SURVEY OF PERCEPTION, BEHAVIOUR AND COMMUNITY NEEDS IN SIX VILLAGES SURROUNDING BERBAK NATIONAL PARK, JAMBI PROVINCE, SUMATRA WITH RELATION TO REDD+ PREPARATION ACTIVITIES

Erwin A Perbatakusuma, Laura D'Arcy, Dolly Priatna and Mulya Shakti

ZOOLOGICAL SOCIETY OF LONDON

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EXECUTIVE SUMMARY

The efforts to Reduce Emissions from Deforestation and Forest Degradation in developing countries, or REDD+, should also produce the additional benefits of poverty reduction, sustainable livelihoods, good governance and protection of people's rights and community adaptation to climate change. Berbak National Park is experiencing intense deforestation and the threat to Berbak's biodiversity and forest carbon stocks makes it an ideal location for REDD+. To successfully implement REDD+, research into community perceptions, behaviour, and needs, within the context of REDD+, is required.

This report is a descriptive analysis of data derived from questionnaires distributed to respondents, field observations, and focus group discussions. The study was conducted in rural areas bordering Berbak National Park including the villages of Sungai Rambut, Air Hitam Laut, Sungai Jambat, Rantau Rasau, Sungai Cemara and Telago Limo in the District of Tanjung Jabung Timur, Jambi Province, Sumatra. A purposive sampling technique was used, covering 2473 households and 516 respondents.

After data analysis using Software SPSS, the conclusions of the survey are as follows:

a. Current economic activity and community behaviour are disrupting the ecosystem integrity of Berbak National Park and its remaining peat forests and identifies the community as one of the key drivers of deforestation and forest degradation in Berbak.

b. There are people in the communities bordering Berbak National Park who, although generally classified as economically poor, are aware of the condition and function of the forest and the damage that bad practice can cause to the availability and condition of resources which are perceived as important for community survival. They are aware of the biodiversity of Berbak National Park and the importance of maintaining its resources, both abundance and quality. However, there remains a gap in perception and resulting actions/attitudes towards exploitative and sustainable utilisation of forest resources.

c. With relation to the institutional management of theNational Park, the community perceives that it is not part of the National Park's management institution, so is not bound by National Park management rules. As a result, villagers tend to use National Park forest products for economic gain. Community perception of the forest is based on to their desire to gain economic benefit from the the forest regardless of the laws governing the National Park area.

However, the villages around Berbak National Park have the potential to gain additional economic benefit from the implementation of REDD+ in Berbak such as reduced poverty, improved governance and the implementation of community forest management rights. This survey also identifies several incentive-based strategies to balance the needs of the local community with the goal of reducing emissions from deforestation and forest degradation.

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CHAPTER 1: INTRODUCTION

1.1 Background

The serious implications of climate change are becoming more evident. Emissions caused by deforestation and forest degradation account for around 20 per cent of all greenhouse gas (GHG) emissions each year, greater than the emissions released by the global transport sector. To overcome this crisis, it is necessary to focus on two aspects: adaptation and mitigation. One mitigation approach is REDD, reducing emissions from deforestation and forest degradation. The idea of REDD+ activities is different from previous forest conservation initiatives because it is associated directly with creating financial incentives for conservation that aim to store carbon in forests and generate additional social benefits and other environmental services for local communities.

National and global policies have focused on the effective reduction of global emissions. REDD+ has the potential to be a main element in global climate change mitigation strategies. There has been much debate regarding the global framework for REDD+ and how to incorporate REDD+ into the Climate Agreement after 2012. Discussion has also focused on how to implement REDD+ to meet the "3 E" standards, namely *effectiveness* in terms of climate change mitigation, *efficiency* in terms of cost, and *equity*, as well as additional benefits such as: the protection of biodiversity and other environmental services, poverty reduction and sustainable livelihoods, good governance and protection of people's rights, and adaptation to climate change. Within the framework of 3 E the close relationship between REDD+ and local communities is evident, particularly the additional impact of REDD+ on poverty reduction, sustainable livelihoods, governance and community rights.

Thus, one of the goals of the REDD+ National Strategy is to improve community welfare and enhance the role and involvement of the communities living within and around the forest management area. Local residents and traditional communities play an important role in this process. It will require more effort to ensure that their land resources and rights are recognised. Government officials, private companies or local elite may be tempted to take over the payment of carbon services from local communities through the new forest scoring system, if the land ownership rights of local residents are not guaranteed.

Designers of REDD must fully consider the legitimate rights of communities living within and around the forest before taking legal action to reduce forest-based carbon emissions. A trade-off between the reduction of carbon emissions and the reduction of poverty and supporting sustainable livelihoods is probably necessary. Local communities' rights to use forests must be balanced with the international community and national goals to overcome climate change. While REDD must reduce emissions, the REDD mechanism is more likely to succeed if it can build on, not create conflict with, the interests of local communities and native peoples ('forest people').

Berbak Peat Forest conservation area, Jambi Province has been designated by the Indonesian Government as one of the pilot sites for REDD+ Demonstration Activities (DA) for the implementation of REDD+ in Indonesia. Demonstration activities are the activities for testing the methodological development, technology and institutions within the framework of the forest carbon management readiness phase.

Therefore a survey to identify perceptions, public behaviour and implementation of community needs in relation with preparation for REDD+ is important, especially to assess local perception of the functions of natural resources, particularly forest conservation, what causes damage to forest resources and how the needs of the community relate to forest conservation.

1.2. Formulation

Law Number 19 Year 2004 (UU No.19/2004) on Forestry, in article 70 paragraph 1, states that: "the people being participatory in the development of forestry." The above law also makes much reference to the rights and obligations related to aspects of forestry. Based on the above description, according to existing regulations, the position of local communities in the context of forest conservation is actually very clear.

However, there is no guarantee that the community knows, understands, or gains benefits in accordance with their rights and obligations as outlined in the above law. For that to happen, it is important to assess local community knowledge, understanding, and benefits, including community rights, obligations and needs in the context of forest conservation.

We need to assess what is the perception of the community in relation to the forest and its function, forest management policies and institutions, rights and obligations attached to them, and how their actions/behaviour relate to and affect the protection forests that surround them. In addition, and more fundamental, is how the communities can gain sufficient information to understand the forest and its functions and what role they can play in its conservation.

The study of the perceptions, behaviour and community needs related to forest conservation is based on how these factors influence the relationship between community actions and forest conservation. Public perception of forest function strongly influences their behaviour in the context of forest conservation. Do people perceive that the main function of forest is as a conservation area? Knowledge about forest conservation policy will allow the public to understand fully the context of their role in conservation of the forest. Similarly, do the rights and obligations of the public in the preservation of forests comply with existing Forestry Law? Do people perceive that cultivation activities should not be conducted in conservation areas?

In the context of REDD+ preparation, attention should be focused on how to translate action in the field to give benefits to forest communities, so it is important to ensure:

    a. Incentives are provided in accordance with the efforts made to reduce deforestation;

b. Benefits are distributed evenly and transparently;

c. Meaningful political participation of the communities in the planning for and implementation of REDD+;

d. Rights of the community around the forest, especially their management control of their land, will be recognised, guaranteed and strengthened.

Based on the description above, the question raised was: "How do the perception, behaviour and needs of the community relate to preservation of the nature conservation area as a buffer zone and the relationship of community life with preparation for REDD+?"

CHAPTER 2: LITERATURE STUDY

A study of the theory used in this survey has been conducted, looking at theoretical studies of forest conservation and environmental psychology (community perception of and behaviour towards the environment).

Conservation means the optimum use of resources (efficient and orderly) in the long term by reducing waste, both economic and social, and maximising net revenue over time. Thus, it can also be said that conservation is the wisest use of resources when taking time into consideration.

Although various conservation approaches have been widely tested to stop the damage and destruction of natural forests in Indonesia, the reality is that deforestation and forest degradation are still happening, even in nature conservation areas such as National Parks which should, by definition, be better protected from deforestation.

Climate change mitigation efforts should give priority to reducing emissions from fossil fuel use in industrialised countries. Although the effect is relatively small, planting trees to absorb carbon also plays a role in mitigating climate change. However, in order to achieve the government target of a 26 per cent reduction of forest-related emissions, we need a new and more effective conservation approach. REDD is one such approach.

Gibson in Suwarto (in Boedojo, 1986) defines perception as a cognitive process that is used by someone to interpret and understand the world around him. Allison (in Boedojo, 1986) says that perception is the 'conceptual lens' that the individual himself uses as a framework to analyse and understand a problem.

Individual perception and understanding of issues are subjective and affect the individual's assessment of the relative importance of the issues being considered. Perception has an important role in decision making. Perception includes the interpretation of objects, signs, and people from the individual's personal perspective.
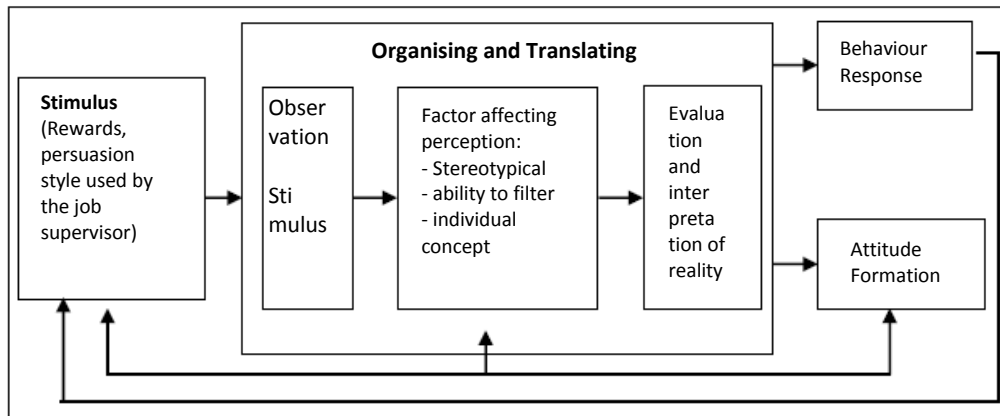
Figure 2.1
Perception as Cognitive Progress
Source: Suwarto 1999 (Dalam Boedojo 1986)

Human perception of the environment is the interpretation of a setting (space) by the individual based on the background, culture, intuition and experience of that individual. Thus each individual can have a different environmental perception of the same object depending on the background that they have.

An individual's response to and relationship with its environment depends on that individual's perception of that environment. Individual attitudes to the environment can be either: (1) The individual does not comply with the state of its environment; (2) The individual is comfortable within its environment; (3) The individual is neutral or status quo, not being compatible with its environment, but not taking steps to modify its behaviour.

Individual interactions with an object will affect that individual's perception of the object. If the perception is within optimal boundaries, then the individual is said to be in a *homeo-static state*, which is a completely balanced state. This situation is optimum for the individual as it creates the most pleasurable feelings. Conversely, if the object is perceived as beyond optimal limits (too big, too powerful, less harsh, less cool, too weird, and so on) then the individual will experience stress. As that stress increases in the individual, that individual will adopt a *coping mechanism* to adapt to the conditions of his environment. As a result of coping, there are two possible outcomes. First, this coping behaviour causes stress and its impact continues to affect the condition of the individual and the individual's perception. The second possibility is that the coping behaviour is successful. In this case, individual will adapt or adjust to the environment.

The impact of this success also depends upon the individual's perceptions. If successful coping behaviour occurs repeatedly, then it is possible for a decline in the level of tolerance for failure or boredom. In addition, there is increased ability to deal with the next stimulus. If failure is experienced repeatedly, awareness will increase. But at some point more serious mental disorders such as hopelessness, boredom, feelings of helplessness and lack of achievement may occur.

The context of this survey is the preparation for REDD+ activities in Berbak peat forest. Basic information about the socio-economic conditions and community perception of nature conservation is required, so that planned REDD+ activities will have a positive impact (as co-benefits) on poverty reduction, sustainable livelihoods, governance and the rights of the community.

Berbak peat forest has a high potential for REDD implementation due to the conditions outlined below:

1. **The ecosystem value is very high because:**
   a) Berbak is the oldest peat forest on Sumatra covering an area of 240,000 hectares which act as a huge carbon store which could potentially be the largest contributor of CO_2e emissions. It is estimated that the reserve carbon store value of the area is 45.5 million tonnes of carbon distributed as follows: Berbak National Park, 26 million; Peat Forest Preserve, 4.1 million tonnes; Forest Park, 3.4 million tonnes and Production Forest 12 million tonnes. Berbak also has the potential to contribute significantly to the mitigation of climate change because, over 30 years (2008-2038), reduced deforestation and forest degradation in Berbak could prevent the release of $C0_2e$ emissions totaling 164.04 million tonnes. Potential sources of CO_2e emissions are estimated at 91% from draining swamps and oxidation, 7.5% from unplanned deforestation (logging, forest fires) and the remaining 1.5% from planned deforestation.
   b) Berbak is rich in biodiversity. It is the oldest wetland ecosystem in Indonesia, listed as a Ramsar site since 1992. Tiger density of over 2 tigers/100 km^2 and over 300 species of migrant and resident birds (have been recorded), including rare bird species such as White-winged Wood Duck, and Nordmann's Greenshank
   c) The poor and vulnerable sectors of 32 villages around Berbak have a high level of dependency on the peat swamp, river, coastal and marine ecosystems.

2. **High deforestation threat**: The average annual deforestation rate during the last 18 years in the Berbak Ecosystem was -1.96%, with Berbak National Park rated at -1.14%, Forest Park -3.03%, Production Forest - 2.43%, Protection Forest - 0.75%. It is estimated that over the next 30 years, the Berbak Ecosystem will lose 40,800 hectares of forest.

3. **Judged to be economically feasible**: Over a period of 30 years to 2038, Berbak Ecosystem can generate carbon credits based on 82.7 million metric tonnes of reduced CO_2e emissions with a market value of USD 779 million broken down as follows: Berbak National Park - 18 million metric tonnes of (reduced) CO_2e with a market value of USD 167.3 million, Forest Park - 24.8 million metric tonnes with a value of USD 229.9 million, Protection Forest - 3.6 million metric tonnes of (reduced) CO_2e emissions with a market value of USD 33.2 million and Production Forests 36.3 million metric tonnes (reduced) CO_2e emissions with a market value of USD 349 million.

Communities living around the Berbak forest area should receive the economic benefits of REDD+ activities while at the same time preserving the forest. However, at present, community actions are one of the major drivers of deforestation and degradation of natural forests. Consequently, the preservation of natural forest areas is dependent upon the perception and behaviour of the community in its use and protection of forest resources.

Perceptions themselves are formed from physical and physiological processes and psychologies and can be defined as a process of an individual's consciousness responding to stimuli around them which they have considered, accepted, understood, interpreted, and predicted subjectively, with evaluation based on the individual's past experience and personal environment. These in turn determine the behaviour, good thoughts, feelings, attitudes and actions of that individual.

Government regulations covering the management of forest conservation areas and government intervention in handling the problems of forest conservation will not be effective in conserving the forest or other protection areas if they are not balanced with the commitment, perceptions and actions of communities bordering and using the forest.

As a result it is necessary to conduct a survey of the key stakeholders who will be involved in and affected by REDD+ activities, namely the local community, especially focusing on socio-economic aspects and the public perception of forest conservation. The fundamental question raised by the survey is: How do community perceptions, behaviours and needs relate to the conservation of Berbak National Park and the broader Berbak Ecosystem?

CHAPTER 3: RESEARCH METHODOLOGY

3.1   Research Type

The research conducted is qualitative descriptive research, adapted to the aim of the survey, namely to describe the perception and behaviour of communities and how they relate to the need for the protection of forests in conservation areas as associated with preparation for REDD+ implementation in Berbak.

3.2   Scope

3.2.1   Time, Location and Substance

The survey was conducted between December 2011 and February 2012, including field data collection, data analysis and reporting. The substance of the survey is related to assessing community perception and behaviour regarding the destruction of forests and requirements for forest preservation.

The selection of villages for inclusion was determined by a ranking system. To simplify the selection process, a cluster approach was devised, based on the topography of the Berbak buffer zone ecosystem. The Berbak ecosystem is divided into three topographical types: coastal, river, and land. In-depth study was conducted in six Berbak buffer villages which are representative of these three clusters. Two coastal villagea and four river villages and one land village were selected as representatives of their "type" selection being determined by a matrix ranking process based on criteria designed to fit the needs and desired outputs of the study.

Criteria for rating villages for inclusion in the study included: 1) distance of the village from the Berbak ecosystem: **"Distance"**; 2) the level of community dependence on the Berbak ecosystem: **"Dependency"**; 3) the socio-economic status of the community living around the Berbak ecosystem: **"Social Economy"**; 4) village experience of assistance from NGOs and government bodies, especially forestry institutions: **"Mentoring"**.

After conducting reviews and based on the matrix ranking above, the villages selected as target survey locations are:

Table 1. Villages Selected for Inclusion

No.	Village	Subdistrict	District	Cluster
1.	Sungai Cemara	Sadu	Tanjab Timur	Coastal
2.	Sungai Rambut	Berbak	Tanjab Timur	River
3.	Air Hitam Laut	Sadu	Tanjab Timur	Coastal
4.	Sungai Jambat	Sadu	Tanjab Timur	River
5.	Rantau Rasau	Berbak	Tanjab Timur	River
6.	Telago Limo	Berbak	Tanjab Timur	River

3.2.2 Population and Sampling Techniques

Sampling is conducted using a purposive sampling technique. That is sampling which is designed to fit a particular purpose. Purposive sampling was used in this study to focus on communities whose activities are related to proximity to the forests of the Berbak ecosystem. The sample selected to describe the population represented between 5-10% of the total population. The more homogeneous the population, the fewer the number of samples taken. A questionnaire was distributed to the community then interviews were conducted with several stakeholders including sub- district authorities, prominent community members, religious leaders in the sub-district/villageand other appropriate stakeholder representatives.

Surveys were conducted by two interviewers recruited from the village, one male and one female, who were trained by ZSL prior to conducting the surveys. Questionnaires were given to as many as 20% of households from each village and the number of respondents balanced 50%/50% between male and female in each village. For ease of communication and openness, male respondents were interviewed by a male interviewer from the same village, and female respondents surveyed by a female interviewer.

The number of respondents from each village, representing 20% of households in total, is outlined in Table 2 below:

Table 2. Number of Respondents for Each Selected Village

No	Village Name	Total Number of Households (Kepala Keluarga)	Number of Respondents / Sample Size	
			Male (10%)	Female (10%)
1	Air Hitam Laut	439	44	44
2	Sungai Jambat	747	75	75
3	Sungai Cemara	95	10	10
4	Sungai Rambut	160	16	16
5	Rantau Rasau	704	70	70
6	Telago Limo	258	26	26
	Total	2473 KK	258	258
	Total		516 Respondents	

In order to obtain a comprehensive data set, Focus Group Discussions (FGD) were also conducted in addition to in-depth interviews with key community figures.

3.2.3. Data Types, Resources and Benefits

The information required from these surveys includes both primary and secondary data. Secondary data is in statistical form in the form of a map. Primary data determine the behaviour and perceptions of community needs based on information collected during interviews and questionnaires.

Results are collated to provide a full picture of the physical, social and economic conditions in the research areas (study area maps and descriptions), basic sampling calculations and data analysis to gauge community perceptions, behaviours and needs related to the preservation of conservation areas.

3.2.4. Observation Phenomenon

The survey research consisted of six observation groups relating to:

a. Community perception of the surrounding natural environment;
b. Community perception of its dependence on forest resources;
c. Community perception and knowledge of forest function;
d. Community perception and knowledge of conservation;
e. Community behaviour (activity) related to the pressures which threaten forest conservation;
f. Community perception of the proposal and the needs of the community to overcome the threat related to the pressures placed on natural resources

3.3 Data Analysis Technique

This survey employed qualitative descriptive analysis techniques. The data analysed comes from respondents' answers to the questionnaire presented by the researchers. To provide a framework for qualitative descriptive analysis, the basic theory of environmental psychology is used, so that the analysis performed has clear direction, grouped into thematic analysis areas. The findings of thematic analysis are then connected to each other using the theory of natural resource conservation, so that conclusions can be drawn concerning the perception and behaviour of the community in the context of the conservation of natural resources, which in this case are the forest resources.

Respondents' responses to the questionnaire are first tabulated in SPSS Software Version 9 to produce the raw data. After that, the raw data were analysed using frequency analysis tool on the pull-down menu which is the *Analyze-Descriptive SPSS is Statistics-Crosstabs/Frequency.*

The output of crosstabs or frequencies is then analysed using the theory of analytic studies. Conclusions and recommendations are then made after each field of study has been analysed.

CHAPTER 4: RESULTS AND DISCUSSIONS

4.1. Spatial Profiles and Village Social Studies

Villages targeted in the survey were those built independently by groups of immigrants with high heterogeneity since Dutch colonial times, namely Bugis, Banjar, Melayu, Banjar, Melayu Jambi, and Melayu Palembang, Jawa, Batak and Padang.

The predominant professions of the people in the research area are coconut and rubber farmers, and throughout the years these have provided dependable livelihoods. However, villages also farm livestock, trade and work as farm labourers or fishermen. Rubber farmers are able to produce gross revenues of Rp. 2.400.000 - Rp.3.600.000 per month, while the rubber sap-collection workers earn gross income of Rp. 1.200.000 - Rp. 1.800.000 per month. Fishermen, during the peak fishing season, can generate income of Rp. 50.000 - Rp. 70.000 per day.

Land use is dominated by rice fields, plantations/coconut, scrub and forest. The structure of land tenure in general at the research location consists of individual ownership rather than collective tenure.

In terms of local health care, the research target villages are only equipped with one community health centre, staffed by one midwife and one doctor in the village of Desa Air Hitam Laut. This health facility is not able to support the health care requirements of local residents. If residents experience health problems that cannot be treated in the village, they usually go to Jambi. In addition to the use of medical services, some people still take advantage of the village witch doctor to address health problems experienced by some, including pregnancy and birth.

Educational standards are generally low, due to the distance required to travel to reach institutes of higher education. This means that higher education requires additional funding from families that cannot afford it, meaning that most children leave school after their basic/primary education. In general, there is only one primary school in each of the target villages, except in Desa Air Hitam Laut which has two primary schools.

Generally in the research villages there are still many groups who are not economically prosperous. The indicators used to determine economic prosperity at a local level are factors such as farm ownership, type of business owned, ownership of gold jewelry and the ability to send their children to school. Indicators for the most economically impoverished groups are: people who work as farm labourers and fishermen, boat owners, live in round wood frame houses with roofs, have no regular income and do not own a motorbike.

The clarity of the boundaries of forest areas belonging to the Berbak forest ecosystem is very important, because it is closely linked to the issues of natural resource management and community survival. Undefined or unrecognised forest boundaries around the villages makes it difficult for villagers to manage their land resources and economic activities. This also affects the extent of unused land and increases tenure conflicts.

The need for productive economic community development is associated with the need to reduce poverty. Economic development is necessary not only to increase production, but also to increase community capacity and economic growth. Economic development needs to be long-term and sustainable if it is to reduce community dependence on the Berbak forest ecosystem and its resources.

Potential initiatives to enhance local economic development, based on community knowledge, include: a) Development of eel farming; b) Development of demonstration plots, greenbelt areas or jelutung farms; c) Development of coconut plantations to establish business in coconut fiber; d) Development of river fish farming and e) Mooring channels for alternative farming.

4.2. Description of the Respondents Age

Respondents from the six target villages can be categorised by productive age. Table 2 below illustrates that the average age of respondents is 39 years, with the youngest being 17 years old and the oldest 73 years old. Productive age is defined as the age at which the person can engage in economically productive activities in the village.

Table 2. Age of respondents from villages around Berbak in 2012

No	Statistic Parameter	Age
1	Mean	39.09
2	Median	39.00
3	Std. Deviation	10.751
4	Variance	115.579
5	Minimum	17
6	Maximum	73
N	Sample	516

The age distribution of respondents is also illustrated in Graph 1 which shows that 93.1 per cent of respondents are of productive age and 6.9 per cent (36 people) are classified non-productive, being more than 55 years of age.

Graph 1. Age distribution of respondents in the villages bordering Berbak National Park 2012

Mean = 39.09
Std. Dev. = 10.751
N = 516
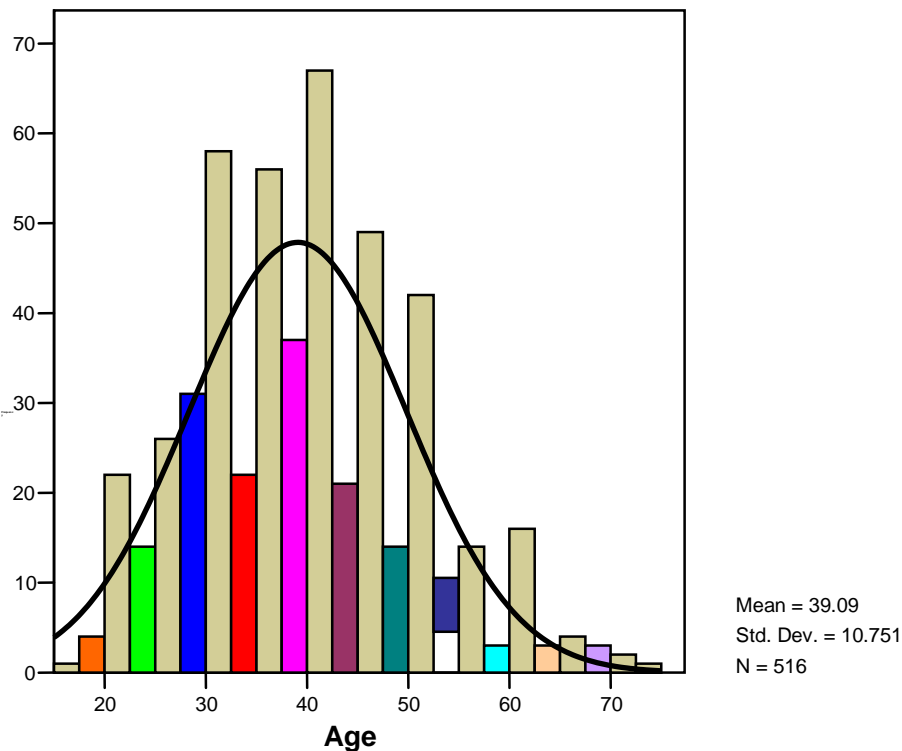
## 4.3. Analysis of Public Perception of Natural Environmental Conditions

The main economic activities of the communities around Berbak National Park focus on agricultural production, especially oil palm plantations and crops. However, rural villages also make use of the surrounding forest area. Interviews conducted to assess the level of knowledge of respondents about the forest showed that 66.9 per cent of respondents know that their villages are surrounded by forest. Table 3 shows that 16.5 per cent of respondents have no knowledge about the forest while 16.7 per cent said they no longer know about the condition of the forests in their region.

Table 3. Frequency distribution of respondents' knowledge of forest conditions

	Frequency	Per cent	Per cent Validity	Cumulative Per cent
No	85	16,5	16,5	16,5
Yes	345	66,9	66,9	83,3
Don't Know	86	16,7	16,7	100,0
Total	516	100,0	100,0	

Respondents' knowledge of the condition of the forest surrounding their villages is illustrated in Graph 2 below. From the responses, we can conclude that public perception in the villages around Berbak National Park is that the forest still has the potential to be developed for various purposes by the villages. Village forest is one example of forest management which benefits the community. By obtaining management rights for the forests around their villages, the community living around the forest will have huge potential to improve the quality of life of the whole community.

Graph 2. Respondents' knowledge about the forests surrounding their villages
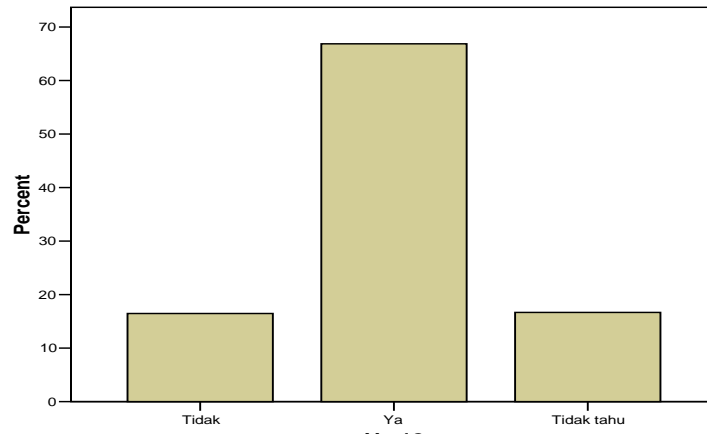
Natural environmental conditions surrounding the villages bordering Berbak National Park can still be said to be good, with the rivers, lakes and swamp existing in and around the villages being used by the community to meet their needs. 27.1 per cent of respondents said that the condition of rivers, lakes or swamps is good in their village. Table 4 shows that 47.5 per cent of respondents believe that the condition of these resources is still quite good.

Table 4. Respondents' opinion on the conditions of rivers, lakes and swamps in and around the villages bordering Berbak National Park

	Frequency	Per cent	Per cent Validity	Cumulative Per cent
Worse	131	25,4	25,4	25,4
Mediocre	245	47,5	47,5	72,9
Good	140	27,1	27,1	100,0
Total	516	100,0	100,0	

Although about 75 per cent of respondents said that the condition of rivers, lakes and swamps around their village is either good or quite good, in certain rural areas the condition of the rivers, lakes and swamps is reported to be quite bad. This is thought to be because of the natural process of peat oxidation resulting in a layer of pyrite being created. In addition, the worsening condition of the rivers, lakes and swamps in the villages around Berbak National

Park is the result of destructive resource utilisation practices, such as the use of toxic chemicals/putas and electric rods for fishing. These views are represented in Graph 3 below.

Graph 3. Respondents' perception of the condition of the rivers, swamps and lakes in and around the villages bordering Berbak National Park
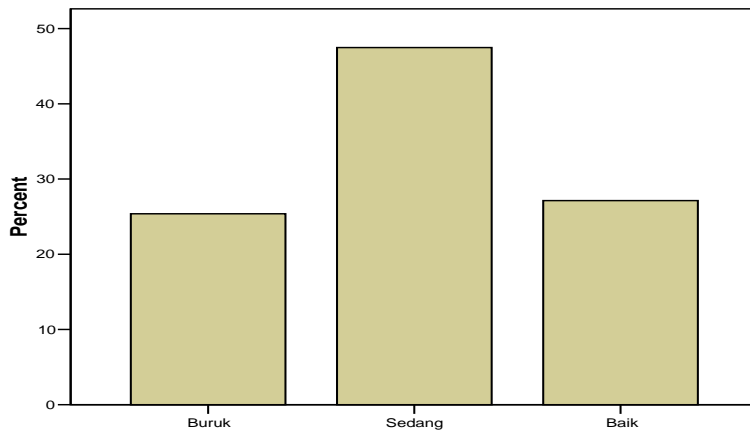
The rural communities around Berbak National Park have less understanding of the level of damage to their natural resources (forests, rivers, lakes and swamps). Interviews with respondents revealed that 72.9 per cent of respondents were unaware of the level of damage to the resources that exist in and around their villages.

Table 5 shows that only 7 per cent of respondents were absolutely sure that the forests, lakes, rivers and swamps in their village are not damaged, while 20.2 per cent of respondents asserted that the natural resources in their villages have been damaged.

Table 5.   Respondents' knowledge about the damage done to the forest, lakes, rivers and swamps in and around the villages bordering Berbak National Park

	Frequency	Per cent	Per cent Validity	Cumulative Per cent
More than half damaged	21	4,1	4,1	4,1
Half	32	6,2	6,2	10,3
Less than half	51	9,9	9,9	20,2
No Damage	36	7,0	7,0	27,1
Don't Know	376	72,9	72,9	100,0
Total	516	100,0	100,0	

Resource degradation in the villages around Berbak National Park varies from one village to another. Graph 4 illustrates that 4.1 per cent of respondents said that the damage to forests, rivers and swamps in the rural areas affects over half of the total natural resources in the village. 6.2 per cent of respondents stated that resource degradation has affected half of the total area.

Graph 4.   Respondents' opinion about the level of damage affecting forest, river, and swamp resources in and around the villages bordering Berbak National Park
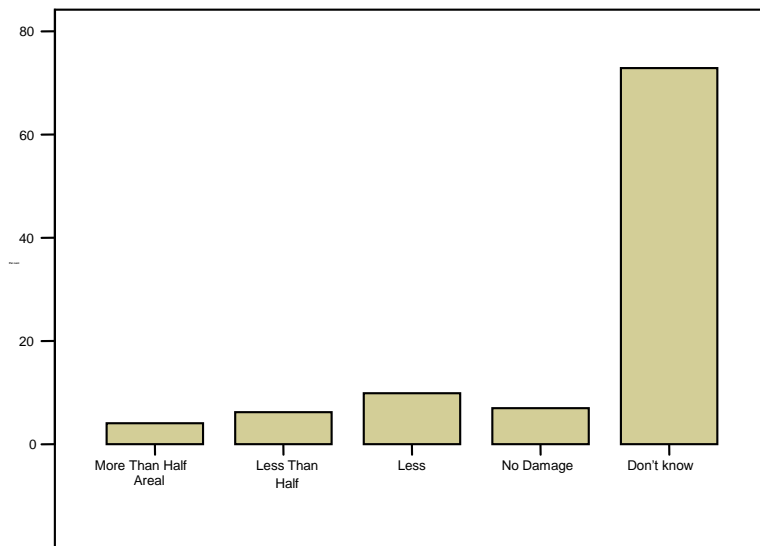

In addition to resource degradation, forest fires are another major problem facing communities bordering Berbak NP. Interviews with respondents resulted in 59.7 per cent of respondents stating that forest fire is a major problem. Forest and land fires are not caused by the process of land clearing for agricultural activities per se, but occur as a result of negligent practices leading to land and forest fires.

Table 6.   Respondents' opinion on forest and land fires in and around the villages bordering Berbak National Park

	Frequency	Per cent	Per cent Validity	Cumulative Per cent
No	121	23,4	23,4	23,4
Yes	308	59,7	59,7	83,1
Don't Know	86	16,7	16,7	99,8
No Response	1	,2	,2	100,0
Total	516	100,0	100,0	

Table 6 above indicates that land and forest fires are not perceived to be a problem in all the villages around Berbak National Park. 23.4 per cent of respondents stated that no forest or land fires had occurred in their area, while 16.7 per cent of respondents said they were not aware of any forest and land fires in their area. Respondents' opinions about land and forest fires can be seen in Graph 5 below.

Graph 5. Respondents' opinions on land and forest fires in and around the villages bordering Berbak
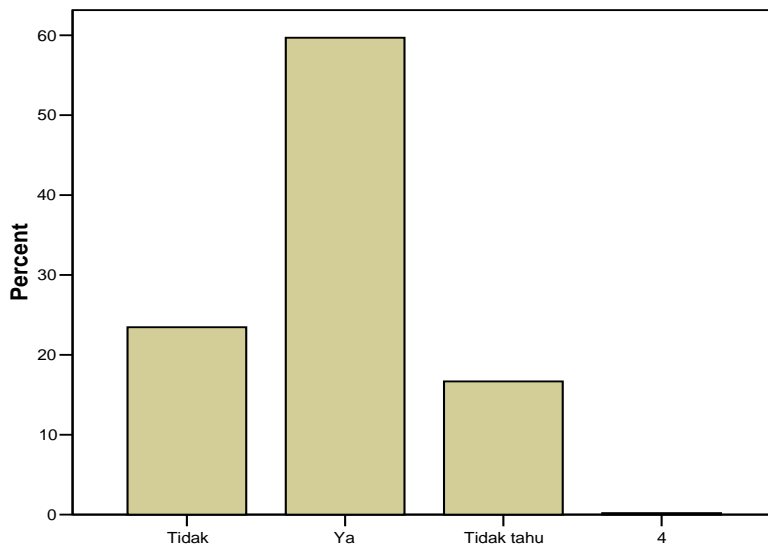

Other than the biological resources provided by forests, rivers and swamps, in the villages around Berbak National Park species of bird such as hornbills (*Enggang*) and eagles are found. Species of hornbill (*Enggang*) and Tongtong Storks inhabit the rice paddies, swamps, and regions overgrown by trees. 63.4 per cent of respondents stated that they still see hornbills (*Enggang*) or tongtong storks in their villages. The level of respondents' awareness regarding the presence of hornbills (*Enggang*) is illustrated in Table 7 below.

Table 7.   Respondents' knowledge of hornbill (*Enggang*) presence in and around the villages bordering Berbak National Park

	Frequency	Per cent	Per cent Validity	Cumulative Per cent
No	31	6,0	6,0	6,0
Yes	332	64,3	64,3	70,3
Don't Know	153	29,7	29,7	100,0
Total	516	100,0	100,0	

Only 6 per cent of respondents said that they no longer see hornbills (*Enggang*) in their village, while 29.7 per cent stated that they did not know anything about the existence or otherwise of hornbills in their village.

Graph 7. Respondents' knowledge of hornbill presence in the villages bordering Berbak National Park
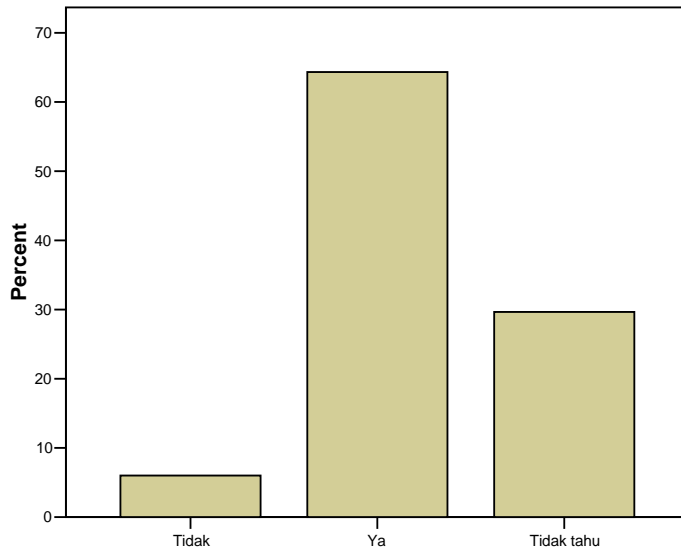

Another important bird species found in villages bordering Berbak National Park is the eagle. Interviews with respondents showed that 76.4 per cent of respondents said that they still see eagles around their village. 8.3 per cent of respondents said they never see eagles around their village and 15.1 per cent of respondents claimed not to know about the presence or otherwise of eagles in their village. These results are illustrated in Table 9 below.

Table 9.   Respondents' knowledge about the presence of eagles in the villages bordering Berbak National Park

	Frequency	Per cent	Per cent Validity	Cumulative Per cent
No	43	8,3	8,3	8,3
Yes	394	76,4	76,4	84,7
Don't Know	78	15,1	15,1	99,8
No Response	1	,2	,2	100,0
Total	516	100,0	100,0	

Respondents' knowledge about the presence of eagles can be seen in Graph 8 below. When comparing respondents' knowledge of the presence of hornbills (*Enggang*) and the presence of eagles in the villages around Berbak NP, it can be concluded that eagles are more commonly seen than hornbills (*Enggang*)

Graph 8. Respondents' knowledge about the presence of eagles in the villages bordering Berbak National Park
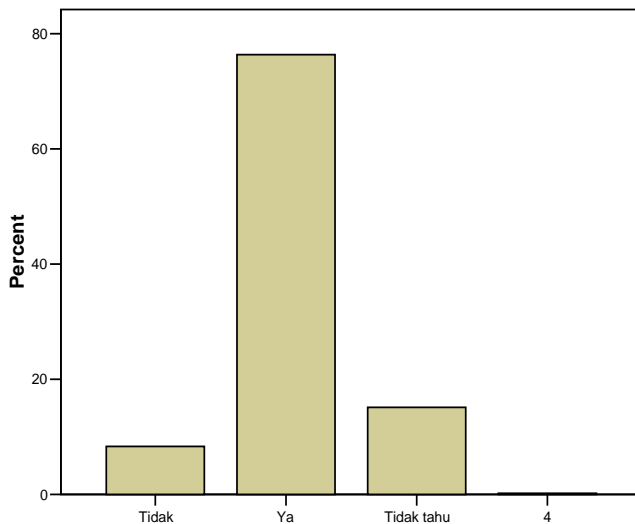

With regards to respondents' knowledge about the utilisation of biological resources in their villages, 37.4 per cent of respondents believe that the utilisation of biological resources such as fish, birds, wild animals, sandalwood (*gaharu*) and jelutung is not done destructively. Utilisation of these resources to meet the needs of the family or for sale is done well, ensuring the long-term availability of these resources. The level of respondents' knowledge concerning the use of biological resources is illustrated in Table 10 below.

Table 10. Respondents' knowledge on the exploitation of biological resources in the villages bordering Berbak National Park

	Frequency	Per cent	Validity Per cent	Cumulative Per cent
No	193	37,4	37,4	37,4
Yes	69	13,4	13,4	50,8
Don't Know	254	49,2	49,2	100,0
Total	516	100,0	100,0	

13.4 per cent of respondents stated that the utilisation of biological resources is conducted in a destructive way or has led to the loss of biological resources. On the other hand, 49.2 per cent of respondents stated that they did not know anything about methods of resource utilisation. Knowledge of the use of biological resources is illustrated in Graph 9 below.

Graph 9. Respondents' knowledge of utilisation of biological resources in the villages bordering Berbak National Park
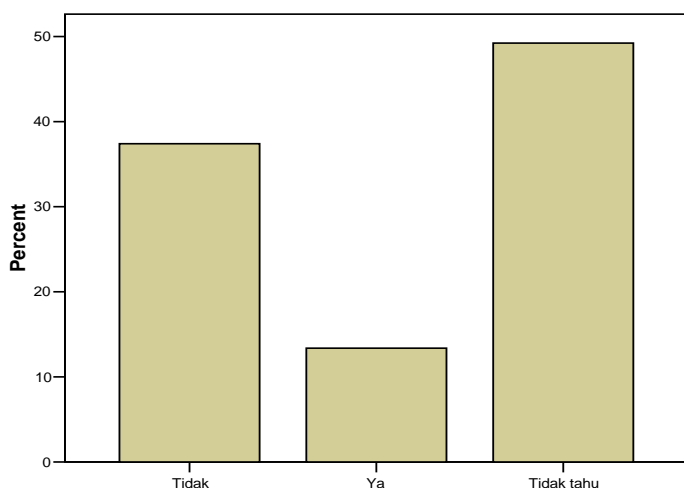

In addition to the biological resources listed above, other genetic resources within the Berbak ecosystem are of rare and protected animals such as the Sumatran tiger. Interviews with respondents showed that knowledge regarding the condition of the tiger is relatively varied. As illustrated in Table 11 below, 36.8 per cent of respondents stated that no tigers had been killed, either tigers from the forest surrounding their village or tigers from Berbak National Park.

Table 11. Respondents' knowledge of the condition of the tiger in the villages bordering Berbak National Park

	Frequency	Per cent	Validity Per cent	Cumulative Per cent
No	190	36,8	36,8	36,8
Yes	159	30,8	30,8	67,6
Don't Know	167	32,4	32,4	100,0
Total	516	100,0	100,0	

However, significantly, 30.8 per cent of respondents stated that there had been incidents of a tiger being killed around their village. 32.4 per cent of respondents had no knowledge concerning tigers in their area. These results are illustrated in Graph 10 below.

Graph 10. Respondents' knowledge about Sumatran tigers in the villages bordering Berbak National Park
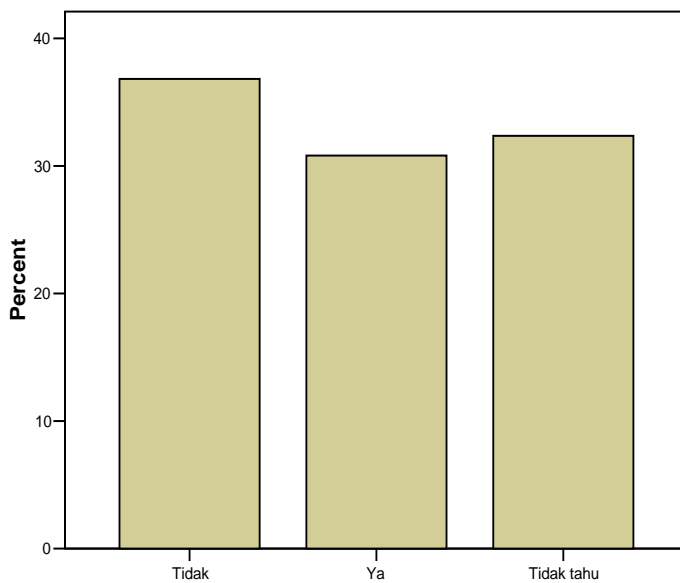
In many places bordering the conservation area, most people are not permitted to use or collect timber in accordance with current legislation. However, in the villages around Berbak NP, some of the communities are permitted to utilise resources such as timber, fish, birds nests, river rock and sand. Only 8.3 per cent of respondents said that they should not be allowed to collect these resources to sell. Respondents' opinions regarding the collection of natural resources for sale can be seen in Table 12 below.

Table 12. Respondents' opinions on collecting and selling natural resources from Berbak National Park

	Frequency	Per cent	Validity Per cent	Cumulative Per cent
Not Allowed	43	8,3	8,3	8,3
Allowed With Difficulty	193	37,4	37,4	45,7
Not Allowed With no Difficulty	183	35,5	35,5	81,2
Don't Know	97	18,8	18,8	100,0
Total	516	100,0	100,0	

Table 12 shows that 37.4 per cent of respondents said that they could collect natural products but that there are some difficulties in obtaining these resources. 35.5 per cent of respondents

said that they are permitted to collect natural products and encountered no problems in doing so. These results are presented in Graph 11 below.

Graph 11. Respondents' opinion about the collection of natural resources from Berbak National Park
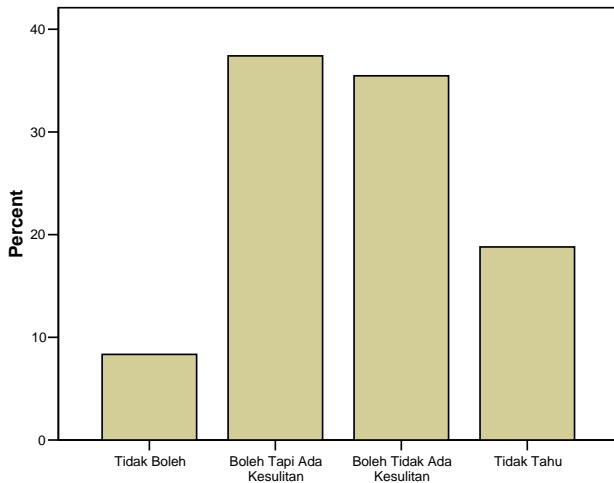
76.9 per cent of respondents stated that they never enter the forest area of Berbak National Park bordering their village in order to collect forest products such as fish, birds, wild animals, birds' nests, wood, rattan, sandalwood *(gaharu)* and jelutung. However, as illustrated in Table 13 below, a total of 23.1 per cent of respondents said that they do enter the forest of Berbak National Park to collect forest products.

Table 13. Respondents' opinion about the accessibility of the forest resources of Berbak National Park

	Frequency	Per cent	Validity Per cent	Cumulative Per cent
No	397	76,9	76,9	76,9
Yes	119	23,1	23,1	100,0
Total	516	100,0	100,0	

Graph 12. Respondents' opinion about accessibility of the forest resources of Berbak National Park
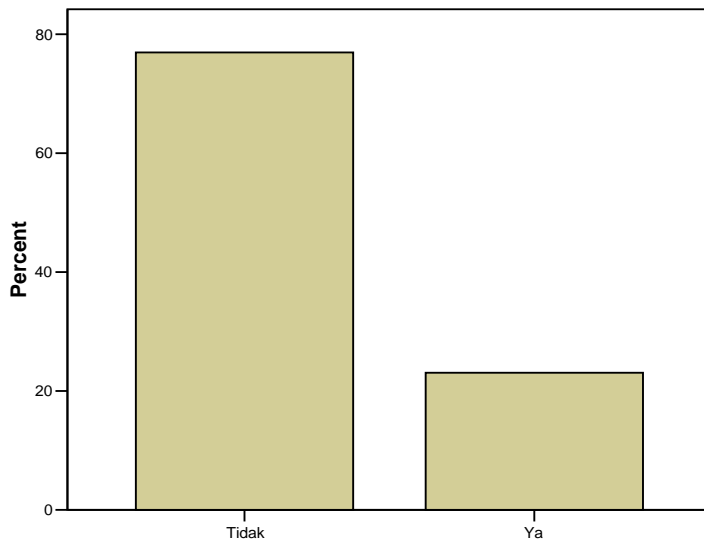
In addition to not entering the forest area of Berbak National Park, 74.6 per cent of respondents stated that they never enter the forest areas bordering their own territory. Table 14 below illustrates these results.

Table 14. Respondents' opinion about access to the forest areas adjacent to their villages

	Frequency	Per cent	Validity Per cent	Cumulative of Per cent
No	385	74,6	74,6	74,6
Yes	131	25,4	25,4	100,0
Total	516	100,0	100,0	

Only 25.4 per cent of respondents said that they had entered the forest areas adjacent to their village territory to take fish, birds, wild animals, birds' nests, wood, rattan, sandalwood (*gaharu*) and jelutung. Results are further illustrated in Graph 13 below.

Graph 13. Respondents' opinion about access to the forest areas adjacent to their villages
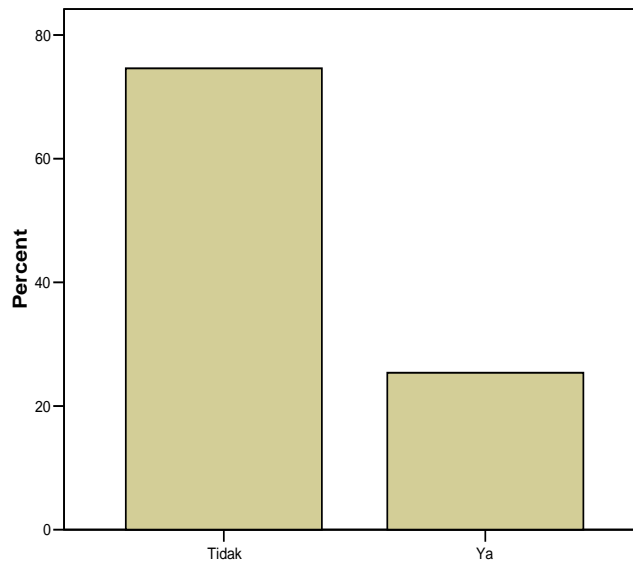
4.4. Analysis of Community Perceptions about Dependency on the Forest

In general, forests do not simply represent standing timber for the community; they are a resource that sustains livelihoods. The forest consists of complex, inter-related elements such as primary and secondary forests, rivers, lakes, fields, plantations, settlements, sacred forest and other ecological resources upon which communities depend. Dependence on the forest for the communities bordering the forest is relatively high, especially in the utilisation of natural resources such as fuel wood and non-timber forest products. However, dependency on different resources varies.

47.7 per cent of respondents said that non-timber forest products are not important to them. Distribution of respondents' opinions about their dependency on non-timber forest products is illustrated in Table 15 below.

Table 15. Respondents' opinion on the importance of non-wood forest products for the villages bordering Berbak National Park

	Frequency	Per cent	Validity Per cent	Cumulative Per cent
Not Important	246	47,7	47,7	47,7
Important	229	44,4	44,4	92,1
Very Important	41	7,9	7,9	100,0
Total	516	100,0	100,0	

However, 44.7 per cent of respondents stated that non-timber forest products are important for them, both to be used directly or as a source of family income. 7.9 per cent of respondents said that the non-timber forest products found in forest are very important to them. Results are illustrated in Graph 14 below.

Graph 14. Respondents' opinion about the importance of non-wood forest resources for the villages bordering Berbak National Park
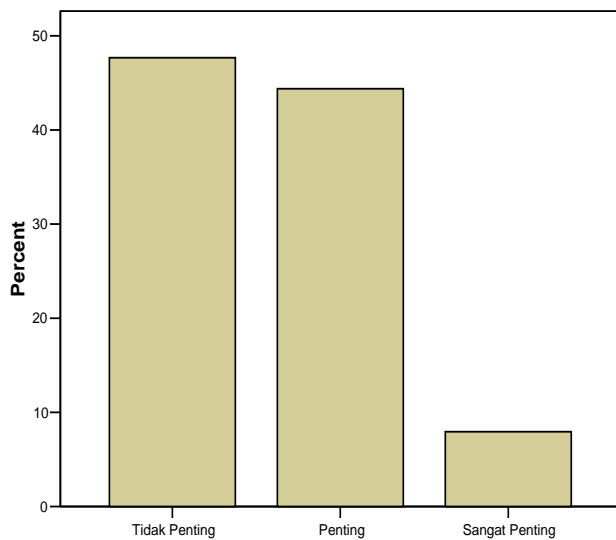
With relation to the hunted animals that are found around the villages bordering and inside Berbak National Park, 57.9 per cent of respondents said that game animals like deer, wild boar, birds and fish are not important to them, either for their own consumption or as a source of income to be sold into the market. Table 16 below presents these results.

Table 16. Respondents' opinion of the importance of hunted animals to the villages bordering Berbak National Park

	Frequency	Per cent	Validity Per cent	Cumulative Per cent
Not Important	299	57,9	57,9	57,9
Important	172	33,3	33,3	91,3
Very Important	45	8,7	8,7	100,0
Total	516	100,0	10,0	

33.3 per cent of respondents said that the game animals mentioned above are important to them, both as a source of food for their own consumption as well as a source of income from the sale of these animals. Only 8.7 per cent of respondents said that game animals are very

important to them. Respondents' opinions regarding their dependence on wild game can be seen in Graph 15 below.

Graph 15. Respondents opinion about dependence on game animals of the villages bordering Berbak National Park
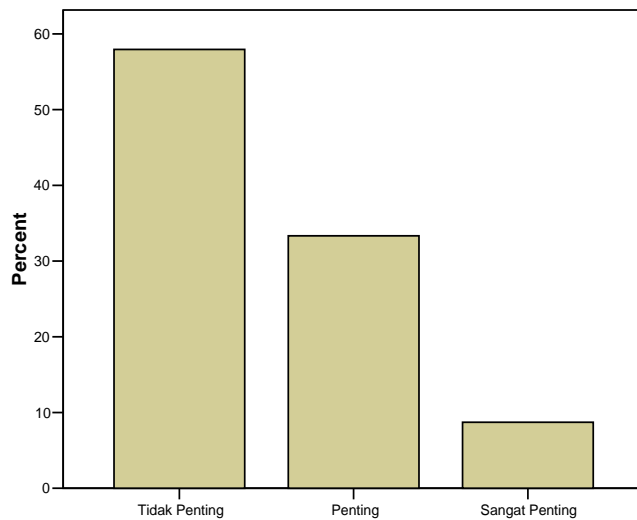
4.5 Analysis of Public Perception and Knowledge of Forest Function

Respondents' understanding of forest function is, in general, relatively high. 67.4 per cent of respondents stated that the forest functions as a water reserve and prevents the occurrence of floods due to the ability of the forest to absorb overflow water in periods of high rainfall. Table 17 below shows that 13.6 per cent of respondents stated that the forests in general have many good functions, either economic, ecological or social.

Table 17. Respondents' understanding of forest function in the villages bordering Berbak National Park

	Frequency	Per cent	Validity Per cent	Cumulative Per cent
Recreational Area	22	4,3	4,3	4,5
Water Reserve and Flood Prevention	348	67,4	67,4	71,9
Source of Income	31	6,0	6,0	77,9
Wildlife and Plant Habitat	41	7,9	7,9	85,9
Many Functions	70	13,6	13,6	99,4
Others	3	,6	,6	100,0

Total	516	100,0	100,0	

Table 16 illustrates that only 6 per cent of respondents stated that the forest is a source of income for them. 7.9 per cent of respondents said that the forest provides a habitat for many species of wildlife and is habitat containing many species of plants. Respondents' opinions about the function of the forest are illustrated in Graph16 below.

Graph 16. Respondents' understanding of forest function in the villages bordering Berbak National Park
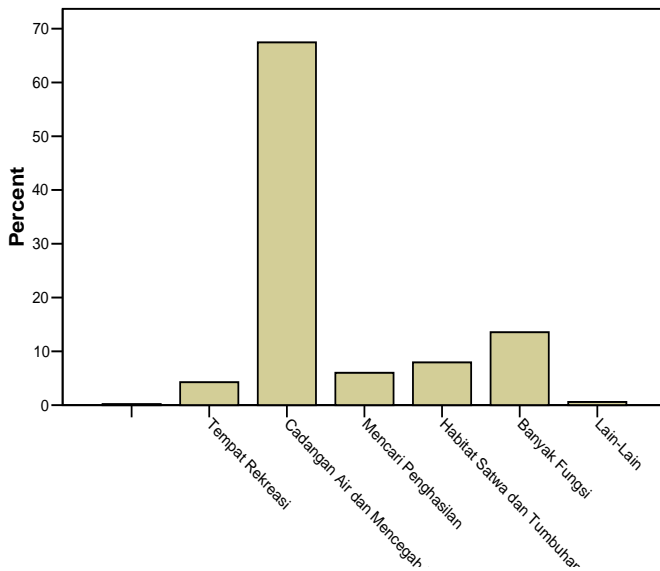
Community knowledge of the legislation governing forestry is very mixed. 59.9 per cent of respondents stated that they know that forestry laws exist, but 35.7 per cent of these do not understand the laws. About 40 per cent of respondents profess to know absolutely nothing about forestry laws. Results are presented in Table 18 below.
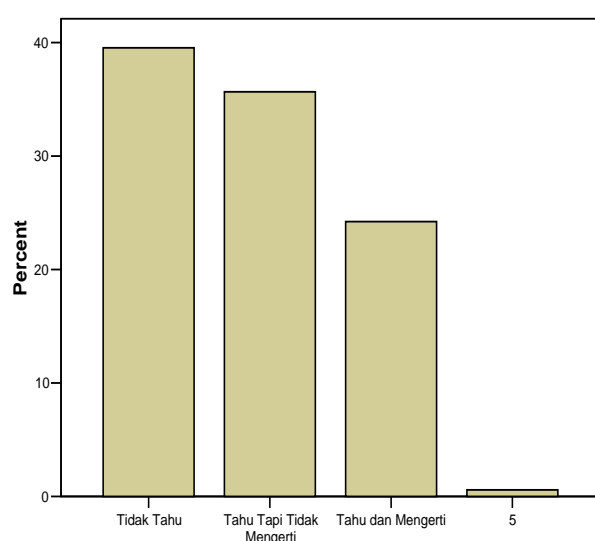
Table 18. Respondents' knowledge of forestry laws in the villages bordering Berbak National Park

	Frequency	Per cent	Validity Per cent	Cumulative Per cent
Don't Know	204	39,5	39,5	39,5
Know But Don't Understand	184	35,7	35,7	75,2

	Frequency	Per cent	Validity Per cent	Cumulative Per cent
Know and Understand	125	24,2	24,2	99,4
No Response	3	,6	,6	100,0
Total	516	100,0	100,0	

Ultimately, only 24.2 per cent of respondents really know about and understand forestry law. Respondents' level of knowledge about forestry legislation is presented in Graph 17 below.

Graph 17. Respondents' knowledge of forestry law in the villages bordering Berbak National Park

Respondents' knowledge of forestry legislation is usually gained from various media sources. Television and radio media are the greatest sources of information about forest laws for respondents living around Berbak National Park. Table 19 below shows that socialisation by relevant institutions also plays an important role in providing information to communities about forest laws.

Table 19. Sources of information regarding forestry legislation for the villages bordering Berbak National Park

	Frequency	Per cent	Validity Per cent	Cumulative Per cent
Newspapers and Magazines	36	7,0	7,0	7,0
Television and Radio	272	52,7	52,7	59,7
Educational Institutions	47	9,1	9,1	68,8
Relevant Social Institutions	87	16,9	16,9	85,7

Neighbours, colleagues, or Others	56	10,9	10,9	96,5
Other Information	18	3,5	3,5	100,0
Total	516	100,0	100,0	

Table 19 illustrates that information about forestry legistlation is also obtained from colleagues and neighbours. Results are presented in Graph 18 below.

Graph 18. Sources of information regarding forestry legislation for the villages bordering Berbak National Park
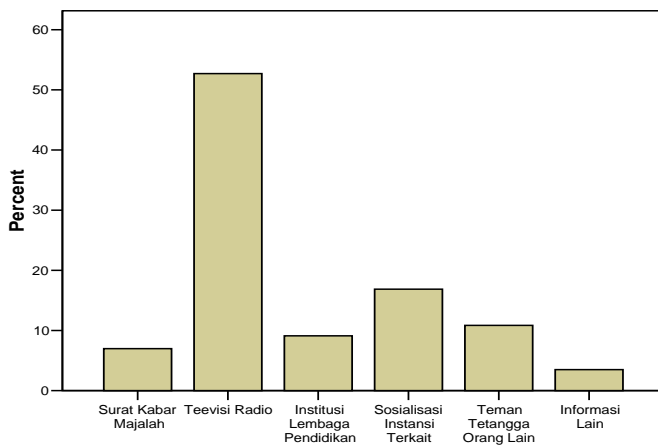
Respondents' knowledge about the function of Berbak National Park forests as water catchment areas is also relatively good. 67.8 per cent of respondents believe that Berbak National Park serves to control the circulation of water and as water catchment areas during periods of high rainfall. However, there are respondents who believe that Berbak National Park no longer functions as a water catchment area, as illustrated in Table 20 below. This view was held by respondents who believe that Berbak NP has been damaged by destructive practices in the utilisation of forest products, as well as by the expansion of plantations owned by the community.

Table 20. Respondents' opinions on the function of Berbak National Park as a water catchment area

	Frequency	Per cent	Validity Per cent	Cumulative Per cent
Yes	350	67,8	67,8	67,8
No	56	10,9	10,9	78,7
Don't Know	110	21,3	21,3	100,0
Total	516	100,0	100,0	

21.3 per cent of respondents did not know whether Berbak National Park still serves as a water catchment area or not. The percentage of respondents' opinions about the functions of Berbak National Park is presented in Graph 19 below.

Graph 19. Respondents' opinions on the function of Berbak National Park as a water catchment area
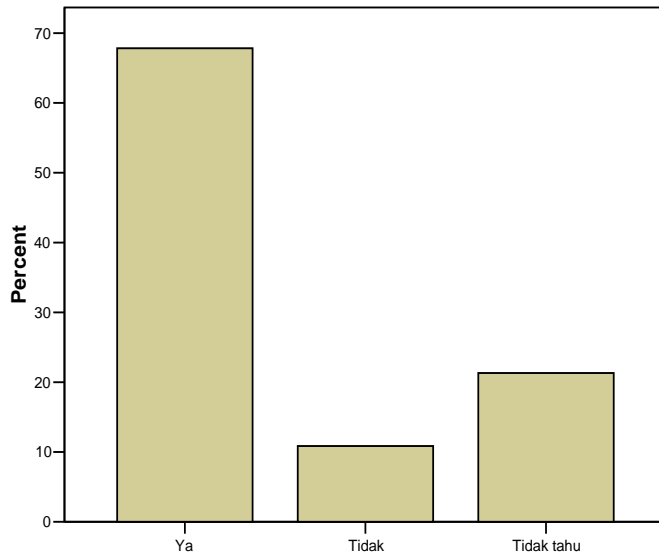
A cause of concern regarding the results of the Berbak community survey is that most repondents did not know the system of Berbak National Park management. The interviews showed that 37.7 per cent of respondents did not know about and that there has been no socialisation of the management strategy for Berbak National Park. Respondents' opinions about the socialisation of Berbak National Park management strategy are presented in Table 21 below.

Table 21. Respondents' opinions on the socialisation of Berbak National Park's management strategy

	Frequency	Per cent	Validity Per cent	Cumulative Per cent
None	166	32,2	32,2	32,2
Once	48	9,3	9,3	41,5
More than Once	115	22,3	22,3	63,8
Don't Know	183	35,5	35,5	99,2
No Response	3	,6	,6	99,8
Not Valid	1	,2	,2	100,0

Total	516	100,0	100,0	

Table 21 shows that 22.3 per cent of respondents stated that they had attended more than one socialisation event in their respective villages. However, 9.3 per cent of respondents stated that they had only attended one socialisation activity for the Berbak National Park management strategy. Respondents' opinions are presented in Graph 20 below.

Graph 20. Respondents' opinions on the socialisation of Berbak National Park's management strategy

The socialisation of Berbak National Park management strategy that did occur elicited different responses from the communities around the park. 78.5 per cent of respondents stated that they had not been asked for advice or to provide input to the management strategy of Berbak National Park. 40.9 per cent said that there had been no response at all and 37.6 per cent stated that they did not know anything about the socialisation of management strategy. Respondents' opinions about the socialisation process are presented in Table 22 below.
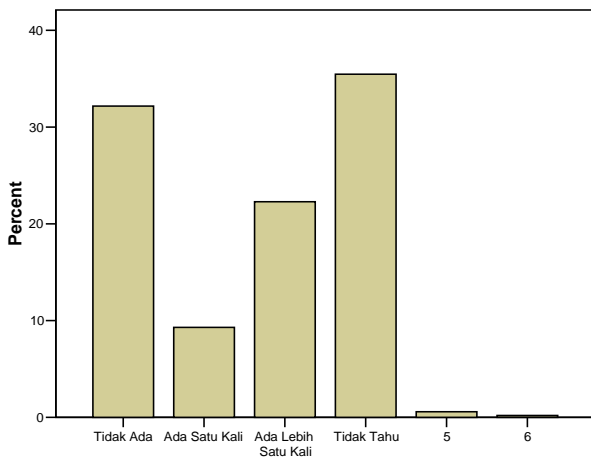
Table 22. Respondents' response to the socialisation of Berbak National Park management strategy

	Frequency	Per cent	Validity Per cent	Cumulative Per cent
None	211	40,9	40,9	40,9
Yes, Used the Opportunity	108	20,9	20,9	61,8
Don't Know	194	37,6	37,6	99,4
No Response	3	,6	,6	100,0
Total	516	100,0	100,0	

20.9 per cent of respondents said that they had been given the opportunity to provide input to the management strategy of Berbak National Park and that they did so. Respondents' opinions are presented in Graph 21 below.

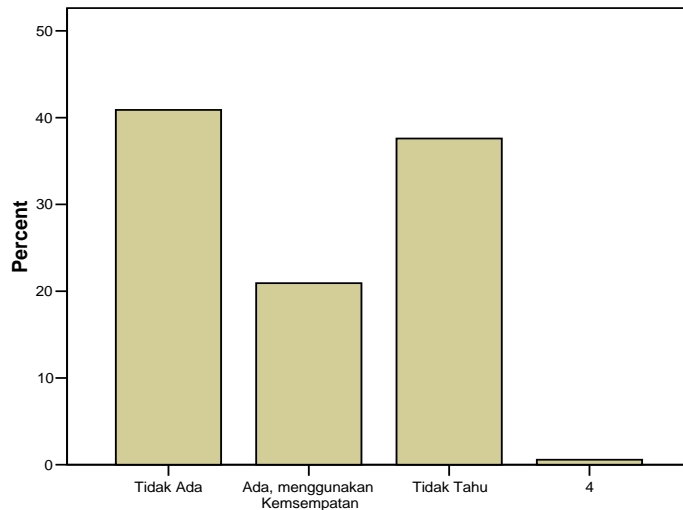**Graph 21: Respondents' response to the socialisation of Berbak National Park management strategy**

In terms of socialisation options, 42.2 per cent of respondents said that they would like community involvement in Berbak NP activities . 50.8 per cent of respondents said they would like the Berbak management institution to follow up with the community. Respondents' suggestions are presented in Table 23 below.

Table 23. Respondents' suggestions for socialisation of Berbak National Park activities in villages bordering Berbak National Park

	Frequency	Per cent	Validity Per cent	Cumulative Per cent
Community Involvement	218	42,2	42,2	42,2
Institution Follow up	262	50,8	50,8	93,0
Others	36	7,0	7,0	100,0
Total	516	100,0	100,0	

4.5 Community Knowledge About Forest Conservation

Communities living around Berbak National Park have generally lived in the area for a long time. Interviews showed that 68.8 per cent of respondents have lived in their villages since they were born and so are knowledgeable about the conditions of their territory and of the

forests around their villages and in Berbak National Park. Data regarding the length of time respondents have lived in their villages are presented in Table 24 below.

Table 24. Respondents' length of time living in their village

	Frequency	Per cent	Validity Per cent	Cumulative Per cent
One Year	34	6,6	6,6	6,6
Three Years	17	3,3	3,3	9,9
Five Years	108	20,9	20,9	30,8
Since Born	355	68,8	68,8	99,6
No Response	2	,4	,4	100,0
Total	516	100,0	100,0	

20.9 per cent of respondents had lived in their village for five years, 3.3 per cent of respondents had lived in their village for three years and 6.6 per cent of respondents for a year or less. These results are illustrated Graph 23 below.

Graph 23. Respondents' length of time living in their village
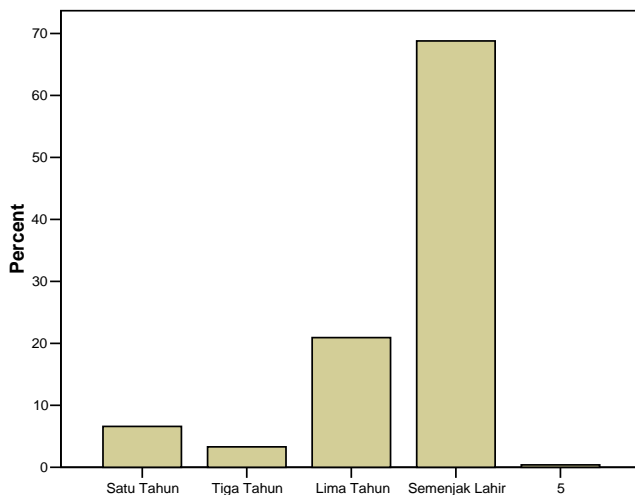
76.9 per cent of respondents were aware of the existence of Berbak National Park while 22.3 per cent were not. Responses are presented in Table 25 and Graph 24 below.

Table 25. Respondents' awareness of the existence of Berbak National Park

	Frequency	Per cent	Validity Per cent	Cumulative Per cent
Yes	397	76,9	76,9	76,9
No	115	22,3	22,3	99,2
No Response	2	,4	,4	99,6
Not Valid	2	,4	,4	100,0
Total	516	100,0	100,0	

Graph 24. Respondents' awareness of the existence of Berbak National Park
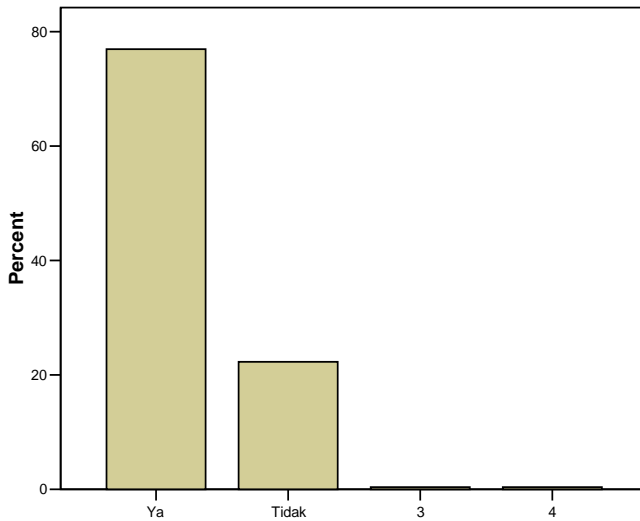
Respondents were also asked about their perception of any disruption that Berbak National Park had caused to their community. 53.9 per cent of respondents stated that Berbak National Park had not disrupted community activities. This may be becauseBerbak National Park is mostly swamp habitat which is difficult to convert to agricultural or residential use. However, 42.8 per cent of respondents, still a high proportion, stated that Berbak National Park had disrupted community activities. These data are illustrated in full in Table 26 and Graph 25 below.

Table 26. Respondents' opinion about the distruption to community activities caused by Berbak National Park

	Frequency	Per cent	Validity Per cent	Cumulative Per cent
Yes	221	42,8	42,8	42,8
No	278	53,9	53,9	96,7
No Response	13	2,5	2,5	99,2
Not Valid	4	,8	,8	100,0
Total	516	100,0	100,0	

Graph 25. Respondents' opinion about the distruption to community activities caused by Berbak National Park
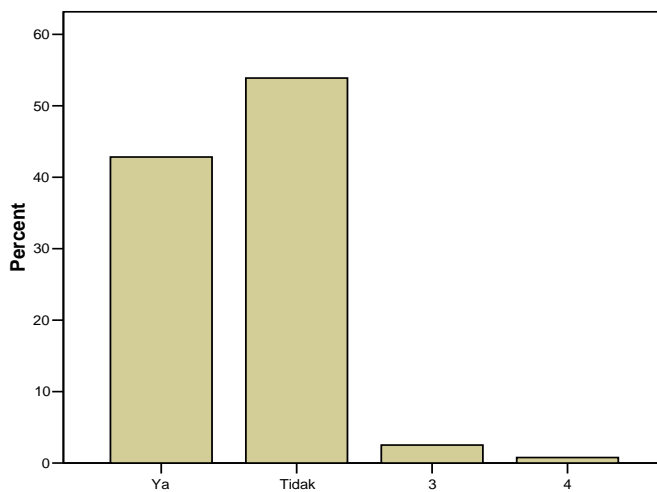
Respondents' perception of human-wildlife conflict in and around their villages is presented in Table 27 below.

Table 27. Respondents' opinion about the existence of human-wildlife conflict in the villages bordering Berbak National Park

	Frequency	Per cent	Validity Per cent	Cumulative Per cent
Human-Wildlife conflict occurs	127	24,6	24,6	24,6
Wildlife-Livestock conflict occurs	176	34,1	34,1	58,7
Wildlife become pests in plantation	190	36,8	36,8	95,5
Other	23	4,5	4,5	100,0
Total	516	100,0	100,0	

24.6 per cent of respondents stated that wildlife had caused disturbance to rural livelihoods which has led to conflict between wildlife and the communities bordering Berbak National Park. Graph 26 presents these results in full.

Graph 26. Respondents' opinion about the existence of human-wildlife conflict in the villages bordering Berbak National Park
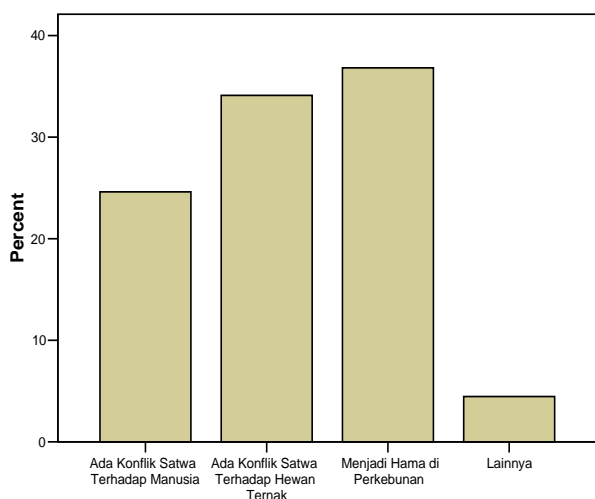
Although people living around Berbak National Park have experienced problems with wildlife such as crop damage and disruption of family life, these village communities want Berbak National Park's preservation to be assured. Based on the interviews, the reasons given by the villagers for wanting to preserve the park are both ecological and economic. Table 28 below shows that 27.3 per cent of respondents stated the desire to keep preserving Berbak National Park for ecological reasons while 31.2 per cent cited economic reasons. Full results can be seen in Table 28 below.

Table 28. Respondents opinions on the reasons to preserve Berbak National Park

	Frequency	Per cent	Validity Per cent	Cumulative Per cent
Ecological Reasons	141	27,3	27,3	27,3
Economic Reasons	161	31,2	31,2	58,5
Both Ecological & Economic	192	37,2	37,2	95,7
Other Reasons	22	4,3	4,3	100,0
Total	516	100,0	100,0	

The graph below shows that 37.2 per cent of respondents said that the reasons for wanting to preserve Berbak National Park are both ecological and economic.

Graph 27. Respondents' opinions on the reasons to preserve Berbak National Park
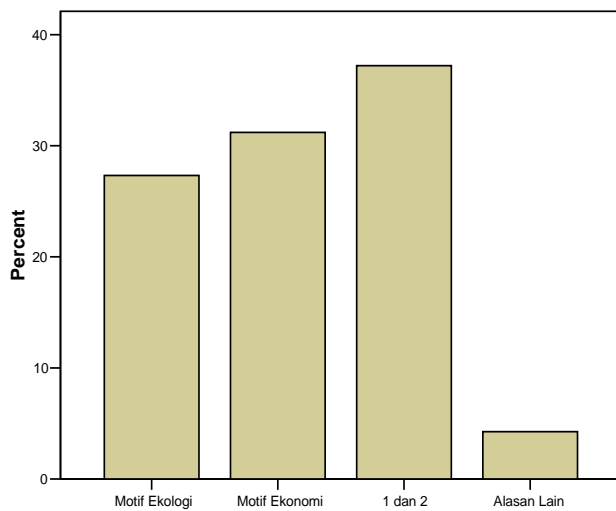
Although most villagers around the National Park want to preserve Berbak NP, 65 per cent of respondents had never taken action to preserve the National Park as illustrated in Table 29 below. 17.8 per cent of respondents said that they had once taken action to conserve the park.

Table 29. Frequency of respondents taking action to preseve Berbak National Park

	Frequency	Per cent	Validity Per cent	Cumulative Per cent
Never	337	65,3	65,3	65,3
Once	92	17,8	17,8	83,1
Often	84	16,3	16,3	99,4
No Response	3	,6	,6	100,0
Total	516	100,0	100,0	

It is encouraging that 16.3 per cent of respondents stated that they had often taken measures to conserve Berbak National Park. These measures included refraining from taking non-timber forest products as well as providing information to others about the laws governing the harvesting of non-timber forest products such as rattan, sandalwood *(gaharu)*, resins, birds' nests and jelutung sap. Results are presented in Graph 28 below.

Graph 28. Frequency of respondents taking action to preseve Berbak National Park
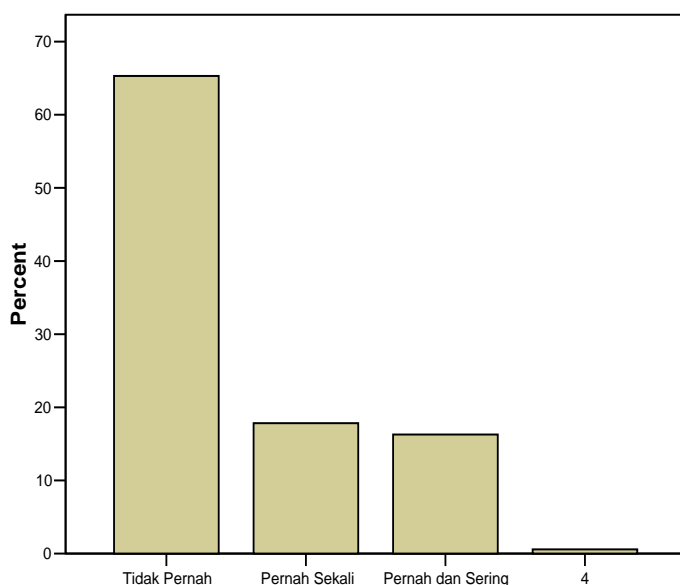
37 per cent of respondents said that there are various obstacles to implementing conservation activities. However, 23.1 per cent said that there are no obstactles or difficulties preventing conservation measures being taken. Results are illustrated in Table 30 below.

Table 30. Respondents' perception of constraints on actions to conserve Berbak National Park

	Frequency	Per cent	Validity Per cent	Cumulative Per cent
No Constraints	119	23,1	23,1	23,1
Constraints Exist	191	37,0	37,0	60,1
Don't Know	206	39,9	39,9	100,0
Total	516	100,0	100,0	

Obstacles to implementing conservation measures include the cost, the need for intitutional support and time constraints. Opinions regarding the constraints on conservation activities are presented in Graph 29 below.

Graph 29. Respondents' perception of constraints on actions to conserve Berbak National Park
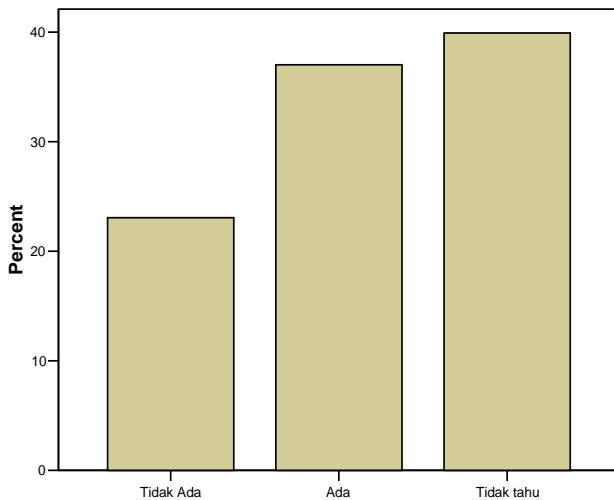
Although respondents generally want Berbak National Park to be preserved, 41.3 per cent of respondents claimed not to be involved in the management of Berbak National Park. This seems to be because it is assumed that public institutions alone manage the National Park and community involvement in management activities is relatively limited. Responses can be seen in full in Table 31 below.

Table 31. Respondents' opinion about community involvement in the management of Berbak National Park

	Frequency	Per cent	Validity Per cent	Cumulative Per cent
Don't Want Involvement	213	41,3	41,3	41,3
Want Involvement	243	47,1	47,1	88,4
Don't Know	60	11,6	11,6	100,0
Total	516	100,0	100,0	

Table 31 shows that 47.1 per cent of respondents were very eager to be involved in the management and conservation of Berbak National Park. This number shows the potential for the active involvement of the community, as has been seen in community involvement in the presevation of Kerinci Seblat National Park. Graph 30 below illustrates the results in full.

Graph 30. Respondents' opinion about community involvement in the management of Berbak National Park
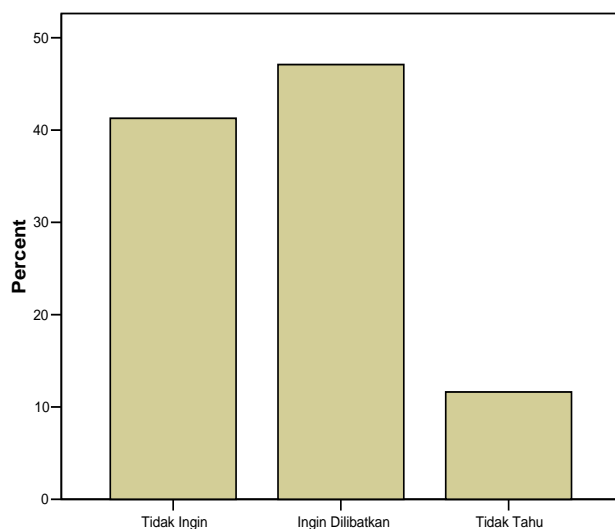
Berbak National Park management has actually involved the community, both directly and indirectly, but 74.4 per cent of the respondents to this survey did not know of any community involvement in the management of Berbak National Park. Table 32 below illustrates the results in full.

Table 32. Respondents' awareness of community involvement in the management of Berbak National Park

	Frequency	Per cent	Validity Per cent	Cumulative Per cent
Don't Know	384	74,4	74,4	74,4
Know	127	24,6	24,6	99,0
No Response	4	,8	,8	99,8
Not Valid	1	,2	,2	100,0
Total	516	100,0	100,0	

24.6 per cent of respondents were aware of community involvement in the management of Berbak National Park. Graph 31 below illustrates this.

Graph 31. Respondents' awareness of community involvement in the management of Berbak National Park
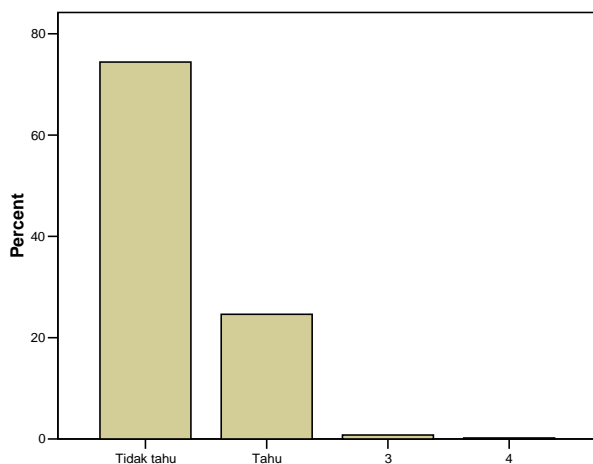
Besides the Berbak National Park management institution, other non-governmental organisations (NGOs) also conduct activities in Berbak National Park. A total of 38 per cent of respondents stated that they did not know of any institutions, NGO research institutions or other, active in the Berbak National Park. Distribution of respondents' knowledge about institutions involved in the management of Berbak National Park is presented in Table 33 below.

Table 33. Respondents' knowledge about the participation of other institutions in the management of Berbak National Park

	Frequency	Per cent	Validity Per cent	Cumulative Per cent
Don't Know	196	38,0	38,0	38,0
Know	97	18,8	18,8	56,8
Know but Do Not Understand about the Institution	222	43,0	43,0	99,8
No Response	1	,2	,2	100,0
Total	516	100,0	100,0	

18.8 per cent of respondents were aware of the presence of other institutions being involved in the management of Berbak National Park. However, although 43 per cent of respondents knew of the involvement of other institutions in the management of Berbak National Park, they did not know which institutions. Results are presented in Graph 32 below.

Graph 32. Respondents' knowledge about the participation of other institutions in the management of Berbak National Park
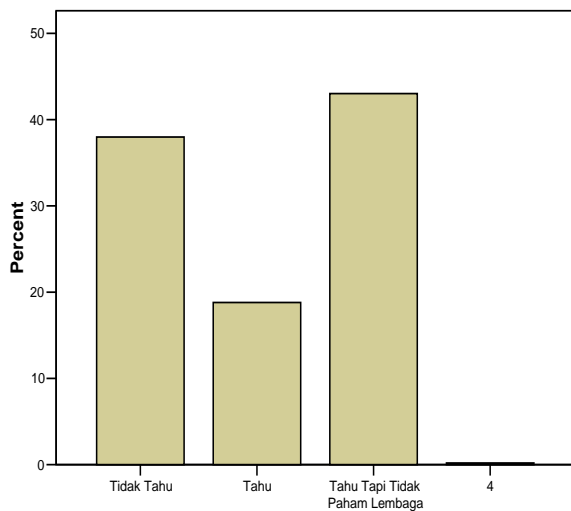
Almost half of the respondents said they knew of the existence of ZSL per se, but 48.1 per cent were unaware of the existence of ZSL working in the Berbak National Park region. Respondents' knowledge about the work of ZSL in the Berbak area is presented in Table 34 below.

Table 34. Respondents' knowledge of ZSL working in the Berbak area

	Frequency	Per cent	Validity Per cent	Cumulative Per cent
Don't Know	248	48,1	48,1	48,1
Know	254	49,2	49,2	97,3
No Response	7	1,4	1,4	98,6
Not Valid	7	1,4	1,4	100,0
Total	516	100,0	100,0	

Interviews with respondents indicated that those who were aware of ZSL activites in the Berbak National Park area perceived these activities as good. 24.4 per cent of respondents were non-committal about the work of ZSL. Distribution of respondents' opinions about ZSL acitivities in the area are presented in Table 35 below.

Table 35. Respondents' perception of ZSL activities in the Berbak National Park area

	Frequency	Per cent	Validity Per cent	Cumulative Per cent
Good	226	43,8	43,8	43,8
Ordinary	126	24,4	24,4	68,2
Not Good	14	2,7	2,7	70,9
Don't Know	150	29,1	29,1	100,0
Total	516	100,0	100,0	

The table also shows that 2.7 per cent of respondents feel that the activities of ZSL are not good and 29 per cent of respondents claimed not to know about the activities of ZSL. Results are displayed graphically below.

Graph 33. Respondents' perception of ZSL activities in the Berbak National Park area
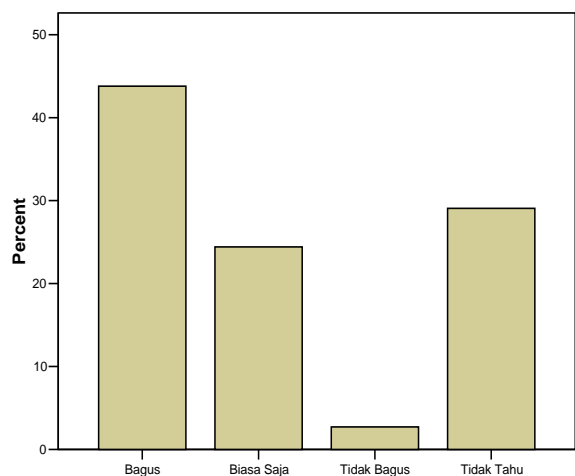
4.6. Public Perception of Threats to Natural Resources

Threats to the existence of forests, especially in the Berbak National Park area, come in a variety of forms such as illegal logging, forest fires, forest clearance for agricultural use, and making drainage ditches or canals that cause the swamp to dry out. Interviews with respondents revealed that the greatest perceived threat to the forests of Berbak National Park is illegal logging. 46.7 per cent of respondents held this view. Distribution of the respondents' opinions regarding threats to the forest are presented in Table 36 below.

Table 36. Respondents' opinion of the threats to Berbak National Park forest

	Frequency	Per cent	Validity Per cent	Cumulative Per cent
Illegal Logging	241	46,7	46,7	46,7
Forest Fires	205	39,7	39,7	86,4
Agricultural Expansion	33	6,4	6,4	92,8
Swamp Drying	2	,4	,4	93,2
Others	35	6,8	6,8	100,0
Total	516	100,0	100,0	

Table 36 also shows that the threat of forest fires ranks second after illegal logging (39.7%). 6.4 per cent of respondents felt that the expansion of agricultural activities posed the main threat to Berbak forest. Responses are illustrated in Graph 34 below.

Graph 34. Respondents' opinion of the threats to Berbak National Park forest
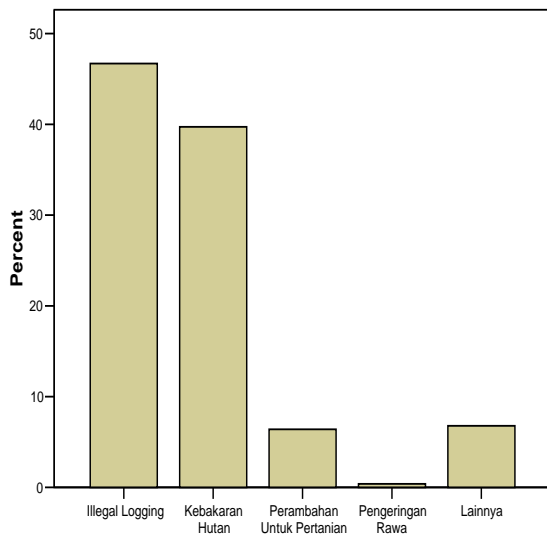
Survey results show that the majority of respondents believe that the main factor driving illegal logging by people in the Berbak National Park area is economic necessity. 50.2 per cent of respondents stated that the cause of the rampant illegal logging in the area is to meet economic needs. Respondents' opinions about the main drivers of illegal logging are presented in Table 37 below.

Table 37. Respondents' perception of the main causes of illegal logging in the Berbak National Park area

	Frequency	Per cent	Validity Per cent	Cumulative Per cent
Meet Economic Needs	259	50,2	50,2	50,2
Housing	94	18,2	18,2	68,4
Human Greed	39	7,6	7,6	76,0
Firewood Needs	3	,6	,6	76,6
Don't Know	121	23,4	23,4	100,0
Total	516	100,0	100,0	

18.2 per cent of respondents believe that the main causes of illegal logging in Berbak National Parks is to meet housing needs. 7.6 per cent of respondents acknowledged that illegal logging is driven by human greed. Results are presented in Graph 35 below.

Graph 35. Respondents' perception of the main causes of illegal logging in the Berbak National Park area
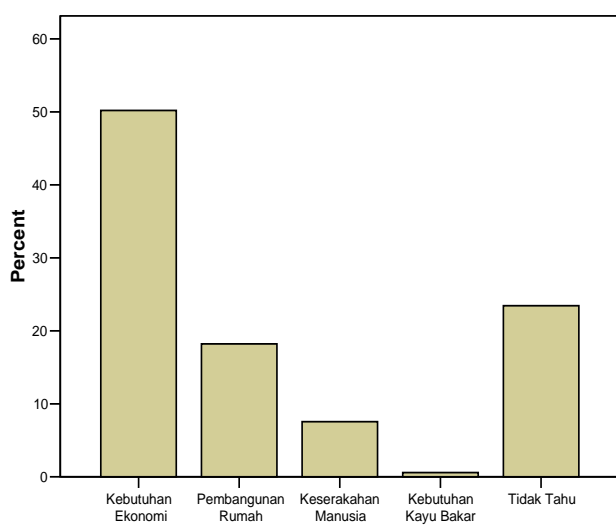
Forest fires which occur in Berbak National Park are caused by several factors including land clearance and the expansion of settlements. 50.4 of respondents said that land clearance has been the main cause of forest fires in the region. Full results are presented in Table 38 below.

Table 38. Respondents' perception of the main causes of forest fire in the Berbak National Park area

	Frequency	Per cent	Validity Per cent	Cumulative Per cent
Land opening	260	50,4	50,4	50,4
Settlements	42	8,1	8,1	58,5
Don't Know	192	37,2	37,2	95,7
Others	22	4,3	4,3	100,0
Total	516	100,0	100,0	

8.1 per cent of respondents perceive that the main cause of forest fires is the expansion of settlements around Berbak National Park. However, interestingly, 37.2 per cent of respondents said they did not know the cause of forest fires in Berbak National Park. Results are illustrated in Graph 36 below.

Graph 36. Respondents' perception of the main causes of forest fire in the Berbak National Park area
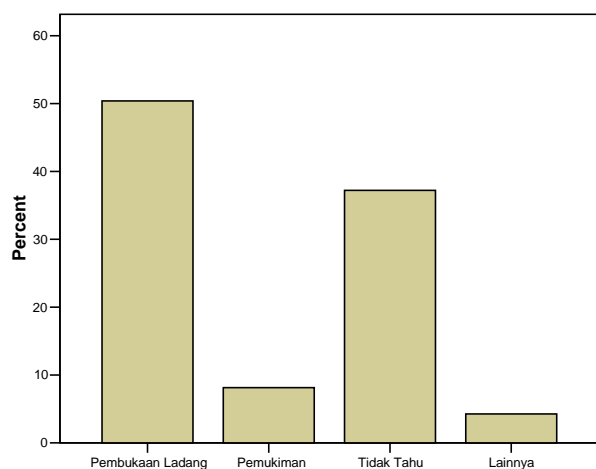
The majority perception is that the main drivers of forest clearance in the Berbak National Park area are economic need and unemployment. 61.2 per cent of respondents stated that forest clearance is due to the economic pressure felt by the community. Results are presented in Table 39 below.

Table 39. Respondents' perception of the main causes of forest clearance in the Berbak National Park area

	Frequency	Per cent	Validity Per cent	Cumulative Per cent
Economic Need	316	61,2	61,2	61,2
Unemployment	39	7,6	7,6	68,8
Don't Know	159	30,8	30,8	99,6
Other	2	,4	,4	100,0
Total	516	100,0	100,0	

In addition to economic pressure, forest clearance is driven by unemployment in the community. 7.6 per cent of respondents stated that unemployment is the main cause of forest clearance in the area. Graph 37 below presents the results in full.

Graph 37. Respondents' perception of the main causes of forest clearance in the Berbak National Park area
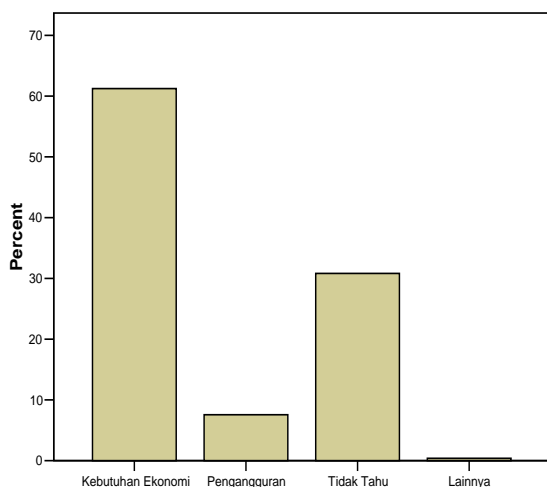
The threat of degradation and destruction of the swamp ecosystem in Berbak National Park originates from the construction of canals/channels which drain the water from the swamp. When the swamp becomes dry, oxidation occurs which results in the formation of pyrite compounds. One driver accelerating the construction of canals/channels is the increasing need for agricultural land. 75.2 per cent of respondents said that the need for agricultural land is the main driver for making channels/canals in the area. Distribution of respondents' opinions are presented in Table 40 below.

Table 40. Respondents' opinion about the drivers for the construction of channels/canals in the Berbak National Park area

	Frequency	Per cent	Validity Per cent	Cumulative Per cent
Agricultural land needs	388	75,2	75,2	75,2
Unemployment	23	4,5	4,5	79,7
Don't Know	103	20,0	20,0	99,6
Other	2	,4	,4	100,0
Total	516	100,0	100,0	

Despite the fact that channel-making has been widespread in the forest area of Berbak National Park, 20 per cent of respondents did not know the reasons for constructing these waterways. 4.5 per cent of respondents said that the creation of channels is driven by unemployment around the Berbak National Park. Results are presented in full in Graph 38 below.

Graph 38. Respondents' opinion about the drivers for the construction of channels/canals in the Berbak National Park area
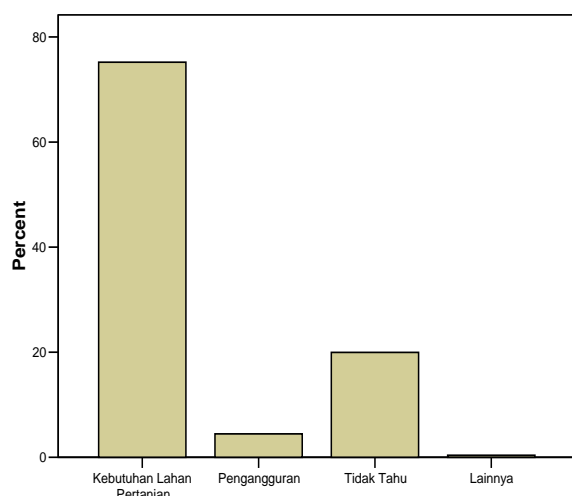
Canal/channel construction is almost evenly distributed in the villages around Berbak. The survey showed that 59.7 per cent of respondents had made canals/drainage channels in their village. Distribution of responses is presented in Table 41 below.

Table 41. Respondents' involvement in channel / canal constuction in the Berbak National Park area

	Frequency	Per cent	Validity Per cent	Cumulative Per cent
Yes	308	59,7	59,7	59,9
No	50	9,7	9,7	69,6
Don't Know	154	29,8	29,8	99,4
No Response	3	,6	,6	100,0
Total	516	100,0	100,0	

Results show that 9.7 per cent of respondents had not been involved in the construction of drainage channels, while 29.8 per cent of respondents did not know if there were any drainage channels in their village area. Responses are presented in Graph 39below.

4.7. Analysis of Public Perceptions about the Availability and Utilisation of Natural Resources

The relative importance of natural resources is defined by their importance to the community in sustaining family life. Palm, clean water and rice fields are some of the most important natural resources in Berbak National Park. Based on the data collected during the survey, it is apparent that, for most respondents, the most important natural resource for the community is rice fields. 29.8 per cent of respondents said that rice fields are an important resource for them. Frequency distribution of respondents' opinions about the relative importance of natural resources is presented in Table 42 below.

Table 42. Respondents' opinions on the relative importance of the natural resources in and around Berbak National Park

	Frequency	Per cent	Validity Per cent	Cumulative Per cent
Clean Water	132	25,6	25,6	25,6
Rattan Plant	39	7,6	7,6	33,9
Palm Plant	9	1,7	1,7	35,7
Timber	100	19,4	19,4	55,0
Forest	10	1,9	1,9	57,0
Soil	65	12,6	12,6	69,6
Rice Field	154	29,8	29,8	99,4
Swallow Bird	3	,6	,6	100,0

Nest				
Others	4	,8	,8	26,4
Total	516	100,0	100,0	

In addition to rice fields, clean water ranks as an important resource for the community with 25.6 per cent of respondents stating that water is an important resource for them.
The above dataalso illustrates that timber is an important resource for communities around Berbak National Park, with 19.4 per cent of respondents stating that timber is an important resource for them. 12.6 per cent of respondents stated that the soil is also an important resource. Respondents' opinions about the relative importance of resources are illustrated in Graph 40 below.

Graph 40. Respondents' opinions on the relative importance of the natural resources in and around Berbak National Park
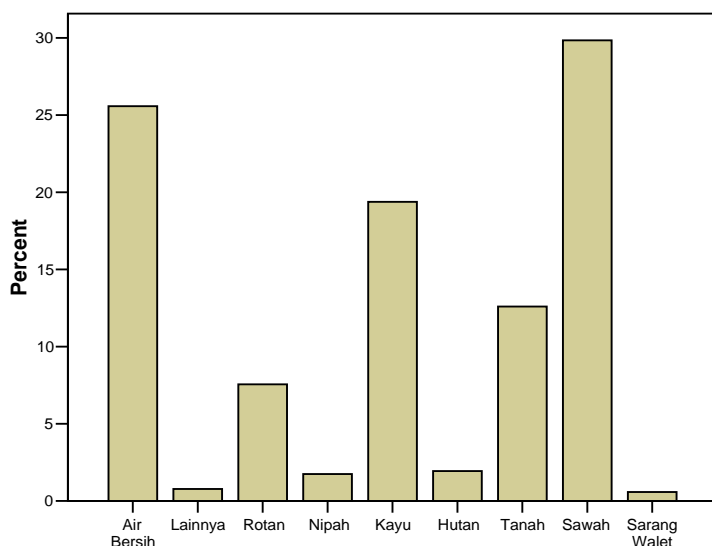
The main criteria defining a resource as important to the community include the resource supporting the survival of the community, providing a source of income, having medicinal properties or providing food for the village. 60.9 per cent of respondents perceive an important resource as being instrumental in supporting their survival, while 24.8 per cent of respondents felt that a resource being a source of income was most important. Frequency distribution of respondents' views is presented in Table 43 below.

Table 43. Respondents' perception of the relative usefulness of natural resources in and around Berbak National Park

	Frequency	Per cent	Validity Per cent	Cumulative Per cent
Support Survival	314	60,9	60,9	60,9
Source of Income	128	24,8	24,8	85,7
Medicinal Properties	50	9,7	9,7	95,3
Food Supply	12	2,3	2,3	97,7
Others	12	2,3	2,3	100,0
Total	516	100,0	100,0	

9.7 per cent of respondents stated that an important resource is one that has medicinal properties while 2.3 per cent of respondents said the main criteria for importance was a resource's potential as a food supply. Percentage of respondents' opinions about the relative usefulness of natural resources is presented in Graph 41 below.

Graph 41. Respondents' perception of the relative usefulness of natural resources in and around Berbak National Park
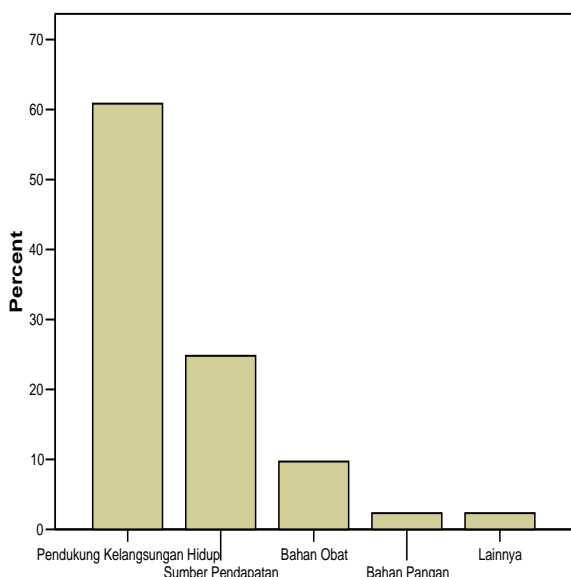
Ease of access to important natural resources for the community varied. Interviews with respondents showed that 56.2 per cent of respondents said that natural resources are hard to obtain while 32 per cent of respondents said that they can sometimes access important natural resources. Distribution of respondents' opinions about the accessibility of important natural resources is presented in Table 44 below.

**Table 44. Respondents' opinion about the accessibility of important natural resources in and around Berbak National Park**

	Frequency	Per cent	Validity Per cent	Cumulative Per cent
Easy to Get	53	10,3	10,3	10,3
Hard to Get	290	56,2	56,2	66,5
Sometimes Accessible	165	32,0	32,0	98,4
No More	6	1,2	1,2	99,6
No Response	2	,4	,4	100,0
Total	516	100,0	100,0	

10.3 per cent of respondents stated that it is very easy for them to access important natural resources and only 1.2 per cent of respondents said that there is no longer any access to these natural resources. Percentage of respondents' opinions about the accessibility of important natural resources are presented in Graph 42 below.

Graph 42. Respondents' opinion about the accessibility of important natural resources in and around Berbak National Park
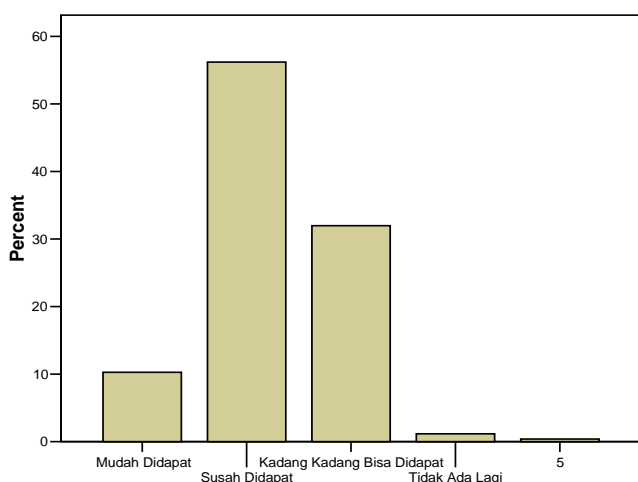
Challenges in obtaining these important natural resources include the use of destructive collection practices reducing the availability of the resource, difficult natural conditions and the resource's rarity in nature. 63 per cent of respondents said that the difficulty in obtaining important natural resources is due to a natural change in its availability. Distribution of respondents' opinions about the difficulty of obtaining important natural resources is presented in Table 45 below.

Table 45. Respondents' opinion about the difficulty of obtaining important natural resources in and around Berbak National Park

	Frequency	Per cent	Validity Per cent	Cumulative Per cent
Utilised without rules	156	30,2	30,2	30,2
Natural change in conditions	325	63,0	63,0	93,2
Other	30	5,8	5,8	99,0
No Response	5	1,0	1,0	100,0
Total	516	100,0	100,0	

30.2 per cent of respondents recognise that part of the difficulty in obtaining natural resources to be utilised to meet community needs has been the use of destructive and unregulated collection practices which has affected availability. 5.8 per cent of respondents stated other reasons such as the conversion of natural habitat into residential areas or agricultural land. Respondents' opinions about the causes of difficulty in obtaining important natural resources are illustrated in Graph 43 below.

Graph 43. Respondents' opinion about the difficulty of obtaining important natural resources in and around Berbak National Park
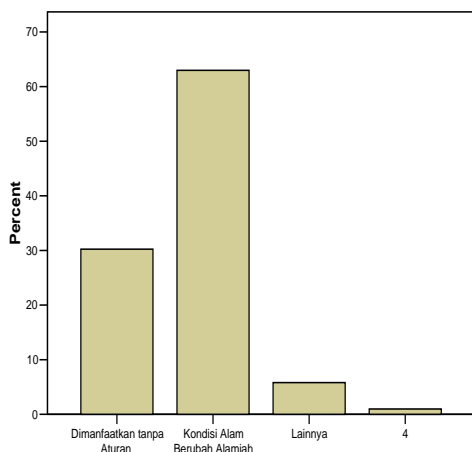
Respondents' projections regarding the availability of important natural resources within the next 10 years are varied. 16.9 per cent of respondents believe that important natural resources will disappear within the next 10 years. Most respondents (62.2%) said that natural resources are increasingly reduced in number. Distribution of respondents' projections for the availability of important natural resources in the future is presented in Table 46 below.

Table 46. **Respondents' projections on the availability of important natural resources within the next 10 years in and around Berbak National Park**

	Frequency	Per cent	Validity Per cent	Cumulative Per cent
Still A Lot	84	16,3	16,3	16,3
Much less	321	62,2	62,2	78,5
No More	87	16,9	16,9	95,3
Other	24	4,7	4,7	100,0
Total	516	100,0	100,0	

The interviews showed that 16.3 per cent of respondents believe that important natural resources will still be abundant in 10 years time. Results are presented in Graph 44 below.

Graph 44. Respondents' projections on the availability of important natural resources within the next 10 years in and around Berbak National Park
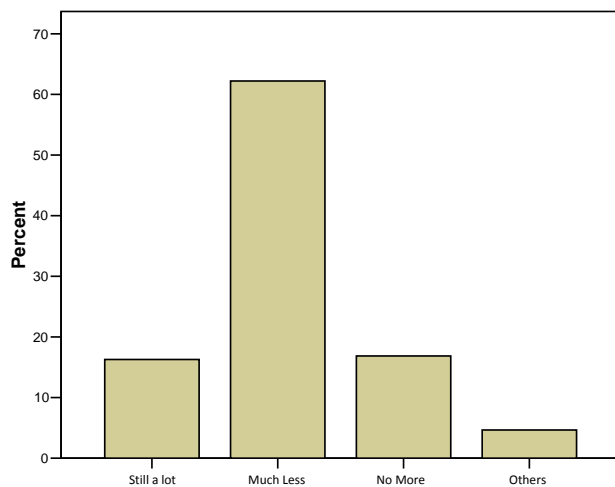
Respondents' plans to prevent potential future shortages of important natural resources indicate relatively high conservation awareness within the local community. 58.9 per cent of respondents stated that these important natural resources should be conserved to ensure their availability in the future. Frequency distribution of respondents' opinions about how to prevent shortage of natural resources in the future is presented in Table 47 below.

Table 47. Respondents' plans to overcome future shortages of important natural resources in and around Berbak National Park

	Frequency	Per cent	Validity Per cent	Cumulative Per cent
No action	2	,4	,4	,4
Conserve	304	58,9	58,9	59,3
Cultivate	143	27,7	27,7	87,0
Have No Idea	38	7,4	7,4	94,4
Have an Idea	29	5,6	5,6	100,0
Total	516	100,0	100,0	

27.7 per cent of respondents mentioned the need to cultivate important natural resources to prevent a potential shortage in the future. Only 0.4 per cent of respondents stated that it is unnecessary to take any action to prevent a potential crisis. Respondents' opinions concerning efforts required to prevent a potential crisis in the availability of important natural resources is presented in Graph 45 below.

Graph 45. Respondents' plans to overcome future shortages of important natural resources in and around Berbak National Park
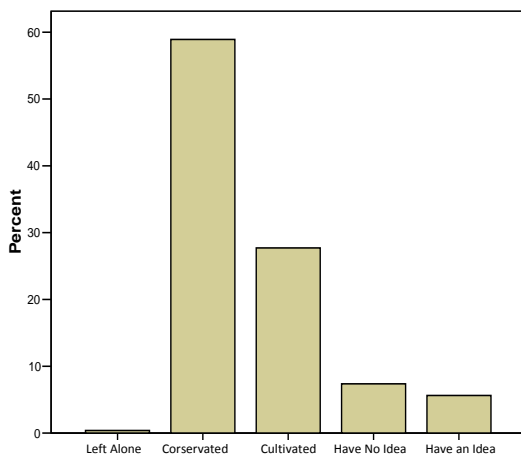
CHAPTER 5: CONCLUSIONS AND RECOMMENDATIONS

5.1. Conditions in Berbak National Park

Based on the study analysis, we conclude that the development of agricultural cultivation activity around the Berbak forest area has disturbed the natural balance of the National Park. The increase in human-wildlife conflict, forest fires, illegal logging, wildlife hunting, illegal fishing, forest clearance and the construction of drainage canals and ditches all cause damage to the Berbak ecosystem.

5.2. Public Perception of the Environmental Condition of the Forest and National Park

Public knowledge of the natural environment surrounding their villages is generally quite good, understanding the condition and function of forests, access to and correct utilisation of forest products and the biodiversity supported by the ecosystem.

In general, the communities in the research villages are still aware of the existence of forest in the area, including the Berbak National Park Conservation Area. Villagers are generally aware of the condition of the rivers, lakes, and swamp areas in and around their villages, perceiving it to be fairly good or good. However, in some villages, the condition of rivers, lakes, and swamp is perceived to be quite bad. This is attributed to the natural process of peat oxidation which forms pyrite layers.

The understanding of rural communities bordering Berbak National Park the extent to which natural resources (forest, rivers, lakes and swamps) have been damaged is relatively less. Communities are aware that one of the main causes of forest damage is by forest fires that often occur in rural areas and are often caused by human carelessness.

Most of the villagers have some knowledge of biodiversity types and are aware of the presence of hornbills (engang), eagles, stork tongtong and Sumatran tigers in and around their villages.

Wild animals in Berbak National Park often cause problems for the rural communities bordering the park. Wildlife have become pests in community plantations and can cause problems to the community-owned livestock.

In relation to the utilisation of biological resources, perception was divided. There are some in the community who believe that the collection of fish, birds, wild animals, sandalwoods (*gaharu*) and jelutung from the forest is not done destructively and that these resources are used sustainably to meet the needs of the community. However, others believe that natural resources are collected in a destructive and non-sustainable way. Despite the divided perception, most communities still utilise the available natural resources such as timber, fish, bird nests, river rock and sand for commercial purposes.

A small number of local people enter the protected forest areas adjacent to their villages to collect forest products such as fish, birds, wild animals, birds' nests, wood, rattan, sandalwoods (*gaharu*), and jelutung.

Communities generally understand that the forest functions as a water reserve and to prevent floods during periods of high rainfall. Communities also perceive the forest as having many other functions including being a habitat for fauna and flora as well as providing a source of community income.

There are different perceptions about forest function. Based on the theoretical study, the primary function of the forest being a National Park is to protect and manage the forest and ensure its resources are used sustainably by management zoning. Thus, community cultivation activity should not be located in the core forest zone of the National Park.

However, in actuality, community perception is that the forest has many functions: a place to store water and prevent flooding/erosion (ecological function); a place providing resourses to earn a living (economic function); a habitat for animals and plants.

Most local people know that there is legislation governing forestry (Act No.41 on Forestry), but most of them do not understand the substance of this legislation, especially regarding the use of natural resources and ecosystem conservation. Because the community lack understanding of the regulations related to forest conservation, they do not have a full understanding of the conservation of the National Park. Also, importantly, the community do not know their rights and obligations within the framework of forest conservation, so that the actions of the people living around the forest area are not influenced either by their own rights or by the obligations as mandated by forest law.

Generally, the existence of the Berbak National Park is known to the public, but community involvement in management activities is very limited, either planning or implementation. In general, people do not want to be involved in the management of Berbak National Park, possibly due to public perception that it is the role of institutions to manage the National Park Berbak.

4.4. Public Perception about Dependence on Important Natural Resources and Threats to these Resources

Public perception is that community dependence on forest resources is high. Most people have a high dependence on non-timber forest products, either for personal use or as a source of family income, including the sale of hunted animals such as deer, wild boar, birds and fish.

The most important natural resource according to community perception is rice fields, followed respectively by clean water, timber, soil, rattan, forest, palm plants and swallow nests. The main function of these important natural resources is to ensure community survival, providing a source of income, medicinal products and a food supply.

Most communities perceive that it is relatively difficult to access natural resources important to the community, either due to naturally difficult terrain, natural changes to the environment and destructive and unregulated collection methods.

Public perception is that the main threats to the forest, especially in the Berbak National Park area, are illegal logging, forest fires, forest clearance for agricultural use, and the construction of drainage channels/ditches which cause the swamp to dry out, increasing the risk of forest fires.

Most illegal logging is driven by the economic needs of the community, followed by home construction, human greed and the demand for firewood. Community perception is that most forest fires are caused by forest clearance to open land for agriculture. The community believes that most forest clearance is driven by economic need, with unemployment being another major motivating factor.

Community perception is that the increased construction of drainage channels in the Berbak area is motivated by ever-growing demand for agricultural land.

According to public perception, withn the next 10 years the availability of important natural resources will be increasingly reduced and resources may even disappear if protection and conservation activities are not implemented. Most communities are aware of the need for conservation measures to ensure the continued availability of important natural resources.

In the context of the conservation of Berbak National Park, most people understand the need for the conservation of the Park, primarily for economic reasons but also for ecological reasons, and many people perceive both economic and ecological factors as equally important reasons for conservation.

Although the majority of rural communities around the Berbak National Park want to preserve the forest, most people never take any action to protect the forest. Very little conservation initiatives in Berbak National Park involve local communities. However, some survey respondents did report that they had taken conservation action by refraining from taking non-timber forest products as well as providing information on the legislation regarding collection of non-timber products such as rattan, sandalwoods(*gaharu*), resins, bird nests, and jelutung sap to their friends and neighbours.

4.5 Relationship with the Preparation for REDD+

In association with preparation for the implementation of REDD+, it was concluded that the villages around the National Park have the potential to gain additional benefits from the implementation of REDD+.

Survey results show that local communities have been identified as one of the main perpetrators of deforestation and forest degradation in the Berbak peat forest area. Human-driven damage includes careless land clearance methods leading to forest fires, illegal logging and the construction of canals/ ditches in the peat swamp forest. However, in line with the community awareness of the declining quality and availability of natural resources, local people are still keen to see conservation action being taken, especially the preservation of the natural resources perceived to be essential for community survival.

Additional benefits of the implementation of REDD+ can be achieved through the reduction of poverty, improved governance and clarification and enforcement of the rights of local communities through their involvement in forest management. This can be in the form of zoning activities to delineate village forest and community plantation forest, river fish farming can be developed in river nets, jelutung gardens created, eel cultivation increased and coconut fibers can be processed and sold. The success of these activities would, in turn, lead to improved social services such as education and health and clarify access rights to basic non-forest land.

The survey has identified some incentive-based strategies to balance the needs of the community with the need to reduce emissions from deforestation and forest degradation, namely:

a. Performance-based payments or other benefits to incentivise reduced deforestation including: reward carbon stored as a result of land restoration; prevention of forest fires; matching conservation targets through sustainable forest management; compensation for costs associated in changes in lifestyle such as improved public infrastructure and subsidies to initiate alternative livelihoods.

b. Clarity and security of community land tenure rights through formal legal recognition of local community rights to manage its forests, forest lands and forest products.

c. Access to alternative income to preserve and reduce pressure on forest resources. Efficient use of land for the intensification of agricultural production in non-forest areas and reduce the pressure on the forest for land conversion. Follow and enforce the rule of law and policy in forestry and conservation.

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APPENDIX :

ZSL INDONESIA, Berbak CARBON PROJECT INITIATIVE

PUBLIC PERCEPTION OF THE INTERVIEW GUIDE
AROUND Berbak National Park

Interviewer		Date / month / year	
Location of the interview			

INFORMANT BIODATA

	Name			
	Gender		Age	
	Ethnic		Religion	
Var1	Village / Village			
Var2	District			
Natural Environment				
Var3	Do you often go into the forest by yourself (jungle, pads, bushes, not young shrubs, not in the area of Berbak National Park) in the area of your own village?			
	1. No			
	2. Yes			
Var4	Do you often yourself go into the forest of Berbak National Park area bordering the territory of your own village?			
	1. No			
	2. Yes			
Var5	Have you ever been to the jungle yourself (the jungle, pads, bushes, not young shrubs, not in the Berbak National Park area) adjacent to the village to pick up your very own forest? (Eg fish, birds, wild animals, birds' nests, wood, rattan, sandalwood(*gaharu*), jelutung etc.)			
	1. No			
	2. Yes			
Var6	Did you ever go into the forest areas bordering Berbak National Park adjacent to your own village area to pick up the forest products ? (Eg fish, birds, wild animals, birds' nests, wood, rattan, gaharu, jelutung			

	etc.)	*Fill this box with the circled number*
	1. No	
	2. Yes	
Natural Environment Circle the answer choices below!		
Var7	Have you ever seen or heard stories of people into the forest areas bordering Berbak National Park your own hometown area to pick up the forest? (Eg fish, birds, wild animals, birds' nests, wood, rattan, sandalwood(*gaharu*), jelutung etc.)	
	1. No	
	2. Yes	
Var8	How much of the natural environment (eg forests, rivers, swamps) in the village that has been damaged? (Compared to overall width)	
	1. More than half the area	
	2. Half Area	
	3. Less than half Area	
	4. No Damage	
	5. Do not know	
Var9	Over the past 12 months, has it ever occur any land and forest fires in the village area? [WELL PREPARED LAND PREPARATION NOT INCLUDED]	
	1. No	
	2. Yes	
	3. Do Not Know	
Var10	Is there still any hornbills or storks tontong around presence in the forest, swamp or lake in this village?	
	1. No	
	2. Yes, there are still	
	3. Do Not Know	
Var11	Is there still a hawk around the forest, swamp or lake in this village?	

	1. No	
	2. Yes	
	3. Do Not Know	

Natural Environment *Circle the answer choices below!*		*Fill this box with the circled number*
Var12	Apakah masih ada hutan sekitar kampung anda (termasuk di wilayah Taman Nasional Berbak yang berbatasan dengan kampung anda)? Is there still a forest around your village (including in the Berbak National which borders your village)?	
	1. No	
	2. Yes	
	3. Do Not Know	
Var13	Apakah pernah terjadi dalam 12 bulan terakhir ini bahwa salah satu sumberdaya alam (mis: ikan, burung, hewan liar, sarang burung, rotan, gaharu, jelutung dll) pernah diambil sampai hampir habis? Have there been any in the last 12 months that one of the natural resources (eg fish, birds, wild animals, birds' nests, rattan, gaharu, jelutung etc.) have taken up running out?	
	1. No	
	2. Yes	
	3. Do Not Know	
Var14	Apakah pernah terjadi dalam 12 bulan terakhir ini bahwa harimau yang berasal dari hutan di sekitar kampung anda/termasuk Taman nasional Berbak terbunuh? Have there been any in the last 12 months that the tiger from the forest around your home / includes national park Berbak killed?	
	1. No	
	2. Yes	
	3. Do Not Know	
Var15	Bagaimana kualitas air sungai, rawa, danau di sekitar kampung anda? What is the quality of rivers, swamps, lakes around your village?	
	1. Buruk	

| | 2. Sedang | |
| | 3. Baik | |

Natural Environment		
Var16	Could you take nature products in the village area (Not In the Berbak National Park Area) (e.g. timber, fish, bird nests, river rock, sand, etc.) for sale?	
	1. Not Allowed	
	2. Yes, may be difficulties	
	3. Yes, without difficulties	
	4. Do not know	

Dependence Condition on forest Circle the answer choices below!		*Fill this box with the circled number*
Var17	Over the past 12 months, is the non-timber forest products (eg, Sandalwood(*gaharu*), rattan, resin, honey, bird nests, jelutung etc.) important to your household income and for own use?	
	1. Not Important	
	2. Important	
	3. Very Important	
Var18	Over the past 12 months, Is hunting (eg deer, wild boar, birds, turtles, fish) important for household income or to own consumption?	
	1. Not Important	
	2. Important	
	3. Very Important	
Knowledge Condition of Forest Functions		
Var19	In your opinion, what is the forest function?	
	1.Recreational Place/ vacation (social function)	
	2. Water Reserve place (ecological function) and prevent flood (ecological function)	

	3. The place to earn a living (economic function)	
	4. Place of living animals and plants (biodiversity functions)	
	5. More than one of the functions mentioned above	
	6. Other function (specify): …………………………………… ………………………	
Var20	Menurut anda apakah fungsi Hutan Berbak sebagai resapan air masih berfungsi dengan baik? Do you think Berbak Forest still properly function as water catchment?	
	1. Yes	
	2. No	
	3. Do not know	
Knowledge condition of Forest Functions *Circle the answer choices below!*		*Fill this box with the circled number*
Var21	Do you know about the rules / laws on forestry?	
	1. Do not know	
	2. Yes, but do not understand	
	3. Yes, and a little understand	
Var22	How did you know about the rules / laws that forest?	
	1. Newspapers / magazines / other printed media	
	2. Television / radio / other electronic media	
	3. Institutional / educational institutions (schools, courses, learning club Package)	
	4. (leaflet, workshop, seminar) Agencies socialization (leaflets, workshops, seminars)	
	5. Friends, neighbors, other people	
	6. From other information (please specify): ………………………………… ………………	
Var23	Is there ever a socialization of Berbak National Park forest management from relevant agencies? (Forest Service-Forest Preserve / Tahura, PHKA TN Berbak)	

	1. No	
	2. Yes, Once	
	3. There are more than one occasion	
	4. Do not know	
Var24	In the socialization you are prompted for an opinion / advice / feedback / questions and did you do it?	
	1. No	
	2. Yes, but did not use this opportunity	
	3. Do Not Know	
Var25	If you are using the opportunity to give suggestionsask,what did you suggest/ask?	
	1. Community involvement in forest management	
	2. The follow up in related to input/public complaint of the forest utilization?	
	3. Something else (please specify):	

	Knowledge Condition of Forest Conservation (national parks, protected forests, Tahura) *Circle the answer choices below!*	*Fill this box with the circled number*
Var26	Did you know the community has been involved in Berbak forest management?	
	1. Do Not Know	
	2. yes	
Var27	Do you want to be involved in Berbak forest management?	
	1. No	
	2. Yes Want to be involved	
	3. Do Not Know	
Var28	Do you want forest conservation (sustainable use)?	
	1. Do Not Want	

	2. Yes, it is required	
	3. Do Not Know	
Var29	If you want the preservation of forests, what is the reason?	
	1. Forest-related quality of life in the the downstream (ecology motive)	
	2. Related to the income of forest communities (economic motive)Forest in related to community income	
	3. Answer 1) and 2)	
	4. Another reason (please specify):	
Var30	Have you been taking measures in order to maintain forest sustainability by providing information to others or personally did not do the illegal to take timber/ non-timber (eg, sandalwood(gaharu), rattan, resin, honey, bird nests, jelutung etc.)?	
	1. Never	
	2. Yes, once	
	3. Often	

	Knowledge condition of Forest Conservation (national parks, protected forests, Tahura) *Circle the answer choices below!*	
Var31	Do you find any constraints/difficulties in the support to forest conservation/preservation activities?	
	1. No	
	2. Yes	
	3. Do not know	
Var32	Did you know any other organisations (eg NGOs, research institutions, etc.) that give assistance in Berbak forest management?	
	1. Do not know	
	2. Yes, I know	
	3. Yes I know, but do not recognize the organisation name	
Var33	Have you ever heard / knew about ZSL institution?	
	1.No, Never heard of / know	

	2. Yes	
Var34	What is your opinion about this institution?	
	1. Good	
	2. Mediocre	
	3. Not good	
	4. Do not know	
Var35	What is the reason for the above answer?	
	1. Because of the relationship / no relationship to the conservation	
	2. Because of the relationship / not related to community	
	3. No	
Var36	Do you want to be involved in activities of ZSL institution?	
	1. No	
	2. Yes	
	3. Do not know	
How long have you lived in this region Fill this box with the figure wreathed		*Fill this box with the circled number*
Var37	1. one year	
	2. tiga years	
	3. lima years	
	4. since born	
Var38	Do you know the presence of Berbak National Park in your area	
	1.Yes	
	2. No	
Var39	Does the Berbak National Park cause any problem to the people activities?	
	1.Yes	
	2. No	

Var40	What problems are most often associated with the presence of Berbak National Park in particular with the existing Wildlife ?	
	1 The conflict between wildlife and human.	
	2. The conflict between wildlife and residents' livestock	
	3. Disturbance and become pest in residents' farm	
	4. Others mentioned	
Var41	Are there any risks in the presence of wildlife in Berbak National Park?	
	1.Yes	
	2. No	
Var42	Do you think there are dangerous incident from the wildlife?	
	1. Yes	
	2. No	
Var43	Are there any impact in the security disruption and other cause of the presence of Berbak National Park?	
	1.Yes	
	2.No	
Var44	How to convey information about security threats from wildlife to related institutions?	
	1. Report to the competent villageauthorities (Pemdes)	
	2. Report to the management of Berbak National Park	
	3. Others have mentioned	
Var45	Do you think security measures for the disturbance of wildlife by related institution have been applied adequately? Mention the activities.	
	1.Yes	
	2.No	
Var46	Is the implementation of the management in interfere with local cultural values?	
	1.Yes	
	2. No	
Var47	Does the implementation of the management cause disruption to other activities? Mentioned	

	1.Yes	
	2. No	
Var48	Are there many newcomers to the area you are today?	
	1.Yes	
	2. No	
Var49	Could the newcomers adapt with the surrounding community?	
	1.Yes	
	2. No	
Var50	Is the presence of newcomers cause problems? (Please specify)	
	1.Yes	
	2. No	
Var 51	Did you know that the forest is a lifeline for our children and grandchildren in the future?	
	1.Yes	
	2.Do Not Know	
	3. Do Not Care	

Pressure Condition / Threats to Natural Resources (Forests, Non Forest, shrub, National Parks, Protected Areas, Tahura, etc.)		
Var52	What activities result in deforestation pressures in the Berbak National Park area at this time?	
	1. Illegal logging 4. Drying swaps from canal/ditch	
	2. Forest Fires 5. (Please specify)	
	3. Forest Clearing for Agriculture	
Var53	What led to the pressure of illegal logging at this point?	
	1. Economic needs 4. Fire Wood Needs Needs	
	2. Housing 5. Do Not Know	
	3. Human Greed 6. Other, please specify	
Var54	What activities which cause pressure the occurrence of forest fires at	

	this time?		
	1. Field Opening 4. Others mentioned		
	2. For settlement		
	3. Do not know		
Var55	What activities which resulted in the forest encroachment of pressure at this time?		
	1. Economic needs 4. Others mentioned		
	2. Unemployment		
	3. Do Not Know		
Var56	What activities resulting the pressure in the making of canals / drying the swamp?		
	1. Agricultural land needs 4. Others mentioned		
	2. Unemployment		
	3. Do not know		
Var57	What activities that lead to forest fires?		
	1. Drought 4. Others, mentioned		
	2. Uncontrolled opening of the field		
	3. Do Not Know		
Var58	What causes forest encroachment/forest clearing in the past?		
	1. Difficult to get the land for farming 4. Others mentioned		
	2. Many companies that make the plantation		
	3. Do Not Know		
Var59	What activities are likely to increase during the coming 10 years?		
	1. Forest encroachment 5. Others mentioned		
	2. Illegal logging		
	3. Making ditch/canal		
	4. Wildlife Hunting		
Var60	Are there any canals or ditch which was made by the community or the government? (State the numbers)		
	1.Yes		
	2. No		

	3.Do Not Know	
Var61	What size of existing canals or ditches in your village (length, width and depth) ?	
	1. 1-2 meter,100-200,meter,1-2 meter1.1-2 0.100 to 200 meters, meter 0.1 to 2 meters	
	2. 2-3 meter,200-500,meter,2-3 meter2.2-3 0.200 to 500 meters, meter 0.2 to 3 meters	
	3. Other/ Do Not Know	
Var62	Do you know when the canal or ditch was made	
	1. 2004-2008	
	2. 2008-2010	
	3. 2010-2011	
	4. Other / Do Not Know	
Var63	Do you notice who made the ditch/canal?	
	1.government 3. Others mentioned	
	2. Community	
Var64	Do you know how much the cost of making a canal or ditch in your village? Mentioned	
	1. 1-5 juta1.1-5 million	
	2. 5-10 juta2.5-10 million	
	3. Other/ Do Not Know	
Var65	Do you know who financed the ditch/canal?	
	1.Community	
	2.Government	
	3. Other/ Do Not Know	
Var66	Do you know the function of the canal or ditch at the time in the making?	
	1. Rice field irrigation	
	2. Transportation	
	3. Other Mention	
Var67	Do you know the status of the canal or ditch currently (active or non active) in your village?	
	1. Still Active	
	2. Not Active	
Var68	Do you know the function / usefulness of the current channel? Mention	
	1. Irrigation	
	2. Transportation	
	3. Other, Mention	
Var69	Do you know who is currently responsible for the maintenance and use of the canal or ditch it?	
	1.Community 4. Other mention	
	2. Village Authorities	
	3.Individual	
Conditions of availability and utilization of important natural resources		

	(water, timber / non wood, species of flora and fauna, etc.)	
Var 70	What do you think the most important natural resource for the community in 10 years back?	
	1. Clean water	
	2. Rattan	
	3. Nipa Palm	
	4. Wood / plant type	
	5. Animal Type	
	6. Forest	
	7. Ground/Soil	
	8. Field	
	9. wallet bird's nest	
	10. Other please specify	
Var71	What do you think about the main function of an important natural resource for the community?	
	1. Source supporting the daily survival of community	
	2. Source of economic income	
	3. Drug substance	
	4. Food supply	
	5. Other please specify	
Var72	What is the condition of important natural resources at this time?	
	1. Easy to come by	
	2 hard to come by	
	3.Seldom	
	4. No more (extinct)	
Var73	If you think hard to come by, what is the cause, mentioned?	
	1. Taken / used without rules	
	2. Natural conditions are changing in nature	
	3. Others please specify	
Var74	What do you think about the condition of most important natural resources in the next 10 years?	
	1.Still many	
	2.Not Many	
	3.No more (extinct) 4. other mention	
Var75	What suggestions or ideas do you think about the financial crisis/shortage/threat of natural resource conditions that you think is most important in the future	
	1. Left alone, because it is not used anymore	
	2. Mmaintained and or preserved	
	3. Cultivated	
	4. Do not know / no idea	
	5. Other ideas, please specify	