ASSESSMENT OF RUSA DEER (*Cervus timorensis* Muller and Schlegel) UTILIZATION IN UPLAND KEBAR GRASSLAND, WEST PAPUA, INDONESIA

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ABSTRACT

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This study aimed to provide a baseline information on deer utilization and its implication to the population for a sustainable forage management in the upland Kebar in West Papua, Indonesia. Some related activities of the natives around the study site were analyzed by interviewing some key informants. Deer population census and habitat analysis were carried out to identify deer utilization and implication to the population and habitat.

Deer utilization in the upland Kebar grassland was purely done through hunting for food and cash. Instead of performing traditional hunting, modern hunting using firearms was observed to be increasing nowadays.

The estimated deer population in 375 ha grassland area was 1,081 animals with density level of three deer per hectare. Composition of deer population structure was 57% adult, 25% fawns and 18% sub-adults with a sex ratio of one male to two females.

The grazing area was composed of 11 grass and five legume species. Deer food plants in Kebar were *Imperata cylindrica, Paspalum conjugatum, Themeda arguens, Melinis minutiflora* and *Cyperus rotundus.* Productivity of the grassland was 30.36 kg/ha, while the carrying capacity was about four deer/ha.

SUMMARY AND CONCLUSIONS

Deer utilization in the upland Kebar grassland was purely done through hunting. Deer provides a good source of animal protein, and a means for household income generation. Also hunting is a part of traditional customs of the communities. All parts of the deer's body were utilized such as meat for food, antler for home display, decoration or medicine, and skin for house holds purposes.

Deer meat was mostly consumed while the excess were sold, or often preserved traditionally in the form of smoked-meat, or a combination of salting and air-drying methods to produce jerky or "dendeng" in local dialect. Antler was sold for medicinal ingredients and handicraft industry materials. Time spent for processing the antler was too long, and more time was required for cash payment. Thus, Kebar natives were less interested in searching and collecting antler.

Hunting using traditional tools was commonly found throughout the area. However, modern hunting technique using guns is increasing. It was noted that modern technique had higher extraction rate, which kill 85% of deer compared to traditional with only 15%. If not well regulated, modern technique can be a major threat to the deer population in Kebar.

Highway construction that passed across the grassland site in Kebar was also considered as another major threats either to deer habitat or deer population. It may directly damage and decrease the effective grassland area, which are recognized as the grazing area of deer in Kebar. On the other hand, highway construction allowed easier access to remote areas. This paved the way for creating more entry points to remote tropical forest. Of course if not controlled, some problems might occur in the future. It

was also found that increasing exposure of local people and migrants through social interaction has changed native Kebar's attitude in utilizing natural resources through hunting and gathering.

The study on population revealed that the density level of deer in natural pasture in Kebar is three animals/ha or 1,081 animals in 375 ha of the grassland areas. The population structure showed that majority of deer were adult (57 %) followed by fawns (25 %) and sub-adults (18 %) or 3:1:1 ratio. Sex ratio is one male to two females. A sex ratio one male to 50 females is ideal for optimum reproduction purposes under farming condition.

With regard to individual number per herd, the count ranged from 1 to 11 heads per group. Male and female (harem) were commonly found during the observation with the highest percentage (27.77 %) or 20 groups. On the other hand, female solitary was found only 5.55 % or 4 groups. A group composed of two individuals was the most frequently (41.67%) observed in Kebar. However, large group composed of eight, nine, ten and eleven individuals observed only 1.39 % or observed only once.

Kebar was composed of four habitat types namely primary forest, secondary forest, swampy areas, and natural pasture known as the only grazing area of deer. Low layer vegetation analysis in the natural pasture found that the grassland was composed of eleven grass species and five legume species. *Imperata cylindrica, Paspalum conjugatum, Themeda arguens, Melinis minutiflora* and *Cyperus rotundus* were identified as food plant of deer in Kebar. Among these species *T. arguens, M. minutiflora, C. rotundus* and *I. cylindrica* were the most preferred species consumed by deer.

The biomass harvest (species productivity) was 30.36kg/ha fresh weight. While deer food productivity in the grassland was slightly lower (26.70kg/ha) than total productivity of the grassland. Four species considered to be the most dominant species in the study site were *I. cylindrica* (55.74%), *P. conjugatum* (22.18%), *E. brownii* (9.37%), and *T. arguens* (8.94%).

In this study the grassland area in Kebar was found to have a carrying capacity of 1,668 deer or four deer /ha. The population size in Kebar was 1,038 animals or slightly lower than the computed carrying capacity. This means the upland Kebar grassland can quantitatively support more deer. For establishing deer farming, deer population should be maintained at densities somewhat below carrying capacity, which is suitable for extensive to semi-extensive.

The grassland in Kebar, has a potential for intensive deer farming. However, some management problems under farming conditions, may limit expanded farming in the tropical regions due to low feed quality provided by native pastures. In this case, important pasture species such as *Pennisetum purpureum*, *Brachiaria mutica*, etc. will play an important role.

The major drainage area is Kasi River. Two other rivers across this valley (Api River, Apriri River) are also supply water to the swampy area. However, since the study was conducted in the dry season, flocks expanded their movement closer to water source (swampy areas, and rivers).

RECOMMENDATIONS

From the data gathered concerning deer utilization in the upland Kebar grassland with regard to population and habitat condition the following recommendations are suggested:

1. The development plan in the upland Kebar should consider the presence of wildlife sanctuary. The location of Kebar between two mountainous regions (North and South Tamrau Protected Areas) has established a function of ecological corridor of wildlife. Therefore, infrastructure development should be based on scientific study related to the benefits served by the area to the wildlife community.
2. Community based resource management is suggested to increase the awareness on sustainable ways of natural resource utilization. Conscious effort should benefit local community in terms of obtaining advantages from the nature along with its sustainable maintaining. Local products from the forest must have significant contribution (price and revenue) to the local community.
3. Regular surveys on deer population and habitat should be conducted for a five- year period to identify the potential number of deer that could be supported by the forage feed resources towards the development of upland Kebar.
4. Improvement of fodder by introducing high quality forage species through further fodder evaluation under the Kebar's conditions. In the prospect of

confined rearing deer, palatability or acceptability study of improved pasture species, both grass and legumes should be conducted.

5. It is essential to establish specific program (through demonstration plot) in smallholder deer management in collaboration with farmers who currently raised deer through traditional backyard farm. This should be done along with a study of management practices as regards the natural habitat condition in Kebar.
6. Reproduction or breeding physiology of the animals must be researched on in connection with their management under farming condition.
7. Increase the deer meat processing through extensive research.