



The Influence of Subjective Norms on Farmers' Behavior in Handling Goat Waste

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ABSTRACT

Waste treatment (WT) was one way to increase the income of small-scale goat farmers. Many factors influence breeders to adopt technology, including the subjective norm (SN) factor. This study aims to determine the effect of subjective norms (SN) consisting of the influence of informal leaders (IL), Family (F), extension (E) /Training Officer (TO), and peer groups (FG) or farmer neighbors (FN) on the behavior of farmers in feces waste treatment (WT). The research was carried out in West Sulawesi Province, precisely in Polman and the Majene Regencies, which were goat farming centers. The respondents were 50 in the Majene district and 100 in the Polman district. The determination of the sample was carried out randomly at the location of the goat breeding center (GBC). The research variable consisted of the behavior of farmers in adopting technology (AT), which consisted of five levels: feces disposed of (score 1), not processed and used alone (score 2), not processed and sold (score 3), processed and used alone (score 4). It was processed and sold (score 5). Independent variables consisted of subjective norms, including the Community Leader (CL) (X1), Family (F) (X2), Extension Workers (EW) or Technical Officers (X3), and Neighbors (N) or colleagues (C) influence (X4). The linear regression model was used to predict the F-test and t-test. The results showed that SN affects breeders' behavior in processing goat livestock waste (GLW). The variable influence of EW, F,

and N was a component of SN that influenced the behavior of breeders, to increase the adoption of WT technology, the role of EW must be increased in assisting farmers in adopting WT technology.

Keywords: Goat, subjective norm, adoption, extension officer, Family member

INTRODUCTION

Goats are an alternative source of livelihood for Indonesian people. It only requires a little land and capital for its development compared to other ruminant livestock. In addition, the goat has a captive market in the form of needs for Qurban and Aqiqah for Muslims and other religious and customary ceremonies.

However, in its development, the goat farming business is carried out traditionally as a side business. The business scale of breeders on the island of Alor, one of the goat centers, is dominated by business scales of 4-10 heads [1]. In Jeneponto Regency, a center for goats in South Sulawesi, the breeder's business scale ranges from 3 to 50 heads per breeder [2]. The income breeders receive is also low, IDR 1,810,950/year [3], which needs to be increased to meet the needs of breeders and their families.

Several ways can improve the performance of the goat farming business in its contribution to increasing farmer income; several methods can be done, such as income from sources other than livestock. In the goat farming business, one source of income that has yet to be optimized is goat livestock waste, feces, and urine. Feces and urine can be a source of additional income because they can be used as fertilizer, producing better crops than without organic fertilizer from goat livestock waste (GLW) [4], [5].

Implementing GLW into organic fertilizer at the farmer level is still diverse. [6] Elisia's research results state that goat farmers with intensive rearing systems adopt WT quite well because of the ease of collecting feces. Likewise, Hidayah et al. [7] found that 76.47% of dairy GB adopted WT. However, according to research by Wahyuningrum et al. [8], solid and liquid and liquid organic fertilizer processing technology adoption is still low (0-38%). Andriani and Maruapey's [9] research also shows that only five farmers directly adopted compost processing from goat manure in Mamuju, West Sulawesi.

Polman and Majene Regencies are two goat livestock centers (GLC) in West Sulawesi Province. The total population of goats in The Polman district reaches 93.283 heads, while in the Majene district, it is 75.570 heads. Various maintenance systems ranging from extensive, semi-intensive, and intensive are carried out by breeders in the two regions. Adopting waste processing technology into organic fertilizer is essential to increase the income of goat farmers.

The factors that influence the adoption of technology by breeders consist of many things. One that is important and has been widely researched is the psycho-social influence on the intention to behave for breeders [10]. Social psycho consists of 3 leading indicators: attitude (A), subjective norms (SN), and control behavior (CB). This one factor, the emotional norm factor (ENF) is significant for small-scale farmers (SSF) because environmental factors (EF) largely determine their behavior. Borges *et al.* [11] stated that the decisions of farmers to adopt improved natural grassland are F, N, traders (T), and workers (W) where they buy their agricultural inputs (AI), EWs,

and finally, the government (G). Baba *et al* [12] stated that the influence of F and N is a subjective norm factor (SNF) that influences the farmer's behavior in adopting the use of straw as feed. This study aims to determine the effect of SN on the breeder's behavior in processing goat livestock waste (GLW).

MATERIALS AND METHODS

This research was conducted in West Sulawesi Province in two districts, Polewali Mandar (Polman) Regency and Majene Regency. These two regencies are goat farming centers in the West Sulawesi province. The research was carried out from February to April 2023. The research method used was a survey using a questionnaire for data collection by trained enumerators. The study population was goat farmers in goat breeding centers (GBC) Campalagian sub-district in The Polman district and the Pamboang sub-district in the Majene district. The samples were 100 people in the Polman district and 50 in the Majene district, which were determined by simple random sampling.

The research variable includes the behavior of farmers in handling waste, which is the dependent variable (Y). The independent variable uses the "Theory of Planned Behavior" proposed by Arkes *et al.* [10], where one part that determines the behavior of farmers is the social pressure of farmers, including the influence of the external environment of farmers, which determines the behavior of farmers in processing waste. Subjective norms include the effect of CL (X1), the influence of F (X2), the power of EWs or TO (X3), and the influence of N or colleagues (X4). Variable farmer behavior in processing waste based on the level of feces left/disposed of (score 1), not processed and used for itself (score 2), not processed and sold (score 3), processed and used itself (score 4), and processed and sold (score 5). Subjective norms are measured based on the Likert scale of very unimportant (score 1), trivial (score 2), moderate (score 3), critical (score 4) and significant (score 5). Data were analyzed using inferential statistics in the form of the F-test for the simultaneous test and the t-test for the independent test of each variable. The model used is multiple linear regression with the following formulation:

$$Y = \alpha + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \varepsilon$$

Where:

Y = Farmer behavior in processing waste (score)

α = Intercept

β_1-4 = X1-4 Coefficients

X1 = Influent from CL (score)

X2 = Influent from F (score)

X3 = Influent from E/TO (score)

X4 = Influent from N or colleagues (C) (score)

RESULTS AND DISCUSSIONS

Farmer Characteristics

The characteristics of GBs in West Sulawesi Province are generally the same as those in Indonesia a side business managed jointly with other farming businesses (FB). The age of GBs in the province of West Sulawesi is dominated by the productive age, which is 18 to 58 years, as much as 84.33%. The same thing was also expressed by the same thing, who said that the age of GBs in Jeneponto is also productive. However, regarding formal education, breeders in West Sulawesi are dominated by breeders with low education (junior high school and below) 74% (Table 1). The same is true of Prabowo and Widodo's [14] findings which state that the educational characteristics of GBs in Manoreh Hill are also dominated by low education. The number of F members who are potential sources of F labor to manage their livestock farming (LF) is 1-4 people per F. The experience of livestock breeders (LB) in West Sulawesi is dominated by breeders who have raised for more than five years by 78.67%, which indicates that goat farming (GF) has been carried out for quite a long time. However, the business scale of breeders is dominated by businesses under ten, as many as 84.7% of breeders. The same thing was found in Central Java, where the business scale of breeders was dominated by less than eight heads [15].

Table 1. Farmer Characteristics in West Sulawesi Province

No	Characteristics	Total	Perc.
1.	Age (years)		
	18 – 38	47	31.33
	39 – 58	80	53.33
	>58	23	15.34
2.	Education level		
	No or Elementary School	91	60.67
	Junior high school	21	14.00
	Senior high school	32	21.33
	Higher education	6	4.00
	Family member (people)		
	1 - 4	116	77.33
	4 – 6	30	20.00
	>6	4	2.67
3.	Farm experience (years)		
	1 – 4	32	21.33
	5 – 8	37	24.67
	>8	82	54.00
4.	Number of goats		
	1 – 5 heads	55	36.70
	6 – 10 heads	72	48.00
	>10 heads	23	15.30

Farmer's Behavior in Utilizing Goat Feces and Urine

There are no farmers who use goat urine as fertilizer. However, goat feces (GF) are generally used by itself (80%) either after being processed into organic fertilizer (OF) (36%) or not through processing (44%). There are 10% of respondents who do not use goat feces (thrown away), and only 6% have processed and sold it commercially (Table 2). Farmers who process feces waste into OF are only 42% of the total breeders. Breeders who do not use goat feces are breeders on a scale of 1-3 tails with a semi-intensive rearing system; goats are kept in pens at night and released during the day in grazing areas prepared by breeders.

Organic fertilizers (OF) derived from goat waste (GW) are suitable for fertilizer for plants [16], but the adoption of solid and liquid organic fertilizer processing technologies (LOFPT) from goats is still low [8]. Efforts to increase the adoption of goat fecal waste processing technology (GFWPT) can be carried out in various ways, such as intensification of counseling and demonstration plots for breeders, improving management, and increasing farmer awareness of the benefits of managing GF waste.

Table 2. Farmers' Behavior in Utilizing Goat Feces

No	Description	Frequency (n = 150 Resp.)	Percentage (%)
1	Feces left/disposed	15	10
2	Not processed and used for itself	66	44
3	Not processed and sold	6	4
4	Processed and used itself	54	36
5	Processed and sold	9	6

The Effect of Subjective Norms on the Behavior of Farmers in Processing Waste

Subjective norm is the farmer's perception of social pressure on how they should behave [10], [11], [17]. In this study, the social pressures received by farmers in conducting were divided into four: pressure from informal leaders in the community, pressure from close F (wife/husband or main F members), pressure from EWs or TO, and pressure from nearest N.

The results showed that the effect of SN on the farmer's behavior in processing waste was quite strong, with an R-value of 0.442. The contribution of the independent variable, the SN consisting of the influence of other breeders, close F, EWs, and N, is 13.5% towards changes in the behavior of farmers in processing waste (Table 3). The results of the partial test showed that the EW/technical officer was the main SN factor that influenced the behavior of farmers in processing waste ($P < 0.001$), followed by the influence of close F ($P < 0.027$) and the influence of N ($P < 0.045$).

EWs or technical assistants are one of the primary references in behavior for GBs in the province of West Sulawesi. The high intensity of visits to serve the needs of breeders, both in terms of livestock health management, technology assistance, and facilitation in product marketing, causes breeders to have a high dependence on technical assistance. In Polman District, a cooperative cooperates with international NGOs to serve breeders by integrating livestock with

cocoa. This activity has been running for three years, so the farmers feel motivated to participate in the cacao integration program with goat farming. A close relationship has been established between the farmer and the EW so that the farmer feels obliged to follow the instructions from the EW. This research aligns with the opinion of Zamasia *et al.* [18], states that EWs are one of the determinants of farmer behavior in the intention to adopt the new technology. EWs serve farmers' needs for new technology, connect with other sources of information, and conduct training for breeders to increase breeder knowledge [19], [20]. Intensive relationships between breeders and EWs, either through direct communication or by using the media, involve several aspects such as psychological aspects, aspects of social cohesion, and aspects of social interaction so that they influence farmers in the behavior [21].

Table 3. Descriptive Statistics for The Independent Variable

Variable	Coefficient	Std. Error	p-value
I treat waste because CL expect me to do it	-0.182	0.065	0.171 ^{ns}
I treat waste because of encouragement from my F.	-0.294	0.057	0.027*
I treat waste because of the influence of EWs/TO who accompany me	0.402	0.049	<0.001**
I treat waste because my N expect me to treat waste	0.227	0.064	0.045*
Constanta	2.831	0.153	<0.001

Noted: N = 150, R = 0.442, adjusted R Square: 0.135. Significant levels: >0.05 significant and > 0.01 very significant.

The role of F members in the livestock business in Indonesia is enormous. Apart from being a source of labor, a large number of F members will increase the motivation of farmers to carry out additional business to meet the needs of large families [22], [23]. In West Sulawesi Province, goat farming is a side business for F farmers, characterized by a small business scale (Table 1). Apart from raising goats, the farmer manages a cocoa and vanilla plantation business. The Goat farming business attempts to increase income so F's needs can be met. F members such as wives and children are tasked with helping the F manage the goat farming business, for example, providing feed, cleaning the stables, collecting and processing feces, and other activities in the stables. Opportunities to increase income from goat farming by processing fecal waste into organic fertilizer have caused other F members to encourage the head of the F to adopt WT technology.

The farmer's behavior in processing feces into organic fertilizer is not only caused by economic factors but also by social factors. If the community in the surrounding environment (social network) adopts the technology, it will be easy for farmers to follow their N to adopt a healthy [24], [25]. The results showed that GBs in West Sulawesi province processed feces into organic fertilizer influenced by N who were also breeders. In areas with a dense population of breeders, they tend to process feces into organic fertilizer compared to areas where breeders are rare [26]. By seeing their N doing WT, other breeders will also do WT. This study's results align

with Qiao *et al.* research [27], which states that farmers who use organic fertilizers are influenced by their N who have also used them on their agricultural land.

CONCLUSION

There are five levels of farmer behavior in managing waste: left and disposed of, not processed and used for itself, not processed and sold, processed and used, and processed and sold. The subjective norm factors influencing farmers in adopting waste treatment are extension workers, Family, and support from other farmers. To increase the adoption of feces treatment, the role of the Extension Worker as a facilitator must be expanded.

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