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The effects of farming Beef Cattle on Baluran National Park Conservation (Case Study in Karang Tekok, Banyuputih District, Situbondo Regency)

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ABSTRACT

This research was conducted in Karang Tekok, Sumberwaru Village, Banyuputih District, Situbondo Regency. This research was carried out from February 4th, 2019 to February 18th, 2019. This study was aimed to determine the characteristics and management of beef cattle farming in KarangTekok and the impact of beef cattle farming on the Baluran National Park regulation. Methods of the research were quantitative descriptive and qualitative with a case study approach. The sampling methods were purposive sampling and snowball sampling. Data collection methods were observation, interview and documentation. The results showed that Karang Tekok cattle farmers had been grazing their cattle for years, increase the income of the Karang Tekok community, the majority work farmers as farm laborers earning less than 500,000 IDR/per month. Education and a low economy forced people to herd cows to the Baluran National Park conservation area to meet the needs of their cattle. The impacts of cattle grazing include social, economic and ecological impacts. There are some government efforts to reduce conflict and carry out conservation, namely by conducting counseling and socialization related to wild grazing, supporting the development of beef cattle farming and forming Singomulyo Farmer Group to help beef cattle farming. The Karang Tekok community must be more aware that there have been many impacts caused by the wild grazing. Programs and assistance from the government solve some problems of beef cattle farming. Baluran National Park management and the government must get closer to the Karang Tekok community, so mutual partnership between parties is reached.

Key word : *Beef cattle farming, Conservation, Wild grazing.*

Introduction

Forest is a wide area, which is covered by vegetations. Its existence is really essential whereas it has many benefits that relate to ecological, socio-cultural, and economical aspects. Utilization of forest products massively will destroy the Indonesian forest area. Department of Forestry recorded that in 2002,96.3 million hectares of forest areas had degraded, 54.6 million hectares had destroyed, which included protected forest, production forest, and conservation forest (Nawir *et al.*, 2008).

One of conservation efforts that had been conducted in Indonesia was establishing National Park as attached on Laws Number 5 of 1990 about Natural Resources Conservation and the Ecosystem, which defined as conservation area that has native ecosystem and being managed by zonation system, as well as utilized for specific purposes, such as research, science, education, and supporting cultivation, tourism, and recreation (Syawaluddin, 2007).

Savanna is meadow and bushes, which spread

over among grasses, and this area is the shift between forest and meadow. Some areas, which are not so arid, savanna may occur due to soil condition and, or repetitive fire. Mackinnon (1991) in Gunaryadi (1996) reported that savanna area is generally less threatened by economic exploitation in comparison with rain forest; however, savanna may sometimes get pressures, for instance, cattle grazing and other farming uses.

The communities themselves in Karang Tekok Village highly depend on the Baluran National Park, for instance, they utilize the National Park as their beef cattle grazing. The communities around the area raise their cows by semi-intensive pattern, in which they herd their cows in the morning and at noon, after that they put them into stable in the afternoon until at night. Such activities have broken the regulation of the National Park, which forbids individual or group to enter the conservation area for their own interests without permission.

Such activities were mostly found at the north part of the National Park area. The community has conducted the grazing for generations, and more cattle are herd year by year. According to Nugroho *et al*. (1991, in Hafis,1992), ±1600 cows and ±400 sheeps/goats are herd wildly at the north part of Baluran National Park area everyday. Even though, it was presumed that capacity of the savanna was not conformed to the numbers of the cattle that being herd, so that overgrazing may occur and threated ecosystem conservation of the savanna. According to the research by Wind and Amir (1977), in 1977, the spread of wild oxen were still occupied the north part of Baluran area, but based on sensus toward big mammals in 2000, no more oxen groups were found in that area as a result of intensive wild grazing.

Materials and Methods

The research was conducted on the farmers of beef cattle farming in Karang Tekok, Sumberwaru Village of Banyuputih District, Situbondo Regency in East Java Province. The research was conducted from November 28th, 2018 to February 18th, 2019. Location was determined purposively by selecting the location in accordance with specific consideration. Whereas, selection of the research location has considered management of the beef cattle farming that applied semi-intensive way by herding the cattles at the conservation area of Baluran National Park.

Method of the research was quantitative descriptive via questionnaires and qualitative through case study, which was done intensively in detail to assist in delivering information, for instance, interview. Interview is a technique of asking some questions to respondents in accordance with the prepared questions in order to obtain information and it is performed communicatively that conforms to norms, which prevails in the social environment.

Results and Discussion

Profile and Background of the Village

According to data of the Central Bureau of Statistic in Situbondo Regency (2018), Sumberwaru covers the area of 111,270 km^2. Geographically, Sumberwaru Village lies at the altitude of 258 masl, under tropical climate and temperature ranges 27^o-30 ^{o}C, as well as considered as the agrarian region with sugarcane as the main plant. In 2017, populations in Sumberwaru Village were 8,273 peoples, and most of them were farmers, cattle farmers, and factory workers. Karang Tekok is a nickname, whereas there was a stone or rock that was made as curved road, however, *Karang* means stone or rock and *Tekok* means curved, and since then it was well-known as Karang Tekok Village.

Potency and Superiority of Beef Cattle Farming

Most of beef cattle farming raise hybrid cows of *Ongole* (PO). PO belongs to *Bos Indicus* that derived from tropical regions and used to live under hot temperature and extensive management, so that they have low growth rate. PO cattles are domestic cows of Indonesia as one of genetic resources in Indonesia. They are raised in semi-intensive management by letting them untied on savanna at the Baluran National Park starting in the morning until in the afternoon, and then they will be put in the stable. PO cattleswell adapt to environmental limitation, such as heat, parasite attack, and well tolerant to high fibrous feed. PO cattles were the grading up between male *Ongole* and female *Bos*, which was generated in 1930. Common characteristics of PO cattles are look like *Ongole*, but they have lower productivity and posture than *Ongole*.

They are characterized by greyish white hide on all over the body, and dark color to black on the head part, neck, and knees. PO cattles have big

Table 1. Data of Population and Width Forage Crops Field in Banyuputih District

No.	Village	Population	Width (km^2)	Population Density	Width of Forage Crops Field (Ha)
1.	Banyuputih	4,965	10.25	484	1,000
2.	Sumberejo	222,88	23.24	959	25
3.	Sumberanyar	17,393	97.71	178	488
4.	Sumberwaru	8,273	111.27	74	3,679
5.	Wonorejo	6,552	239.19	27	242
	Total	59,471	481.66	123	5,434

Source: District Office of Banyuputih and Agricultural Official 2017

Table 2. Numbers of Cattle Farming and Population of Large and Small Cattles in Sumberwaru Village

No.	Village	Beef Cattle Population
1.	Sidodadi	366
2.	Jagunung	165
3.	Merak	1,301
4.	Sidomulyo (KarangTekok)	2,279
5.	Karanganyar	416
6.	Belangguan	349
	Total	4,876

Source: Sensus on Cattle 2017

body and relatively short head, curved forehead, short horns, big hump, jowl and skinfolds below the abdomen and neck (Astuti *et al.,* 2002).

Characteristics of Beef Cattle Farming of the Community in Karang Tekok Village

Beef cattle farming in KarangTekok Village have applied profit sharing system, in which the community cooperates with investor. The investors who provide cows to the community, were from outside the village, however, they expected the community in Karang Tekok to raise and manage the cows. The explanation conforms to Nasarudin and Surya (2004), in which the investor may be individual or institution, both from domestic or abroad, who invest in accordance with investment type, which they choose, in short-term or long-term period.

Social and Economic Characteristics of the Community in KarangTekok Village

The resulted characteristics from 50 respondents in accordance with their age, they showed that the dominant age of the respondents were around 51-60 years old, 38%. However, 94% of the respondents were men. For education level, 64% of the respondents graduated from Elementary School. Majority of the respondents worked as farm laborers, 40%, whereas it was supported by the surrounded environment, wide farming land. 40% of the respondents' income were <Rp 500,000,- per month. Numbers of the raised cattle in cattle unit (ST) were 5-10ST, 60%. The greatest numbers of family dependents were 2-3 persons, 62%.

Profit Sharing System

Besides that, majority of the public work as farm laborers, communitiesin Karang Tekok Village raise beef cattle by profit sharing system. Communitites in Karang Tekok raise beef cattle as side job whereas majority of them work as farm laborers, employees, and merchants. The beef cattle farmers in Karang Tekok have applied profit sharing system. The investors who came from outside Karang Tekok Village have cooperated with the beef cattle farmers in Karang Tekok by entrusting their cows to the cattle

Table 3. Right and Obligation of the Investor and the Cattle Farmer

	Right	Obligation
Investor	• Sell the cows anytime they want. • Get the profit from the sales, 75%. • Get the calf in the second year.	• Buy cows at the beginning of the agreement • Get the calf in the first year.
Cattle farmers or so-called Herdsman Community	• Get profit from the sales, 25%. • Raise cattle starting from feed, stable, and sanitation/health.	

farmers in order to be raised, and after that the authorized capital that resulted from the cow sales will be transferred to the investors, and the rest will be shared evenly with the cattle farmers.

However, 47 out of 50 respondents apply the profit-sharing system, but few people do not apply it. As recorded, there are only 3 respondents who do not apply the profit-sharing system.

According to Al-Qardhawi (2001), profit sharing system is sharing profit between both parties in accordance with their previous agreement, in which profit sharing requires the shareholders to cooperate with the business or work in the interest of beneficial for both parties, as well as the community. Consequence of such partnership, which relates to profit sharing system, is taking the risk, whether it makes a profit or loss.

Descendant

Today, the communities in Karang Tekok mostly apply artificial insemination to breed their cattles. Previously, they have just depended on natural mating, which sometimes could not determine the reproduction success, 100%. The establishment of UPSUS SIWAB program from the government has turned the community in KarangTekok to apply artificial insemination. The data conforms to Toeli here (1981), which suggests that optimalization of the artificial insemination program should be more activated due to the program provides higher adding value for the source of Locally-Generated Revenue, and for the cattle farmers, it will increase population and productivity of of the cattle, accelerate the birth spacing of the cattle, and produce superior descendant, thus these will increase the community's prosperity.

Today, there are many types of beef cattle, which are available and produced for descending and fattening up purposes. More beef cattle farming via cross breeding of Simental-PO and Limousin-PO are found particularly in Java Island. Most of superior studs of the beef cattle as a result of selection process and conservation at the area of the descent source are raised by the cattle farmers. Beef cattle can be improved through technology of reproduction and descent improvement, as well as to increase genetic improvement through selection. The establishment of superior cattle can be produced through grading up the crossbreeding system whereas the descendant is always be backcrossed with the studs (Bamualim, 2010).

Feed

Supplementary feeds for the cattle are wide-leaved grass *(Pennisetum purpureum*) and *teki* (*Cyperus rotundus*), as well as agricultural wastes, for example, corn (*Zea mays*) leaves, but most of the cattle farmers prefer the wide-leaved grass for their cattles. Some of the cattle farmers plant the wide-leaved grass intentionally on their own land, but few of them take it from the conservation forest of Baluran National Park.

All of the respondents take the cut and carry system in order to cover the feed deficiency of their cattles, thus it can be calculated that 50 respondent who took the grasses from the forest, each of them carried 50 kg wide-leaved grass per day, therefore, it is presumed that 2.5 ton wide-leaved grasses have been taken away per day.

Good productivity of grasses, according to Wind and Amir (1997) in Budi Utomo (1997), will be able to produce 150 Kg/ha/day. The meadow may not be able to have good productivity because of two factors, internal (from the plant itself) factor and external (environment) factor. The internal factors include competition, ability or survivability and ability to grow vegetatively, as well as resistant to animal stepped.

Putting the Cattle in Stable

The community of Karang Tekok put their cattles in the stable after they were grazing all day long. Moreover, a drinking trough is available in the stable. Community in Karang Tekok has diverse sizes of stable, such as 20 x 10 m^2, 12 x 5 m^2, and 5 x 6 m^2. The stable width is adjusted with numbers of the cattle and the empty space that owned by the cattle farmer.

Fig. 1. Community takes the wide-leaved grass from the forest for their cattles.

Table 4. Width of Stable that Owned by Informant of the Research

No.	Name	Number of Cattle	Width of Stable (m)
1.	Kusnadi	8	8 x 7
2.	Atmariyah	3	3 x 2
3.	Suraton	7	8 x 7
4.	Mualim	4	4.5 x 3.5
5.	Durrahman	5	7 x 6
6.	Rahmadi	5	7 x 6
7.	Yayan	4	4.5 x 3.5
8.	Rohmin	15	17 x 10
9.	Slamet	8	8 x 7
10.	Sahmo	5	7 x 6

Stable in KarangTekok has been suitable for the cattle because it has good carrying capacity, good material of the building and enough air circulation will make the cattles feel comfortable. Some of the cattle farmers build the stable using their savings while other cattle farmers get the stable as inheritance of their parents. Majority of the cattle farmers got the stables from profit sharing system with investors, which they saved to build the stables.

Health

Community in Karang Tekok do not concern with health of their cattle, however, as they apply semi-intensive management and have low economy, thus it has made them less concerned with their cattles. If their cattle were sick, they will ask to the veterinarian's assistant about the medicine and the price as well. They may ask about alternative medication if the cure for their cattle was costly.

Management of Maintenance

Darmawi (2011) suggested that maintenance of the beef cattle has been categorized into three ways that include intensive management whereas the cattles are put into the stable, semi-intensive management system whereas the cattles are put into the stable at night and herd on grazing land in the morning, and extensive management system whereas the cattles are untied on the grazing land.

Apparently, communities in KarangTekok apply semi-intensive management in raising their cattles, in which the cattle farmers have a stable behind their houses for their beef cattle, and then the cattles will be grazed at the forest area of Baluran National Park.

Fig. 2. The cattles are grazed in the forest

Marketing

The cattle farmers in Karang Tekok just sell their cattles if it is necessary, for instance, when they plan to have a feast that require more expenses, but their savings were not enough to cover it, they will sell their cattles. Such system is only prevailing if the cattles belong to the investors. Their marketing system is very simple and traditional, at the beginning the cattle farmer will go to the animal market to survey the prevailing price in the market in order to avoid any deception and to compare the price with other cattle farmers in the neighborhood who had sold their cattles as well. After that, the cattle farmers will contact the merchant in the animal market to come to their houses in order to ensure the cattles, which are going to be sold. Then, both will have bargaining process. When they have agreed with the price, the merchant will buy the cattles, and then sell them in the animal market.

Conflic between Management of the Baluran National Park and the Herdsman Community

Conflicts between the community of herdsman in KarangTekok and management of the Baluran National Park are as follow: a) social conflict, in which the conflict between the herdsman community and management of the Baluran National Park is due to wild herding that has been done by the community of Karang Tekok since 1960s, b) economy conflict, whereas management of the Baluran National Park has issued funds to overcome the problem, c) ecology conflict, whereas such wild grazing will disturb ecosystem in the forest of Baluran National Park.

Conflict between management of the Baluran national Park and the herdsman community in

Karang Tekok has not revealed. Such statement is based on factual condition in the field, however, when the management closed the access to the forest, the community will react harshly against them, and even they perform demonstration to the Secretariat of Baluran National Park in Karang Tekok. They disobey the rules of the Baluran National Park, which is incompatible with wild grazing in the forest area.

Fig. 3. Interview process

The fact in the field as in Karang Tekok is considered as realistic conflict whereas the communities in Karang Tekok feel disappointed toward government who paid less attention to their economy condition, which is getting worse. They have no choice but grazing their cattles to the forest because their hard works are only enough to fulfill their primary needs. Thus, the only choice to get free feeds is grazing their cattle to the forest.

According to Fuad andMaskanah (2000), a conflict reflects problems that relate to the existing attitudes, behaviors, and situations. Types of conflict include a) no conflict, b) latent conflict, which is concealed, c) open-conflict, and d) conflict on the surface.

Conflict in KarangTekok Village is a latent conflict, which is concealed and should be revealed on the surface in order to be overcome properly.

The economy impact indicates that the community enjoy a benefit form such grazing because they do not have to spend much money to buy feeds for their cattle. The whole feeds for the cattles are taken from forest area of Baluran National Park, whether during the cattles are grazed or taken as supplemental feeds when the cattles are in stable.

The ecology impacts, which are caused by such grazing activity, are as follow:

1. Fragmentation of habitat.
2. Soil compactness.
3. Threatening the wild ox.
4. Assisting the dissemination of invasive vegetation.
5. Spreading the disease via cattle feces.

Government has tried to overcome the conflict by cooperating with management of the Baluran National Park starting from socialization to action of the government to make both parties realize and make an agreement. The efforts are presented in table below.

Besides vertical conflict with management of the Baluran National Park, communities in Karang Tekok have horizontal conflict among themselves.

Table 7. Efforts to Relieve Conflict

No.	Activity	Executor
1.	Socialization (program and types of aid)	Department of Animal Husbandry
2.	Establishment of Cattle Group	Department of Animal Husbandry
3.	Right and Obligation of the Community	Local Government
4.	Determining the border of grazing area (zonation system)	Department of Animal Husbandry and Management of Baluran National Park

Table 8. Efforts to Relieve Conflict and Establish Forest Conservation

No.	Program Activities	Executor
1.	Extension	Department of Animal Husbandry and Management of Baluran National Park
2.	Providing alternative feeds	Department of Animal Husbandry
3.	Public Cattle Group	Department of Animal Husbandry and Management of Baluran National Park

Karang Tekok Village has a progressive group of cattle farmers, which is led by Mr. Abrori, and the group is named Singomulyo Farmer Group.

Singomulyo Farmer Group is a cattle farmer group, which was built by Department of Animal Husbandry in Situbondo Regency that was aimed as sample for the communities in relation to good and proper pattern of beef cattle management. Besides that, this group is intended to give more prosperous life to its members, and then to communities around it. This cattle group was established since 2011 that has 16 members. At the beginning, Mr. Abrori submitted a proposal to Department of Animal Husbandry and Animal Health in Situbondo Regency, and then the Department will investigate prospect and opportunity of the submitted proposal. After the Department approved it, the group will be assisted and guided by the department.

The communities around it had presumed and wondered why they were just specific group or individual who was assisted. They thought that only the interested ones who enjoy the funding and assisted by the government.

Conflict between the herdsman in Karang Tekok Village and management of the Baluran National Park include: 1) semi-intensive management, which herding the cattles to the conservation forest, and 2) the communities look for supplemental feeds for their cattles in the forest without permission from management of the Baluran National Park. Besides vertical conflict with management of the Baluran National Park, communities in Karang Tekok have horizontal conflict with their own community, Singomulyo Farmer Group.

Forest Conservation by the Stakeholders

The stakeholders in forest conservation of Baluran National Park are officers of the management in Baluran National Park and Department of Animal Husbandry and Animal Health in Situbondo Regency. Officers who manage the Baluran National Park are responsible for the forest conservation area, while Department of Animal Husbandry and Animal Health in Situbondo Regency mediates the communities who herd their cattles and the management of Baluran National Park.

Extension or suggestion was given to the community of Karang Tekok about losses that they may be borne if they apply such profit-sharing system with the investors. Investors have already gotten more profit without thinking about how to raise the cattles, whereas they just bought the cattles in the pre-agreement while the community of Karang Tekok should manage the cattles and finally, they are forced to graze their cattles to Baluran National Park. Numbers of investor should be restricted whereas out of 50 respondents of the research, it was just 3 of them did not apply the profit-sharing system with the investors.

Forest conservation problem by encouraging the community to follow the government programs is intended to decrease wild grazing, and it has been included in forest conservation. Besides that, community who take firewoods will be allowed by the management of Baluran National Park because they just take the firewoods from *acacia* trees, which are considered as invasive plants and parasite for other plants in the surroundings.

Conclusion

1. Majority of the community in KarangTekok are farm laborers, but their earnings are not enough to meet their needs, so that they have beef cattle farming in which they make an agreement with the investors and both parties have agreed to share the profit by applying profit sharing system. In running the business, Community in Karang Tekok has applied semi-intensive management in which they put them into stable in the afternoon until at night and herd their cows in the morning until at noon.
2. Impacts, which are caused by wild grazing, are as follow

a) Social impact, in which a conflict emerged between the herdsmen and management of Baluran National Park, b) economy impact, in which the community gets more profits because they do not have to think about the expenses for feed as their cattles have been grazed in the forest, c) ecological impact, which is caused by such grazing activity, such as fragmentation of the wild animal habitat, the soil turns to compact, threatening originality of the wild ox as the germplasm and assist the dissemination of invasive vegetation.

Suggestion

1. The government pays more attention on the community of Karang Tekok in order to support their economy. Thus, the community will have better life and more prosperous.

2. The community of Karang Tekok must be more aware toward the impacts of wild grazing socially, economically, and ecologically. Program and assistance from the government have helped to solve the problem about the beef cattle farming of the community around the area and social role to participate in this program.

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