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# Improving Livestock Productivity, Quality and Safety to Respond to the Increasing Demand from Upper and Middle - Class Consumers

## PROCEEDINGS The 5<sup>th</sup> International Seminar of Animal Nutrition and Feed Sciences

Mataram - Indonesia, 7 - 9 November 2017



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**“Improving Livestock Productivity, Quality and Safety to Respond to the  
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## Contribution of communal grazing land on providing feeds for large ruminants and its advantages for local community and government of Sumbawa District

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### ABSTRACT

The existence of communal grazing land (*Lar*, *Samawa language*, Sumbawa) in Sumbawa district, Nusa Tenggara Barat Province, has decreased both in large and quantity as the result of weed invasion and functional shift to other than livestock sector. Therefore, the quantity, area, status, forage production, botanical composition and other function of Sumbawa communal grazing land remind unidentified. This study was to identify these questionable problems by conducting survey-based research and direct measurement on the field. Regarding the result, there were 67 pastures in this district ranged between 143 Ha and 20,000 Ha in size. Of all, 7 pastures have legally registered and hold decree of Bupati. Forages for ruminant feeds produced approximately by 6.03 tonnes of DM/Ha/Year. Botanical compositions (*Lar* of Gili Rakit, Badi, and Kuang Bira) include *Heteropogon contortus* (70%), *Cyperus rotundus* (10%), *Elusin indica* (10%), and *Desmodium triflorum* (10%). The functions of communal grazing land are not limited to grazing cattle, but also as a place for cattle mating and calving, location for training and extension, collective vaccination, animal registration, and tax collection as income source of local government.

Keywords: *Sumbawa Lar*, *Production and botanical composition*.

### INTRODUCTION

Communal grazing land exists only in some regions of Indonesia, including Sumbawa island Nusa Tenggara Barat Province. It is commonly named as '*Lar*' (*Samawa Language*) Sumbawa or '*So*' (*Mbojo Language*) Bima-Dompu. *Lar* or *So* is a place utilizing for grazing ruminants/herbivores in Sumbawa. This island is ecologically suitable for the growth of communal grazing land/native pasture, not only pasture (*stepa*), and *savanna*, but also dryland that covered by grass only during rainy season (*tundra*). These are useful for grazing and raising cattle (Dilaga, 2000 & 2011). *Lar* existence has been known long ago and releasing cattle on *lar* has been a hereditary culture practiced by locals community with mutually agreed boundaries amongst them (Sutaryono et al, 2017). Use of *lar* has becoming degraded in size and quantity due to increase in population and development. Although in 1960s *lar* could be found in each sub-district. Until today, data about area and quantity, status and *Lar* contribution on providing feeds for large ruminant is still limited.

## MATERIALS AND METHODS

The research *conducted* using a method of survey through collecting second data from related governmental institution or agencies. From data obtained, 3 *Lar* were chosen purposively as represents of 3 different categories of *Lar*: dry, medium, and wet. Then data primer obtained by sampling of those chosen *Lar*. Therefore, primer data described as production of forages and botanical composition. Measuring forage production was taken place by method developed by Susetyo (1980), i.e. determining a quadrant sized 1x1m randomly for certain times. Therefore, botanical composition determined by recording and calculating proportion of each type of plant in each decided quadrant. In addition, interview also conducted with farmers to find out benefits/advantages of *Lar* in their perspective. Results then being descriptively explained and discussed.

## RESULT AND DISCUSSION

There are 67 *Lar* at 16 of 24 sub-districts in Sumbawa with a total area of 42,470 Ha. However, only 7 *Lar* (10%) have been determined by Sumbawa Government through Regent's Decree (5 in 2000 and 2 in 2009). These *Lar* are formally acknowledged *de facto* and the original function should not be shifted or changed.

### 1. *Lar* Condition

There are three different *lar* chosen for survey and sampling, i.e. *Lar* of Gili rakit, *lar* of Badi, and *lar* of Kuang Bira which represent category of dry, medium, and wet respectively. Brief explanation of each is given in the following.

- a. ***Lar* of Gili rakit** is dominated by *Ziziphus jujube* and other woody bush or small trees covering 60-70% of the area. This *lar* is typically over grazing with composition grass:legume = 85:15 persen. Type of grass include *Heteropogon contortus*, *Cyperus rotundus*, *Eleusine indica*, and *Digitaria sp*, and a bit native legume. The number of grazing cattle and buffalo is around 6000 heads originated from sub-districts of Empang, Tarano, and Plampang.
- b. ***Lar* of Badi**, almost all area is covering by bush, particularly *Lantana camara*, *Chromolaena odorata*, *Ziziphus jujube* and *Tamarindus indica*. There plants are categorized as weeds. Less grass and forage grown. Under *Lantana camara* and *Chromolaena odorata*, a few *desmodium triflorum* is found it is a native legume liked by animal. Therefore, the

number cattle grazing here is 2500 heads originated from sub-districts of Lape, Lopok, and Moyo Utara.

- c. **Lar of Kuang Bira**, there are founts in this area that people use for irrigation system of some crops such as corn, mungbean, and paddy. Crop residues resulted from agricultural activity such as corn stover, mungbean straw, rice straw used as animal feed. The number of cattle grazing at this *lar* is 1300 heads, originated from sub-districts of Rhee and Utan. This *lar* is dominantly covered by *Heteropogon contortus*, *Cyperus rotundus*, and weeds such as *Lantana camara*, *Choromolaena odorata*, and *Zizipus jujuba*. Generally, condition of *Lar Kuang Bira* is better compared to Gili Rakit and Badi.

## 2. *Lar Productivity*

Forages produced by observed *lar* were limited. *Lar* found to have less capacity to support and to provide feeds for grazing large ruminants. It is due to overgrazing and weeds invasion such as *Lantana camara*, *Choromolaena odorata*, *Zizipus jujube*, *Jatropha sp.*, and *Calotropis gigantean*. In other hand, there is no improvement and good management taking place by community and government. Based on sampling results of forages at *lar*, 6.03 tonnes of grass production per Ha per day. Nowadays, area of *lar* that opened and grown by grass maximal 30% or 12,741 Ha of total existing *lar*. Therefore, it can be estimated that production of forage produced by *lar* in Sumbawa district in providing feeds for large ruminants is 12.5% (24084.1 AU) of 192,048 total animal units. Why animal population in Sumbawa district is exceeding *lar* carrying capacity? It is because livestock system applied relying mostly on *lar* and, sometimes, paddy field as there are crop residues such as rice straw, corn stover, and mungbean that can be used as feeds. Some farmers graze the cattle only for 4 months during rainy season or paddy cultivating season. After harvesting, cattle are herd to paddy field. To increase the productivity of *lar*, some ways can be taken place, such as fertilization, rotating shepherding, and plantation tree legume such as *Leucaena cv taramba* that is resistant *Heteropsylla cubana*.



Table 1. Location, quantity, size, estimated forage production, and carrying capacity of lar in Sumbawa district.

No	Sub-district <i>Lar</i> Location	<i>Lar</i> Quantity	<i>Lar</i> Area (Ha)	Forage Production (tonnes)*	Carrying Capacity (AU)**
1	Utan <sup>a)</sup>	5	1,023.0	1,850.61	580.1
2	Rhee	2	769.0	1,391.12	436.1
3	Alas Barat	2	175.0	316.58	99.2
4	Moyo Hilir	2	550.0	994.95	311.9
5	Moyo Utara <sup>c)</sup>	4	1,250.0	2,261.25	708.9
6	Moyo Hulu	6	480.0	868.32	272.2
7	Ropang	8	5,000.0	9,045.00	2,835.4
8	Lantung	2	2,000.0	3,618.00	1,134.2
9	Lenangguar	6	20,000.0	32,562.00	10,207.5
10	Lunyuk	4	143.0	258.69	81.1
11	Lape	4	630.0	1,139.67	357.3
12	Lopok <sup>c)</sup>	6	2,400.0	4,341.60	1,361.0
13	Plampang <sup>b)</sup>	5	2,900.0	5,246.10	1,644.5
14	Maronge <sup>a)</sup>	2	850.0	1,537.65	482.0
15	Empang	7	2,300.0	4,160.70	1,304.3
16	Tarano <sup>a)</sup>	2	2,000.0	3,618.00	1,134.2
<b>Total</b>		<b>67</b>	<b>42,470.0</b>	<b>73,210.23</b>	<b>22,949.9</b>

Source: Department of Livestock and Animal Health Sumbawa District (2016) and Primer Data Processed (2017)

Notes: <sup>a)</sup> 1 has obtained Bupati Decree in the year of 2000

<sup>b)</sup> 2 have obtained Bupati Decree in the year of 2000

<sup>c)</sup> 1 has obtained Bupati Decree in the year of 2009

<sup>\*)</sup> Estimated 30% of *lar* Area

<sup>\*\*)</sup> 1 AU = 250 Kg and Feed Dry Matter requirement = 3.5% BW

### 3. Botanical composition of forages

Botanical composition of forages at three *Lar* after sampling conducted were *Heteropogon contortus* (70%), *Cyperus rotundus* (10%), *Elusin indica* (10%), and *Desmudium triflorum* (10%). These various forages contain energy (TDN) 10-26% and crude protein (CP) 2.8-5.2% of its dry matter (Kearl, 1982). Therefore, it is explained that energy content and protein at this amount is enough for maintenance only. For optimal growth of cattle, TDN and CP contents should reach 55% and 8.0% respectively. Based on this fact, hence *lar*

management should count on botanical composition in order to balance the ratio of grass and legume 1.5:1.0. Because good balance of grass and legume will give high efficiency in grazing livestock business.

#### 4. *Lar* Status in Sumbawa District

Sumbawa government put less concern and protection on *Lar*. Until now, most of *lar* has not been legally acknowledged by decree, and this is very vulnerable for functional shift of *lar*. Without decree, *lar* area has not legal power, whereas Sumbawa government has declared to be a district of livestock. Concern of community on *lar*, where they graze the cattle is also very low. There is no effort done by community to improve *lar* quality. Fertilization, rotating graze, plantation of superior grass or tree legume could increase productivity of *lar* and cattle.

#### 5. Other Advantages of *Lar* for Community and Government

For Sumbawa community, *lar* has a strategic position as temporary shelter, even for cattle mating and calving. Most people release their cattle on *lar* throughout the year. High occupation level of *lar*, making carrying capacity oftentimes exceeds its ability to provide feeds. With all drawbacks and advantages inherently attached to *lar*, one farmer is enabled to graze cattle, buffalo, and hundreds to thousands of horses. *Lar* makes life of community livestock easier. Security control also done together by farmers who grazing their cattle on *lar*. Without any intervention on providing feed input, for instance, farmers could harvest livestock products whenever they want. This condition is impossible to conduct by farmers from other places with limitation of land provided.

Animals that grow naturally make government taking benefit from many aspects. For instance, retribution gained regularly by government treasury from cattle, buffalo and horse selling that freely grazing on *lar*. Health concern on community caused by animal keeping is almost zero as they graze them far away on *lar*. Vaccination and medical treatment are oftentimes conducted on *lar*. Poverty issue, social discrepancy and community problem, also could be tackled because of *lar* existence. Farmers owned hundreds of cattle or buffalos can hire disadvantage neighbours to raise and to take care of animals on *lar* with profit sharing system. Most of rich farmers give extra fee for workers who assist them raising and keeping cattle on *lar* by sending them to pilgrimage in Mecca.

### CONCLUSIONS

1. 90% of *lar* (out of 67) in Sumbawa has not been legally acknowledged by Bupati Decree.
2. Estimated carrying capacity of *lar* to provide feeds for ruminants is about 12.5%.
3. *Lar* area vary from 143 ha to 20,000 Ha and could produce forages 6.03 tonnes DM per hectare per year.
4. Botanical compositions of *lar* include *Heteropogon contortus* (70%), *Cyperus rotundus* (10%), *Elusin indica* (10%), and *Desmudium triflorum* (10%).
5. *Lar* advantages for government and community are a place for cattle calving and mating, cattle sell transaction, collective vaccination and extension place, animal registration conducted by government, and as a source of local revenue.

### RECOMMENDATION

It is necessary for government to issue Regent's Decree regarding status of *lar*. Since it has legal power, *lar* will not be functionally shifted by anyone. In addition, revitalization of *lar* to increase quality of botanical composition should take place by leucaena plantation which resist to fleas to decrease the level of weeds invasion.

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