefits in discussions and ceramah are more efficient and facilitate the direction of discussion so that the information exchange process can run well. Selection of methods is not always the same according to time and place, but depends on the problems, situations and conditions that exist.

In general, Suitability of method with the activities held the shows category according to the score 545. The higher the ability to apply the material and methods, the better the level of performance of the extensionist in conducting livestock extension (Sajow et al. 2014; Garcia- Martinez et al.2016; Ediset and Jaswandi 2017). The role of livestock extension workers in the delivery of materials and methods is the role of educators so that extensionist must be able to increase the knowledge and insight of farmers so that farmers get useful and up-to-date information on livestock development and techniques (Sapar et al. 2012; Mujiburrahmad et al. 2014; Mangare et al.2016). This can be assessed from the completeness of the material provided by the extensionist.

The suitability of the material and methods of extension delivered to breeders is beneficial to generate target interest, achieve more goals, help overcome language barriers, stimulate targets to carry out messages, help the target to learn more and precisely, stimulate the target to forward messages received to people others, making it easier to get information by the target, encouraging the desire of people to know, then further exploring and finally giving a better understanding, and helping to establish the understanding gained (Saswita et al. 2013; Sajow et al. 2014). Sumner et al. (2018) states that raising the knowledge and management of livestock farmer can be done through the delivery of material and methods that are easy to understand and easily explained. This is greatly influenced by the competence of extensionist.

Perception of farmers to procurement of activities

Procurement of activities is an effort to improve farmer behavior through extension activities to increase farmers' knowledge and skills and change farmer attitudes. Data on perceptions of farmers to procurement of activities are presented in table 4.

Table 4. Perception of farmers to procurement of activities

No.	Indicators	Value Score	Σ Respondents	Σ Score	%
1	The procurement of the activity is clear and understandable	5	4	20	7,84
		4	21	84	41,18
		3	23	69	45,10
		2	3	6	5,88
		1	-	0	-
	Total 1			**179**	**100,00**
2	The procurement of activities to support the personal goals of farmers	5	4	20	7,84
		4	30	120	58,82
		3	13	39	25,49
		2	3	6	5,88
		1	1	1	1,96
	Total 2			**186**	**100,00**
	Total 1+2			**365**	**Agree**

The data in table 4 about the procurement of the activities is clear and understandable shows a number of 49.02% of respondents said they agree and strongly agree, as many as 45.10% of respondents said they were quite agree, and 5.88% of respondents said they did not agree if the objectives of the activity were clear and understandable. The purpose of extension activities is improving farmers' behavior which is a manifestation of a person's knowledge, attitudes and skills that can be observed by other people / parties, either directly or indirectly in terms of applying innovation. The purpose of extensioning from each activity held by the extensionist is clear and can be understood by respondents. Whereas respondents who said that the purpose of each extensioning held was poorly understood were believed to be due to the low level of education..

Furthermore, the farmer's perception of the procurement of activities to support the personal goals of farmers in table 4 shows that a number of 66.66% of respondents said they agreed and strongly agreed, a number of 25.49% of respondents said they quite agreed, and 7.84% of respondents said they did not agree and strongly disagreed if the purpose of the activity supports the personal goals of the farmer. In general, the farmer's perception of the procurement of activities to support the personal goals in the value category agrees with a total score of 365. This explains that the role of extensionist as facilitators can work well so that they hold extension activities that are appropriate to the personal needs of farmers and easy to implement. The role of extensionist as facilitators is the role of extensionist in supporting the implementation of the farmers' learning process well. The role extensionist is not only as providers or informants, but are more needed as motivators, dynamicators, and facilitators.

Perception of farmers to extensionist performance

The indicator to measure perceptions of extensionist performance is extensionist profiles, materials and activity methods, and the purpose of procuring activities that explain the responsiveness, responsibility, and quality of services of the extensionist themselves. Data on farmer perceptions of extensionist performance are presented in table 5.

Table 5. Perception of farmers to extension workers

Variable	Sub-Variable	Value	Information
Perception	1. Extensionist Profile	737	Agree
	2. Material and Method	545	Agree
	3. Procurement of activities	365	Agree
Total		**1647**	**Agree**

In general, farmer perceptions of extensionist performance in the agree category with an overall score of 1647. This explains that the existence of extensionist can be said both in terms of performance profile, suitability of materials and methods, as well as in the procurement of activities. This condition explains that extensionist carry out their duties and functions in the field in accordance with existing standards, namely as mediators, motivators, educators, communicators, facilitators, and mentoring / visits. Surahmanto et al. (2014) stated that the achievement of government programs is determined by the high or low performance of extensionist in the field because they are technical implementers in the field. Then Abdullah and Jaswandi (2014) stated that the performance of extensionist had a significant relationship with the achievement of Bali

cattle development programs because the performance of high extensionist would be followed by high achievement of the program, and vice versa of low program achievement indicate low performance.

Avaibility of teaching aids, and intensity of extension activities

The intensity of extension is the frequency of farmers in accessing communication channels or information about technology that can be applied in livestock business. The effectiveness of extension is the frequency of farmers in participating in extension activities as well as farmer groups. The intensity of the extension program is seen from the number of meetings with extensionist. Data on the availability of teaching aids and the intensity of livestock extension activities are presented in table 5.

Table 6. Availability of teaching aids and intensity of extension activities

No.	Description	Σ Respondents	%
1	Teaching aids		
	(-) 1 kind		21,57
	(-) 2 kind		15,69
	(-) > 2 kind		62,75
	Total		**100,00**
2	Activity intensity last year		
	(-) > 1 time		49,02
	(-) No activity		29,41
	(-) Don't know because it's not invited		21,57
	Total		**100,00**

The availability of assistive devices in extension activities can improve the effectiveness of communication, where the effectiveness of communication can be improved with the help of teaching aids. Teaching aids that are usually used during extension are whiteboards, loudspeakers, farm business manuals, leaflets, posters and photocopies of material that are explained by extensionist, and newspapers or magazines. The data in table 5 about the availability of props in the extension activities shows that 62.75% of respondents said that the teaching aids were used is more than 2 types, making it easier for farmers to understand well according to the power of receiving different information messages. Respondents also claimed to be able to hear more clearly and easily understand the information conveyed if explained through an illustration and easy to follow because the user guide is available. Yunasaf and Tasripin (2012) and Talibo et al. (2017) states that one of the important factors influencing the performance level of an extensionist is the extent to which extension activities carried out not are supported by the availability of adequate teaching aids.

The data in table 5 about the intensity of extension activities during the last 1 year shows 49.02% of respondents said more than 1 time on the year, a number of 29.41% of respondents said there were no activities, and a number of 21.57% said they did not know because they were not invited. In general the location of the extension is usually done in the village office. Most respondents said that they often attend extension activities because the location of the house is not far from the village office, they have mobile communication media that can accept invitations to activities, and are active in group activities so as to easy access to activity information. Whereas respondents who said there were no activities were believed to be because the data of the profession as a group farmer was only a formality of the activity, and usually the activities carried out at the Village Office had "sitting money" so that those involved were people around the organizing committee. Whereas respondents who said they did not know because they were not invited said that the extension activities held at the Village Office did not have any benefits because what was taught was old material that was actually known by farmers. Extension activities must be able to achieve satisfaction. Satisfaction will determine the participation of targets in the extension programs.

CONCLUDING

Farmers' perceptions of extension worker performance in the agree category. This explains that extensionist serving in their area are skilled extensionist, mastering the material, creative and innovative, and discipline extensionist in start in activities. Then the farmer's perception of the material and method is in the category of agree if the teaching aids are used in accordance with the activities, the material delivered is in accordance with the needs of the farmers, and the methods used are in accordance with the activities. While the

procurement of activities is in the category of agree if the objectives of the activity are clear to understand, and the purpose of the activities to support the personal goals of the farmer. Availability of teaching aids, most (62.75%) use more than two kinds of teaching aids with activity intensity more than 1 time a year. In general, the perception of farmers in the good category on the performance of extensionist in the pasture agroecosystem of Timor Tengah Utara District.

REFERENCES

Abdullah, A., Ibrahim, H. 2014. Perception of farmers against the performance of extensionist in the development of rice processing technology and beef cattle waste. Jitro., 1(1):99-107.

Alpianor, M., Aid, A., Mariani. 2017. The compability level of materials, methods and agricultural extension tools on farmers' participation in extension activities on rice farming in west martapura sub-district, banjar district. Frontier Agribisnis., 1(4):65-70.

Ediset., Jaswandi. 2017. extension method in the adoption of artificial insemination (ai) innovation in cattle farming in dharmasraya regency. Journal of Animal Science., 14(1):1-10.

Garcia-Martinez, A., Rivas-Rangel, J., Rangel-Quintos, J., Espinosa, J.A., Barba, C., de-Pablos-Heredero, C. 2016. A methodological approach to evaluate livestock innovations on small-scale farms in developing countries. J.Future Internet., 8(25):1-17.

Gidoi, R., Owoyesigire, B., Eneku, G., Wasukira, A., Owere, L. 2015. Farmers' perception and knowledge of crop and livestock production in Bukedi Subzone of Uganda. Journal of Biology, Agriculture and Healthcare., 5(20):30-39.

Lamarang, Z., Sondakh, B.F.J., Rintjap, A.K., Sajow, A.A. 2017. The role of extensionists to the decision of farmers in the adoption of technological innovation farms in Sangkub Sub-District, North Bolaang Mongondow District. Zootek Journal., 37(2):496-507.

Mahbubi, A. 2015. Development program of Madura as an island of cattle: sustainable supply chain management perspective. J. Agriekonomika., 3(2):94-105.

Makatita, J., Isbandi., Dwidjatmiko, S. 2014. The level evectiveness method extension development beef cattle in Buru Regency Maluku Provincy. Agromedia., 32(2):64-74.

Mangare, G., Sondakh, B.F.J., Oley, F.S., Massie, M.T. 2016. Analysis of socio-economic characteristics of educator with extension in the District Minahasa. Zootek Journal., 36(2):333-341.

Mujiburrahmad., Muljono, P., Sadono, D. 2014. Performance agricultural extension in pidie district of aceh province to implement tasks and functions. Jurnal Penyuluhan., 10(2):141-150.

Polohindang, A.F., Sondakh, B.F.J., Lainawa, J., Yumewu, J.M. 2016. Performance evaluation of field farm educator in Pineleng District Pineleng of Minahasa Regency., 36(2):429-438.

Priyanto, D. 2016. Strategies to return East Nusa Tenggara as a source of beef cattle. Jurnal Litbang Pertanian., 35(4):167-178.

Rintjap, A.K. 2015. Effective communication of information recipient in cattle farmer groups in Remboken, Minahasa District, North Sulawesi. Biodiversity Journal., 1(7):1711-1714.

Rohaeni, E.S., Hartono, B. 2014. Strategy of the sustainable development of beef cattle in Tanah Laut District, South Kalimantan, Indonesia. IOSR-Journal of Agriculture and Veterinary Science., 7(11):49-57.

Sajow, N., Sondakh, B.F.J., Legrans, R.A.J., Lainawa, J. 2014. Extension program evaluation in cattle farm business around Inonsayang District, South Minahasa Regency. Zootrek Journal., 34(2):27-38.

Sapar., Jahi, A., Asngari, P.S., Amiruddin., Purnaba, I.G.P. 2012. The performance agricultural extension workers and their impact at competence cacao farmers in four District South Sulawesi. Jurnal Penyuluhan., 8(1):29-41.

Saswita, I.M.U., Suparta, I.N., Suarta, I.G. 2013. Perception of farmers own role in imporoving knowledge and extension livestock cattle management was held at the cattle group Sekar Sari, Pangsan Village, The District of Petang, Badung Regency. Journal of Tropical Animal Science., 1(1):34-44.

Sucihatiningsih, D.W.P., Waridin. 2010. Institutional strengthening model of agricultural extension institutions in improving farm performance through transaction cost: empirical study in Central Java Province. Journal of Development Economics., 11(1):13-29.

Sumner, C.L., von-Keyserlingk, M.A.G., Weary, D.M. 2018. Perspectives of farmers and veterinarians concerning dairy cattle welfare., 8(1):8-13.

Surahmanto., Haryadi, F.T., Sumadi. 2014. The performance of agricultural field extension workers as information dissemonator, facilitator and guidance in development program achievement of Bali cattles (*Bos sondaicus*) at the District of Muna Southeast Sulawesi Province. Buletin Peternakan., 38(2):116-124.

Talibo, R., Sondakh, B.F.J., Sajow, A.A., Lainawa, J. 2017. Analysis of cattle farmers perception on the role of extension agents in Sangkub District North of Bolaang Mongodow Regency. Zootek Journal., 37(2):513-525.

Yunasaf, U, Tasripin, D.S. 2012. The Role of extension agent in learning process dairy farmer in KSU Tandangsari Sumedang. Jurnal Ilmu Ternak., 12(1):41-46.

Wirdahayati, R.B. 2010. Application of technology on improving beef cattle productivity in East Nusa Tenggara. Wartazoa Journal., 20(1):12-20.