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ANALYSIS EXTENSION PROGRAM AND DEVELOPMENT OF ARTIFICIAL INSEMINATION FORAGE PRODUCTION ON THE IMPROVEMENT OF BEEF CATTLE IN DISTRICT BONDOWOSO

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ABSTRACT

To improve farm products particulary cattle production, The goverment of Bondowoso District did through some policy : (1) extension program, (2) artificial insemination and (3) forage development.Although the program has been launched, there are still many problems occured. It is indicated by decreasing population of cattle, the declined result of artificial insemination and decreasing of meat production. The purpose of this research to find out the effect of extension program, artificial insemination and the development of forage on the increasing of beef cattle in Kabupaten Bondowoso. This research used explanatory research with Structural Equation Modeling (SEM) analysis. The result showed that the extension program didn't effect improvement of beef cattle production, but the production can be improved by artificial insemination and forage development.

Key Words: Artificial insemination, extension program, forage development.

INTRODUCTION

Development in the field of agriculture one of them emphasized on livestock development as a provider of animal protein, the raw material of fast food industry, employment and capital investment. The role of livestock potential in improving public welfare through the development and utilization of available resources of each region. Availability of resources and cattle ranchers, land for various types of forage, as well as the availability of technological innovation processing become a strong capital to meet the consumption needs of meat for the Indonesian people, potentially even become an exporter of farm products. If the potential of existing land can be utilized 50% only, the number of animals that can be accommodated up to 29 million units of livestock (ST) (Bamualim *et al.*, 2008). Province of East Java in 2011 as one of the barns beef cattle in Indonesia with a population of cattle and buffalo as much as 5:05 million. Whereas in fact in the year 2013 the population of cattle and buffaloes fell 24.2% to3.83 million head, even a decline in beef cattle population is also happening in the regency.

The program to improve the production of livestock products set the target as a benchmark of the performance of the program, but in the implementation of the program there was some lack conformity between the target and actual achievement as shown in Table 1.

Bondowoso government program in Livestock Production Enhancement results in particular cattle is done through several policies that either: (1) The awareness program; (2) artificial insemination; and (3) development of FAF (Forage Animal Feed). However, some of the programs that do not run optimally, the obstacles that arise in beef cattle farms in the regency is very important to do research analysis on the effect of educational programs, artificial insemination and expansion against Development of forage

Animal feed (FAF) to the improvement of beef cattle production in Bondowoso.

The research problems are: 1) Is there a significant positive effect on the variable extension program to increase beef cattle production in Bondowoso, 2) Is there a significant positive effect on the variable artificial insemination to the improvement of beef cattle production in Bondowoso, 3) whether there is a significant positive effect on the variable development of FAF to the improvement of beef cattle production in the regency.

The research was conducted with the aim of: 1) to analyze the effect of the extension program to increase beef cattle production in Bondowoso, 2) to analyze the effect of artificial insemination to increase beef cattle production in Bondowoso, 3) to analyze the effect of the development of FAF to the improvement of beef cattle production in the regency.

This study has several hypotheses, among others: 1) Program extension (X1) significant positive effect on improvement of beef cattle production (Y1) in the regency, 2) artificial insemination (X2) significant positive effect on improvement of beef cattle production (Y1) in the District Bondowoso, 3) Development of FAF (X3) significant positive effect on the increase in production (Y1) in the regency Scope of this study conducted in a population of breeder cattle belonging to 147 farmers groups of beef cattle in the regency totaling 1650 people, using until 160 respondents by *random* sampling. The research variables include outreach programs, artificial insemination, and the development of FAF (Forage Forage) to increase the production of beef cattle. The analysis tool using SEM *(Structural Equation* Modeling). Results are expected to gain managerial implications for policy-making in the improvement of beef cattle production in the regency.

METHODS

This study was a research explanations *(explanatory research)* that analyzes the variables based on the indicators of the most dominant dimensional. The study also included confirmatory *(confirmatory research)* which confirms the research results through managerial *implications.* Type and data sources using primary data obtained directly from respondents and secondary data obtained from research institutions and agencies or institutions involved in the research.

Table 1. Achievement of the Performance Improvement Program ofLivestock Production

No.	Performance Indicators	Year	Target		Actual%
1	Production of Meat (kg)	2008	4.215.090	3.220.486	76,40
		2009	4.299.392	2.973.862	69,17
		2010	4.389.679	3.393.676	77,31
		2011	4.486.252	3.832.495	85,43
		2012	4.589.436	4.023.092	87,66
		2013	4.699.582	3.238.096	68,90
2	Large Livestock Population (Tails)	2008	109.582	128.403	117,18
		2009	127.430	136.980	107,50
		2010	130.000	142.833	109,87
		2011	135.200	204.896	151,58
		2012	140.608	213.830	152,08
		2013	146.232	189.676	129,71
3	Births Result of AI	2008	31.936	33.116	103,69
		2009	35.230	35.941	102,31
		2010	38.994	40.329	103,43
		2011	43.673	42.752	97,89
		2012	49.351	43.456	88,06
		2013	56.280	37.239	66,67

Source : Department of Animal Husbandry and Fisheries in Bondowoso

Table 2. Characteristics of Respondents

No.	Characteristics		Total (Person)	Percentage (%)
1	Age (Years)		25-45134	83.73
2	Education Level	Junior-High	109	68.12
3	Practice Farming (Years)	0 123	-10	77
4	Total Holdings Cow (Tail)		1-6142	88.75
5	Main Job	Growers	83	51.87

Table 3. Participants Livestock Extension Program

No.	Indicator	Unit	Year		
			2012	2013	2014
1	Farmers Who Receive Counseling	Person	900	672	1200

Source : Department of Animal Husbandry and Fisheries Bondowoso (2014).

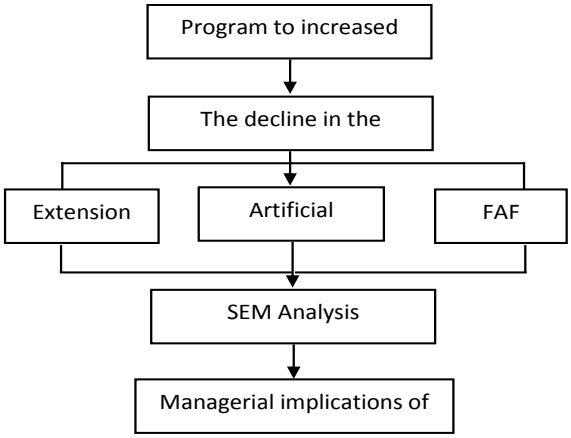

Figure 1. Framework

The location of research conducted in the District Bondowoso East Java Province. This study uses a sample size of 160 respondents. Mechanical sampling was selected with consideration of the characteristics of the respondents were relatively homogeneous. Characteristics of respondents can be seen in Table 2.

Research variables used in the analysis of the data based on an assessment of the exogenous variables (Program extension, artificial insemination and development of FAF) and endogenous variables (cattle production pieces) were obtained by questionnaire respondent statement through several indicators. The framework of this study are presented in Figure1.

Operational definition of variables study conducted an analysis based on an assessment of the exogenous variables (Program extension, artificial insemination and expansion FAF) and endogenous variables (beef cattle production) obtained by statement questionnaire respondents through several indicators, including:

- Program extension (X1)
1. Competence extension (X1.1)
2. intensity of illumination (X1.2)
3. Facilities and infrastructure extension (X1.3) (Marliati *et al.*, 2008; Sumual *et al*., 2015; Sumual *et al.*, 2008)

- Artificial Insemination Program (X2)
1. Capital (X2.1)
2. Experience breeder (X2.2)
3. Ease of communication (X2.3)
4. Timeliness of arrival officer (X2.4)
5. Skills breeder (X2.5)
6. Motivation breeder (X2. 6) (Okkyla *et al.*, 2013; Yasin 2005; Hastuti 2008, Umam *et al.*, 2012 and Hutahean and Sulistyawati, 2008)

- Expansion of land HMT (X3)
1. The availability of land for cultivation FAF (X3.1)
2. Availability of seed FAF (X3.2)
3. Availability of fertilizers (X3.3)
4. The need for labor (X3.4) (Bamualim *et al.*, 2008; Pomegranate *et al.*, 2015; Nuriyasa *et al.*, 2012 and Winata *et al.*, 2012)

- Production of Beef Cattle (Y1)
1. livestock population (Y1.1)
2. Production meat (Y1.2)
3. Number of births result of AI (artificial insemination) (Y1.3) (Diternak 2010, Siregar *et al.*, 1995 and Rustijarno and Sudaryanto, 2006).

Analysis was used to test the hypothesis in this study is a structural equation model *(structural equation Modeling* or SEM) by using the program package AMOS *(Analysis of Moment* Structure) version 18.

RESULTS AND DISCUSSION

Education Program. Counseling program for farmers in the District Bondowoso involving medical personnel (6), veterinarian (12) and AI officers (46) as an extension. The average intensity of the programs of education is still very low, on average once a year. Implementation of the program was dependent on the presence of funds from the state budget. Program outreach to farmers ever held in the form of counseling about animal health, breeding proper application of technology in the form of socialization livestock waste treatment (Bokashi).

Artificial Insemination. To support the success of the AI program, Department of Animal Husbandry and Fisheries of Bondowoso has 46 power inseminator. Characteristics of AI officers can be seen in Table 4.

The results of the artificial insemination program in the regency can be seen in Table 5.

Table 4. Characteristics AI Officer

No.	Characteristic	Education Level	Amount (Person)	Percentage (%)
1	Education Level	Junior High School / Vocational Diploma	44 1 2.17 95.66 2.17 2	
2	Old Work (Years)	0-5	5	10.87
		6-10>	4	8.7
		10	35	76.09
3	Interval Training	1-2>	26	56.52
		2	20	43.48

Source: Department of Animal Husbandry and Fisheries Bondowoso (2014).

Table 5. The Results of The Implementation of Artificial Insemination Programs

No.	Accomplishment AI	Year		
		2012	2013	2014
1	of Frozen Semen Fulfillment	64 945 doses	70,000 doses	doses 77 600
2	Result Artificial Insemination	63 075 dose of	63 420 doses of	75,285 doses of
3	Acceptors	49 069 head	50 688 head	59 944 doses of
4	Birth of	43 456 head	37 239 head	38 565 head
5	*Service per Conception* (S / C)	1.3	1.3	1.3
6	*Conception Rate* (CR)	80%	70%	70%
7	*Calving Interval* (CI)	16 months	16 months	16 months

Source : Department of Animal Husbandry and Fisheries Bondowoso (2014).

Table 6. Land FAF

No.	Indicator	Unit	Year			
			2011	2012	2013	2014
1	Forages Land	Ha	3,050	3,314	3,869	3,865

Source: Department of Animal Husbandry and Fisheries Bondowoso (2014).

Table 7. Production Development of Forage Feed (FAF) in The Regency

No.	Indicator	Unit	Year			
			2011	2012	2013	2014
1	Forages Production	Ton / Year	915 000	994 200	1.1607 million	1.1595 million

Source : Data Processed.

Development of Forage Feed (FAF). Development of forage fodder implemented by providing assistance in the form of cuttings from plants that can be cultivated as a source of livestock feed. In addition to help seed, fertilizer and also provided assistance cultivation equipment (hoes, sickles and spades). The results of forage fodder development activity can be seen in Table 6.

Production forage a cumulative production of crops for one year an area of land for planting. Feed livestock forage production (FAF) in the regency are listed in Table 7.

Results Analysis SEM.

a. Sample Size

Modeling SEM sample size that must be met for *Maximum Likelihood estimation (MLE)* is 100-200 (Ferdinand 2002). This study used a sample (10 x 16 indicators) means the number of samples 10 x 16 = 160 samples. The total sample of 160 is obtained from cattle rancher group members in the regency. So this research meets the assumption of the number of samples.

b. The Test Results *Outlier*

Criterion used is based on the value of *Chi Squares* on a variable number of degrees of freedom indicator 16 (indicators x 4 variables) research on the level (α = 0.05) amounted to 83.675. If data have distance *Mahalnobis Distance* greater than 83.675 is *Multivariate* Outliers. Results *Outlier Test* showed that the highest score of 48.159 so that in no case has a value of *Mahalanobis Distance* is greater than 83.675. It can be concluded no *Multivariate Outliers* in research data.

c. Test Normality

Normality test results or *Assessment of normality* value of -1.246 CRwhich lies between (-1.96 ≤ CR ≤ 1,96 in error (α = 0.05), so it can be said that the normal multivariate data. In addition, the data also indicated by the normal univariate all grades *Critical Ratio* among all indicators (-CR ≤ 1.96 ≤ 1.96)

d. Multicolinearity

Ghozali (2008) menyampaikan that *Multicolinearity* can be seen through the determinant of the covariance matrix. Values determinant of very small or close to zero, the indication of the presence of problems*multicolinierity* or singularity. The test results provide value *determinant of Sample Covariance Matrix* of 7.373. This value away from zero so that it can conclude that the data is not there a problem *multicolinierity* and singularity on the analyzed data.

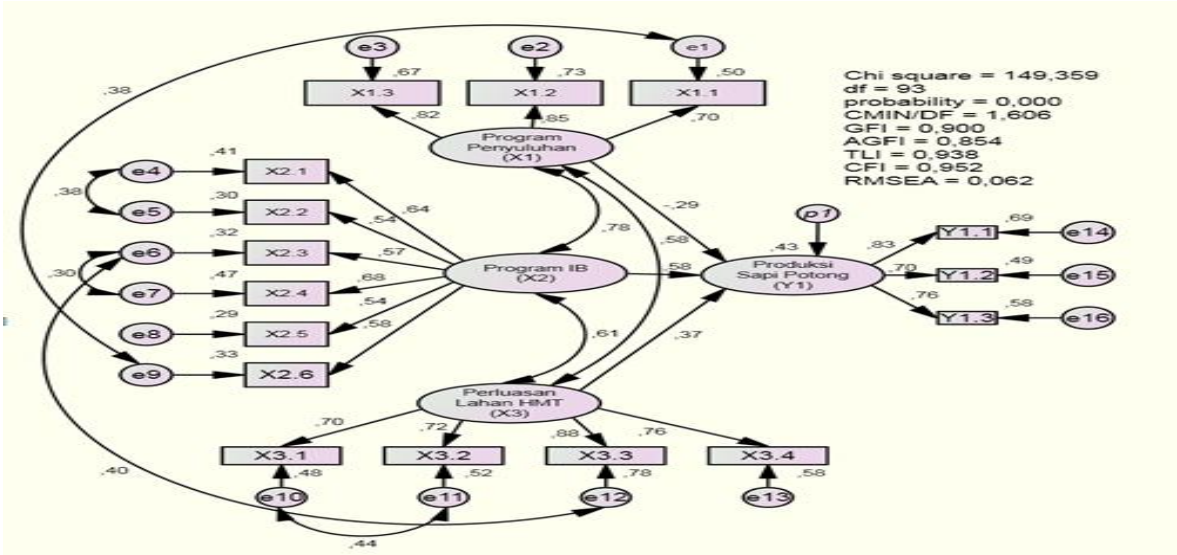

Figure 2. CFA SEM (Structural Equation Modeling)

Table 8. Test Results Suitability Index Models

Criteria	Value *Cut Off*	Calculation Result	Description
Chi square	smaller Expected 183 311	149.359	Good Fit
significant Probability	≥ 0.05	0.00	MarginalFit
RMSEA	≤ 0.08	0.062	Good Fit
GFI	≥0.90	0.90	Good Fit
AGFI	0.90 ≥	0.854	Marginal Fit
CMIN / DF	≤ 2.00	1.606	Good Fit
TLI	≥0.90	0.938	Good Fit
CFI	≥ 0.90	0.952	Good Fit

Table 9. Causality Test Results Endogenous and Exogenous Variables

Variable / Indicators Research			Path Coefficient	CR	Probability	Description
AWARENESS PROGRAM (X1)	--->	PRODUCTION CATTLE (Y1)	-0293	- 1,594	0.111	Non Significant
ARTIFICIAL INSEMINATION (X2)	--->	PRODUCTION CATTLE (Y1)	0580	2,742	0,006	Significant
INCREASE IN PRODUCTION FAF (X3)	--->	PRODUCTION CATTLE (Y1)	0368	3,039	0,002	Significant

Table 10. Assay Results Causality Between Variables and The Dominant Indicator

Variable / Indicators Research			Path Coefficient	CR	Probability	Description
AWARENESS PROGRAM (X1)	--->	Intensity Extension (X1.2)	0853	10 824	0,000	Significant
ARTIFICIAL INSEMINATION (X2)	--->	The Timeliness of Arrival Officer (X2.4)	0.852	0.685	0.000	Significant
EXPANSION FAF (X3)	--->	The Availability of Fertilizers (X3.3)	0.881	10.685	0.000	Significant
CATTLE PRODUCTION (Y1)	--->	Birth Results AI (Y1.3)	0.764	9.079	0.000	Significant

Model structural equation generated by the application program AMOS version of 18:00, is to analyze the construct of exogenous against endogenous constructs simultaneously. All the indicators variables above 0.50 proved to be valid and reliable above 0.70 so that the model can be used for analysis, as presented in Figure 2.

SEM testing results obtained value *overall goodness of fit models* are presented in Table 8.

Hypothesis testing results of SEM models can be presented Table 9.

Hypothesis testing is proof of variables that have been proposed in the study. At 0:05 significant level, the results can be said to be acceptable if the value *probability (P)* of < 0.05 to the value *Critical Ratio (CR)* >2:00. Based on the results of the interpretation of each coefficient lines are as follows:

H1 : The awareness program is not affect the improvement of beef cattle production in the regency. Parameter estimation shows the coefficient value of -0293 probability value of 0.111 and the CR

value of -1594. This means that the awareness program is not affect the improvement of beef cattle production in the regency. Thus the first hypothesis can not be verified (rejected).

H2 : Artificial insemination significant positive effect on improvement of beef cattle production in the regency. Parameter estimation for 0580 shows the coefficient value probability value of 0.006 and the value of CR for 2742. This means that the artificial insemination significant positive effect on improvement of beef cattle production in the regency. Thus the second hypothesis can be verified (accepted).

H3 : FAF developing significant positive effect on improvement of beef cattle production in the regency. Parameter estimation for 0368 shows the coefficient value probability value of 0.002 and the value of CR for 3039. This means that the development of FAF significant positive effect on improvement of beef cattle production in the regency. Thus the third hypothesis can be verified (accepted).

Influence Education Program to Increase Production of Beef Cattle in Bondowoso. Based on the results of testing models analyzed in the study using *Structural Equation Modeling* (SEM) showed that the program extension does not affect the improvement of beef cattle production in the District Bondowoso. Not influential outreach program to increase beef production due to the lack of intensity of farm extension activities. This is shown by the indicator of the most dominant of the extension program (X1) is the intensity of illumination (X1.2). Of the total 160 respondents, 33% of respondents have been getting counseling about appropriate technology, 83% of respondents get counseling about prevention of infectious diseases, while respondents who received a second extension program is only 16% of respondents. Counseling programs are usually accompanied by assistance, E.g an extension of appropriate technology. More project-based counseling program that is not sustainable, so that the assistance given is considered finished when it came to the goal of breeders. The absence of monitoring and evaluation of the development of this project led to no prominent problems faced by farmers.

Extension of animal health should be focused more on reproductive health, in accordance with the opinion of Diwiyanto (2012) that the health of livestock, particularly related to reproductive organs become critical success artificial insemination (AI). The material required for the IA in terms of birth outcomes, each decreased (Table 5). 2014 birth year AI results to increase (38 565 head), but is still lower than in the year 2012. The birth of AI results Though the number of cows that follow the AI program in the year 2014 and in 2013 more than in 2012 (Table 5). The decline in the number of births AI results indicate a lack of knowledge about reproductive health. Breeders need to acquire knowledge and skills about the detection of heat, so there is no delay in marrying livestock. In addition, the decline in birth outcomes AI can also be caused by mains of beef cattle miscarried, so that AI was initially successful (occurring pregnancy), but because of a miscarriage then to fail to get chicks beef cattle.

Although the number of farmers who follow education programs each year has increased (Table 3), but because of the intensity of illumination is less, then the resulting low level of adoption farmers against extension materials. This is consistent with the results of research by Sumual *et al.,* (2015) which declared the meeting with farmers intense will affect the relations of cooperation, thereby building trust. Limitations of educational programs in Bondowoso district in addition to the intensity of its implementation is also located at the target extension. During this time the target extension is limited to members of farmer groups assisted the Department of Livestock and Fisheries Bondowoso, still does not reach farmers outside the group.

Effects of Artificial Insemination (AI) Against Increased Production of Beef Cattle in Bondowoso. Based on the results of testing models analyzed in the study using *Structural Equation Modeling* (SEM) proved that artificial insemination significant positive effect on improvement of beef cattle production in the regency. Indicators of exogenous artificial insemination (X2) factor the most influence is the timeliness of the arrival of the officers. The results of causality test the dominant influence of beef cattle production endogenous variable (Y1) is the result of birth AI (Y1.2). Judging from the result of artificial insemination, as shown in Table 5, service per conception (S / C) with a value of 1.3, quite good, because it is still below the value 2. The numbers were excellent for a normal range S / C ranges between 1.5-2.0 (NurIhsan, 1996). That is, for one pregnancy only takes 1.3 times AI services. This is related to the technical skills of officers for artificial insemination. If the terms of the experience of the officers, an average have adequate experience for the success of the AI (35%), with a tenure of more than 10 years. Officers also receive adequate training, in at least one year of training officers receive 1-2 times, even more. Thus, in terms of skills of personnel, can be said to be having problems.

If seen from the figures *conception rate* (CR) or number pregnancy rate when doing Artificial Insemination (AI) in the period and the number of certain livestock, within the period of 2012 to 2014, the rate of CR ranges between 70% - 80%. The figure actually included in the category according to both *Toelihere* (1981) that the rate of CR in cattle reared intensively ranged between 65-70%. CR in the year 2012 figure of 80%, but in 2013 and 2014 decreased to 70% (Table 5). This can be a clue is less successful in detecting estrus or ranchers may also indicate a delay in the implementation of the AI. Raising beef cattle in the regency majority of the sideline (Table 2), most farmers who were respondents in this study as the main profession of farmers (51.87%). The condition, in accordance with the opinion of *Toelihere* (1981) that the alleged pattern of maintenance affects the success of the AI in general. Intensive observation will give an opportunity to the level of accuracy and detect estrus in cattle, farming as a sideline business motivation lead to low control of the cow. Supposedly breeders routinely exercise control over the livestock, control estrus in cattle should be done in the afternoon and morning, because usually beef cattle showed signs of estrus at these times.

Delays in the implementation of the AI can also result from delays in coordination between farmers and officers, or can also be attributed to late arrival of AI officer. In terms of coordination or communication, breeders did not have trouble, because most farmers have communication devices such as cellular phones. In accordance with the opinion of Umam *et al.*,(2012) that the need for ease of communication between farmers with AI officers that the success rate of insemination in cattle be more timely. However, the speed of coordination on animal lust time is not matched by timely arrival of officers. According to farmers, if breeders report their lust mark in the afternoon, AI officers came in daylight the next day. It should be a great time to AI if early signs of estrus was found late in the evening, is the time when the morning the next day. Best pregnancy rate obtained when AI is done at the time of the mid-estrus (estrus) until the end of estrus. Implementation of proper marital about 10-14 hours since the signs of estrus. In cows showed estrus mornings AI conducted on the afternoon of the next and vice versa, cows show estrus afternoon, do Artificial Insemination (AI) following morning (Vishwanath *et al.*, 2004). Old estrus or estrus in cattle is 18-19 hours with ovulation occurs 10-11 hours after estrus ends (Hafez, 2000). Punctuality for artificial insemination can be attributed to problems in the field related to the weakness of the service system, which caused difficulties reach remote areas. Of the 160

respondents 60% said that officers arrived 3-5 hours after the optimum time for AI, in other words more or less come clerk 17-19 hours after ranchers have reported early signs of estrus in livestock. Less service is caused because the officer did not have a vehicle that is in accordance with the conditions of the terrain area of Bondowoso which is largely mountainous with the condition of roads and bridges are still inadequate.

Influence Development of Forage Feed to Increase Production of Beef in The Regency. Based on the results of model testing were analyzed in the study using *Structural Equation Modeling* (SEM) proved that the development of FAF significant positive effect on improvement of beef cattle production in the regency. Effect of forage fodder development program is directly evidenced by the response of beef cattle farmers who claim that the indicator is the most dominant availability of fertilizer. Through forage development program Fodder in Bondowoso has provided assistance to farmers groups, each group getting quality seeds FAF 5000 cuttings, organic fertilizer 50 kg, 100 kg of inorganic fertilizer and cultivation equipment such as hoes, sickles and hype. But help farmers is still not adequate, especially the need for fertilizer. Forage developed land lying scattered farmers, because the use of land that is less productive, thus requiring more fertilizer than the needs of the productive land. FAF production in the regency in 2014 decreased (Table 7) than in 2013. The decline can be caused by lack of fulfillment of nutrients needed by FAF. Availability of adequate fertilizer can increase the production of FAF, FAF considering most of the land is less productive land use. In accordance with the opinion of Nuriyasa *et al.,* (2012) that the forage production can be optimized when the types and amounts of nutrients are added in sufficient quantities. Winata *et al.*, (2012) reinforces the assertion that the proper use of fertilizers and efficient would boost growth and forage production. To address the need for fertilizers, farmers need to be equipped with knowledge of livestock waste treatment so that it can be used as fertilizer. With the skill of processing manure, the farmer can meet the needs of fertilizer for FAF land independently.

Land FAF in Bondowoso many take advantage of non-productive land, such as hillsides and mountains also take advantage of the rice field or fields. Production and accretion FAF land area in the regency is not well developed, even in 2014 decreased compared to the previous year (Table 6). This trend occurs because of land conversion. To overcome the shortage of forage land in the regency, related agencies should facilitate cooperation between farmers and cattle growers group, so intertwined synergies between planters and food crops by cattle ranchers. Marsetyo (2008) stated that efforts for the provision of animal feed must be done comprehensively one obtained by the business development of integration between livestock and crops or plantation crops.

In terms of manpower requirements for the development of forage fodder, it still requires attention, since time allocated to develop the land forage is less likely, given the profession breeder is a sideline (table 2). Most cattle ranchers have a main occupation as a farmer (51.87%). Time to take care of forage land using only free time breeders. Forage breeders obtained by relying on wild grass and forage or grass field. In the opinion of Marsetyo (2008) generally breeder beef cattle farmers who grow crops, with cattle ownership levels are limited (2-5 mice). In terms of labor most of the time farmers used to cultivate the land, plant care, and little time is given to the cows.

Technology waste processing of agricultural and agro-industry waste into a complete feed is one of the efforts to improve the nutritional value of the waste (Maluyu *et al.,* 2010), Under conditions of a region has a high potential in the availability of agricultural waste such as straw (rice, corn, etc.), it would require a good strategy for the diffusion of appropriate technologies, so that the program *of upgrading* to improve the nutritional value of feed ingredients

available can be readily adopted by ranchers, and can give a maximum contribution to the production of beef cattle (Kusmartono 2008).

Managerial Implications. This study has managerial implications for policy makers in an effort to increase the production of beef cattle, namely through three approaches include:

1. Improving the performance of the extension program breeder cattle that prioritized on the most dominant indicator is the intensity of illumination, so that the program extension program is more intensive and effective.
2. It meets the needs of facilities and infrastructure supporting artificial insemination, especially vehicles AI officer. Vehicles should be adjusted to the field conditions the regency most of their area is mountainous with poor infrastructure. From the side of the farmers, in anticipation of the arrival of officers who are not on time, farmers need to be provided with the skills to detect heat, so that farmers can contact the officer earlier.
3. Development of FAF need special attention to keep pace with the success of artificial insemination. Breeders should be given the knowledge and skills to utilize farm waste as fertilizer, so the need for fertilizers can be fulfilled independently. In addition, farmers also need equipped with feed preservation technology, so when forage is abundant breeders can process and store forage to meet the needs of forage during the dry season. Extension of land FAF can also be done by working with plantation companies and the forest department.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

The study analyzes the influence of outreach programs, artificial insemination and land FAF to the improvement of beef cattle production in Bondowoso summarized as follows:

1. The awareness program is not significant positive effect the improvement of beef cattle production in the regency. Proving that the hypothesis is rejected. Extension programs are predominantly illumination intensity. While the increase in cattle production of the most dominant is the number of births IB results. Direct influence on the impact of the lack of intensity of illumination provides significant negative response to the number of beef cattle population. This requires an increase in the intensity of counseling to transfer information and technology from the breeder to the maximum extension.
2. Artificial insemination significant positive effect on improvement of beef cattle production in the regency. Proving that the research hypothesis is accepted. Indicators of variable artificial insemination is the most dominant arrival punctuality AI officer. Increased production of cattle most dominant is the number of births AI results. Directly influence the impact of the arrival punctuality AI officer significant positive effect on the number of beef cattle population. So that the arrival time clerk on time (within the period of time mating / lust), the necessary operational vehicles in accordance with field conditionsn Bondowoso most of their area is mountainous with poor infrastructure.
3. Development FAF significant positive effect on improvement of beef cattle production in regency. Proving that the research hypothesis (accepted). Indicators of land expansion FAF is the most dominant fertilizer available. Fulfillment of fertilizer in the expansion of the adequacy of the FAF provides fodder needs of cattle. In a variable increase in cattle production of the most dominant is the number of births AI results. Effect directly to the adequacy of the amount of feed by the number of beef cattle population in the long term to support increased production of beef cattle. To

offset the increase in beef cattle population will require adequate forage fodder, both in quality and quantity.

Suggestions

From the research results can be proposed several suggestions for improving the production of beef cattle in the regency, among others:

1. The government needs to increase the role of extension workers farm so that it can be spearhead the dissemination of information and technology for cattle ranchers.
2. Improvements in infrastructure needs to be done to facilitate access for farmers to develop their business and facilitate the entry of technology related to beef cattle ranchers to the remotest regions.

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