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Anoa Conservation Model (Buballus Depresicornis) In Donggala District Central Sulawesi

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Abstract: Anoa maintenance program at the local community level is one of the activities undertaken by the community in Danpelas, Pani'i Village in fulfilling the need for animal protein product in addition to improve the local community's economy. One of the factors behind this activity is because of the activity of hunting Anoa in forest area around the village, but also because of local culture factor. In the line of above problems, then conducted a study with the aim to analyze the behavior of society in supporting the Anoa conservation program at community level. The research used descriptive verification method through Structural Equation Modeling (SEM) analysis, data analysis was done with Partial Least Square and SmartPLS 3.00 software. Based on the result of Structural Equation Modeling (SEM) analysis, the variable endogenous construct of hunting anoa is influenced by economic exogenus (X1), health (X2) and socio culture (X3), the determinant coefficient (R-square) variable endogenous variable hunting anoa (Y1) equal to 0.778 with value of t-count equal to 26.145 and preservation anoa (Y2) equal to 0,552 with value t-count 11,839. The value of R-square (R2) variable of hunting anoa (Y1) shows that the variable can explain the influence of economic variable (X1), health and social culture of 77.8% and the rest of 22.2% influencedby factors outside the model studied, (X2), health (X2) and socio-culture (X3) on preservation (Y3) is 55.2% and the
rest 44.8% is influenced by variables outside the model under study.
Keyword:*Control Model, Hunting Activity, Anoa*

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I Introduction

1.1 Background

Anoa is an endemic species of Sulawesi, it's currently spread mainly in North Sulawesi and Gorontalo, Central Sulawesi, West Sulawesi, Southeast Sulawesi and Buton Island. While in South Sulawesi, the Anoa population is increasingly scarce even in some places these animals have experienced local extinction. In addition, these animals are also protected by Law no. 5 of 1990 on the Conservation of Biological Natural Resources and its Ecosystem. Even in the IUCN Red List of Threatened Animal (The International Union for the Conservation of Nature and Natural Resources) 2009, Anoa is categorized as a rare animal that is feared to be extinct and according to CITES 2008 (The Convention on International Trade in Endangered Species of Wild Flora and Fauna) Anoa included in Appendix I which means the animal is protected and not traded (Arini, 2013).

According to Saroyo's research, (2001), that animal meat has become a true commodity of hunting, so that fishing and hunting are widespread to Gorontalo Province. A similar case was reported Pattiselanno et al. (2008) in Papua that the hunting of animals by the community not only contributes to the fulfillment of family animal protein intake, but also an alternative source of income for rural households.

Various efforts have been made by related agencies on the activities of Anoa hunting in forest areas, but until now these activities are still practiced. The purpose of these fishing activities is due to the need for animal meat, but there are also people who hunt Anoa to be kept at the Village. Therefore, research is conducted to analyze the behavior of the community that causes the Anoa hunting activity in Donggala District, Central Sulawesi. Data and information on activities of arrest and maintenance activities of Anoa at the community level in Central Sulawesi, especially in Donggala District, have not been reported yet, though the data is very necessary as the foundation / basis of Local Government as a reference in making the policy of Anoa conservation program at the local community level in Donggala District.

II Material And Methods

This study was conducted to obtain information on the effect of hunting activities on policy regulation and its implications on the Anoa hunting control program in Donggala District. In accordance with the above purposes, the type of research used is descriptive and verificative, and case studies because this study aims to test the answers of problems that are temporary (hypothetical) based on a particular theory or empirical data (Nazir, 2003). This research uses survey method that is observation observation directly in the field, whether related to object, occurrence, process of relation and condition of society, and natural environment related to research purpose (Adimihardja & Hikmat, 2004), then sampling of respondent using random sampling method based on Mantra's reference, (2003).

Design analysis of this research refers to the purpose of research that is verification descriptive method using tool analysis of Structural Equation Modeling (SEM) or Partial Least Squares (PLS). Where in this formulation approach is integrated several factor analysis, structural model and path analysis, which can be done three activities simultaneously namely, validity and reliability test of instrument (equivalent factor of confirmatory analysis), testing of relation model between latent variable (equal to path analysis), and derive useful models for forecasts (equivalent to structural and regression models), (Solimun, 2002). In the Structural Equation Model (SEM) analysis, the number of samples taken from the population was determined at 5-10 times the number of indicator variables used in the analysis design, the sample size ranged from 0 to 100 (Hair et al., 1998, and Ferdinan, 2003) then the questionnaire will be circulated a number of 100 questionnaires.

This research using first order confirmatory model will be tested the influence of model built with SmartPLS program version 3.0 seen from loading factor value from each construct in measurement of Outer Model (measurement model). The research design that will be used in this research is hypothesis testing to prove that exogenous economic variables (X1), health (X2), and socio-culture (X3), influence endogenous variables of hunting (Y1), and preservation of Anoa (Y2). To find out how the relationship of each variable studied it will explain the object under study. The research variables are presented in Table 1.

Table 1. Research variables

Latent Variables	Indicator	Symbol
Economics (X1)	Income	X1.1
	Potential of diversification	X1.2
	More commercial	X1.3
	High price	X1.4
Health (X2)	Protein sources	X2.1
	Source of nutrition	X2.2
	Nutrition fulfillment	X2.3
	Medicinal properties	X2.4
Social Culture (X3)	Low public knowledge about animal protection	X3.1
	The role of society	X3.2
	Container role	X3.3
	The role of consumers	X3.4
The rise of poaching (Y1)	The request (Rp)	Y1.1
	Offers (Rp)	Y1.2
	The presence of a container	Y1.3
	Consumer existence (Rp / head)	Y1.4
Conservation of Anoa (Y2)	Economic value is important	Y2.1
	Typical sound	Y2.2
	Behavior	Y2.3
	Source of protein / nutrition	Y2.4

III Result

3.1. Respondents Characteristics

The socioeconomic characteristics of the community in the study sites based on age, education, experience and income are presented in Table 1. Based on the interviews, the age of the majority of respondents in the study sites was 20-40 years old (80.41%) with the frequency of 78 people, 20 years (18.56%) with frequency of 18 people. This result is in line with the Mantra statement (2000) that the productive age is between 15 to 60 years. Meanwhile, according to Garsetiasih, 2015 states that the age class of 20-49 years is included in the productive age class.

Table 2. Respondent Characteristics

No.	Indicators	Panii Village	
		Total (Person)	Percentage (%)
1	Age		
	< 20 years	18	18.56
	20 - 40 years	78	80.41
	> 40 years	1	1.03
2	Education		
	Before Primary School	15	15.46
	Primary School	68	70.10
	Junior High Scholl	14	14.43
	Senior High School	0	0.00
3	Experience		
	< 10 years	14	14.43
	10 -20 years	51	52.58
	> 40 years	32	32.99

Source: Processed Data 2017

The highest education level of the respondents was found in primary school (SD) of 68 people (70.10%), 15 and 15 (15.46%) primary school and 14.43% for junior high school (14.43%). While experience in doing hunting activities is 10 - 20 years as many as 51 people (52.58%) while over 40 years as many as 32 people (32.99%). The education of respondents is included in the low category because most of them only finish primary school. The low level of education makes the community research location. Low human resources affect the understanding of wildlife protection, especially Anoa and limited knowledge possessed. According to Gunawan et al. (2013) that the educational background determines the acceptance level of innovation and affects perception, so it can determine the success or failure of a government program.

Further According Adhawati (1997), the level of education affects a person in thinking or understanding the importance of maintaining environmental sustainability both in every activity and thinking in solving the problem. Therefore, to change the views of the community on hunting activities it is necessary to increase the knowledge and understanding of the protection aspects contained in Law No.5 of 1990 concerning the conservation of biological natural resources and its ecosystem and Government Regulation No.7 Year 1999 concerning preservation of plant species and animals through counseling or socialization and education and community assistance.

The high experience of respondents between 10 - 20 years is due to their experience in hunting activities and most often interact in forest areas, besides their activities that often do gardening activities around the forest area and take forest products such as honey, *Enau* and rattan. According to Garsetiasih, 2015, the function of forest as an object to be utilized such as nature tourism, take honey and wood. The hunting experience for the Kaili ethnic community is derived from the generation of generation, where the activity has become a culture in meeting the need for protein of animal origin.

Not only traditional hereditary cultures and can improve the economics of rural communities, the hunting of animals in tropical forests is also a fundamental need for traditional communities to survive (de Vos, 1973; Eltringham, 1984; Redford & Robinson, 1987). When hunting activities are able to provide valuable products to consumers, animals are then considered a source of family income (Hart, 1978, Pattiselanno, 2003). Furthermore, according to Pattiselanno and Mentansan, (2010) traditional / local wisdom is a social, political, cultural, economic and environmental system within the local community. It is dynamic, sustainable and acceptable.

3.2. Structural Equation Model Analysis

Data processing techniques using Partial Least Square (PLS) SEM method requires two stages to assess the Fit Model of a research model (Ghozali, 2014). Criteria using SmartPLS is done by assessing outer model based on value of Convergent Validity, Discriminant Validity and Composite Reliability, Convergent validity of measurement model with reflexive indicator is judged by correlation between estimated item score / component score. Individual reflexive sizes are said to be high if they correlate more than 0.70 with measured constructs. However, according to Ghozali, (2014) for the initial stage of development of measurement scale of loading values of 0.5 to 0.6 is considered sufficient. In this research will be used the load factor limit of 0.60. The stages are as follows:

3.2.1. Validity test

In Figure 1, the result of the structural equation model analysis was obtained by the value of the loading factor of all variables satisfy the convergent validity with the suggested value is above 0.60. Thus, it can be concluded that the convergence validity of the exogenous construct variable X1 consisting of income indicators (X1.1), diversification potential (X1.2), more commercial (X1.3) and high price (X1.4) is expressed "valit ". Furthermore, the value of factor loading on health construction variable (X2) with indicator of protein source (X2.1), nutrient source (X2.2), nutrient fulfillment (X2.3), and drug efficacy (X2.4) obtained value of 0.888, 0.929, 0.938, and 0.878> 0.60. So it can be assumed that the construct variable is eligible convergant validity and declared valid.

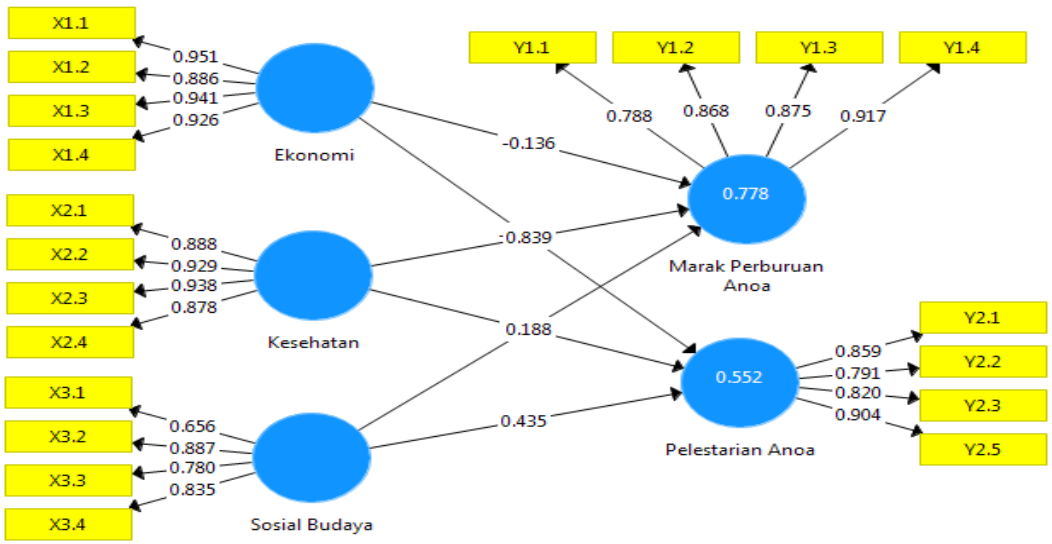

Figure 1.The Result of The Structural Equation Model Analysis

Furthermore, socio-cultural construct variables (X3) were obtained by factor loading factor with low indicator of community knowledge (X3.1), community role (X3.2) and container role (X3.3) and consumer role (X3.4) 0.656, 0.887, 0.780 and 0.835> 0.60. This indicates that the construct variable is eligible for convergence validity and it was valid. The factor loading value for the variables of hunting Anoa (Y1) consisting of indicators: the demand (Y1.1), there is supply (Y1.2), there is a container (Y1.3) and there consumer (Y1.4) obtained value of 0.788, 0.868, 0.875 and 0.917> 0.60, so it can be concluded that the variable is valid. The factor loading values for Anoa conservation construct variables (Y2) as measured by important economic value indicators (Y2.1), voice characteristics (Y2.2), behavior (Y2.3) and protein / nutrient sources (Y2.4) obtained values of 0.859, 0.791, 0.820 and 0.904> 0.60 respectively, meaning that the variable is dominantly influenced by the need for protein source of animal origin, so that it qualifies the convergence validity, and is it valid.

Based on Figure 1, the result of the analysis obtained factor loading all indicators of these variables meet the recommended conditions and can explain the endogenous constructs. The value of the discriminant validity of all indicators in the exogenously latent construct is valid and has satisfied the convergent validity. The model of structural equation (inner model) and equation of measurement (outer model) through reflective model equations based on path estimation yield outer loading correlation / correlation value between latent variable with indicator has strong correlation with latent variable. The next stage is the evaluation of Goodness of Fit criteria.

Table 3. Value of Discriminant Validity

Variables	X1	X2	Y1	Y2	X3
Economics	0.926				
Health	0.931	0.909			
RampantAnoa Hunting	0.818	0.879	0.863		
Conservation of Anoa	0.706	0.715	0.516	0.845	
Socio-cultural	0.918	0.885	0.806	0.727	0.794

Description: SmartPLS Data Processing Result, 2017

Based on Table 3 above, the loading factor values for each indicator of each latent variable still have a loading factor value that is almost as large as the loading value when associated with other latent variables. This means that each latent variable has good discriminant validity in which some latent variables still have a high correlation meter with other constructs. So it can be concluded that the largest cross loading is in the construct it formed and the research indicators meet the discriminant validity.

3.2.2. Test Reliability

The recommended reliability test is to use composite reliability in testing the reliability of a construct (Ghozali, 2014). The reliability test is performed by looking at the composite reliability value of the indicator block measuring the construct with the recommended value above 0.60. The result of composite reliability will show satisfactory value if above 0.60. Based on the analysis results obtained composite reliability values for X1 constructs of 0.960, X2 of 0.950, Y1 of 0.921, X3 0.908 and Y2 of 0.871, as in Table below.

Table 4. Composite Reliability Results

Construct	Average Variance Extracted (AVE)	Composite Reliability	Rule of thumb	Status
X1	0.858	0.960		Reliabel
X2	0.826	0.950		Reliabel
Y1	0.745	0.921	0.7	Reliabel
X3	0.713	0.908		Reliabel
Y2	0.631	0.871		Reliabel

Description: SmartPLS Data Processing Result, 2017

Table 4 shows that all latent variables (economic, health, rampant Anoa hunting and socio-culture and aqua preservation) have values greater than 0.60. This means that all latent variables have a consistently excellent level of reliability or satisfy the reliability test. According to Wiyono (2011) that a latent variable is considered reliable if the value of its composite reliability is above 0.70. The AVE value in this study shows AVE values above 0.60. Therefore, that indicator of the observed variables can explain the influence of latent variables well, thus meeting the requirements of convergent validity.

3.3. Structural Model Testing (Inner Model)

In the structural model of PLS, R-square value is used to measure the level of variation of exogenous variables changes to endogenous variables. The higher the R-square value means the better predicted model of the proposed research Based on Yamin and Kurniawan, (2011) that the criterion of the R-square value limit can be classified in three classifications, ie R-square 0.67, 0.33, 0.19 as substantial, , moderate and weak. The structural model is evaluated by looking at the R-square value which is a goodness-fit model test, to find the answer to the hypothesis proposed in the research by showing the t-statistic value and the R-square value.

The result of the analysis shows that R-square value in variable of hoards of anoa hunting obtained value of 0.778. This means that the influence of economic variables (X1), health (X2) and socio-cultural society (X3) on the rise of community hunting activities give a strong influence or equal to 77.8% and the remaining 22.2% influenced by variables outside the model under study. Similarly, the value of R-square in conservation variable (Y2) is 0.552 which means that the influence of economic variable (X1), health (X2) and socio-culture (X3) gives moderate effect with the value of 55.2% toward anoa conservation variables and the rest 44.8% is influenced by other variables outside the model under study.

Table 5. R Square Value

Variable	R Square
Anoa Hunting Rampant	0.778
Anoa Conservation	0.552

Description: SmartPLS Data Processing Result, 2017

Based on these results, it can be concluded that local government policy in community-based anoa conservation program gets a good response at local community level. The support response is influenced by economic and socio-cultural factors through the maintenance of anoa at the local community level. According to Semiadi, (2017) In Malaysia, the belief in the new potential of livestock diversification by using wild animals through the development of deer farm industry on a large scale, in addition to the economic value contained in it that can increase the source of income of local communities.

3.4. Hypothesis Testing

Hypothesis test will be done with alpha level 0,05 and t-table = 1.96. The research hypothesis to be tested states that there is a positive direct effect of anoa development activity on the rise of hunting. The statistical hypothesis to be tested is: H0: γiηξi> 0: and H1: γiηξi <0. The result of the structural model analysis is evaluated by looking at the R-square value and it is known that the research model is moderate on the proposed hypothesis.

Table 6. Path Coefficients (Mean, STDEV, T-Statistics)

Variabel	Koefisien Jalur	T-hitung ≥ 1.36	Keterangan
Ekonomi -> Marak Perburuan	-0.136	0.815	Ditolak
Ekonomi -> Pelestarian	-0.002	0.006	Ditolak
Kesehatan -> Marak Perburuan	0.839	6.022	Diterima
Kesehatan -> Pelestarian	0.331	1.082	Ditolak
Sosial Budaya -> Marak Perburuan	0.188	1.435	Diterima
Sosial Budaya -> Pelestarian	0.435	2.126	Diterima

Description: SmartPLS Data Processing Result, 2017

Based on the above table, that between economic variables (X1) with the rise of hunting anoa (Y1) is not significant with t-count 0.815 <(1.36) and the coefficient value of the path is -0.136. The negative value indicates that the higher the value of economic variables will cause the lower the variable value of the rise of Anoa hunting. Therefore, economic factors do not affect the rise of hunting anoa, so declared hypothesis is **declined**.Result of analysis of economic variable (X1) to preservation variable (Y2) showed negative effect also with coefficient value of -0.002 and t-hitung 0.006 <(1.36). The negative value of the path coefficient indicates that the more tingga the value of the economic variable will cause the lower the value of preservation of anoa in the research location. Therefore, between the economic factors of hunting are not significant in the 5% confidence interval, so the hypothesis is **declined**.The result of health variable analysis (X2) with hunting (Y1) showed a positive influence, and significant at 5% confidence interval with path coefficient value of 0.839 with t-count 6.022> (1.36), so hypothesis is **accepted**. The positive value of the path coefficient indicates that the higher the value of health will be the higher the value of widespread hunting.The result of health variable analysis (X2) to the preservation variable (Y2) obtained by the coefficient value of 0.331 with the value of t-hitung 1,082 <(1.36). These results show a positive but insignificant effect on the 5% confidence interval, so the hypothesis is **declined**. This means it can be assumed that the higher the health value will be more the preservation of anoa in the research location.Result of analysis of social culture variable (X3) on the rise of hunting anoa (Y1) have positive and significant influence on 5% confidence interval. The value of path coefficient obtained for 0.188 and t-count value 1.435> (1.36), so the hypothesis is **accepted**. These results indicate that socio-cultural factors influence the occurrence of anoa hunting activity.Result of social culture analysis variable (X3) to conservation variable (Y2) obtained by coefficient value of 0,435 and t-count 2,126> (1.36). These results indicate that the socio-cultural variables have positive and significant influence on the 5% confidence interval, so the hypothesis is accepted. This means that the higher the value of socio-cultural factors will increase the Anoa conservation program at the local community level.

IV Conclusion

4.1 Conclusions

Structural model testing results using SmartPLS 3.0 indicate that the model built in the research is fit but from the results obtained on hypothesis testing proposed not all hypotheses are acceptable, some are not accepted. The results of the above tests and analyzes, concluded several things, among others:

1. The influence of economic variables on the rise of Anoa hunting and preservation is negative and insignificant.
2. In the health variables on the rise of hunting Anoa is positive and significant, as well as health of Anoa conservation is positive, but not significant.
3. The influence of socio-cultural variables on the rise of Anoa hunting and preservation is positive and significant.

4.2 Suggestions

1. To control the activities of Anoa hunting in Panii Village needs to be socialized and counseling from relevant agencies about the aspects of animal protection.
2. To prevent the occurrence of hunting activities need to be accompanied to the community. Communities need to be involved in Anoa maintenance program in an integrated and sustainable way around the village area to be used as ecotourism activities, education and education of species that cannot directly improve the community's economy.
3. Community-based Anoa breeding program ex-situ in Anoa conservation efforts through a comprehensive approach by involving local government, community, non-governmental organizations.

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