

# Biodiversity Action Plan and Biodiversity Off-set Management Plan (Appendix C)

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Project Number: 42916  
31 January 2015

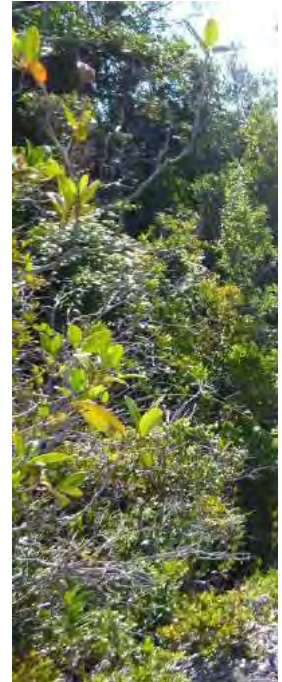
## Sarulla Geothermal Power Development Project (Republic of Indonesia)

Prepared by Sarulla Operations Limited for the Asian Development Bank

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# Appendix C. Biodiversity Socialisation Programme and Delivery Report



# Sarulla Geothermal Power Project

Biodiversity Socialisation Delivery Interim  
Report  
July 2014

Sarulla Operations Ltd  
CONFIDENTIAL



# Sarulla Geothermal Power Project

Biodiversity Socialisation Delivery Interim  
Report

July 2014

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# Issue and revision record

Revision	Date	Originator	Checker	Approver	Description	Standard
A	27 Jun 2014	N Shibuya F Ricciardi	K Haymon	E Low	Interim report	

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# Executive Summary

Further to the Environmental and Social Impact Assessment (ESIA) findings in 2013, SOL commissioned Mott MacDonald to develop a Biodiversity Action Plan (BAP) and Biodiversity Offset and Ecological Management Plan (BOEMP). The BAP/BOEMP is one of a number of plans which comprise Sarulla Operations Limited (SOL)'s Environmental and Social Management Plan (ESMP). The BAP and BOEMP are of particular significance as the Project is located in a critical habitat as defined by International Finance Corporation (IFC) Performance Standards 6 (PS6) with presence of species of conservation value such as Sumatran tiger. Specifically the BAP and BOMP are required to ensure that the Project:

- Implements the mitigation, compensation and biodiversity offsetting measures within the ESIA
- Complies with national legislative requirements
- Complies with international environmental requirements and best practice, including the Asian Development Bank (ADB) Safeguards Policy Statement 2009, IFC PS6, and the Equator Principles

The BAP proposed ten actions as presented in **Table S.1** to be undertaken by SOL with the aim of achieving 'no net loss' to biodiversity or a net gain of the affected biodiversity in accordance with the IFC PS6.

**Table S.1: Summary of BAP Objectives**

No	Action
1	Inform construction staff on the habitats of conservation value and notable plant species
2	Conduct further biodiversity surveys and prepare a detailed map of the habitats of conservation value
3	Socialisation programme with local villages to promote awareness of importance of habitats and plant species of conservation value
4	Undertake habitat restoration within laydown, disposal, borrow and former production well areas
5	Clear demarcation of areas to be cleared during construction
6	Reduce hunting and logging in areas opened up through the creation of new or improved access roads
7	Reduce and prevent mortality of wildlife from collision from vehicles
8	Light control within Project Area to minimise disturbance to forest species
9	Methodical clearance of forested areas to allow natural dispersal of wildlife into adjacent habitat and not to create isolated areas with no means of escape.
10	Undertake habitat restoration in degraded forest areas outside the Project Area within the WBTFB.

Source: Mott MacDonald (2014) BAP and BOMP (Rev D)

Due to the close proximity of communities to both the Project and forest of high conservation value, a socialization programme was determined to be essential in promoting awareness of the importance of habitats of conservation value for compliance with Lenders' safeguards to demonstrate SOL's commitment toward 'no net loss' to biodiversity and 'net gain' in critical habitat. A further objective of the Socialisation Programme was to support SOL's proper implementation of the BAP. Therefore, the Socialisation Programme was designed and delivered to raise awareness of the following:

- National legislative and international lenders' requirements on biodiversity that the Project must comply with
- Importance of biodiversity and habitats and species of conservation value and sensitivities of the Project area
- Measures to be implemented and monitored on site as per the BAP and BOEMP during the construction phase
- Procedures to be followed in the event of non-compliance with the BAP and BOEMP

- Roles and responsibilities of each entity and personnel

The Socialisation Programme was delivered to the following groups as of 12 June 2014:

- Group 1 – SOL and Contractors senior and middle managers in Jakarta
- Group 2 – SOL, Contractors, and Subcontractors senior site staff
- Group 3 – Focus group meetings with local communities and government agencies including the Heads of Pahae Jae and Pahae Julu Sub-districts as well as Department of Mines and Energy and Department of Environment

This Interim Report presents the delivery of Socialisation Programme conducted as of 12 June 2014, which was delivered to total 365 internal and external stakeholders as shown in **Table S.2**.

**Table S.2: Delivery Date and Location**

Group	Audience	Date	Duration	Location	# of participants
1	SOL and Contractors senior and middle managers	5 June 2014	20min	SOL Jakarta office	36
2	SOL and Contractors site staff and contractors	10 June 2014	1hour	SOL site office	75
3	Local communities and Heads of Sub-district	11 June 2014	1.5hour	A church in Pahae Jae Sub-district	118
		12 June 2014	1.5hour	A church in Pahae Julu Sub-district	126
	Local government agencies	11 June 2014	1hour	SOL site office	10
<b>TOTAL:</b>					<b>365</b>

SOL will deliver further socialisation at ten villages in the two Sub-districts of the Project’s Area of Influence (AoI). SOL will also deliver further socialisation to all the SOL, Contractors, and Subcontractors site staff as part of their induction training and refresher on an annual basis.

Furthermore, as part of SOL’s commitment toward ‘no net loss’ to biodiversity and ‘net gain’ in critical habitat, SOL will be implementing a range of informal and formal economic activities that will assist the transition of subsistence communities to alternative methods of income generation. This may be conducted through mechanisms such as microcredit systems, ‘local business initiatives’ and vocational education programs. In many cases, training in agroforestry, rotational cropping or other non-forest based agricultural practices will not only help to increase yields but have shifted cultivation from forest areas to cleared or already degraded land. However, it is of note that many of the community members may conduct hunting for hobby and production of a local alcohol. Therefore, engagement of communities will be implemented together with awareness raising programme as described above.

# 1 Introduction

## 1.1 Rationale

The Socialisation Programme is an integral component of the Biodiversity Action Plan (BAP) and Biodiversity Offset and Ecological Management Plan (BOEMP). The BAP/BOEMP is one of a number of plans which comprise Sarulla Operations Limited (SOL)'s Environmental and Social Management Plan (ESMP). The ESMP is a compendium of documents that have been compiled with the express purpose of demonstrating SOL's application of (and conformance with) the provisions of international lenders' standards as listed in Section 1.4. Each plan presents a comprehensive assessment of the management, mitigation and monitoring requirements necessary to manage the relevant environmental and socioeconomic impacts as identified in the Environmental and Social Impact Assessment (ESIA) documents. Together, these plans will be an integral component of SOL's Environmental and Social Management System (ESMS) which sets out to provide the Company with a robust structure to ensure its risks and impacts are effectively managed.

The BAP and BOEMP are of particular significance as the Project is located in a critical habitat as defined by International Finance Corporation (IFC) Performance Standard 6 (PS6) with presence of species of conservation value such as Sumatran tiger. Specifically the BAP and BOEMP are required to ensure that the Project:

- Implements the mitigation, compensation and biodiversity offsetting measures within the ESIA
- Complies with national legislative requirements
- Complies with international environmental requirements and best practice, including the Asian Development Bank (ADB) Safeguards Policy Statement 2009, IFC PS6, and the Equator Principles

## 1.2 Project Background

SOL is the operation company established by the consortium of Itochu Corporation, Kyushu Electric Power Co., Inc., Ormat International, Inc. and PT. Medco Energi International Tbk. SOL plans to develop the geothermal field and power plant with combined capacity of 330 MW in Sarulla, in Pahae Jae and Pahae Julu Districts, North Tapanuli Regency, North Sumatera Province.

The Project comprises the development of two geothermal fields within the Sarulla valley and includes the following activities:

- The development of Sarulla geothermal field i.e. Silangkitang (SIL) field and Namora I Langit (NIL) field
- The construction and operation of a combined capacity of 330 MW geothermal power plant, one unit at SIL and two units at NIL each with a nominal capacity of 110 MW
- The construction of a combined length of approximately 14kms of 150 kV (high voltage) overhead transmission line from Silangkitang field (SIL 1) to Perusahaan Listrik Negara (PLN) Substation and from Namora I Langit field (NIL 1) to PLN substation

Based on initial surveys as part of the Environmental and Social Impact Assessment, SOL has developed a Biodiversity Action Plan (BAP) and Biodiversity Offset and Ecological Management Plan (BOEMP). The BAP proposed ten actions as presented in Table 1.1 to be undertaken by SOL with the aim of achieving 'no net loss' to biodiversity or 'net gain' in critical habitats in accordance with the IFC PS6.

Table 1.1: Summary of Action Plan Objectives

No	Action
1	Inform construction staff on the habitats of conservation value and notable plant species
2	Conduct further biodiversity surveys and prepare a detailed map of the habitats of conservation value
3	Socialisation programme with local villages to promote awareness of importance of habitats and plant species of conservation value
4	Undertake habitat restoration within laydown, disposal, borrow and former production well areas
5	Clear demarcation of areas to be cleared during construction
6	Reduce hunting and logging in areas opened up through the creation of new or improved access roads
7	Reduce and prevent mortality of wildlife from collision from vehicles
8	Light control within Project Area to minimise disturbance to forest species
9	Methodical clearance of forested areas to allow natural dispersal of wildlife into adjacent habitat and not to create isolated areas with no means of escape.
10	Undertake habitat restoration in degraded forest areas outside the Project Area within the WBTFB.

Source: Mott MacDonald (2014) BAP and BOMP (Rev D)

### 1.3 Objectives

Due to the close proximity of communities to both the Project and forest of high conservation value, a socialization programme was determined to be essential in promoting awareness of the importance of habitats of conservation value for compliance with Lenders' safeguards to demonstrate SOL's commitment toward 'no net loss' to biodiversity and 'net gain' in critical habitat. A further objective of the Socialisation Programme was to support SOL's proper implementation of the BAP.

The potential outcomes of achieving the above objectives include:

- All construction footprints are maintained to a minimum and as planned
- Proper implementation of biodiversity construction management measures, which aim to avoid:
  - Destruction of flora/fauna, habitat loss and edge effects
  - Fauna injuries and fatality through site clearing and grading activities
  - Introduction of invasive flora and fauna species
  - Light and noise causing behavioural disturbances to animals
  - Erosion impacts
  - Hazardous material spills
  - Waste impacts
  - Brine discharge impacts
  - Reduction in numbers of vulnerable animals
  - Reduction in numbers of flora species near camp sites
  - Disturbance impact from noise and presence of people due to Staff site and welfare facilities
  - Break in habitat continuity for tigers and other terrestrial mammals through embankments on site access roads
- Implementation of methodical clearance of forested areas to allow natural dispersal of wildlife into adjacent habitat and to prevent clearance of habitats of conservation value resulting in isolation of wildlife from escape

- Restriction of entrance into “exclusion zones” and informal routes/tracks or off road driving are refrained
- Clear responsibilities and procedures for reporting and managing injured wildlife or road kill
- Discouragement of killing animals (including procedural implications for employees engaged in such activities) and a protocol to be followed in the event of animals being encountered on site

#### 1.4 Compliance

This Socialisation Programme was designed and delivered to support the implementation of the BAP and BOEMP, which have been developed in accordance with the following international and national requirements:

##### National Legislation

- Law No 5 of 1990 regarding the Conservation of Natural Resources and Ecosystems
- Government Regulation 7 of 1997 regarding the Wildlife Protection Act

##### International Treaties

- United Nations Convention on International Trade in Endangered Species of Wild Fauna and Flora – accession 1978;
- United Nations Convention on Biological Diversity (CBD) – ratified 1995
- International Tropical Timber Agreement – ratified 1995
- Convention on the Conservation of Migratory Species of Animal Wildlife (CMS)
- Convention on International Trade of Endangered Species of Wild Fauna and Flora (CITES) – accession 1978
- Convention on International Trade in Endangered Species of Wild Fauna and Flora - accession 1978

##### Lenders' Requirements

- Asian Development Bank (ADB) Safeguard Requirements1: Environment (Section D8 'Biodiversity Conservation and Sustainable Natural Resource Management')
- IFC PS 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources
- Japan Bank for International Cooperation (JBIC) Environmental and Social Confirmation Guideline
- Equator Principles

#### 1.5 Scope

This Socialisation Programme was designed and delivered to raise awareness of the following:

- National legislative and international lenders' requirements on biodiversity that the Project must comply with
- Importance of biodiversity and habitats and species of conservation value and sensitivities of the Project area
- Measures to be implemented and monitored on site as per the BAP and BOEMP during the construction phase
- Procedures to be followed in the event of non-compliance with the BAP and BOEMP

- Roles and responsibilities of each entity and personnel

## 1.6 Structure of this report

This report is structured as follow:

- Section 2 – reports on the Socialisation Programme delivered as of 12 June 2014
- Section 3 – presents the key performance indicators (KPIs) developed and recorded against the BAP as well as the objectives of next reporting
- Appendix A – presents the Participants Register
- Appendix B – presents the presentation and other materials used for the socialisation
- Appendix C – presents the biodiversity quizzes used to identify the current knowledge level and to develop a KPI
- Appendix D – records the minutes of discussion held at the end of each socialisation event
- Appendix E – records the photos taken during each socialisation event to-date



## 2 Delivery

### 1.7 Date and Location

The Socialisation Programme was delivered to the following groups as of 12 June 2014 as summarised in **Table 2.1**:

- Group 1 – SOL and Contractors senior and middle managers in Jakarta
- Group 2 – SOL, Contractors, and Subcontractors senior site staff
- Group 3 – Focus group meetings with local communities and government agencies including the Heads of Pahae Jae and Pahae Julu Sub-districts

**Table 2.1: Delivery Date and Location**

Group	Audience	Date	Duration	Location
1	SOL and Contractors senior and middle managers	5 June 2014	20min	SOL Jakarta office
2	SOL and Contractors site staff and contractors	10 June 2014	1hour	SOL site office
3	Local communities and Heads of Sub-district	11 June 2014	1.5hour	A church in Pahae Jae Sub-district
		12 June 2014	1.5hour	A church in Pahae Julu Sub-district
	Local government agencies	11 June 2014	1hour	SOL site office

### 1.8 Audience

The Socialisation Programme was delivered to total 365 internal and external stakeholders as presented in **Table 2.2** as of 12 June 2014.

**Table 2.2: Number of Participants (as of 12 June 2014)**

Group	# of participants
SOL senior managers	28
Contractors senior managers	8
SOL and Contractors site staff	75
Local communities in Pahae Jae	118
Local communities in Pahae Julu	126
Local government agencies	10
<b>TOTAL:</b>	<b>365</b>

The participant registers are provided in **Appendix A**. The local stakeholders included the following groups in addition to the villagers within the Project's Area of Interest (AOI) and high biodiversity forest (East and West Batang Toru forest blocks):

- Head of Pahae Jae Sub-district (Kecamatan)
- Head of Pahae Julu Sub-district (Kecamatan)
- Heads of village (Kepala Desa)
- Village representatives (Badan Permusyawaratan Desa)

- Department of Mines and Energy (Dinas Pertambangan dan Energi)
- Department of Environment (Dinas Lingkungan Hidup)
- Development of Family Welfare (Pembinaan Kesejahteraan Keluarga)
- Indonesian national army (Tentara Nasional Indonesia)
- Religious leaders

### 1.9 Delivery Team

The Socialisation Programme was delivered by:

- Mott MacDonald staff
- SOL Environmental Engineers and External Relation Officers
- Yayasan Ekosistem Lestari (YEL) and PanEco staff.

YEL and PanEco are the local and international non-governmental organisations (NGOs) working on conservation of biodiversity and sustainable use of natural resources in Western Batang Toru Forest. They have been engaged by the Project to conduct ecological surveys since November 2013.

### 1.10 Modes of Delivery

#### 1.10.1 Overview

The Socialisation Programme was delivered through:

- Batang Toru Ecosystem documentary produced by PanEco
- PowerPoint presentation (as provided in Appendix B.1)
- Question and Answer (Q&A) session

In addition, SOL and YEL distributed printed materials as provided in **Appendix B.2** to the participants during the Socialisation Programme. These materials consist of:

- Protected Wildlife Poster in Bahasa
- Leaflets on Protected Wildlife, Laws, and Implications of violations in Bahasa

#### 1.10.2 Communication with Target Communities

The Socialisation Programme was delivered to local communities in a culturally appropriate manner and language (both Bahasa Indonesia and Batak). Distribution of materials to the target communities followed the procedures established as part of SOL's Stakeholder Engagement Plan (SEP). SOL distributed invitations to meetings and materials through:

- Head of village and local communities leaders/informal leaders
- Village board information
- Village administration staff
- Representatives from community group

Verbal communication with the target communities followed the procedures established as part of SOL's SEP.

## 1.11 Modules

### 1.11.1 Overview

An overview of modules including targeted participants is summarised in **Table 2.3**.

**Table 2.3: Overview of Modules**

#	Module	BAP Ref	SOL and Contractors Senior and Middle Management	SOL and Contractors Site Staff	Local Communities	Local government agencies
0.	Level of Awareness	-	✓	✓	✓	✓
1	National Legislation and International Lenders' Requirements	-	✓	✓	✓	✓
2	Importance of Biodiversity	Action 1 Action 3	✓	✓	✓	✓
3	Biodiversity Action Plan and Offset Management Plan	Action 4 Action 5 Action 6 Action 7 Action 8 Action 9 Action 10	✓	✓	✓	✓
4	Enforcement	-	✓	✓		✓
5	Monitoring and Reporting	Action 2	✓	✓		✓
6	Q&A	-	✓	✓	✓	✓

### 1.11.2 Module 0 – Level of Awareness

An overview of this module is presented in **Table 2.4**.

**Table 2.4: Overview of Module 0**

MODULE 0	LEVEL OF AWARENESS
Objectives	<ul style="list-style-type: none"> <li>To provide a written record of participants' level of knowledge and awareness on biodiversity after completing this Socialisation Programme</li> <li>To serve as a KPI by comparing to results of the first quiz</li> </ul>
Mode of Delivery	Paper

MODULE 0	LEVEL OF AWARENESS
Target audience	SOL, Contractors, Subcontractors, Local Communities, and Local government agencies

Prior to the commencement of the socialisation, all participants were requested to take a 5-minute quiz on their present awareness and knowledge on biodiversity within the Project AOI and the potential risks and impacts of the Project’s current and planned activities. A final quiz was also undertaken at the end of the Socialisation Programme to:

- Provide a written record of participants’ level of knowledge and awareness on biodiversity after completing this Socialisation Programme
- Serve as a KPI by comparing the score of the first and final quizzes.

The quiz was prepared in both English and Bahasa as presented in **Appendix C**. The quiz consisted of multiple choice and short answer questions. A different quiz was prepared for local communities and local government agencies as the questions related to the Project’s construction mitigation measures are less important to these stakeholders.. The quiz results are summarised in **Table 2.5**.

Table 2.5: Results of Quiz

Group	Average score of 1st Quiz	Average score of 2nd Quiz
SOL and Contractors Senior Managers	83%	89%
SOL and Contractors site staff	60%	80%
Local communities in Pahae Jae	[to be reported in the next submission]	[to be reported in the next submission]
Local communities in Pahae Julu	[to be reported in the next submission]	[to be reported in the next submission]
Local government agencies	[to be reported in the next submission]	[to be reported in the next submission]

### 1.11.3 Module 1 – National Legislation and International Lenders’ Requirements

An overview of this module is presented in **Table 2.6**.

Table 2.6: Overview of Module 1

MODULE 1	NATIONAL LEGISLATION AND INTERNATIONAL LENDERS’ REQUIREMENTS
Objectives	To raise awareness on: <ul style="list-style-type: none"> <li>• Requirements stipulated under the national legislative and international requirements listed in Section 1.4 and their implications to their activities</li> <li>• The recent changes to the Regency Spatial Plan, which has changed the status of the forest</li> </ul>
Mode of Delivery	PowerPoint presentation
Target audience	SOL, Contractors, Subcontractors, Local Communities, and Local government agencies

A brief introduction to the key national legislation, international conventions that the Government of Indonesia is signatory to, as well as lenders’ requirements was presented to the audience. The level of details and terminologies used were adjusted to meet the audience’s level of knowledge.

#### 1.11.4 Module 2 – Importance of Biodiversity

An overview of this module is presented in **Table 2.7**.

**Table 2.7: Overview of Module 2**

MODULE 2	IMPORTANCE OF BIODIVERSITY
Objectives	To raise awareness on the forest habitats of conservation value and wildlife and notable plant species within the Project AOI
Mode of Delivery	PowerPoint presentation and video
Target audience	SOL, Contractors, Subcontractors, Local Communities, and Local government agencies

In particular, the following were presented to the audience:

- Fauna and flora of conservation value including the species protected in accordance with the national legislation and species listed in the threatened categories in IUCN Red List
- Batang Toru Forest as an internationally recognized area
- Batang Toru Forest’s functions as water catchment area and implications to local livelihoods

#### 1.11.5 Module 3 – Biodiversity Action Plan (BAP)

An introduction to the activities that are permitted or not permitted in the habitats of conservation value as defined in the BAP was provided to SOL and Contractors. In particular, an introduction to the following actions was provided:

- Action 1 - Inform construction staff on the habitats of conservation value and notable plant species
- Action 3 - Socialisation programme with local villages to promote awareness of importance of habitats, wildlife and plant species of conservation value
- Action 4 - Undertake habitat restoration within laydown, disposal, borrow and former production well areas
- Action 5 - Clear demarcation of areas to be cleared during construction
- Action 6 – Promote reduction in hunting and logging in areas opened up through the creation of new or improved access roads
- Action 7 - Reduce and prevent mortality of wildlife from collision from vehicles
- Action 8 - Light control within Project Area to minimise disturbance to forest species
- Action 9 - Methodical clearance of forested areas to allow natural dispersal of wildlife into adjacent habitat and not to create isolated areas with no means of escape.

##### 1.11.5.1 Local Communities

An overview of this module is presented in **Table 2.8**.

**Table 2.8: Overview of Module 3 for Local Communities**

MODULE 3	BAP FOR LOCAL COMMUNITIES
Objectives	To raise awareness on <ul style="list-style-type: none"> <li>• Activities that are or are not permitted in the areas of conservation value including the access roads</li> </ul>

MODULE 3 BAP FOR LOCAL COMMUNITIES	
	and buffer zones as well as restored habitats (e.g., logging, hunting of Threatened and protected species)
	<ul style="list-style-type: none"> <li>SOL's construction activities and commitment to biodiversity</li> </ul>
Mode of Delivery	PowerPoint presentation
Target audience	Local Communities

As the Batak have a sense of attachment to the land, SOL deliberately did not deliver the message to reduce illegal logging during the socialisation conducted in June 2014. SOL's external relation officers will work with local communities regarding this issue.

#### 1.11.5.2 SOL and Contractors

An overview of this module is presented in **Table 2.9**. SOL's Environmental Engineer delivered the presentation to SOL site staff and Contractors to emphasise SOL's commitment to implementing the BAP. A summary of the BAP was also provided to the local government agencies.

Table 2.9: Overview of Module 3 for SOL and Contractors

MODULE 3 BAP FOR SOL AND CONTRACTORS	
Objectives	To raise awareness on: <ul style="list-style-type: none"> <li>Appropriate construction management measures within the Project AOI</li> <li>Activities that are or are not permitted in the areas of conservation value including the access roads and buffer zones as well as restored habitats</li> </ul>
Mode of Delivery	PowerPoint presentation and group discussion
Target audience	SOL, Contractors, Subcontractors, Local government agencies

A brief introduction to the key biodiversity management measures for the construction phase was provided to SOL site staff, Contractors, and Subcontractors. The objectives of implementing appropriate construction management measures are to:

- Maintain all construction footprints to a minimum and as planned
- Implement methodical clearance of forested areas to allow natural dispersal of wildlife into adjacent habitat and to prevent clearance of habitats of conservation value resulting in isolation of wildlife from escape
- Avoid:
  - Destruction of flora/fauna, habitat loss and edge effects
  - Fauna injuries and fatality through site clearing and grading activities and traffic
  - Introduction of invasive flora and fauna species
  - Light and noise causing behavioural disturbances to animals
  - Erosion impacts
  - Hazardous material spills
  - Waste impacts
  - Brine discharge impacts
  - Reduction in numbers of vulnerable animals

- Reduction in numbers of flora species near camp sites
- Disturbance impact from noise and presence of people due to Staff site and welfare facilities
- Break in habitat continuity for tigers and other terrestrial mammals through the creation of embankments on site access roads.

#### 1.11.6 Module 4 – Enforcement

An overview of this module is presented in **Table 2.10**. SOL’s Environmental Engineer delivered this module to the SOL site staff, Contractors, and Subcontractors. As SOL cannot enforce local communities to adopt the BAP, this was instead communicated to the local government agencies to seek their assistance.

**Table 2.10: Overview of Module 4**

MODULE 4	ENFORCEMENT
Objectives	To raise awareness on: <ul style="list-style-type: none"> <li>• SOL’s ‘no tolerance policy’ for its employees and contractors engaged in poaching wildlife and collecting forest products</li> <li>• the importance of adhering to the lenders’ requirements and penalties for breaching</li> </ul>
Mode of Delivery	PowerPoint presentation
Target audience	SOL, Contractors, Subcontractors, and Local government agencies

#### 1.11.7 Module 5 – Monitoring and Reporting

An overview of this module is presented in **Table 2.11**. SOL’s Environmental Engineer delivered this module to the Contractors, Sub-contractors, and local government agencies.

**Table 2.11: Overview of Module 5**

MODULE 5	ENFORCEMENT
Objectives	To raise awareness on: <ul style="list-style-type: none"> <li>• Lines of communication and responsibilities for reporting and managing injured wildlife or roadkill and unpermitted act</li> <li>• Monitoring for infringements</li> <li>• Monitoring surveys plan set out in the BAP and BOEMP for pre-construction, construction, and post-construction phase</li> </ul>
Mode of Delivery	PowerPoint presentation
Target audience	SOL, Contractors, Subcontractors, and Local government agencies

#### 1.11.8 Question and Answer (Q&A)

A Q&A session followed at the end of the programme to answer any queries arising from the participants. The minutes of discussion held are provided in **Appendix D**. Photos recorded during the Socialisation Programme are presented in **Appendix E**.

[A summary of the key issues/concerns raised will be reported in the next submission].

## 3 Key Performance Indicators (KPIs) and Way Forward

### 1.12 Overview

The Socialisation Programme was delivered to the following groups as of 12 June 2014:

- Group 1 - SOL and Contractors senior and middle managers in Jakarta
- Group 2 - SOL, Contractors, and Subcontractors senior site staff
- Group 3 - Focus group meetings with local communities and government agencies including the Heads of Pahae Jae and Pahae Julu Sub-districts as well as Department of Mines and Energy and Department of Environment

The key performance indicators (KPIs) for the effectiveness of the Socialisation Programme in raising awareness of biodiversity issues were developed and recorded and are discussed further in **Section 3.2**. SOL's progress against the KPIs will be updated in the Final Report.

SOL will deliver further socialisation at ten villages in the two Sub-districts of the Project's Area of Influence (AoI). SOL will also deliver further socialisation to all the SOL, Contractors, and Subcontractors site staff as part of their induction training and refresher on an annual basis.

### 1.13 KPIs

SOL's progress against the KPIs as of 12 June 2014 is presented in **Table 3.1**. Since the primary objective of the Socialisation Programme is awareness raising and the actual implementation is largely dependent on enforcement and implementation of appropriate measures by SOL, Contractors, Subcontractors, and external stakeholders, majority of the KPIs refer to the quiz scores to measure the improved level of awareness (cf, the actual outcomes of implementing the BAP).

Table 3.1: KPIs for the Socialisation Programme (as of 12 June 2014)

KPI of Socialisation Programme	Achievement	BAP									
		#1	#2	#3	#4	#5	#6	#7	#8	#9	#10
[Number] of SOL and Contractors Senior Managers attending the Socialisation Programme	28	✓									
[Number] of SOL, Contractors, and Subcontractors site staff attending the Socialisation Programme	75	✓									
[%] improvement by SOL and Contractors senior managers on first and final quiz	6%	✓	✓		✓	✓		✓	✓	✓	✓
[%] improvement by SOL and Contractors, Sub-contractors site staff	20%	✓	✓		✓	✓		✓	✓	✓	✓
[%] improvement by local communities in Pahae Jae on first and final quiz	14%				✓			✓			
[%] improvement by local communities in Pahae Julu on first and final quiz	10%				✓			✓			
[Number] of biodiversity posters displayed in the Sarulla site office and work areas	24	✓									



KPI of Socialisation Programme	Achievement	BAP									
		#1	#2	#3	#4	#5	#6	#7	#8	#9	#10
[Number] of biodiversity brochures distributed to the SOL, Contractors, and Sub-contractors staff	103	✓									
[Number] of socialisation programme delivered to the local communities	2		✓				✓				
[Number] of socialisation programme delivered to the local government agencies	1		✓				✓				
[Number] of biodiversity posters displayed in the village information board	[To be reported in the next submission]		✓				✓				
[Number] of posters and brochures distributed to the local communities in Pahae Jae	118		✓				✓				
[Number] of posters and brochures distributed to the local communities in Pahae Julu	126		✓				✓				
[Number] of posters and brochures distributed to the local government agencies	10		✓				✓				

SOL aims to continuously improve its progress against the KPIs where appropriate, and this will be reported on an annual basis. KPIs will be reviewed and revised as appropriate on an annual basis.

#### 1.14 Way forward

SOL will deliver further socialisation activities with local communities.

It is of note that the Socialisation Programme to the villages in Pahae Jae and Pahae Julu Sub-districts will be delivered by SOL in cooperation with PanEco/YEL and the Contractors' external relations officers. According to a survey conducted in 2009, there are approximately 6,200 inhabitants in Pahae Jae and Pahae Julu Sub-districts as shown in **Table 3.2**. The physical boundary of the target communities is provided in **Figure 3.1**.

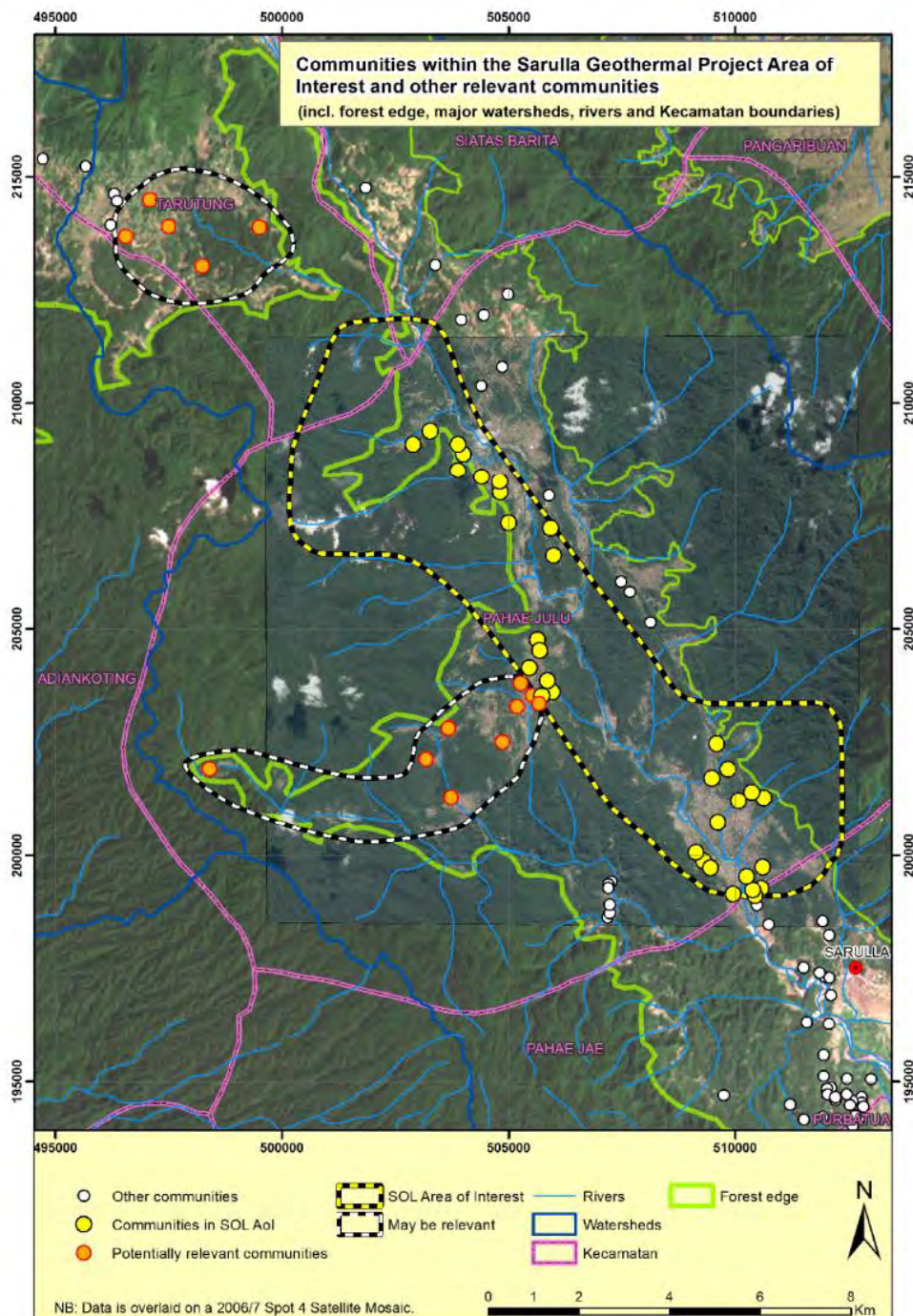
Table 3.2: Population of Communities in SOL Area of Interest

Kecamatan	Village Name	Inhabitants (2009)
Pahae Julu	Simataniari	570
	Simanampang	420
	Sibaganding	479
	Lumban Tonga	671
	Lumban Jaean	545
	Lumban Garaga	561
	Lumban Gaol	711
Sub-total	7 villages	3,957

Kecamatan	Village Name	Inhabitants (2009)
Pahae Jae	Siopat Bahal	585
	Sigurunggurung	710
	Pardomuan Nainggolan	977
Sub-total	3 villages	2,272
Total	10 villages	6,229

Source: Pan Eco / YEL

Figure 3.1: Communities within the Project AOI



SOL will deliver further socialisation at ten villages in the two Sub-districts of the Project's Area of Influence (AoI). SOL will also deliver further socialisation to all the SOL, Contractors, and Subcontractors site staff as part of their induction training and refresher on an annual basis. A refresher thereafter will be arranged and delivered by SOL in coordination with the Contractors on an annual basis throughout the construction phase.

Furthermore, as part of SOL's commitment toward 'no net loss' to biodiversity and 'net gain' in critical habitat, SOL will be implementing a range of informal and formal economic activities that will assist the transition of subsistence communities to alternative methods of income generation. This may be conducted through mechanisms such as microcredit systems, 'local business initiatives' and vocational education programs. In many cases, training in agroforestry, rotational cropping or other non-forest based agricultural practices will not only help to increase yields but have shifted cultivation from forest areas to cleared or already degraded land. However, it is of note that many of the community members may conduct hunting for hobby and production of a local alcohol. Therefore, engagement of communities will be implemented together with awareness raising programme as described above.

# Appendices

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# Appendix A. Participants Register

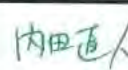
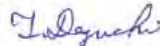
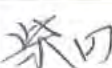
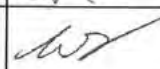
## Meeting Participants Register

**Project Title** Sarulla Geothermal Power Project  
**Subject** ESMS Capacity Building and Biodiversity Socialisation  
**Location** SOL office in Jakarta  
**Date of Meeting** 05-Jun-14

#	Name	Organisation	Position	Initials
1	Takao Shinohara	SOL	CEO	TS
2	Hisao Nakano	SOL	CFO	HN
3	William Lajousky	SOL	COT	WL
4	Fauzi Imron	SOL		
5	Masaya Shibata	SOL	Project Control Manager	MS
6	Tetsuya Deguchi	SOL	Project Engineering Manager	T. Deguchi
7	Naoto Uchida	SOL	Civil Engineer	内田 直人
8	Makoto Nogami	SOL		
9	Sakaue Jumpei	SOL	Project Finance Manager	J. Sakaue
10	Dave Packers	SOL	Human Resources & ES Manager	D. Packers
11	Melva Samosir	SOL	CSR & AMDAL	MS
12	M. Rangga Wirapasa	SOL	Legal Counsel	MR
13	Samsul Abdul Hakim	SOL	Doc Control	S. Hakim
14	Ria Mahdia Fitri	SOL	Doc Control	RF
15	Herry Saleh	SOL	HR Staff	HS
16	Olivia H.	SOL		
17	Petrus Gunawan	SOL	HSE Manager / KTPB	PG
18	Johannes Sagala	SOL	HSE Engineer	JS
19	Jose Perez Villarreal	Halliburton	Sr. Project Manager	JP
20	Adnil Isvan Nurdin	Halliburton		
21	Kabul Prasetyo Utomo	Halliburton	LOGISTICS & MATERIALS MANAGER	KPU
22	Mohammad Nur Azan	Halliburton	HSE MANAGER	MNA
23	Juan Rosales	Halliburton	Engineering Manager	Juan B. Rosales
24	Cesar Sarmiento	Halliburton		

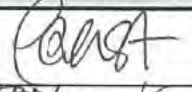
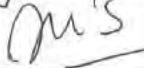







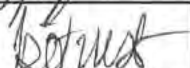
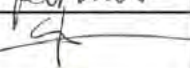

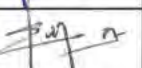






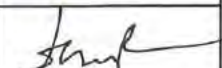
(Contn.)

**Registration Form**  
**ESMS TRAINING AND BIODIVERSITY SOCIALIZATION**  
 By Mott MacDonald  
 Thursday, June 5th, 2014  
 NIL 1&2 Meeting Room, The Energy Building 51st Floor

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**Registration Form**  
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 By Mott MacDonald  
 Thursday, June 5th, 2014  
 NIL 1&2 Meeting Room, The Energy Building 51st Floor

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29	Linda Tanamas	SOL	Finance staff	<i>[Signature]</i>
30	Samuel A. Itakun	SOL	Doc. Center	<i>[Signature]</i>

31. Ahmad Rifqi

SOL

Formalities & Custom Clearance SPV

~~32~~ *[Signature]*

*[Signature]*

**DAFTAR HADIR**  
**SOSIALISASI KEANEKARAGAMAN HAYATI**  
**(BIODIVERSITY)**

HARI : Selasa, 10 Juni 2014  
 TEMPAT : SOL Office  
 Pukul : 09.00 Wib. s/d selesai



NO.	Nama	Alamat	Perusahaan / Instansi	Tandatangan
1	FITRI RUMIAMI	Lumban Garaga	Hjunda	
2	PANDA LAYU SUMBERAYAK	LUMBAN GARAGA	HDEC	
3	ADRIANUS M. SIMANGUNSONI	TARUTUNG	HYUNDAI	
4	ROLDRES	TARUTUNG	HDEC	
5			YEL Ratic	
6	Fricka Hutasaot	Pandan, Tapteng	YEL - Paneco	
7	Ronald Siagian	Pandan, Tapteng	YEL	
8	DANIEL SICHUAN	Pandan, Tapteng	YEL	
9	CHOKY NARUKOM	Stikcautz	Halliburton	
10	IPRAN FANTAN	Jkt	Halliburton	
11	Aeli Lukman Sihombing	Kumbuh	SOL	
12	Jalo	Serulla	Dyfluo	
13	Alces Sitompul	Blaykily	SOL	
14	EDWIN	JAKARTA	HALLIBURTON	
15	Nina Eultrim	Jakarta	Halliburton	
16	Muradut Siregar	Parutung	SOL	
17	Harold Sitaban	Tarutung	SOL	
18	Lenny Sitombing	Selayang	SOL	
19	ARTHUR	TARUTUNG	SOL	
20	Uci Leli M Artonang	Pakae	SOL	
21	Industri Sitompul	Pakae Julu	SOL	
22	LINDA Samudra	PAKAE JAE	Purabaya	
23	Dampoc Puncak	P. Jue	Gion	
24	FRANS	Sarulla	SOL	
25	Syaiful Hamid Ak	Tarutung	CAKRA YADHA	
26	Paffi. S. Nababan	Pakae	Pakae, A. Zbc	
27				
28	Nisri Sitompul	Serulla	SOL	
29	TEICKY SIREGAR	SERULLA	C.V. SION	
30	MARKIAND SITOMPUL	PAKAE JULU	C.V. RSB	
31	Suslyant	Sarulla	SOL	
32	Sry Ayu	Sarulla	SOL	

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HARI : Selasa, 10 Juni 2014  
 TEMPAT : SOL Office  
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NO.	Nama	Alamat	Perusahaan / Instansi	Tandatangan
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34	HERBERT CIANTURI	PAHAE	SOL	[Signature]
35	Leonard Sitompul	Taiching	SOL	[Signature]
36	Martulus Smitulir	Pahae	CV. [unclear]	[Signature]
37	MART B. NAINGGOLAN	PAHAE	CV GEMA PAHAE	[Signature]
38	HAPPY M	"	CV GEMA PAHAE	[Signature]
39	MALULAK Sitompul	PAHAE	CV DUMA AKTIA	[Signature]
40	PAWEL Sitompul	PIMATANIARI	CV. DUMA AKTIA	[Signature]
41	SARDIANAN SIBOGAE	PAHAE	SOL	[Signature]
42	Ramli Sitompul	Pahae	SOL	[Signature]
43	Narlan Sitompul	Pahae Julu	SOL	[Signature]
44	Jansoni Sitompul	Pahae Julu	CV. DUMA AKTIA	[Signature]
45	Hendri Sitompul	Onon Kasang	PT. PP	[Signature]
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49	Deo Tinambunan	Pahae Julu	PT. PP	[Signature]
50	Bintol Sitompul	Fondasi	ND. [unclear]	[Signature]
51	HILSA TANPAHAN	DIRUKI	CV. PAHAEMANDIT	[Signature]
52	POLTRAK P. Bolu	SIMATANIARI	CV SIMATANIARI	[Signature]
53	Richardo Paffahan	SIMATANIARI	CV PUTRA DUTA	[Signature]
54	A. SIMONWIKI.	L. GALASA	CV L GL	[Signature]
55	JIMMI TANBUKAN	P. Julu	CV. KIRYA BERSAMA	[Signature]
56	HERMAN P. Bolu	P. Julu	PT. SAMPAT PAHAE	[Signature]
57	Milki RARON	KUL	KUL	[Signature]
58	RST FRANK pangabean	P. Julu	CV RJE PAHAE	[Signature]
59	Dr. Roy Rumban	Tambay	PMI	[Signature]
60	Jugul B. Cudhane	Onon Joto	CV. WADYA GROUP	[Signature]
61	Antonius Tambunan	"	CV power play	[Signature]
62	Mauliate Sitompul	"	CV KITA PPA SPA	[Signature]
63	Togu Pitaban	"	"	[Signature]
64	Meliana Dany	MI	Karanehor	[Signature]

**DAFTAR HADIR**  
**SOSIALISASI KEANEKARAGAMAN HAYATI**  
**(BIODIVERSITY)**

HARI : Selasa, 10 Juni 2014  
 TEMPAT : SOL Office  
 Pukul : 09.00 Wib. s/d selesai



NO.	Nama	Alamat	Perusahaan / Instansi	Tandatangan
65	SUSAN RINA PASARIBU	Banjir dea	Cp. BR-BORNEO	[Signature]
66	R. Sitompy Ismail	Klampitang	Cv. PIRASALANG	[Signature]
67	D. Sari dan Sitompul	Sikotort	Cv. Lang 606	[Signature]
68	MARTHIN SITOMDUL	Sigutung 3	CV. GLOBY	[Signature]
69	Kriston Surogo	Silangtelrang	LEID - WADUNILARA	[Signature]
70	MILITER SOMPUL	SITANGKEMALI	CV MEGA KREASI	[Signature]
71	MARINDU SITOMPUL	Jl. GURUNG 2	Kep. PADI HARAPAN	[Signature]
72	Subratman Sitompul	Sikotort 2	MCI	[Signature]
73	Hyo Min You	Tanjutung	HDEC	[Signature]
74	Lee Seok Ho	"	"	[Signature]
75	Khon Se Hyun	"	"	[Signature]
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**DAFTAR HADIR**  
**SOSIALISASI KEANEKARAGAMAN HAYATI**  
**(BIODIVERSITY)**

HARI : Rabu, 11 Juni 2014  
 TEMPAT : GXPI Pangaloran  
 Pukul : 09.00 Wib. s/d selesai



NO.	Nama	Alamat	Instansi/Posisi	Tandatangan	Keterangan	Bertugas
1	SE. T. Sitompul	Desa Sigurung 2	TANI	[Signature]		
2	G. H. P. SITOMPUL	SIOPATBAHAL	DAGANG	[Signature]		
3	St. H.G. SITOMPUL	SI GURUNG 2	PETANI	[Signature]		
4	Alina Ekhotom	Jakarta	Haliburton	[Signature]		
5	Budi F. Tumonggor	Jakarta	PRA	[Signature]		
6	Dr. R. Rumpen	Tanby	PMI	[Signature]		
7	St. J. Partogi 2	SIOPATBAHAL	PKS	[Signature]		
8	Yahner Dedy	Tarutung	PMI	[Signature]		
9	Yohm D. S	Jakarta	PRA	[Signature]		
10	Robert Sitompul	Pangaloran	Korpri	[Signature]		
11	[Signature]		PRM	[Signature]		
12	F. B. B. B. B.	Sarulla	SOL	[Signature]		
13	Adi P. Sinaen	Tanjung	SOL	[Signature]		
14	Diana	Sarulla	SOL	[Signature]		
15	Arti S	Sarulla	SOL	[Signature]		
16	Anton Simanung	DESA D. NANGOLAN	TANI	[Signature]		
17	B. ARTOMANING	PARDAMUAN	TANI	[Signature]		
18	Maman Pak. S	PARDAMUAN	TANI	[Signature]		
19	Tomas Tompulo	DORONGAN	TANI	[Signature]		
20	PARLIN PARAPAT	SIGURUNG 2	TANI	[Signature]		
21	BUDI NANGOLAN	PARDAMUAN	TANI	[Signature]		
22	PANGONDAN GURU	PARDAMUAN	TANI	[Signature]		
23	LESTERIA BARDI	SIGURUNG 2	PMI	[Signature]		
24	Margalea Gristipung	Pardamuan	PKS	[Signature]		
25	H. P. P. P. P.	Pardamuan	Tomas	[Signature]		
26	[Signature]	Pardamuan	BPD	[Signature]		
27	Bismar Pappala	Pardamuan	Kadus	[Signature]		
28	Rahat Simamora	Pardamuan	Tokoh Masyarakat	[Signature]		
29	Asufi	Tarutung	PRA	[Signature]		
30	S. M. Ari Tomp	Pekkat	Tokoh Masyarakat	[Signature]		
31	Horatim NANGOLAN	PARDAMUAN	BPD	[Signature]		
32	Ranjan Tambunan	SIOPATBAHAL	KADUS	[Signature]		
33	ANGGAT NANGOLAN	PARDAMUAN	BPD	[Signature]		
34	Elt. A. Nalaban	PAR TOBUAH	TOMAS	[Signature]		
35	Bahar Sitompul	Pardamuan	BPD	[Signature]		
36	Gugun Sitompul	SIOPATBAHAL	T. NANGOLAN	[Signature]		
37	Laswida Sinaen	Silangit	PKK	[Signature]		

**DAFTAR HADIR**  
**SOSIALISASI KEANEKARAGAMAN HAYATI**  
**(BIODIVERSITY)**

HARI : Rabu, 11 Juni 2014  
 TEMPAT : GKPI Pangalaoan  
 Pukul : 09.00 Wib. s/d selesai



NO.	Nama	Alamat	Instansi/Posisi	Tandatangan	Keterangan
38	ERIDA SINGKITING	SILANGKITING	PKK	[Signature]	
39	Dorli Simanungkalak	Silangkiting	BPD	[Signature]	
40	MAR di Simanungkalak	Silangkiting	DJK	[Signature]	
41	Hirta palomas Tambunan	Silangkiting	PKK	[Signature]	
42	ELISABET SHOMBING	SIOPAT BAHU	KADES	[Signature]	
43	Rajin Sihombing	Sigungay?	BPD	[Signature]	
44	T. Pakpahan	Pardamean	To. Masyarakat	[Signature]	
45	Jahlan Sihombing	Silangkiting	To. Masyarakat	[Signature]	
46	Herman Rampel	Siopat Bahu	T. Pemuda	[Signature]	
47	Pdt. S.P. Pasaribu	Pardamean	Gereja	[Signature]	
48	P. Hutabarat	Silangkiting	DISPEN	[Signature]	
49	BERTA. NAINEGOLAN	PARDOMUAN	KADES	[Signature]	
50	JENNI-SINAGA	PARDOMUAN	PKK	[Signature]	
51	LITINA ANNALI	PARDOMUAN	PKK	[Signature]	
52	Ramisa Siantoni	Pardamean	PKK	[Signature]	
53	MARIDA NAINGOLAN	PARDOMUAN	PKK	[Signature]	
54	Elizabeth Pardede	PARDAMEAN	T. Pemuda	[Signature]	
55	EDWARD NAINGOLAN	PARDOMUAN	PAD-	[Signature]	
56	PERMANO. S.	Silangkiting	MUDA	[Signature]	
57	TOHOMA -S.	SILANGKITING	SEKDES	[Signature]	
58	Herki Hutabarat	Silangkiting	BPD	[Signature]	
59	LUSTER KAIYAGA	ANANJASA	TOKA pemuda	[Signature]	
60	SANI POMPUL	Sigungay	KADES	[Signature]	
61	FARTO NAINGOLAN	PARDOMUAN	PEMUDA	[Signature]	
62	Elimar Tambunan	Pardomean	kep. pemuda	[Signature]	
63	Hisar Hutabarat	Silangkiting	Demuda	[Signature]	
64	RADOT SHOMBING	Sigungay	PKK	[Signature]	
65	Darwis G	Pardomean	pemuda	[Signature]	
66	PARLUNGAN NGU	PARDOMUAN	TOKOH MASYARAKAT	[Signature]	
67	Edward Pitompul	Pardomean	-/1 -/1	[Signature]	
68	SARKAS SITINEL	SIOPAT BAHU	TOKOMAS	[Signature]	
69	Binas Tampubelo	Pardomean	T. AGAMA	[Signature]	
70	A. Sumarta S.	Sarulla	CV. Tunas Karu	[Signature]	
71	T. Tampubelo	Sarulla	CV KEY	[Signature]	
72	Renal Hutabarat	Silangkiting	Perangkat desa	[Signature]	
73	Pdt. Lela Tambunan	Pakpahan	lokak. NNU	[Signature]	
74	Randa Sompul	Sigungay	Toko pemuda	[Signature]	

**DAFTAR HADIR**  
**SOSIALISASI KEANEKARAGAMAN HAYATI**  
**(BIODIVERSITY)**

HARI : Rabu, 11 Juni 2014  
 TEMPAT : GKPI Pangaluan  
 Pukul : 09.00 Wib. s/d selesai



NO.	Nama	Alamat	Instansi/Posisi	Tandatangan	Keterangan
75	RUMITA SITOMPUL	DESA SAURUMBAZ	Utusan Perumahan	[Signature]	
76	JESRON SITOMPUL	DESA SEORUNG	TEKOH MASUK	[Signature]	
77	ALVIAHAYATI SIBONBU	DESA PARDAMEAN	Kep. Dusun	[Signature]	
78	RIKIS POKARAR	SITOLU OMPU	PERAMPUNAN	[Signature]	
79	RIZKI DINDIRITAM	Si Bulung	mas. para ket	[Signature]	
80	Faidu Simatupang	Pardamean	Per. desa.	[Signature]	
81	Sri Munarti	GOURUNG	Perempuan	[Signature]	
82	Sarmany Sitompul	Sitolu-ompu	Perampunan	[Signature]	
83	Laris PASTALOR	Sitolu ompu	BPD.	[Signature]	
84	Tolasitompul	Sitolu ompu	BPD	[Signature]	
85	DARMINA Sitompul	Sitolu ompu	Perampunan	[Signature]	
86	Maryambon Simatupang	Sitolu	Kir. Camul	[Signature]	
87	H. Simatupang	Sitolu	-//	[Signature]	
88	ZIDWAN SITOMPUL	Sitolu Bahal	Perampunan	[Signature]	
89	HORMINTA SITOMPUL	Sitolu Bahal	Perampunan	[Signature]	
90	DONNER Sibonbu	Sitolu Bahal	BPD.	[Signature]	
91	HEWRI Sibonbu	-//	BPD	[Signature]	
92	MARSUNDUNGCLB	-//	Toko Agama	[Signature]	
93	Sadi Puzi Kiba	-//	Perampunan	[Signature]	
94	RITA SIPEGAR	SITAMPING	KIAPES	[Signature]	
95	Rumana Humbantubing	Sitolu ompu	Tokoh berkehidupan	[Signature]	
96	Lidia manullana	Sitolu ompu	Perampunan	[Signature]	
97	Ariano sitompul	Sitolu ompu	Perampunan	[Signature]	
98	Minda Tega Sitompul	Si Bulung	Kedua	[Signature]	
99	Elinor Sibonbu	Sitolu Ompu	Toko Agama	[Signature]	
100	JAWID JAMPUNAN	SITOLU OMPU	BPD.	[Signature]	
101	CHRISTO SITOMPUL	SITOLU OMPU	PERIUDA	[Signature]	
102	SAUL SITOMPUL	SITOLU OMPU	T. Masyarakat	[Signature]	
103	ABDUL SITOMPUL	SITOLU OMPU	BPD	[Signature]	
104	Almar Sitompul	SITOLU OMPU	kep dusun	[Signature]	
105	Nulidunna Sitompul	SITOLU OMPU	kep dusun	[Signature]	
106	TOMY SITOMPUL	-//	BPD	[Signature]	
107	MANCARI SITOMPUL	SITOLU OMPU	BPD	[Signature]	
108	Hardi Sitompul	-//	BPD	[Signature]	
109	Manonayur Sitompul	-//	Kdua	[Signature]	
110	LINCA SITOMPUL	SITOLU OMPU	SEK DES	[Signature]	
111	Soriatam Nababan	Siguring 2	Masyarakat	[Signature]	



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**SOSIALISASI KEANEKARAGAMAN HAYATI**  
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 TEMPAT : GKPI Pangaloran  
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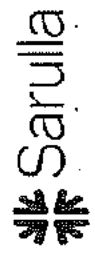
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112	ALTHEA	JRT	SOL		
113	Industri Subanpl	Subanpl	SOL		
114	Yonandini AG	Tidung	OKRA Y		
115	Uci Leli H Ardiyaning	Pahae Jae	SOL		
116	TONNY Tampubolon	Sarulla	Kecamatan		
117	A. INAGTION	SETIA	KORPRI		
118	M. Strombiz	Sarulla	Kecamatan		
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DISTRIBEN → DEPARTMENT OF MINES AND ENERGY  
 LINGKUNGAN → DEPT. NATURAL RESOURCES  
 HIDUP → DEPT FORESTRY  
 KEHUTANAN → SUB-DISTRICT

BPD → BADAN PERMUSYAWARATAN DESA  
 PKK → PEMBINAAN KESEKUTERAAN KEKAWAN  
 (DEVELOPMENT OF FAMILY WE/FACE)

DAFTAR HADIR  
 SOSIALISASI KEANEKARAGAMAN HAYATI KEPADA DESA (KDES) → HEAD OF THE VILLAGE  
 (BIODIVERSITY)

WAK  
 TEMPAT  
 Pukul



NO.	Nama	Alamat	Instansi/Jabatan	Tandatangan	Keterangan
1					
2					
3	KUSALI	Desa...	Persemen	[Signature]	
4	...	...	...	[Signature]	
5	...	...	...	[Signature]	
6	ARLINDIYAHY SITHAK	Tambun	KAREBSA L.H	[Signature]	
7	FRANS HARAHAN	TARUNING	UMONGAN HDUP	[Signature]	
8	...	...	...	[Signature]	
9	Pangpali Sinaga	...	Kebudayaan	[Signature]	
10	Muli Suli M. Anrauh	...	UMONGAN HDUP	[Signature]	
11	Moray Amunsehi Antabara	Jantun	Kebudayaan	[Signature]	
12	Toreng N. PUTAONE	Jantun	Kebudayaan	[Signature]	
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**DAFTAR HADIR**  
**SOSIALISASI KEANEKARAGAMAN HAYATI**  
**(BIODIVERSITY)**

Rabu, 12 Juni 2014  
 Gereja HKBP Onanhasang  
 09.00 Wib. s/d selesai



NO	Nama	Alamat	Instansi/Posisi	Tandatangan	Keterangan
1	Hellian Pasaribu	Kan Jaran	Pendidikan	[Signature]	
2	Piomas Sitompul	Lumban Jaran	PKK	[Signature]	
3	Kastiaty Sitompul	- " -	PKK	[Signature]	
4	Maria Ritonga	- " -	PKK	[Signature]	
5	Rosman Gultom	- " -	BPD	[Signature]	
6	Ahriyol Sitompul	Kan Jaran	PKK	[Signature]	
7	F. B. B. S	S. J. S. S.	SOL	[Signature]	
8	Darlan Sitompul	Lumban Jaran	SOL	[Signature]	
9	P. H. M. S.	D. H. S.	Pendidikan	[Signature]	
10	Laosma Simanungkalit	J. S. S.	PKK	[Signature]	
11	L. Sitompul	Tanjung	SOL	[Signature]	
12	A. Sitompul	S. J. S.	KADES	[Signature]	
13	DARWIN SIMANUNGKALIT	SIMATAMBAH	PEV. P. S. S.	[Signature]	
14	Rosmanda Iphodan	Oran Hulu	PKK	[Signature]	
15	Monday Siregar	Onanhasang	BPD	[Signature]	
16	Hiler Pengorani	Onanhasang	BPD	[Signature]	
17	BEV EZER S	J. S. S.	DEMUJA	[Signature]	
18	Simhat Piter	Kan Jaran	W. K. S. BPD	[Signature]	
19	ROBERT SITOMPUL	Lumb. J. S.	K. S. S.	[Signature]	
20	JAN MAURIP SITOMPUL	L. S. S.	T. S. S.	[Signature]	
21	Penn. Sitompul	Sitoganding	BPD	[Signature]	
22	Adi Putra Sihoran	Tanjung	SOL	[Signature]	
23	Rodiman Simanungkalit	SIMATAMBAH	T. Masyarakat	[Signature]	
24	Meri Sitompul	- " -	SEKDES	[Signature]	
25	Sutan Sitompul	- " -	T. Masyarakat	[Signature]	
26	RAMSES Sitompul	- " -	BPD	[Signature]	
27	Mangontang	- " -	T. PEMUDA	[Signature]	
28	SARIDUN Sitompul	- " -	T. PEMUDA	[Signature]	
29	Petar Jaya S	- " -	BPD	[Signature]	
30	Nurcahyas	- " -	PKK	[Signature]	
31	ELDICA S	- " -	PKK	[Signature]	
32	LENORA M.	- " -	PKK	[Signature]	
33	HULIRCE S	- " -	PKK	[Signature]	
34	HULMAN S	- " -	T. Masyarakat	[Signature]	
35	JAPAWER S	- " -	T. Masyarakat	[Signature]	
36	CHANDRATORANG	L. J. S.	T. S. S.	[Signature]	
37	Kelindungan S	J. S. S.	BPD	[Signature]	

**DAFTAR HADIR**  
**SOSIALISASI KEANEKARAGAMAN HAYATI**  
**(BIODIVERSITY)**

Waktu: Rabu, 12 Juni 2014  
 Tempat: Gereja HKBP Onanhasang  
 Waktu: 09.00 Wib. s/d selesai



NO	Nama	Alamat	Instansi/Posisi	Tandatangan	Keterangan
38	M. D. ...	...	...	[Signature]	
39	Septhian Silita	Onanhasang	Masyarakat	[Signature]	
40	Alia ...	...	...	[Signature]	
41	Kaunper Stempel	Sibogaling	...	[Signature]	
42	Mumpel ...	Onanhasang	LPM	[Signature]	
43	Renward ...	...	...	[Signature]	
44	Harlec Siregar	Toba ...	Toba ...	[Signature]	
45	KARLOJAHAN T.	Onanhasang	LPM	[Signature]	
46	PINTAWLI PANGGABEAN	Onanhasang	Tokoh Pendidikan	[Signature]	
47	Destin Siregar	Onanhasang	Perempuan	[Signature]	
48	Lamria Sitalahi	Onanhasang	Perempuan	[Signature]	
49	AMELIA ...	...	...	[Signature]	
50	M. ...	...	...	[Signature]	
51	St. M. ...	...	...	[Signature]	
52	ARIGOTAY ...	J. ...	BPD	[Signature]	
53	Flora Sianipar	Onanhasang	...	[Signature]	
54	DAVID ...	Onanhasang	Camat	[Signature]	Ditunjuk
55	JACOBI ...	...	BPD	[Signature]	
56	...	...	...	[Signature]	
57	...	...	...	[Signature]	
58	...	...	...	[Signature]	
59	...	...	BPD	[Signature]	
60	...	...	...	[Signature]	
61	MUSLIMAH ...	...	BPD	[Signature]	
62	HOTAM ...	...	...	[Signature]	
63	Parti ...	...	BPD	[Signature]	
64	Pansa ...	...	...	[Signature]	
65	NELSON ...	J. ...	Masyarakat	[Signature]	
66	...	...	...	[Signature]	
67	Hamam ...	J. ...	Masyarakat	[Signature]	
68	JEPERSON S.	J. RAJA	Masyarakat	[Signature]	
69	J. ...	O. ...	...	[Signature]	
70	T. ...	O. ...	...	[Signature]	
71	Budiman ...	Sibogaling	BPD	[Signature]	
72	...	O. ...	BPD	[Signature]	
73	...	O. ...	BPD	[Signature]	
74	Rentawan Siregar	Kel Onanhasang	Perempuan	[Signature]	

**DAFTAR HADIR**  
**SOSIALISASI KEANEKARAGAMAN HAYATI**  
**(BIODIVERSITY)**

Tgl: Rabu, 12 Jun. 2014  
 Gg: Gedung BRBP Ombudsman  
 Jam: 09.00 Wib. s/d selesai



No	Nama	Alamat	Instansi/Posisi	Tandatangan	Keterangan
75	LILIS SIBURIANI	Sangi Natagu	Pemuda	[Signature]	
76	LISLES SISAANAWA	- - -	Perempuan	[Signature]	
77	Ria Bp. halit	Sangi Natagu	Perempuan	[Signature]	
78	Mariahas	Sangi Natagu	Tamara	[Signature]	
79	Rolanta Hutagal	Onan Hasang		[Signature]	
80	Alo Pul-ke L	Onan Hasang		[Signature]	
81	Pancalis	Sibaganding		[Signature]	
82	Warkana Sitompul	KAMPUNG KAS		[Signature]	
83	JAYAKI SIREGAR	JANJINAGAN	MASUKAN	[Signature]	
84	Wagana Sibing	Sibaganding	EKO	[Signature]	
85	Wolvi Sitaban	Ombudsman	Pemuda	[Signature]	
86	HARMIN SIREGAR	Ombudsman	T.MAS	[Signature]	
87	SUDIANTO Sarmin	loban naan	Pemuda	[Signature]	
88	BEP LINDI Tobias	- - -	BPD	[Signature]	
89	Indusia Sibing	- - -	SOL	[Signature]	
90	DIANA	- - -	SOL	[Signature]	
91	Lelia Sitompul	Sibaganding	Pemuda	[Signature]	
92	Pandjaja	Sangi Natagu		[Signature]	
93	Wahana Sibing	Sangi Natagu	Pemuda	[Signature]	
94	Lambito S	Sangi Natagu	Pemuda	[Signature]	
95	Destantina Siman	Sangi Natagu	Perempuan	[Signature]	
96	HERDY BA TABING	- - -	Perempuan	[Signature]	
97	Hendri Siregar	Onan Hasang	Pemuda	[Signature]	
98	Samuel	Onan Hasang	Pemuda	[Signature]	
99	AGUS	Onan Hasang	Pemuda	[Signature]	
100	Pirdanti Siregar	Onan Hasang	MASUKAN	[Signature]	
101	TOKI Sinaga	Ombudsman	T. MAS	[Signature]	
102	Merde	Ombudsman	T. MAS	[Signature]	
103	NOPE SIBING	Sibaganding	T. PEMUDA	[Signature]	
104	ANTONI Tobing	- - -	- - -	[Signature]	
105	Masru Parasiba	- - -	T. AGAMA	[Signature]	
106	Jusauli Siregar	Sibaganding	PKK	[Signature]	
107	Lany Sitompul	lob. naan	PKK	[Signature]	
108	Helen Sinaga	- - -	- - -	[Signature]	
109	Hermida Nabban	- - -	BPD	[Signature]	
110	Bosanna Sitompul	Sibaganding	PKK	[Signature]	
111	Rentauli Panguluan	Sibaganding	Pendidikan	[Signature]	

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**SOSIALISASI KEANEKARAGAMAN HAYATI**  
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HAR : : Rabu, 12 Juni 2014  
 TEMPAT : : Gereja HKBP Onanhasang  
 Pukul : : 09.00 Wib. s/d selesai



NO.	Nama	Alamat	Instansi/Posisi	Tandatangan	Keterangan
112	SINARSIPATUJAE	Siborong	TERAUSNA	[Signature]	
113	MANTO PASARIU	-/-	PALUWA	[Signature]	
114	KARMONANGSI H.	Pulau	TO MAS	[Signature]	
115	OP. Jumbina R.	Kabupaten	Tomar	[Signature]	
116	M. SKUMORANG	KORAMIL 24	TKI	[Signature]	
117	R. ALITONASIB	KORAMIL 24	TNI	[Signature]	
118	KRUMAD KUMPU	Pulau	CRADUS	[Signature]	
119	JON. EDUARDI S.	Kab. Jember	CRADUS	[Signature]	
120	JUMILY H. GELVE	Gimacem	Tomar	[Signature]	
121	HETTI TAMARUAN	Pulau	MOSYATAK	[Signature]	
122	SARIPU SIMPLE	O. HONG	MOSYATAK	[Signature]	
123	KARIONA SIAGIAN	O. HONG	MOSYATAK	[Signature]	
124	EVAN H. TAMARUAN	H. JULU	MOSYATAK	[Signature]	
125	Yohanes Achy	Tanitung	PMI / MDC	[Signature]	
126	WIBIAR WAINGELAN	O. JOKO	PMI / MDC	[Signature]	
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# Appendix B. Socialisation Materials

## **B.1 Presentation**

## Biodiversity Socialisation

Sarulla Geothermal Power Project



## Agenda

- National legislation and international requirements
- Importance of biodiversity
- Biodiversity Action Plan and Offset Management Plan
- Enforcement, Monitoring, and Reporting
- Q&A



## Quiz

# What do you know about biodiversity?



Source: PanEco / YEL



Source: PanEco / YEL



## Key international requirements



- **United Nations Framework Convention on Climate Change (1994)**
  - Gol has set a voluntary commitment to reducing carbon emissions, including mitigation of emissions from deforestation through:
    - Combating illegal logging; conservation and rehabilitation of forest resources; empowering the economy of the community within and surrounding the forest area
- **United Nations Convention on Biological Diversity (1995)**
  - BAPPEDA produced the Indonesian Biodiversity Strategy and Action Plan (IBSAP).
  - BSAP for 2020 is currently under preparation to include mechanisms for monitoring and evaluating implementation at national and local levels
- **Convention on International Trade in Endangered Species of Wild Fauna and Flora (1978)**
  - Gol is signatory to this legally binding agreement between governments to ensure that international trade in wild animals and plants does not threaten their survival.





## International lenders' requirements Asian Development Bank's Environmental Safeguards

**ADB**

- Do not implement project activities in areas of critical habitats, unless:
  - There are **no measurable adverse impacts**, or likelihood of such, on the critical habitat which could impair its high biodiversity value or the ability to function;
  - The project is not anticipated to lead to a reduction in the population of any recognized **endangered or critically endangered species** or a **loss in area of the habitat** concerned such that the persistence of a viable and representative host ecosystem be compromised;
  - For any lesser impacts, mitigation measures will be designed to achieve at least **no net loss of biodiversity**.




## International lenders' requirements IFC PS6 - Biodiversity Conservation and Sustainable Management of Living Natural Resources

**IFC**  
International Finance Corporation  
World Bank Group

- In areas of critical habitat, the client will not implement any project activities unless:
  - No other viable alternatives within the region exist for development of the project on modified or natural habitats that are not critical;
  - The project **does not lead to measurable adverse impacts** on those biodiversity values for which the critical habitat was designated, and on the ecological processes supporting those biodiversity values;
  - The project **does not lead to a net reduction** in the global and/or national/regional population of any **Critically Endangered or Endangered species** over a reasonable period of time; and
  - A robust, appropriately designed, and long-term **biodiversity monitoring and evaluation program** is integrated into the client's management program.




## International lenders' requirements (cont'd)

- **Equator Principles**
  - Signed by the Sarulla project's financial institutions










- **Japan Bank for International Cooperation (JBIC) Environmental and Social Confirmation Guideline**








## National legislation



- Law No 5 of 1990 regarding the Conservation of Natural Resources and Ecosystems
  - Outlines the importance of preserving plant and animal diversity and their ecosystems and sustainably using natural resources.
  - Regulates the participation of the people in the conservation of biological resources and ecosystems
- Law No 19 of 2004 regarding Forestry
  - Regulates the management and conservation of forests
  - Categorise forests into: Conservation, Protection, and Production
- Government Regulation 7 of 1999 regarding Conservation of Plants and Animals
  - A species of plants and animals must be protected if: it has a small population; there is a sharp decrease in the number of individuals in the wild; limited distribution range (endemic).
  - For those species of plants and animals which fulfill the criteria referred to in paragraph (1) there is need to conservation efforts






### Law No 5/1990

Catch      Kill      Own      Keep



Harm      **Protected Species**      Transport

Trade

Max 5 years of imprisonment



Minimum fine of Rp100M

### Project Baseline

- [Batang Toru Forest and its functions](#)
- [Internationally recognized forest](#)
- [Results of field surveys](#)

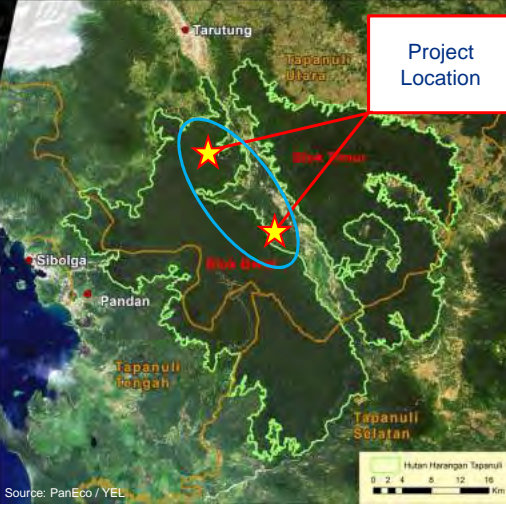
**→ The Project site is located in critical habitats of high conservation value**

### Batang Toru Forest

- All of the upper watershed has been denuded of forest, currently only 30% is forested
- This remaining forest are crucial in maintaining ecosystem stability


**Project Location**



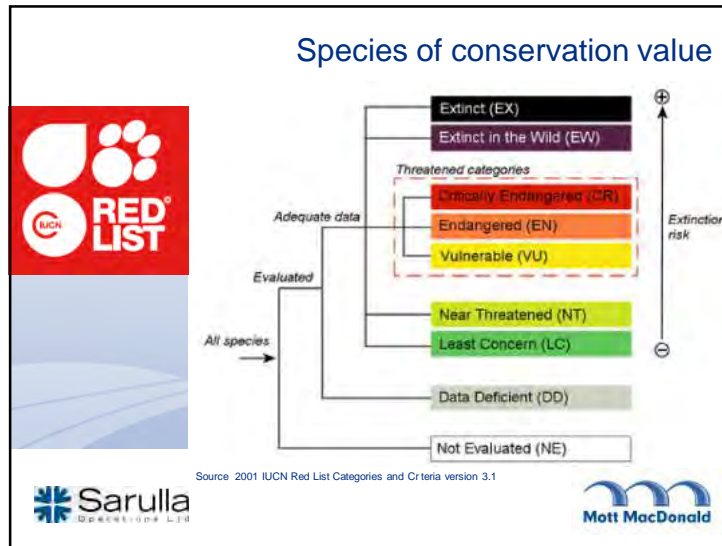
Source: PanEco / YEL

### Batang Toru River Watercatchment area


- The Batang Toru watershed (3400 km<sup>2</sup>) is one of the most important ones in North Sumatra with following functions:
  - Store water, thereby reducing **flooding** during heavy rains, and provide **water** during the dry season.
  - Reduce **erosion** and **landslides**
  - Accelerate the formation of soil and **nutritional** cycles
  - Forests regulate (local) climate, thereby reducing temperature fluctuations and regulating rainfall.





Source: PanEco / YEL




### Jenis-Jenis Flora Di Tapanuli



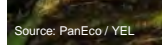

1. Bunga padma  
 Lokal : Bunga bangkai  
 Inggris: Rafflesia  
 Latin : *Rafflesia sp.*  
 PP 7 : Dilindungi  
 IUCN : Kurang data (DD)  
 Fungsi: Estetika, ilmu pengetahuan, ekosistem,

### Jenis-Jenis Flora Di Tapanuli



2. Bunga bangkai  
 Lokal : Atturbung  
 Inggris : *Amorphophallus*  
 Latin : *Amorphophallus titanum*  
 PP 7 : Dilindungi  
 IUCN : Kurang data (DD)  
 Fungsi : Estetika, ilmu pengetahuan, ekosistem,

## Jenis-Jenis Flora Di Tapanuli



Source: PanEco / YEL



Source: PanEco / YEL

3. Kantong semar  
 Lokal : Tahu-tahu  
 Inggris : Nepenthes  
 Latin : *Nepenthes spp.*  
 PP 7 : Semua jenis dilindungi  
 IUCN : Kurang data (DD)



Jenis-jenis  
 Anggrek

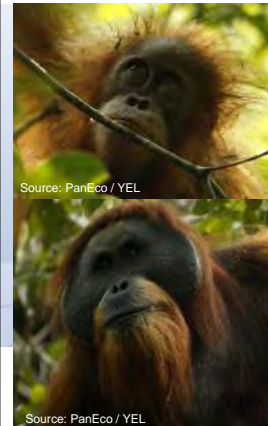
Source: PanEco / YEL



Jenis-jenis  
 Anggrek

Source: PanEco / YEL

## Jenis-Jenis Fauna Di Tapanuli



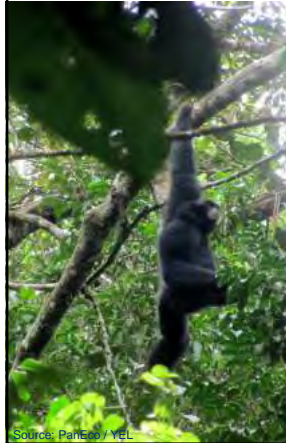
Source: PanEco / YEL

Source: PanEco / YEL

1. Orangutan sumatera  
 Lokal : Juhut bontar  
 Inggris : Sumatran orangutan  
 Latin : *Pongo abelii*  
 PP 7 : Dilindungi  
 IUCN : Kritis/sangat terancam punah (CR)  
 Fungsi : Penyerbukan, pemencar biji, pengendali populasi hewan yang dimangsanya, dan pemangkasan pohon secara alami.  
 Ket. : Kepadatan populasi rendah sehingga habitat perlu dipertahankan



## Jenis-Jenis Fauna Di Tapanuli



2. Siamang  
Lokal : Imbo  
Inggris : Siamang  
Latin : *Symphalangus syndactylus*  
PP 7 : Dilindungi  
IUCN : Rentan (VU)  
Fungsi : Penyerbukan, pemencar biji, dan pengendali populasi hewan yang dimangsanya.



## Jenis-Jenis Fauna Di Tapanuli



3. Owa-wa  
Lokal : Sarudung  
Inggris : Agile gibbon  
Latin : *Hylobates agilis*  
PP 7 : Dilindungi  
IUCN : Rentan (VU)  
Fungsi : Penyerbukan, pemencar biji, dan pengendali populasi hewan yang dimangsanya.



## Jenis-Jenis Fauna Di Tapanuli



4. Kukang  
Lokal : Huhang  
Inggris : Slow loris  
Latin : *Nycticebus coucang*  
PP 7 : Dilindungi  
IUCN : Rentan (VU)  
Fungsi : Rantai makanan dan ilmu pengetahuan



## Jenis-Jenis Fauna Di Tapanuli



5. Harimau sumatera  
Lokal : Babiak, ompu, raja hutan  
Inggris : Sumatran tiger  
Latin : *Panthera tigris sumatrae*  
PP 7 : Dilindungi  
IUCN : Kritis/sangat terancam punah (CR)  
Fungsi : Predator puncak (pengendali populasi satwa yang dimangsanya)  
Ket. : Kepadatan populasi rendah sehingga habitat perlu dipertahankan



## Jenis-Jenis Fauna Di Tapanuli



Source: PanEco / YEL

6. Kucing batu  
Lokal :Antuasu  
Inggris :Marbled cat  
Latin :*Pardofelis marmorata*  
PP 7 :Dilindungi  
IUCN :Rentan (VU)  
Fungsi :Ekosistem, ilmu pengetahuan



## Jenis-Jenis Fauna Di Tapanuli



Source: PanEco / YEL

7. Kucing emas  
Lokal : Angguliman  
Inggris : Golden cat  
Latin : *Pardofelis temminckii*  
PP 7 : Dilindungi  
IUCN : Hampir terancam (NT)  
Fungsi : Ekosistem, ilmu pengetahuan



## Jenis-Jenis Fauna Di Tapanuli

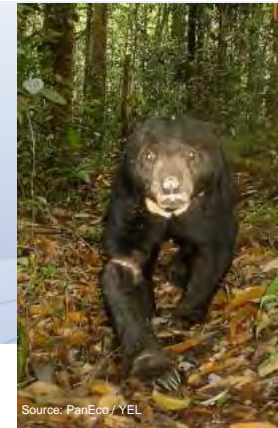


Source: PanEco / YEL

8. Kucing kuwuk  
Lokal : Babiatri  
Inggris : Leopard cat  
Latin : *Prionailurus bengalensis*  
PP 7 : Dilindungi  
IUCN : Risiko rendah (LC)  
Fungsi : Ekosistem, ilmu pengetahuan



## Jenis-Jenis Fauna Di Tapanuli



Source: PanEco / YEL

9. Beruang madu  
Lokal : Gompul  
Inggris : Sun bear  
Latin : *Helarctos malayanus*  
PP 7 : Dilindungi  
IUCN : Rentan (VU)  
Fungsi : Ekosistem, ilmu pengetahuan



## Jenis-Jenis Fauna Di Tapanuli



Source: PanEco / YEL

10. Tapir  
Lokal : Sipan  
Inggris: Asian tapir  
Latin : *Tapirus indicus*  
PP 7 : Dilindungi  
IUCN : Terancam (EN)  
Fungsi: Ekosistem, ilmu pengetahuan



## Jenis-Jenis Fauna Di Tapanuli



Source: PanEco / YEL

11. Kambing hutan  
Lokal : Belu, bedu  
Inggris : Serow  
Latin : *Capricornis sumatraensis*  
PP 7 : Dilindungi  
IUCN : Rentan (VU)  
Fungsi : Ekosistem, ilmu pengetahuan



## Jenis-Jenis Fauna Di Tapanuli



Source: PanEco / YEL

12. Rusa  
Lokal : Ursa  
Inggris : Sambar deer  
Latin : *Cervus unicolor*  
PP 7 : Dilindungi  
IUCN : Rentan (VU)  
Fungsi : Ekosistem, ilmu pengetahuan



## Jenis-Jenis Fauna Di Tapanuli



Source: PanEco / YEL

13. Kijang  
Lokal : Hije  
Inggris : Common barking deer  
Latin : *Muntiacus muntjak*  
PP 7 : Dilindungi  
IUCN : Risiko rendah (LC)  
Fungsi : Ekosistem, ilmu pengetahuan



## Jenis-Jenis Fauna Di Tapanuli

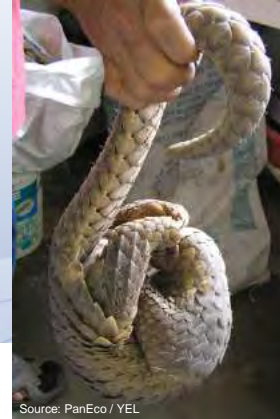


14. Kancil, planduk  
Lokal : Pelanduk, napu  
Inggris : Lesser mouse deer  
Latin : *Tragulus kanchil*  
PP 7 : Dilindungi  
IUCN : Risiko rendah (LC)  
Fungsi : Ekosistem, ilmu pengetahuan

Source: PanEco / YEL



## Jenis-Jenis Fauna Di Tapanuli



15. Tenggiling  
Lokal : Tanggiling  
Inggris : Pangolin  
Latin : *Manis javanica*  
PP 7 : Dilindungi  
IUCN : Terancam (EN)  
Fungsi : Ekosistem



Source: PanEco / YEL

Source: PanEco / YEL

## Jenis-Jenis Fauna Di Tapanuli

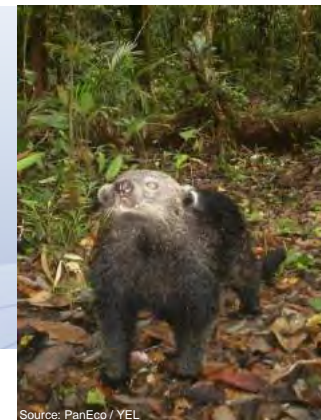


16. Landak raya  
Lokal : Parindurian  
Inggris : Malayan porcupine  
Latin : *Hystrix brachyura*  
PP 7 : Dilindungi  
IUCN : Risiko rendah (LC)  
Fungsi : Ekosistem, ilmu pengetahuan

Source: PanEco / YEL



## Jenis-Jenis Fauna Di Tapanuli



17. Binturong  
Lokal : Misang andor  
Inggris : Binturong  
Latin : *Arctictis binturong*  
PP 7 : Dilindungi  
IUCN : Rentan (VU)  
Fungsi : Ekosistem, ilmu pengetahuan

Source: PanEco / YEL





## Jenis-Jenis Fauna Di Tapanuli



18. Linsang  
Lokal : Misang pandan  
Inggris : Banded linsang  
Latin : *Prionodon linsang*  
PP 7 : Dilindungi  
IUCN : Risiko rendah  
Fungsi : Ekosistem, ilmu pengetahuan



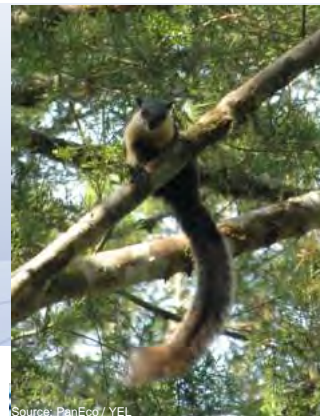
## Jenis-Jenis Fauna Di Tapanuli



19. Kubung  
Lokal : Hubung  
Inggris : Sunda flying lemur  
Latin : *Cynocephalus variegatus*  
PP 7 : Dilindungi  
IUCN : Risiko rendah (LC)  
Fungsi : Ekosistem, ilmu pengetahuan



## Jenis-Jenis Fauna Di Tapanuli



20. Bajing besar  
Lokal : Antalas  
Inggris : Black giant squirrel  
Latin : *Ratufa bicolor*  
PP 7 : Dilindungi  
IUCN : Hampir terancam (NT)  
Fungsi : Ekosistem, ilmu pengetahuan



## Jenis-Jenis Fauna Di Tapanuli



21. Bajing tiga garis  
Lokal :  
Inggris : Three-striped ground squirrel  
Latin : *Lariscus insignis*  
PP 7 : Dilindungi  
IUCN : Risiko rendah (LC)  
Fungsi : Ekosistem, ilmu pengetahuan



## Jenis-Jenis Fauna Di Tapanuli



22. Baning  
Lokal : Baning  
Inggris : Burmese mountain  
tortoise  
Latin : *Manouria emys*  
PP 7 : Dilindungi  
IUCN : Terancam (EN)  
Fungsi : Ekosistem, ilmu  
pengetahuan



## Jenis-Jenis Fauna Di Tapanuli



23. Kuau raja  
Lokal : Bulayan  
Inggris : Great argus  
Latin : *Argusianus argus*  
PP 7 : Dilindungi  
IUCN : Hampir terancam (NT)  
Fungsi : Ekosistem, ilmu pengetahuan



## Jenis-Jenis Fauna Di Tapanuli



24. Enggang badak  
Lokal : Onggang  
Inggris : Rhinoceros hornbill  
Latin : *Buceros rhinoceros*  
PP 7 : Semua famili Bucerotidae  
adalah dilindungi  
IUCN : Hampir terancam (NT)  
Fungsi : Membantu pemencaran biji  
buah dan pengendali  
populasi serangga



## Jenis-Jenis Fauna Di Tapanuli



25. Elang paria  
Lokal : Lali  
Inggris : Black kite  
Latin : *Milvus migrans*  
PP 7 : Semua jenis dilindungi  
IUCN : Risiko rendah (LC)  
Fungsi : Burung pemangsa,  
menjaga  
keseimbangan di  
alam.



## Jenis-Jenis Fauna Di Tapanuli



Source: PanEco / YEL

26. Babi hutan  
 Lokal : Aili  
 Inggris : Wild boar  
 Latin : *Sus scrofa*  
 PP 7 : Tidak dilindungi  
 IUCN : Risiko rendah (LC)  
 Fungsi : Membantu dekomposisi di hutan; penggali tanah; penyebar biji/spora jamur; hewan mangsa



Di Kuala Lumpur, burung gagak dibiarkan hidup untuk membersihkan kota dari lalat, ulat, dan sampah sisa-sisa makanan.



Internet



Source: PanEco / YEL

20/04/2021

Di Tapanuli, kalong/haluang awalnya sangat banyak dan berperan membantu penyerbukan durian dan petai, tapi sayangnya semakin habis d buru.



## Project's Potential Impacts

### Project footprint: 90ha

- Deforestation/habitat destruction/edge effects
- Break of habitat continuity
- General construction works (noise, light, hazardous materials)
- Invasive species introduction



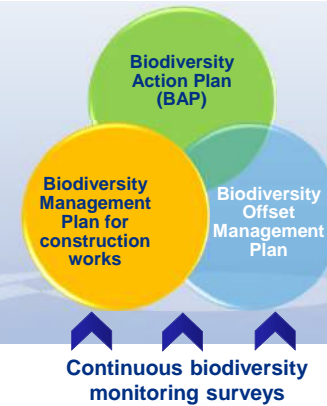
Source: MM



Source: MM



## SOL's commitment toward biodiversity conservation



## Biodiversity Action Plan (BAP)

### GOALS: NO NET LOSS TO BIODIVERSITY NET GAIN IN CRITICAL HABITATS

- BAP was developed based on the mitigation hierarchy:



## Biodiversity Action Plan (Cont.)

Avoid	Reduce	Inform staff about biodiversity	
	Good practice	Socialisation programme with local villages	
Avoid	Reduce	Remedy	Conduct further biodiversity surveys
Avoid	Reduce	Promote reduction in hunting and logging in areas opened up due to access roads	
Avoid	Reduce	Clear demarcation of forest areas to be cleared	
Avoid	Reduce	Reduce and prevent mortality of wildlife from collision from vehicles	
Avoid	Reduce	Light control	
Avoid	Reduce	Methodical clearance of forested areas to prevent creation of isolated areas	



## Biodiversity Action Plan / Offset Management Plan

- Remedy** Onsite habitat restoration
- Offset**
- Areas temporarily lost during construction: Laydown, disposal areas, borrow area
  - Former well pads previously developed by Petermina PLN in 1998



- Offset** Offsite habitat restoration (TBC)



### Avoid Reduce

## Biodiversity Management Plan for minimising Deforestation

- Clear the minimum land possible (mark appropriately on drawings and in the field to avoid mistakes)
- Locate facilities within existing disturbed areas
- Site non-essential site facilities and welfare facilities outside of the forest boundary
- Utilize or upgrade existing roads
- Directional drilling technology to avoid the requirement for additional pad area
- Stockpile and keep cleared vegetation for other uses (rehabilitation, landscaping, erosion control)
- Avoid embankments on edge of site roads to form 'cliffs'



Source: MM



**Avoid Reduce** **Biodiversity Management Plan for minimising Deforestation**

- Employ clearance and felling methods that retain trees and allow fauna to escape
- Relocate habitat features and resources for native fauna in a manner to limit damage to existing vegetation
- Avoid damage to trees by machinery that are not scheduled for felling. Do not permit vehicles or other plant or machinery to enter areas of intact vegetation.
- Avoid use of herbicides to clear vegetation.
- Do not use intact vegetation areas for stockpiling or as lay down areas.




Source: MM

**Sarulla** **Mott MacDonald**

**Avoid Reduce** **Biodiversity Management Plan for general construction activities**

- **Reduce the noise and light disturbance** (appropriate vehicle maintenance, speed limit, reduce light)
- **Control the erosion** (erosion control devices, replant vegetation)
- **Control waste/chemical disposal**
- Inject Condensate and brine generated during the power plant production testing and operation into re-injection wells
- **Prohibit hunting/fishing/harvesting** of forest's products



Source: MM

**Sarulla** **Mott MacDonald**


**Avoid Reduce** **Biodiversity Management Plan for avoiding Invasive Species**

- Identify existing areas of non-native plant species and develop a management plan
- Hygiene measures for construction machinery and workforce
  - Disinfection and wash down of plants/machinery prior to the arrival
  - Contain and treat washdown water
  - Locate wash areas away from water bodies
- Use native species for restoration areas
- Prohibit the possession of cats/dogs on site
- Avoid the use of herbicides unless strictly necessary


**Sarulla** **Mott MacDonald**

**Avoid Reduce** **Biodiversity Management Plan for Critical Habitats Conservation**


- In case of wildlife found on the site, ensure that it is **relocated in a suitable habitat** not too far from the original area.
- Check continuously for the **presence of endangered species**
- Threat abatement of impacted species (**poaching-free zone**)
- **Avoid habitat interruption** (e.g. site embankments of site roads)



Source: PanEco/YEL



Source: PanEco/YEL



Source: PanEco/YEL

**Sarulla** **Mott MacDonald**

## Enforcement, Monitoring, and Reporting

- No tolerance policy
- Monitoring of infringement
- Lines of communication
- Biodiversity monitoring surveys for pre-construction, construction, and O&M phase
  - Update BAP report
  - Biodiversity Monitoring and Evaluation Programme



Compliance with national legislation and international requirements



**NO NET LOSS TO BIODIVERSITY  
NET GAIN IN CRITICAL HABITATS**

Avoid and/or minimise:

- Ecological impacts
- Commercial risks
- Reputational risks



## **B.2 Poster and Brochure**

# Rupo-rupo Ni Angka Binatang Na Dijago Undang-undang Ni Indonesia

Sanga Ise Na Marburu/ manakkup Angka Binatang/Unggas Na Dijago Ni Pamareta Gabe di Dando ma ia dohot Hepeng Rp 100.000.000,- Sanga Dium Hurungan lima taon penjara

## Jenis-jenis Satwa Yang Dilindungi Undang-undang Indonesia

Setiap orang yang memburu/menangkap jenis satwa/burung yang dilindungi dapat kena denda Rp 100.000.000,- atau 5 tahun penjara (UU No. 5 tahun 1990).





## Orangutan sumatera (Juhut bontar)



Orangutan jantan (gambar atas) memiliki bantalan di pipi (cheek-pads) yang membesar kalau dewasa. Informasi salah yang beredar ialah: orangutan dapat menculik anak kecil, memperkosa wanita, & dapat menyerang manusia dengan melemparkan kayu/ranting pohon.



Induk & anak orangutan masih menyusui (gambar di samping). Orangutan lambat berkembangbiak. Betina orangutan hanya punya satu anak sekaligus yang tinggal bersamanya selama 8 tahun lalu berpisah pelan-pelan.

Populasi orangutan (mawas) di dalam Hutan Tapanuli mempunyai ciri genetika yang berbeda dengan orangutan lain di Sumatera Utara dan Aceh, sehingga patut

dilesrtaikan.

Secara alami makanan orangutan adalah bunga, buah, daun, liana, kulit kayu, rayap, serangga lain, dll. Orangutan menjaga keseimbangan hutan melalui rantai makanan, membantu penyerbukan, dan memencarkan biji-bijian.

Penangkapan burung di alam liar baik untuk peliharaan (hobi) maupun dijual marak terjadi. Perlu kesadaran dari masyarakat agar mengurangi aktivitas ini untuk memulihkan populasi burung yang saat ini semakin langka.



## STOP PERBURUAN & PERDAGANGAN SATWA LIAR DEMI KELESTARIAN ALAM KITA SEMUA!



“Setiap orang dilarang untuk: menangkap, melukai, membunuh, menyimpan, memiliki, memelihara, mengangkut, dan memperniagakan satwa yang dilindungi (UU No. 5 tahun 1990)”.



Apabila terjadi konflik dengan orangutan dan satwa liar dilindungi lainnya, segera SMS ke :

**0812-6569-8936 (YEL)**

**0813-9772-0000 (OIC)**

**0634-23450 (BKSDA Wil. II P.Sidempuan)**



## Mengapa Terjadi Konflik Manusia-Satwa Liar?

1. Aktivitas manusia yang semakin masuk ke hutan mengakibatkan kerusakan atau penyempitan habitat satwa.



Pembukaan hutan untuk areal perkebunan akan mengakibatkan satwa liar kehilangan tempat tinggalnya.

2. Berkurangnya satwa mangsa akibat perburuan oleh manusia mengakibatkan satwa predator datang ke pemukiman masyarakat. Rusa & kambing hutan merupakan salah satu contoh jenis pakan Harimau sumatera yang jumlahnya menurun karena diburu.



3. Dianggap hama (pengganggu). Contohnya pada saat musim panen durian, orangutan masuk ke kebun buah yang lokasinya dekat/merupakan daerah bekas hutan.
4. Masih banyak masyarakat yang kurang mengetahui manfaat penting satwa liar bagi alam.



Maraknya perburuan Kukang untuk dijadikan hewan peliharaan semakin mempercepat berkurangnya populasi kukang di alam liar.

Babi hutan merupakan salah satu hewan yang dimangsa Harimau Sumatera. Bila Harimau punah, maka mengakibatkan populasi babi di hutan membludak, sehingga akan mengganggu keseimbangan alam.



## Mengapa Satwa Liar Perlu Dilindungi?

1. Di dalam hutan ada suatu sistem yang lengkap disebut ekosistem (hubungan timbal-balik antara makhluk hidup dengan lingkungannya). Bila satwa liar hilang/ punah, maka sistem tidak akan berjalan dengan baik, sehingga lingkungan akan rusak.
2. Beragam satwaluar yang dilindungi memiliki peran sangat penting dalam menjaga keseimbangan alam.
3. Perkembang-biakannya sangat lambat.
4. Menjaga kekayaan alam hayati yang sangat istimewa ini merupakan tanggung-jawab kita bersama.

Landak raya & trenggiling sering diburu untuk perdagangan ilegal, dengan dalih satwa ini merupakan hama tanaman. Tindakan ini melanggar hukum.



## Penanggulangan Konflik Antara Manusia Dan Satwa Liar:

1. Bila ada ancaman dari satwa liar di sekitar saudara, segera hubungi atau SMS ke **0812-6569-8936**.
2. Demi keselamatan saudara, jangan terlalu dekat dengan satwa tersebut.
3. Kerumunan orang banyak hanya akan membuat satwa liar menjadi stres dan cenderung mengamuk.
4. Jangan mengambil tindakan yang dapat melukai satwa liar, karena akan membuat satwa tersebut semakin ganas. Selain itu tindakan tersebut juga melanggar hukum.

Setiap orang yang menangkap, melukai, membunuh, menyimpan, memiliki, memelihara, mengangkut, dan memperniagakan satwa dilindungi akan dipidana dengan pidana penjara paling lama 5 tahun dan denda paling banyak Rp. 100.000.000 (UU No. 5 tahun 1990).



# Appendix C. Quiz

## **C.1 SOL/Contractors**

**Sarulla Geothermal Power Project  
Biodiversity Socialisation**

**Quiz 1**

Name: \_\_\_\_\_(optional)

Your organization (please circle one) : SOL / Hyundai / Halliburton (required)

Date: 5 June 2014

Question	Answer
<b>MODULE 1 - NATIONAL LEGISLATION AND INTERNATIONAL LENDERS' REQUIREMENTS</b>	
1. What happens when you hunt a protected species in Indonesia?	1. Warned 2. Jailed and fined 3. Death penalty 4. Nothing happens
2. Which of the lenders requires biodiversity risk and impact assessment and implementation of mitigation / compensation measures?	1. ADB 2. JBIC 3. National Australian Bank 4. Japanese banks 5. All of the above
<b>MODULE 2 - IMPORTANCE OF BIODIVERSITY</b>	
3. How many hectares of forest are going to be cleared by the Project?	1. 10ha 2. 50ha 3. 90ha
4. Please name one protected species (animal or plant) found within the vicinity of the Project site.	
<b>MODULE 3 - BIODIVERSITY ACTION PLAN (BAP)</b>	
5. How many actions are there in SOL's biodiversity action plan (BAP)?	1. 8 2. 10 3. 15
6. Please describe one action from the BAP.	
<b>MODULE 4 - ENFORCEMENT</b>	
7. Who is responsible for implementing the BAP?	1. SOL 2. Contractors 3. Sub-contractors 4. All of the above
<b>MODULE 5 - MONITORING AND REPORTING</b>	
8. When is biodiversity monitoring survey carried out?	1. Pre-construction 2. Post-construction 3. All of the above
9. True or False: SOL and the Contractors are required to regularly report to the lenders about the implementation status of BAP	1. True 2. False

## **C.2 Local Communities**

## Daftar Pre Test dan Post Test Sosialisasi di Pahae 2014

### A. Identitas Peserta

- 1 Nama :
- 2 Jenis kelamin : Pria / Wanita
- 3 Umur : tahun
- 4 Pendidikan terakhir (lingkari jawaban yang sesuai) : Tidak / tamat SD Tidak / tamat SMA  
Tidak / tamat SMP Universitas
- 5 Agama & aliran Gereja :
- 6 Jenis pekerjaan :
- 7 Asal desa/dusun :

### B. Benar/Salah (B / S)

Lingkari pilihan yang menurut Bapak/Ibu merupakan jawaban yang tepat.

1. Membuka kebun di hulu hutan dapat merugikan masyarakat yang berada di hilir (B / S).
2. Penggundulan hutan dapat mengakibatkan kekeringan pada musim kemarau, karena kurangnya persediaan air di dalam tanah (B / S).
3. Apabila binatang-binatang di hutan habis, maka lama kelamaan hutan akan rusak (B / S).
4. Landak (parindurian) merupakan jenis binatang yang **tidak** dilindungi (B / S).
5. Di Indonesia tidak ada peraturan khusus mengenai perlindungan satwa dan tumbuhan (B / S).
6. Hutan tidak berperan dalam proses terjadinya hujan (B / S).
7. Menangkap trenggiling akan dipidana penjara paling lama 5 tahun dan denda paling banyak Rp 100.000.000 (B / S).
8. Sangsi bagi setiap orang yang melukai, menangkap atau membunuh satwa dilindungi adalah sama beratnya (B / S).
9. Pembukaan lahan hutan termasuk penyebab terjadinya konflik antara Manusia dengan satwa (B / S).
10. Orangutan di Tapanuli adalah sama dengan orangutan sumatera yang berada di Aceh (B / S).
11. Konservasi sumberdaya alam hayati dan ekosistemnya adalah tanggung jawab dan kewajiban pemerintah saja (B / S).

### C. Pilihan berganda

1. Manfaat keberadaan kalong/haluang bagi kelestarian hutan: (Hanya 1 jawaban)
  - a. Mengurangi jumlah nyamuk
  - b. Membantu penyebaran biji tumbuhan
  - c. Membantu penyerbukan bunga pada tumbuhan
  - d. Jawaban b dan c benar
2. Mengapa kepunahan harimau sumatera dapat mengganggu keseimbangan di dalam hutan? (Boleh lebih dari 1 jawaban)
  - a. Harimau membantu penyebaran biji-bijian
  - b. Harimau membantu penyerbukan bunga
  - c. Harimau suka mencari mangsa di kampung
  - d. Harimau merupakan pemangsa hewan yang bisa menjadi hama di kebun masyarakat

3. Jenis binatang yang tidak termasuk dilindungi undang-undang di Indonesia: (Boleh lebih dari 1 jawaban)
- Harimau sumatera (babiat)
  - Kijang (hije)
  - Orangutan (mawas)
  - Beruk (bodat)
4. Jenis tumbuhan yang dilindungi undang-undang di Indonesia: (Boleh lebih dari 1 jawaban)
- Anturmangan
  - Amorphophallus/atturbung/bunga bangkai
  - Kantung semar/tahul-tahul
  - Jamur
5. Apabila Bapak/Ibu melihat seseorang melakukan perburuan binatang dilindungi, tindakan apa yang paling tepat untuk Bapak/Ibu lakukan? (Boleh lebih dari 1 jawaban)
- Ikut berburu
  - Merasa sedih
  - Berkelahi dengan pemburu tersebut
  - Melaporkan ke kepala desa dan dinas terkait
6. Menurut Bapak/Ibu, siapa yang bertanggung-jawab atas kelestarian hutan disekitar kita? (Boleh lebih dari 1 jawaban)
- Anak sekolah
  - Tenaga pendidik
  - Masyarakat
  - Pemerintah
7. Menurut anda apakah fungsi hutan? (Boleh lebih dari 1 jawaban)
- Tempat rekreasi/berlibur (fungsi sosial)
  - Tempat menyimpan cadangan air dan pencegah erosi & banjir (fungsi ekologi)
  - Tempat mencari penghasilan (fungsi ekonomi)
  - Menjaga kesuburan tanah
8. Keuntungan yang dapat dirasakan oleh Bapak/Ibu apabila hutan di sekitar anda terjaga: (Boleh lebih dari 1 jawaban)
- Suasana damai, udara sejuk, sumber air jernih
  - Dapat berburu untuk kebutuhan sehari-hari
  - Hidup sehat
  - Tidak ada keuntungan
9. Faktor apa yang menentukan suatu wilayah hutan patut dilestarikan: (Boleh lebih dari 1 jawaban)
- Keterjalan (topografi)
  - Kepemilikan
  - Jenis pohon di hutan
  - Kepekaan tanah terhadap erosi/longsor
10. Berapa persen sisa penutupan hutan di DAS Batang Toru? (Hanya 1 jawaban)
- 95 %
  - 60 %
  - 30 %
  - 12 %

## Pre Test and Post Test for Socialization

### A. Participant profile

1	Name	:	
2	Gender	:	Male / Female
3	Age	:	
4	Education (Sign your answer)	:	<input type="radio"/> Did not complete Primary School / Graduate from Primary School <input type="radio"/> Did not complete Senior High School / Graduate from Senior High School
		:	<input type="radio"/> Did not complete Junior High School / Graduate from Junior High School <input type="radio"/> University
5	Religion & Church	:	
6	Occupation	:	
7	Residence	:	

### B. True/False (T / F)

Circle your answer.

1. Building a field at upstream forest can pose negative impacts to communities who live in downstream forest. (T / F)
2. Deforestation could cause draught during the dry season due to lack of water retention capacity in the soil. (T / F).
3. When there is a reduction in animals population in forest, eventually the forest conditions will be damaged.
4. Hedgehog (parindurian/landak) is **not** a protected animal. (T / F)
5. Indonesia does not have a special regulation about protecting animals and plants. (T / F)
6. Forest does not affect a rainfall pattern. (T / F)
7. Hunting anteater (trenggiling) will be led to in-prison for at most 5 years and fined for maximum IDR 100.000.000. (T / F)
8. Penalties or sanctions for peoples who hurt, catch or kill the protected animals are the same. (T / F)
9. Forest clearance will cause a conflict between human and animals. (T / F)
10. Orangutan in Tapanuli is the same species as the orangutan in Aceh Province. (T / F)
11. Conservation of forest biodiversity and its ecosystem are only the government's responsibility/obligation. (T / F).



### C. Multiple Choices

1. The benefit of bats for forest sustainability: (Give only 1 answer)
  - a. Reducing mosquitos
  - b. Help spread plant's seeds
  - c. Help pollinate flowers
  - d. B and C are true
2. Why the extinction of Sumatran tiger can disturb the ecosystem balance in forest? (May choose more than 1 answer)
  - a. Tigers help spreading seeds
  - b. Tigers help the flowers pollination
  - c. Tigers like to prowl in the village
  - d. Tigers are predator for pests in villagers field
3. Which animal species are not protected by Indonesia regulation: (May choose more than 1 answer)
  - a. Sumatran tiger (babiat)
  - b. Deer (hije)
  - c. Orangutan (mawas)
  - d. Monkey (bodat)
4. Which plant species are protected by Indonesia's regulation : (May choose more than 1 answer)
  - a. Anturmangan
  - b. Amorphophallus/atturbung/bunga bangkai
  - c. Kantung semar/tahul-tahul
  - d. Fungus
5. What will you do if you observe people hunting the protected animals? (May choose more than 1 answer)
  - a. Join to hunt
  - b. Feeling sad
  - c. Fight with the hunter
  - d. Report to the head of village and government
6. Who has responsibility on forest sustainability around us? (May choose more than 1 answer)
  - a. Students
  - b. Teachers
  - c. Villagers/Peoples
  - d. Government
7. What are the forest functions? (May choose more than 1 answer)
  - a. Recreation /holiday (social function)
  - b. Water supply and erosionprevention of flooding (ecology function)
  - c. Give income to people (economic function)
  - d. Maintain the soil fertility
8. The benefits/advantage when we have sustainable forest around us: (May choose more than 1 answer)
  - a. Peacefull, fresh air, fresh water source.
  - b. Peoples can hunt animals for their living.
  - c. Healthy life
  - d. No benefit
9. Factors which determine the status of forest: (May choose more than 1 answer)
  - a. Topography
  - b. Lands property
  - c. Kind of tress
  - d. Sensitivity of soil againts erotion/landslide
10. How many percentage of primary forest is there in Batang Toru watersheed? (Choose 1 answer)
  - a. 95 %
  - b. 60 %
  - c. 30 %
  - d. 12 %

## Appendix D. Minutes of Discussion

### **D.1 11 June 2014 – Pahae Jae**

[to be provided in the next submission]

### **D.2 11 June 2014 – Local Government Agencies**

[to be provided in the next submission]

### **D.3 12 June 2014 – Pahae Julu**

[to be provided in the next submission]

# Appendix E. Photos

## E.1 10 June 2014 - SOL and Contractors Site Staff

Figure E.1: Biodiversity poster erected at site office



Source: Mott MacDonald

Figure E.2: Biodiversity Presentation for Site Staff



Source: Mott MacDonald

Figure E.3: Socialisation venue at site office



Source: Mott MacDonald

Figure E.4: SOL, Contractors, and Subcontractors staff attending the socialisation



Source: Mott MacDonald

Figure E.5: SOL Environmental Engineer presenting the BAP



Source: Mott MacDonald

## E.2 11 June 2014 – Pahae Jae

Figure E.6: Socialisation venue



Source: Mott MacDonald

Figure E.7: Biodiversity Presentation for Pahae Jae District



Source: Mott MacDonald

Figure E.8: SOL External Relation Officer giving an opening remark at the socialisation



Source: Mott MacDonald

Figure E.9: Local communities attending the socialisation



Source: Mott MacDonald

Figure E.10: A villager during the Q&A session



Source: Mott MacDonald

Figure E.11: Head of Sub-district giving a closing remark



Source: Mott MacDonald

### E.3 11 June 2014 – Local Government Agencies

Figure E.12:: Biodiversity Socialisation for Government Officers



Source: Mott MacDonald

Figure E.13:: Government officers taking a biodiversity quiz



Source: Mott MacDonald

Figure E.14: A government officer during Q&A session



Source: Mott MacDonald

Figure E.15: Government officers during the socialisation



Source: Mott MacDonald

**E.4 12 June 2014 – Pahae Julu**

Figure E.16: Biodiversity Socialisation registration



Source: Mott MacDonald

Figure E.17: Biodiversity Presentation for Pahae Julu District



Source: Mott MacDonald

Figure E.18: Villagers during the socialisation



Source: Mott MacDonald

Figure E.19: Religious leader during the socialisation



Source: Mott MacDonald