Development of Buffalo Caring System from Various Maintenance Pattern

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Abstract. Indonesia has not been able to meet meat needs so it still imports both in the form of meat and in the form of livestock. One of the germplasm that must get attention and can be developed is buffalo. Three forms of maintenance patterns for buffaloes in Indonesia, namely; 1) The extensive system of buffalo livestock is released in the wild without any touch from humans, breeding naturally, 2) The semi-intensive system is livestock grazed during the day and at night tethered near the house or caged and 3) The intensive system where all day long cattle are stocked with all the livestock needs provided. The study was carried out in the Lubuk Duku Nagari Lalan buffalo livestock group, Lubuak Tarok District, Sijunjung District. Indonesia. The study found that there are three patterns of maintenance of buffaloes, the second pattern of maintenance is the most dominant practices. In the second system, groups were formed at the initiative of farmers, through group counseling and training. It can be concluded that livestock groups can be improved the way of maintenance, feeding, management and so forth. With the existence of a solid group, maximum monitoring can be carried out by livestock development through breeding by farmers. The result shows that farmer can improve the population of buffalo by 6.36 % per year if they are provided with local government support in managing the caring system.

1. Introduction
Indonesia has high percentage of buffalo population compare to cow, its number may lead to successful meat self-sufficiency as it has huge contribution in meeting the need of meat compare to cow. It is resulted by farmer ability to make used of low quality feeding raw material as well as the buffalo ability to survive in tropical area [1]. However, the current situation where the land is less than before also affect the population of buffalo. Haryanto [2] stated that the decreasing population of buffalo is resulted by the conversion of land as well as changing in cultivation that reduce the feeding quality. It is also resulted by the buffalo ability to reproduce as well as the caring system which does not run commercially. In order to increase the population of the buffalo, the caring system should be improved as it determines the cattle health [3].

Tre types of caring system in Indonesia including extensive or traditional system where the buffalo life for free without being touch by the human, 20 semi intensive system where the cattle is pastured during the day and strung up at night, 30 intensive system allow the farmer to keep the cattle all day long by providing their necessaries. The first and the third system rarely found in Indonesia as most of the farmer apply the second caring system for around 90% of them with the number of cow they own is around 2 or 3 buffalo. It can be assumed that the caring system in Indonesia is still considered as a side job since they rely on the natural resources only.

Buffalo is not only as meat and milk stock but as well as the source of fertilizer. Agricultural department in 2017 noted that buffalo contribute to 0.6 ton meat in 2016, since it has higher potency in...
contribute to meat consumption. It also has value during religious rituals in Toraja while people from Blora, Banten dan Sijunjung are mostly consume buffalo meat.

Buffalo is superior in feeding conversion, as it can consume low quality feeding to survive while maintaining their optimal production as the result of their digestive system. It can survive in worse environment where the feeding is low in quality, compare to cow. There are still other benefits that can be mentioned about breeding the buffalo, but this research will focus on describing good caring system to give ideas about further research.

2. Material and method

This research was conducted in Nagari Lalan in the Lubuk Duku Farmer Group, Lubuak Tarok Sub-district, Sijunjung District, West Sumatra, for 7 months (March to August 2018). The location is purposively selected for this research as they are classified as 17 District that support meat-sufficiency with buffalo in 2014. The survey method is questionnaire that collect the data while the observation is done directly to the locations. The data that are collected include the caring management (feeding and reproduction).

3. Result and discussion

3.1. Buffalo population

Base on Ref. [6] the population of buffalo in 2017 is 1.39 million in each province, Sumatra contributes to 43% follows by Java 21.9% and Bali for 20.7%. The growth population of buffalo is described in the following Table 1.

Table 1. Distribution of Buffalo Livestock Population According to the Big Island (2009 – 2017)

| Island                  | Sumatera | Jawa    | Bali/NTT/NTB | Kalimantan | Sulawesi | Maluku/Papua | Total    |
|-------------------------|----------|---------|--------------|------------|----------|--------------|----------|
| 2009                    | 926.111  | 453.969 | 309.832      | 65.516     | 148.463  | 20.036       | 1.932.927|
| 2010                    | 953.366  | 458.033 | 325.187      | 77.169     | 155.150  | 30.699       | 1.999.604|
| 2011                    | 512.821  | 363.049 | 257.610      | 41.534     | 110.393  | 19.671       | 1.305.078|
| 2012                    | 594.329  | 360.403 | 298.543      | 44.988     | 117.933  | 21.851       | 1.438.295|
| 2013                    | 432.585  | 298.355 | 215.195      | 40.791     | 103.605  | 19.105       | 1.109.636|
| 2014                    | 567.581  | 312.169 | 265.164      | 48.593     | 121.878  | 19.520       | 1.355.147|
| 2015                    | 550.005  | 308.455 | 267.553      | 51.895     | 122.605  | 21.268       | 1.346.917|
| 2016                    | 573.871  | 297.929 | 283.914      | 52.751     | 129.770  | 16.889       | 1.355.124|
| 2017                    | 596.870  | 304.884 | 288.721      | 54.767     | 133.657  | 16.298       | 1.395.191|

Table 1 shows that each province experience the decreasing number of buffalo population in 2009 to 2017. It shows that Sumatera population of buffalo has decreased by 35.6%. Jawa 32.8%. Bali/NTT/NTB 6.8%. Kalimantan 16.4%. Sulawesi 9.9%. Maluku/Papua 18.7%. The decreasing of buffalo population is caused by various reasons Sulaeman [4] which is not differ than other countries in Asia. It is caused by internal aspect including the (long waited time for pregnancy, actuate, lust, long calving interval) and external factors (feeding and social culture). In West Sumatra, the population of buffalo has increased by 0.83% by each year from 2012 to 2016 which is lead by Agam, as it is shown in Table 2.
Table 2. Population of West Sumatra livestock farmers year 2012-2016

| No | Distric/ City                  | Male | Female | Total (head) |
|----|--------------------------------|------|--------|--------------|
| I  |                                |      |        |              |
| 1  | Kep. Mentawai                  | 39   | 76     | 115          |
| 2  | Pesisir Selatan                | 2.850| 5.580  | 8.430        |
| 3  | Solok                          | 3.677| 7.198  | 10.875       |
| 4  | Sijunjung                      | 5.175| 10.132 | 15.307       |
| 5  | Tanah Datar                    | 3.666| 7.178  | 10.844       |
| 6  | Padang Pariaman                | 4.708| 9.217  | 13.925       |
| 7  | Agam                           | 6.894| 13.497 | 20.391       |
| 8  | Lima Puluhi Kota               | 4.648| 9.100  | 13.748       |
| 9  | Pasaman                        | 999  | 1.957  | 2.956        |
| 10 | Solok Selatan                  | 2.529| 4.951  | 7.480        |
| 11 | Dharmasraya                    | 2.120| 4.150  | 6.270        |
| 12 | Pasaman Barat                  | 603  | 1.180  | 1.783        |
| II |                                |      |        |              |
| 13 | Padang                        | 1.014| 1.984  | 2.998        |
| 14 | Solok                         | 9    | 18     | 27           |
| 15 | Sawahlunto                     | 657  | 1.286  | 1.943        |
| 16 | Padang Panjang                | 24   | 48     | 72           |
| 17 | Bukittinggi                   | 19   | 38     | 57           |
| 18 | Payakumbuh                    | 64   | 125    | 189          |
| 19 | Pariaman                      | 194  | 379    | 573          |
| 2016 |                                | 39.889| 78.094| 117.983     |
| 2015 |                                | 41.701| 80.238| 121.939     |
| 2014 |                                | 37.890| 80.954| 118.844     |
| 2013 |                                | 37.976| 76.037| 114.013     |
| 2012 |                                | 37.336| 76.034| 113.370     |

Population of buffalo in West Sumatra based on shows an increasing number around 0.83 % each year from 2012 to 2016.

3.2. Three types of caring system

3.2.1. Extensive system or traditional
the buffalo is freed in green area without being touch by the farmer. The reproduction happens naturally which allow the buffalo to marry by the same offspring. It may lead to negative impact to the next generation. The inbreeding will decrease the reproduction quality which is supported by Croquet et al that said that inbreeding will decrease the profit. This type of caring system is only applied in a small number of farm and the number of cattle that they have is numerous. However, it begins to decrease as the land becomes less than before as it is said by Syamsu [5] it has decreased by 30%. The population of buffalo in an area is determined by land availability in producing feeding raw material and as a farm areal, it is also determined by the surrounding socio economic condition, market for livestock, supporting technology and the government support.

3.2.2. Semi intensive system
It is a familiar caring system where the number of buffalo is only around 2 or 3 [7]. The buffalo owning indicate the total income of the farmer that correspond to their social economic indicator. The result of the research shows that 64.78% farmers have 1 to 2 buffalo and those who have 3 buffalo are around 35,20%. It indicates that Sumatra Barat only have a small farm scale to begin with which is considered as a side job and as a saving. The farmer let the buffalo free in the daylight around the rice field and around harvested field and cage them around the house at night. The farmer provide greening at night, but the buffalo has never consumed concentrate feeding such as bran. Direktorat Jenderal Peternakan has limit the operational of buffalo farming with the following approach 1) creating group as a learning community, as a production unit, as well as corporation group 2) regional pattern to improving the
buffalo productivity, helping the marketing easier, supporting agribusiness development and giving coaching 3) direct assistance which is rotated regularly 4) partnership pattern as a corporation among small and middle size enterprise, coaching and improving the production by focusing on corporation principles.

3.2.3. Intensive caring system
This model is done by the farmer to improve the body mass of their cattle, and mostly conducted by those who have asset and they mostly gathered in the market.

3.3. Development in buffalo farm population on farmers
The number of buffalo population has increased by 31.81 % in 5 years with average 6.36 %.year and one of the possible solutions to increase the population is by improving the caring system as good system determines the health of buffalo [3]. The intensive caring system is applied by Lubuk Duku which is supported by the local government to increase the population as well as the production of buffalo meat, to create farm group, as the main source of reproduction, and to conserve germplasm of the local buffalo. The government has support them with 22 buffalos which 20 of them is female, as the main purpose of this support is to reproduce, it will be determined the group ability to play an active role in the project as well as the local government support. Previous research by Harly [7] found that 68.30 % for professional who has worked for 10 years, while the rest 20.78 % is less than 5 years. It indicate that West Sumatra people love to farm, as buffalo is used as a saving; with their long experience they may recognize problems, when the problem is difficult to solve they can ask local livestock service. The experience play the main role in solving the problem during the process, as those who have experience show good performance; as they gather information from their family and local government.

3.4. Buffalo caring management on farmer
Three factors that determine buffalo self-sufficient program is good feeding, high quality breed, and disease control [8].

3.4.1. Feeding
The farmer let the buffalo free in the daylight around the rice field and around harvested field and cage them around the house at night. The farmer provides additional greening at night, but the buffalo has never consumed concentrate feeding. In rainy season farmer has no difficulties in finding the green, but not in summer as they need to spend 2-3 hours in finding 15-20 kg of grass which is not equal to their need. Although the body mass of their cattle is high, but their feeding system bellow the criteria. Feeding should be 10% of the body mass, however the farmer only provides the green and not concentrate feeding. The green is a combination of the local grass type with low nutrition. Farmer has not used plantation waste as the source of feeding raw material. Indonesia has prospect in buffalo self-sufficiency program as it produces exported the agricultural commodity such as corn, rice, vegetables, cassava, spices, palm oil, rubber, coffee, and etc. Those commodities produce agricultural waste which can be used as the feeding raw materials for buffalo, cow, goat and other ruminants species which have good digestive system.

3.4.2. Breeding
One of the conditions for the timely marriage of buffaloes is the availability of males. Proper marriage can be carried out well through an artificial insemination program (IB) if the implementation of IB is programmed well will be able to increase pregnancy and birth rates. However, the IB program farmer group has never done it but has not produced results, so the farmer no longer uses the IB. Breeding is mostly done naturally by using the male from other village.

4. Conclusion
The result shows that farmer can improve the population of buffalo by 6.36 % per year if they are provided with local government support in managing the caring system.
References

[1] Suhubdy. 2007. Strategi penyediaan pakan untuk pengembangan usaha ternak kerbau. Warta zoa. 17(1): 1-11
[2] Haryanto B. 2004. Sistem Integrasi Padi Ternak dan TernakSapi (SIPT) dalam Program P3T [abstrak]. Dalam: Seminar Pekan Padi Nasional, Balai Penelitian Tanaman Padi, Sukamandi, 15-19 Juli 2004
[3] Hernowo, B. 2006. Prospek pengembangan usaha peternakan sapi potong di Kecamatan Surade Kabupaten Sukabumi. Skripsi. Program Studi Sosial Ekonomi Peternakan. Fakultas Peternakan. Institut Pertanian Bogor, Bogor.
[4] Sulaeman, 2010. Percepatan Peningkatan Populasi dan Kualitas Kerbau Melalui efisiensi Reproduksi. Prosiding Lokakarya Nasional Kerbau 2010, UniversitasPadjadjaran.
[5] Syamsu Jamal A. Sofyan. Lily A. dan Sa’id E. Gumbira. 2003. Daya dukung limbah pertanian sebagai sumber pakan ternak ruminansia di Indonesia. Warta zoa Vol. 13 No. 1 Th 2003. Hlm 30-37
[6] Badan Pusat Statistik Indonesia. 2018. Statistik Indonesia. Badan Pusat Statistik Indonesia. Jakarta
[7] Harly, Resolinda. 2009. Potensi dan Strategi Pengembangan Usaha Ternak Kerbau Untuk Meningkatkan Perekonomian Rakyat Perdesaan Sumatera Barat. Disertasi Program studi Program Doktor Universitas Andalas. Padang
[8] Prawiradiputra, Bambang R., Sajimin, Nurhayati, D. Purwantari&Iwan H. 2005. Hijauanpakanternak di Indonesia. Badan Penelitian dan PengembanganPertanian.

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