

# Typology and Characterization of Siompu Goat Production Systems in Siompu Island, Southeast Sulawesi, Indonesia

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## ABSTRACT

Siompu goat is one of local breeds that are bred and kept well in Siompu Island, Southeast Sulawesi. Siompu goat farming has contributed to the local economic and social development. This study aimed to explore the typology and production characteristics of Siompu goat farms. The study was conducted at 38.62 km<sup>2</sup> areas of Siompu District, Siompu Island, Buton Selatan regency, Southeast Sulawesi using purposive sampling method. The selection of interviewees was conducted by purposive and snowball sampling methods. Survey by questionnaires was done to 37 Siompu goat farmers. The data collected were categorized into 7 groups: age and farming experience length; educational background; workers; social profile; purpose of goat farming and financial support; farming system and pen management; and feed and grazing management. The data collected were analysed descriptively by calculating the percentage of each variable. Results of the study show that the typology of Siompu goat farms is traditionally managed; small-holding farming system and the management system based on habits from generation to generation. The results also show low educational background of farmers, the absence of bank investment, the absence of farmers' organization, and the lack of training for improving the farmers' skills. The production system is dominated by semi-intensive system (48.65%), followed by intensive system (43.24%), and extensive system (8.11%). The average number of goats per farmer is 11 heads and there is low technology application either on pen system or feeding..

**Keywords:** *Siompu goat, local goat, small-holding farm, feed technology.*

## 1. INTRODUCTION

Small ruminants (goat and sheep) hold important roles in improving farmers' social and economic welfare in developing countries in order to fulfil the nutrition, income, and abstract function (such as savings, insurance, cultural and ceremonial functions) [1]. The purposes of animal farming in small-holding farm are mostly for basic family needs, to be sold, manure production, as insurance, unexpected case of cash need, and for social status [2]. Small-holding farms also play role in aiding the farmers in production diversification, reducing agricultural risk, and creating opportunities for

marginal sources utilization such as agricultural by-products [3]. Small-scale farmers worldwide maintain their livelihood by animal production farming in facing unexpected situation [4]. The trading of small ruminants such as goats contributes significantly to family income and acts as main livelihood in village population [5].

In Indonesia, small ruminants play important role in economic status especially for farmers living in dry land and archipelagos. The main purposes of goat farming are meat production, saving assets, also religious and cultural rituals needs. The goat farming business is supported by suitable climate and abundance grassland

and other natural resources [6]. Siompu goat is local breed that is traditionally kept and well developed in Siompu Island of Southeast Sulawesi. Siompu Island is the center of Siompu goat development and widely known as goat breeding source at Buton archipelagos, Southeast Sulawesi. Siomu goat farming has been practiced traditionally by Siompu Island people for generations.

Goat farming business plays important roles in developing rural area and as strategy to broaden the development in order to decrease the gap between cities and rural area. Rural area development will not succeed if the government ignores the agricultural sector; meanwhile agricultural development is highly correlates to rural area due to the farmers and agricultural lands located in rural area [7]. The difference in views of small-holding farming system may obstruct effective animal husbandry policy making in order to increase the farmer's social and economic welfare [4].

This study aims to explore the typology and production characteristics of Siompu goat farms business at Siompu Island, Southeast Sulawesi. The information gathered in this study is critical as the baseline for creating the strategy for sustainable farming business development.

## 2. METHODOLOGY

### 2.1 Area of the study

This research was conducted at Siompu district, Siompu Island, Buton Selatan Regency, Southeast Sulawesi. The research area was 38.62 km<sup>2</sup>. The area was chosen by purposive sampling method.

### 2.2. Data collection and statistical analyses

The data were collected by direct interview to 37 Siompu goat farmers from October until November 2019. The total goats kept by the farmers were 407 heads. The interviewee selection was based on purposive sampling in the conditions that the farmer had at least 2 years' experience in Siompu goat farming. Snowball method was applied to gather more interviewees by recommendation of one farmer to another until the number of interviewee was sufficient [8]. The farmers as interviewee answered open questions aided by questionnaires. The data collected were categorized into 7 groups: age and farming experience length; educational background; workers; social profile; purpose of goat farming and financial support; farming system and pen management; and feed and grazing management. The data collected were analyzed descriptively by calculating the percentage of each variable [9].

## 3. RESULTS AND DISCUSSION

### 3.1. General view of study area

Siompu Island is located at Southwest of Buton Island. The borders of Siompu Island are Batauga district, Buton Selatan regency at the north side; Kadatua Island at the south side; Baubau City at the east side; and Flores Sea at the west side. Siompu Island is divided into two districts: Siompu district with 38.62 km<sup>2</sup> area and Siompu Barat District with 14.58 km<sup>2</sup> area. The island's area is 53.20 km<sup>2</sup> with 22.544 populations. The land topography of Siompu Island is dominated by hills and bumpy ground. The plains are located between the hills and are potential for goat

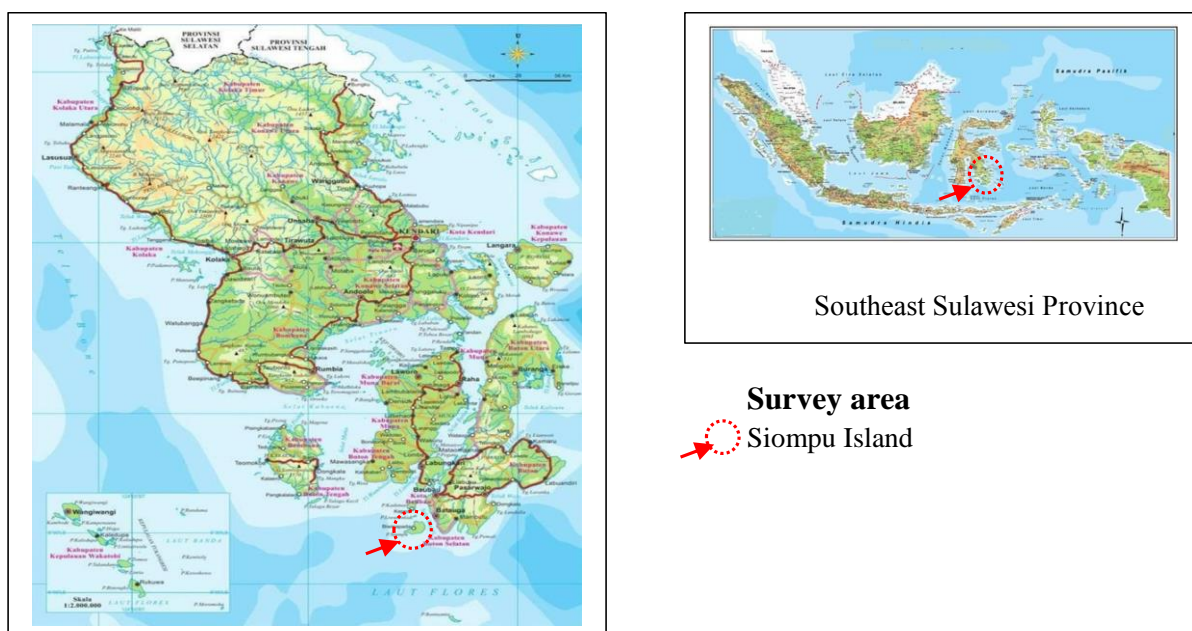


Figure 1. Geographical representation of surveyed in the Siompu Island

farming development. The climate at Siompu Island is tropical with rainy season in December to June and dry season in July to November [10], [11].

### 3.1. Siompu farmers' profiles

Survey result shows that there are 37 Siompu goat farmers located Siompu Island with the profiles shown in Table 1. There are 75.68% male and 24.32% female Siompu farmers. Female farmers' involvement in farming business is due to farming as main income of the family and those females farmers act as head of the family. Previous studies indicate that female farm workers contribute to total work load and total income in dairy cattle farm in Banyumas [12].

Total family members of goat farmers are  $4.86 \pm 1.96$ , and family members' involvement in maintaining the goat farm is  $2.30 \pm 1.24$ . The high value of family members' involvement is due to the most dominant farming system applied, which is grazing system. The average of farmers' age is  $53.22 \pm 11.35$  years old. Siompu goat farmers are categorized as productive age with farming experience average of  $12.30 \pm 11.86$  years. The difference in farming experience impact the farmers' knowledge and skills in managing the goat farm. Siompu goat farming has been practiced for generations.

The social profiles of Siompu goat farmers are shown in Table 2. The farmers' educational backgrounds are dominated by elementary school graduates followed by senior high school graduates and illiterate farmers. Junior high school and university graduates are two of the lowest number for farmers' education. Education, either formal or informal, is an attempt to develop personality and increase one's competence which continues throughout the years. Education is a process to shape the attitude, character, and behavior. The education affects positively and significantly workers' productivity [13]. Education is highly correlated to farmers' competency, and in return affects significantly business productivity [14], as shown by the higher the farmers' education, the higher their productivity [15], [16]. Education and training are forms of investments in human resource aspect of a business in order to increase the workers' productivity [17].

Sufficient level of education is important for entrepreneurship, mainly in order to maintain the business and problem-solving [18]. Higher level of education contributes to the level of knowledge and skills to manage the business. Education plays important role in the success of small-holding business [19]. Level of education directly affects farming behaviour [20] and level of technologies applied in the farm. Farmers with higher educational background are prone to understand

and assimilate new technologies and in return have higher chance to adopt the technologies [21].

**Table 1.** Farmers' age, farming experience, and numbers of workers in siompu goat farm

Variable	Mean $\pm$ DS
Farmer's age (years)	$53.22 \pm 11.35$
Farming experience (years)	$12.30 \pm 11.86$
Goat farming duration (years)	$12.30 \pm 11.86$
Family members (person)	$4.86 \pm 1.96$
Family worker (person/day)	$2.30 \pm 1.24$

**Table 2.** Social profile analysis of siompu goat producers in the Siompu Island

Variable	n	Percentage
<b>Level of education</b>		
Illiterate	5	13.51
Elementary school	21	56.76
Junior High School	2	5.41
Senior High school	8	21.62
University	1	2.70
<b>Producer training in the activity</b>		
Yes	0	0
No	37	100
<b>Place of residence</b>		
In town	0	0
In rural area	37	100
<b>Financing</b>		
Yes	0	0
No	37	100
<b>Accounting</b>		
Annual Eventual	0	0
Does not make	37	100
<b>Activeness in farmers organization</b>		
Yes	0	0
No	37	100
<b>Type of main occupation</b>		
Farmer	11	29.73
Animal husbandry	11	29.73
Fishermen	11	29.73
Civil servant	1	2.70
Artisan	3	8.11

The main occupations of Siompu farmers are 29.73% agriculture farmers, 29.73% livestock farmers,

29.73% fishermen, and the rest 10.81% government civil servants and artisans. The 29.73% farmers of Siompu Island state that goat farming is their main occupation. Goat farming as the main occupation has contributed greatly to the increase of Siompu Island people's welfare by fulfilling basic family needs, the children's education until bachelor or master degree. This condition portrays that even the dry land may not be the obstacle in achieving welfare, by good management of goat farming.

The purposes of Siompu goat farming are divided into two major purposes; which are main business (29.75%) and side business (70.27%) as shown in Table 3. Purpose and motivation affect the business productivity more than personal characteristics (age, formal and informal education, cosmopolite) [22] [23]. This can be seen from the number of goats raised by farmers which reach 11 heads and all are self-owned. The number of goats raised per farmer in Siompu Island is greater than those of Muna Barat Regency which is only 6 heads per farmer [6].

The financing for goat farming business at Siompu Island is supported by the farmers' own funding or their parents'. All farmers interviewed did not apply for additional fund from any institution (Table 3), and this was due to the scale of farms maintained were still small-scale farms which are only intended for additional

**Table 3.** Purpose, financing, accounting, organization activity, and goat ownership (n =37) of Siompu Island goat farmers

Variable	Percentage
Purpose of goat farming (%)	
- Main business	29.73
- Side business	70.27
- Saving asset	0.00
- Manure production	0.00
Business financing (%)	
- Yes	0.00
- No	100
Financial accounting (%)	
- Yes	0.00
- No	100
Activeness in farmer's organization (%)	
- Yes	0.00
- No	100.00
Total goats kept (head)	11
Goats ownership	
- Self-own	100.00

occupation, saving, or social status.

All farmers interviewed do not keep record of accounting of the farms. All farmers interviewed (100%) also do not join any farmers organization or association; which is similar to the goat farmers of Muna Barat Regency [6]. Any farmers association or organization may become the source for developing farming skills, increasing productivity [24], which in return may find solutions for the absence of training or open lecture provided by the government.

### 3.2. Production and pen system

The goat farming, breeding, and pen management systems of Siompu goat are presented in Table 4. The farming systems most applied are semi-intensive system (48.65%), followed by intensive system (43.24%) and lastly by extensive system (8.11%). The intensive farming system refers to the continuous controlled supply of feed, drinking water, and reproduction needs. Extensive farming system is the opposite of intensive system which all the goats' needs are not interfered by farmers; while semi-intensive farming system is the combination of intensive and extensive systems. In semi-intensive system application, the goats are kept at grazing plains at morning until afternoon, and then the goats are kept in pen at night. Siompu goats' farmers bring their goats for grazing at 8 AM, put their goats back in pen at 11 and provide legumes and drinking water. At 3 PM the farmers will bring their goats for grazing until 5 PM before putting them back in the pen after grazing. The farmers continuously observe the goats while grazing. The breeding system applied by the farmers is natural breeding.

There are two types of pen used by Siompu goat farmers: scaffold and ground types. Most farmers use ground floor (94.29%) for the floor type, while only 5.71% farmers use wood floor. The materials used for building the pens are locally available materials such as second-hand wood material, bamboo, and tin or coarse grass roof. The pens for herd are not divided by the physiological status, thus the kids, pregnant goats, male goats, and lactating goats are crowded in one pen. This situation may be the cause of the high incidence of diseases [25]. It would be beneficial for the farmers to separate the goats based on their physiological status.

Most farmers (91.89%) own pens for the goats, but 8.11% farmers apply the extensive farming system with no usage of pen, and the goats are left unlatched or latched to the trees around the house. This may lead to the exposure of bad weather and pathogens which can cause diseases and even death. Inadequate pen and facilities is the major cause for the failure of goat farms' production. From 91.89% farmers who own goat pens, 100% of them clean the pens regularly.

**Table 4.** The goat farming, breeding, and pen management systems of siompu goat

Variable	Percentage
Farming type (n=37)	
Intensive	43.24
Free-range (extensive)	8.11
Semi-intensive	48.65
Breeding system (n=37)	
Natural breeding	100
Artificial insemination	0
Pen type (n=35)	
Scaffold type	5.71
Ground type	94.29
Pen materials (n=35)	
Woods (pen and floor)	5.71
Wood pen and ground floor	94.29
Pen management (n=35)	
Mixed	94.29
Divided on physiological features	7.71
Individual	0
Pen cleaning (n=35)	
Yes	100
No	0
Pen cleaning frequency (n=35)	
Daily	62.86
Every 3 days	8.57
Weekly	22.86
Monthly	0
When necessary	5.71

### 3.3. Feeding system

The feeding system of Siompu goats varies based on the production system applied (extensive, semi-intensive, or intensive). In intensive farming system, the feed given is only legumes. In extensive farming system, the goats are kept outside for grazing for legumes and any other types of grass available. In semi-intensive farming system, the farmers leave the goats for grazing twice a day, at 8 AM and 3 PM to 5 PM. At 11 AM, the farmers keep the goats in the pen and provide legumes and drinking water, while at night after grazing (5 PM), there is no feed provided. The types of feeds, feeding and drinking water given frequencies are presented at Table 5.

The legumes fed to Siompu goat at Siompu Island are *lea-lea*, *sauburu*, *wintono*, *lapi*, and *kanangka-nangka* (local language). The type of grass fed is dominated by

**Table 5.** The types of feeds, feeding and drinking water given frequencies of siompu goat (n=37)

Variable	Percentage
Feed type (%)	
Native pasture + legume	64.86
Legume	35.14
Feeding frequency (%)	
Once daily	5.40
Twice daily	86.49
Foraging	8.11
Drinking water (%)	
Yes	94.60
No	5.40
Total drinking water/day (liter)	1-2

*Brachiaria decumbens* and a small proportion of coarse grass (*Cogon grass*). There are 35.14% farmers who exclusively feed legumes to Siompu goat, and the rest 64.86% farmers feed native pasture and legumes to their goats. Concentrate is not used as feed for any farmers sampled. There are 5.40% farmers who do not give drinking water to their goat even in dry season, and those give about 1 to 2 liters of water to the Siompu goats per day.

## 4. CONCLUSION

The result of this study shows that the typologies of Siompu goat farming conducted in Siompu Island consist of small-holding farming system managed traditionally and habitually from generation to generation. The results also indicate low educational background and the absence of financial aid, farmers' organization, and technical aid for development of Siompu goat farming. The production system is mainly conducted as semi-intensive system (48.65%), intensive system (43.24%), and lastly extensive system (8.11%), the average number of goat per farmer is 11 heads, and there is lack of pen and feed technology utilization.

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## REFERENCES

- [1] I.S. Kosgey, Breeding objectives and breeding strategies for small ruminants in the tropics, Ph.D Thesis, Wageningen University, 2004, 272 pp.
- [2] N.T. Kusina, Goat productivity in smallholder farming areas of Zimbabwe. Paper presented at

- the BVSc, /BADC/ITM Workshop on Health, Production and Management of small ruminants, Harare, Zimbabwe 16-18 August 2000, 10 pp.
- [3] B. Masunda, Studies on reproductive activity in indigenous cows under traditional management in the communal areas of Zimbabwe: A case study of Sanyati communal area. MPhil Thesis, Animal Science Department, University of Zimbabwe, Harare, Zimbabwe, 2011.
- [4] C. Ndlovu, R. Mayimele, O. Wutete, A. Ndudzo, Breeding of goats: An indigenous approach to enhancing opportunities for smallholder farmers in Inyathi, Zimbabwe. *International Journal of Livestock Production* 11(3) (2020) 91-101. DOI: <https://doi.org/10.5897/IJLP2019.0586>
- [5] S.T. Ben, R. Smith, A review of goat production in Zimbabwe, *Journal of the Zimbabwe Society of Animal Production* 4 (2008) 111-118.
- [6] S. Rahadi, E.D. Kusumawati, Kuswati, N. Isnaeni, L. Hakim, G. Ciptadi, T. Susilawati, V.M.A. Nurgiartiningasih, Characterization and typology of goat production systems in West Muna Regency, Southeast Sulawesi, Indonesia. *International Conference: Improving Tropical Animal Production for Food Security. IOP Conf. Series: Earth and Environmental Science* 465 012057, 2020. DOI: <https://doi.org/10.1088/1755-1315/465/1/012057>
- [7] D.N. Prihatiningrum, Penerapan sistem agribisnis peternakan kambing jawa randu dalam kerangka pengembangan wilayah Kecamatan Karangpucung Kabupaten Cilacap. *Jurnal Wilayah dan Lingkungan* 1(2) (2013) 141-56.
- [8] W.L. Neuman, *Social Research Methods: Qualitative and Quantitative Approaches* (7th ed.). Pearson Education Limited, London, 2014.
- [9] G. James, D. Witten, T. Hastie, R. Tibshirani, *An Introduction to Statistical Learning with Applications in R*, Springer Science Business Media, New York, 2013.
- [10] BPS Buton, Kecamatan Siompu Dalam Angka, Badan Pusat Statistik Kabupaten Buton, Pasarwajo, 2020.
- [11] BPS Buton, Kecamatan Siompu Dalam Angka, Badan Pusat Statistik Kabupaten Buton, Pasarwajo, 2020.
- [12] S. Mastuti, N.N. Hidayat, Peranan tenaga kerja perempuan dalam usaha ternak sapi perah di Kabupaten Banyumas. *Animal Production* 11(1) (2011) 40-47.
- [13] C. Ramayani, Pengaruh pendidikan, kesehatan, investasi pemerintah, dan investasi swasta terhadap produktivitas tenaga kerja di Indonesia. *Jurnal Pelangi* 7(1) (2014) 38-45. DOI: <https://doi.org/10.22202/jp.2014.v7i1.190>
- [14] U. Iswadi, Pengaruh kompetensi terhadap produktivitas karyawan pada PT. ISS Cabang Cilegon. *Jurnal Ekonomi Efektif* 2(4) (2020) 602-608. DOI: <http://dx.doi.org/10.32493/JEE.v2i4.10693>
- [15] Hanif, N. Rista, Pengaruh tingkat pendidikan dan tingkat kesehatan terhadap produktivitas tenaga kerja di Provinsi Sumatera Barat. *Aliansi: Jurnal Manajemen dan Bisnis* 14(1) (2019) 17-22. DOI: <https://doi.org/10.46975/aliansi.v14i1.30>
- [16] A. Ananta, H. Hafid, L.O.A. Sani, Faktor-faktor yang mempengaruhi produktivitas usaha ternak sapi bali pada peternak transmigran dan non transmigran di Pulau Kabaena Kabupaten Bombana. *Jurnal Ilmu dan Teknologi Peternakan Tropis* 2(3): (2015) 52-67. DOI: <http://dx.doi.org/10.33772/jitro.v2i3.3811>
- [17] M.P. Todaro, S.C. Smith, *Pembangunan Ekonomi di Dunia Ketiga*, Erlangga, Jakarta, 2003.
- [18] B. Alma, *Kewirausahaan untuk Mahasiswa dan Umum*, Alfabeta, Bandung, 2010.
- [19] B.P.D. Riyanti, *Kewirausahaan dari Sudut Pandang Psikologi Kepribadian*, PT. Grasindo, Jakarta, 2003.
- [20] I.M. Mulyawati, D. Mardiningsih, Satmoko, Pengaruh umur, pendidikan, pengalaman dan jumlah ternak peternak kambing terhadap perilaku sapta usaha beternak kambing di Desa Wonosari Kecamatan Patebon. *Agromedia* 34(1) (2016) 85-90.
- [21] E.Z. Monte, E.C. Teixeira, Determinantes da adoção da tecnologia de despolpamento na cafeicultura. *Revista de Economia e Sociologia Rural* 44(2) (2006) 201-17. DOI: <https://doi.org/10.22004/ag.econ.160594>
- [22] D. Fauziah, R. Nurmalina, Burhanuddin, Pengaruh karakteristik peternak melalui kompetensi peternak terhadap kinerja usaha ternak sapi potong di Kabupaten Bandung. *Jurnal Agribisnis Indonesia* 3(2) (2015) 83-96. DOI: <https://doi.org/10.29244/jai.2015.3.2.83-96>
- [23] Salju, M. Lukman, Pengaruh motivasi dan pengalaman kerja terhadap produktivitas kerja karyawan PT. Comindo Mitra Sulawesi Cabang Palopo. *Jurnal Manajemen STIE Muhammadiyah*

Palopo 4(2) (2018) 1-7. DOI:  
<http://doi.org/10.35906/jm001.v4i2.280>

- [24] M.A. Mauludin, S. Winaryanto, S. Alim, Peran kelompok dalam mengembangkan keberdayaan peternak sapi potong (kasus di Wilayah Selatan Kabupaten Tasikmalaya). *Jurnal Ilmu Ternak* 12(1) (2012) 1-8.
- [25] Maphosa, V. 1993. Assessment of worm burden in sheep and goats using the faecal egg count method. In: Sibanda L. M. (Ed) *Small Ruminant Production in Zimbabwe: prospects and Constraints*. Proceedings of a Workshop held at the Matopos Research Station, Bulawayo 19-20 August 1993. pp: 101-106.