

BIOPHYSICS ENVIRONMENTAL CONDITIONS OF SWAMP BUFFALO *Bubalus bubalis* PAMPANGAN IN DISTRICT RAMBUTAN SOUTH SUMATERA

Yuanita Windusari, Erwin Nofyan, Mustafa Kamal, Laila Hanum and Rahmat Pratama
Department of Biology, Faculty of Mathematic and Natural Science, Sriwijaya University,
Jl. Palembang-Prabumulih KM 32, Indralaya (OI) Sumatera Selatan 30662
Corresponding Author email: ywindusari@yahoo.com

ABSTRACT

Swamp buffalo (*Bubalus bubalis*) is a germ plasm specific of Pampangan and endemic in South Sumatera with low productivity and limited distribution. The aims of this study was to obtain information regarding biophysical conditions in the central areas of swamp buffalo in South Sumatera. The method used is purposive sampling method. Data collected in the form of quantitative and qualitative. Primary data were obtained through direct observation, interviews breeders selected as respondents while secondary data obtained from various related. The data obtained are presented descriptively and data tabulation. Productivity of swamp buffalo Pampangan can be increased by managing and maintaining habitat conditions although traditional maintenance. The results of observations of the biophysical condition of swamp buffalo (*B. bubalis*) Pampangan showed that habitat of swamp buffalo Pampangan consists of dominated by lowland swamp area is overgrown with shrubs and grass. The conclusion of the research are productivity and population of swamp buffalo (*B. bubalis*) pampangan as specific plasma nuffah of South Sumatra can be improved by studying the characteristics and preferred habitat of the buffalo, although developed in a traditional farms but is good enough and so need to be developed, grass is most preferred by swamp buffalo Pampangan derived from 'Kumpai' grass group, and 'Kasur' grass and 'Kumpai' grass is the dominant grass type found in habitat swamp buffalo Pampangan.

Key words: biophysical condition, the swamp buffalo (*Bubalus bubalis*) Pampangan

INTRODUCTION

Indonesia has a diverse group of buffalo that as long separated from the place of its origin, and they adapt to the local environment, and are named according to the name of the area where the buffalo developed, such as *Bu-ffalo pampangan* (Pampangan/South Sumatra), *Buffalo bi-nanga* (South Tapanuli/Sumatra), Swamp buffaloes (in Sumatra and Kalimantan) (Talib, 2008). Swamp buffalo (*Bubalus bubalis*) has long been adapted to the swampy areas that are not planted (Lendhanie, 2005), and this is the type of native species and one of the germplasm of buffalo in South Sumatra with their distribution only in the District Pampangan (Ogan Ilir and Ogan Komering Ilir) and Banyuasin district.

Maintenance and swamp buffalo Pampangan ranch generally still traditionally, and this high level of cuts of buffalo meat for subsistence ($\pm 10\%$ per year), and low po-pulation growth ($\pm 0.64\%$ per year) cause swamp buffalo Pampangan population shrinking (BPTP, 2002). Preser-vation efforts to maintain the existence of this species is very important because this swamp buffalo pampangan as germplasm, has potential as a producer of meat, the so-urce of income of farmers, and as a tourist attraction.

Low productivity of swamp buffalo Pampangan has important implications for such species as endemic germ-plasm loss. Therefore necessary to the observation of the biophysical conditions that a major part in the conser-vation process. This study aims to provide information on the biophysical condition of land in central areas of swamp buffalo in South Sumatra, so that potential for development can be enhanced swamp buffalo Pampa-ngan.

MATERIAL AND METHOD

Materials research is swamp buffalo Pampangan that live in village Rambutan, Banyuasin district, South Sumatera, Indonesia (Figure 1).

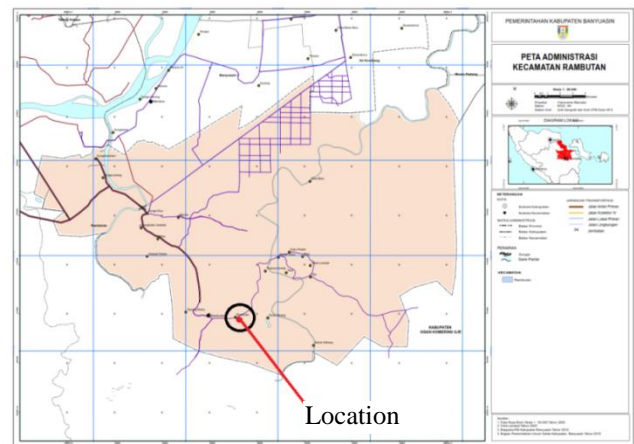


Figure 1. Location of the study in in village Rambutan, Banyuasin district, South Sumatera

This research were carried out by observation of the swamp buffalo Pampangan based on observations of biophysical conditions which include observations on habitat and behavior swamp buffalo Pampangan. The method were used is purposive sampling method. Data collected in the form of quantitative and qualitative. Primary data were obtained through direct observation, interviews breeders selected as respondents while secondary data obtained from various related. The data obtained are presented descriptively and data tabulation.

Vegetation growing in the area of observation were analyzed by making plots measuring 1m x 1m with inter-plot is 100 meters from the cage (Figure 2). Determination ordinate plot based on the prediction of continuous places traveled and visited by buffaloes in search of food and rest. The observed parameters is collecting and identifying the type of grass in the natural food. Measurement data recorded in the tally sheet.

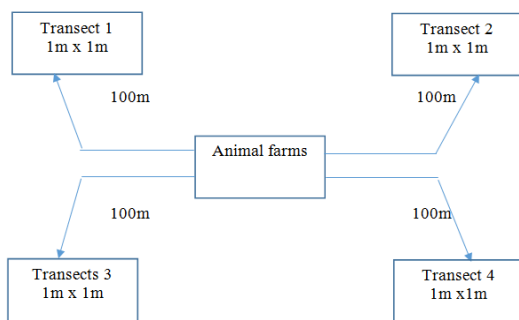


Figure 2. Pattern observation of biophysical condition of vegetation

RESULT

Biophysical conditions observed in this study include the habitat and behavior of swamp buffalo Pampangan. From the observations, showing swamp buffalo Pampangan generally maintained naturally released in the habitat. Habitat of swamp buffalo Pampangan consists of dominated by lowland swamp area is overgrown with shrubs and grass. Swamp buffalo (*B. bubalis*) is one of the local buffalo that has a good adaptability to the environment swamp and a limited distribution area which is in Pampangan at Ogan Ilir and Ogan Komering Ilir District (Figure 3).

Swamp at the study site is dominated by grasses Kumpai Tembaga (*Hymenachine amplexicaulis*), Kumpai Minyak (*Ischaemum byrone*), Kumpai Padi (*Panicum astagninum R*), 'kasur' grass, kumpai 'bebulu', and 'pasir' grass (*Andropogon ischaemum L*). The observations made in the study of grass vegetation analysis that has been done shows that kumpai minyak has the highest dominance index value compared with other grasses presence of the grass vegetation in the swamp buffalo ranch shows that the condition of the biophysical environment suitable for growth.

Based on identification and observation in the field, found 9 species of grass (*Ischaemum byrone*, *Hymenachine amplexicaulis*, *Andropogon ischaemum L*, *Fimbristylis annua*, *Panicum astagninum R*, *Hallucinogenic mushroom*, *Imperata cylindrica (L.)*, and *Echinochloa colonum*) in swamp buffalo habitat which included in 3 families are Poaceae, Graminae, and Cyperaceae. This result can be seen in Table 1.

Based on observation and interviews, 'kumpai' grass is species favorite by the buffalo, and the average buffalo grass requires ± 20 kg/individual. Types of 'kasur' grass and kumpai grass is a type of grass that dominates in swamp buffalo pampangan habitat and serve as a food source. In the dry season availability of natural grass to be greatly reduced in number and will directly affect the feed intake in cattle. This will affect the quality and quantity of swamp buffalo Pampangan.

Buffalo looking for food in the form of large groups led by a male buffalo and the average weight of the edible grass kumpai i.e ± 20 kg/individual. This different treatment of buffalo are kept in houses, buffalo tied every day in the area around the swamp behind the cattle pen in the morning (at 06.00 am) and inserted into the cattle in the early afternoon (17:00 pm) (Figure 4).

The observation behavior of buffalo in the night with cold temperature conditions and high humidity, the behavior of buffalo at night, around 20:00 to 23:00 pm buffalo has not slept in a cage and do activities such as chewing, throwing feces and urine. In rainy conditions much longer soaking behavior that is 2 times / day.

As the air temperature increases, buffalo soak in pools or swamps with a depth of + 1.5m to keep moisture from the body. In the dry season, the pools of dry up and buffalo will soak in the river (Figure 5).

Table 1. Analysis of vegetation in swamp buffalo Pampangan habitat

Family	Species	Local name	Presentation (transect)			
			1	2	3	4
Poaceae	<i>Ischaemum byrone</i>	Kumpai Minyak	+	+	+	-
Graminae	-	Rumput Kasur	+	+	-	+
Graminae	-	Kumpai Bebulu	+	-	+	-
Cyperaceae	<i>Hymenachine amplexicaulis</i>	Kumpai Tembaga	-	+	+	-
Poaceae	<i>Andropogon ischaemum L</i>	Rumput Pasir	+	-	+	+
Cyperaceae	<i>Fimbristylis annua</i>	Alang Lebak	-	-	+	-
Graminae	<i>Panicum astagninum R</i>	Kumpai Padi	-	-	+	+
Hymenogastraceae	<i>Hallucinogenic mushroom</i>	Jamur Penghayal	+	-	-	-
Graminae	<i>Imperata cylindrica (L.)</i>	Ilalang	-	-	+	-
Poaceae	<i>Echinochloa colonum</i>	jajagoan	-	-	+	-

Note : += present ;
--= absent



Figure 3. Environmental of swamp buffalo Pampangan

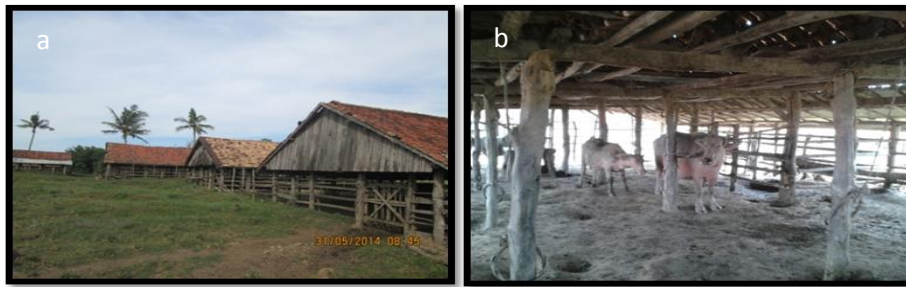


Figure 4. Cattle pen of swamp buffalo Pampangan (a) outside of cattle pen and (b) inside of cattle pen

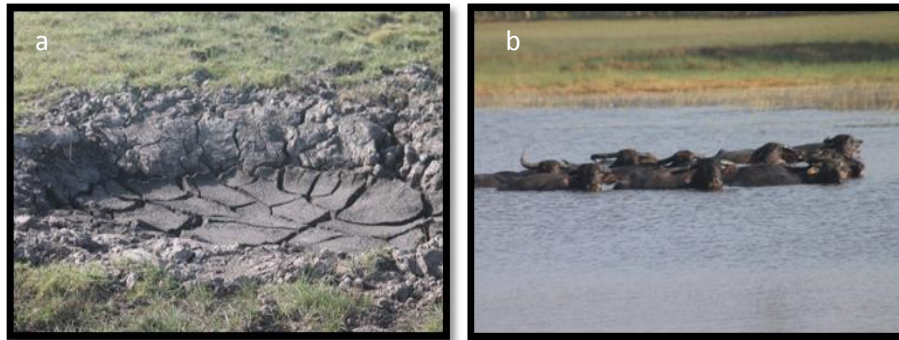


Figure 5. Habitat condition of swamp buffalo Pampangan (a) dry season (b) soaking in the river

DISCUSSION

Swamp buffalo Pampangan has a good adaptability to the environment which is much overgrown swamp bushes and grass. According Lendhanie (2005) the buffalo also has a digestibility of the high crude fiber, and is able to utilize low-quality feed to produce meat. Kumpai Tembaga (*Ischaenum aristatum nina*), Kumpai Minyak (*Himendchue ampleacaulinesness*), Kumpai Padi (*Himendchue interuptabuese*), 'kasur' grass, and 'pasir' grass are favorite grasses of swamp buffalo, and a source of natural food which is good because the high mineral content.

Most of the feed consumed is derived from ruminant livestock forage (60%), either in the form of fresh or dry matter (Subiyanto, 2010). Contributions feed very strong influence on the performance of reproduction. Pampangan buffalo breeder is basically a traditional rancher and a decreased activity down so that feeding is generally obtained at the time of grazing, it is as done in this area pampangan buffaloes. Grass growing in the field, in the paddy fields or roadsides is feed available at the time of grazing. Feed given at home is generally dry hay that is sometimes watered salt solution. Buffalo will be able to utilize grazing pastures despite bad crop quality, particularly in the tropics (Webster and Wilson, 1980; Semali et al, 2001).

Behavior generally of swamp buffalo consists grazing and mating behavior. At the time of grazing, a group led by a male buffalo to the pasture. According to Putu et al., (1994), the mileage at the time of grazing buffalo reaches 2 km from the cage, with an average speed of movement of 2.20 m / min. At the time of mating, the female is in heat is usually surrounded 5-6 stud tail trying to marry with a marriage uncertain.

Buffalo has several advantages for improved especially with regard to the potential role of genetic and environmental aspects. Buffalo has a very high adaptability,

visible from a wide distribution, ranging from the dry climate, swamp land, mountainous areas, and low-lying areas. Buffaloes also have the ability to utilize low quality feeds such as dried grass with low nutrient levels and high crude fiber.

The big difference in ability between buffalo and cattle in feed utilizing poor due to differences in behavior, digestive function and physiological adaptation in each condition. With the ability to utilize low-quality diet, showed that to meet the needs good nutrition for maintenance can be provided at a cheaper price when compared with the need for cattle.

Environmental conditions such as swamps makes this area very difficult to find a source of clean water, to obtain a source of clean water must travel a distance of 100. At warmer temperatures, most places for buffalo wallow in a severe drought that most buffalo bathing in the deepest area of the river into + 1.5 m.

The development of a buffalo in the study site is a bit slow compared to cattle. It is strongly influenced by environmental factors that are nearby. According Dasman (1981) requires that the buffalo habitat in accordance with the environment needed to support life, because the habitat has the function of providing food, water and protection. Suitable habitat for a species, is not necessarily appropriate for other types, because each species requires habitat conditions vary.

From this study it can be concluded that productivity and population of swamp buffalo (*Bubalus bubalis*) pampangan as specific plasma nutfah South Sumatra can be improved by studying the characteristics and preferred habitat of the buffalo, although developed in a traditional farms but is good enough and so need to be developed, grass is most preferred by swamp buffalo Pampangan derived from 'Kumpai' grass group and also the 'Kasur' grass and 'Kumpai' grass is the dominant grass type found in habitat swamp buffalo Pampangan.

ACKNOWLEDGMENTS

Acknowledgements submitted to DP2M the Directorate General of Higher Education for funding this research.

REFERENCES

- Arora, S. P. 1995. Pencernaan Mikroba Pada Ruminansia. Cetakan Kedua. Gajah Mada University Press, Yogyakarta.
- Bedi, S. P. S. and S. A. Khan, 1984. Trace element status of soil, fodder and animals in Bijnore district of Uttar Pradesh. *Indian J. Anim. Sci.* 54(6): 570-574.
- Dasman, R.F. 1981. *Wildlife Biology*. John Willey and Sons, New York.
- Diwyanto, K. dan E. Handiwiawan. 2006. Strategi pengembangan ternak kerbau: Aspek penjarangan dan distribusi. hlm. 3-12. Prosiding Lokakarya Nasional Usaha Ternak Kerbau Mendukung Program Kecukupan Daging Sapi. Sumbawa, 4-5 Agustus 2006. Pusat Penelitian dan Pengembangan Peternakan bekerja sama dengan Direktorat Perbibitan Direktorat Jenderal Peternakan Dinas Peternakan Provinsi Nusa Tenggara Barat, dan Pemerintah Kabupaten Sumbawa.
- Diwyanto, K. dan Subandriyo. 1995. Peningkatan mutu genetik kerbau lokal di Indonesia. *Jurnal Penelitian dan Pengembangan Pertanian XIV(4)*: 92-101.
- Fischer, H. dan P. Bodhipaksha. 1992. *Reproduction in swamp buffalo*. In: *Buffalo Production*. N.M. Tulloh, and J.H.G. Holmes (eds.). Elsevier, New York.
- Foley, R.C., D.L. Bath, F.N. Dickinson., and H.A. Tucker. 1973. *Dairy Cattle Principles, Practices, Problem and Profits*. Lea and Fe-biger, Philadelphia.
- Hasil Survey Dinas Peternakan Kab.OKI. 2011. *Data Jumlah dan penyebaran kerbau dari rentang waktu 2011*. Pemkab. OKI. Kayuagung.
- Hasil Survey Dinas Peternakan Provinsi. 2009. *Data jumlah dan penyebaran kerbau di daerah-daerah Provinsi Sumatra Selatan tahun 2009*. Diknas Peternakan provinsi Sumatra Selatan. Palembang.
- Hedaoo, M.K., K.P. Khllare, M.D. Meshram, S.K. Sahatpure and M.G. Patil. 2008. Comparative studies of certain Biochemical constituents of normal cyclic and anoestrus surti buffaloes. *Veterinary World*. 1(4): 105-106.
- Lendhanie, U.U. 2005. Karakteristik Reproduksi Kerbau Rawa Dalam Kondisi Lingkungan Peternakan Rakyat. *Bioscientiae*. 2(1) : 43-48
- Mandal, A. B., S. S. Paul, and N. N. Pathak. 2003. *Nutrients requirements and feeding of buffaloes and cattle, 1st ed*. International Book distribution Co. Chaman Studio Building, 2nd floor, Charbagh, Lucknow 226004 UP. India.
- Murti, T.W. 2007. *Beternak Kerbau*. P.T. Citra Aji Pratama. Yogyakarta.
- Nanda, A. S. and R. D. Sharma, 1982. Incidence and etiology of prepartum prolapse of vagina in buffaloes. *Indian J. Dairy Sci.* 35(2): 168-171.
- Orskov, E. R. 1992. *Protein Nutrition in Ruminant, 2nd Ed*. Academic Press, Harcourt Brace Jovanovich Publisher, London.
- Pipiana, J., Baliarti, E. dan Budisatria, I.G.S. 2010. Kinerja kerbau betina di pulau Moa, Maluku. *Buletin Peternakan*. 34(1):47-54.
- Praharani, L dan E. Triwulanningsih. 2008. Karakteristik bibit kerbau pada agrosistem dataran tinggi. Prosiding Seminar dan Lokakarya Nasional Usaha Ternak Kerbau. Jambi 22-23 Juni 2007. *Pustlitbang Peternakan Bogor*. 113-123.
- Putu, I.G.M., M. Sabrani, M. Winugoho, T. Chaniago, Santoso, Tarmudji, A.D. Supriyadi, dan P. Oktaviana. 1994. *Peningkatan produksi dan reproduksi kerbau kalang pada agroekosistem rawa di Kalimantan Selatan*. Laporan Hasil Penelitian. Balai Penelitian Ternak, Bogor. 54 hlm.
- Samad, H. A., C. S. Ali, N. U. Rehman, A. Ahmad and N. Ahmad, 1987. Clinical incidence of reproductive disorders in the buffalo. *Pakistan Vet. J.* 7(1): 16-19.
- Santosa, U. 2008. *Mengelola Peternakan Sapi Secara Profesional*. Penebar Swadaya. Jakarta.
- Seitaridis, K. and E. Papadopoulos, 1978. Contributions to the aetiology of vaginal prolapse in pregnant cows. *Vet. Bull.* 48: 5058.
- Semali, A., B. Setiadi, B., dan H.M. Togatorop. 2001. Prospek pengembangan hijauan pakan ternak dilahan pasang surut dan rawa. *Wartazoa*. 2(1-2): 11-14.
- Sharma, M.C., C. Joshi and T. K. Sarkar. 2002. Therapeutic efficacy of minerals supplement in macro-mineral deficient buffaloes and its effect on haematobiochemical profile and production. *Asian-Aust. J. Anim. Sci.* 15(9):1278-1287.
- Webster, C.C and Wilson, P.N. 1980. *Agriculture in the tropics, 2nd ed*. Longma