HALIMUN-SALAK NATIONAL PARK AS A POTENTIAL SITE FOR ESTABLISHING THE SECOND POPULATION OF JAVAN RHINOCEROS (*Rhinoceros Sondaicus*)

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INTRODUCTION

Javan Rhinoceros Population

The population of Javan rhinoceros in Ujung Kulon National Park has shown that the population increased from 25 to 58 individuals from 1967 to 1980. However, there is no significant increase in the population since (Setiawan *et al* 2002). In fact, based on rhino census, the actual size of population from 1986 to 1991 is lower than 3% rate of increase as shown in the fig.1.

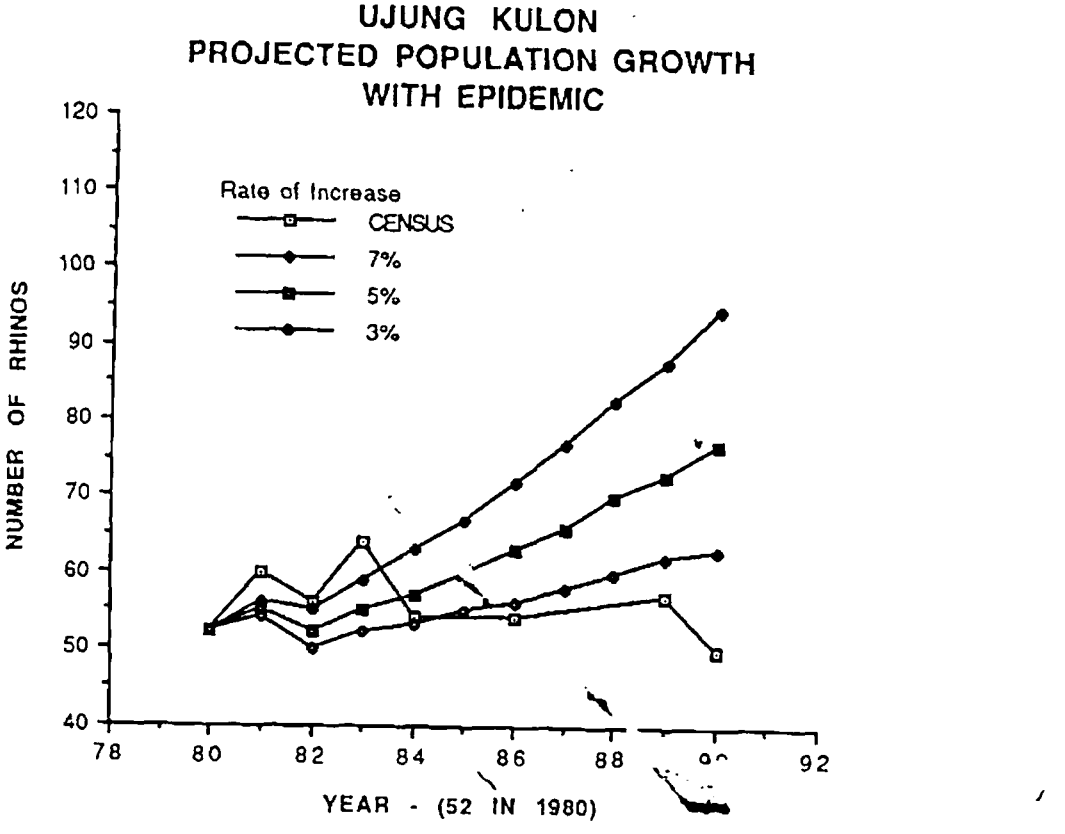

Fig 1. Projected growth of Javan rhino population in Ujung Kulon NP with epidemics and 52 individuals in 1980. (Reproduced from Briefing Book – Indonesian rhinoceros conservation strategy)

Similar trend can also be inferred from Camera trap surveys conducted by Ujung Kulon National Park authority and WWF Indonesia.

Years	Range	Estimate	Source
1993	31 - 74	46	Mike Griffith
2002	24 - 53	38	A Yahya

Table 1. Range and estimation of Javan rhino population based on Mark-recapture calculation using data from camera trap.

Table 1 shows that in 1993 and 2002 the range of population estimates overlap, thus indicating the relatively stagnant population during the 9-year period. Therefore, It is suspected that there are several factors inhibiting the normal growth of Javan rhinoceros population in Ujung Kulon National Park.

Food plant Availability

Rhinoceros habitat in the peninsula of Ujung Kulon NP covers an area of approximately 30,000 ha. Unfortunately, not all of this area is accessible to the rhinos due to limited availability of food plant. *Arenga* palm domination (*Arenga obtusifolia*) is believed to prevent penetration of sunlight to the forest floor; thus inhibiting the growth and distribution of food plants for rhinoceros (YMR 2004).

Competition with Banteng (*Bos Javanicus*)

Banteng's (Wild cattle) population increases at a much greater rate than the Javan rhinoceros, so they are widely spread in Ujung Kulon National Park including the peninsula. Although the Bantengs feed on different types and parts of vegetation (grazer), having a large population they tend to intrude Rhino's home range; thus creating inter-specific space competition (YMR 2004).

Other Threats

Many other threats do not currently pose direct influence to the size of population. Nevertheless, they should be taken into account in regards to future wildlife management. These threats include:

1. Natural processes such as land degradation and erosion that could reduce the size of the habitat.
2. Natural disaster such as tsunami and volcanic eruption (Krakatoa) that could potentially wipe out the entire population.
3. Spread of diseases that could lead to mass mortality. Potentially pathogenic endoparasites have also been identified recently from feces of rhinoceros (Priosoerjanto *et al* 2004).

Judging from above factors, it is not safe to have only one population in Ujung Kulon NP. A second population must be set up as a conservation strategy (PHKA 2004).

Habitat for the Second Population

PHKA (2004) have set the criteria for selecting best place for second habitat consisting of the following aspects:

1. Areas that are within historic home-range of the Javan rhinoceros
2. Appropriate and suitable habitat
3. Year round water availability
4. Protected area to support habitat and species protection
5. Areas that are large enough to sustain the new population

6. Indications of previous rhino inhabitation
7. Ease of transport for trans-locating the rhinos
8. Degree of separation between original and second habitats
9. Management capacity in the second habitat
10. Potential external support for this area
11. Commitment from local government in this area
12. Potential of eco-tourism activities in this area
13. Potential for education and community awareness in the new habitat

The above criteria are used to assess the suitability in Halimun-Salak NP for setting up the second population from July 2005 to January 2006.

MATERIALS AND METHODS

Materials

Materials for Halimun-Salak NP habitat survey consists of:

1. Global Positioning System (GPS)
2. Contour Map from BAKOSURTANAL
3. Compass
4. Field transportation
5. Digital camera
6. Community Questionnaire

Methods For Habitat Assessments

Potential areas within Halimun–Salak NP are selected and identified using topography map. Relatively flat areas accessible for the Javan rhinos are preferred. Size of this area is estimated, and coordinates of this area are recorded. Based on this, a ground survey is conducted to observe food plant availability and to check the actual topography in the area.

Methods for Community Assessments

Survey is conducted in settlements around and inside the National Park. General information is gathered from village records, and statistics of *Kabupaten*. Detailed information is collected through direct interview with village leaders and community members. Information is categorized into three aspects:

1. Social economic structure includes occupations, educations, social structure, income, and awareness levels.
2. Potentials for alternative livelihood and sustainable use of resources. This includes handicraft, home industry, tourism, agriculture, and agro-industry.
3. Potential and existing anthropogenic threats

RESULTS AND DISCUSSIONS

Habitat Assessments

Survey on existing ecosystem in Halimun-Salak NP reveals information that relates to criteria no 1,2,3,4,5,6,7,8, and 9. While criteria no 1 is also supported by the result from historic distribution survey (Yahya 2002). Yahya (2002) conducted interviews with village leaders and found that many places near Halimun-Salak NP (in Sukabumi and Cianjur regencies) were named based on the presence of the Javan rhinos in these areas. One village leader in Majasari enclave stated that in 1940s his father had a direct encounter with a Javan rhinoceros in this area.

Potential Areas (Size, food plant, competition)

Ujung Kulon and Halimun-Salak National Park are parts of West Java lowland and mountain forest eco-region. This shows that despite lack of current geographic connectivity, both National Parks belong to the same biome. Halimun-Salak NP territory has been designated as a National Park in 2003 covering an area of 113,357 hectares. This Park lies in the regencies of Lebak (Banten province), Bogor, and Sukabumi. According to YMR (2005), the most suitable areas are found in Lebak regency (less mountainous). Table 2 shows the size of potential areas within Halimun-Salak NP in relevance with current areas extensively inhabited by rhinoceros in Ujung Kulon NP.

Location in HSNP	Size (ha)	Size (ha) in UKNP	Block Name in UKNP	No of rhinos in UKNP (absolute minimum)
Cibedug resort	1,610	1,500	Cikeusik - Cibandawoh	5
Cisoka resort	2,100	1,900	Cikeusik - Citadahan	4
Gunung bedil resort	Not surveyed yet	2,400	Citadahan - Talanca	6
		800	Cigenter	3
Totals	3,700	6,600		18

Table 2. Areas accessible for rhinoceros in Halimun-Salak National Park in comparison with Ujung Kulon NP.

These areas and possible corridors between them have no or minimum human contact to ensure proper protection of the second habitat of the Javan rhinoceros. It is safe to predict that these areas are relatively easy to protect. The absence of major threats such as *Arenga* palm invasive species and *Banteng* in Halimun-Salak NP make this Park perfect for rhinoceros inhabitation. During ecological assessment survey, 60 types of rhino food plants have been identified in these areas.

Water Availability

Halimun-Salak NP is blessed with continuous water supply throughout the year. In fact, this Park serves as a watershed catchments area for municipalities of Rangkasbitung and Tangerang (in Banten province), Sukabumi, and Bogor (in West Java province). Two major mineral water companies (*Aqua* and *Dua Tang*) rely on water supply from this National Park.

Potential areas for rhino trans-location are located up stream from any human settlements, this ensure clean and healthy water supply for the rhinoceros. Furthermore, the soil type in these areas is classified as brown-yellow *latosol*, very similar to that of Ujung Kulon NP. This type of soil is perfect for retaining water for wallowing (YMR 2005). There is also a mountain swamp area and 2 sources of saltwater (Gunung Julang & Majasari). YMR (2005) states that the climate type in Halimun-Salak NP will not have any negative effects on the individual rhinoceros.

Social Economic Assessments

These assessments are relevant with criteria no 9,10,11,12,13 and some additional aspects not covered in the list of criteria.

Management Capacity

It is clear that Halimun-Salak NP authority is the leading management authority in the area, and they are already empowered to carry out any management, scientific and law enforcement initiatives in this potential new rhinoceros habitat. Fortunately, there are social aspects that could also support the protection and management of the Park. Local wisdom of the *Kasepuhan* sets restriction of access to a certain forest locally known as *leuweung tutupan* (closed forest). Another form of natural resource protection is the regulation to prevent forest resource extraction. WWF sees this as a potential mechanism for enhancing natural resource management and protection (WWF CE Working group 2004). Halimun-Salak NP has received various international supports with JICA being the most recent. This shows that there is a potential for external supports.

Support from local Government

Javan rhinoceros have been the pride of Banten province. Therefore, trans-locating the rhinos to Lebak conservation section (Banten province) will likely to get full support from provincial government. Furthermore, WWF is working closely with a key figure for promoting Javan rhinoceros conservation to ensure local government's acceptance towards the trans-location.

Potential for eco-tourism

Many organizations have worked on the tourism potential of Halimun-Salak NP. Canopy Trail, camping ground, Loop trail, and research station have been set up in the eastern part of the Park (West Java sections). However, there are also potential destinations in Lebak sections as well consisting of ruins of Cibedug and Kosala temples, Hot water spring, Waterfalls, and also coastal destination in Bayah districts south of the Park. *Seren Taun*, a traditional Islamic new-year celebration, is also known as a potential for culture tourism.

Economic stability

People residing in and around Halimun-Salak NP are self-sustaining. They practice sustainable farming, so they can produce their own rice, fish, vegetables, coffee, and sugar. Most people have pride in their custom. Furthermore, *Kolot* (village elder) has a strong influence in the community. If necessary, there are possibilities of alternative income generating schemes that could be developed consisting of:

1. Handicraft / home industries.
2. Garment industry and weaving
3. Sustainable farming and fisheries practices
4. Livestock
5. Easy access to marketplaces

With 10 years of experience in Ujung Kulon NP's community empowerment, interventions to prepare local people in Halimun-Salak NP prior to introducing an endangered species will have a great chance of success.

RECOMMENDATIONS

In order to set up a second Javan rhinoceros population, new habitat in Halimun-Salak NP must be prepared both ecologically and anthropologically (working with local people).

Protect & Restore

Interventions are required to prevent degradation of habitat in Halimun-Salak NP. Potential sites are identified as High Conservation Value Forest (in the context of Javan rhinoceros). Park authority will then protect the habitat with regular and additional patrol. Local community can also involve in protecting the potential sites. This way, vegetations (including rhino food plants) will start to grow in deforested / degraded areas. In the future, both NP authority and local people can establish a protective buffer around the rhinoceros.

Manage

Existing local wisdom will be acknowledged and optimized to support conservation. This includes mainly in relevance with natural resource management schemes, Non timber forest products will also be encouraged. Home industries and handicraft will be included in Green & Fair product schemes. Sustainable natural resource management schemes will be the output that contributes to the overall conservation of the second rhino habitat.

Community Empowerment

Interventions will be targeted towards community/settlements in the buffer zone and enclave with a close proximity to the new rhino habitat. This intervention includes conservation education, awareness campaigns, as well as providing alternative livelihood schemes if necessary. WWF will need to ensure that conservation also benefit local people (WWF 2003).

Genetic Analysis

Thorough research in genetic analysis is required in order to identify individuals for setting up a second population based on their genetic viability. This will increase the chance of success of reproduction and also genetic variability of the population.

RISKS AND SIDE EFFECTS

Risks

There are always risks in trans-locating wildlife to a new habitat. However these risks can be minimized by:

1. Providing technical and medical experts during the transport
2. Minimizing transport time (Ujung Kulon and Halimun-Salak NP are apart but the distance between the two locations is relatively short)
3. Easy access for close monitoring of the animals after transport. Effective monitoring stations can easily be set up in Halimun-Salak NP.

Side Effects

Preparing a second habitat for Javan rhinoceros will have the following positive side effects:

1. Ensuring pristine forest condition in Halimun-Salak NP will also ensure the preservation of water supplies for municipalities of Rangkasbitung and Tangerang (Banten), Bogor and Sukabumi (West Java)
2. Preservation of rare plant and animal species in Halimun-Salak NP

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