

**Data Collection Survey on
Forest & Peatland Fire Control and
Peatland Restoration in Indonesia
(Phase 2)**

Final Report

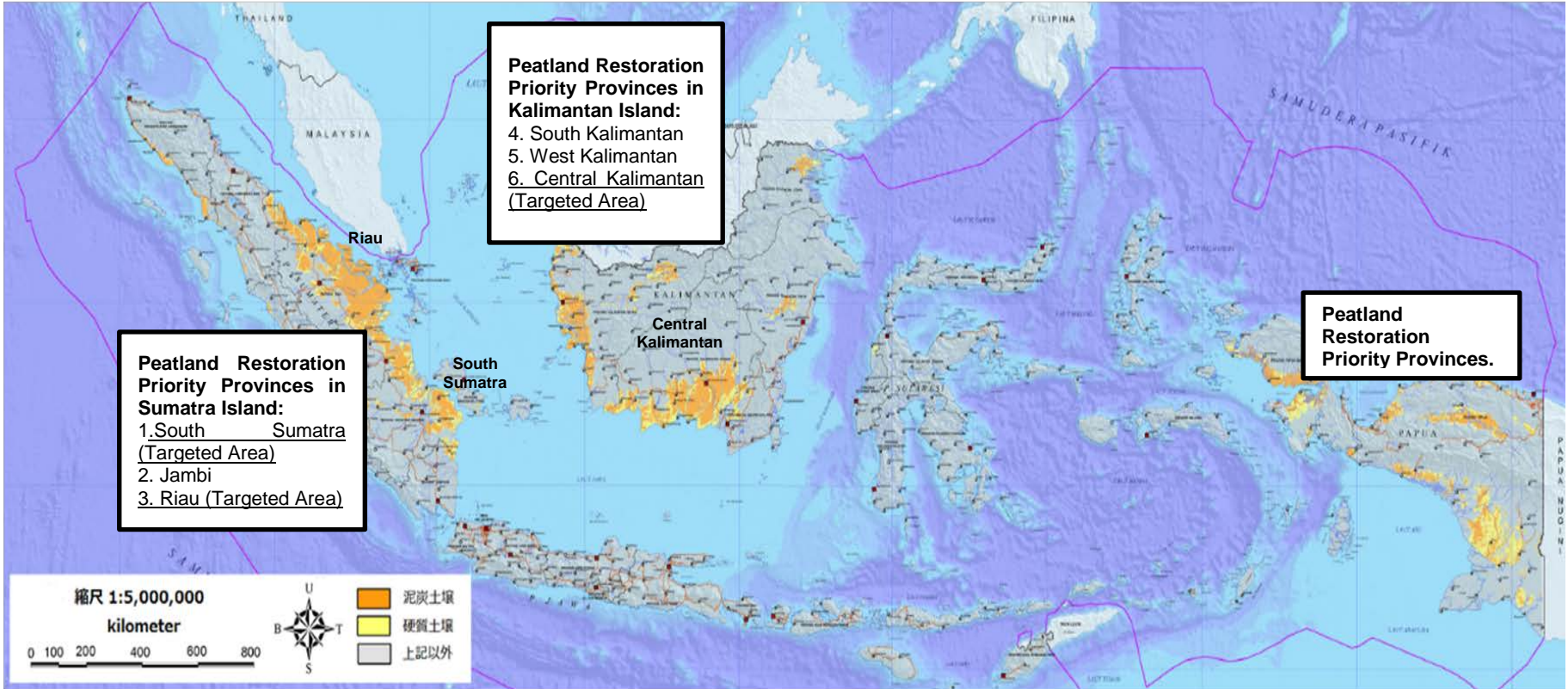
October 2017

Japan International Cooperation Agency

**Japan Forest Technology Association
Nippon Koei Co. Ltd.**

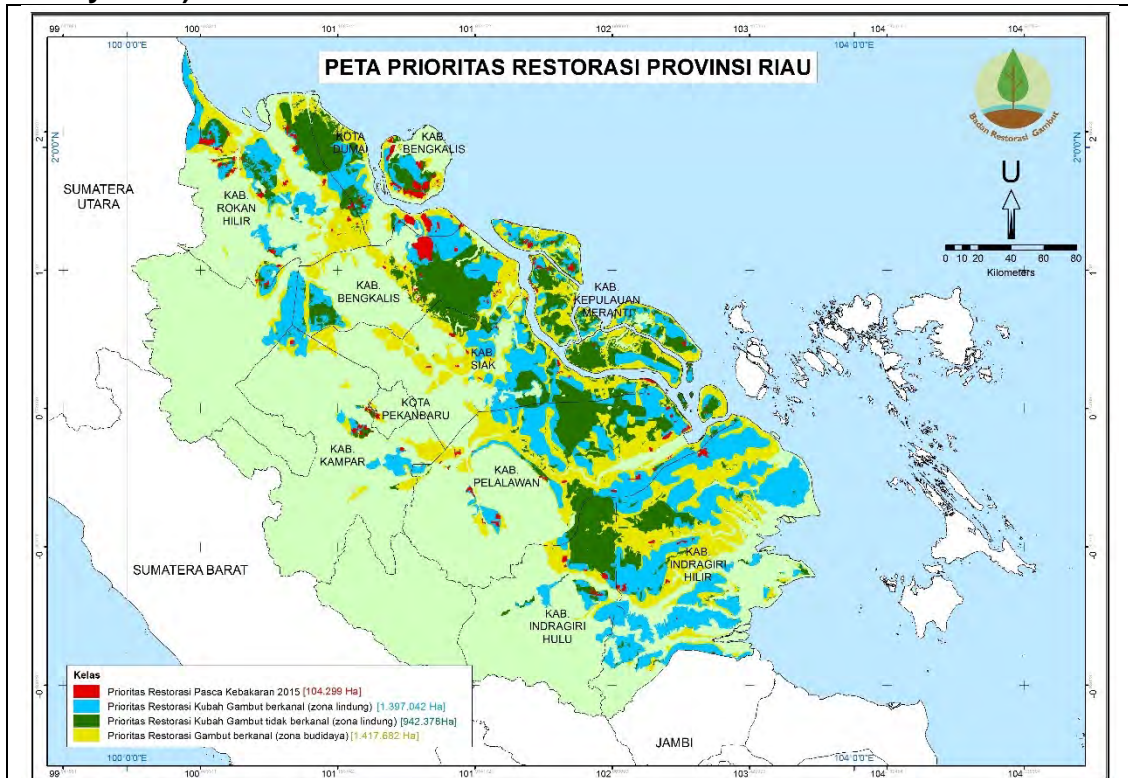
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Location Map on Survey Sites

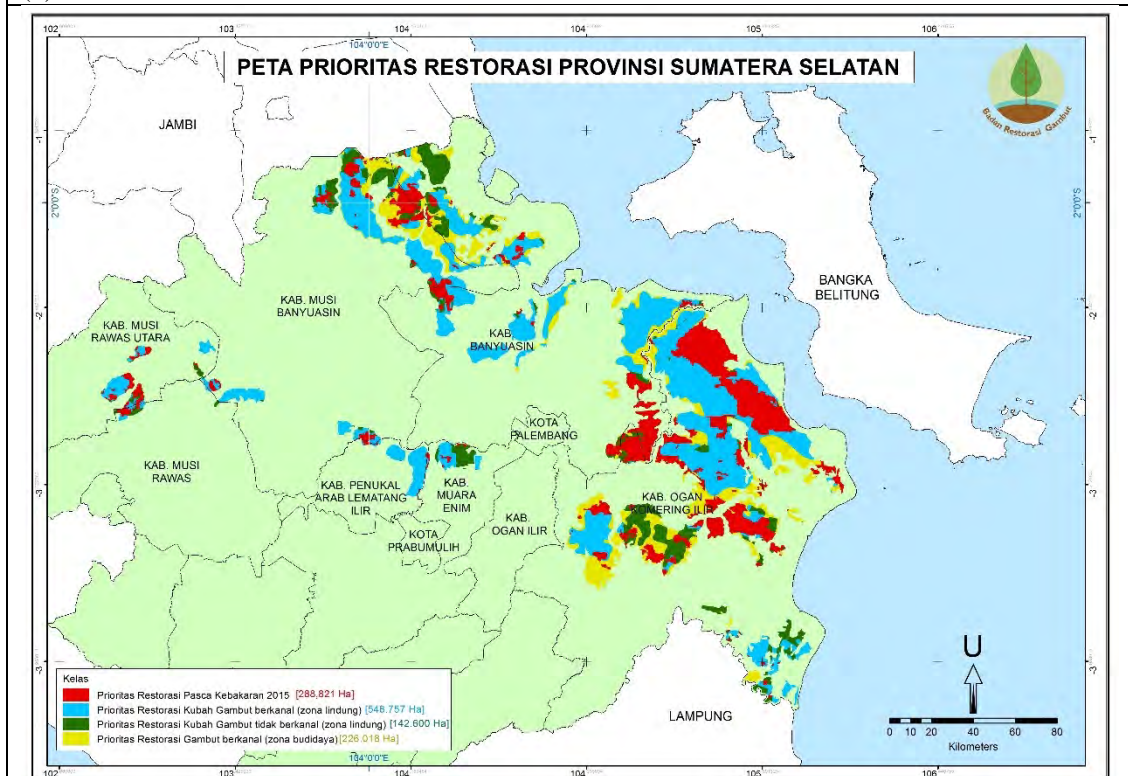


Sources: MoEF 2015

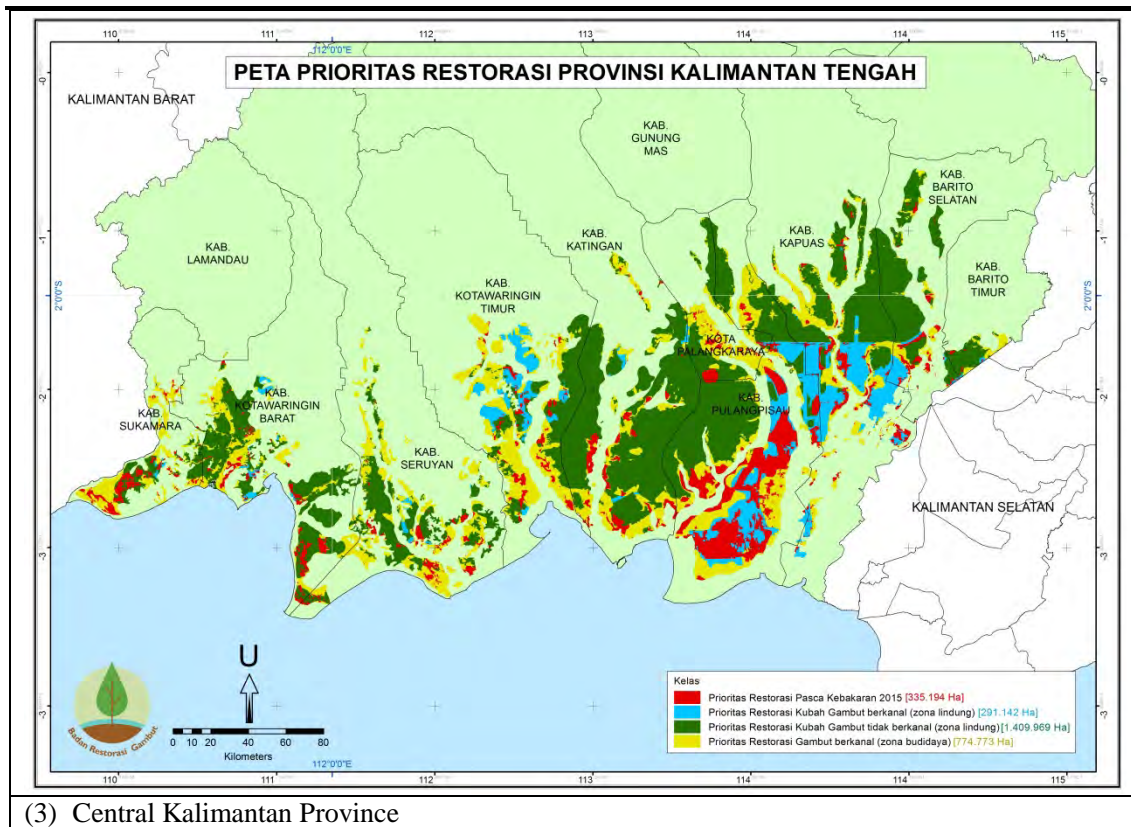
Indicative Planning Maps on Prioritized Sites by Peatland Restoration Area (Prioritized Survey Sites)



(1) Riau Province



(2) South Sumatra Province



(3) Central Kalimantan Province

Sources: Highly Prioritized Peatland Maps by BRG (as of August 2016)

Abbreviation and Acronym

Abbreviation/ Acronym	Indonesian	Abbreviation/ Acronym	English
-	-	AATHP	ASEAN Agreement on Transboundary Haze Pollution
AAUI	Asosiasi Asuransi Umum Indonesia	-	Association of Indonesian General Insurance Companies
ADPI	Asosiasi Dana Pensiun Indonesia	-	Indonesian Pension Fund Association
ABLO	Agribisnis Berbasis Limbah Organik	-	Agribusiness-Based Organic Waste-based Agribusiness
-	-	AEs	Accredited Entities
AEKI	Asosiasi Eksportir Kopi Indonesia	-	Association of Indonesian Coffee exporters
AKKI	Asosiasi Kartu Kredit Indonesia	-	Indonesian Credit Card Association
APBN (D)	Anggaran Pendapatan dan Belanja Negara (Daerah)	-	National (Local) Budget
APEI	Asosiasi Perusahaan Efek Indonesia	-	Indonesian Securities Investor Association
-	-	APEX	Asian People's Exchange (Japanese NGO)
APHI	Asosiasi Pengusaha Hutan Indonesia	-	Association of Indonesian Forest Concessions Holders
APRDI	Asosiasi Pengelola Reksa Dana Indonesia	-	Indonesian Mutual Fund Managers Association
APL	Areal Penggunaan Lain	-	Other Use Area
ASEAN	-	ASEAN	Association of Southeast Asian Nations
-	-	AWL	Automatic Water Logger
B (B) KSDA	Balai (Besar) Konservasi Sumber Daya Alam	NRCC	Natural Resources Conservation Center
Bap (p) eda	Badan Perencanaan (Pembangunan) Daerah	-	Regional (Development) Planning Agency
Bappenas	Badan Perencanaan Pembangunan Nasional	-	National Development Planning Agency
BBSDLP	Balai Besar Litbang Sumberdaya Lahan Pertanian:	-	Center for Research and Development on Agricultural Land Resources
BCA	Bank Central Asia	-	-
-	-	BCR; B/S Ratio	Benefit-Cost Ratio
BEI	PT. Bursa Efek Indonesia	-	Indonesian Stock Exchange
BI	Bank Indonesia	-	Indonesian Central Bank
BIG	Badan Informasi Geospasial	-	Geospatial Information Agency
BKPM	Badan Koordinasi Penanaman Modal	-	Investment Coordination Agency
BLU	Badan Layanan Umum	-	Public Service Agency
BMKG	Badan Meteorologi, Klimatologi dan Geofisika	-	Meteorological, Climatological and Geophysical Agency
BNI	Banak Negara Indonesia	-	-
BNPB	Badan Nasional Penanggulangan Bencana	-	National Disaster Management Agency
BPBD	Badan Penanggulangan Bencana Daerah	-	Regional Disaster Management Agency
BPN	Badan Pertanahan Nasional:	-	National land Agency
BPOM	Badan Pengawasan Obat & Makanan	-	-
BPPT	Badan Pengkajian dan Penerapan Teknologi	-	Agency for the Assessment and Application of Technology
BPPLHK; BP2LHK	Balai Penelitian dan Pengemangan Lingkungan Hidup dan Kehutanan	-	-
BRG	Badan Restorasi Gambut	PRA	Peat Restoration Agency
BRI	Bank Rakyat Indonesia	-	People's Bank of Indonesia
BTN	Bank Tabungan Negara	-	National Savings Bank
BTPN	Bank Tabungan Pensiunan Nasional	-	National Pension Savings Bank
(Perum) BULOG	(Perum) Badan Urusuan Logistik	-	Indonesian Bureau of Logistic
BUMDES	Badan Usaha Milik Desa	-	Village public enterprise
BUMN	Badan Usaha Milik National	-	National enterprise
BUMD	Badan Usaha Milik Daerah	-	Local government enterprise
-	-	CDM	Clean Development Mechanism
-	-	CH	Concession Holder
-	-	CIMTROP	Center for International Cooperation in Sustainable Management of Tropical Peatlands
CPO	-	CPO	Crude Palm Oil
Daops	Daerah Operasi	-	Office of Forest Fire Control
Des	Desa	-	Village
(Dis/B) LH(D)	Dinas/Badan Lingkungan Hidup (Daerah)	-	Environmental Service Agency
Dishut	Dinas Kehutanan (Lingkungan Hidup)	-	Forestry (and Environmental) Service
Dus	Dusun	-	Hamlet
-	-	ENSO	El Nino Southern Oscillation
-	-	ESG	Environmental, social and governance
-	-	EU	European Union
-	-	FCP	Program of Community Development of Fires Control in Peat Land Area (MoF-JICA)
-	-	FDRS	Fire Danger Rating System
-	-	FFPMP (-1/2)	Forest Fire Prevention and Management Project (MoF-JICA) (Phase-1/Phase-2)
-	-	FFPP	Forest Fire Prevention Project by Initiative of People in Buffer Zone (MoF-JICA)
-	Diskusi Kelompok Terfokus	FGD	Focus Group Discussion
GAPKI	Gabungan Pengusaha Kelapa Sawit Indonesia	-	Indonesia Oil Palm Business Union
-	-	GCF	Green Climate Fund
-	-	GEF	Global Environment Facility
-	-	GGGI	Global Green Growth Institute
GRK	Gas Rumah Kaca	GHG	Green House Gas
HD	Hutan Dea	VF	Village Forest
HHBK	Hasil Hutan Bukan Kayu	NTFP	Non Timber Forest Product

Abbreviation/ Acronym	Indonesian	Abbreviation/ Acronym	English
HKm	Hutan Kemasyarakatan	-	Community Forest-
HL	Hutan Lindung	PF	Protection Forest
HPH	-	-	Logging concession
HTI	-	-	Industrial Forest Plantation Concession
HTR	Hutan Tanaman Rakyat	-	Community Plantation Forest
-	-	JICA	Japan International Cooperation Agency
HGU	Hak Guna Usaha	-	Business use right
-	Titik panas	HS	Hotspot
-	-	ICCTF	Indonesia Climate Change Trust Fund
-	-	IDH	Dutch Sustainable Trade Initiative
-	-	IFAD	International Fund for Agricultural Development
-	-	IC	Investment Committee
IMTA	Izin Mempekerjakan Tenaga Asin	-	-
INPRES	Instruksi Presiden	-	Presidential Instruction
INPARA	Inbrida Padi Raya	-	-
IPB	Institut Pertanian Bogor	-	Bogor Agricultural University
IPM	Indeks Pengembngan Manusia	HDI	Human Development Index
-	-	JCM	Joint Crediting Mechanism
LPHD	Lembaga Pengelolaan Hutan Desa	-	Village Forest Management Board
-	-	IRR	Internal Rate of Return
IUPHHK-HT/HA	Izin Usaha Pengelolaan Hasil Hutan Kayu Hutan Tanaman/Hutan Alam	-	Nature/ Plantation Forest Timber Forest Product Management Business Permit
IUP-P	Izin Usaha Perkebunan untuk Pengolahan	-	Certificate for plantation cultivation business for processing business
Kab.	Kabupaten	District	District, Regency
Karhutla	Kebakaran Hutan dan Lahan	-	Forest and (farm) land fires
Kalteng	Kalimantan Tengah	CK	Central Kalimantan
KBRI	Kedutaan Besar Republik Indonesia	-	Embassy of Republic of Indonesia
Kec.	Kecamatan	-	Sub-district
KEHATI	Keanekaragaman Hayati Indonesia	-	-
KEK	Kawasan Ekonomi Khusus	SEZ	Special Economic Zone
Kemenkeu	Kementerian Keuangan	MoFi	Ministry of Finance
Kemendagri	Kementerian Dalam Negeri	MoHA	Ministry of Home Affairs
Kemendes	Kementerian Desa, Pembangunan Daerah Tertinggal dan Transmigrasi	MoDDRT	Ministry of Village, Disadvantage Region and Transmigration
Kemendag	Kementerian Koordinator Bidang Perekonomian	-	Coordinating Ministry of Economic Affairs
Kementan	Kementerian Pertanian	MoA	Ministry of Agriculture
KH	Kawasan Hutan	SF	State Forest
KHG	Kesatuan Hidrologis Gambut	PHU	Peatland Hydrological Unit
KK	Kawasan Konservasi	-	Conservation Areas
KK	Kepala Keluarga	HH	Household
KKP	Kementerian Kelautan dan Perikanan	-	Ministry of Marine Affairs and Fisheries
KLHK	Kementerian Lingkungan Hidup dan Kehutanan	MoEF	Ministry of Environment and Forestry
KLN	Biro Kerjasama Luar Negeri	-	International Cooperation Bureau
KJRI	Konsulat Jenderal Republik Indonesia	-	Consulate of Republic Indonesia
KoENIG-Merah Putih	Kawasan Ekonomi Restorasi Gambut	-	Peatland Restoration Economy Special Zone
KPBU	Kerjasama Pemerintah dan Badan Usaha	PPP	Public Private Partnership
KPEI	PT Kliring dan Penjaminan Efek Indonesia	-	Indonesian Clearing and Guarantee Corporation
KPH P/L/K	Kesatuan Pengelolaan Hutan Produksi/ Lindung/ Konservasi	Prod./Prot./Conser. FMU	Production/ Protection/ Conservation Forest Management Unit
KSEI	PT Kustodian Sentral Efek Indonesia	-	Indonesian Central Security Depository
-	-	LDC	Least Developed Countries
LPS	Lembaga Penjamin Simpanan	-	Indonesia Deposit Insurance Corporation
-	-	LULUCF	Land Use, Land Use Change, Forestry
MA	Mangala Agni	-	MoF's Forest Fire Brigade
-	-	MEL	Midori Engineering Laboratory Co., Ltd.
-	-	MDB	Multilateral Development Banks
-	-	SLM-MDTF	Indonesia Sustainable Landscapes Management Multi Donor Trust Fund
MPA	Masyarakat Peduli Api	-	Fire Care Community Group
MUBA	Musi Banyuasin	-	-
-	-	Norfund	The Norwegian Investment Fund for Developing Countries
-	-	NDA	National Designated Authority
-	-	NGO	Non-Governmental Organization
NKB	Nilai Kini Bersih	NPV	Net Present Value
-	-	NPO	Non-Profit Organization
OJK	Otoritas Jasa Keuangan	FSA	Financial Services Authority
OKI	Ogan Komering Ilir	-	-
Pemda	Pemerintah Daerah	-	Local government
Pemkab/Pemprov.	Pemerintah Kabupaten/Provinsi	-	District/ Provincial government
Permen	Peraturan Menteri	-	Ministerial Regulation
Perdirjen.	Peraturan Dirjen.	-	Director General's Regulation
Perpres	Peraturan Presiden	-	Presidential Regulation
PKE	Paket Kebijakan Ekonomi	-	Economic Policy Package
PKG	Direktorat Pengendalian Kerusakan Gambut	PDC	Directorate of Peat Damage Control
PKH (L)	Direktorat Pengendalian Kebakaran Hutan (dan Lahan)	FLFC	Directorate of Forest and Fire Control
PLTB	Persiapan/Pembukaan/ Pengolahan Lahan Tanpa Bakar	-	Land Preparation/Clearing/Handling without Burning
POKJA	Kelompok Kerja	-	District Working Group
PP	Peraturan Pemerintah	-	Government Regulation

Abbreviation/ Acronym	Indonesian	Abbreviation/ Acronym	English
PPI	Direktorat Jenderal Pengendalian Perubahan Iklim	CCC	Directorate General of Climate Change
Prop./Prov.	Propinsi/ Provinsi	-	Province
Pulpis	Pulang Pisau	-	-
PU-PR	Kementerian Pekerjaan Umum dan Perumahan Rakyat	PU-PR	Ministry of Public Works and People's Housing
Puskesmas	Pusat Kesehatan Masyarakat	-	Community Health Center
RAKORNIS	Rapat Koordinasi	-	Coordination Meeting
RCR	-	RCR; RC Ratio	Revenue Cost Rate
REDD+	-	REDD+	Reducing Emissions from Deforestation and Forest Degradation in Developing Countries Plus
Renstra	Rencana Strategis	-	Strategic Plan
RKM	Rencana Aksi Masyarakat	-	Community Action Plan
RPJM	Rencana Pembangunan Jangka Menengah	-	Mid-term Development Plan
-	-	RINH	Research Institute for Humanity and Nature (Japanese National Institute)
RoD	Rekaman Diskusi Kerjasama Teknis JICA	R/D	Record of Discussion
Satgas	Satuan Kerja	TF	Task force
SATREPS	-	-	Science and Technology Research Partnership for Sustainable Development
SDGs	-	SDGs	Sustainable Development Goals
SESAME	-	SESAME	Sensory data transmission Service Assisted by Midori Engineering
-	-	SIDS	Small Island Developing States
SIG	Sistem Informasi Geografis-	GIS	Geographic Information System
SKPD	Satuan Kerja Pemerintahan Daerah	-	Local Government's Work Unit
SMBC	-	SMBC	Sumitomo Mitsui Banking Corporation
Sosek	Sosial Ekonomi	-	Social economy
SPBK	Sistem Peringatan Bahaya Kebakaran	-	-
-	-	SRI	Social and Responsible Investment
Sumsel	Sumatera Selatan	SS	South Sumatra
STD-B	Surat Tanda Daftar Usaha Perkebunan untuk Budidaya	-	Registration of Plantation Business
STD-P	Surat Tanda Daftar Usaha Perkebunan untuk Industri Pengolahan Hasil Perkebunan	-	Certificate for registration for processing business for plantation cultivation business
-	-	TAU	Technical Assistance Unit
TJSL	Tanggung Jawab Sosial dan Lingkungan	-	-
TN	Taman Nasional	NP	National Park
ToT	-	ToT	Training of Trainers
TPD	Tim Pendamping Desa Pencegahan Karhutla	VFT	Village Facilitation Team for Land and Forest Fire Prevention
TRGD	Tim Restorasi Gambut Daerah	-	Local Peatland Restoration Team
-	-	UK	United Kingdom
-	-	UN	United Nation
-	-	UNDP	United Nation Development Program
-	-	UNFCCC	United Nations Framework Convention on Climate Change
UNPAR; UPR	-	UNPAR	University of Palangka Raya
-	-	USA	United Nations of America
UU	Undang-undang	-	Law
-	-	VCS	Verified Carbon Standard
-	-	ZMEI	PT. Zenbi Machinery and Electronics Indonesia

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Final Report

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Annex Volume (only in English)

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CHAPTER 1 INTRODUCTION

1.1 Background of Survey

1.1.1 Background of Survey

The Republic of Indonesia (hereafter referred to “Indonesia”) has the third largest country of tropical forest area in the world. Such tropical forest area contributes to maintain the biological diversity as the habitat of wildlife in the world. In recent years, importance of protection and rehabilitation of tropical forests in Indonesia is also paid attention by international community in the perspective of climate change control. However, the pressures of deforestation and forest degradation by forest fires and agriculture development, land use conversion to establish oil palm plantations and illegal logging become high so that counter measuring to deal with the pressure becomes the urgent issues.

Tropical peatlands accumulate the large amount of carbons and around 70% of tropical peatlands in the world exist in the Southeast Asia. The most of the tropical peatland locates extensively in lowland areas in Indonesia. However, as the consequence of establishing large scale of channels and logging in tropical peatland forests at the end the 20th century, carbon emissions from peatland has increased because of fire outbreaks and decomposition by microbe. In addition to the difficulties of extinguishing fire in peatland, the extension of the fire causes further carbon emissions.

Japan International Cooperation Agency (JICA) has implemented the five years technical cooperation from 2010 until July 2015 “Program of Community Development of Fires Control in Peat Land Area (FCP)” was implemented. The results in the targeted provinces by applying village-based fire prevention activities by village facilitation team (Tim Pendamping Desa: TPD) composed of fire brigade (Manggala Agni:MA) and community groups in Riau and West Kalimantan Provinces showed contribution to the decreased numbers of burning by community residents resulting in the reduction of hotspots. Additionally, JICA implemented scientific research cooperation, so called SATREPS, “the Project for Wild Fire and Carbon Management in Peat Forests in Indonesia” for 4 years and 4 months since December 2009 in collaboration with University of Hokkaido. The project outputs include building fire detection system and carbon evaluation model by using data collected through measurement, remote sensing and simulation models according to each output for developing peat forest management methodology.

In 2015, large scale of forest and peatland fires was broken out due to the influence of El Nino. The adverse impacts include large amount of GHG emission equivalent to the emission in Germany in one year and increased respiratory diseases and cancellation of flights due to haze and diffusion to the neighboring countries of haze which resulted in diplomatic issues. In response to such issues, the Government of Indonesia (GOI) announced to organize Peatland Restoration Agency (BRG) to prevent forest fires and reduce Green House Gases (GHG) at the 21st COP Conference (COP21/UNFCCC). And the BRG was established in January 2016 based on the directions to maintain water table as well as to restore and to utilize effectively more than 200 million ha of degraded peatlands by conducting reforestation and cultivation of economic crops.

Meanwhile in 2015, an application for Japan’s Technical Cooperation “Community Movement Program on Forest and Land Fire Prevention” was submitted to Bappenas. It comprehensively covers from the dissemination of outputs of FCP cooperation including organizing and strengthening institutional arrangement of central and local governments in forest and land fire control.

In January 2016, JICA dispatched a mission on forest and peatland fires in Indonesia. And

then since May 2016 the JICA Data Collection Survey on Forest and Peatland Fire Control and Peatland Restoration (hereafter referred to “the previous survey”) has conducted data collection and analysis on peatland fire control and peatland restoration in the authorities concerned as Ministry of Environment and Forestry (MoEF) and relevant ministries and agencies, provincial/district governments, donors and private sectors etc. JICA HQ dispatched Detailed Planning Survey Team on the requested next technical cooperation “Community Movement Program on Forest and Land Fire Prevention ”in Sep. 2016 to conclude basic agreement on cooperation framework of “Community Movement Program on Forest and Land Fire Prevention”. However, newly needed duty of monitoring peatland is still unclear in role sharing and cooperation institutional arrangement among the relevant ministries and agencies. Such conditions needs to technical assistance to the stakeholders.

In the course of Detailed Planning Survey, the Head of BRG requested for supplemental surveys including profile surveys for peatland restoration and building small scale peatland restoration system for trial in prioritized 4 districts in 3 provinces that is required to respond urgently (hereafter referred to “Preliminary Feasibility Study” or “Urgent Survey”). As a discussion with the MoEF and the relevant authorities, the requested survey is conducted supplementary based on the consent that assistance to efforts for peatland restoration means important issues and future cooperation will be examined.

Table 1.1.1.1. Planned Contents of Supplemental Surveys for Peatland Restoration in the BRG’s Most Prioritized 4 Districts in 3 Provinces

Outline of JICA Mission’s Activity			
No.	Framework	Summary of Proposed Contents	Remarks
1.	Title	Pre-feasibility Study for Peatland Restoration Investment in Four Most Prioritized Areas in Indonesia	
2.	Period	Nov. 2016-Oct. 2017	
3.	Goals	To develop economic development models to contribute climate change mitigation by peatland restoration	
4.	Objective	To develop peatland restoration portfolio options in prioritized 4 districts	
5.	Major components	1. Trial baseline measurement and monitoring of peatland hydrological conditions of the target area 1.1. Piloting for harmonization in national monitoring system 1.2. Building consensus on detail monitoring plan 1.3. Training of Trainers (TOT) for stakeholders on peatland hydrological monitoring 1.4. Installing water logger real time to monitor peatland hydrological	a) Phase 1: 4 loggers in 1.4.in South Sumatera Prov. (MUBA District: 1KHG, OKI District: 2 KHG) b) Phase 2: 10 loggers *Water loggers as survey equipment is temporarily possessed by JICA Indonesia Office and then will be transferred to BRG at the end of survey period.
		2. Profiling surveys of the target area and quick preliminary feasibility study for facilitating peatland restoration by private business investment 2.1.Quick feasibility study on biophysical and economic on peatland restoration to develop peatland restoration portfolio 2.2. Conducting market research and cost benefit analysis on the proposed peatland-friendly species plantation development associated with potential business development 2.3. Identifying the location for implementing peatland restoration portfolio based on quick feasibility study 2.4. Designing and establishing demonstration plot for peat restoration 2.5. Monitoring and evaluation on demonstration plot	Phase 2
6.	Target sites	3. Stakeholders’ coordination meetings to promote private business investment on peatland restoration 3.1. Regular coordination meetings (more than 3 times) 3.2. Support to BRG International Symposium (Dec. 2016) 3.3. . Open Seminar on Investment on Peatland Restoration at Tokyo (Apr. 2017) 3.4. Open WS on Investment on Peatland Restoration at Jakarta (July 2017)	a) Phase 1: 1 st in 3.1 and 3.2. b) Phase 2: Remain
		1. Musi Banyuasin (MUBA) District focusing on 1KHG (KHGS, Air Hitam Laut-S.Buntu Kecil), South Sumatera Prov. 2. Ogan Kemering Ilir (OKI) District focusing on 3KHG(KHGS, Sugihan-S.Lumpur, S. Sibumbang-S. Batok, S.Sugihan-S. Saleh), South Sumatera Prov. 3. Pulang Pisau District focusing on 2KHG (KHG S. Kahayang- S. Sebanggau, S.Kahayang-S. Kapuas/S. Katingan-S. Sebanggau) 4. Kepulauan Meranti District focusing on 1KHG (KHG Pulau Tebing Tinggi)	

Sources: JICA Survey Mission for Data Collection on Forest & Peatland Fire Control and Peatland Restoration (Phase 2)

Sources: Modified according to the progress from the Proposed Work Plan by BRG Letter dated on 28 Oct. 2016¹

As the results of examination above, BRG submitted the written proposal at the additional surveys in Oct. 2016². The proposed contents of the supplemental surveys are as follows. And

¹ BRG (Deputy 4). 2016. BRG-JICA Urgent Cooperation Action Plan (2016-2017): Pre-feasibility Study for Peatland Restoration Investment in Four Most Prioritized Areas in Indonesia TOR

² BRG Letter No. S.167/BRG-KB/10/2016 Subject: Proposal of Urgent Cooperation Action 2016-2017 between BRG-JICA (28 Oct. 2016)

then in Nov. 2016 BRG and JICA concluded the Minutes of Meeting on Basic Information Surveys on Peatland Restoration in Indonesia³. In the previous survey, the first phase of study was conducted by supporting parts of trial peatland monitoring in Indonesia.

Notes

- 1) Phasing (Phase 1: since Nov. 2016; Phase 2: since Feb. 2017) was proposed by JICA HQ's internal consideration after signing the Minutes of Meetings.
- 2) As implicated in the BRG's written proposal, there is the information on the needs of the equipment procurement: the Presidential Office (KSP) who will receive the report from BRG is implicated to direct "real-time monitoring" and then the Head of BRG is implicated to designate "SESAME brand" according to the experiences in peatland environment. And also the needs to build real-time monitoring/ early warning system at least at the target restoration sites (e.g. the damaged sites by the large scale of fires in 2015) by beginning of the fire danger season due to the predication of the drier condition derived from ENSO again in 2017.
- 3) The targeted sites for the phase 1 was defined based on the BRG's proposal in Nov. 2016 that South Sumatra is more urgent than Central Kalimantan and Riau Provinces⁴. One of the background of the proposal is related to BPPT's donation of 8 equipment at the some peatland monitoring prioritized sites in Central Kalimantan and Riau Provinces.

1.1.2 Significance of Survey

(1) Preparation to facilitate private investment in peatland restoration

The profile survey aim at contributing to develop new business model that can assist peatland restoration while the support to stakeholders coordination meetings aim at contributing to prepare interment environment to new business models.

More than half of the BRG targeted peatland restoration area belongs to private concession. And the government cannot input state budget in such private managed concession areas. Thus BRG also plans to facilitate investment strategically (See table below). According to execution of serial MoEF's ministerial regulation enacted in Feb.2017 affected the existing concession located in Protected Zone should change business model. There are risk to result in actual open access if private corporate would give back the concession due to deterioration in corporate management to respond the needs of change of business models.

In other BRG targeted peatland restoration area outside of private concession area, peatland restoration will be conducted by community like in social forestry. Successful community-based restoration also requires to collaborate private sectors in marketing and processing. Thus developing new business model contributing maintaining higher water table in peatland by land-based business with the alternative crops as Sago and its downstream industries as well as its investment facilitation scheme to such business are urgently requested.

Table 1.1.2.1. Outline of BRG's Needs on Investment Facilitation
(Collected as of End of Sep. 2017)

Year	Policy	Summary/Feature
2016	2016-2020 BRG Strategic Plan ⁵	● Where no concession in production forests, protection forests in State Forests and in APL

³ Minutes of Meetings between Peatland Restoration Agency of the Government of Republic of Indonesia and Japan International Cooperation Agency for Basic Information Survey on Peatland Restoration in Indonesia (11 Nov. 2016)

⁴ BRG Letter No. S.011/BRG-4/11/2016 Subject: Proposed Priority Location for Peatland Monitoring (30 Nov. 2016)

⁵ Peraturan Kepala Badan Restorasi Gambut Republik Indonesia Nomor P.5/KB BRG-SB/11/2016 tentang Rencana Strategis Badan Restorasi Gambut 2016-2020(30 November 2016)

Year	Policy	Summary/Feature
		<ul style="list-style-type: none"> Where become protection area from production area. It requires to develop legal system to make possible management by community or for investment scheme for Ecosystem Restoration Project Assumed implementation by investors. Possibly implementation in cooperation with NGOs and community

Sources: JICA Survey Mission for Data Collection on Forest & Peatland Fire Control and Peatland Restoration in Indonesia (Phase 2) (as of Sep. 2017)

However as shown in table below, donors tends to prefer to assist to the associated issues of peatland restoration and fire prevention area. It is inferred that the direct contribution to peatland restoration at BRG's peatland restoration area tends to little especially in peatland restoration by private sector. It will be required to develop peatland restoration by private sector by private investment from private funds.

Table 1.1.2.2. Outline of Potential Donors (Collected as of End of Jul. 2017)

Source	Potential Amount (US\$)	Area of Interest/ Project Type
Norway	88,000,000	<ul style="list-style-type: none"> Protection Mapping Economic analysis
USA	35,225,000	<ul style="list-style-type: none"> Mapping Governance Prosperity
UK	13,000,000	<ul style="list-style-type: none"> Forest fires Climate change
Germany	10,285,279	<ul style="list-style-type: none"> Strategic plan Capacity building
UN	7,500,000	<ul style="list-style-type: none"> Palm oil Fire management
EU	6,000,000	<ul style="list-style-type: none"> Hazes mitigation
Australia	3,025,220	<ul style="list-style-type: none"> Forest fire Climate change
Denmark-Norway	190,000	<ul style="list-style-type: none"> Joint project Technical assistance
Total	163,225,499	

Sources: Prepared using Presentation by Deputy 1, BRG at Development Partner Coordination Meeting held by BRG in Apr. 2017⁶

(2) Preparation to develop peatland water table monitoring system

This survey will contribute also to prepare development of appropriate peatland water table monitoring system which will be important to evaluation peatland restoration quantitatively by do trial installation of real-time water table measurement equipment.

1.2 Objectives and Scope of Survey

1.2.1 Objectives of Survey

Taking into the results of the previous survey since May 2016, the content of future cooperation will be proposed by collecting and analyzing data on present conditions, issues and needs relating peatland restoration in Indonesia. Concrete objectives are as follows;

⁶ BRG. 2017. Struktur Fasilitas Investasi Restorasi Gambut. Presentasi Fasilitator Diskusi Kelompok di Diskusi Terfokus Merancang Skema Fasilitas dan Insentif Investasi Swasta dalam Restorasi Gambut (23 Mei 2017). (FGD (Deputy Bidang Perencanaan dan Kerjasama))

Table 1.2.1.1. Objectives of JICA Survey for Data Collection on Forest & Peatland Fire Control and Peatland Restoration in Indonesia (Phase 2)

No.	Objectives
1	Developing institutional arrangement for management of peatland water table monitoring equipment: To develop institutional arrangement for management of peatland water table monitoring equipment by installing the equipment and conducting trial monitoring at 14 sites in targeted 4 districts in 3 provinces
2.	Conducting profile surveys on the targeted areas: To propose suitable sites and business models by participation of private sectors in the targeted 4 districts in 3 provinces
3.	Proposing cooperation program: To examine future-potential cooperation by JICA

Sources: JICA Survey Mission for Data Collection on Forest & Peatland Fire Control and Peatland Restoration in Indonesia (Phase 2)

1.2.2 Scope of Survey

The surveys will focus on the most prioritized 4 districts in 3 provinces (Kepulauan Meranti District in Riau Province, Ogan Komering Ilir (OKI) and Musi Banyuasin (MUBA) Districts in South Sumatra Province and Pulang Pisau District in Central Kalimantan Province) among the target sites of BRG according to Presidential Regulation No. 1, 2016⁷.

The targeted organization to be surveyed will include BRG, the authorities concerned in the ministries and agencies such as Directorate of Peatland Damage Control (PKG) in Ministry of Environment and Forestry (MoEF) and provincial and district governments focusing on the prioritized 3 provinces relating peatland restoration as well as private sectors and international cooperation donors.

Table 1.2.2.1. Assignments in Indonesia of Data Collection Survey on Forest & Peatland Fire Control and Peatland Restoration in Indonesia (Phase 2)

Steps	Assignment	Main assignments in Indonesia	Remarks
Preparation	Preparatory works in Japan		
1 st Step	From the middle of Feb. till the beginning of Apr. 2017	<ul style="list-style-type: none"> a) Prepare Inception Report(Ic/R) b) Support to pre-installation of water table monitoring equipment (South Sumatera, Riau and Central Kalimantan Provinces) c) Hold training on water table monitoring to local stakeholders in South Sumatera Province (2/2) d) Hold stakeholders coordination meetings for facilitation to peatland restoration investment (1st overall, only economic authorities) e) Coordinate to hold Tokyo Seminar for Facilitation to Peatland Restoration Investment 	Beginning of Apr. 2017: Progress reporting at JICA HQ
2 nd Step	From the middle of Apr. till the end of May 2017	<ul style="list-style-type: none"> a) Start profile surveys b) Support to pre-installation of water table monitoring 	a) End of May 2017: Progress reporting at JICA HQ and JICA Indonesia Office

⁷ Peraturan Presiden Republik Indonesia Nomor 1 Tahun 2016 tentang Badan Restorasi Gambut (6 Januari 2016)

Steps	Assignment	Main assignments in Indonesia	Remarks
		equipment (South Sumatera, Riau and Central Kalimantan Provinces) c) Hold stakeholders coordination meetings for facilitation to peatland restoration investment (2 nd overall) d) Coordinate to hold Tokyo Seminar for Facilitation to Peatland Restoration Investment	b) 1 st Revision to supplement equipment installation cost (Amendment of contract dated 1 Jun. 2017)
3 rd Step	From the beginning of Jun. till end of Jul. 2017	a) Hold village level socialization/training on water table monitoring equipment b) Install water table monitoring equipment (South Sumatera, Riau and Central Kalimantan Provinces) c) Support to formulating monitoring plan with using water table monitoring equipment d) Hold stakeholders coordination meetings for facilitation to peatland restoration investment (Incentive planning WG)	a) 2 nd Revision to supplement Jakarta seminar cost, to extend contract period and to increase assignment (Amendment of contract dated 14 Jul. 2017) b) End of Jun. 2017: Progress reporting at JICA HQ c) Mid Jul. 2017: Progress reporting at JICA Indonesia Office
Sorting information	Works in Japan	Prepare Draft Final Report(Df/R)	End of Aug. 2017: Submission of Df/R at JICA HQ
4 th Step	From the mid Sep. till beginning of Oct. 2017	a) Report and discuss Df/R b) Hold stakeholders coordination meetings for facilitation to peatland restoration investment (3 rd overall etc.) c) Prepare Final Report (F/R)	
Closing	Works in Japan	Prepare Final Report(F/R)	Mid Oct. 2017: Submission of F/R at JICA HQ

Sources: JICA Survey Mission for Data Collection on Forest & Peatland Fire Control and Peatland Restoration in Indonesia (Phase 2)

1.3 Framework of Surveys

1.3.1 Counterpart Agencies of Survey

BRG is the counterpart agency of survey in central level. Activities in the Targeted Area was conducted in cooperation with the Provincial Peatland Restoration Team (TRGD) in addition to BRG.

Those agencies cooperate to activities in central and local level by coordinating with the relevant authorities and facilitating the survey sites and survey mission.

1.3.2 Composition of JICA Survey Mission

The survey team is composed of a total of 3 international experts as show below.

Table 1.3.2.1 Outline of JICA Survey Mission for Data Collection on Forest & Peatland Fire Control and Peatland Restoration in Indonesia (Phase 2)

Responsibility	Name	Affiliation	Assignment in Indonesia
Team Leader / Peatland Restoration	KUNO Hiromitsu	Japan Forest Technology Association (JAFTA)	a) 22 Feb.-6 Apr.2017 b) 12 Apr.-31 May 2017 c) 1-23 Jun. 2017 d) 2-31 Jul. 2017 e) 15-24 Sep.; 29 Sep.-13 Oct. 2017
Private Sector Investment Facilitation	SAKURAI Akihito	Nippon Koei Co. Ltd.	a) 12-30 Mar. 2017 b) 16 Apr.-13 May 2017 c) 11-29 Jul. 2017
Coordinator/ Assistant for private sector investment facilitation (costed by JAFTA)	AIKAWA Shinichi	Japan Forest Technology Association (JAFTA)	20-29 Jul. 2017

Sources: JICA Survey Mission for Data Collection on Forest & Peatland Fire Control and Peatland Restoration in Indonesia, 2017(Phase 2)

1.3.3 Institutional Arrangement for Survey

Profile surveys (including conducting village level socialization of peatland water table monitoring equipment) on the targeted areas, the main component of this surveys are requested to conduct through supporting research and development by Deputy 4 of BRG. The local entrusted consulting service contract was conclude dated 2 May 2017 by building the institutional arrangement of joint study as follow.

This arrangement was taking into consideration the proposal from Deputy 4 of BRG that the institutional arrangement will be built by organizing a consortium team for joint study (Consortium; contract party is UNSRI) of 3 universities and 1 research center that have MOU with BRG, Sriwijaya University (UNSRI⁸) in South Sumatera Province, Riau University (UNRI) in Riau Province, Palangkaraya University (UPR) and branch research and development center in South Sumatera Province of MoEF's Research and Development Agency.

⁸ The Faculty of Agriculture of UNSRI has established "Lowland-Wetland & Coastal Area Data Information Center" in the graduate program and implementing researches on peatland including monitoring and restoration. The center has the experiences to create good practices in district level increase of agricultural productivity by optimizing peatland hydrological management in his action research in Banyuasin District in the province. Based on the above experiences, the coordinator of center serves as an advisor to the Directorate General of Regional Development in MoHA and District Governor in other provinces in addition to the other districts in the province.

Institutional Arrangement for Profile Surveys in Target Area: Consortium Team for Joint Study

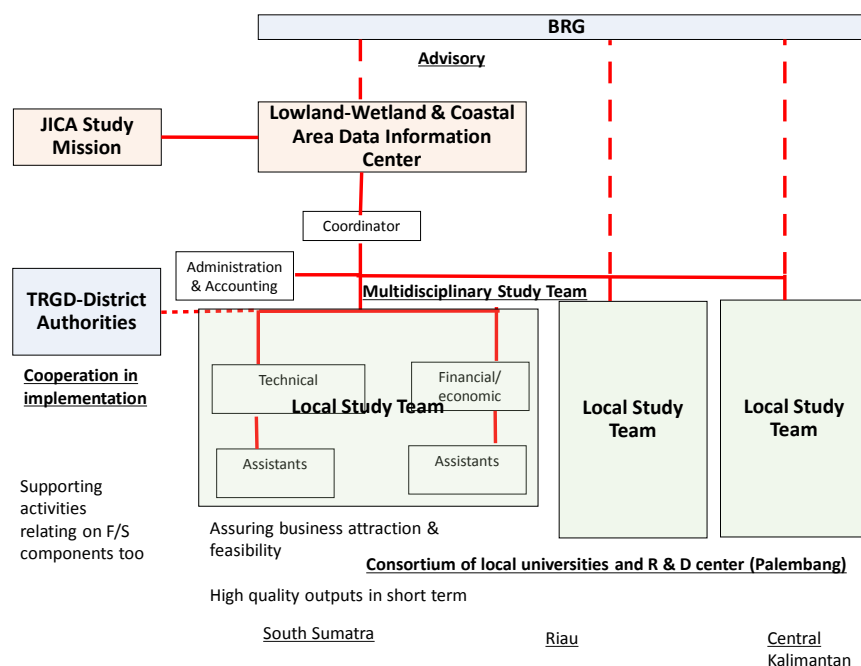


Figure 1.3.3.1. Consortium Team for Joint Study in Profile Surveys in Targeted Area

Sources: JICA Survey Mission for Data Collection on Forest & Peatland Fire Control and Peatland Restoration in Indonesia. 2017(Phase 2)

Table 1.3.3.1. Outline of Discussion Activities in Joint Study under Data Collection Survey on Forest & Peatland Fire Control and Peatland Restoration in Indonesia (Phase 2)

Date and time (Place)	Held by	Meetings and Discussions	Remarks
23 Mar. 2017 (Meeting Room, UNSRI)	BRG	Meeting to examine institutional arrangement for joint study implementation by local universities and research center	To organize consortium
4 May 2017 (Meeting Room, BRG Imam Bojol)	Consortium	Kickoff meeting/1 st of BRG-Consortium Regular Coordination Meeting	Chaired by BRG Deputy 4
12 Jun. 2017 (Seminar Room, UNRI Hospital)	UNRI	Opinion Exchange by UNRI-Researchers in relation to Kyoto University and APEX	To seek collaboration in Targeted Area
14 Jun. 2017 (Hotel Morrissy)	Consortium	2 nd BRG-Consortium Regular Coordination Meeting	Chaired by BRG Deputy 1 and 4
14 Jul. 2017 (Governor's Office in Riau Prov.)	UNRI	Opinion Exchange by UNRI-Researcher of Kyoto University and local NGO	To seek collaboration in Targeted Area
21-23 and 25-26 Jul. 2017 (Hotel Grand Zuri Palembang, Hotel Oria Jakarta)	Consortium	Co-works by consortium	To examine the important matters in the contents
4 Oct. 2017 (Meeting Room, BRG Imam Bojol)	BRG	Final meeting of BRG-Consortium Regular Coordination Meeting	Chaired by KaPokja BRG Deputy 4

Sources: JICA Survey Mission for Data Collection on Forest & Peatland Fire Control and Peatland Restoration in Indonesia. 2017(Phase 2)

Furthermore, 1 Indonesian administrative assistant who also assists to the member for private investment facilitation as well as 1 Indonesian expert who is in charge of private sector investment facilitation are employed for smooth data collection and analysis as assistant for the Japanese expert.

1.3.4 Survey Activities

As shown in the table below based on the TOR from JICA, mainly survey activities (1a in table below) and technical cooperation activities (1b)-e) in table below) were conducted. The activities other than for survey (including meetings and seminars) is shown in each chapter.⁹

Table 1.3.4.1. Outline of Activities in Data Collection Survey on Forest & Peatland Fire Control and Peatland Restoration in Indonesia (Phase 2)

No.	Survey Activities	Survey contents
1.	Trial peatland water table monitoring	
a)	Collect information on circumstances on peatland water table monitoring duty	To update the information on enacted relevant laws and regulation and circumstances on inter-agency coordination
b)	Support to formulate detailed monitoring plan	To support to build institutional arrangement for stakeholders collaboration by proposing technical guidance, concrete methods and role-sharing and collaboration system in relation to proposed management system of water table monitoring equipment
c)	Implement to training to stakeholders	To implement training on monitoring methods to target groups in the target 4 districts
d)	Support to collect information and reconfirm landowners in relation to selection sites for installing peatland water table monitoring equipment	To facilitate deciding installing sites by BRG and local stakeholders by supporting collecting information on landowners on installing sites
e)	Install peatland water table monitoring equipment, operate and management of installed peatland water table monitoring	<ul style="list-style-type: none"> To install "field data logging and transmitting machine "SESAME" that can transmit the monitored data via mobile telephone signal based on the request from BRG. In Dec. 2016, preliminary procurement for 4 SESAME was conducted by JICA Indonesia Office. The

⁹ The following meetings and seminars were conducted in the Phase 1.

Data(Place)	Held by	Meeting & seminars	Remarks
15-16 Dec. 2016 (Hotel Borobudur)	BRG- KLHK	International Symposium "Towards National Scale Integrated Peatland Restoration Action"	In cooperation with UNDP etc.
3 Feb. 2017	BRG	1 st FGD for Detailed Planning for Harmonized National Peatland Hydrological Monitoring	
7 Feb. 2017	BRG	1 st Stakeholder Meeting for Investment Engagement in Peatland Restoration	
9-10 Feb. 2017	BRG- TRGD of South Sumatra Province	1 st ToT Training for Provincial Peatland Hydrological Monitoring in South Sumatra	

Holding the international symposium organized by BRG and MoEF held on 15-16 Dec. 2016 was assisted by coordinating and collaborating with the secretariat established by BRG-UNDP in examining program and speakers as well as logistic matters for holding seminar.

No.	Survey Activities	Survey contents
	equipment	additional procurement of the remaining 10 SESAME to install and operate for 3 districts of targeted 4 districts in 3 provinces as well to support to build management system of the installed SESAME.
2.	Profile surveys in Targeted Area	
a)	To collect information on general conditions of Targeted Area	To collect and sort basic data
b)	To research and analyze commodity adaptable to peatland environment	To analyze market of the selected commodity that can be feasible as business and adaptable to peatland environment post restoration
c)	To prepare maps and/or profile on potential sites for private investment	To propose the suitable sites for investment participated by private sector by preparing list or maps and profile (current land use, soil and potential crops etc.) on the candidate sites for new issuing concessions
d)	To collect information for developing demonstration plot	To propose business model for peatland restoration participated by private sector by collecting information to specify development of demonstration plots
3.	Support to facilitation of investment to peatland restoration	
a)	To support regular stakeholders coordination meetings	To support to hold regular meeting with the relevant ministries and agencies concerned in smooth survey implementation and private investment for future
b)	To support to hold peatland restoration investment seminars (Jakarta and Tokyo)	To collect and sort information and seminar outputs in addition to assisting logistic matters, by supporting examining program and speakers as well as logistic matters for holding 2 times of peatland restoration investment seminars in Tokyo and Jakarta planned by BRG.
c)	To support to propose business model for peatland restoration participated by private sectors and design private sector investment facilitation system	<ul style="list-style-type: none"> ● To collect information for finding concrete potential investment plan applicable green bonds etc., and on existing finance and tax break system ● To support to examine design of incentive system (tax break etc.) to facilitate investment
4.	To propose cooperation programs	
a)	To propose cooperation programs	To propose mid-term cooperation by sorting cooperation potential expected for peatland restoration

Sources: JICA Survey Mission for Data Collection on Forest & Peatland Fire Control and Peatland Restoration in Indonesia. 2017(Phase 2)

In survey activities above, the collaborative works as meetings etc. to focus on facilitating brainstorming among stakeholders taking into consideration technical cooperation attitude¹⁰ not only to enhance stakeholders' ownership¹¹ to newly proposing cooperation contents.

¹⁰ As the basic policy in Development Cooperation Charter of Japan's ODA (Nov. 2015), survey activities were implemented taking into consideration for self-reliant development through assistance for self-help efforts as well as dialogue and collaboration based on Japan's experience and expertise

Thus this technical cooperation in this survey does not aim mainly at knowledge or technology transfer from Japan like the past technical cooperation. This technical cooperation in this survey focuses on developing issue solution models as the results of broad aspect of capacity development through collaboration between the stakeholders of Japan and Indonesia in actual actions as action research.

¹¹ In the past Forestry Ministerial Degree (S.328/Menhut.II/2010)"on Management of Foreign Assistance" was issued. In Article 3, Clause b shows most cooperation frame proposal by bilateral, multilateral and NPO (NGO and private sector) tend to become partner driver especially issues on climate change.

1.3.5 Structure of Report

As the table below, the report comprise 5 chapters of body and annex part.

Table 1.3.5.1. Structure of Final Report on Data Collection Survey on Forest & Peatland Fire Control and Peatland Restoration in Indonesia (Phase 2)

Chapter	Major contents	Remarks
Chapter 1	Introduction and background	Including the activities for consortium
Chapter 2	Implementation of trial peatland monitoring in the targeted areas	a. Including the change of recent trend on laws and regulation in relation to peatland restoration b. Including the activities for trials including meetings
Chapter 3	Profile surveys in the targeted areas	
Chapter 4	Support to stakeholders coordination meetings to facilitate private investment to peatland restoration	a. Including the activities for trials including meetings b. Including the most recent information on international collaboration
Chapter 5	Proposed cooperation program	a. Including reviews on peatland fires and peatland damage b. Including image of ideas for the potential technical cooperation and financial cooperation for forest and peatland fire control
Annex	a) Outline of Missions b) Translation of Recent Governmental Regulations concerned with Peatland Restoration c) Organization Structures of Relevant Organization d) Supporting Information on Profile Surveys e) Summary of Green Finance f) List of Collected References g) List of Interviewees	

Sources: JICA Survey Mission for Data Collection on Forest & Peatland Fire Control and Peatland Restoration in Indonesia (Phase 2)

This survey was conducted by consultant-based mission so this report does not express any views and way of thinking of JICA and JICA Experts as well BRG and other authorities concerned.

CHAPTER 2 IMPLEMENTATION OF TRIAL PEATLAND MONITORING IN TARGETED AREAS

2.1 Current Information Collection on Peatland Monitoring Duty

2.1.1 Regulatory Framework in Relation to Peatland Water Table Monitoring

The following table shows the situation of enacting relevant laws and regulations in relation to peatland water table monitoring.

Five ministerial regulations of MoEF in relation to peatland management were stipulated as MoEF's Ministerial Regulation No. 15 2017 "on Water Table Monitoring Method at the Peatland Ecosystem Control Points".

Table 2.1.1.1 Outline of Regulatory Framework Concerned with Peatland Water Table Monitoring

Year	Law/Regulation	Summary/Feature	Remarks
2009	Law on Environmental Protection and Management ¹²	<ul style="list-style-type: none"> To stipulate to cover peatland in ecosystem damage quality criteria (Article 21) 	
2014	Governmental Regulation on Peatland Protection and Management ¹³	<ul style="list-style-type: none"> To stipulate peatland ecosystem damage quality criteria (Article 23) <ol style="list-style-type: none"> Protection Function Zone <ol style="list-style-type: none"> With drainage Exposed pyrite/ quart Decreased area/volume of land cover Cultivation Function Zone <ol style="list-style-type: none"> Deeper 0.4m from peatland surface Exposed pyrite/ quart 	
2016	Governmental Regulation on Revision on Peatland Protection and Management ¹⁴		
2017	MoEF's Ministerial Regulation on Water Table Monitoring Method at the Peatland Ecosystem Control Points ¹⁵	<ul style="list-style-type: none"> Monitoring points are called as "Control Points" (Article 2). There are 2 control points as follows. <ol style="list-style-type: none"> Grid sampling points in mapping Supervising points in project/activity Numbers of control points: at least 15% of total numbers of main crop/production blocks (Article 2) Monitoring implementers: Party in charge of project/activity in private sector managed area; KPH or community groups other than private sector managed area (Article 3) One control point is regarded as the samples of 50m in radius at the block center. Monitoring matters at control points (Article 5) 	

¹² Undang-undang No.32 Tahun 2009 tentang Perlindungan dan Pengelolaan Lingkungan Hidup (3 Oktober 2009)

¹³ Peraturan Pemerintah Republik Indonesia Nomor 71 Tahun 2014 tentang Perlindungan dan Pengelolaan Ekosistem Gambut (15 September 2014)

¹⁴ Peraturan Pemerintah Republik Indonesia Nomor 57 Tahun 2016 tentang Perubahan atas Peraturan Pemerintah Nomor 71 Tahun 2014 tentang Perlindungan dan Pengelolaan Ekosistem Gambut (6 Desember 2016)

¹⁵ Peraturan Menteri Lingkungan Hidup dan Kehutanan Republik Indonesia Nomor P.15/Menlhk/Setjen/Kum.1/2/2017 tentang Tata Cara Pengukuran Muka Air Tanah di Titik Penaatan Ekosistem Gambut (27 Februari 2017)

Year	Law/Regulation	Summary/Feature	Remarks
		<ul style="list-style-type: none"> a) Location, Coordinate, Elevation b) Water table c) Precipitation d) Date and time of measurement e) Subsidence speed ● Measurement frequency at control point (Article 6) <ul style="list-style-type: none"> a) Manual measurement: once/ 2 weeks b) Automatic measurement: once/ day (at least one point in water management zone) ● Precipitation: at least one point/ 20 control points. At least once/day (Article 7) ● Reporting of data to PKG: once/ 3 months. With other information on land cover, change of drainage (Article 8) ● Cost is boned by Party in charge of business/activity in the private sector managed area; APBN, APBD in other area but executor of budget is KPH or community group (Article 12) 	

Sources: JICA Survey Mission for Data Collection on Forest & Peatland Fire Control and Peatland Restoration in Indonesia (Phase 2) (as of Sep. 2017)

2.1.2 Circumstances of Coordination in Relation to Peatland Water Table Monitoring

(1) Outline of coordination circumstances

The outline of coordination circumstances on peatland water table monitoring is shown in table below.

Table 2.1.2.1 Outline of Recent Coordination Circumstances on Peatland Water Table Monitoring (Early 2017)

Date	Coordination circumstance	Summary/ Feature	Remarks
20-21 Mar. 2017	Socialization of MoEF's Ministerial Regulations in central level	Inviting other relevant ministries and agencies including BRG	
24 Mar. 2017	Informal meeting a BRG	Visit by Director of PKG	
5 & 13 Apr. 2017	BRG "Preparatory meeting for survey to plan water control points"	Involving PKG in BRG's activity	
5 May 2017	KLHK "Socialization on execution of policy of peatland ecosystem protection and management to oil palm estate business in peatland"	Involving Head of BRG and DG of Estate Crop in MoA in PKG activity	

Sources: JICA Survey Mission for Data Collection on Forest & Peatland Fire Control and Peatland Restoration in Indonesia (Phase 2) (as of Jul. 2017)

(2) Coordination on information system development on peatland water table monitoring

Various information systems are being developed by mainly PKG and BRG in relation to water table monitoring as shown in the table below. As shown in the figure below, internal BRG coordination started to establish Operation Room mainly by Deputy1 Planning and Cooperation Field (D1) while it is inferred that coordination with the national database on peatland water table information in PKG who is the responsible agency on peatland water table monitoring didn't started yet.

Table 2.1.2.2. Outline of Recent Circumstances on Information System Development on Peatland Water Table Monitoring (Early 2017)

Authority	Information system	Summary/ Feature	Remarks
PKG	Reporting Service Server Water Table Monitoring	<ul style="list-style-type: none"> ● GIS Server ● Database server & application ● Web server ● Reporting by SMS ,Android, Excel/Email and Logger/Real-time 	
BRG (Deputy 1)	Peat Restoration Information Management System	<ul style="list-style-type: none"> ● Data collection and management: Data input, Validator and verifiers, Executive report ● Spatial analysis: Produced monitoring maps <ol style="list-style-type: none"> a) Hydrological maps b) Restoration actions planning maps c) Restoration performance/progress monitoring maps d) Land cover change maps ● User interface: Internal use & published by web based GIS 	For Operation Room
BRG (Deputy 4)-BPPT	Integrated real-time water table monitoring information	<ul style="list-style-type: none"> ● Integration system for monitoring all water table data of SESAME data and MORPAPALAGA data ● Modeling of water table prediction with SAR satellite data 	

Sources: JICA Survey Mission for Data Collection on Forest & Peatland Fire Control and Peatland Restoration in Indonesia (Phase 2) (as of Sep. 2017)

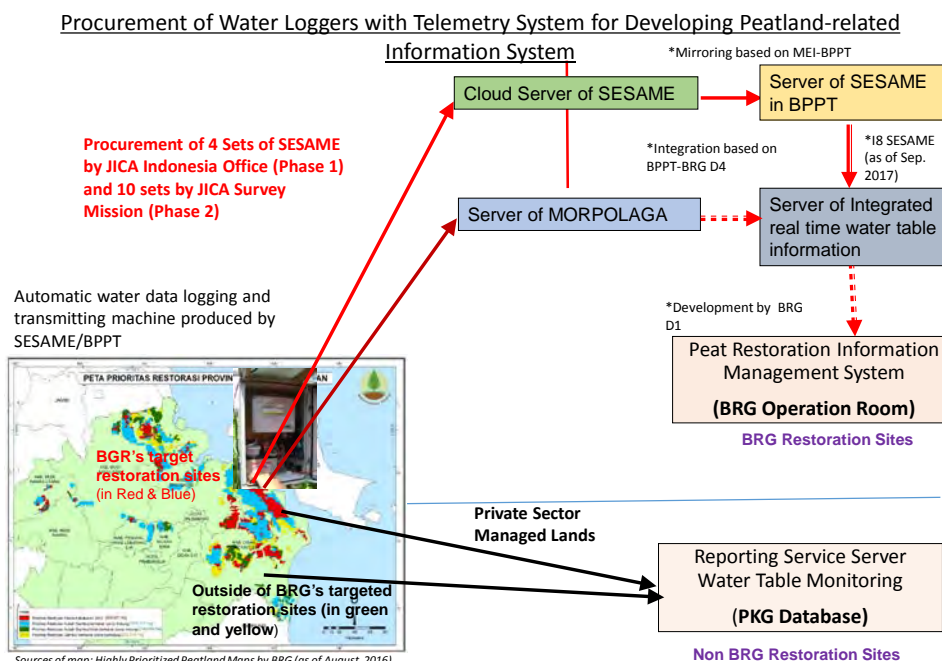


Figure 2.1.2.1. Outline of Development of Information System on Peatland Water Table Monitoring

Sources: JICA Survey Mission for Data Collection on Forest & Peatland Fire Control and Peatland Restoration in Indonesia (Phase 2)

2.2 Support to Formulation of Detailed Monitoring Plan

2.2.1 Outline of Telemetry-based Peatland Water Table Monitoring Equipment

In Indonesia there are two products for water table monitoring equipment which has experiences of trial water table monitoring in peatland are. One is “MORPALAGA” made by BPPT (see Figure 2.2.1.1. below) and another is “Automatic data logging and transmitting machine SESAME II-2d” made by “Midori Engineering Laboratory Co., Ltd.” (See Figure 2.2.1.2). Here examines the outline of the equipment based on SESAME II-2d (brand mainly for water table sensor) designated by JICA.

This equipment applies telemetry system to transmit data by utilizing general electromagnetic wave for telephone line (mobile phone) from data logger that stores data from the sensor procured temporary.



Telemetry-based Peatland Water Table Monitoring Equipment made by BPPT MORPOLAGA (Sanggar Seni, Public Accommodation of Sub-district Office in Des. S. Tohor, Sub-district Tebing Tinggi Timur, Kepulauan Meranti District, Riau Province ; 17 Jul. 2017)

Figure 2.2.1.1. Overview of Telemetry-based Peatland Water Table Monitoring Equipment MORPALAGA

Sources: JICA Survey Mission for Data Collection on Forest & Peatland Fire Control and Peatland Restoration in Indonesia (Phase 2)

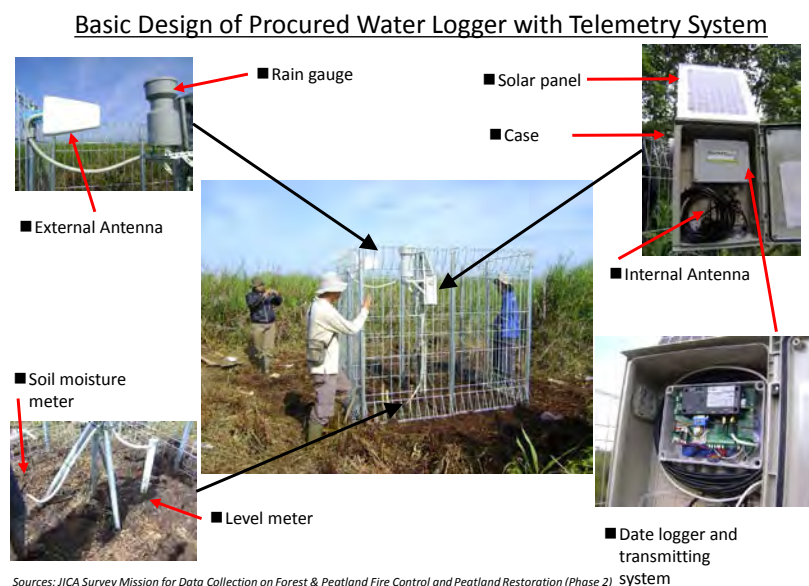


Figure 2.2.1.2 Overview of Telemetry-based Peatland Water Table Monitoring Equipment SESAME II-2d

Sources: JICA Survey Mission for Data Collection on Forest & Peatland Fire Control and Peatland Restoration in Indonesia (Phase 2)

Table 2.2.1.1 Composition of Telemetry-based Peatland Water Table Monitoring Equipment

Basic Component of Procured Water Logger with Telemetry System				
No	Goods	Part Code	Quantity (per set)	Specification
1	Automatic data logging and transmitting machine	SESAME II -02d	1set	With ■ Circuit board (Standard SIM: M to M) ■ Communication module ■ Internal antenna
2	Level meter (5m)	M86H-B type	1 piece	■ Made in Switzerland ■ Pressure type ■ Adjusted ■ 10m cable
3	Rain gauge	OW-34-BP	1 piece	■ Made in Japan ■ Assembled
4	Soil moisture meter	SM150	1 piece	■ Made in UK ■ Assembled ■ 10cm depth based on BRG's instruction
5	Solar panel	10W	2 panels	■ Assembled ■ 1 panel for spare
6	Case		1 case	
7	Others			■ 1 bind of manual: II-2d and web site ■ CD program ■ Key for case ■ External antenna (optional)

Sources: JICA Survey Mission for Data Collection on Forest & Peatland Fire Control and Peatland Restoration (Phase 2)

Sources: JICA Survey Mission for Data Collection on Forest & Peatland Fire Control and Peatland Restoration in Indonesia (Phase 2)

The important difference with Telemetry-based Peatland Water Table Monitoring MORPALAGA is in level water sensor; MORPALAGA is ultrasonic type while pressure type in SESAME.

Basic Design of Web-based Field Data Manager (BRG Specific web application)



Figure 2.2.1.3 Overview of Web Site on Peatland Data of SESAME Specific for BRG

Sources: JICA Survey Mission for Data Collection on Forest & Peatland Fire Control and Peatland Restoration in Indonesia (Phase 2)(as of 4 Oct. 2017)

2.2.2 Support to Building Institutional Arrangement for Management of Telemetry-based Water Table Monitoring Equipment

- (1) Facilitation to build insitutional arrangement for management of pealtand water table monitoring equipment

BRG tends to discuss technical aspects of monitoring and to refrain from discussion on social preparation and security matters of monitoring. Thus through facilitation of the following phased discussion, building institutional arrangement for management of peatland water table monitoring equipment is supported. In the Targeted Area, coordination with TRGD and the district authorities is also supported.

Table 2.2.2.1 Outline of Meeting & Discussion Activities on Trial Peatland Water Table Monitoring

Date & time (Place)	Held by	Meetings & discussions	Remarks
Phase 1			
3 Feb. 2017 (BRG Teuku Umar Office)	BRG	Coordination meeting on developing peatland monitoring system	Participated by IJREDD+
Phase 2			
31 Mar. 2017 (BRG Teuku Umar Office)	BRG	Technical discussion on developing peatland water table monitoring system	<ul style="list-style-type: none"> ● Budget from IJREDD+ ● Participated by Japan's Academia (Participate by Mr. Osaki)
27 Apr. 2017 (BRG Imam Bonjol Office)	BRG	Technical discussion on preparation of TOT on Producing Telemetry-based peatland water table monitoring equipment	Mainly BPPT
7 Jul.2017 (Hotel Oria)	BRG	Technical discussion on preparation on management of telemetry-based peatland water table monitoring equipment	Including the candidate actual field managers of equipment
Planned			
Sep. 2017 (planning)	BRG	Technical discussion on preparation for facilitating response post telemetry-based peatland water table monitoring	<ul style="list-style-type: none"> ● Including the authorities concerned with forest & land fire control, regional & village administration ● Integrate holding another meeting planned in Table2.2.3.1

Sources: JICA Survey Mission for Data Collection on Forest & Peatland Fire Control and Peatland Restoration in Indonesia (Phase 2)



Technical discussion on preparation of TOT on Producing Telemetry-based peatland water table monitoring equipment (BRG Imam Bonjol Office, Jakarta; 27 Apr. 2017)



Technical discussion on preparation on management of telemetry-based peatland water table monitoring equipment (Hotel Oria, Jakarta; 7 Jul. 2017)

Figure 2.2.2.1 Overview of Meeting & Discussion Activities on Trial Peatland Water Table Monitoring

Sources: JICA Survey Mission for Data Collection on Forest & Peatland Fire Control and Peatland Restoration in Indonesia (Phase 2)

The early discussion focused on water table monitoring aiming at early warning to fire outbreaks by developing Fire Danger Rating System (FDRS). In short-term, developing monitoring system using real-time system water table monitoring equipment is directed while developing monitoring system using satellite image finally. But recently it seems to change to emphasize the main purpose to verify and evaluate peatland restoration¹⁶ from the main purpose for early warning and fire prevention in establishing institutional arrangement for peatland water table monitoring due to take into consideration sharing the function and duty of MoEF.

As the result of the serial discussions, JICA should hand over the ownership of equipment just to BRG not to actual field manager-functioning office. During existence of BRG, BRG should take responsibility for maintenance and management of peatland water table monitoring equipment handed over (budget too secured by BRG). The background of impossibility of handover to actual field manager is because the implementers of peatland management (including water table monitoring) outside of the private sector managed sites are “Forest Management Unit/KPH” and “Community Groups” according to the MoEF’s Ministerial Regulation (No. 15/2017 etc.) stipulated in 2017. The source of budget should be prepared by central and local government (environmental duty is the compulsory duty in local autonomy). Actual operation in local administration has not yet realized outside of private sector managed sites¹⁷.

¹⁶ There is information KSP requests the “actual peatland area restored” and another haze and fire prevention indicator as “predicted reduction of GHG emission from fire”.

¹⁷ The candidate actual field manager of peatland water table monitoring equipment tends to be passive to be handed over due to the following circumstances.

- a) Most local government does not formulate peatland ecosystem protection and management plan per KHG as the basis of peatland management.
- b) There is little possibility to secure the budget with confidence by the authorities concerned with KPH and local government in the short term because they don’t have much experiences for budgeting on peatland management.
- c) There doesn’t establish administrative procedure to hand over the asset from BRG to MoEF in central level and to local governments.

(2) Examination of system to early warning and response at peatland drying time

Another technical meeting will be planned to hold by October 2017 to examine response methods of prevention of peatland damage, early warning to fire outbreaks and fire prevention at the lower water level according to the monitoring results using peatland water table equipment. This is also to response the suggestion from Director of PKG that examination of actual field manager of peatland water table monitoring equipment in the perspective to take actions from peatland water table monitoring.

The system to response the lower peatland water table can be proposed as the figures below.

- It is assumed that patrol of equipment, investigation to disordered equipment by field level while securing budget of maintenance of equipment by provincial level.
- The relevant authorities conduct instruction and recommendation to take actions by field level.
- It is expected to response to do wetting by water control and to strengthen patrol as early warning to fire outbreaks at the drier peatland.
- It is recommended that community groups as MPA is requested to set up the warning board around the drier peatland in the fire prone sites not only at the village center.

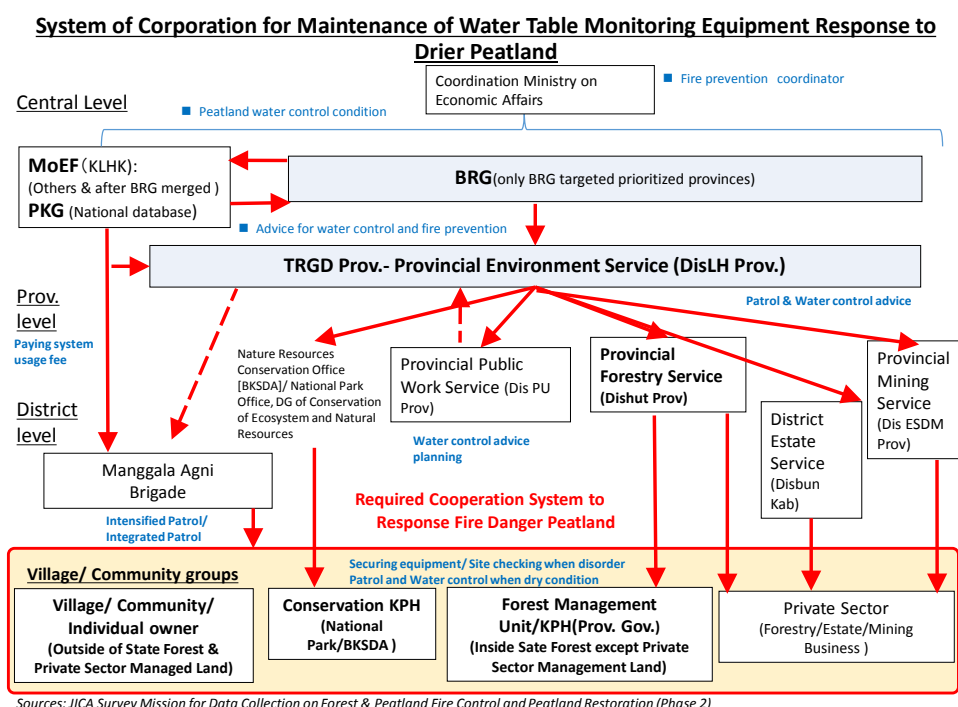


Figure 2.2.2.2 Proposed Institutional Arrangement for Early Warning and Response to Drier Peatland

Sources: JICA Survey Mission for Data Collection on Forest & Peatland Fire Control and Peatland Restoration in Indonesia (Phase 2)

Proposed Patrol and Early Warning with Setting-up Warning Sign Board of Drier Peatland

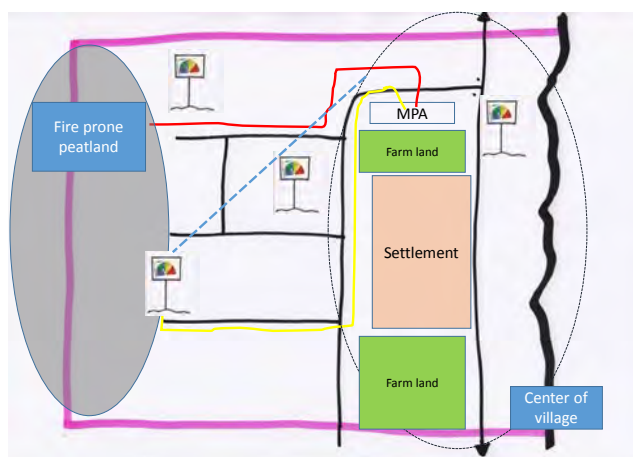


Figure 2.2.2.3 Image of Setting up of Warning Board at the Drier Peatland

Sources: JICA Survey Mission for Data Collection on Forest & Peatland Fire Control and Peatland Restoration in Indonesia (Phase 2)

(3) Proposed system to manage peatland water table monitoring equipment other than in private sector managed sites

As the results of discussion above, improvement of “Attachment 6. Draft Proposed Responsibility in Peatland Water Monitoring in Other Use Area/APL” in the Minutes of Meeting in Sep. 2016 at the visit by the Detailed Planning Survey Team on the requested next technical cooperation “Community Movement Program on Forest and Land Fire Prevention” consented with the authorities concerned is proposed as the table below.

Table 2.2.2.2 Proposed Role Sharing in Maintenance and Management of Water Table Monitoring Equipment Outside of Private Sector Managed Area

Proposed Role Sharing in Maintenance/Management of Water Table Monitoring Equipment outside of Private Sector Managed Area

No.	Role	BRG	PKG	Prov./TRGD (KPH P/L)	Kab./LH (KPH P/L)	Desa	Remarks
I BRG Restoration Sites until 2020							
1	Planning	X					
2	Design & Management	X		X	X		Include. installation location
3	Place arrangement			(X)		X	
4	Providing Equipment	(X)					Equipment received by BRG will be National Assets. And then the equipment will be handed over from BRG to local gov. as Local Gov. Assets.
5	Providing Training	X					
6	Maintenance of device and Payment for tele-communication (include. SIM - card and prepaid Pulsa)	X		(X)			BRG will allocate budget for maintenance and tele-communication for the first year. BRG will recommend the local government to allocate budget.
7	Security			X	(X)	X	
8	Reporting data to National Database (PKG)	X		(X)	(X)		
II Non BRG Restoration Sites and Whole KHG after 2020							
1	Planning		X				Non BRG target
2	Design & Management		X	X	X		Include. installation location
3	Place arrangement		(X)	(X)	(X)	X	
4	Providing Equipment		(X)				
5	Providing Training		(X)				
6	Maintenance of device and Payment for tele-communication		(X)	X			
7	Security			X	X	X	By organizing/ strengthening village facilitators (and/or TPD) for peat management
8	Reporting data to National Database			X	X		
9	National Database Management		X				

Sources: JICA Survey Mission for Data Collection on Forest & Peatland Fire Control and Peatland Restoration (Phase 2)

Sources: JICA Survey Mission for Data Collection on Forest & Peatland Fire Control and Peatland Restoration in Indonesia (Phase 2)

2.2.3 Examination to Facilitate Community-based Peatland Water Table Monitoring

(1) Needs of facilitation to community-based peatland water table monitoring and management

As discussed above, in future community groups are assumed to become actual implementers of peatland water table monitoring and management at peatland other than state forest (except private sector managed sites).

But UNRI team pointed out the importance to examine measures to prevent the following trends in planning and implementing actions in field based on the experiences and lessons learned so far.

- a) Many visitors from outside comes to the district after the visit of President at Des. S. Tohor from international and domestic donor, NGO and researcher.
- b) Canal blocking, tree planning and livelihood improvement activities were conducted with assistance from the outside without any facilitation to empower community initiatives.
- c) As the result, community tends to rely on the outside assistance to peatland restoration. The cooperation to the outsiders relating peatland restoration becomes business because they can obtain labor wage and/or honorarium in the process of grant assistance as income source by just waiting grant assistance from outsiders. The adverse impact include destroying the sites constructed or reforested and waiting for another assistance.

The above trends implicate the more grant aid to community by stakeholders concerned with peatland restoration including BRG the more adverse impact to refuse group work in community on land management and to seek reliance from the outside. In the past JICA technical cooperation FCP can facilitate to procure and install a deep well called by “Sumur Bor” by self-reliant. But in peatland restoration, Sumur Bor is installed by grant aid from outside. As the result, fuel for pumping up will depend on outside assistance. In developing demonstration plot of PLTB in paddy field tried by BRG in Pulpis District, Central Kalimantan Province (see 5.2.3 below) also shows that some community tends to refuse weeding by group works and to become to ask the fund to buy fertilizer, chemicals, water pumps and even fuel for water pump to outside assistance (at field visit in Jun. 2017). It is thought to become important to examine community-based peatland water table monitoring and management.

It is thought to become important to examine to facilitate for community to prepare action plan for peatland water table monitoring and management by self-initiative based on the following experience and lessons learned.

(2) MoEF’s Community facilitator system

PKG in MoEF has established “Community self-reliance program for peatland ecosystem restoration (Program Kemandirian Masyarakat untuk Pemulihan Ekosistem Gambut)” using the experiences of organizing environment care community work team (Tim Kerja Masyarakat Warga Cinta Lingkungan) for watershed protection in village level. The program aims at preparing “Community action plan (Rencana Aksi Masyarakat [RKM])” by the following procedure.

- a) MOU with university
- b) Facilitation to the target villages by university
- c) Training to the candidate facilitators
- d) Organizing village level peatland restoration working team
- e) Preparing problem identification and situation analysis
- f) Preparing community action plan

(3) Peatland Care Village (Desa Peduli Gambut)

BRG has also established framework to collaborate with rural development programs in peatland area especially in the peatland restoration are and the surrounding.

This framework directs to establish “Peatland rural area” to start the planning stage on peatland management by village level and then to integrate into strengthening cooperation inter-villages in KHG. The followings are some facilitation activities.

- a) Establishing “Peatland rural area”
- b) Planning Spatial Plan in village and peatland rural area
- c) Identification and resolution of conflicts
- d) Identification and legalization of system, right and access for hydrology and land management
- e) Economic empowerment
- f) Strengthening local wisdom
- g) Preparedness of village community to peatland fire

2.3 Implementation of Training to Stakeholders

Trainings on monitoring using peatland water table monitoring equipment to local stakeholders were conducted through the following activities.

Table 2.3.1.1 Outline of Training Activities on Peatland Water Table Monitoring to Local Stakeholders

Date & time (Place)	Held by	Meetings & discussions
Phase 1		
9-10 Feb.2017	BRG-TRGD of Sumsel	1 st ToT Provincial Training on Peatland Water Table Monitoring in South Sumatera Province
Phase 2		
22-23 Mar. 2017	BRG-TRGD of Sumsel	2 nd ToT Provincial Training on Peatland Water Table Monitoring in South Sumatera Province
10-11 Jul. 2017	BRG-UPR	Joint ToT Provincial Training on Peatland Water Table Monitoring in Central Kalimantan and Riau Provinces

Sources: JICA Survey Mission for Data Collection on Forest & Peatland Fire Control and Peatland Restoration in Indonesia (Phase 2)

2.3.1 Training on Use and Maintenance of Water Table Monitoring Equipment to Local Stakeholders in South Sumatera Province

(1) 1st Training

The training on peatland water table monitoring to local stakeholders were conducted on 9-10 Feb. 2017 in South Sumatera Province by the following curriculum and with the following participants.

Table 2.3.1.2. Outline of Curriculum of Training on Peatland Water Table Monitoring in South Sumatera Province (1st)

Time & Date (Day)	Curriculum	PIC
9 Feb. 2017 (Thurs.) Hotel The 101 Palembang, South Sumatera Province		
8:00-8:30	Registration	Secretariat
8:30-9:15	Progress Report on Peatland Water Table Monitoring System	Deputy for Research & Development, BRG
	Remarks and Direction from Governor of South Sumatera Province	Coordinator of TRGD
	Remarks, Direction and Opening from Head of BRG	Head of BRG
9:15-10:15	Coffee Break	Secretariat
10:15-10:55	Preparation of Peatland Water Table Monitoring System in Peatland Damage Control	Dir. PKG
10:55-11:20	Session 1: Basic of peatland water control (Theory)	Head of Expert Group of TRGD
11:20-11:50	Session 2: Basic of peatland water monitoring (Theory)	Head of National Research Council
11:50-13:10	Discussion	BRG
13:10-14:00	Lunch Break	Secretariat
14:00-15:20	Session 3: Method of Utilization, Maintenance of peatland water control monitoring equipment (Theory & Practice)	BPPT & ZMEI/MEI
15:20-16:30	Session 4: Peatland water control monitoring planning (Brainstorming)	BRG
10 Feb. 2017 (Fri.) Hotel The 101 Palembang, South Sumatera Province		
8:00-9:00	Registration	Secretariat
9:00-10:00	Group Discussion	BRG
10:00-11:00	Presentation by Group & Plenary discussion	BRG
11:00-11:30	Closing	<ul style="list-style-type: none"> ■ Wakil Secretary of TRGD ■ Deputy for Research & Development, BRG BKSDA Sumsel

Sources: JICA Survey Mission for Data Collection on Forest & Peatland Fire Control and Peatland Restoration in Indonesia (Phase 2)

Table 2.3.1.3 Outline of Participants of Training on Peatland Water Table Monitoring in South Sumatera Province (1st)

Classification	Numbers of participants (persons)	Remarks
Provincial level	52	Including central level
District/ village level	25	OKI and MUBA Districts
Private sectors	27	
Total	104	Increased participants due to the expectation of Governor's remarks

Sources: JICA Survey Mission for Data Collection on Forest & Peatland Fire Control and Peatland Restoration in Indonesia (Phase 2)



1st Provincial Training on Peatland Water Table Monitoring in South Sumatera Province “Opening Session”(Palembang[Hotel 101]; 9 Feb. 2017)



1st Provincial Training on Peatland Water Table Monitoring in South Sumatera Province “Lecture on SESAME”(Palembang[Hotel 101]; 9 Feb. 2017)

Figure 2.3.1.1 Overview of Training on Peatland Water Table Monitoring in South Sumatera Province (1st)

Sources: JICA Survey Mission for Data Collection on Forest & Peatland Fire Control and Peatland Restoration in Indonesia (Phase 2)

Taking into the consideration the needs and proposal from the participants above, the following aspects are improved in the next training.

- a. ToT in central will be conducted to the selected trainees after local trainings.
- b. The stakeholders in district level will be focused in local trainings.
- c. Local trainings will cover the lectures on the matters in the textbook. The practice on assembling equipment will also be incorporated.

(2) 2nd training

The training on peatland water table monitoring to local stakeholders were conducted on 22-23 Mar. 2017 in South Sumatera Province by the following curriculum and with the following participants. The 2nd training incorporated field practice (excursion to the installed peatland water table monitoring equipment and demonstration/trial of installation) in addition to in-room trainings.

Table 2.3.1.4. Outline of Curriculum of Training on Peatland Water Table Monitoring in South Sumatera Province (2nd)

Time & Date (Day)	Curriculum	PIC
22 Mar. 2017 (Wed.) Hotel Aston Palembang, South Sumatra Province		
8:00-8:30	Registration	Secretariat
8:30-9:10	Remarks, Direction and Opening from BRG	Deputy for Research & Development, BRG
9:10-9:40	Provincial policy concerned with Peatland monitoring	Coordinator of TRGD
9:40-10:35	Update on Laws and Regulation concerned with Peatland Monitoring	Dir. PKG
10:35-11:00	Work on Construction, Operation & Maintenance of BRG	Deputy for Construction, Operation & Maintenance, BRG

Time & Date (Day)	Curriculum	PIC
11:00-11:15	Coffee Break	Secretariat
11:15-11:45	Material 1: Important aspect in implementation in installation of peatland water table monitoring equipment	Head of WG of Date Development of BRG
11:45-13:00	Lunch Break	Secretariat
13:00-16:30	Session 2: Processing and analysis of water table data	BPPT
23 Mar. 2017 (Thurs.) Peat Forest Genetic Conservation Plot in Sepucuk Area, OKI District, South Sumatra Province		
8:00-16:30	Installation of water table monitoring equipment (Practice)	ZMEI/MEI

Sources: JICA Survey Mission for Data Collection on Forest & Peatland Fire Control and Peatland Restoration in Indonesia (Phase 2)

Table 2.3.1.5. Outline of Participants of Training on Peatland Water Table Monitoring in South Sumatra Province (2nd)

Classification	Numbers of participants (persons)	Remarks
Provincial level	33	Including central level
Private sector	16	
Total	49	

Sources: JICA Survey Mission for Data Collection on Forest & Peatland Fire Control and Peatland Restoration in Indonesia (Phase 2)



2nd Provincial Training on Peatland Water Table Monitoring in South Sumatra Province “Opening Session”(Palembang[Hotel Aston]; 22 Mar. 2017)



2nd Provincial Training on Peatland Water Table Monitoring in South Sumatra Province “In-room practice” (Palembang [Hotel Aston], 22 Mar. 2017)

Figure 2.3.1.2 Overview of Training on Peatland Water Table Monitoring in South Sumatra Province (2nd)

Sources: JICA Survey Mission for Data Collection on Forest & Peatland Fire Control and Peatland Restoration in Indonesia (Phase 2)

2.3.2 Joint Training on Use and Maintenance of Water Table Monitoring Equipment to Local Stakeholders in Central Kalimantan and Riau Provinces

(1) Outline of training

The training on peatland water table monitoring to local stakeholders were conducted on 10-11 Jul. 2017 in Central Kalimantan Province by the following curriculum and with the following participants. Basically the curriculum is almost same as the 2nd training. But the training tried comprehension tests and incorporated on basic structure of water table monitoring equipment in the first day. Field practice was conducted in parallel to actual newly installation in Des. Mantaren I.

Table 2.3.2.1. Outline of Curriculum of Joint Training on Peatland Water Table Monitoring of Central Kalimantan and Riau Provinces

Time & Date (Day)	Curriculum	PIC
10 Jul. 2017 (Sen.) Hotel Luwansa Palangkaraya, Central Kalimantan Province		
8:00-8:30	Registration	Secretariat
Opening Material		
8:30-8:45	Remarks, Direction and Opening from BRG	Deputy for Research & Development, BRG
8:45-9:00	Overview of Trial of Peatland Water Control Monitoring Outside of Concession Area (Component 1)	JICA Survey Mission
9:20-9:40	Technics of field monitoring and data processing (Lessons learned from Jambi)	Head of Expert Group of TRGD Jambi
9:40-10:00	Discussion	BRG
10:00-10:15	Coffee Break	Secretariat
Core Material		
10:15-12:00	Assembling peatland water table monitoring equipment and discussion	BPPT
11:45-13:00	Lunch Break	Secretariat
13:00-16:00	Assembling peatland water table monitoring equipment (Practice)	BPPT
16:00-16:20	Processing and analysis of water table data as well as preparation of design of satellite-based peatland monitoring system	BPPT
16:20-16:40	Water table monitoring system	BPPT
16:40-17:00	Discussion	BRG
11 Jul. 2017 (Tue.) KPH Kepahayang Hilir in Mantaren I Village, Pulpis District, Central Kalimantan Province		
8:00-16:30	Installation of water table monitoring equipment (Practice)	ZMEI/MEI

Sources: JICA Survey Mission for Data Collection on Forest & Peatland Fire Control and Peatland Restoration in Indonesia (Phase 2)

Table 2.3.2.2 Outline of Participants of Joint Training on Peatland Water Table Monitoring of Central Kalimantan and Riau Provinces

Classification	Numbers of participants (persons)	Remarks
Provincial/ Pulpis District/Village level, Central Kalimantan Province	32	Including central level
Meranti District/ village level, Riau Province	3	
OKI & MUBA District/Village level in South Sumatera Province	5	
Private sector	0	

Classification	Numbers of participants (persons)	Remarks
Total	40	

Sources: JICA Survey Mission for Data Collection on Forest & Peatland Fire Control and Peatland Restoration in Indonesia (Phase 2)



Joint Provincial Training on Peatland Water Table Monitoring of Central Kalimantan and Riau Provinces “Comprehension testing at beginning” (Palangkaraya[Hotel Luwansa];10 Jul. 2017)



Joint Provincial Training on Peatland Water Table Monitoring of Central Kalimantan and Riau Provinces “Field practice” (MT site, KPHP, Pulpis District, Central Kalimantan Prov.; 11 Jul. 2017)

Figure 2.3.2.1 Overview of Joint Training on Peatland Water Table Monitoring in South Sumatera Province of Central Kalimantan and Riau Provinces

Sources: JICA Survey Mission for Data Collection on Forest & Peatland Fire Control and Peatland Restoration in Indonesia (Phase 2)

(2) Issues and lessons learned

The following issues and lessons learned are collected through the experience of trainings above.

- The participants from Riau Provinces were limited due to the difficulty to book the flight to Central Kalimantan because many full booking flights happened affected by the booking by KSP immediately before the training Central Kalimantan Province. It will be important to involve the stakeholders in Riau Province in planning the similar trainings by BRG.
- The targeted peatland monitoring implementers of KPH and community groups should be listed up at first, and then designing the overall training to scope the trainers to be needed in future trainings before designing ToT trainings.
- The training curriculum should be improved by adjusting the capacity to be required to the implementers of peatland water table monitoring so as to be appropriate to the targeted trainee groups.

2.4 Support to Information Collection and Confirmation of Land Owner for Selection of Peatland Monitoring Equipment Installation

2.4.1 Selection of Peatland Water Table Monitoring Trial Sites

Basically under the cooperation with the program expert of Deputy of Research and Development, BRG, the candidate locations of peatland water table monitoring trial sites were selected at the previous survey. The remaining 10 sites for peatland water table monitoring trial were also selected as the previous survey.

Table 2.4.1.1. BRG's Selection Criteria on Location of Installation of Peatland Monitoring

No.	Criteria
1	Peatland (depth of peat is deeper than 50cm)
2	Non-concession areas, but public owned lands, such as the state forest, community forests, property of local government building, and so on.
3	Available mobile network
4	Areas suffered by the peatland fire in 2015. And the areas not suffered by the peatland fire in 2015 is also selected for comparison in the neighbouring areas.

Sources: Prepared based on the Interviews with BRG Personnel (Dec. 2016)

2.4.2 Selection of Candidate Sites for Installing Peatland Water Table Monitoring Equipment

Based on the criteria above, TRGD in Sumsel, BRG and head of sub-district/ village head in Kalteng and mainly district authorities concerned and village head preliminary selected candidate sites for installing peatland water table monitoring equipment. And then information collection on land owners etc. was supported in cooperation with the local team of Consortium in order to support serial process by BRG and TRGD (Secretary) to decide the installing sites. Confirmation of field at the installing sites were conducted with TRGD, district authorities concerned and village officer. the installation position is set more than 500m far from small channel in field confirmation of selected installing sites.

In Riau Province, it took time until to collect information on land owners etc. of the candidate installing sites due to difficult access and far between TRGD secretary, district and the candidate sites. Thus 3 times preliminary site surveys were conducted to support the following information collection and field confirmation of installing sites.

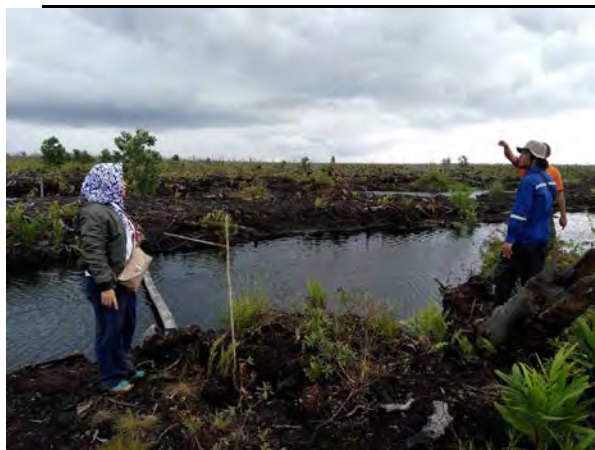
- a) The first candidate sites for peatland water table monitoring in the 3 villages (Des. Insit, Kota Selat Panjang, Des. Banglas Barat) proposed by BRG changed to other 3 villages (Des. Tenan, Des. Alai, Des. Lukun) due to difficulty to find feasible candidate locations of installing sites.
- b) Because it was difficult to find concrete information of land owners in the 3 villages, Deputy for Research and Development of BRG decided to find the candidate locations of installing sites in village forests and other public lands in Des. S. Tohor and Des. Lukun on 4 May 2017.

Table 2.4.2.1 Outline on Selection of Candidate Sites for Installing Peatland Water Table Monitoring Equipment

Code	Province	District	Sub-district	Area/Village	KHG	Comparison	Land status (Land owner)	Remarks
Phase 1								
OKI-1	Sumsel	OKI	Kayu Agung	Sepucuk/Kedaton	S. Simbambung-S.Batok	No Fire	APL (District)	
OKI-2	Sumsel	OKI	Tulung Selapan	Simpang Tiga	S. Sugihan-S. Lumpur	Fire 2015	APL (Puskesmas)	
MUBA-1	Sumsel	MUBA	Lalan	Sungai Merang/Bakung	S. Air Hitam-S.Batok	No Fire	KH (KPHP)	
MUBA-2	Sumsel	MUBA	Lalan	Kepayang	S. Air Hitam-S.Batok	Fire 2015	KH (KPHP)	

Code	Province	District	Sub-district	Area/Village	KHG	Comparison	Land status (Land owner)	Remarks
Phase-2								
PS-1	Sumsel	OKI	Pangkalan Lampam	Sebokor/ Baru	S. Sugihan-S. Saleh	No Fire	KH (KPHK/BKSD A)	Lumpur2
PS2R	Sumsel	Banyu Asin	Muara Padang	PLG/ Sidomulyo	S. Sugihan-S. Saleh	Alternative No Fire	KH (KPHK/BKSD A)	Seleh2 Due to no accessibility of the first candidate site in the southern KHG.
AS1R	Sumsel	OKI	Pangkalan Lampam	Riding	S. Sugihan-S. Lumpur	Alternative Fire 2015	APL (Kadus /KaDAOPS MAIII)	■ Lumpur1 ■ Due to no accessibility of the first candidate site in the BRG first priority area
PT-1	Sumsel	OKI	Pedamaran Timur	Pulau Geronggang	S. Simbambung -S.Batok	Fire 2015	KH (KPHP)	Seleh1
SJ	Kalteng	Pulpis	Sebangau Kuala	Sebangau Jaya	S. Katingan-S. Sebangau	Fire 2015	APL (Poktan/Family of Village Head)	Batok1
PM	Kalteng	Pulpis	Sebangau Kuala	Paduran Mulya	S. Katingan-S. Sebangau	Fire 2015	APL (Poktan/ Family of Village Head)	Kecil1
BT	Kalteng	Pulpis	Kahayang Hilir	Buntoi	S. Kahayang-S.Sebangau	Fire 2015	KH (KPHP)	■ Kecil2 ■ Changed to outside of HD due to proposed by villagers in the socialization
M1	Kalteng	Pulpis	Kahayang Hilir	Mantaren I	S. Kahayang-S.Sebangau	Fire 2015	KH (KPHP)	■ Batok2 ■ Changed to outside of HD due to proposed by villagers in the socialization
ST	Riau	Meranti	Tebing Tinggi Timur	Sungai Tohor	Pulau Tebing Tinggi	No Fire	KH (LPHD)	Tinggi1
LK	Riau	Meranti	Tebing Tinggi Timur	Lukun	Pulau Tebing Tinggi	No Fire	KH (Des)	■ Tinggi2 ■ Difficult to look for clear land ownership information

Sources: JICA Survey Mission for Data Collection on Forest & Peatland Fire Control and Peatland Restoration in Indonesia (Phase 2)



Field confirmation survey at candidate sites for installing peatland water table monitoring equipment (PT-1 site) (Pulau Geronggang Village, District OKI, Prov. Sumsel; 21 Feb. 2017)



Information collection on land owners at candidate sites for installing peatland water table monitoring equipment (BT site)(Buntoi Village, District Pulpis, Prov. Kalteng; 9 Mar. 2017)

Figure 2.4.2.1. Overview of Selection of Candidate Sites for Installing Peatland Water Table Monitoring Equipment

Sources: JICA Survey Mission for Data Collection on Forest & Peatland Fire Control and Peatland Restoration in

2.4.3 Holding Village-level Socialization/ Training on Peatland Water Table Monitoring

Village-level socialization/ training on peatland water table monitoring were held by the local team of Consortium by involving TRGD and district authorities.

Table 2.4.3.1 Outline on Village-level Socialization/ Training on Peatland Water Table Monitoring

Date	Place	Targeted sites	Remarks (Main team)
Phase 1			
South Sumatera Province			
6-7 Mar.2017	Des. Kedaton, Kec. Kayu Agung, Kab. OKI	OKI-1	UNSRI
26 Mar.2017	Des. Bakung, Kec. Lalan, Kab. MUBA	MUBA-1	UNSRI
26 Mar.2017	Des. Kepayang, Kec. Lalan, Kab. MUBA	MUBA-2	UNSRI
1 Apr. 2017	Des. Simpangtiga, Kec. Tulung Selapan, Kab. OKI	OKI-2	UNSRI
Phase 2			
South Sumatera Province			
13 Jun.2017	Des. Riding, Kec. Pangkalan Lampan, Kab. OKI	AS1R	BP2LHK
13 Jun.2017	Des. Perigi, Kec. Pangkalan Lampan, Kab. OKI	PS1	BP2LHK
14 Jun.2017	Des. Pulau Geronggang, Kec. Pedamaran Timur, Kab. OKI	PT1	BP2LHK
19 Jun.2017	Des. Sidomuluyo 20, Kec. Pangkalan Lampan, Kab. OKI	PS2R	BP2LHK
Central Kalimantan Province			
20 Jun.2017	Kec. Kahayang Hilir, Kab. Pulpis	Des. Buntoi, Des. Mantaren I	UPR
22 Jun.2017	Kec. Subangau Kuala, Kab. Pulpis	Des. Subangau	UPR

Date	Place	Targeted sites	Remarks (Main team)
		Jaya Des. Paduran Mulya	
Riau Province			
15 Jul.2017	Des. Lukun, Kec. Tebing Tinggi Timur, Kab. Meranti	Des. Lukun	UNRI
16 Jul.2017	Des. S. Tohor, Kec. Tebing Tinggi Timur, Kab. Meranti	Des. S. Tohor	UNRI

Sources : Tim Konsorsium UNSRI-UNRI-UPR-BP2LHK Palembang. 2017. Final Report BRG-JICA (Phase-II) Pra Studi Kelayakan Investasi pada Empat Wilayah Restorasi Lahan Gambut Prioritas di Indonesia Kab. OKI, MUBA, Kepulauan Meranti dan Pulpis. Oct. 2017



Village-level Socialization on Peatland Water Table Monitoring (MUBA-2 site)(Kepayang Village, District MUBA, Prov. Sumsel; 26 Mar. 2017)



Village-level Socialization on Peatland Water Table Monitoring (AS1R site)(Ridng Village, District OKI, Prov. Sumsel; 13 Jun. 2017)

Figure 2.4.3.1 Overview on Village-level Socialization/ Training on Peatland Water Table Monitoring

Sources: JICA Survey Mission for Data Collection on Forest & Peatland Fire Control and Peatland Restoration in Indonesia (Phase 2)

2.4.4 Support to Confirmation of Consent to Installation of Peatland Water Table Monitoring Equipment

Written confirmation on installation of peatland water table monitoring equipment was concluded by land stakeholders through facilitation by the local team of Consortium by involving TRGD and district authorities.

Table 2.4.4.1 Outline on Progress on Conclusion of Written Confirmation on Installation of Peatland Water Table Monitoring Equipment

Code	Province	District	Area/ Village	Written confirmation for installation (TRGD)	Written Report of installation/ spare delivery (Vendor)
Phase 1					
OKI-1	Sumsel	OKI	Sepucuk/ Kedaton	<ul style="list-style-type: none"> ■ 7 Des. 2017 ■ BPPLHK Palembang ■ Bappeda Kab. OKI 	<ul style="list-style-type: none"> ■ 17 Des. 2017 ■ ZMEI-MEL ■ Bappeda Kab. OKI
OKI-2	Sumsel	OKI	Simpang Tiga	<ul style="list-style-type: none"> ■ 6 Des. 2017 ■ Kades Simpang Tiga ■ Bappeda Kab. OKI 	<ul style="list-style-type: none"> ■ 18 Des. 2017 ■ ZMEI-MEL ■ Bappeda Kab. OKI
MUBA-1	Sumsel	MUBA	Sungai Merang/ Bakung	<ul style="list-style-type: none"> ■ 14 Des.2016 ■ Bappeda Kab. MUBA ■ KPHP Lalan 	<ul style="list-style-type: none"> ■ 20 Des. 2017 ■ ZMEI-MEL ■ TRGD/ Tim 9

Code	Province	District	Area/ Village	Written confirmation for installation (TRGD)	Written Report of installation/ spare delivery (Vendor)
MUBA-2	Sumsel	MUBA	Kepayang	Mangasang Mendis	<ul style="list-style-type: none"> ■ 20 Des. 2017 ■ ZMEI-MEL ■ TRGD/ Tim 9 ■ 21 Des. 2017 ■ ZMEI-MEL ■ BAPPEDA kab. MUBA
Phase-2					
PS-1	Sumsel	OKI	Sebokor/ Baru	<ul style="list-style-type: none"> ■ 13 Jun. 2017 ■ Kades Perigi ■ BKSDA ■ Dis LH Kab. OKI 	<ul style="list-style-type: none"> ■ 21 Jun. 2017 ■ ZMEI ■ TRGD/ Tim 11
PS2R	Sumsel	Banyu Asin	PLG/ Sidomulyo	<ul style="list-style-type: none"> ■ 18 Jun. 2017 ■ Kades Sidomulyo ■ BKSDA ■ Bappeda Banyu Asin 	<ul style="list-style-type: none"> ■ 21 Jun. 2017 ■ ZMEI ■ TRGD/ Tim 11
AS1R	Sumsel	OKI	Riding	<ul style="list-style-type: none"> ■ 13 Jun. 2017 ■ Kades Riding ■ Dis LH Kab. OKI 	<ul style="list-style-type: none"> ■ 21 Jun. 2017 ■ ZMEI ■ TRGD/ Tim 11
PT-1	Sumsel	OKI	Pulau Gerongga ng	<ul style="list-style-type: none"> ■ 14 Jun. 2017 ■ KPH Mesuji ■ Dis LH Kab. OKI 	<ul style="list-style-type: none"> ■ 21 Jun. 2017 ■ ZMEI ■ TRGD/ Tim 11
SJ	Kalteng	Pulpis	Sebangau Jaya	NA	<ul style="list-style-type: none"> ■ 12 Jul. 2017 ■ ZMEI ■ TRGD/Dis LH Prov.
PM	Kalteng	Pulpis	Paduran Mulya	NA	<ul style="list-style-type: none"> ■ 12 Jul. 2017 ■ ZMEI ■ TRGD/Dis LH Prov.
BT	Kalteng	Pulpis	Buntoi	NA	<ul style="list-style-type: none"> ■ 12 Jul. 2017 ■ ZMEI ■ TRGD/Dis LH Prov.
M1	Kalteng	Pulpis	Mantaren I	NA	<ul style="list-style-type: none"> ■ 12 Jul. 2017 ■ ZMEI ■ TRGD/Dis LH Prov.
ST	Riau	Meranti	Sungai Tohor	NA	<ul style="list-style-type: none"> ■ 17 Jul. 2017 ■ ZMEI ■ Dis LH Kab.
LK	Riau	Meranti	Lukun	NA	<ul style="list-style-type: none"> ■ 17 Jul. 2017 ■ ZMEI ■ Dis LH Kab.

Sources: JICA Survey Mission for Data Collection on Forest & Peatland Fire Control and Peatland Restoration in Indonesia (Phase 2)

2.5 Installation and Operation as well as Institutional Arrangement for Management of Peatland Monitoring Equipment Installation

2.5.1 Handover of Water Table Monitoring Equipment Installed in the Previous Survey

Handover documents on exiting peatland water table monitoring equipment (4 sites) installed in South Sumatera Province (procured directly by JICA Indonesia Office in Dec. 2016) were signed at Closing Peatland Investment Workshop shown in 4.4. below (27 Jul. 2017) after preparation of handover on ownership of equipment based on the confirmation of data transmission and concluding the confirmation of spare part delivery etc.

At MUBA-2 site in Des. Kepayang, MUBA District, additional external Yagi-type antenna procured in local market was installed due to failed data transmission which was derived from unstable telephon line at installation in Dec. 2016.

Spare parts etc. were delivered to Temporary Field Manager who manage until handover to actual field manager future. Handover of ownership of equipment takes times from installation but data transmission starts immediately after installation. Thus ownership of data attribute to BRG or the authorities designated by BRG.

Table 2.5.1.1 Outline on Installed Sites and Manager of Peatland Water Table Monitoring Equipment (Existing from installed in phase 1) in South Sumatera Province

Procured in Phase 1 by JICA Indonesia Office
(South Sumatra installed in December 2016)

No.	Code	Goods/ Jenis (Inspection Date)	Specification/ Spesifikasi	Location/ Lokasi	Temporarily Manager/ Pengelola Sementara	Proposed Field Manager/ Calon Pengelola
S1	OKI-1	Data transmission system SESAME II-02d AWLRS With Fence (17 Dec. 2016)	With ■ Initial setup fee ■ System usage fee (1 year)	<ul style="list-style-type: none"> ■ S3° 25'25.82", E104° 52' 41.87" (Logger) ■ Kebun Konservasi Genetik Hutan Gambut BPPLHK di Tanah Kabupaten (Outside of State Forest) ■ Kelurahan Kedaton, Kecamatan Kayu Agung, Kab. OKI ■ KHG Sungai Sibumbang – Sungai Batok 	Tata Ruang (Bappeda/P U Kab.) OKI	Dis LH Kab. (District Env. Office)
S2	OKI-2	Data transmission system SESAME II-02d AWLRS With Fence (18 Dec. 2016)	With ■ Initial setup fee ■ System usage fee (1 year)	<ul style="list-style-type: none"> ■ S3° 19'58.60", E105° 27' 33.22" (Logger) ■ Areal Penggunaan Lain (Puskesmas) (Outside of State Forest) ■ Desa Simpangtiga, Kecamatan Tulung Selapan, Kab. OKI ■ KHG Sungai Sugihan – Sungai Lumpur 	Tata Ruang (Bappeda/P U Kab.) OKI	Community Group (MPA?)
S3	MUBA-1	Data transmission system SESAME II-02d AWLRS With Fence (20 Dec. 2016)	With ■ Initial setup fee ■ System usage fee (1 year)	<ul style="list-style-type: none"> ■ S2° 2'50.90", E104° 3' 4.29" (Logger) ■ Hutan Produksi KPH Lalan Mangsang Mendis (Production Forest Non Concession) ■ Desa Bakung, Kecamatan Lalan, Kab. MUBA ■ KHG Sungai Air Hitam Laut-Sungai Buntu Kecil 	Tata Ruang (Bappeda/P U Kab.) MUBA	KPH, Prov. Sumsel (FMU of Provincial Forestry Service)
S4	MUBA-2	Data transmission system SESAME II-02d AWLRS With Fence (19 Dec. 2017)	With ■ External Antenna (Temporarily from local market) ■ Initial setup fee ■ System usage fee (1 year)	<ul style="list-style-type: none"> ■ S2° 5'7.27", E104° 16' 2.34" (Logger) ■ Hutan Produksi KPH Lalan Mangsang Mendis (Production Forest Non Concession) ■ Desa Kepayang, Kecamatan Lalan, Kab. MUBA ■ KHG Sungai Air Hitam Laut-Sungai Buntu Kecil 	Tata Ruang (Bappeda/P U Kab.) MUBA	KPH, Prov. Sumsel (FMU of Provincial Forestry Service)

Sources: JICA Survey Mission for Data Collection on Forest & Peatland Fire Control and Peatland Restoration in Indonesia (Phase 2)

2.5.2 Installation, Operation and Handover of Water Table Monitoring Equipment Installed in This Survey

Newly transportation and installation at 10 sites for installing peatland water table monitoring equipment was conducted by equipment procurement contract with PT. Zenbi Machinery and Electronics Indonesia (ZMEI), solo distributor of SESAME in Indonesia as the equipment installed in Phase 1 and according to the designation of brand to SESAME by JICA (See table below). Handover of equipment ownership will be conducted in Sep. 2017 after confirmation of all data transmission and documents on spare part delivery etc.

- a) 4 sites in OKI District in South Sumatera Province: Installation work 10-18 Jun. 2017; Site installation confirmation inspection 13 and 18-19 Jun. 2017
- b) 4 sites in Pulpis District in Central Kalimantan Province: Installation work 7-11 Jul. 2017; Site installation confirmation inspection 9 and 10-11 Jul. 2017
- c) 2 sites in Kepulauan Meranti (Meranti) District in Riau Province: Installation work 14-17 Jul. 2017; Site installation confirmation inspection 16-17 Jul. 2017

Handover documents on the 10 sites of newly installed peatland water table monitoring equipment (procured by JICA Survey Mision [equipment for grant]) were signed at the opening

of the final stakeholder coordination meeting (5 Oct. 2017) as discussed in 4.4.below. Because it was confirmed that no more than 2 weeks of intermitted period of data transmission by 4 Oct. 2017 with improvement as shown in below after preparation of handover on ownership of equipment and concluding the confirmation of spare part delivery etc.

- a) At ST site in Des. Sebangau Jaya, additional external Yagi-type antenna procured in local market was installed in Aug. 2017 due to failed data transmission which was derived from unstable telephone line.
- b) At all installed 4 sites in Pulpis District, Central Kalimantan Province, regular SIMs Kartu Halo (post-paid type) were replaced on 22-24 Sep. 2017 due to failed data transmission by M to M SIM (for internet) even stable telephone line with resulting in more than 2 weeks of intermitted period of data transmission. And also at BT site in Buntoi Village, battery was inspected and then miss-connection of cables were improved.

Spare parts etc. were delivered to Temporary Field Manager who manage until handover to actual field manager future. Handover of ownership of equipment takes times from installation but data transmission starts immediately after installation. Thus ownership of data attribute to BRG or the authorities designated by BRG.

Table 2.5.2.1 Outline on Installed Sites and Manager of Peatland Water Table Monitoring Equipment (Newly installed in phase 2) in South Sumatera Province

Procured in Phase 2 by JICA Mission (South Sumatra installed in June 2017)

No.	Code	Goods/ Jenis (Inspection Date)	Specification/ Spesifikasi	Location/ Lokasi	Temporarily Manager/ Pengelola Sementara	Proposed Field Manager/ Calon Pengelola
S5	PS-1	Data transmission system SESAME II-02d AWLRS With Fence (18 Jun. 2017)	With ■ External Antenna ■ Initial setup fee ■ System usage fee (1 year)	<ul style="list-style-type: none"> ■ S2° 57'49.69", E105° 7' 28.19" ■ Hutan Suaka Margasatwa Padang Sugihan (Conservation Forest) ■ Desa Baru, Kecamatan Pangkalan Lampam, Kab. OKI ■ KHG Sungai Sugihan – Sungai Saleh 	Tim 11 TRGD (Dishut Prov.) Sumsel	BKSDA Sumsel, KLHK (Branch of MoEF)
S6	PS-2R	Data transmission system SESAME II-02d AWLRS With fence (18 Jun. 2017)	With ■ External Antenna ■ Initial setup fee ■ System usage fee (1 year)	<ul style="list-style-type: none"> ■ S2° 43'9.06", E105° 7' 45.61" ■ Hutan Suaka Margasatwa Padang Sugihan (Conservation Forest) ■ Desa Sidomulyo, Kecamatan Muara Padang, Kab. Banyuasin ■ KHG Sungai Sugihan – Sungai Saleh 	Tim 11 TRGD (Dishut Prov.) Sumsel	BKSDA Sumsel, KLHK (Branch of MoEF)
S7	AS-1R	Data transmission system SESAME II-02d AWLRS With Fence (13 Jun. 2017)	With ■ External Antenna (Grant from ZMEI/MEI) ■ Initial setup fee ■ System usage fee (1 year)	<ul style="list-style-type: none"> ■ S3° 6'44.24", E105° 12' 49.29" ■ Areal Penggunaan Lain (Head of Dusun) (Outside of State Forest) ■ Desa Riding, Kecamatan Pangakalan Lampam, Kab. OKI ■ KHG Sungai Sugihan – Sungai Lumpur 	Tim 11 TRGD (Dishut Prov.) Sumsel	Community Group (MPA?)
S8	PT-1	Data transmission system SESAME II-02d AWLRS With Fence (19 Jun. 2017)	With ■ Initial setup fee ■ System usage fee (1 year)	<ul style="list-style-type: none"> ■ S3° 29'41.87", E104° 58' 2.04" ■ Hutan Produksi Terbatas Pedamaran Kayu Agung, KPH Wil. V Mesuji (Production Forest Non Concession) ■ Desa Pulau Geronggang, Kecamatan Pedamaran Timur, Kab. OKI ■ KHG Sungai Sibumbang – Sungai Batok 	Tim 11 TRGD (Dishut Prov.) Sumsel	KPH, Prov. Sumsel (FMU of Provincial Forestry Service)

Sources: JICA Survey Mission for Data Collection on Forest & Peatland Fire Control and Peatland Restoration in Indonesia (Phase 2)

**Overview of Water table Monitoring Equipment in
South Sumatra installed in June 2017**

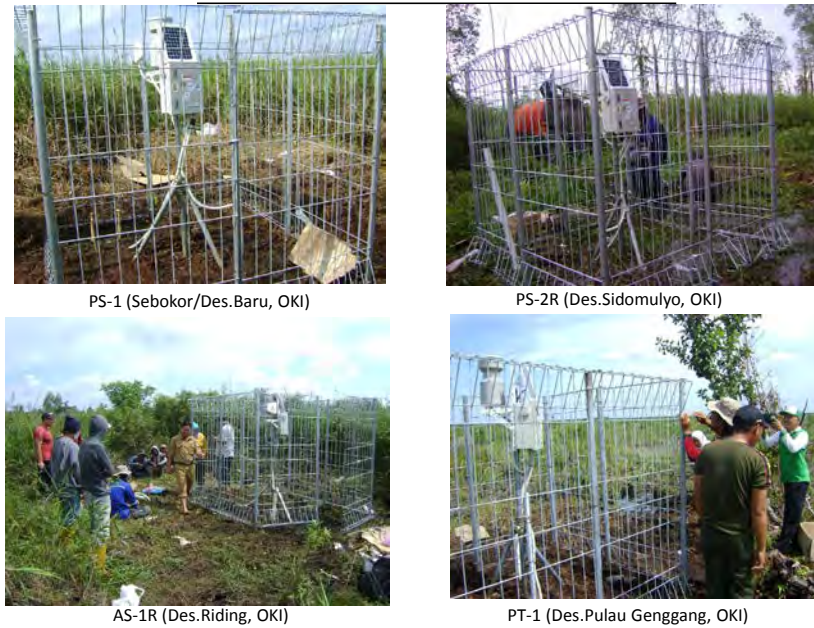


Figure 2.5.2.1. Overview on Installed Sites and Manager of Peatland Water Table Monitoring Equipment (Newly installed in phase 2) in South Sumatera Province

Sources: JICA Survey Mission for Data Collection on Forest & Peatland Fire Control and Peatland Restoration in Indonesia (Phase 2)

Table 2.5.2.2 Outline on Installed Sites and Manager of Peatland Water Table Monitoring Equipment (Newly installed in phase 2) in Central Kalimantan Province

Procured in Phase 2 by JICA Mission
(Central Kalimantan installed in July 2017)

No.	Code	Goods/ Jenis (Inspection Date/ Tgl. Inspeksi Terencana)	Specification/ Spesifikasi	Planned Location/ Lokasi Terencana	Temporarily Manager/ Pengelola Sementara	Proposed Field Manager/ Calon Pengelola
C1	SJ	Data transmission system SESAME II-02d AWLRS With Fence (9 Jul. 2017)	With ■ External Antenna (Temporarily from local market) ■ Initial setup fee ■ System usage fee (1 year) <Regular SIM>	<ul style="list-style-type: none"> S2° 53'12.95", E113° 50' 16.11" Tanah Kelompok Tani (Demplot PLTB BRG D2), Areal Penggunaan Lain (Outside of State Forest) Desa Sebangau Jaya, Kecamatan Sebangau Kuala, Kab. Pulang Pisau KHG Sungai Katingan-Sungai Sebangau 	TRGD (Dishut/DisL H Prov.) Kalteng	Community Group (MPA?)
C2	PM	Data transmission system SESAME II-02d AWLRS With fence (9 Jul. 2017)	With ■ Initial setup fee ■ System usage fee (1 year) <Regular SIM>	<ul style="list-style-type: none"> S2° 51'29.78", E113° 48' 25.44" Tanah Kelompok Tani (Demplot PLTB BRG D2), Areal Penggunaan Lain (Outside of State Forest) Desa Paduran Mulya, Kecamatan Sebangau Kuala, Kab. Pulang Pisau KHG Sungai Katingan-Sungai Sebangau 	TRGD (Dishut/DisL H Prov.) Kalteng	Community Group (MPA?)
C3	BT	Data transmission system SESAME II-02d AWLRS With fence (10 Jul. 2017)	With ■ Initial setup fee ■ System usage fee (1 year) <Regular SIM>	<ul style="list-style-type: none"> S2° 49'48.96", E114° 10' 8.14" Kawasan Hutan KPHP Unit 31 Kahayang Hilir (Production Forest Non Concession) Desa Buntoi, Kecamatan Kahayang Hilir, Kab. Pulang Pisau KHG Sungai Kahayang-Sungai Sebangau 	TRGD (Dishut/DisL H Prov.) Kalteng	KPH, Prov. Kalteng (FMU of Provincial Forestry Service)
C4	MT	Data transmission system SESAME II-02d AWLRS With fence (11 Jul. 2017)	With ■ External Antenna ■ Initial setup fee ■ System usage fee (1 year) <Regular SIM>	<ul style="list-style-type: none"> S2° 45'2.35", E114° 10' 40.72" Kawasan Hutan KPHP Unit 31 Kahayang Hilir (Production Forest Non Concession) Desa Mantaren I, Kecamatan Kahayang Hilir, Kab. Pulang Pisau KHG Sungai Kahayang-Sungai Sebangau 	TRGD (Dishut/DisL H Prov.) Kalteng	KPH, Prov. Kalteng (FMU of Provincial Forestry Service)

Sources: JICA Survey Mission for Data Collection on Forest & Peatland Fire Control and Peatland Restoration in Indonesia (Phase 2)

Procured in Phase 2 by JICA Mission
(Central Kalimantan installed in July 2017)



Figure 2.5.2.2 Overview on Installed Sites and Manager of Peatland Water Table Monitoring Equipment (Newly installed in phase 2) in Central Kalimantan Province

Sources: JICA Survey Mission for Data Collection on Forest & Peatland Fire Control and Peatland Restoration in Indonesia (Phase 2)

Table 2.5.2.3 Outline on Installed Sites and Manager of Peatland Water Table Monitoring Equipment (Newly installed in phase 2) in Riau Province

Procured in Phase 2 by JICA Mission
(Riau installed in July 2017)

No.	Code	Goods/ Jenis (Planned Inspection Date)	Specification/ Spesifikasi	Planned Location/ Lokasi Terencana	Planned Temporarily Manager/ Pengelola Sementara Terencana	Proposed Field Manager/ Calon Pengelola
R1	ST	Data transmission system SESAME II-02d AWLRS With Fence (17 Jul. 2017)	With <ul style="list-style-type: none"> ■ External Antenna ■ Initial setup fee ■ System usage fee (1 year) 	<ul style="list-style-type: none"> ■ N0° 50'4.39", E102° 56' 27.22" ■ Hutan Desa, Kawasan KPH Tebing Tinggi (Production Forest Non Concession) Desa Sungai Tohor, Kecamatan Tebing Tinggi Timur, Kab. Kepulauan Meranti ■ KHG Pulau Tebing Tinggi 	TRGD (Dishut Prov.) Riau	Dis LH Kab. (District Env. Office)?
R2	LK	Data transmission system SESAME II-02d AWLRS With Fence (16 Jul. 2017)	With <ul style="list-style-type: none"> ■ Initial setup fee ■ System usage fee (1 year) 	<ul style="list-style-type: none"> ■ N0° 55'52.10", E102° 48' 52.31" ■ Tanah Desa (untuk hibahkan kegiatan BRG-Walhi) di Kawasan KPH Kepulauan Meranti (Production Forest Non Concession) ■ Desa Lukun, Kecamatan Tebing Tinggi Timur, Kab. Kepulauan Meranti ■ KHG Pulau Tebing Tinggi 	TRGD (Dishut Prov.) Riau	KPH, Prov. Riau (FMU of Provincial Forestry Service)

Sources: JICA Survey Mission for Data Collection on Forest & Peatland Fire Control and Peatland Restoration in Indonesia (Phase 2)

Procured in Phase 2 by JICA Mission

(Riau installed in July 2017)

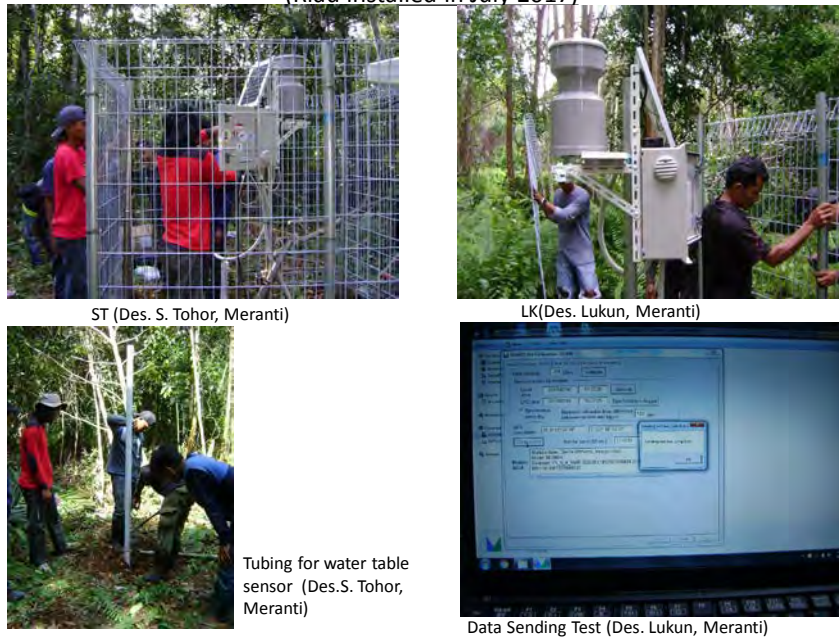


Figure 2.5.2.3. Overview on Installed Sites and Manager of Peatland Water Table Monitoring Equipment (Newly installed in phase 2) in Riau Province

Sources: JICA Survey Mission for Data Collection on Forest & Peatland Fire Control and Peatland Restoration in Indonesia (Phase 2)

2.5.3 Issues in Management of Water Table Monitoring Equipment at Installed Sites

(1) Prospect and issues on future management of equipment each site

Outline of prospect and issues on future management of equipment each site is as follows.

a) South Sumatera Province

- Team work by TRGD is very active.
- Targeted actual field managers are BKSDA as a branch of MoEF for 2 sites, KPH as a branch of provincial forestry service for 4 sites, community groups for 2 sites and district for 1 site. Most dominant managers are central and provincial authorities.
- Actual field managers have potential to secure and execute management budget by facilitating initiatives of TRGD.

b) Central Kalimantan Province

- Activity by TRGD secretariat has just started.
- Targeted actual field managers are KPH as a branch of provincial forestry service for 2 sites and community groups for 2 sites. KPH has also just restarted activity in Jul. 2017 since transition time from district government to provincial government.
- It will take time until actual field managers can secure and execute management budget.

c) Riau Province

- Activity by TRGD secretariat has just started.

- Targeted actual field managers are KPH as a branch of provincial forestry service for 2 sites. However KPH didn't change to belong to provincial government. Moreover 1 site is designated as village forest. And district government still has forestry service even after revision of Law on Local Administration and TRGD Secretary also assumes district environmental and forestry service in management of KPH.
- It will take time until actual management can begin.

(2) Issues predicted in relation to management

a) Assurance and execution of budget for maintenance and management by BRG

Based on the handover documents (BAST), BRG will register installed SESAME as National Asset. BRG will be required to visit the installed sites to put the registration numbers to the installed SESAME¹⁸. If delay of registration as National Asset, BRG will be difficult to assure and execute maintenance and management budget from BRG budget.

b) Follow up landowners at installed SESAME in APL

Landowners in APL are community. It is inferred that even the consent to install SESAME, community will expect payment to them as honorarium to watching out or patrolling SESAME. Examination of agreement for maintenance and management with landowners will be important. Payment of honorarium will be required from maintenance and management budget according to the agreement.

c) Delay of payment of telecommunication fee

All of installed SESAME in Central Kalimantan Province uses regular SIM due to failed data transmission by M to M SIM not similar to other provinces. Regular SIM needs to pay telecommunication fee every month through the distributor.

d) Distortion of location on Web and site

The 4 equipment installed in Phase 1 in South Sumatera showed the difference in location information between one on Web and one transmitted from equipment. The cause inferred is MEL change the location on google map maybe due to distortion of Google Map because MEL felt incompatibility of location information transmitted from equipment on maps. In the handover document, location information maintains the description information using the one transmitted from the equipment.

e) Vulnerability to legal conflict

Basic structure of equipment is assembling of existing product with any intellectual right.

There is no process to handover data itself to owner of data. BRG cannot feel ownership even after handover.

Original data is stored in producer's server. BRG will be obliged to take legal action to the producer who stores original data if it happens to leak, misuse of data in server depending on security.

f) Vulnerability in financial management due to high price

The equipment will become fixed asset due to high price. While IT develops so fast and updating equipment will be needed in short term. But it will difficult to update the equipment due to fixed assets.

¹⁸ BRG cannot execute maintenance and management MORPOLAGA granted by BPPT in 2016 because BRG cannot register the granted MORPOLAGA as National Asset due to no signed BAST.

CHAPTER 3 PROFILE SURVEYS IN TARGETED AREA

3.1 Profile of Targeted Area

3.1.1 Overview of Targeted Area

Based on the request from BRG on October 28, 2016, and the Minutes of Meeting between BRG and JICA regarding the basic survey on the peatland restoration in Indonesia, signed on November 11, 2016, the Pre-feasibility Study for Peatland Restoration for the 4 districts in 3 provinces, where the urgent actions are necessary, (hereinafter referred to as “the pre-F/S”) as the sub-contract basis. The Pre-F/S was conducted in coordination with the provincial peatland restoration team (TRGD) under each provincial governor, in order to conduct the profile surveys, including condition survey, market survey, preparation of candidate location maps and profiles, planning of demonstration plots, etc., for the 7 Peatland Hydrological Units (KHGs) in 4 districts in 3 provinces.

Table 3.1.1.1 Candidate Peatland Hydrological Units (KHGs) for the Peatland Restoration Businesses

Province	District	Peatland Hydrological Units (KHG)
South Sumatra	Ogan Komering Ilir (OKI)	Sungai Sugihan- Sungai Lumpur, Sungai Sibumbang- Sungai Batok Sungai Sugihan- Sungai Saleh
	Musi Banyuasin (MUBA)	Sungai Air Hitam Laut- Sungai Buntu Kecil
Riau	Kepulauan Meranti	Pulau Tebing Tinggi
Central Kalimantan	Pulang Pisau.	Sungai Kahayang- Sungai Sebanggau Sungai Kahayang- Sungai Kapuas/Sungai Katingan- Sungai Sebanggau

Sources: JICA Survey Mission for Data Collection on Forest & Peatland Fire Control and Peatland Restoration in Indonesia (Phase 2). 2017 (as of May 2017)

Detail information of Targeted Areas for the Pre-F/S for the peatland restoration intervention are described below.

(1) Ogan Komering Ilir (OKI) District in South Sumatra Province

Ogan Komering Ilir (OKI) District is one of the districts in South Sumatra province, with extension of 19,023 km², located in the lowland areas with average altitude of 10m a.s.l. Population has 787,513 in total, in which 402,169 male and 384,894 female, in 2015, and growth rate is 1.45% between 2014 and 2015.

Human Development Index (HDI/ IPM) shows 63.87, which is lower than the provincial average ratio: 66.75.

The revenue of OKI district increase to 1,600 billion IDR in 2015 from 1,519 billion IDR in 2014. The average per capita expenditure of the population increased 27.8% from 2014 which amounted to IDR 564,733 per month in 2014 to IDR 722,014 per month in 2015. Comparison between food and non-food expenditure is food expenditure (56%) and non-food expenditure (44%).

Economic growth in OKI district indicates slowdown from the previous year; 5.07% in 2014, and 4.81% in 2015. The highest growth sectors are the information and communication sector (14.4%), followed by the transportation and warehousing sector (12.1%).

Among the labor forces by business sectors, the sectors of agriculture, forestry, animal husbandry, fishery and plantation are those have the largest number of workers (1,244

worker) in 2015. The sectors of agriculture, forestry, animal husbandry, fishery and plantation contribute most to the regional economy in OKI district. Among the agriculture sector, paddy (rice) is the leading commodity, resulting in 567,999 t production of rice in 2015 from the paddy fields of 138,460 ha. Plantation is also one of the leading commodities in the agriculture sector in OKI district. The largest areas of smallholders plantation is rubber plantation with 155,005ha, followed by palm oil with 14,932 ha and coconut with 3,323 ha.

(2) Musi Banyuasin (MUBA) District, South Sumatra

Musi Banyuasin (MUBA) District is one of the districts in South Sumatra province, with extension of 14,265 km², with 14 sub-districts and 250 villages. Population has 611,510 in total, of which 13.6% of the population reside in the capital city of the district: Sekayu.

Human Development Index (HDI/ IPM) of MUBA district shows 64.93, which is lower than the provincial average ratio: 66.75.

GRDP of MUBA with oil and gas is worth for 53,913 billion IDR in 2015, at current prices for the last 3 years. The economic growth of MUBA with oil and gas in 2.28% in 2015, which goes down from 4.67% in 2014, however, the economic growth of MUBA without oil and gas shows 4.94% in 2015.

The average per capita expenditure of the population was IDR 622,954 per month in 2014, and IDR 373,319 are communed for food, and remained IDR 249,615 are for non-food.

Agriculture in the main business sector in MUBA district, and plantation products; i.e. rice, rubber, coconut, and palm oil, are mainly produced. There are also mineral/ mining products, and industrial goods, and these products are supported by the trade and transport sectors in MUBA district.

The geographical conditions consist mostly of wavy highlands with elevations ranging from 20-140m a.s.l., and many rivers/ streams flow to the downstream. For those areas, it is possible to transport to the district capital through the land route, however, it needs to take water route (by public/ private boats) to downstream villages.

(3) Kapulauan Meranti District, Riau Province

Kapulauan Meranti District is one of the districts in Riau province, with extension of 3,714 km², composing in the main four islands, with 9 sub-districts and 101 villages. Population has 181,095 in total, in which 93,017 males and 88,078 females, in 2015, and growth rate is 0.57% between 2010 and 2015. About 30% of the total population reside in Tebing Tinggi Island, the largest island in the district.

Human Development Index (HDI/ IPM) of Kapulauan Meranti district shows 62.91.

The revenue of Kapulauan Meranti district shows 15.12 trillion IDR in 2015, in which approximately 40% of them come from the agriculture sector.

As there are abundant natural resources related to mining, plantation and fisheries in the district, Kapulauan Meranti district has high potential on investment. Plantations have important position in agricultural sector both nationally and regionally. Main commodities from the plantations are palm oil and rubber. The extensive data and production of plantation crops in 2015 shows the total areas of rubber plantation 20,394ha, areca nut 394 ha, coconut 31,453ha, and sago 38,614ha, with production of rubber: 7,636t, areca nut: 160t, coconut: 27,384t and sago: 200,062t. In addition, there are 3,162ha of non-hybrid paddy field, 367ha of maize, 216ha of cassava in the district.

(4) Pulang Pisau District, Central Kalimantan

Pulang Pisau District is one of the districts in Central Kalimantan province, with

extension of 8,997 km², with 8 sub-districts and 95 villages. Population has 124,845 in total, in which 64,939 males and 59,906 females, in 2015, and growth rate is 0.67% between 2014 and 2015.

Human Development Index (HDI/ IPM) of Kapulauan Meranti district shows 65.00.

GRDP of Pulang Pisau is worth for 3,687 billion IDR in 2015, in which agriculture sector worth for 38.9%, followed by the construction sector for 15.9%. The economic growth of Pulang Pisau shows 7.80% in 2015.

The average per capita expenditure of the population was IDR 796,854 per month in 2015, and IDR 440,613 are communed for food, and remained IDR 356,241 are for non-food.

As there are abundant natural resources related to mining, plantation and fisheries in the district, Kapulauan Meranti district has high potential on investment. Plantations have important position in agricultural sector both nationally and regionally. Main commodities from the plantations are palm oil and rubber. The extensive data and production of plantation crops in 2015 shows the total areas of rubber plantation 20,394ha, areca nut 394 ha, coconut 31,453ha, and sago 38,614ha, with production of rubber: 7,636t, areca nut: 160t, coconut: 27,384t and sago: 200,062t. In addition, there are 3,162ha of non-hybrid paddy field, 367ha of maize, 216ha of cassava in the district.

Agriculture is the main business sector in the district, and the plantation commodities, such as rice, rubber, coconut, and palm oil, are produced in the whole district. In 2015, there are 94,772 ha of paddy fields, 18,015ha of dry field/ gardens, 12,678ha of farm/ huma, and 41,256ha of unused land. The largest vegetable production in Pulang Pisau district is the long bean and bananas. Rubber is the highest production plantation in the district, with 88,252t of production from 46,880ha rubber gardens.

3.1.2 Issues and Potential of Targeted KHG

Those issues on the targeted KHG are to be considered in terms of peatland natural conditions, and social conditions.

- Land status issue: the areas with good accessibility have been already utilized as the concessions.
- Natural conditions: the peatland where canals have been dug become lower ground water level, drier peat, and prone to be fired. Also most areas are already suffered from the fire.
- Access issues: not so good accessibility from the main cities. Most of the remained village forests are located in the areas, which are a bit far from the village center.

Contrarily, there are also such potentials for the target KHG in terms of site and natural conditions as follows:

- As the many peatland areas are located relatively nearby the coast/ sea, and easy to transport/ move to the coastal areas through existing rivers/ canals, there may be possibilities that products, which would be produced in the targeted areas, to be exported not only inside Indonesia, but also to the neighboring countries, through the water route, depending on the production volumes and quality of the products.
- As there are possibilities to produce the products which are not yet marketed/ distributed at the market, there may be possibilities to explore the new markets, depending on the production volumes and quality of the products.

3.1.3 Issues and Potential on Economic Activities at Peatland in Targeted Area

Basically, the peatland areas are located in the rural areas, and have low accessibilities from the main cities, due to the less infrastructure: i.e. roads, bridges, railways, from the main cities. In terms of natural conditions, the peatland areas are considered not to be suitable for investment, due to acid soil conditions, high ground water level, and prone to be burnt. In terms of social conditions, most of villages show high poverty ratio inside and surrounding with the peatland, and main business are related to agriculture, forestry, and fishery. Under these circumstances, public fund and services are basically used for the peatland restoration activities, however, it is important to facilitate private sectors to involve in the peatland restoration, in order to restore wider areas of degraded peatlands.

The following issues are considered in case of facilitating private sectors to involve in peatland restoration activities.

- It is difficult to obtain loans from the financial institutions, due to lack of major industry in the peatland areas.
- Most of private companies and financial institutions do not recognize the importance of peatland restoration.
- In case that private companies in and nearby the peatland areas try to obtain loans from the banks, it would occur the shortage of collateral and warranty, because most of private companies in and nearby the peatland areas are in small scale.
- It would be difficult to decide investment to the peatland areas, because of lack/shortage of incentives for investment to the peatland areas.
- It would be difficult for the late-coming companies to enter business for the peatland areas where are easy to access/ easy to develop, because most of such areas are already utilized by the concessionaires.

Contrarily, there are also such potentials for the private sectors to involve in the peatland restoration activities in terms of site and natural conditions as follows:

- As there are vast un-utilized areas in the peatland areas, it would be possible to implement the large-scale business, even though it would be necessary to conduct adequate control and management of ground water level, and prevention of peatland fire.
- As the many peatland areas are located relatively nearby the coast/ sea, and easy to transport/ move to the coastal areas through existing rivers/ canals, there may be possibilities that products, which would be produced in the targeted areas, to be exported not only inside Indonesia, but also to the neighboring countries, through the water route, depending on the production volumes and quality of the products.

3.2 Examination of Method of Market Analysis of Commodity Crops Adaptable to Peatland Environment

3.2.1 Overviews of Technical Standards and Basic Plans in Relation to Peatland Restoration

(1) Technical Standards

As peatland restoration become urgent issues in Indonesia, several concerned ministries/agencies, i.e. MOEF, BRG, issue regulations and guidelines on peatland restoration continuously. The following Minister Regulation of Ministry of Environment and Forestry has become the basic technical standard for the peatland restoration. Apart from this Regulation, BRG prepares and issues the technical guidelines on the specific technical

issues.

The MoEF issued the Ministerial Regulation on the technical guideline for recovery of functions of peatland ecosystem (P.16/ MENLHK/ SETJEN/ KUM.1/2/2017) on February 2017. This ministerial Regulation is based on the former Ministerial Regulation No. 71¹⁹ of 2014, and to be coordinated with the Ministerial Regulation (P.14/MENLHK/SETJEN/ KUM.1/2/2017²⁰) on the procedure of inventory and defining of peatland ecosystem functions. The Ministerial Regulation No. P.16/2017 is to be the guideline for peatland ecosystem restoration for the implementing agencies, activities, local government, central government and communities, and stipulates basis for restoration, criteria on damage, importance of peatland restoration, target for restoration, and so on. It also stipulates the procedures on planning, implementing, monitoring and reporting, and evaluation for peatland ecosystem restoration, and describes the implementing methods of peatland ecosystem restoration of the peatland hydrological units (SKHG) through the newly-introduced methods due to the development of science technology.

In addition, BRG continues to prepare the guidelines on activities related to peatland restoration from the start of its establishment in 2016. The following guidelines have been/ are to be prepared as of July 2017.

Table 3.2.1.1 Guidelines on Peatland Restoration prepared and to-be-prepared by BRG

Document Name	Issued Date
Technical Guideline for Canal Blocking	Under preparation
Guidance and Procedures for Nursery Development in Peatlands	2016
Guidance and Procedures for Peat Swamp Forest Cultivation	2016
Guidelines and Procedures for Planting in Peatlands and Maintenance	2016
Technical Guideline for Revegetation on the Peatland	2017
Guideline for Social Safeguard for Peatland Restoration	Under consideration
Guideline and Manuals for Ground Water Level Monitoring	Under consideration
Guideline for Zero Burning Peatland Management	To-be published in August 2017

Sources: JICA Survey Mission for Data Collection on Forest & Peatland Fire Control and Peatland Restoration in Indonesia (Phase 2). 2017 (as of August 2017)

(2) Basic planning of peatland restoration

The main ministries/ agencies responsible for peatland restoration are Sub-directorate of Peatland Damage Control under MoEF (PKG), BRG and Sub-directorate of Lowland under Directorate of Water Resources of PU-PR.

BRG is one of the main implementing agencies for peatland restoration in Indonesia, which has been established by the Presidential Regulation No.1 in 2016. BRG is the 5-year-limited agency, and has obligation to promote and facilitate the restoration for 2 million-ha peatland in the 7 priority provinces, in coordination with the concerned agencies/ ministries. Following the establishment of BRG on January 2016, BRG stipulated BRG 5-year Strategic Plan, and Peatland restoration Action Plan, and facilitate the TRGDs in 7 provinces to establish the provincial peatland restoration action plans. As of August 2017, the 3 provinces, which are priority provinces in 2016; namely Riau, South Sumatra and Central Kalimantan, have already established the provincial action plans.

The peatland areas in the BRG's prioritized 7 provinces are categorized as shown in the

¹⁹ PP No.71/2014: Peraturan Pemerintah Republik Indonesia Nomor 71 Tahun 2014 tentang Perlindungan Dan Pengelolaan Ekosistem Gambut

²⁰ Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor P.14/MenLHK/Setjen/Kum.1/2/2017 tentang Tata Cara Inventarisasi dan Penetapan Fungsi Ekosistem Gambut

following table, based on the criteria for priority restoration, and the total peatlands areas become 2.5 million ha.

Table 3.2.1.2 Peatland Areas in the BRG's Prioritized Seven Provinces

Province	Post-Burn Incident in 2015 fire			Peat dome with canals		Shallow peat with canals	Total
	Production forest (with license)	Production forest (without license)	Protected areas (KK and HL)	Production forest (with license)	Protected areas (KK and HL)	Protected areas (KK and HL)	
Riau	38,884	63,535	2,008	668,502	9,913	31,890	814,732
Jambi	19,245	26,008	19,642	80,530	2,738	3,500	151,663
South Sumatra	172,290	76,797	41,277	305,573	10,427	9,543	615,907
West Kalimantan	1,769	27,239	2,850	62,308	4,801	20,667	119,634
Central Kalimantan	16,057	162,951	155,899	13,754	173,577	190,837	713,076
South Kalimantan	1,586	11,153		26,022			38,761
Papua	4,144	29,262	4,659	278		409	38,753
Total	253,975	396,945	226,335	1,156,968	201,457	256,846	2,492,527

Note: KK=Kawasan Konservasi or Conservation Areas, HL=Hutan Lindung or Protections Forests

Source: Documents for the Donor Coordination Meeting, facilitated by BRG (April 18, 2017)

Divided the restoration Targeted Areas (approximately 2.5 million ha) by the management types, concession areas are occupied more than half of the total restoration Targeted Areas, as shown in the following table.

Table 3.2.1.3 Restoration Targeted Areas by the Management Type

Management Type	Category	Area	Percentage
National and Regional governments	Sub-total	689,000ha	28%
	Conservation areas	337,000ha	13%
	Protection areas	352,000ha	14%
Community	Sub-total	396,000ha	16%
	Production forest	234,000ha	9%
	APL areas	162,000ha	6%
Concessions	Sub-total	1,400,000ha	56%
	Production forest in peatland	250,000ha	10%
	Protection areas in peatland	1,150,000ha	46%
Total		2,500,000ha	100%

Source: Documents for the Donor Coordination Meeting, facilitated by BRG (April 18, 2017)

In the BRG 5-year action plan, BRG has set the annual restoration targets, ranging 200,000ha and 600,000ha as shown in the following table.

Table 3.2.1.4 Year-wise Targeted Areas for Restoration

Year	Restoration Target (ha)	Priority Mapping result (ha)	
		Non-Licensed	Licensed
2016	600,000	0	600,000
2017	400,000	235,000	325,000
2018	400,000	325,000	285,000
2019	400,000	325,000	200,900
2020	200,000	195,600	0
Total	2,000,000	1,081,600	1,411,400
		2,500,000	

Source: Documents for the Donor Coordination Meeting, facilitated by BRG (April 18, 2017)

The peatland restoration would be implemented through formulating the contingency plans per each KHG. Among all the prioritized KHGs in the target 7 provinces, the contingency plan in 2017 has been formulated for the following 32 KHGs in 6 provinces.

Table 3.2.1.5 List of targeted KHGs of Contingent Peat ecosystems Restoration Plan 2017 in the target 6 provinces

Province	KHG	Province	KHG	
Riau	KHG Pulau Padang	West Kalimantan	KHG Sungai Ambawang - Sungai Kubu	
	KHG Pulau Tebing Tinggi		KHG Sungai Kapuas - Sungai Simpang Kanan	
	KHG Sungai Kampar - Sungai Gaung		KHG Sungai Landak - Sungai Mempawah	
	KHG Sungai Rokan - Sungai Siak Kecil		KHG Sungai Punggurbesar - Sungai Ambawang	
	7KHG	KHG Sungai Kiyap - Sungai Keinci	Central Kalimantan	KHG Sungai Kapuas - Sungai Barito
		KHG Sungai Siak - Sungai Kampar		KHG Sungai Kahayan - Sungai Kapuas
		KHG Sungai Tapung Kiri - Sungai Kiyap		KHG Sungai Kahayan - Sungai Sebangau
Jambi	KHG Sungai Mendahara - Sungai Batanghari	4KHG	KHG Sungai Katingan - Sungai Sebangau	
	KHG Sungai Baung - Sungai Betara		South Kalimantan	KHG Sungai Balangan - Batangalai
	KHG Sungai Betara - Sungai Mendahara	KHG Sungai Barito - Sungai Alalak		
4KHG	KHG Sungai Pengabuan - Sungai Baung	4KHG	KHG Sungai Barito - Sungai Taping	
South Sumatra	KHG Sungai Air Hitam Laut - Sungai Buntu Kecil*		KHG Sungai Utar - Sungai Serapat *	
	KHG Sungai Lalan - Sungai Merang			
	KHG Sungai Merang - Sungai Ngirawan			
	KHG Sungai Ngirawan - Sungai Sembilang			
	KHG Sei Lalan - Sungai Bentayan			
	KHG Sungai Bentayan - Sungai Penimpahan			
	KHG Sungai Penimpahan - Sungai Air Hitam			
	KHG Sungai Sugihan - Sungai Lumpur			
9KHG	KHG Sungai Saleh - Sungai Sugihan			
Total		32 KHG		

Note: * Cross province KHG

Data source: KHG MOEF March 2017

Source: Documents for the Donor Coordination Meeting, facilitated by BRG (April 18, 2017)

3.2.2 Selection of Possible Suitable Business

Basically, the peatland areas are located in the rural areas, and have low accessibilities from the main cities. In order to select suitable business to these areas, it would be necessary to consider the suitability to the areas and accessibilities to/from such areas. The possible businesses suitable to the target districts (4 districts in 3 provinces) would be 1) agriculture, 2) forestry, 3) fishery, and 4) tourism. Based on the discussions with concerned officials from BRG and the provinces, the following activities would have higher possibilities to introduce and implement in the peatland areas.

(1) Agroforestry, including sago palm, and bioenergy

Alternative livelihood improvement activities are to be one of the options for peatland restoration in Indonesia. As of now, those activities, i.e. paldiculture (wetland agriculture),

plantation and utilization of sago palm, handicrafts by rattan, etc. are considered to be optional activities. Those tree species and agricultural products, suitable for paldiculture, are listed in the Ministerial Regulation on technical standard for recovering the functions of peatland ecosystem²¹ as following table.

Table 3.2.2.1 Types and Species naturally inhabited in the peatland, which can be utilized for vegetation recovery and paldiculture in the peatland

No.	Benefit	Selected Species
1.	Producers of food (including fruit, carbohydrates, protein, spices and fats / oils)	Sago (<i>Metroxylon</i> spp.) Asam kandis (<i>Garcinia xanthochymus</i>) Kerantungan (<i>Durio oxleyanus</i>) Pepaken (<i>Durio kutejensis</i>) Mangga kasturi (<i>Mangifera casturi</i>) Mangga kueni (<i>Mangifera odorata</i>) Rambutan (<i>Nephelium</i> spp.) Nipah (<i>Nypa fruticans</i>) Kelakai (<i>Stenochlaena palustris</i>) Tengkawang (<i>Shorea stenoptera</i> , <i>S. macrophylla</i>) Liberian coffee (<i>Coffea liberica</i>)
2.	Producers of fiber (as a substitute raw material for pulp and paper)	Geronggang (<i>Cratoxylum arborescens</i>) Terentang (<i>Campnosperma auriculatum</i>) Gelam (<i>Melaleuca cajuputi</i>)
3.	Source of bio-energy (wood pellets, briquettes, bio-ethanol)	Gelam (<i>Melaleuca cajuputi</i>) Sago (<i>Metroxylon sago</i>) Nipah (<i>Nypa fruticans</i>) Bintangur (<i>Callophyllum</i> sp.)
4.	Producing sap / latex	Jelutung (<i>Dyera polyphylla</i>) Nyatoh (<i>Palaquium leiocarpum</i>) Sundi (<i>Payena</i> spp., <i>Madhuca</i> spp.)
5.	Sources of medicines	Akar kuning (<i>Cosciniun fenestratum</i>) Pulai (<i>Alstonia pneumatophora</i>)
6.	Timber for construction	Klakok (<i>Gluta renghas</i>) Tumih (<i>Combretocarpus rotundatus</i>) Gelam (<i>Melaleuca cajuputi</i>)
7.	Source of honey bee (apiculture)	Gelam (<i>Melaleuca cajuputi</i>) Blawan (<i>Tristaniopsis</i> sp.)
8.	Other forest products	Gaharu (<i>Aquilaria</i> sp.) Gemor (<i>Alseodaphne</i> sp.) Purun tikus (<i>Elaeocharis dulcis</i>) Rotan irit (<i>Calamus trachycoleus</i>)
9.	Wood conservation value	Ramin (<i>Gonystylus bancanus</i>) Meranti merah (<i>Shorea macrantha</i> , <i>Shorea balangeran</i>)

Source: Ministerial Regulation No. P.16/2017, modified by the results of interviews with FORDA and Directorate General of Social Forestry (2017)

(2) Livestock

1) Abstract

Livestock production in Indonesia is basically stipulated by the Law on Animal Husbandry and Animal Health (Law No. 18/2009)²², its amendment (Law No. 41/2014)²³, and Government Regulation No. 48 of 2011 on Genetic Resources of Animals and Live stocking (PP 48/2011)²⁴. However, there are no specific descriptions

²¹ Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor P.16/MenLHK/Setjen/Kum.1/2/2017 tentang Pedoman Teknis Pemulihan Fungsi Ekosistem Gambut

²² Law No. 18 of 2009 on Animal Husbandry and Animal Health

²³ Law No. 41 of 2014 on Amendment to Law No. 18 of 2009 on Animal Livestock and Health

²⁴ Government Regulation No. 48 of 2011 on Genetic Resources of Animals and Livestocking

and articles on the livestock on the peatland in those regulations. Based on the interviews with the concerned organizations, those livestock, i.e. water buffalo/ cattle, poultry (chicken, and duck), are considered to be the possible livestock which can be introduced to the peatland areas.

2) Cow/ Cattle, Water Buffalo

a) Species/ Varieties

Based on the information from the Livestock Research Agency, the following species/ varieties are recommended to the peatland areas, depending on the site conditions.

- ✓ Bali Cow / Local cattle Central Kalimantan
- ✓ Water Buffalo South Sumatra

b) Production of fodder materials

In order to increase the productivity of livestock, it is necessary to produce / secure the adequate fodder for each livestock. Although there are many kinds of fodder plants suitable for mineral soils, there are limited varieties suitable for peatland areas.

Normally, amounts of fertilizers are applied to increase the productivity of one kinds of fodder at pasture lands, however, it would have risks in water pollution in the downstream areas.

In order to minimize the fertilizer application, and maximize the growth of pasture, mixed planting with fodder plants and leguminous plants encompassing rhizobia, as leguminous plants encompassing rhizobia can fix nitrogen in the air, and the fixed nitrogen will facilitate the fodder to grow.

The ordinal fodder varieties do not grow well at the acid soil, such as below pH4. However, the following fodder plants and leguminous plants could grow well on the peatland areas.

Table 3.2.2.2 Type and Varieties of Fodder Plants, to be able to Cultivate on the Peatland Areas

Category	Variety	Description
Fodder grass	<i>Brachiaria decumbens</i>	Fodder grass native in Africa. It can grow in infertile soil and below pH3.5. Slow growth under waterlogged heavy clay areas. ²⁵
	<i>Setaria sphacelata</i> var. <i>splendida</i>	Fodder grass native in Africa. It can grow in infertile soil. Dry season should be short to grow well. Growth rate would decrease during the less rain period and dry season, and have high resistance to inundation. ²⁶
	<i>Hymenachne amplexicaulis</i> (Kumpai Grass)	Fodder plants, native in the North America, and spread to all over the world. Water conditions are important for it to grow, and it can grow at the high humid areas; i.e. edge of swamp/ pond, flood plain, river side. It also can grow at the areas with water depth of 1-2m. ²⁷
Legumes	<i>Sesbania rostrata</i>	Legumes, native in Africa. This is used for green manure and fodder for livestock, as it fixes nitrogen and grows fast. Although it can grow at the acid soil (below pH4.3), the ratio of fixing nitrogen will decrease

²⁵ http://www.tropicalforages.info/key/Forages/Media/Html/Brachiaria_decumbens.htm

²⁶ http://www.tropicalforages.info/key/Forages/Media/Html/Setaria_sphacelata_var._splendida.htm

²⁷ http://www.tropicalforages.info/key/Forages/Media/Html/Hymenachne_amplexicaulis.htm

Category	Variety	Description
		under such conditions. Bad growth at the heavy clay areas. ²⁸
	<i>Indigofera zollingeriana</i>	Legumes, native in South East Asia. Inhabit on the coast and sandy beach. It can grow at the sunny mountainous areas. Suitable for dried peat soils. It can be planted as the shade trees for other crops. ²⁹

Source: Results of interview with Livestock Research Agency and Directorate of Animal Feed, Directorate General of Livestock and Veterinary Health, Ministry of Agriculture (2017)
Tropical Forage website: <http://www.tropicalforages.info/>

3) Poultry (Chicken and duck)

Based on the information from the Livestock Research Agency, the following species/ varieties are recommended to the peatland areas, depending on the site conditions.

Table 3.2.2.3 Type and Varieties of Poultry, to be able to raise at the Peatland Areas

Category	Variety	Description
Chicken	KUB Chicken (superior chicken)	Interbred variety in Indonesia. Hens will produce much eggs, and cocks are utilized as meat.
Duck	Master Duck	Hybrid with Mojosari variety and Alabio variety (MA duck). Can be suitable for several kinds of environment. ³⁰
	Mojosari Putih	White Mojosari (hybrid of Mojosari duck and Peking duck)

Source: Results of interview with Livestock Research Agency and Directorate of Animal Feed, Directorate General of Livestock and Veterinary Health, Ministry of Agriculture (2017)

Even though the productivity of poultry would be increased by commercial feeds, it may be difficult for the rural villagers to apply commercial feeds, due to the high costs. In case poultry raising freely, it may be no need to feed them, but it also be possible to feed them, mixed with sago draft.

Also paddy with duck raising, which is popular in Japan, is also one of the possible combination to raise poultry. By feeding grasses and pest insects, it would become no need to supply herbicide and insecticide, and wastes of duck may facilitate the paddy grow well.

(3) Aquaculture/ fish culture

- 1) Aquaculture at the reservoirs The small water reservoirs upstream from the canal blocking, which are to be constructed crossing the canals could be utilized for fish culture, as one of the possible activities. The fish in the following table are to be considered to be cultured in the peatland water. It is necessary to select adequate species, depending on the natural environment, i.e. water quality, acidity, etc.

Table 3.2.2.4 Fish varieties suitable for aquaculture in the peatland areas

	Species	Remarks
1.	Papuyu (<i>Anabas testudineus</i>)	Most suitable to introduce
2.	Gabus Haruan (<i>Chanana striata</i>)	Most suitable to introduce
3.	Jelawat (<i>Leptobarbus hoevenii</i>)	

²⁸ http://www.tropicalforages.info/key/Forages/Media/Html/Sesbania_rostrata.htm

²⁹ <http://tropical.theferns.info/viewtropical.php?id=Indigofera+zollingeriana>

³⁰ <http://agricultural-info.blogspot.jp/2014/02/master-ducks-commercial-seed-laying.html>

4.	Kelabau (<i>Osteochilus melanopleuras</i>)	
5.	Arwana (<i>Schleropages formosus</i>)	
6.	Baung (<i>Mystus nemurus</i>)	
7.	Gurami (<i>Ospronemus gouramy</i>)	
8.	Belida (<i>Chitala lopis</i>)	

Source: Results of interview with Directorate General of Aquaculture, Ministry of Maritime Affairs and Fisheries (2017)

2) Minapolitan (Fishery-recommended Areas): Minapadi (aquaculture in paddy field) / Ugadi (shrimp culture in paddy field)

Based on the Ministerial Regulation of Maritime Affairs and Fisheries No. 18 of 2012³¹ and No. 35 of 2013³², aquaculture methods, in accordance with the Minapolitan, are being promoted. The guideline of planning Minapolitan was stipulated based on the Ministerial Regulation No. 18 of 2012, the recommended areas for promoting Minapolitan are being specified based on the Ministerial Regulation No. 35 of 2013, and the recommended fish varieties are selected, based on the Regulation of Directorate General of Aquaculture No. 111^a of 2015³³. Based on those regulations, such activities as Minapadi; aquaculture in paddy field, and Ugadi; shrimp culture in paddy field, are promoted. At this moment, those activities are promoted only in Java Island.

Table 3.2.2.5 Lists of Locations to be recommended for Minapolitan Aquaculture, and recommended Fish Varieties

Province	District	Minapolitan Aquaculture Area *1	Minapolitan Fishing Area *1	Commodity *2
Riau	Kepulauan Meranti	-	PPI Tanjung Samak	-
South Sumatra	Ogan Komering Ilir (OKI)	Kecamatan Lempuing Kecamatan Mesuji Kecamatan SP Padang Kecamatan Pampangan Kecamatan Jewawi	-	Udang, Patin, Mas, Nila
	Musi Banyuasin (MUBA)	Kecamatan Lais Kecamatan Sungai Lilin Kecamatan Sekayu	PUD Sungai Musi	Nila, Patin
Central Kalimantan	Pulang Pisau	Kecamatan Kahayan Hilir Kecamatan Jabiren Raya	-	-

Source:

*1: Ministerial Regulation of Maritime Affairs and Fisheries No. 35 of 2013

*2: Regulation of Directorate General of Aquaculture No. 111A of 2015

(4) Paddy

Paddy could be implemented at the shallow peat areas: 60-100cm in depth, together with soil improvement and water level control. At the deep peat areas, it would be very difficult to conduct paddy.

One of the rice varieties, suitable for the wet and swamp areas could be recommended:

³¹ Menteri Kelautan dan Perikanan Republik Indonesia Nomor PER.18/MEN/2012 tentang Pedoman Penyusunan Rencana Induk Pengembangan Kawasan Minapolitan

³² Menteri Kelautan dan Perikanan Republik Indonesia Nomor PER.18/MEN/2012 tentang Pedoman Penyusunan Rencana Induk Pengembangan Kawasan Minapolitan

³³ Direktur Jenderal Perikanan Budidaya Nomor 111A/KEP-DJPB/2015 tentang Lokasi Sentra Produksi Perikanan Budidaya Berbasis Kawasan Minapolitan Terintegrasi Tahun 2016

Inbrida Padi Rawa (INPARA). Especially for the peatland areas, IMPARA3³⁴ was recommended by the Agriculture Center. This variety of paddy: IMPARA3, are most suitable for paddy activities in the peatland, cultivate with fish and shrimp through above-mentioned Minapolitan method.

(5) Reduction of Greenhouse Gas (GHG) Emission

Indonesia's annual greenhouse gas (GHG) emissions amounted to approximately 2.1 Giga tons (Gt) in 2005, mainly from decomposition of peat, deforestation, forest fire, and so on. Among the total emission in Indonesia, approximately 78% volumes come from peatland, of which 41% are generated by decomposition of the peat soils (DNPI, 2010)³⁵. Therefore, the reduction of the GHG emissions from peatland will contribute to the reduction of the whole amounts of emissions.

It is also reported the emissions from peatland differ from the land uses on the peatland. Kanematsu (2016)³⁶ reports the differences of land-use wise CO₂ emissions in the southern part of Vietnam, which show CO₂ emissions at agriculture land (36.4 tCO₂/ha/yr) and melaleuca plantation sites (31.8 tCO₂/ha/yr) are higher than the peatland in the less-disturbed national park (27.3 tCO₂/ha/yr). Taking the peatland fires into consideration as one of the natural disturbances, the emissions from the areas with fire damages (27.3 tCO₂/ha/yr) is about twice compared with the areas without fire damages (13.65 tCO₂/ha/yr). Accordingly, the CO₂ emissions increase by developing the peatland into the agricultural lands, and also suffering the fire damages, it is necessary and important to conduct adequate manages of the developed areas, peatland restoration, and fire prevention for the peatland.

3.2.3 Examination of Criterion to Select Possible Suitable Business

Site conditions and social conditions differ from each target district. Therefore, adequity of activities to be introduced to each target district will be examined, based on the following criteria. Also, the requests of the villagers and plans/ requests of BRG/ TRGD are also to be considered for examining the proposed activities.

Table 3.2.3.1 Example list of Criteria to examine the Adequity of Activities to be Introduced to Target Sites

Criteria	Details	Remarks
Existence of peat	1.1 Peat depth: shallower than 0.5m 1.2 Peat depth: deeper than 0.5m till 2m 1.3 Peat depth: deeper than 2m	Paddy can be introduced to the areas with shallow peat.
Land status	1.4 State forest Production forest Protection forest National park 1.5 Other use land/ APL	
In which, type of concession	1.6 Logging concession (HPH) 1.7 Palm Oil Plantation Concession (HGU) 1.8 Industrial Forest Plantation Concession (HTI) 1.9 Ecosystem restoration concession 1.10 No licensed area	

³⁴ <http://bbpadi.litbang.pertanian.go.id/index.php/varietas/inbrida-padi-rawa-inpara/content/item/71-inpara-3>

³⁵ Dewan Nasional Perubahan Iklim, Indonesia (DNPI: National Council on Climate Change), 2010, Indonesia's Greenhouse Gas Abatement Cost Curve

³⁶ Kanematsu Corporation and Japan NUS (2016): Final report for FY 2015 Feasibility Study for the Joint Crediting Mechanism for Reduced Emissions from Deforestation and forest Degradation-Plus in Developing Countries

Criteria	Details	Remarks
Accessibility to and from villages and market	1.11 Near from the villages	In case that target sites are located far from the village center, and/or a bit far from the market or there are no infrastructure to the market from the target site, long-life products should be introduced to such areas.
	1.12 Far from the village	
	1.13 Near to the market	
	1.14 Far to the market	
	1.15 With infrastructure to access	
	1.16 Without infrastructure to access	

Sources: JICA Survey Mission for Data Collection on Forest & Peatland Fire Control and Peatland Restoration in Indonesia (Phase 2). 2017

Also, such criteria would be examined to consider adequate of investment.

Table 3.2.3.2 Criteria to examine the Adequate of Investment

	Criteria	Description
1	Contribution to peatland restoration	Whether ground water level increase up to 0.4m below the ground or not.
2	Implementing body	Whether implementing body is definite or not.
3	Benefit-ability	Whether B/C ratio is over 1.0 or not.
4	Profitability	Whether actual benefit will be obtained or not.
5	Payback period	How many years does it take to start to obtain profit?

Sources: JICA Survey Mission for Data Collection on Forest & Peatland Fire Control and Peatland Restoration in Indonesia (Phase 2). 2017

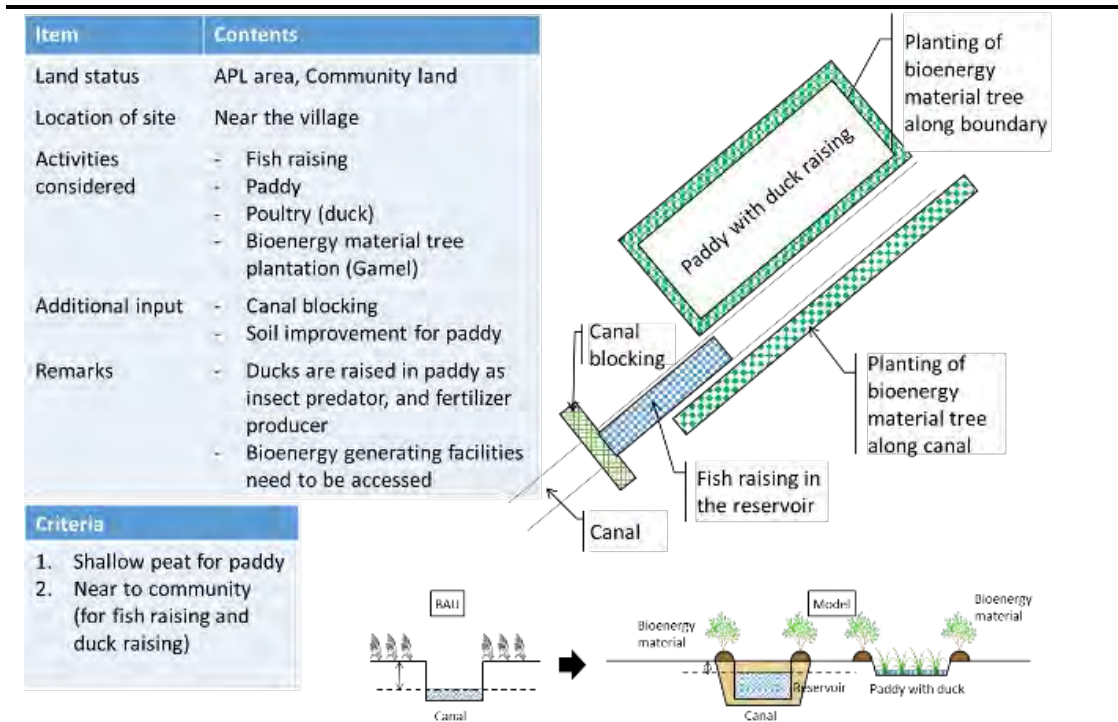
3.2.4 Examination of Mix of Possilbe Suitable Business and Commodity Crops

To-be introduced activities to the target sites were preliminary examined by examining the activities listed in the sub-clause 3.2.2 based on the criteria listed in the sub-clause 3.2.3 at first, as shown in the following table. The results of examination were referred to and utilized by the sub-contracted pre-F/S study. Those basic business models to the peatland restoration are integrated models to combine several activities suitable for each site, by considering the site conditions and social conditions, and so on.

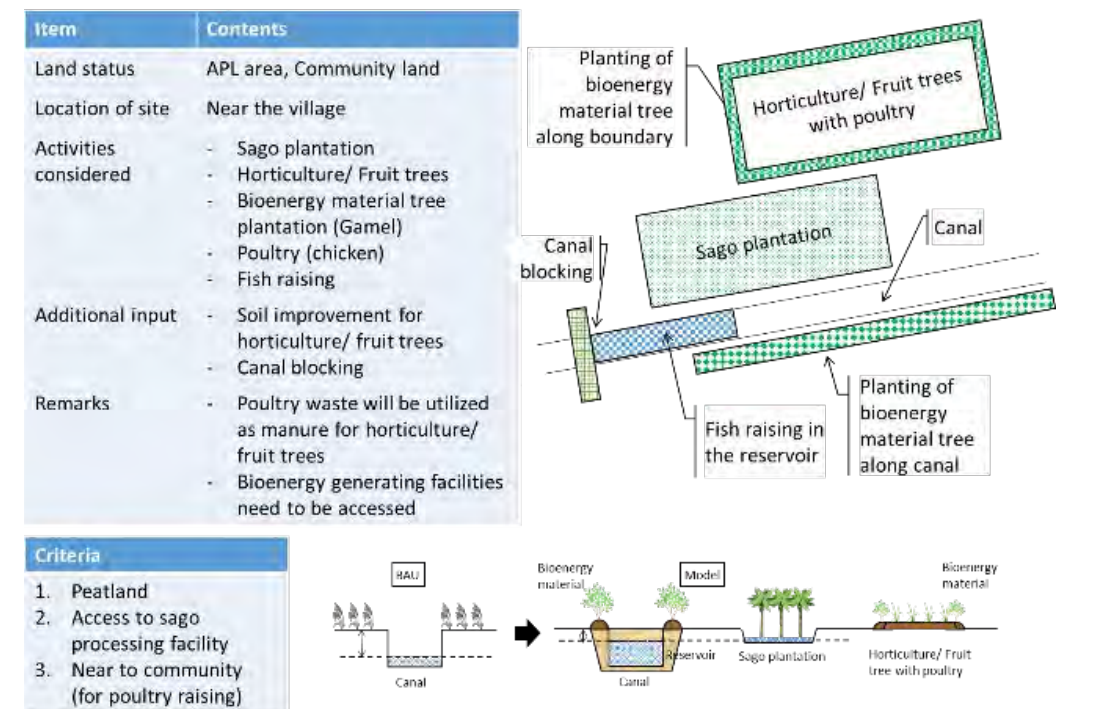
Table 3.2.4.1 Example of the Basic Business Models on the Peatland Restoration

Products	Activity Item	Tentative Basic Business Models				
		Model 1	Model 2	Model 3	Model 4	Model 5
Agriculture products	Vegetables		X	X		
	Fruit trees		X	X		
	Rice (paddy)	X				
	Materials for bioenergy	X	X	X	X	
	Coffee					
Forest-related products	Sago palm		X		X	
	Indigenous trees				X	X
	Indigenous plants					X
	Non-timber forest products				X	
Livestock/ fishery	Water buffalo			X		
	Chicken		X	X		
	Duck	X				
	Fish	X	X			
	Fodder cultivation			X		
Non-productive activity	Infrastructure for eco-tourism					X
	Canal blocking	X	X	X	X	X

Sources: JICA Survey Mission for Data Collection on Forest & Peatland Fire Control and Peatland Restoration in Indonesia (Phase 2). 2017



(1) Model 1: Business model to consider the measures to tackle with food, water and energy (example model at APL/ customary land)



(2) Model 2: Business model to consider the measures to tackle with food, water and energy (example model at APL/ customary land)

Figure 3.2.4.1 Examples of Basic Business Model

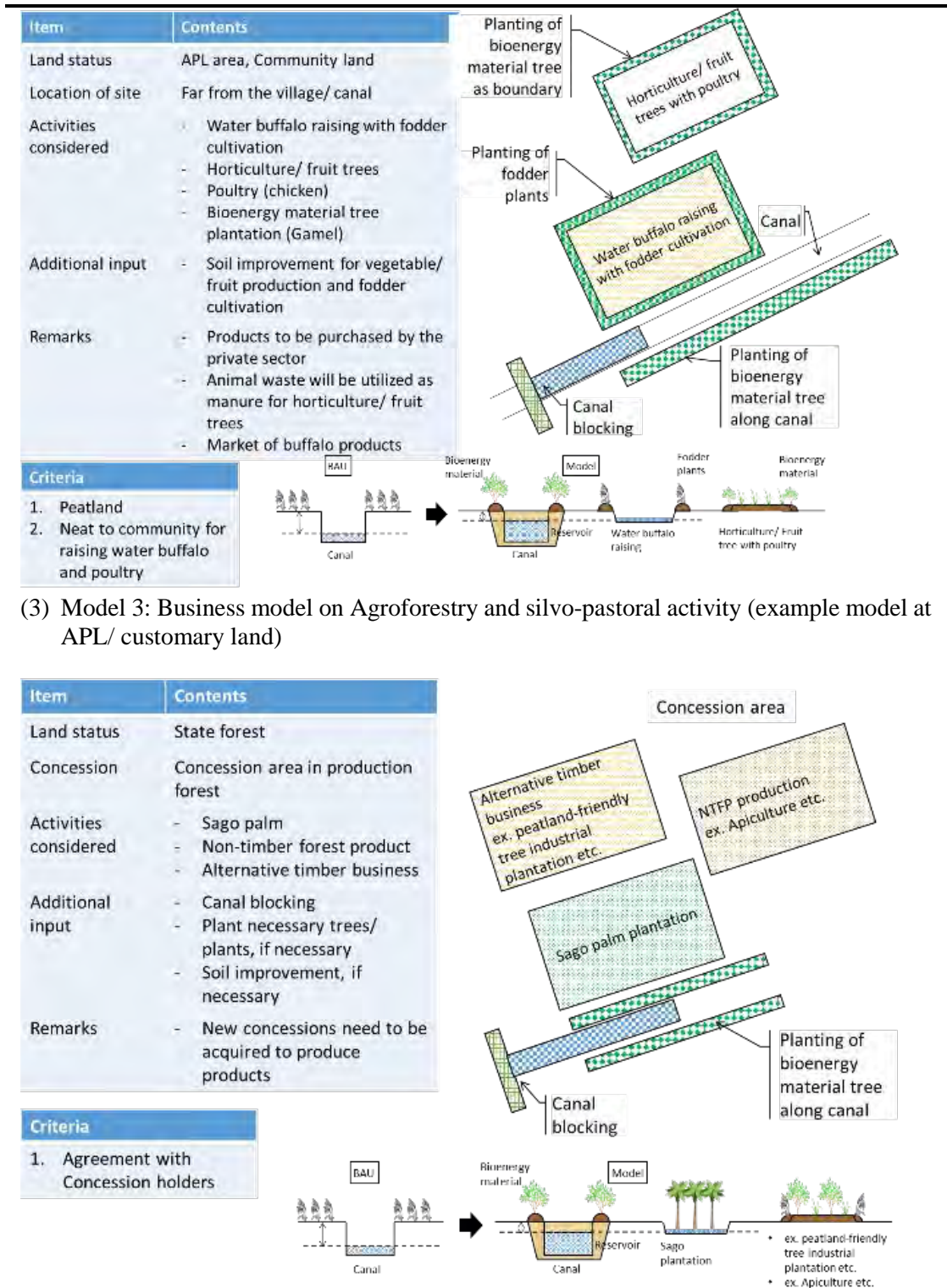
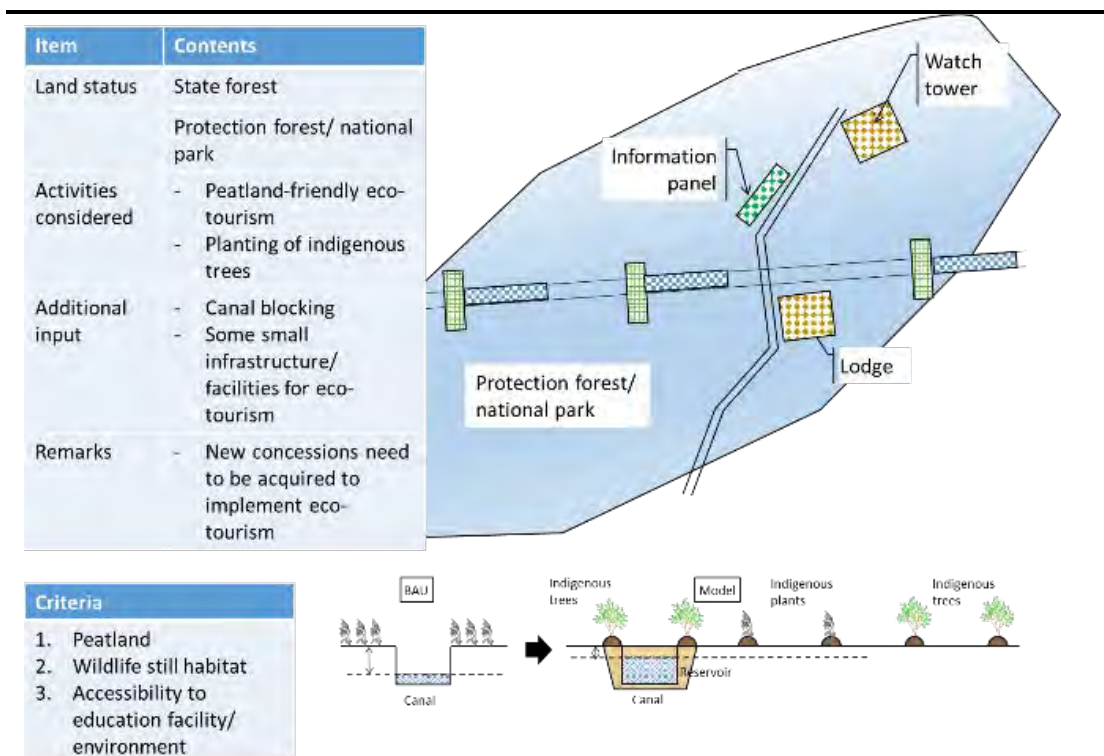


Figure 3.2.4.1 Examples of Basic Business Model (Continued)



(5) Model 5: Business model on eco-tourism, agro-tourism (protection areas)

Figure 3.2.4.1 Examples of Basic Business Model (Continued)

Sources: JICA Survey Mission for Data Collection on Forest & Peatland Fire Control and Peatland Restoration in Indonesia (Phase 2). 2017

Based on the results of the pre-F/S survey, the details of basic business models are examined, followed by the detail implementing plan and economic analysis.

3.2.5 Examination of Business Schemes and Financing Schemes

To-be proposed business models are divided into two models, depending on the implementing bodies: community-based activities and corporative-based activities, due to site conditions, production conditions, and so on. The criteria to determine implementing bodies are shown in the following table.

Table 3.2.5.1 Criteria to determine the Implementing bodies by the Activities

Criteria	Implementing Bodies	
	Community -based Activity	Corporative-based Activities
Initial investment	Initial investmant is in small amount or not	Initial investmant is in large amount or not
Total cost	Total project cost is in small amount or not	Total project cost is in large amount or not
Benefitability	It can be that B/C ration is below 1.0.	B/C ratio should be more than 1.0.
Marketability	Accessibility to the small-scale market.	Accessibility to the large-scale market.
Productivity	Productivity is relatively in small scale or not.	Whether it can be produced more than some amount or not.
Processing (Maintenance of	When transporting the product for long distance, the products	When transporting the productfor long distance, the

Criteria	Implementing Bodies	
	Community -based Activity	Corporative-based Activities
quality)	will be damaged without processing or not.	quality of the products will be maintained even without processing or not.
Processing (processing facility)	Whether products can be processed by the small and simple facility or not.	Whether products need to be processed, and need large-scale processing facility or not.

Sources: JICA Survey Mission for Data Collection on Forest & Peatland Fire Control and Peatland Restoration in Indonesia (Phase 2). 2017

Depending on the above-mentioned two implementing bodies, financing schemes, which can be utilized, differ from the implementing bodies, as following table.

Table 3.2.5.2 Financing Schemes to be utilized by the Implementing Bodies

Implementing Body	Financial Scheme to be utilized
Community base	Financial schemes in Indonesia are to be utilized: KUR, Forest Development Fund, etc. Details of financial schemes are described in the Chapter 4.4
Corporative base	Facilitation of investment by private sectors. Public and private bonds/ funds, such as Green Bond, etc. Can be utilized. Details of financial schemes are described in the Chapter 4.4

Sources: JICA Survey Mission for Data Collection on Forest & Peatland Fire Control and Peatland Restoration in Indonesia (Phase 2). 2017

3.3 Results of Market Research on Commodity Crops and Services Adaptable to Peatland Environment

3.3.1 Results of Potential Commodity Crops and Service Adaptable to Peatland Environment

Natural and social conditions of the target sites differ from each other, even all the sites are located on the peatland. Therefore, the pre-F/S was conducted by the consortium of the 3 universities in the target three provinces, and the possibilities of the commodities and services, which are possible to produce and feasible, at each district in each province, were surveyed and analyzed, and the feasibilities of each product/ service were examined. The commodities/ services, which are defined to be feasible, are listed in the following table.

Table 3.3.1.1 List of Products and Services, which are defined to be feasible, for each district

Category	Items	Target Province/ District			
		Riau	South Sumatra		Central Kalimantan
		Meranti	OKI	MUBA	Pulang Pisau
Agriculture/ plantation	Food crop	Sago	Swamp paddy		Paddy, maize
		Vegetable			Chili, water melon
	Fruit		Pineapple	Pineapple	
	Coffee	Liberica coffee	Liberica coffee		
	Areca nut			Areca nut	
Forestry	Plantation				Rubber
		Fast growing trees	Gelam plantation		

Category	Items	Target Province/ District			
		Riau	South Sumatra		Central Kalimantan
		Meranti	OKI	MUBA	Pulang Pisau
	Indigenous trees	Beriang plantation	Tree planting		
	NTFP	Kenaf	Kenaf	Purun (grass)	Kenaf
Aquaculture			Fisheries in flooding season (Lebak kebung)	Fish culture upstream from canal blocking	Fish culture
Livestock			Water buffalo		Duck raising
Processing		Production of sago flour			
		Utilization of sago waste			
		Processing of NTFP			
Others		Eco tourism			
		Reduction of GHG emission			

Sources: Final Report for BRG-JICA Pre-Feasibility Study for Peatland Restoration Investment at Four Priority Areas in Indonesia. 2017(as of Oct. 2017)

3.3.2 Market Research and Cost-Benefit Analysis on Prospective Commodity Crops

- (1) OKI district, South Sumatra province
 - 1) Products from Water Buffalos (Gulo Puan)
 - a) Market analysis

The market of products from the water buffalo milk in OKI district is still limited. The products are usually transferred to Palembang once or twice a week, with 30-60kg per once, and sold in the capital city. Gulo puan, produced in OKI, are usually sold to the middlemen directly from the producers. As the production of buffalo milk is not stable, the production of gulo puan is also unstable. The products from the water buffalo milk are quite new for Palembang, with small amounts of sales and less recognition among the citizens. In order to increase the volumes of production, sales and recognition of the products, it is necessary to establish the structures and facilities to produce value-added products: i.e. caramel milk candy, yohgurt, and ice cream, etc.

Price of fresh buffalo mil is 15,000 - 20,000IDR/litter, and gulo puan can be sold as 60,000IDR/litter.

- b) Financial analysis

The results of financial analysis of production of Gulo puan from hte milk of water buffaloes are shown in the following table.

Table 3.3.2.1 Financial analysis of production of Gulo Puan during the paddy season (between June and October)

Item	Value	Remarks
Unit scale	Production: 30kg/month	
Analysis period	5 months	
Initial investment	IDR 0.6 million	
Production cost	IDR 5.9 million	32litter
Sales amount	IDR 1.8 million	30kg
Revenue	IDR 9.0 million	
RCR	1.53	

Sources: Final Report for BRG-JICA Pre-Feasibility Study for Peatland Restoration Investment at Four Priority Areas in Indonesia. 2017 (as of Oct. 2017)

Table 3.3.2.2 Financial analysis of production of Gulo Puan during the non-paddy season (between November and May)

Item	Value	Remarks
Unit scale	Production: 60kg/month	
Analysis period	7 months	
Initial investment	IDR 0.6 million	
Production cost	IDR 13.0 million	80litter
Sales amount	IDR 3.6 million	60kg
Revenue	IDR 24.2 million	
RCR	1.94	

Sources: Final Report for BRG-JICA Pre-Feasibility Study for Peatland Restoration Investment at Four Priority Areas in Indonesia. 2017 (as of Oct. 2017)

2) Swamp fisheries (Dry fish and smoked fish)

a) Market analysis

Only 10% of dry fish and smoke fish produced in OKI district are consumed inside OKI, and most of production (90%) of salted fish and smoke fish products are marketed outside the province, with most demand from Bandung, Bogor and Padang for salted fish, while Medan for smoked fish. In average, the products are delivered twice a week, and 100kg of salted fish are sold outside of the province per day. As most of products are sold to outside of the province, there are generally no significant constraints among the producers, traders and collectors. Therefore, main competitors are those from Jambi and North Sumatra.

The problem on swamp fishery in OKI is not enough warehouse/ storage to store the products before transporting them to the market.

b) Financial analysis

The results of financial analysis on the production of dried salted fish and smoked fish are as follows:

Table 3.3.2.3 Financial Analysis on the production of Dried Salted Fish

Item	Value	Remarks
Unit scale	Production: 3,000kg/month	Raw materials: 9,000kg/month
Analysis period	1 months	
Initial investment	IDR 110.8/month	
Production cost	IDR 120.0 million /month	
Sales amount	IDR 8.5 million /month	
Revenue	IDR 8.5 million /month	
RCR	1.08	

Sources: Final Report for BRG-JICA Pre-Feasibility Study for Peatland Restoration Investment at Four Priority Areas in Indonesia. 2017 (as of Oct. 2017)

Table 3.3.2.4 Financial Analysis on the production of Smoked Fish

Item	Value	Remarks
Unit scale	Production: 3,000kg/month	Raw materials: 9,000kg/month
Analysis period	1 months	
Initial investment	IDR 18.0 million	
Production cost	IDR 179.5 million/month	
Sales amount	IDR 300.0 million /month	Production volume: 3,000kg/month
Revenue	IDR 119.6 million /month	
RCR	1.66	

Sources: Final Report for BRG-JICA Pre-Feasibility Study for Peatland Restoration Investment at Four Priority Areas in Indonesia. 2017 (as of Oct. 2017)

3) Handicrafts made from Purun grass

a) Market analysis

The handicrafts made from prun grass are generally produced on the order. The local government has attempted to promote these handicraft products to the markets. The main issue is that the marketing method are still on the order basis, followed by the necessity to secure the skilled craftsmen, and securement of purun grass as raw materials. As even the skilled craftsmen can produce only 10 numebns of the products per day, it would be difficult for the craftsmen to get a lots of orders at once.

Even the simple and cheap materials are used for purun handicrafts, those products are sold as follows: purun mat at IDR 25,000-30,000 per piece, purun bag at IDR40,000-50,000 per piece, wallet at IDR 25,000 per piece, and so on.

b) Financial analysis

The results of financial analysis of production of purun handicrafts are shown in the following table.

Table 3.3.2.5 Financial analysis of production of Purun Handicrafts

Item	Value	Remarks
Unit scale	Production: 53,100 unit/month	
Analysis period	1 months	
Initial investment	IDR 1.3 million	
Production cost	IDR 456.3 million /month	
Sales amount	IDR 686.7 million /month	
Revenue	IDR 230.4 million /month	
RCR	1.50	

Sources: Final Report for BRG-JICA Pre-Feasibility Study for Peatland Restoration Investment at Four Priority Areas in Indonesia. 2017 (as of Oct. 2017)

4) Swamp paddy

a) Market analysis

Swampy paddy is generally marketed in local markets to meet local demands. This is because swamp paddy production is still low due to one time production in a year. The income of swamp paddy farmers is still low because of low productivity due to natural obstacles, which are not yey overcome. Also, in general, the harvested rice are sold to middlemen in the form of dry grain, so that the income of farmers are still in low.

b) Financial analysis

The results of financial analysis of production of swampy paddy are shown in the following table.

Table 3.3.2.6 Financial analysis of Swampy paddy production

Item	Value	Remarks
Unit scale	2.5ha	
Analysis period	1 year	
Initial investment	IDR 6.2 million	
Production cost	IDR 20.4 million /year	
Sales amount	IDR 40.0 million /year	
Revenue	IDR 18.0 million /year	Production volume: 1 st year: 10,000kg
RCR	1.82	

Sources: Final Report for BRG-JICA Pre-Feasibility Study for Peatland Restoration Investment at Four Priority Areas in Indonesia. 2017 (as of Oct. 2017)

5) Liberica coffee

a) Market analysis

Liberica coffee is one of the paludiculture commodities, which can be produced on the wamp area and peatland area. This coffee are mainly produced on the peatland areas in Jambi province. Even though small demand of coffee in the local market, however, the coffee beans are marketed to Singapore and Malaysia. In Jambi, the price of liberica coffee is higher than those of Robusta and Arabica coffee, which is IDR 25,000 per kg. Coffee prices from farmers to middlemen amount to IDR 37,000-38,000/kg, then are sold to cooperatives at the prices of IDR 44,500-45,000/kg.

At this moment, packaging of coffee beans in Jambi is still not good condition, so that the improvement of packaging is one of the ways to extend the market of the coffee beans.

b) Financial analysis

As of necessity of shade trees for cultivation of liberica coffee trees, the financial analysis of the production of combination of liberica coffee and arecanut trees, as shown in the following table.

Table 3.3.2.7 Financial Analysis on the production of Liberica coffee and Areaca nuts

Item	Value	Remarks
Unit scale	1 ha	
Analysis period	25 year	
Production cost	IDR 72.38 million	Discount factor: 11%
Revenue	IDR 141.87 million	Discount factor: 11%
NPV	IDR 69.50 million	
BCR	1.96	
IRR	20.5	

Sources: Final Report for BRG-JICA Pre-Feasibility Study for Peatland Restoration Investment at Four Priority Areas in Indonesia. 2017 (as of Oct. 2017)

6) Areca nut

a) Market analysis

Areca nuts are generally grown with agroforestry pattern, with pineapple, coconut, or coffee. The fruits of areca nuts are sold to India and/or Malaysia in a good price, depending on the quality of the products. The price of areca nuts depend on the quality of nuts, types of nuts, and post-harvest drying process. Especially, the water contents in and color of the nuts are important points to be taken care. The main problem at the famer level is tha lack of knowledge to process properly to keep their quality, resulting in low prices.

At the farmer level, the price of younf areca nuts is between IDR 4,000 and 5,000/kg, while for dry nuts as IDR 15,000/kg.

b) Financial analysis

As the combination of areca nuts and other agricultural crops is one of the alternatives on the peatland areas, the financial analysis of the production of combination of areca nuts and paddy/ maize is conducted, as shown in the following table.

Table 3.3.2.8 Financial Analysis on the production of Areca nuts and Paddy/ Maize

Item	Value	Remarks
Unit scale	1 ha	
Analysis period	25 year	

Item	Value	Remarks
Production cost	IDR 116.66 million	Discount factor: 11%
Revenue	IDR 412.62 million	Discount factor: 11%
NPV	IDR 295.97 million	
BCR	3.54	
IRR	30.9	

Sources: *Final Report for BRG-JICA Pre-Feasibility Study for Peatland Restoration Investment at Four Priority Areas in Indonesia. 2017 (as of Oct. 2017)*

7) Pineapple

a) Market analysis

Pineapple has big enough prospective market to fulfill both in domestic and international market. Based on information of the Center of Agricultural Information Systems and Data (2015), the deficit of pineapple production be 17,149t in 2017, and increase to 58,079t in 2019.

Generally, the farmers still sell the crops in the form of fresh fruit to the middlemen, so that the prices are determined by middlemen as buyers.

The crops are generally sold to the middlemen in bulk quantities sometime before harvesting, with the prices of IDR 60-80 million per ha.

b) Financial analysis

As the combination of areca nuts and other agricultural crops is one of the alternatives on the peatland areas, the financial analysis of the production of combination of pineapple and areca nuts is conducted, as shown in the following table.

Table 3.3.2.9 Financial Analysis on the production of Pineapple and Areca nuts

Item	Value	Remarks
Unit scale	1 ha	
Analysis period	25 year	
Production cost	IDR 79.50 million	Discount factor: 11%
Revenue	IDR 364.10 million	Discount factor: 11%
NPV	IDR 284.60 million	
BCR	4.57	
IRR	38.7	

Sources: *Final Report for BRG-JICA Pre-Feasibility Study for Peatland Restoration Investment at Four Priority Areas in Indonesia. 2017 (as of Oct. 2017)*

(2) MUBA District, South Sumatra Province

1) Kenaf

a) Market analysis

As the demand of fiber is quite high both in domestic and foreign countries. Under the climate conditions in Indonesia, kenaf is able to harvest just in 3,5 months after planting, so that there is much possibilities to produce kenaf in Indonesia.

According to the information from the consortium, Mr. Bambang Prayitno has been cultivating kenaf in a 1,500 ha in east Java and Sulawesi. The price of kenaf depends on international fiber prices, and the selling prices range from IDR 9,000 to 20,000 per kg. From the experience of kenaf cultivation in east Kalimantan, in order to produce fiber optimally, it is necessary for kenaf to be planted in a large areas.

Nowadays, kenaf is planted by relatively large areas, and few farmers are interested in cultivating kenaf. That is because kenaf needs to be planted in a large scale, and not easy for farmers to market it if cultivated in a large scale. Most users of kenaf are automobile sectors in Indonesia, so it is not easy for farmers to open and access to such market.

In Indonesia, several companies use kenaf as raw materials to produce their products. For example, PT Indonesia Nihon Seima (Tangerang) produces jute and geotextile mat, and PT Abadi Barindo Autotech (PT ABA) produce special fiberboard for automotive industry. PT. ABA requires 3,000 tonnes of fiber per year, however, only half of their demand can be met in Indonesia, and rest of them (1,500t) are imported from Vietnam.

Japanese and American automobile companies are interested in utilizing kenaf fiber. When manufacturing the environmentally-friendly vehicle, automobile companies recognize the merit to utilize natural raw materials, in replacement of plastic.

In order for that, there are four conditions to be considered in developing the kenaf fiber industry for car interiors, that is, the supply should be on demand, the quality as needed, the cost can compete with the plastic, and the price of kenaf fiber offered by China and Vietnam, and timely delivery so as not to disrupt the process The automotive industry itself.

b) Financial analysis

Generally, kenaf is planted, intercropping with trees and other commodity crops, i.e. maize. The results of financial analysis of production of kenaf at other areas in Indonesia are shown in the following table.

Table 3.3.2.10 Example of Financial Analysis on the production of Kenaf in Indonesia

Loaction/ Site Condition	Implementer	Financial Analysis
Kenaf farm in the tidal swamp land in Central Kalimantan	Agricultural Technology Assessment Board - BPTP, Central Kalimantan	R/C Ratio: 3.04
Kenaf cultivation in the non-tidal swamp land of East Java with intercropping system of Kenaf and maize	Indonesian Tobacco and Fiber Crops Research Institute - Balittas, Malang	B/C Ratio: 2.12
Kenaf cultivation in the non-tidal swamp land in East Java	-	R/C Ratio: 1.56

Sources: Final Report for BRG-JICA Pre-Feasibility Study for Peatland Restoration Investment at Four Priority Areas in Indonesia. 2017 (as of Oct. 2017)

(3) Meranti District, Riau Province

1) Sago Palm

a) Market analysis

The price and prospect of sago market depends on its shape when it is sold. In case sold as stem or tual, then the market is very local because the scope is usually not extensive, maybe only inside one village or between adjacent villages, and may be sold to the local refinery to produce wet sago. In case sold as wet sago, the sale can be wider, from villages to district level, then sold to the secondary refinaery to produce dry sago flour, and sometimes sold to Malaysia.

In the form of dry sago flour, this commodity will reach more wider market. Almost all the sago flour produced in Meranti District is sold to Cirebon company, and very few amounts are consumed locally.

The price of sago plant ranges from IDR 250,000- 400,000 per stem, and IDR 35,000- 40,000 per tual/ pith, depending on the length weight of stem and sold to the primary refinery to produce wet sago. The wet sago / sago paste cost about IDR 1,800 – 2,000 per kg, and the price of dried sago flour reach to IDR 4,500 – 6,000 per kg.

Given the higher economic value when sold as dry sago, the central government has planned the construction of an intergrated sago refinaery and processing plant, with value of IDR 20 billion, by 2020. If this plan would be realized, vast amounts of sago would be necessary as raw materials, so that sago productions would be the sustainable income source for the villagers, even they need the sustainable sago forest management.

The target areas in Meranti island are adjacent to the sago forests of PT. NSP (National Sago Prima). As the productions of sagos from the sago forests (concessions) of PT. NSP do not meet with the production capacities of the processing palnts in the island, they procure and transport sagos from Siak district, located on the opposite side of the river, besides supplying from its own concession areas. Therefore, it is expected that sago trees could be procured by PT. NSP from the forested areas, especially in the Village Forest permits and unlicensed areas managed directly by KPHP Beting Tinggi, through the partnership model with the company.

b) Financial analysis

As it is difficult to secure timbers/ poles at islands, such as Meranti district, there are high demands on the timbers/ poles. And there are many tree species, such as Selumar, which can grow on the peatlands and swamp areas. Therefore, the combination of sago palm and selumar trees is one of the alternatives on the peatland areas, the financial analysis of the production of combination of sago palm and selumar trees is conducted, as shown in the following table.

Table 3.3.2.11 Financial Analysis on the production of Sago Palm and Selumar Trees

Item	Value	Remarks
Unit scale	1 ha	
Analysis period	20 year	
Production cost	IDR 55.4 million	Discount factor: 16%
Revenue	IDR 310.0 million	Discount factor: 16%
NPV	IDR 23.18 million	
RCR	0.98	
BCR	1.98	
IRR	10.74	

Sources: Final Report for BRG-JICA Pre-Feasibility Study for Peatland Restoration Investment at Four Priority Areas in Indonesia. 2017 (as of Oct. 2017)

2) Mushroom production with usage of sago waste

a) Market analysis

Sago refineries produce an enoumous amount of organic waste, such as barks, pith pulp, liquid waste. This plans to cultivate mushroom by using sago waste as medium. The use of sago waste as medium has two advantage: i) effective utilization of sago waste, and ii) new livelihood improvement method to the villagers.

Mushrooms, as food, are comsumed in South East Asia, including Indonesia and East Asia, as the healthy food, and mushroom market is widely open, both inside Indonesia and abroad. In Indonesia, the general price of muchrooms range between IDR 25,000 to 40,000 per kg.

b) Financial analysis

Economic analysis of mushroom production has been done by Mr. Dedi Suyerman. Using the examples that have been done the calculations are obtained as shown in the

following table.

Table 3.3.2.12 Financial analysis of production of Mushroom with usage of Sago Waste

Item	Value	Remarks
Unit scale	4 unit	Sago pulp: 5,000kg
Analysis period	1 year	
Initial investment	IDR 14.5 million	
Production cost	IDR 6.8 million	
Revenue	IDR 201.0 million	Production 600kg/month
RCR	2.10	
BCR	1.10	

Sources: Final Report for BRG-JICA Pre-Feasibility Study for Peatland Restoration Investment at Four Priority Areas in Indonesia. 2017 (as of Oct. 2017)

3) Wood pellet

a) Market analysis

Wood pellet produced in Indonesia are mainly exported to South Korea for industrial and home usages. Recently, many other contries, such as China, Japan and many countries in the Europe have expressed their interested in wood pellet.

b) Financial analysis

Sago waste in the form of stem bark reaches 739,000 t/year, equivalent to production of 465,000t of wood pellets per year. The potential of raw materials and production can grow 20 wood pellet factories with production capacity of 6 ton/hour or 23,000 ton/year.

The financial analysis of the production of wood pellet is conducted, as shown in the following table.

Table 3.3.2.13 Financial analysis of production of Wood pellet

Item	Value	Remarks
Unit scale	1 factory	
Analysis period	1 year	
Production cost	IDR 227.860 million	Discount factor: 16%
Sales amount	IDR 302,400 million	
Revenue	IDR 74,540 million	Discount factor: 16%
NPV	IDR 29,835.19 million	
RCR	0.26	
BCR	1.26	
IRR	48.17	

Sources: Final Report for BRG-JICA Pre-Feasibility Study for Peatland Restoration Investment at Four Priority Areas in Indonesia. 2017 (as of Oct. 2017)

4) Liberica coffee

a) Market analysis

Coffee is one of the most important beverage commodities in the world and in Indonesia. According to the record of the Association of Indonesian Coffee Exporters (AEKI), about 80 percent of the crop yields in the Sempian and Kedabu Rapat are exported to Malaysia.

In the form of green bean, Liberica coffee price is between IDR 40,000 to 50,000 per kg, while in the form of roasted bean, the price reaches IDR 120,000 to 130,000 per kg.

b) Financial analysis

In Sempian and Kedabu Rapat districts, in Jambi province, which are the main production sites of liberica coffee, through proper management can increase productivity to 8,000 to 10,000 kg/ha/year. As it may be difficult to produce same level of production in Meranti district, assuming that coffee can be produced 10% of their level, resulting the production of 800 to 1,000 kg/ha/year as assumption, equivalent to IDR 36 to 45 million per year.

Table 3.3.2.14 Financial analysis of production of Liberica Coffee

Item	Value	Remarks
Unit scale	1ha	
Analysis period	17 years	
Production cost	IDR 87.1 million	Discount factor: 16%
Sales amount	IDR 375.8 million	
Revenue	IDR 288.63 million	Discount factor: 16%
NPV	IDR 43.86 million	
RCR	2.30	
BCR	1.30	
IRR	16.61	

Sources: Final Report for BRG-JICA Pre-Feasibility Study for Peatland Restoration Investment at Four Priority Areas in Indonesia. 2017 (as of Oct. 2017)

(4) Pulang Pisau District, Central Kalimantan

1) Gelam (*Melaleuca cajuputi*)

a) Market analysis

The needs of wood raw material, especially Gelam wood, are high in supporting infrastructure development in Kalimantan, where there are macu swamp areas. Gelam are highly resistant to fires and drought, swamp areas, low pH (3-5) fresh water or high acidity, and less fertile soil. As Gelam has thick bark, so that only 52% of weight of roundwood of Gelam can be used for logs/ timber, and rest of them (48%) are wasted and unused. Gelam is also used for construction of house, and high building, used for concrete casting. Gelam is also used as raw materials for handicrafts, and wastes of Gelam are raw materials for sawmill, charcoal making and charcoal briquettes.

b) Financial analysis

The results of financial analysis of production of Gelam (*Melaleuca cajuputi*) are shown in the following table.

Table 3.3.2.15 Financial analysis of plantation of Gelam (*Melaleuca cajuputi*)

Item	Value	Remarks
Unit scale	1ha	
Analysis period	5 years	
Investment	IDR 45.50 million	Discount factor: 16%
Sales amount	IDR 137.5 million	Discount factor: 16%
NPV	IDR 18.07 million	
BCR	1.38	
Payback period	5 years	

Sources: Final Report for BRG-JICA Pre-Feasibility Study for Peatland Restoration Investment at Four Priority Areas in Indonesia. 2017 (as of Oct. 2017)

2) Laban (*Vitex pinnata* L) planting

a) Market analysis

Laban (*Vitex pinnata* L) is one type of forest plant with spread all over Indonesia, covering Java, Sumatra, Kalimantan, and so on. Laban generally grows well on the mineral soils.

Laban wood sold in the form of logs is only 70% of the total weight, and rest 30% are wasted away. Laban woods are used for interior design, furniture, construction of house, and wasted parts are used for making charcoal. Also leaves and roots of Laban can be used as herbal medicine.

b) Financial analysis

The results of financial analysis of production of Laban (*Vitex pinnata* L) are shown in the following table.

Table 3.3.2.16 Financial analysis of plantation of Laban (*Vitex pinnata* L)

Item	Value	Remarks
Unit scale	1ha	
Analysis period	20 years	
Investment	IDR 56.98 million	Discount factor: 16%
Sales amount	IDR 64.9 million	Discount factor: 16%
NPV	IDR 7.87 million	
BCR	1.14	
Payback period	7 years	

Sources: Final Report for BRG-JICA Pre-Feasibility Study for Peatland Restoration Investment at Four Priority Areas in Indonesia. 2017 (as of Oct. 2017)

3) Balangeran (*Shorea balangeran* (Korth.)) planting

a) Market analysis

Balangeran (*Shorea balangeran* (Korth.)) is one kinds of species of Dipterocarpaceae family, and grows in the humid tropical forests, swamp and river side, peatland, sandy soils. Timber of Balangeran is high resistance to dryness and humidity, balangeran wood is widely used to make small boats and motr boats. As it takes more than 20 years to harvest Balangeran timber, few community cultivate Balangeran trees.

b) Financial analysis

The results of financial analysis of production of Balangeran (*Shorea balangeran* (Korth.)) are shown in the following table.

Table 3.3.2.17 Financial analysis of plantation of Balangeran (*Shorea balangeran* (Korth.))

Item	Value	Remarks
Unit scale	1ha	
Analysis period	20 years	
Investment	IDR 44.09 million	Discount factor: 16%
Revenue	IDR 119.48 million	Discount factor: 16%
NPV	IDR 75.40 million	
BCR	2.71	
Payback period	15 years	

Sources: Final Report for BRG-JICA Pre-Feasibility Study for Peatland Restoration Investment at Four Priority Areas in Indonesia. 2017 (as of Oct. 2017)

4) Rubber plantation

a) Market analysis

Rubber trees are planted in 24,293 ha in Pulang Pisau district, however, are mostly old (70 years old). Therefore, there is a need to replant the new rubber trees, and cut-

down old rubber trees can be the raw materials for wood pellets, furniture, charcoal.

b) Financial analysis

The results of financial analysis of production of rubber trees are shown in the following table.

Table 3.3.2.18 Financial analysis of plantation and production of Rubber tree

Item	Value	Remarks
Unit scale	1ha	
Analysis period	25 years	
Investment	IDR 42.18 million	Discount factor: 16%
Revenue	IDR 48.82 million	Discount factor: 16%
NPV	IDR 6.65 million	
BCR	1.16	
Payback period	9 years	

Sources: Final Report for BRG-JICA Pre-Feasibility Study for Peatland Restoration Investment at Four Priority Areas in Indonesia. 2017 (as of Oct. 2017)

5) Alabio duck raising

a) Market analysis

Alabio duck (*Anas platyrhynchos Borneo*) are native in South Kalimantan, and can grow and develop well on aquatic fields, open spaces with sheltered place of trees. Alabio ducks start producing eggs when aged 5-6 months, with a productive age of 2 years, and egg production for 18 months

b) Financial analysis

The results of financial analysis of raising of Alabio duck are shown in the following table.

Table 3.3.2.19 Financial analysis of raising Alabio Duck

Item	Value	Remarks
Unit scale	100 ducks	
Analysis period	22 months	
Investment	IDR 76.29 million	Discount factor: 16%
Revenue	IDR 36.58 million	Discount factor: 16%
NPV	IDR 39.71 million	
BCR	2.06	
Payback period	1 year	

Sources: Final Report for BRG-JICA Pre-Feasibility Study for Peatland Restoration Investment at Four Priority Areas in Indonesia. 2017 (as of Oct. 2017)

6) Paddy

a) Market analysis

There are 66,052 ha of paddy fields in Pulang Pisau district, and all paddy are not irrigated, but water supply depends of tidal and rain water. Therefore, there is a need to manage water adequately in order to optimize the production of paddy.

b) Financial analysis

The results of financial analysis of production of paddy are shown in the following table.

Table 3.3.3.20 Financial analysis of production of paddy

Item	Value	Remarks
Unit scale	1ha	

Item	Value	Remarks
Analysis period	1 year	
Investment	IDR 6.82 million	
Revenue	IDR 7.38 million	Revenues from cassava, maize and vegetables are included
NPV	0.56 million IDR	
BCR	1.08	
Payback period	1 year	

Sources: Final Report for BRG-JICA Pre-Feasibility Study for Peatland Restoration Investment at Four Priority Areas in Indonesia. 2017 (as of August 2017)

7) Aquaculture

The fishery sector in Pulang Pisau district is mostly from marine/ river/ swamp and inland water (ponds, ponds and keramba). Fishery production KHG S. Kahayan-Sebangau are more than 20,000 tonnes in a year. Local people prefer the processed fish, such as fish asapan, dried fish, and wadi, and processed fish are more expensive than fresh fish.

(5) Services applicable to all the target areas

1) Environmental Services

a) Market analysis

Carbon absorption and carbon trade by adequate forest management could be one of the prospective services, related to the emission reduction of greenhouse gas.

b) Financial analysis

Evaluation of the benefits and costs of reducing emissions from deforestation and forest degradation is conducted by the Forestry research Institute of Palembang (2010). At discount factor 10% in 8 years, timber concession of one company is not feasible; negative NPV, BCR less than 1, and IRR less than 10%. However, in case that forest exploitation would be intended for CO₂ emission reduction or timber/ carbon concessions, the results will show feasible: BCR more than 2, and IRR more than 28%.

Table 3.3.2.21 Financial analysis of business development of environmental services

Commodity	Value (Discount factor: 10%)			Remarks
	NPV (Rp.)	BCR	IRR (%)	
Wood	-3,714,370	0.85	6.65	
Carbon	9,605,864	1.38	18.16	
Wood and carbon	31,261,136	2.23	28.65	

Sources: Final Report for BRG-JICA Pre-Feasibility Study for Peatland Restoration Investment at Four Priority Areas in Indonesia. 2017 (as of Oct. 2017)

2) Emission reduction of Greenhouse gas (GHG)

As it is expected the groundwater levels at peatland areas would be increased by implementing the business mode proposed by the survey, emissions of GHG would be also expected to be reduced. MRV methods for peatlands could be applied for VCS (Verified Carbon Standard) and JCM-REDD+ in Indonesia. This report does not describe each MRV methods in detail, however, the possible reduction volumes of CO₂ emission by implementing the proposed business models will be estimated in this report by referring the methods of existing projects, such as CDM, REDD+.

Based on the PEAT-CO₂ (Hooijer et al., 2006)³⁷, in the report of Shimizu Corporation

³⁷ Hooijer, A, M. Silvius, H. Wösten, and S. Page, 2006: PEAT-CO₂, Assessment of CO₂ emissions from drained peatlands in SE Asia. Delft Hydraulics report Q3943

(2011)³⁸, CO₂ emission reduction will be estimated in this report. Although the target areas for this survey are mainly the areas damaged by fire, PEAT-CO₂ did not consider the CO₂ emission from the peatland fire.

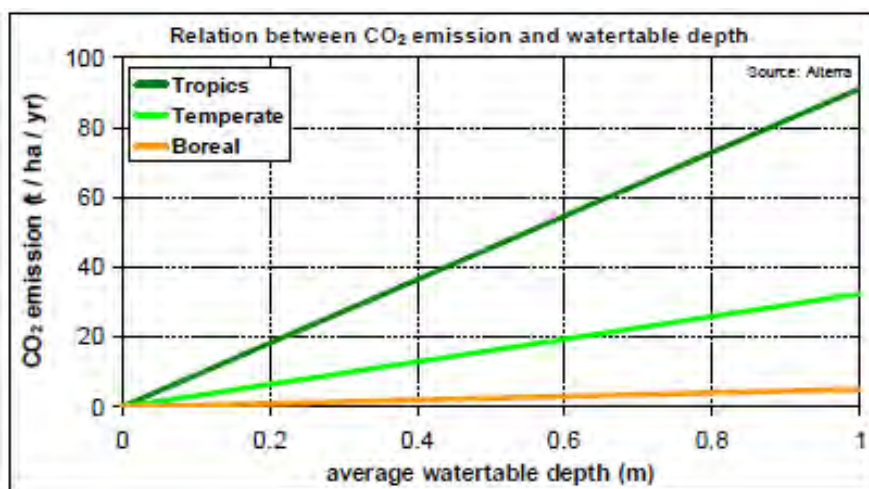


Figure 3.3.2.1 Average Water Table Depth and CO₂ emission

Source: Hooijer et al., (2006)

- Aerobic decomposition of peat occurs caused by drainage from manmade canals in peatland, leading to emission of CO₂.
- The regression line on relation between CO₂ and drainage depth is given by the following expression, which is applicable to drainage depths of 0.5-1 m in Southeast Asia (Hooijer *et al.*, 2006): 91t-CO₂/ha/y per m of drainage depth in peatland.
- More conservative rate of its half is adopted in this survey, as follows.
45.5t-CO₂/ha/y per m of drainage depth in peatland x Area (ha) x difference of drainage depth (m)

In PEAT-CO₂, this regression line is used for calculating CO₂ emission by peat decomposition at the areas with decreasing water levels by drainage. Therefore, when water table would be increased, the CO₂ emission would be reduced (mitigated).

The above-mentioned regression line between the average water table depth and CO₂ emission by Hooijer *et al.* (2006) is used (applicable to drainage depths of 0.5-1 m) for estimating CO₂ emission reduction by implementing the proposed business models by using the below-mentioned conditions. In order for more precise estimation, more detail and continuous surveys would be needed, so that the following estimation would be used for reference only.

- Conditions of emission reduction calculation
 - Model site areas: 100ha
 - Average rise in drainage depth: Increase of 0.5m from -0.9m to -0.4m
- Calculation result
 - 45.5 t-CO₂/ha/y/m x 100ha x 0.5m = 2,275 t-CO₂/ha/y

³⁸ Shimizu Corporation (2011): Feasibility Study on Sustainable Peatland Management in Indonesia under NAMAs - Peatland mitigation in coastal lowlands -

3.4 Preparation of Maps and Profile of Candidate Sites for Prioritized Investment Plans

3.4.1 Draft Investment Plans at Each Area

Based on the above-mentioned analysis results, the examined results of draft prioritized investment plans of each province are listed in the following table. Characteristics of each district, results of market survey and financial analyses are referred for examination of the prioritized investment plans.

Table 3.4.1.1 Draft Prioritized Investment Plans of OKI District in South Sumatra Province

Location	Main Commodities	Products	Business fields by Implementer		Finance
			Community	Corporate	
<ul style="list-style-type: none"> Desa Bangsal Desa Kuro Desa Manggris Pulau Layang 	<ul style="list-style-type: none"> Water buffalo 	<ul style="list-style-type: none"> Gulo puan (wet- crystal caramel milk) Dadih (fermented buffalo milk) Susu segar (pasteurized fresh milk) Minuman yoghurt Es krim (ice cream) Permen susu (caramel milk candy) 	<ul style="list-style-type: none"> Swamp buffalo cultivation Harvesting of buffalo milk Processing of ready-to-sell products 	<ul style="list-style-type: none"> Market Processing of derivative products 	<ul style="list-style-type: none"> Private Government: Bumdes, BLU, government programs through ministries and non-ministries Financial services institutions (banking and non-banking institutions): revolving funds, sharia banking, conventional banking (KUR), green bonds PT Sarana Multi Infrastruktur (SMI)
<ul style="list-style-type: none"> Pedamaran Kayuagung Pampangan SP Padang Pangkalan Lampam Tulung Selapan Cengal Sungai Menang 	<ul style="list-style-type: none"> Swamp fishery (Lebak Lebung) 	<ul style="list-style-type: none"> Fresh fish Salted fish Smoke fish 	<ul style="list-style-type: none"> Fish cultivation Harvesting fish Processing of ready-to-sell products 	<ul style="list-style-type: none"> Market Processing of derivative products 	
<ul style="list-style-type: none"> Pampangan Pedamaran 	<ul style="list-style-type: none"> Purun 	<ul style="list-style-type: none"> Bag Purse Pencil case Mat Key chain Sandals Fan 	<ul style="list-style-type: none"> Processing of ready-to-sell products 	<ul style="list-style-type: none"> Market 	
<ul style="list-style-type: none"> Pedamaran Kayuagung Pampangan Pangkalan Lampam Tulung Selapan Cengal Sungai Menang Air sugihan SP Padang 	<ul style="list-style-type: none"> Agriculture Food Crops and Horticulture 	<ul style="list-style-type: none"> Rice Palawija Vegetables 	<ul style="list-style-type: none"> Cultivation Harvesting Processing of ready-to-sell products 	<ul style="list-style-type: none"> Market Processing of derivative products 	

Location	Main Commodities	Products	Business fields by Implementer		Finance
			Community	Corporate	
<ul style="list-style-type: none"> Pedamaran Pedamaran Timur 					
<ul style="list-style-type: none"> Rengas Merah Bukit Batu Riding Penyajab 	<ul style="list-style-type: none"> Liberika Coffee 	<ul style="list-style-type: none"> Drink and mixed food ingredients Charcoal Vinegar to eat Chemical material 	<ul style="list-style-type: none"> Cultivation Harvesting Processing of ready-to-sell products 	<ul style="list-style-type: none"> Market Processing of derivative products 	<ul style="list-style-type: none"> Private Government: Bumdes, BLU, government programs through ministries and non-ministries Financial services institutions (banking institutions and
<ul style="list-style-type: none"> HPT Pedamaran Pedamaran Pampangan Rengas Merah Bukit Batu Riding Penyajab 	<ul style="list-style-type: none"> Areca nut 	<ul style="list-style-type: none"> Food and beverages Drugs Cosmetic ingredients Chemical material Alternative energy sources 	<ul style="list-style-type: none"> Cultivation Harvesting Processing of ready-to-sell products 	<ul style="list-style-type: none"> Market Processing of derivative products 	<ul style="list-style-type: none"> Financial services institutions (banking institutions and
<ul style="list-style-type: none"> HPT Pedamaran Pedamaran Pampangan Rengas Merah Bukit Batu Riding Penyajab 	<ul style="list-style-type: none"> Pineapple 	<ul style="list-style-type: none"> Fresh fruit Food and beverages Cosmetic ingredients Chemical material Compost Animal feed 	<ul style="list-style-type: none"> Cultivation Harvesting 	<ul style="list-style-type: none"> Market Processing of derivative products 	
<ul style="list-style-type: none"> HPT Pedamaran Pedamaran Pampangan 	<ul style="list-style-type: none"> Beriang 	<ul style="list-style-type: none"> Building material Firewood 	<ul style="list-style-type: none"> Cultivation Harvesting 	<ul style="list-style-type: none"> Market 	<ul style="list-style-type: none"> Private Government: Bumdes, BLU, government programs
<ul style="list-style-type: none"> Rengas Merah Bukit Batu Riding Penyajab 	<ul style="list-style-type: none"> Gelam 	<ul style="list-style-type: none"> Limited construction materials Firewood 	<ul style="list-style-type: none"> Cultivation Harvesting 	<ul style="list-style-type: none"> Market 	

Sources: Final Report for BRG-JICA Pre-Feasibility Study for Peatland Restoration Investment at Four Priority Areas in Indonesia. 2017 (as of Oct. 2017)

Table 3.4.1.2 Draft Prioritized Investment Plans of MUBA District in South Sumatra Province

Location	Main Commodities	Products	Business fields by Implementer		Finance
			Community	Community	
<ul style="list-style-type: none"> Merang forest Around 7,250 ha Regulation of the Minister of Forestry No.54 / Menhut-II / 2010 dated January 21, 2010 Kepayang Village Forest Around 5.170 	<ul style="list-style-type: none"> Kenaf Bergan Splash Pinang Pineapple Food crops and horticulture Canal blocking swamp fisheries Environmental carbon sequestration services. 	<ul style="list-style-type: none"> Fiber Building material Limited construction materials Firewood Food and beverages Drugs Cosmetic ingredients Chemical material 	<ul style="list-style-type: none"> Cultivation Harvesting Processing of ready-to-sell products 	<ul style="list-style-type: none"> Market Processing of derivative products 	<ul style="list-style-type: none"> Private Government: Bumdes, BLU, government programs through ministries and non-ministries Financial services institutions (banking and non-banking institutions):

Location	Main Commodities	Products	Business fields by Implementer		Finance
			Community	Community	
ha Regulation of the Minister of Forestry No.573 / Menhut-II / 2013 dated 23 August 2013 • HP Non Concession Around 56.029, 74 ha		<ul style="list-style-type: none"> • Alternative energy sources • Fresh fruit • Compost • Animal feed 			revolving funds, sharia banking, conventional banking (KUR), green bonds • PT Sarana Multi Infrastruktur (SMI)

Sources: Final Report for BRG-JICA Pre-Feasibility Study for Peatland Restoration Investment at Four Priority Areas in Indonesia. 2017 (as of Oct. 2017)

Table 3.4.1.3 Draft Prioritized Investment Plans of Meranti District in Riau Province

Location	Main Commodities	Products	Business fields by Implementer		Finance
			Community	Community	
• Sungai Tohor village	• Sago	<ul style="list-style-type: none"> • Wet sago form • Dried sago flour, • Liquid sugar, • Shrimp crackers, and sago pearl • Sago noodles, 	<ul style="list-style-type: none"> • Cultivation • Harvesting • Processing Products ready to sell	<ul style="list-style-type: none"> • Market • Processing of derivative products 	<ul style="list-style-type: none"> • Private • Government: Bumdes, BLU, government programs through ministries and non-ministries • Financial services institutions (banking and non-banking institutions): revolving funds, sharia banking, conventional banking (KUR), green bonds • PT Sarana Multi Infrastruktur (SMI)
• Sungai Tohor village	• Sago mushroom	• Mushroom			
• Teluk Buntal, Tanjung Gadai, Tanjung Sari, Sendanu Darul Ihsan, and Nipah Sendanu villages	• Liberica coffee	<ul style="list-style-type: none"> • Drink and mixed food ingredients • Charcoal • Vinegar to eat • Chemical material 			

Sources: Final Report for BRG-JICA Pre-Feasibility Study for Peatland Restoration Investment at Four Priority Areas in Indonesia. 2017 (as of Oct. 2017)

Table 3.4.1.4 Draft Prioritized Investment Plans of Pulang Pisau District in Cenral Kalimantan Province

Location	Main Commodities	Products	Business fields by Implementer		Finance
			Community	Community	
• Location A	<ul style="list-style-type: none"> • Splash • Balangeran • Ducks • Fish 	<ul style="list-style-type: none"> • Building material • Firewood • Charcoal • Telor • Meat • Fresh fish • Smoke fish • Dried fish • Wadi 	<ul style="list-style-type: none"> • Cultivation • Harvesting • Processing Products ready to sell	<ul style="list-style-type: none"> • Market • Processing of derivative products 	<ul style="list-style-type: none"> • Private • Government: Bumdes, BLU, government programs through ministries and non-ministries • Financial services

Location	Main Commodities	Products	Business fields by Implementer		Finance
			Community	Community	
• Location B	<ul style="list-style-type: none"> • Laban • Rubber • Agriculture of Food Crops and Horticulture 	<ul style="list-style-type: none"> • Building material • Firewood • Charcoal • Sap • Rice • Palawija • Vegetables 			institutions (banking and non-banking institutions): revolving funds, sharia banking, conventional banking (KUR), green bonds • PT Sarana Multi Infrastruktur (SMI)

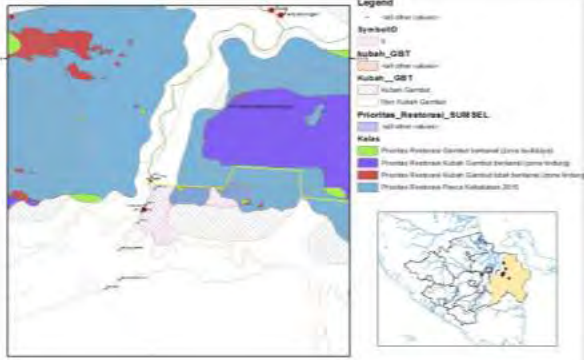
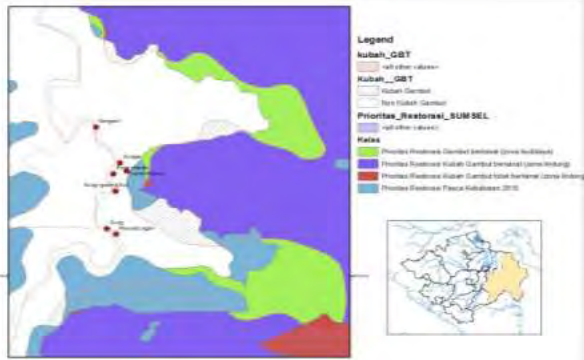
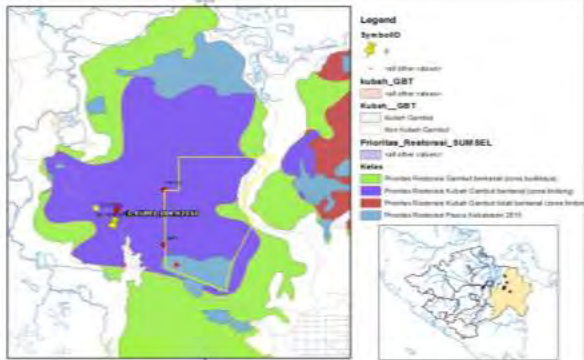
Sources: Final Report for BRG-JICA Pre-Feasibility Study for Peatland Restoration Investment at Four Priority Areas in Indonesia. 2017 (as of Oct. 2017)

3.4.2 Examination of Suitable Sites for Peatland Restoration Participated by Private Enterprises

Among the draft prioritized investment plans for each target district, the pilot areas and pilot activities are selected based on the financial analysis and feasibility. Details of each draft pilot activity plan is shown below.

Table 3.4.2.1 Draft Pilot Activity Plan at OKI District in South Sumatra Province

No.	Items	Description		Remarks
1	Pilot activity	Agroforestry with Areca nuts and Pineapples		
2	Pilot location	Riding village, KHG Sungai Sugihan- Sungai Lumpur	1,650ha	APL area, shallow peat
		Rengas Merah village, KHG Sungai Sugihan Sungai Lumpur	600ha	Planted area of PT. BMH, shallow peat
		Limited Production Forest in Pedamaran village, KHG Sungai Sibumbang-Sungai Batok	10,000ha	Limited Production Forest in Pedamaran village, deep peat (peat dome)
3	Description of Pilot Activity	1. Inter-cropping of areca nuts and pineapples 2. Area nuts, planted with a distance of 3 x 12 m (287 stems / ha) 3. Pineapples, planted with a distance of 30 x 100cm (21,500 pcs/ha). Pineapples can be harvested every 9 to 12 months		
4	In-situ Implementer (on site)	Farmers group to conduct cultivation, harvesting and initial processing of ready-to-sell products		
	Ex-situ Implementer (off site)	Traders to conduct marketing, and private companies to conduct secondary processing of derivative products		
5	Investment (Discount factor = 11%)	Initial cost	IDR 47,200,000	Land clearing, planting, fertilizing
		Operation cost	IDR 84,630,000	
		Total	IDR 131,830,000	
6	Revenue (Discount factor = 11%)	Coffee	IDR 280,000,000	
		Areca nut	IDR 262,800,000	
		Total	IDR 542,800,000	
7	Financial analysis	NPV (IDR)	141,857,494IDR	
		BCR (%)	1.96	
		IRR (%)	20.5	25-year cycle
		RCR (%)		
		PBP 'year)		
8	Possible financial source	• Private		

No.	Items	Description	Remarks
		<ul style="list-style-type: none"> Government: Bumdes, BLU, government programs through ministries and non-ministries Financial services institutions (banking and non-banking institutions): revolving funds, sharia system, local banks (KUR), green bonds 	
9	Map		
			Map of potential areas for agroforestry activities in Riding village
			Map of potential areas for agroforestry activities in Rengas Merah village
			Map of potential areas for agroforestry activities in Limited Production Forest in Pedamaran village

Sources: Final Report for BRG-JICA Pre-Feasibility Study for Peatland Restoration Investment at Four Priority Areas in Indonesia. 2017 (as of Oct. 2017)

Table 3.4.2.2 Draft Pilot Activity Plan at MUBA District in South Sumatra Province

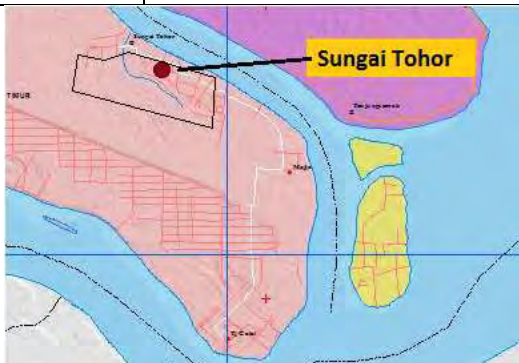
No.	Items	Description	Remarks	
1	Pilot activity	Kenaf production		
2	Pilot location	Muara Merang village, KHG Sungai Air Hitam Laut Sungai Buntu Kecil	7,250ha	Village forest, deep peat
	(area)	Village forest in Kepayang village, KHG Sungai Air Hitam Laut Sungai Buntu Kecil	5,170ha	Ex. Logged over areas of HPH PT. Bumi Raya, deep peat
3	Description of Pilot Activity	1. Kenaf planting		
4	In-situ Implementer	Farmers group to conduct cultivation, harvesting and initial		

No.	Items	Description	Remarks
	(on site)	processing of ready-to-sell products	
	Ex-situ Implementer (off site)	Traders to conduct marketing, and private companies to conduct secondary processing of derivative products	
5	Investment	Initial cost	IDR N/A
		Operation cost	IDR N/A
		Total	IDR N/A
6	Revenue		N/A
			N/A
			N/A
7	Financial analysis	BCR (%)	2.12 (Indonesian Tobacco and Fiber Crops Research Institute, Balittas, Malang)
		RCR (%)	3.04 (BPPT), 1.56 (Lamongan, East Java)
		PBP (year)	N/A
8	Possible financial source	<ul style="list-style-type: none"> Private Government: Bumdes, BLU, government programs through ministries and non-ministries Financial services institutions (banking and non-banking institutions): revolving funds, sharia system, local banks (KUR), green bonds 	
9	Map		Map of potential areas for kenaf production in KHG Sungai Air Hitam Laut Sungai Buntu Kecil

Sources: Final Report for BRG-JICA Pre-Feasibility Study for Peatland Restoration Investment at Four Priority Areas in Indonesia. 2017 (as of Oct. 2017)

Table 3.4.2.3 Draft Pilot Activity Plan at Meranti District in Riau Province

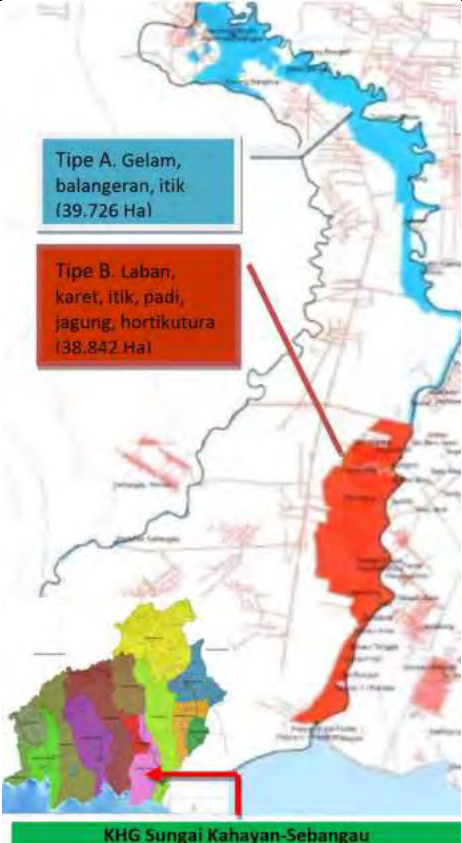
No.	Items	Description	Remarks
1	Pilot activity	Sago and Selumar production with mushroom production and wood pellet	
2	Pilot location	Village forest in Sungai Tohor village, KHG Pulau Tebing Tinggi	300ha Ex-PT. LUM areas, shallow peat
3	Description of Pilot Activity	<ol style="list-style-type: none"> Sago/ Selumar Tree Cultivation <ol style="list-style-type: none"> Inter-cropping of sago palm and selumar tree Sago palm, planted in a distance of 9 x 9 m. (123 trees/ha) Sago can be harvested after 12 years Selumar tree, planted in a distance of 4.5 x 4.5 m (370 trees /ha) Mushroom <ol style="list-style-type: none"> 600kg of mushroom will be produced by using 5,000kg of sago waste as media. Wood pellet <ol style="list-style-type: none"> Wood pellet will be produced by using sago waste. 	
4	In-situ Implementer	Farmers group to conduct cultivation, harvesting and	

No.	Items	Description				Remarks
	(on site)	transporting to the local fineries				
	Ex-situ Implementer (off site)	Local fineries to produce wet sago, traders to market the wet sago				
5	Investment		Sago/ Selumar (per ha)	Mushroom (per 4 incubation chamber)	Wood pellet (per 6t/ha)	
		Initial cost	12,698,272	14,465,000	11,984,000,000	
		Operation cost	42,670,000	81,390,000	215,875,633,333	
		Total	55,368,272	95,855,000	227,859,633,333	
6	Revenue		310,040,988	21,000,000	302,400,000,000	
7	Financial analysis	Analysis period	20 years	12 month	1 year	
		NPV (IDR)	23,183,746		29,835,194,653	
		RCR (%)	0.98	2.10	0.26	
		BCR (%)	1.98	1.10	1.26	
		IRR (%)	10.74		48.17	
		Discount Factor	16%		16%	
8	Possible financial source	<ul style="list-style-type: none"> Private Government: Bumdes, BLU, government programs through ministries and non-ministries Financial services institutions (banking and non-banking institutions): revolving funds, sharia system, local banks (KUR), green bonds 				
9	Map					Map of potential areas for production of sago and Selumar in KHG Pulau Tebing Tinggi

Sources: Final Report for BRG-JICA Pre-Feasibility Study for Peatland Restoration Investment at Four Priority Areas in Indonesia (as of Oct. 2017)

Table 3.4.2.4 Draft Pilot Activity Plan at Pulang Pisau District in Central Kalimantan Province

No.	Items	Description		Remarks
1	Pilot activity	Silvo-forestry with tree planting and duck raising		
2	Pilot location (area)	APL areas in KHG Sungai Kahayan Sungai Sebangau,	39,726 ha in total	APL area, shallow peat
3	Description of Pilot Activity	<ol style="list-style-type: none"> Gelam and Balangeran, planted in 39,726 ha shallow peat land in total Alabio duck raising under the shade of trees 		
4	In-situ Implementer (on site)	Farmers group to conduct cultivation, harvesting and initial processing of ready-to-sell products for Gelam and Balangeran.		
	Ex-situ	Farmers group to raise duck and market to the local market		
		Traders to conduct marketing, and private companies to conduct secondary		

No.	Items	Description				Remarks
	Implementer (off site)	processing of derivative products for Gelam and Balangeran				
5	Investment		Gelam (per ha)	Balangeran (per ha)	Alabio duck (100 pcs)	
		Initial cost	41,000,000	32,500,000	6,000,000	
		Operation cost	7,500,000	30,000,000	34,050,000	
		Total	48,500,000	62,500,000	40,050,000	
6	Revenue		137,500,000	1,500,000,000	90,940,000	
7	Financial analysis	Analysis period	5 year	20 years	22 month	
		NPV	18,065,784	75,396,164	39,708,686	
		BCR	1.38	2.71	2.09	
		RCR				
		PBP	5 year	15 year	1 year	
	Discount factor	16%	16%	13%		
8	Possible financial source	<ul style="list-style-type: none"> Private Government: Bumdes, BLU, government programs through ministries and non-ministries Financial services institutions (banking and non-banking institutions): revolving funds, sharia system, local banks (KUR), green bonds 				
9	Map					Map of potential areas for silvo-forestry activity (Type A) in KHG Sungai Kahayan Sungai Sebangau

Sources: Final Report for BRG-JICA Pre-Feasibility Study for Peatland Restoration Investment at Four Priority Areas in Indonesia. 2017 (as of Oct. 2017)

3.5 Information Collection for Establishment of Demonstration Plot

3.5.1 Potential Entrepreneur

(1) Indonesian Entrepreneur

Among the private companies in Indonesia, which would be suffured from the smog/smoke derived from the peatland fire, and which could utilize the products from the peatland areas, there would be the high potential private companies, which could be the implementing bodies for peatland restoration. The private companies/ sectors, which would be the implementers for the community-based and corporate-based activities for the peatland restoration.

Table 3.5.1.1 Potential Implementers by Activities among the Indonesian Private Sectors

Activity	Private Companies/ Sectors with high Potential to be the Implementers	Remarks
Community-base		
Corporate-base	<ul style="list-style-type: none"> ✓ Paddy: Paddy productions have been already conducted as the corporate base in Central Kalimantan and South Kalimanta by the private company. This company has high potential to be the implementer, even though there are necessity on technial development and improvement. ✓ In spite of a bit of difficulty on transportation, cultivation and production of kenaf is one of the potential commodities to be the raw meterials of fiber as the replacement of Acacia plantation. Kenaf could be sold to the pulp/ paper factory, and fiberboard factory. 	

Sources: JICA Survey Mission for Data Collection on Forest & Peatland Fire Control and Peatland Restoration in Indonesia (Phase 2). 2017

(2) Foreign Entrepreneur

Among the private companies in the South East Asian countires, which would be suffured from the smog/smoke derived from the peatland fire, and those in other countries, which could utilize the products from the peatland areas, there would be the high potential private companies, which could be the implementing bodies for peatland restoration. The private companies/ sectors, which would be the implementers for the community-based and corporate-based activities for the peatland restoration.

Table 3.5.1.2 Potential Implementers by Activities among the Private Sectors outside from Indonesia

Activity	Private Companies/ Sectors with high Potential to be the Implementers
Community-base	✓ Biomass energy generation, by utilizing the waste materials of sago; i.e. branches and barks, and liquid wastes of sago
Corporate-base	<ul style="list-style-type: none"> ✓ Utilization of dry sago flour: Food and cosmetics manufacturing industry, which utilize the dry sago flour. Sago flour could be utilized for health foods against anti-allergy incorporating gluten-free elements. ✓ Extraction of fibers from the waste materials of sago: i.e. branches, and barks. ✓ Kenaf

Sources: JICA Survey Mission for Data Collection on Forest & Peatland Fire Control and Peatland Restoration in Indonesia (Phase 2). 2017

3.5.2 Business Model for Peatland Restoration Participated by Private Enterprise

Those business models above-mentioned in Sub-clause 3.1 to 3.5 could be introduced to other regions in Indonesia, apart from the targeted three (3) districts in three (3) provinces. Some useful information on these business models are summarized below, taking examinations and recommendations into considerations.

Table 3.5.2.1 Business models which can be promoted to other areas

Category	Item	Characteristics	Candidate Areas
Agriculture/ Plantation	Sago	Can be introduced to relatively deep peat areas. Some processing facilities are needed to process sago flour, as mentioned below.	Peatland/ swamp areas in Sumatra and Kalimantan islands
	Paddy/ Maize	Can be introduced to relatively shallow peat areas, with adequate facilities to manage water level. Possibility to multi income sources by combining below-mentioned aquaculture, duck raising.	Shallow peat areas in Sumatra and Kalimantan islands
	Pineapple/ Areca nut	Can be year-wise incomes by combining areca nuts, etc.	Nationwide
	Liberica coffee	Suitable for lowland weather conditions, and can be grown on the peatland and swamp. As flowing periods differ from individual trees, the fruits can be harvested year around in one coffee forest.	Peatland/ swamp areas in Sumatra and Kalimantan islands
Forestry	Fast-growing tree species (Gelam, etc.)	Can be introduced to the areas with less trees for timber/ poles in island areas.	Kepulauan Meranti district, Kepulauan Riau province, etc.
	Indigenous tree species (Beriang, etc.)	Can be introduced to the areas with less trees for timber/ poles in island areas.	Kepulauan Meranti district, Kepulauan Riau province, etc.
	Forest products (Kenaf)	Can be introduced to any areas, regardless the peat depth. Access to the market (factories/ plants) should be considered.	Nationwide
Fishery	Aquaculture	Can be introduced to the areas where canal blockings will be constructed. Fish raising with fish species suitable for specific areas.	Better near to the market
		Combination with paddy with aquaculture and shrimp raising are promoted by the concerned ministry	Shallow peat areas in Sumatra and Kalimantan islands
Livestock	Water buffalo raising		
	Duck raising	Can be introduced in combination with sago forest and paddy.	Nationwide
Processing	Production of sago flour	Some equipped facilities are needed to produce sago flour	Same areas / adjacent areas to the sago production
	Utilization of sago waste	Mushroom cultivation and biogas generation can be introduced by using sago waste	

Sources: Final Report for BRG-JICA Pre-Feasibility Study for Peatland Restoration Investment at Four Priority Areas in Indonesia. 2017 (as of Oct.201)

CHAPTER 4 SUPPORT TO STAKEHOLDERS COORDINATION MEETINGS TO FACILITATE PRIVATE INVESTMENT

4.1 Holding Regular Meetings

4.1.1 Outline of Holding Stakeholder Coordination Meetings etc.

Examination of measures to facilitate investment of public and private for peatland restoration business was supported through the activities shown in table below, taking into consideration into the current policies and systems for private sector investment as discussed above.

Table 4.1.1.1. Outline of Stakeholders' Coordination Meetings and Seminars for Facilitation of Peatland Restoration Investment

Phase/ Stage	Date	Place <Held by>	Meetings/ Seminars	Remarks
Phase 1				
Stakeholders Coordination Meeting No.1	7 Feb. 2017	Hotel AONE (Jakarta)<BRG>	FGD on Facilitation of Private Sector Investment in Peatland Restoration	
Phase 2				
Stakeholders Coordination Meeting No.2	3 Apr. 2017	Hotel Oria (Jakarta)<BRG>	FGD on Idea of Facilitation Scheme to Private Sector Investment in Peatland Restoration	
Peatland restoration investment seminar (Tokyo))	11 Apr. 2017	Conference Hall University of Tokyo(Tokyo) <JICA>	Seminar on Private Sector Investment for Peatland Restoration in Indonesia	10 Apr. 2017: International Symposium "Reduction of GHG Emission from Forest and Peatland"
Stakeholders Coordination Meeting No.3	23 May 2017	Hotel. Oria (Jakarta)<BRG>	FGD on Design of Facilitation Scheme to Private Sector Investment in Peatland Restoration	
Stakeholders Coordination Meeting No.4	20 Jun. 2017	Hotel. Morrisey (Jakarta)<BRG>	Organizing and Discussion of Investment Incentive and Facility Design Team for Peatland Restoration	
Stakeholders Coordination Meeting No.5	12 Jul. 2017	Hotel. Morrisey (Jakarta)<BRG>	FGD on Investment Incentive and Facility Design Team for Peatland Restoration	
Stakeholders Coordination Meeting No.6	25 Jul. 2017	Hotel. Oria (Jakarta)<BRG>	FGD for Concluding Investment Incentive and Facility Design Team for Peatland Restoration	
Peatland restoration investment seminar (Jakarta))	27 Jul. 2017	Hotel Sari Pan Pacific (Jakarta)<BRG>	Workshop on Peatland Restoration Business Model for Green Economy Development	
Stakeholders Coordination Meeting No.7	5 Oct. 2017	Hotel. Morrisey (Jakarta)<BRG>	Final Reporting on Peatland Restoration Business Model for OKI, MUBA< Kepulauan	

Phase/ Stage	Date	Place <Held by>	Meetings/ Seminars	Remarks
			Meranti, Pulpis Districts	
Stakeholders Coordination Meeting No.8	6 Oct. 2017	OJK (Jakarta) <OJK>	Discussion on Draft-0 Guideline of Finance to Peatland Restoration Business	<ul style="list-style-type: none"> ● 17 Mar. 2017: Courtesy calls at OJK by BRG (Deputy 1 & 4) ● 26 Jul. 2017: Discussion on OJK needs for guideline with OJK by Consortium Study Team

Sources: JICA Survey Mission for Data Collection on Forest & Peatland Fire Control and Peatland Restoration in Indonesia (Phase 2)

4.1.2 Outline of Discussion in Stakeholders Coordination Meetings etc.

Through serial 7 meetings as shown in table below, discussions to draft measures to facilitate to invest to business contributing peatland restoration by applying current incentive and facility schemes were supported. Especially among the proposed ones, it was proposed for BRG to apply “Peatland Restoration Economic Special Zona (KoEING-Merah Putih)” into Special Economic Zone (Kawasan Ekonomi Khusus/KEK) where various incentive and facility according to the current systems can be applied easily. As the result of the meeting on 5 Oct. 2017, Deputy 4, BRG concluded to begin preparation for establishing proposed Special Economic Zones.

Table 4.1.2.1. Outline of Agendas of Stakeholders' Coordination Meetings
(See Appendix 1.2)

Coordination meetings	Date		Agenda/ Discussion topics (Resource persons/ Facilitators)	Remarks
Phase 1				
No.1	7 Feb. 2017 (0.5day)	1	BRG's Targets related to investment to peatland restoration and mapping of potential locations (BRG/Deputy1)	
		2	Green investment by private sector in Peatland restoration (JICA Survey Mission)	
		3	F/S results related to peatland restoration investment (UNSRI)	
		4	Policy support in investment and development (Kemenko Ekon)	
		5	Investment potential for peatland restoration in 3 prov. (TRGD Sumsel, TRGD Kalsel)	
		6	Continued discussion and summary	
Phase 2				
No.2	3 Apr. 2017 (0.5day)	1	Incentive approach for investor/ entrepreneur in business contributing peatland restoration (BRG/ Kapokja Deputy 4)	
		2	Facility approach for funding to business contributing peatland restoration (BRG/ Head of WG Deputy 4)	

Coordination meetings	Date		Agenda/ Discussion topics (Resource persons/ Facilitators)	Remarks
		3	Business model contributing peatland restoration (KLHK/ Special Staff for Minister)	
		4	Following Stage/ Action (BRG/ Program Expert Deputy 4)	
No.3	23 May 2017 (1.0day)	1	Proposed concept of Investment Engagement Seminar for Peatland Restoration (Jul. 2017) (JICA Survey Mission)	
		2	Example of potential fishery business with peatland wetting (KKP)	Panel Discussion
		3	Example of potential incentive for investor related to peatland restoration (BKPM)	
		4	Example of integration of utilization of Sago waste (ABLO)	
		5a	Group A: Scope of business contributing peatland restoration (Consortium Study Team)	Group discussion
		5b	Group B: Basic design of facility and incentive to enhance funding to business contributing peatland restoration (BRG/ Deputy1)	
		6	Presentation of results of group discussion, and discussion for next step/action(BRG/ Program Expert Deputy 4)	Panel Discussion
No.4	20 Jun. 2017 (0.5day)	1	Results of FGD on facility and incentive for investment di Peatland (23 May 2017) and coordination meeting on study progress of consortium study team (14 Jun. 2017) (JICA Survey Mission)	
		2	Discussion for organizing Design Team of Facility and Incentive in peatland restoration, as well as follow-up discussion (BRG/ Head of WG Deputy 4)	
No.5	12 Jul. 2017 (0.5day)	1	Proposed way of thinking on kinds of business influencing peatland restoration as targets of incentive/facility (JICA Survey Mission)	
		2	Study progress on MUBA and OKI Districts in Sumsel Prov., Meranti District in Riau Prov., and Pulpis District in Kalteng (Consortium Study Team)	
		3	Recommended facility for investment in peatland restoration (Facility Group of Design Team)	
		4	Recommended incentive for investment in peatland restoration (Incentive Group of Design Team)	
		5	Analysis by Business Consultant (International Center for Applied Finance and Economics, IPB [Inter CAFÉ] and PT. Cutivate)	
No.6	25 Jul.2017 (0.5day)	1	Proposed way of thinking on concept of peatland business investment model as targets of incentive and facility (JICA Survey Mission)	
		2	Draft concluded incentive scheme for investment in peatland restoration (Incentive Group of Design Team)	
		3	Draft concluded facility scheme for investment in peatland restoration (Facility Group of Design Team)	
		4	Discussion by Business Consultant (Inter CAFE)	
		5	Draft conclude study results (Consortium Study Team)	
			Finalizing draft concluded incentive and facility scheme for peatland restoration	

Sources: JICA Survey Mission for Data Collection on Forest & Peatland Fire Control and Peatland Restoration in Indonesia (Phase 2)

Overview of Stakeholder Coordination Meetings/FGD for Incentive & Facility on Investment for Peatland Restoration



Figure 4.1.2.1. Overview of Stakeholders Coordination Meetings

Sources: JICA Survey Mission for Data Collection on Forest & Peatland Fire Control and Peatland Restoration in Indonesia (Phase 2)

4.2 Support to Organize Holding Peatland Restoration Seminars (Jakarta and Tokyo)

In supporting to holding 2 times of peatland restoration investment seminars in Tokyo in Apr. 2017 and Jakarta in Jul. 2017 planned by BRG, collecting information and sorting outputs from speakers and participants were supported in addition to logistic matters including various coordinations in the seminar organization and the necessary payment to speakers etc.

4.2.1 Outline of Peatland Restoration Seminar (Tokyo)

The international seminar entitled "Private Investment Seminar for Peatland Restoration in Indonesia" were held in Tokyo on 7th April, 2017. The seminar aimed to provide the basic information and ideas on potential business development with synergy of peatland restoration, and was organized to encourage private sectors/ potential corporate investors stationed in Japan to work for peatland management and restoration in Indonesia.

In the keynote speeches, basic information such as the distribution of peatlands and the amount of carbon accumulation was provided, and the functions of peatlands such as recharge functions and local residents' resources were explained. In addition, community-based planting of sago palm which is currently being promoted was also introduced.

In the panel presentations, 3 speakers lectured about the following topics.

- a) Strong economic growth of Indonesia and the shift to the environmentally focused policy
- b) Large-scale fire in South Sumatra and the preparation of some countermeasures against fire after that
- c) Financial scheme applicable to peatland restoration such as Green Climate Fund and Green Bond

In the panel discussion, based on the above lectures, discussions were made about the measures necessary to attract private investment and about the current situations of private investment in Japan and Indonesia.

In the closing remarks, the summary of this seminar were summarized as follows.

Currently, there are 6-7 million ha of devastated peatlands in Indonesia, and BRG has set a goal to recover 2 million ha of peatlands within 5 years. This is an urgent global environmental issue and therefore it means there is a huge demand for investment. The recovery of peatlands is a area with great potential, therefore continuous efforts is needed to obtain multifaceted effects through the activities.

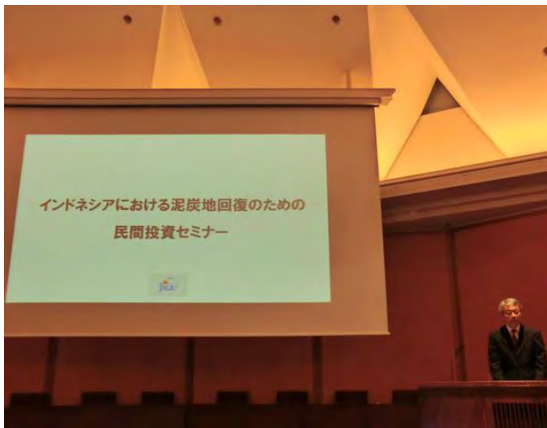
After the seminar, a roundtable meeting was held by the Indonesian government officials and Japanese stakeholders to discuss about more practical problems and questions to promote investment from Japan.

Table 4.2.1.1. Agendas of the investment seminar in Tokyo

(See Appendix 1.3)

Time	Speaker/ Moderator	Agenda
09:00 - 09:10	Mr. Takahiro MORITA, Deputy Director General, Forestry and Nature Conservation Group, Global Environment Department, JICA	Opening session: Welcoming Remarks
09:10 - 09:50	1. Dr. Nur Masripatin, Director General of Climate Change, Ministry of Environment and Forestry (MoEF), Indonesia	Keynote speech 1. National policies in Indonesia
	2. Mr. Nazir Foad, Head, Peatland Restoration Agency(BRG), Indonesia	2. Peatland restoration and green investment in Indonesia
09:50 - 10:10	Coffee Break	
10:10 - 11:10	< Moderator > Dr. Ken-ichi ABE, Professor, Research Institute for Humanity and Nature (RIHN)	Panel Presentation- Potential of private investment for peatland restoration in Indonesia
	1. Dr. Kosuke MIZUNO, Professor, Kyoto University 2. Mr. Alex Noerdin, Governor of South Sumatra Province	1. Economy and Green Investment in Indonesia 2. Responsible Peatland Management that Providing Economic Opportunities in South Sumatra

Time	Speaker/ Moderator	Agenda
	3. Ms. Mari YOSHITAKA, Chief Consultant, Mitsubishi UFJ Morgan Stanray Securities Co., Ltd.	3. Financial scheme for private involvement in Peatland Restoration
11:10 - 11:55	< Moderator > Dr. Ken-ichi ABE, Professor, Research Institute for Humanity and Nature (RIHN)	Panel Discussion “Opportunities and challenges of private Investment for peatland restoration in Indonesia”
11:55 - 12:00	Dr. Kosuke MIZUNO, Professor, Kyoto University	Closing Remarks



Welcoming Remarks



Keynote Speech



Panel Discussion



Round Table Discussion

Figure 4.2.1.2. View of the investment seminar in Tokyo

The Indonesian Consulate at Osaka, Japan proposed to hold an Osaka Peatland Restoration Investment Seminar by their budget at BRG delegation visit at Kyoto for cooperation with University of Kyoto and RINH in Apr. 2017 immediately before Tokyo Peatland Restoration Investment Seminar discussed below. BRG would have a plan to find investment potentials by peatland restoration investment seminar with the Indonesian Consulate at Osaka. The outputs of this study will also be utilized in such future investment potential findings.

4.2.2 Outline of Peatland Restoration Seminar (Jakarta)

The investment seminar entitled "Workshop on Restoration Business Model of Peatland

Areas in Enhancing the Development of Green Economy" were held in Jakarta on 27th July, 2017.

The workshop aims to:

- a) Develop the concept of a peat restoration business to attract investors.
- b) The development of business concepts should be based on:
 - priority areas for peat restoration,
 - commodity selection by the type of financial services, type of community, type of investment such as from government or from private sector,
 - identification of the initiator / executor,
- c) development of the financing model. Investment scheme maturation, investment readiness step, type of facilitation and incentives to be provided.
- d) Recommend the steps to be done for the promotion of potential investors.

In the opening speech (Session-1) by representatives of JICA and BRG, the present situation and problems on peatland restoration business were outlined, and the necessity of private investment were also explained.

In the panel discussion (Session-2), the following topics were provided: (1) the results of the feasibility study in the 4 priority districts, (2) agricultural use (wet-field rice cultivation) of peatlands, and (3) setting special economic zones.

In the group discussion (Session-3), the participants were divided into two groups. Group 1 discussed about the community-based business model on peatland restoration in the Special Economic Zone of Investment. Group 2 discussed about the company-based business models.

In the plenary session (Session-4), results of each group discussion were shared. As a result of Group 1, some business concepts to attract investor and the steps to enhance the community-based business were proposed. As a result of Group 2, two business models the regional-business-model and the commodity-model were suggested as the models that were applicable in the future.

In the closing remarks, the necessity of future effort such as following up the outcomes in this workshop, verifying the current progress of our operations and sharing the vision of the future goals of investment development were mentioned.

Table 4.2.2.1. Agendas of the investment seminar at Jakarta

(See Appendix 1.3)

Time	Speaker/ Moderator	Agenda
09:00 - 10:00	1. Hideyuki Kubo, JICA Indonesia 2. Nasir Foad, Head of Peat Restoration Agency (BRG)	Session-1 Opening Speech
10:00 - 10:15	Coffee Break	
10:15 - 12:15	Moderator: Mr. Budi Wardhana 1. Prof. Robiyanto, Coordinator of University Consortium Team 2. Team PT. Sinar Pangan Indonesia 3. Ani Suryati Ningsih, Coordinating	Session-2 Panel Discussion: "Business Model for Peatland Restoration" 1. Pre-Feasibility Study for Peatland Restoration Investment in Four Most Prioritized Areas in Indonesia 2. Peatland Processing for Agricultural Land 3. Draft for Development of Special Economic

Time	Speaker/ Moderator	Agenda
	Ministry for Economic Affairs, Incentives and BRG Facilitating Team	Zone on Peatland Investment (KOENIG)
12:15 - 15:45 (12:30 - 13:30 Lunch Break)	Group 1: Facilitator: Hanni Adiati (KLHK) and Hiromitsu Kuno (JICA Mission) Group 2: Facilitator: Sri Endang Novitasari (BKPM) and Hening Parlan (BRG)	Session-3 Group Session Group 1: Theme: Community-Based Business Model in the Special Economic Zone of Peatland Restoration Investment Group 2: Theme: Company-Based Business Model
15:45 - 16:00	Coffee Break	
16:00 - 17:00	Moderator: Head of Working Group on Restoration Research	Session-4 Plenary Session Results of Discussion Group 1: Community-Based Business in Special Economic Zone for Peat Restoration Investment Results of Discussion Group 2: Proposed Model
17:00 - 17:15	Haris Gunawan, Deputy of Research and Development, BRG RI	Closing Remarks



Figure 4.2.2.1. View of the investment seminar in Jakarta

4.3 Support to Examine System to Facilitate Private Sector Investment

4.3.1 Policies, Regulatory Framework and Institutional Arrangement on Private Sector Investment Facilitation

Regulations and decisions on private investment in Indonesia are regularly formulated and amended often, whilst the basic laws and presidential Regulations remain without changes for a long period. Also there are sometimes less coordination between related ministries, so that regulations on similar contents are sometimes issued by the several organizations.

The regulations to be the basement to facilitate the private investment in Indonesia are listed in the following table.

Table 4.3.1.1 Regulations and Policies on Private Sector Facilitation

No.	Name of Regulation	Titles/ Contents
2007	Law on Investment (UU No. 25/2007)	- Law on Investment
2014	Law on Trade (UU No. 7/2014)	- Law on Trade
2016	Presidential Regulation No. 44 of 2016 (Perpres No.44/2016)	- Presidential Regulation on the lists of business fields that are closed to and business fields that are open with conditions to investment - Negative list
2015	Ministerial Regulation of Finance No. 159/PMK.010/2015 (Permenkeu No. 159/2015)	- Ministerial Regulation on provision of facility for corporate income tax reduction - Exemption of company income tax/ Tax holiday
2014	Presidential Regulation No. 39 of 2014 (Perpres No. 39/2014)	- Presidential Regulation on the list of business fields closed and business sectors opened with conditions in the investment sector - Negative list
2012	Ministerial Regulation of Finance No. 76/PMK.011/2012 (Permenkeu No. 76/2012)	- Ministerial Regulation on amendment to ministerial Regulation of finance No. 176/PMK.011/2009 on exemption from import duty on import of machinery as well as goods and materials for development or industrial development in the framework of investment - Tax exemption
2009	Ministerial Regulation of Finance No. 176/PMK.011/2009 (Permenkeu No. 176/2009)	- Ministerial Regulation on exemption from import duty on import of machinery as well as goods and materials for development or industrial development in the framework of investment - Tax exemption
2015	Regulation of Head of the Investment Coordinating Board No. 19 of 2015 (Perka BKPM No.19/2015)	- Regulation of BKPM chairman on revisions of Regulation of BKPM chairman No. 13 of 2015 on application procedures for facilities income tax reduction for agency. - Tax holiday
2015	Regulation of Head of the Investment Coordinating Board No. 13 of 2015 (Perka BKPM No.13/2015)	- Regulation of BKPM chairman No. 13 of 2015 on application procedures for facilities income tax reduction for agency. - Tax holiday
2009	Ministerial Regulation of Finance No. 144/PMK.011/2012 (Permenkeu No. 144/2012)	- Ministerial Regulation on facilitation of income tax for investment in specific business sector and/or specific location.
2015	Government Regulation No. 18 of 2015 (PP No.18/2015)	- Government regulation on the income tax facility for investment in specific business sector and/or specific location - Tax allowance

No.	Name of Regulation	Titles/ Contents
2015	Ministerial Regulation of Finance No. 89/PMK.010/2015 (Permenkeu No. 89/2015)	- Ministerial Regulation on Procedures for Provision of Income Tax Facilities for Investment in Specific Business Sector and/or in Specific Locations and Transfer of Assets and Sanctions for Domestic Agency Taxpayers Income Tax Facilities - Revision of Ministerial Regulation of Finance No. 144 of 2012
2016	Governmental Regulation No. 9 of 2016 (PP No.9/2016)	- Amendment of Governmental Regulation No. 18 of 2015 on Income Tax Facility for Investment in Specific Business Sector and/or in Specific Locations - Tax allowance
2015	Ministerial Regulation of Finance No. 159/PMK.010/2015 (Permenkeu No. 159/2015)	- Facilities of Income Tax Development
2015	Regulation of Head of the Investment Coordinating Board No. 18 of 2015 (Perka BKPM No. 18/2015)	- Revisions of Regulation of Head of Investment Coordinating Board No. 8 of 2015 on Income Tax Facilities for Investment in Certain Business Fields and/or Certain Locations
2015	Regulation of Head of Investment Coordinating Board No. 8 of 2015 (Perka BKPM No. 8/2015)	- Application Procedures of Income Tax Facilities for Capital Investment in Certain Business Fields and/or Certain Regions
2016	Regulation of Head of Investment Coordinating Board No. 10 of 2016 (Perka BKPM No. 10/2016)	- Implementation and Guidelines of Implementation of Decentralization in Control of Implementation of Capital Investment by 2017
2015	Regulation of the Head of Investment Coordinating Board No. 16 of 2015 (Perka BKPM No. 16/2015)	- Guidelines and Procedures for Investment Facility Services
2015	Regulation of Head of Investment Coordinating Board No. 17 of 2015 (Perka BKPM No. 17/2015)	- Guidelines and Procedures for Controlling the Implementation of Investment
2016	Regulation of Head of Investment Coordinating Board No. 6 of 2016 (Perka BKPM No. 6/2016)	- Amendment of Regulation of Head of Investment Coordinating Board No. 14 of 2015 on Guidelines and Procedures Permit Investment Principles
2015	Regulation of Head of Investment Coordinating Board No. 14 of 2015 (Perka BKPM No. 14/2015)	- Guidelines and Procedures Permit Investment Principles
2015	Regulation of Head of Investment Coordinating Board No. 15 of 2015 (Perka BKPM No. 15/2015)	- Guidelines and Procedures for Licensing and Non licensing Investment

Sources: JICA Survey Mission for Data Collection on Forest & Peatland Fire Control and Peatland Restoration in Indonesia (Phase 2). 2017

(1) Laws related to investment

Laws in Indonesia related to the investment and trade are as follows:

Table 4.3.1.2 List of Laws in Indonesia related to Investment

	Laws	Description
1	Foreign Investment Law (No. 1, 1967) Amendment (No.11, 1970)	Basic law for foreigners/ foreign companies to start business in Indonesia
2	Internal Investment Law (No. 6, 1968) Amendment (No.12, 1970)	Basic law for Indoensian company (PMDN) with incentive measures.
3	Investment Law (No. 25, 2007)	

Sources: JICA Survey Mission for Data Collection on Forest & Peatland Fire Control and Peatland Restoration in Indonesia (Phase 2). 2017

(2) Business fields for investment

Business fields which can be invested with conditions and closed to investment are stipulated by the Negative list. As mentioned below, the negative list is being revised in

every few years, and the Presidential Regulation No. 44 of 2016 is now applied.

Table 4.3.1.3 List of Amendment of Regulations to stipulate the Fields for Investment

Issued Year	Regulation	Contents
July, 2000		Amendment of fields close to investment (Negative list)
December, 2007	Presidential Regulation No. 111	Amendment of fields close to investment (Negative list)
May, 2010	Presidential Regulation No. 36	Amendment of fields close to investment (Negative list)
2014	Presidential Regulation No. 39	Amendment of fields close to investment (Negative list)
May, 2016	Presidential Regulation No. 44	Amendment of fields close to investment (Negative list)

Sources: JICA Survey Mission for Data Collection on Forest & Peatland Fire Control and Peatland Restoration in Indonesia (Phase 2). 2017

The summary of business fields for investment, stipulated in the Presidential Regulation No. 44 of 2016 are summarized as below.

Table 4.3.1.4 Summary of Business Fields, as of 2017

Category	Sub Category	Summary	No. of Fields/ Business
Open Business Fields	-	Foreign investment without any conditions	—
Closed Business Fields	-	Business fields that are close to investment	20 business fields in 8 sectors
Business fields that are open with conditions	a. Business fields that are Open with conditions, which are reserved for or in partnership with a Small, Micro, and Medium Enterprise, and Cooperatives	Business fields that are Open with conditions, which are reserved for or in partnership with a Small, Micro, and Medium Enterprise, and Cooperatives	145 business fields in 8 sectors
	b. Business fields that are Open under certain Conditions	1. limited foreign capital ownership; 2. certain locations; 3. special licenses/permits; 4. 100% (one hundred percent) domestic capital; and/or 5. Limited capital ownership in the context of the Association of Southeast Asian Nations (ASEAN) cooperation.	350 business fields in 16 sectors

Sources: Presidential Regulation No. 44 of 2016

Among the business fields and sectors which are open to investment, those related to peatland restoration are as follows:

Table 4.3.1.5 List of Business Fields which are open to Investment, related to Peatland Restoration

(1) Business fields that are Open with conditions, which are reserved for or in partnership with a Small, Micro, and Medium Enterprise, and Cooperatives

Sector	Business Field	No	Business
Agriculture	Staple food crop cultivation	1	Rice

Sector	Business Field	No	Business
	business, in an area of more than 25 ha		
	Plantation seeding business, in an area of less than 25 ha	7	Jatropha curca crops
		15	Oil palm crops
		20	Medicinal/ pharmaceutical crops (other than horticulture crops)
		22	Rubber and other Latex Producing crops
		29	Oil palm plantation
		33	Essential oil plantations
		34	Medicinal/ pharmaceutical crops (other than horticulture plantations)
		36	Rubber and other latex producing poantations
	Business wth specific capacities	39	Crude vegetable and animal oil industry (edible oil)
		40	Copra, fiber, coconut shell charcoa, dust, nata de coco industry
		41	Coconut oil industry
		42	Palm oil industry
		45	Peeling, cleaning, drying, and sorting of poantation products industry (cocoa and coffee beans industry)
		51	Rubber for sheet, concentrated latex industry
52		Jatropha curcas oil industry	
Forestry	Business wth specific capacities	53	Breeding and raising of pigs in a total of less than or equivalent to 125 in number
		54	Breeding and raising of native chickens and crossbreeding
		55	Other forest plantation businesses (sugar palm, Pecan, Tamarind seed, Charcoal raw material, cinnamon)
		58	Production of swallow nest in nature
Fishery	Business wth specific capacities	59	Sawmill industry (production capacity of up to 2,000 m ³ /year)
		66	Shellac, allternative food crop (sago), latex, and honeybee business
		69	Hatchery of brackish water fish
		70	Hatchery of freshwater fish
		72	Rearing of brackish water fish
		73	Rearing of freshwater fish
		74	Fishery product processing business: salting/ drying of fish and other water biota industry
		75	Fishery product processing business: smoking fish and ither water biota industry
		76	Fishery product processing business: yeating/ fermentation fish and other cooked products (for ectraction and fish jelly) industry
		77	Fishery product processing business: Minced fish and surimi processing-based industry
		78	Marketing, distribution, sholesale, and export businesses of fish products
79	Fish preservation industrty		

Sources: Presidential Regulation No. 44 of 2016

(2) Business fields that are Open under certain Conditions

Sector	Business Field	No.	Business	Condition
Agriculture	Seeding/ seedling business of staple food crops in an area of more than 25 ha	1	Rice	Foreign capital ownership: Max 49%
	Cultivation business of staple food crops in an area of more than 25 ha	7	Rice	Foreign capital ownership: Max 49%
	Plantation seeding business industry, in an	13	Jatropha curca crops	Foreign capital ownership: Max 95%

Sector	Business Field	No.	Business	Condition
	area of 25 ha or more	19	Coconut palm crops	Foreign capital ownership: Max 95%
		20	Oil palm crops	Foreign capital ownership: Max 95%
		21	Beverate material crops (tea, coffee and cocoa)	Foreign capital ownership: Max 95%
		27	Rubber and other latex producing crops	Foreign capital ownership: Max 95%
	Plantation business in an area of 25 ha or more up to a specified area without processing units	29	Jatropha curca plantation	Foreign capital ownership: Max 95%
		36	Coconut palm plantation	Foreign capital ownership: Max 95%
		37	Oil palm plantation	Foreign capital ownership: Max 95%
		42	Medicinal/ pharmaceutical material plantation	Foreign capital ownership: Max 95%
	Plantation business in a total area of 25 ha or more integrated to the processing units iwth the same or exceeding a certain capacity	44	Rubber and other latex producing plantation	Foreign capital ownership: Max 95%
		47	Jatropha curca plantation and jatropha oil industry	Foreign capital ownership: Max 95%
		51	Coconut palm plantation and coconut oil industry	Foreign capital ownership: Max 95%
		52	Coconut palm plantation and industry of copra, fiber, shell charcoal, dust and nata de coco	Foreign capital ownership: Max 95%
		53	Oil palm plantation anc crude palm oil (CPO) industry	Foreign capital ownership: Max 95%
		54	Coffee plantation and coffee bean peeling, cleaning and sorting industry	Foreign capital ownership: Max 95%
		59	Rubber plantation and industry of sheet, concentrated latex	Foreign capital ownership: Max 95%
	Business with the same or exceeding a certain capacity	63	Coconut oil industry	Foreign capital ownership: Max 95%
		64	Palm oil industry	Foreign capital ownership: Max 95%
		65	Peeling, cleaning, drying and sorting of plantation products industry (cocoa beans and coffee beans)	Foreign capital ownership: Max 95%
		71	Industry of rubber to be sheets, concentrated latex	Foreign capital ownership: Max 95%
96		Mushroom cultivating	Foreign capital ownership: Max 30%	
		101	Horticulture agrotourism business	Foreign capital ownership: Max 30%
Forestry		112	Nature tourism business in teh form of provision of ecotourism facilities, activities and services within forest areas incuding water tourism, natural adventure tourism and cave tourism	Foreign capital ownership: Max 49%
Tourism and Creative Economy Sector		242	Natural tourism object business outside conservation areas	Foreign capital ownership: Max 67%

Sources: Presidential Regulation No. 44 of 2016

(3) Approval to plantation business

Ministerial Regulation of Agriculture No. 98 of 2013 (No.98/Permentan/OT.140/9/2013) stipulates the approval to the plantation business.

1) Category of plantation business and approval

a) Plantation Cultivation Business

The certificate for registration of plantation cultivation business (STD-B: Surat Tanda Daftar Usaha Perkebunan untuk Budidaya) is necessary for cultivation areas less than 25 ha, and certificate of plantation cultivation business (IUP-B: Izin Usaha Perkebunan untuk Budidaya) is necessary for cultivation areas more than 25 ha. Depending the crops, there are limitation in the cultivation areas; i.e. 150,000ha for sugarcane, 100,000ha for oil palm, 20,000ha for rubber, tea and cotton, 100,000ha for coffee, cacao, cashew nuts, and so on.

b) Processing business of plantation cultivation crops

Processing business of oil palm, tea and sugarcane with more than some extent need to obtain the certificate for processing business for plantation cultivation business (IUP-P: Izin Usaha Perkebunan untuk Pengolahan), and processing business for other crops need to obtain the certificate for registration for processing business for plantation cultivation business (STD-P: Surat Tanda Daftar Usaha Perkebunan untuk Industri Pengolahan Hasil Perkebunan).

c) Integrated business of plantation cultivation and processing business

Integrated business of plantation cultivation and processing business of oil palm more than 1,000ha, tea more than 240 ha, and sugarcane more than 2,000ha, need to obtain the plantation business certificate (IUP: Izin Usaha Perkebunan).

Depending the crops, there are limitation in the cultivation areas; i.e. 150,000ha for sugarcane, 100,000ha for oil palm, 20,000ha for rubber, tea and cotton, 100,000ha for coffee, cacao, cashew nuts, and so on.

2) Participation of foreign enterprises into plantation business

Foreign companies of foreign individuals need to establish the Indonesian companies in cooperation with the domestic business sectors. In order for the investment application by BKPM, the recommendation letter from the Directorate General of Plantation under Ministry of Agriculture are necessary to be obtained in advance.

3) Other issues

a) The IUP-B holders need to secure at least 20% of all the raw materials from their own plantation.

b) The IUP-B holders and IUP holders more than 250ha have responsibilities to develop and donate community plantation, with extent of more than 20% of whole plantation areas, employ the community people, and get written agreements with communities.

c) Necessity to open the land without fire, secure the human resources, facilities, and equipment for preventing the fire.

4.3.2 Incentive to Private Sector Investment Facilitation as Tax Incentive

In Indonesia, the economic policy package (PKE: Paket Kebijakan Ekonomi) has functions to realize the key policies of expanding investment and promoting infrastructure, as well as realizing economic stimulus packages, by compiling the economic policy package (PKE) and deregulating to the international standard. Improvement of investment environment includes various measures to expand infrastructure development, revision of tax system, expansion of incentives, improvement of land reclamation law, promotion of industrial estates and economic special zones. Generally, the projects related to the peatland restoration are considered not to be suitable for private investment, therefore, it is important for incentives for investment in promoting private investment in peatland restoration. In Indonesia, incentives related to the investment include import duty exemption, tax holiday (corporate base) and tax allowance (business base). Details of each incentive are shown below.

(1) Import Duty Exemption

Exemption of import duty on the import of machines, good and materials for production is summarized as below:

Table 4.3.2.1 Summary of Exemption of Import Duty in Indonesia

Item	Description
Regulation	Regulation of Ministry of Finance No. 76/PMK.011/2012 jo. No. 176/PMK.011/2009 ³⁹
Contents	<ul style="list-style-type: none"> Exemption from import duty on the import of machines, goods & materials for production for a period of 2 years. Import duty exemption is granted for 2 years based on the installed machine capacity for production purpose and available for 1 year extension. If the company uses at least 30% local machineries, import duty exemption is available for additional product for 4 years.
Requirements	Imported machine, goods and raw material are: <ul style="list-style-type: none"> Not yet being locally produced If the local machines are available, yet unable to fulfil criteria of required machines If the local machines are available, yet unable to fulfil the total required machines

Sources: BKPM website (<http://www.bkpm.go.id/en/investment-procedures/investment-incentives/>)

(2) Income tax exemption/ Tax holiday

Income tax exemption/ tax holiday for the private corporate who plans to invest to Indonesia is summarized as below:

Table 4.3.2.2 Summary of Income Tax Exemption/ Tax Holiday in Indonesia

Item	Description
Regulation	<ul style="list-style-type: none"> Ministerial Regulation of Finance No. 159 or 2015⁴⁰ Regulation of Chairman of BKPM No. 18 of 2015⁴¹
Contents	<ul style="list-style-type: none"> By doing hte main business as written in the business license, the private corporate will be able to receive corporate income tax exemption. Income tax exemption or Tax Holiday (10% to 100%) are available for 5 to 15 years and is possible for the extension up to 20 years under the discretion of MoF. If the investment value exceeds Rp1 trillion, the exemption is available up to 100%. For Communication, Information and Telecommunication Industry, the value of Investment plan could be lowered from Rp500 billion to Rp1 trillion for exemption up to 50%.
Requirements	<ul style="list-style-type: none"> Industries that have broad relevances of pioneer industries, with high value addition and extensibility, and that give strategic values to teh national economy by using the new technologies. There are 9 type of industries that are eligible for Tax Holiday: <ol style="list-style-type: none"> Upstream metal industry Oil refinery industry Organic basic chemical industry, based on oil and natural gas Machinery industry producing industrial machine Processing industry based on agriculture, forestry fisheries

³⁹ Ministerial Decree of Finance No. 76/PMK.011/2012 on Amendment of. No. 176/PMK.011/2009

⁴⁰ Regulation of Ministry of Finance No. 159/PMK.010/2015

⁴¹ Regulation of Chairman of BKPM No. 18 of 2015 on Guidance of Income Tax Facility Application for Investment in certain Business Fields and/or Locations

Item	Description
	<ul style="list-style-type: none"> 6) Telecommunication, information and communication equipment industry 7) Maritime transportation industry 8) Processing industry that are main industry in Special Economic Zone (SEZ) 9) Economic infrastructure not in the scheme of Government and Business project (KPBU⁴²)
New taxpayer	<ul style="list-style-type: none"> • Minimum investment is 1 trillion IDR • Achieve optimal debt to capital ratio • Taxpayers need to submit the pledge stating that they deposit at least 10% of the planned investment amount with banks in Indonesia and do not withdraw deposits before realizing the investment plan. • The company should be established after August 15, 2011. • The process periods were shortened for corporate tax exemption. The applicant company submits the application to BKPM, then BKPM handles this application within 25 days, then it will be processed by the Ministry of Finance within 20 days. In total, the process will be completed in 45 days. • If the application would be denied, the applicant can enjoy this incentive, if the application would meet the criteria in the Regulation of Chairman of BKPM No. 18 of 2015.

Sources: BKPM website (<http://www.bkpm.go.id/en/investment-procedures/investment-incentives/>)

(3) Tax reduction/ Tax Allowance

Tax allowance for the private corporates who plan to invest to Indonesia is summarized as below:

Table 4.3.2.3 Summary of Investment Tax Reduction/ Tax Allowance in Indonesia

Item	Description
Regulation	<ul style="list-style-type: none"> • Ministerial Regulation of Finance No. 89/PMK.010/2015⁴³, • Government Regulation Number 18 of 2015⁴⁴ • Governmental Regulation No. 9 of 2016⁴⁵
Contents	<ul style="list-style-type: none"> • Total net income reduction by 30% of the investment, that are charged respectively 5% per year in the 6 years period. • Accelerated depreciation and amortisation. • Imposition of income tax on dividends which paid to foreign tax subject of 10% (ten percent), or a lower rate according to the avoidance of double taxation agreement, and • Compensation losses longer than 5 (five) years but not more than 10 (ten) years with the certain conditions (can be seen in the regulation) for the companies that are <ul style="list-style-type: none"> 1) Located in industrial or bonded zone 2) Developing infrastructure 3) Using at least 70% domestic raw material 4) Absorbing 500 to 1000 labors

⁴² Skema Kerjasama Pemerintah dan Badan Usaha

⁴³ Ministerial Decree of Finance No. 89/PMK.010/2015 on Procedures for Provision of Income Tax Facilities for Investment in Specific Business Fields and / or in Specific Regions and Transfer of Assets and Sanctions for Domestic Agency Taxpayers Income Tax Facilities

⁴⁴ Government Regulation Number 18 of 2015 on Income Tax Facilities for Investment in Specific Business Area and/or in Specific Regions

⁴⁵ Governmental Regulation No. 9 of 2016 on Amendment of Governmental Regulation No. 18 of 2015 on Income Tax Facility for Investment in Specific Business and/or Specific Regions

Item	Description
	<ul style="list-style-type: none"> 5) Having Research and Development (R&D) program 6) Reinvesting capital 7) Exporting at least 30% of selling product
Eligible Business Fields	<ul style="list-style-type: none"> • There are 145 eligible business fields for tax allowance. Further details could be accessed on the 1st and 2nd attachment of the Regulation.

Sources: BKPM website (<http://www.bkpm.go.id/en/investment-procedures/investment-incentives/>)

(4) Special Economic Zone (SEZ)

In Indonesia, the Law on Economic Special Zone (Law No. 39, 2009) was issued in 2009, however, the development of special economic zones was delayed for a while. However, since 2012, development of special economic zones has been proceed, and nowadays, 10 numbers of special economic zones have been operating.

In the Economic Policy Package No. 6 (November 2015) detail provisions and various incentives are announced as accelerating the development of SEZ as one of the infrastructure development policy.

Table 4.3.2.4 Summary of Special Economic Zone in Indonesia (SEZ)

Item	Description
Regulation	<ul style="list-style-type: none"> • Law on Special Economic Zone (No.39, 2009) ⁴⁶ • Ministerial Regulation of Finance No. 104, 2015⁴⁷
Contents	<p>Financial incentives to SEZ are listed below.</p> <ul style="list-style-type: none"> • Corporate tax: tax reduction in 20% to 100% for 25 years as maximum. • Imported raw materials: tax exemption of value added tax • Sales of products: exemption of sales tax for domestic sales • Restaurant, etc.: 50-100% discount of entertainment tax • Manufacturers: Tax holiday <p>Other incentives are as follows:</p> <ul style="list-style-type: none"> • Exemption from negative list • Permission to possess real estate • Shortening issuance period of IMATA (work permit) • Permission to continues portable water business • Online permission of BPOM for food sales business

Sources: Website of BKPM-JICA Investment Promotion Policy Adviser Office (<http://www.pma-japan.or.id/>)

4.3.3 Public Subsidy Scheme

Generally, the projects that communities would be the implementation bodies show not so high benefit cost ratio, so that it is generally difficult to utilize the private investment. Therefore, public financing schemes are utilized for investment for these projects. Related to policies and regulations related to support for investment to the community business, the following public funds are expected to be utilized.

(1) Credit for Business Program (Kredit Usaha Rakyat: KUR)

In Indonesia, micro, small and medium enterprises are in important portions in the Indonesian economy, however, the financial systems for micro, small and medium enterprises are inadequate from the viewpoint of quantitative satisfaction. About 60% of

⁴⁶ Law of the Republic of Indonesia Number 39 Year 2009 regarding Special Economic Zones (SEZ)

⁴⁷ Peraturan Menteri Keuangan Republik Indonesia Nomor 104/PMK.010/2016 tentang Perlakuan Perpajakan, Kepabeanan, dan Cukai Pada Kawasan Ekonomi Khusus

micro, small and medium enterprises are self-financing, because they cannot obtain loans from the banks.

Under such circumstances, GoI has been trying to improve the access to funds for micro, small and medium enterprises, and the GoI stipulated the credit for business program (KUR) in 2007, which is the main policy for improving the access to funds for micro, small and medium enterprises. However, most of KUR loan balance by business sectors are for the wholesale and retail trading sectors, the loan balance for agriculture, forestry and fishery, which are the priority sectors for KUR system, is only about 20%, and only a few % for manufacturing sector, resulting that lending to the production sector are still limited.

In addition, as part of the GoI policy to raise commercial interest in order to provide the cheap, simple and quick services to the micro, small and medium enterprises, KUR system is shifting from subsidizing guarantees to subsidizing interests from 2015.

Table 4.3.3.1 Summary of Credit for Business Program (Kredit Usaha Rakyat: KUR)

Item	Contents			
Related Ministries	Coordination Ministry on Economy, Ministry of Finance, Ministry of Agriculture, Ministry of Environment and Forestry, Ministry of Industry, State Ministry for Cooperatives and Small and Medium Enterprises			
Distributing banks	Seven (7) commercial banks and 26 local development banks			
Guarantee ratio	80%: Agriculture, Fishery, Forestry, small business 70%: Other sectors			
Target	Targets are Micro, Small and Medium Enterprises and Cooperatives, business groups, linkage institutions			
		Micro Enterprise	Small Enterprise	Medium Enterprise
	Net asset	Less than IDR 50 million	More than IDR 50 million, less than IDR 500 million	More than IDR 500 million, less than IDR 5 billion
	Sales	Less than IDR 300 million	More than IDR 300 million, less than IDR 2.5 billion	More than IDR 2.5 billion, less than IDR 50 billion
	Productive enterprises, which are unable to meet requirements set by banks (not yet bankable) are the main targets.			
Usage of fund	Operation cost, equipment cost			
Loan term	Operation cost: 3 years, equipment cost: 5 years			
Loan limit	KUR Micro: Maximum up to IDR 25 million KUR Retail: Maximum between IDR 25 million to 500 million KUR TKI: Maximum IDR 25 million			
Maximum interest rate	KUR Micro: 9% KUR Retail: 9%			

Sources: Results of interviews with Coordination Ministry on Economy

(2) Revolving Fund for Financing Forestry Business

The Center of Environment and Forestry Financing is a unit in the Ministry of Environment and Forestry which enhanced its function as a public service agency (Badan Layanan Umum (BLU)) which has main task (mandate) to manage revolving funds, sourced from the reforestation fund and others for forest development and environmental investment.

Revolving Fund for Financing Forestry Business is based on Minister Regulation No: P.59/Menlhk-Setjen/2015 regarding Revolving Fund for Land and Forest Rehabilitation⁴⁸, and it is stipulated as i) part of the state budget (APBN), and it is not a grant nor the project

⁴⁸ Minister Decree No: P.59/Menlhk-Setjen/2015 regarding Revolving Fund for Land and Forest Rehabilitation

oriented, ii) given to the community (forest farmers) that is assessed having feasible business, iii) disbursed, collected and revolved to the other beneficiaries, and iv) strengthening business capital of forestry or environmental investment. Details of Revolving Fund for Financing Forestry Business is summarized below.

Table 4.3.3.2 Summary of Revolving Fund for Financing Forestry Business

Items	Contest
Purpose	Strengthening forestry business capital and financing to environmental degradation/pollution control
Management principle	Right actor, right location, right activities and right disbursement and repayment with Phase Disbursement Mechanism
Scheme	Loan; Revenue sharing; and sharia (moslem financing system: under preparation)
Interests of loans	<ul style="list-style-type: none"> • Medium scale enterprises (IDR 40 billion): Indonesia Bank rate +4% (10% maximum) per year • Micro and small scale enterprises (max IDR 2 billion): Indonesia Bank rate (8% maximum) • Linkage agency (channel agency): 50% of Indonesia Bank rate (4% maximum) • Corporate, cooperative: minimum 35% of revenue for Financing Center • The interest rate for forestry business in the protected area is 50% of the on the production area rates
Forest business funded by revolving fund	<ul style="list-style-type: none"> a) Industrial Plantation Forest (HTI) b) Community Plantation Forest (HTR) c) Social Forestry (HKM) d) Village Forest e) Private Forest f) Non-timber Forest Products (NTFP) g) Intensive silviculture and Ecosystem Restoration

Sources: Results of interviews with Center of Environment and Forestry Financing (BLU PUSAT P2H)

4.3.4 Proposed Approach to Facilitate for Peatland Restoration

(1) Approach through establishing economic special zones

According to the serial discussions through stakeholders' coordination meetings and the information collected as shown in above, there is one potential approach to facilitate investment through establishing "Peatland Restoration Special Economic Zone (KoENG-Merah Putih)" utilizing the current Special Economic Zone System as follows

In order to realize facilitation to concrete investment for peatland restoration, BRG has begun dialog with the relevant District Governors by visits at proposed area by Consortium Study in August 2017⁴⁹. As the result of the meeting on 5 Oct. 2017, Deputy 4 of BRG concluded to begin preparation of establishment of proposed Special Economic Zones.

Table 4.3.4.1. Basic Matters of Concept of Peatland Restoration Special Economic Zone

No.	Matter	Summary/ Feature
1	Applicant	Ministry/Agency: BRG (Fewer requirement)

⁴⁹ Team of Deputy 4 BRG (with researcher on business development from IPB) visited in OKI District, South Sumatera Province 7-9 Aug. 2017 while 11-13 Aug. 2017 in Pupis District, Central Kalimantan Province.

No.	Matter	Summary/ Feature
2	Purpose	<ul style="list-style-type: none"> ● Other economy: Environmental friendly new economic growth zone (Different from other special zone) a) To focus on new president's policy b) To position pillar of economic development in peatland with development constraints and peculiarity. And to contribute to increase added value, absorb labor force and alleviate poverty. c) Principal of sustainable development. To Contribute to achieve SDG indicators. And also to contribute to reduce carbon emission by reducing peatland fire
3	Economic activities	<ul style="list-style-type: none"> ● Economic sectors/ activities should utilize local nature resources ● Sectors/ activities should produce competitive commodity ● Sectors/ activities should be environmental friendly and developed with appropriate technology ● Sectors and activities can develop middle and small enterprise ● To fulfil economic scale developable by one activity ● Sectors/ activities should be according to the characteristics of peatland
4	Attraction of investment	<ul style="list-style-type: none"> ● Land-based (activity and crop) and non-land-based (Downstream synchronizing land-based) ● Selected activities by middle and small enterprise level and large enterprise level; targeted domestic investment not only foreign investment ● Village public enterprise (BUMDES) has important role in small enterprise level activities ● Funds by sustainable finance (green bond is a measure) should be procured to meet the increased needed capital (from foreign enterprise than is interested in downstream) ● Eco-tourism specific peatlands should be incorporated to attract foreign tourists

Sources: JICA Survey Mission for Data Collection on Forest & Peatland Fire Control and Peatland Restoration in Indonesia (Phase 2)

(2) Approach through revising list of targeted business for tax break system

One of alternative proposed in the discussion above is approach to revise the list of targeted business for tax break system according to Governmental Regulation on Reduction of Corporate Income Tax to Specified Business⁵⁰ as described in 4.1 above. Revision process is once two years after 2015 and 2016. This 2017 is time to prepare revision of 2018.

Large scale investment enterprise in industry of agriculture, forestry and fishery products can apply exemption of corporate income tax according to the current investment facilitation. Meanwhile middle and small enterprise can apply corporate and personal income tax separately (Governmental Regulation No. 46, 2003⁵¹).

Incorporation of water control into business location and contents is proposed as shown in table below for the perspective to enhance peatland restoration impact. While incorporation of finance to peatland restoration business and processing of products from peatland restoration sites is also proposed for the perspective to accelerate investment to peatland restoration.

⁵⁰ Peraturan Pemerintah Republik Indonesia Nomor 18 Tahun 2015 tentang Fasilitas Pajak Penghasilan untuk Penanaman Modal di Bidang-bidang Usaha Tertentu dan/atau di Daerah-daerah Tertentu (6 April 2015)

⁵¹ Peraturan Pemerintah Republik Indonesia Nomor 46 Tahun 2013 tentang Pajak Penghasilan atas Penghasilan dari Usaha yang Diterima atau Diperole Wajib Pajak yang Memiliki Peredaran Bruto Tertentu (13 Juni 2013)

Table 4.3.4.2. Proposed Basic Scope of Peatland Restoration Business in Tax Break System

	General Incentive/Facility	Special Economic Zone (KEK)
Location	In 7 BRG's Prioritized Provinces	Same as left
	Covering first Restoration Priority: Fire Prone (e.g. 2015)	Same as left
Business	Including rewetting/ water control (average water table >0.4m)	And to contributing food/ energy security and other strategic purposes in the province
	Including financial Institution to finance the business as shown in above	And primary processing using the products from the restoration area

Sources: JICA Survey Mission for Data Collection on Forest & Peatland Fire Control and Peatland Restoration in Indonesia (Phase 2)

4.4 Policy and Regulatory Framework and Institutional Arrangement in Relation to Green Economic Growth

4.4.1 Possibility of Finance from Indonesian Financial Institution

OJK Regulation No. 51, 2017 requires enterprises implement green finance from larger scale corporates in Jan. 2017. This enhance enabling conditions to take investment and funding to the needed capitals to peatland restoration businesses.

The table below indicate that large porportion of private sector fianancing was provided by bank credit, with followed by capital market by issuing equity and bonds. Thus green lending and issuing bonds are one of first examination for potential investment and funding sources.

Table 4.4.1.1. Outline of Source of Funds of Private Sector in Indonesia (2013)

Classification	Details	Trillion IDR	Remarks (%)
Bank credit		585.01	(78.42)
Non-bank financing		161.02	(21.58)
	Capital market	115.04	(15.42)
	IPO/Right issues	57.54	(7.71)
	Corporate bonds	57.50	(7.71)
	Financing companies	45.98	(6.16)
Total		746.03	(100.00)

Sources : UNEP. 2015. towards a Sustainable Financial System in Indonesia. Table4

(1) Potential and issues in fund procurement from banks⁵²

There are about 120 banks operating in Jan. 2015. This includes 4 large state-owned banks and 10 foreign banks. The 10 largest total banking are of Bank Mandiri, Bank Rakyat Indonesia (BRI), Bank Central Asia (BCA), Bank Negara Indonesia (BNI), CIMB Niaga, Bank Danamon Indonesia, Bank Permata, Bank Pan Indonesia, Bank Tabungan Negara (BTN), and Bank International Indonesia.

⁵² UNEP. 2015. Towards a Sustainable Financial System in Indonesia. pp 16, 19.

The relevant authorities as OJK seems to grasp such information. According to information from private sector including PT. SPSJ (Producer of Sago starch, banks tend to easily provide credit to oil palm estate and property development that can specify lands as guarantee But banks tend to be difficult to provide credit to manufacturing that cannot easily specify guarantee except machine tools.

As the status quo, only around 20% of Indonesian companies are inferred to make use of bank loans or formal credit lines. Lenders generally hesitant to grant loans, especially small business or to new forms. The lack of access to bank finance is seen as a major barrier toward green investments.

Distribution of green financing by project are “renewable resources” as Mini hydro and Geothermal, “Sustainable agriculture”, “Green industry” as environmentally efficient machineries and Eco label products, and “Ecotourism”. But total green financing portfolio is inferred to only account for 1 % of total financing portfolio.

As the private financial system for agriculture, forestry and fishery sectors, private banks have microfinance schemes for small and medium enterprises. Among the private banks, BRI (Bank Rakyat Indonesia) is the largest bank in Indonesia for small scale and micro finance.

Also, private banks, such as BTPN, have also financial schemes for micro, small and medium enterprises, other than BRI. In this case, they lend loans not to individual farmers, but to groups and cooperatives (Koperasi) formed by farmers.

As results of interviews with Japanese bank in Indonesia (SMBC Indonesia), even though they normally lend large scale loans (USD 3 - 10 million) to major companies in Indonesia, but they also lend small scale loans to the Indonesian companies, which have relationship with Japanese companies. In this case, it is necessary for Japanese company to have bank accounts with this bank in Japan.

(2) Potential and issues in fund procurement from capital market⁵³

According to the information in Nov. 2014, foreign investors held about 65% of tradeable stocks listed in Indonesian Stock Exchange (BEI). Institution accounts for more than 70% of each local and foreigner investor. Not only equity, but also bond is growing. Bond markets especially corporate local currency bond markets have an important role to play as a source of long-term funding for green investment.

The Indonesia market for sustainable investments remains low. But Indonesia has enormous investments needs in its energy infrastructure. There is a large growth potential in renewable energy.

In 2009, BEI in cooperation with KEHATI Biodiversity Conservation Trust Fund launched a Social and Responsible Investment (SRI) index, KEHATI index, following the standard and regulation of SRI. And then in 2014, PT. Indo Primer Investment Management launched SRI-KEHATI-ETF that can track SRI KEHATI Index.

In 2014, PT. Ciputra Residence, a residential property developer, applied IFC’s green building standards to issue bond at BEI supported by a partial credit guarantee from IFC. There is a case 20 banks acted as selling agents of government bond ORI 010 to donate a share of the selling agent’s fee to a rehabilitation project for mangrove forests under Mangrove Rehabilitation Program by KEHATI and the Ministry of Finance.

4.4.2 Possibility of Finance by International Financial Institutions

BRG prioritizes ICCTF, Jokowi Village Fund by IFAD and World Bank as the public funding sources as shown in figure below.

⁵³ UNEP. 2015. Towards a Sustainable Financial System in Indonesia. pp 17, 20-21,33

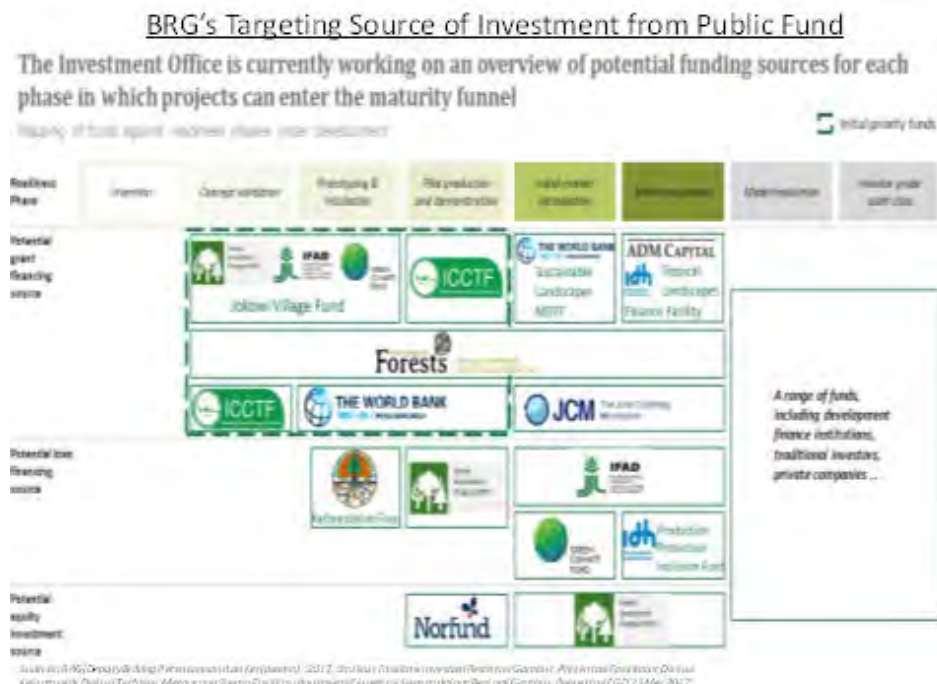


Figure 4.4.2.1. Public Funds Assumed by BRG

Sources: Presentation by Deputy1, BRG at Stakeholders Coordination Meeting in May 2017)⁵⁴

World Bank is the fund manager of Multi Donor Trust Fund (MDTF) having 3 components (One-map, peatland restoration and fire prevention). This fund component for peatland restoration uses the Norway fund and grant to activities and project planned by BRG. According to the person concerned with World Bank, MDTF will focus on assistance to BRG. ADM Capital's Tropical Landscape Finance Facility has a potential to funding to private sector.

There are such international funds as Green Climate Fund (GCF) and Global environmental facility (GEF), which are able to utilize national, regional and/or world wide global environmental issues and climate change measures for developing countries and economic transition countries. In case of Indonesia, Multi Donor Trust Fund (MDTF), which are based on the Norwegian funds, is also one of the funds for those purposes.

Green Climate Fund (GCF)

The Green Climate Fund (GCF) is the international and global fund to support the developing countries to respond to reduce their greenhouse gas emission (mitigation) and adapt the climate change (adaptation). It was set up at Cancun Agreement through COP 16 in 2010 as to be the implementing body of financial mechanism for the United Nations Framework Convention on Climate Change (UNFCCC).

The total amounts of USD 10.2 billion are committed by the supporting countries in total, including USD 1.5 billion committed by The Government of Japan. The GoJ has signed to pledge USD 1.5 on May 2015. In accordance with this signing by GoJ, the pledged amounts to GCF became more than 50% of the total announced amounts, which is the threshold line to commence disbursement to the developing countries for implementation and planning, the GCF had commenced their assistance activities officially.

⁵⁴Sources: BRG(Deputy Bidang Perencanaan dan Kerjasama). 2017. Struktur Fasilitas Investasi Restorasi Gambut. Presentasi Fasilitator Diskusi Kelompok di Diskusi Terfokus Merancang Skema Fasilitas dan Insentif Investasi Swasta dalam Restorasi Gambut. Presentasi FGD 23 Mei 2017

Table 4.4.2.1 Summary of Green Climate Fund (GCF)

Items	Contesnts
Investment policy	<ul style="list-style-type: none"> Invest to the projects/ programs which promote a paradigm shift to low-emission and climate-resilient development, Vest minimum concessibility to materialize the target projects/ programs Consider not to keep out other public funds and private funds by investment of GCF Loan should be vested only for the activities, which are financially feasible.
Invetment strategy and portfolio target	<ul style="list-style-type: none"> 50:50 balance between mitigation and adaptation investments over time 50% of the adaptation allocation for particularly vulnerable countries, including Least Developed Countries (LDCs), Small Island Developing States (SIDS), and African States Distribute funds to many countiries adequately Miximize to cooperate with the private sectors by distributing some amounts of funds through its Private Sector Facility (PSF) Assist to the developing countires to be able to access with GCF funds.
Fomr of investment	<ul style="list-style-type: none"> grants, loans, equity or guarantees
Supporting sectors	<ol style="list-style-type: none"> Adaptation (climate-resilient development) <ul style="list-style-type: none"> Ecosystem/ Ecosytem services Infrastructure/ construction environment Health, food, and water sacurity Livelihood improvement of community Mitigation (GHG emission reduction) <ul style="list-style-type: none"> Elelctricity generation and improvement of energy access (energy conservation) Transportation Building, city, industry, home appliances (energy conservation) Forest, landuse

Source: Abstract from the presentation on “Progress of intervention of Green Climate Fund (GCF)”, August 2017

The Green Climate Fund works through a wide range of Accredited Entities (AEs) to channel its resources to projects and programmers. AEs are the organizations which submit the project proposal to GCF to apply the financial assistances, supervise and instruct to the approved project, and disburse funds to the approved projects. AEs can be private or public, non-governmental, sub-national, national, regional or international, as long as approved by the board of directors. As of August 2017, there are 54 approved AEs, including JICA and Bank of Tokyo-Mitsubishi UFJ, Ltd. Types of AEs are divided into two: i.e. direct access entities (national and regional) and international access entities.

Table 4.4.2.2 Entity types of Accredited Entities (AEs) for Green Climate Fund (GCF)

Direct Access	International
<ul style="list-style-type: none"> Private, public and NGO at national, sub-national and regional level Government or public organizations of developing countries, private companies in developing countires, regional international organizations and financial institutions in developing countries 	<ul style="list-style-type: none"> Multilateral Development Banks (MDBs), United Nations organizations, Bilateral Development Assistance orgzaniations/ Development Financial Institutions, International NGOs, private companies/ multi-national companies in developed countries
<ul style="list-style-type: none"> Need to be recommended by NDA in the developing country Be able to receive the readiness resources. 	<ul style="list-style-type: none"> Need the wide ranges of knowledges on climate change issues in the wide areas JICA and Bank of Tokyo-Mitsubishi UFJ, Ltd. Are included in this category.

Source: Abstract from the presentation on “Progress of intervention of Green Climate Fund (GCF)”, August 2017

4.4.3 Investment Potential Project Finding

(1) Overview of potential finding

BRG has begun to examine toward investment facilitation in cooperation with other donors.

- a) BRG has examined supporting process for assessment and enhancing maturity of potential business model as “Peatland Incubator” in cooperation with Sistemiq⁵⁵. BRG organizes “Investment Committee (IC)” and then Sistemiq organized “Technical Assistance Unit (TAU). As far as information obtained as of Jun. 2017, they listed 2 concept as “Idea level/ Stage 1” with lower maturity, 8 concepts at “Idea note level/ Stage 2”, 3 concepts at “Concept note level/ Stage 3”. High-level investment criteria emphasizes “High reduction of carbon emission”, “Large-scale business area”.
- b) The concept without restoration is acceptable as far as covering protection. According to a member of Sistemiq⁵⁶, she trends to prefer to intact peatland area with any development like Papua than already developed peatland area like Central Kalimantan. Sistemiq’s cooperation is inferred to be interested in developing REDD+ or carbon offset business.

(2) Benefit-sharing Based Rice Estate Business in Pulpis District in Central Kalimantan Province

PT. SPI⁵⁷ has business plan of benefit-sharing based Rice Estate that can contribute to restore around 1,500ha peatlands prioritized by BRG in Pulpis District in Central Kalimantan Province.

As demonstration plots of Land Management without Burning (PLTB) tried by BRG in Pulpis District, SPI’s rice estate plans also applies decomposer to land cover waste from land preparation resulting in land preparation without land burning and neutralize pH so as to rice can be arable in peatland . Rice cultivation can expect to result in enhanced water table and/or enhanced soil moisture in the shallow peat and also resulting enhanced pH and alleviation of pyrite in soil to peatland restoration.

SPI applies also mechanized land preparation to open the former fallow paddy field based on large-scale contract cultivation so as to result in large-scale PLTB efficiently. Contract farmer can become worker for the corporate and also apply micro-credit from bank for enhanced benefit-sharing in cooperation with banks.

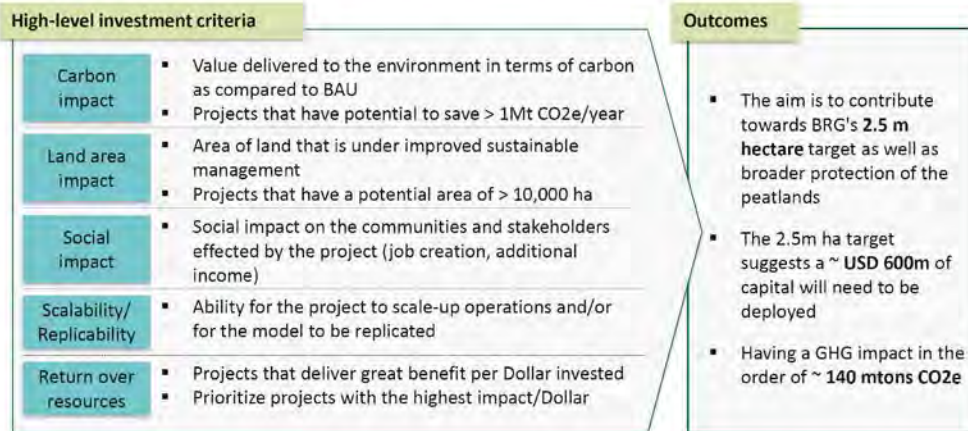
Procurement of necessary operation fund is prioritized to realize this business plan. This business concept is promising and in the process negotiation with PT. BNI in cooperation with KUR to farmers in the targeted areas. This business plan is prioritized to be one of targets for finance from private sector financial institutions.

⁵⁵ International business consultancy service firm specializing energy, waste and environment related issues based in UK. It plays as a secretariat too of the Business and Sustainable Development Commission, which was established by business fiendl at Davos in 2016.

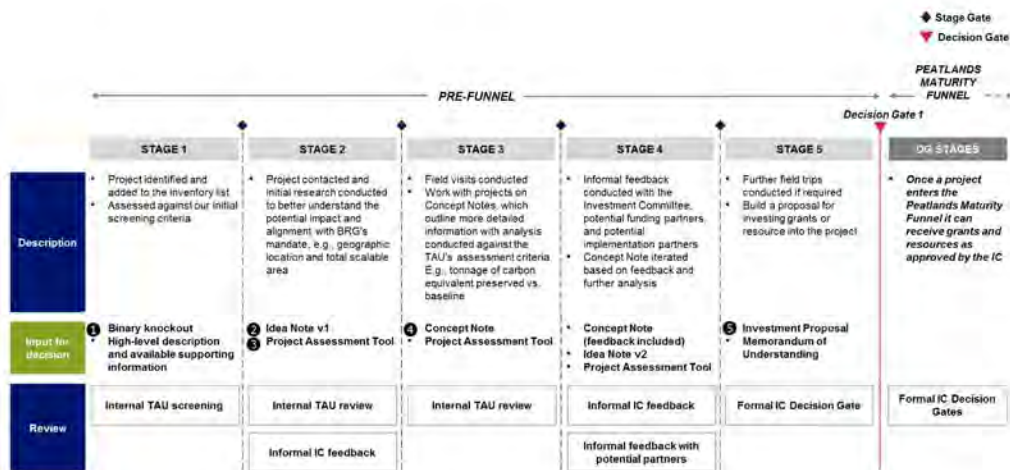
⁵⁶ Information through joint site visit surveys with Sistemiq in May 2017 at the BRG’s developing demonstration plots of PLTB in Pulpis District, Central Kalimantan Province

⁵⁷ PT.Sinar Pangan Indonesia

We are setting up a 'Technical Assistance Unit' capable of delivering public and private sector funding as effectively as possible to projects developing scalable approaches to restoring, protecting, and sustaining the Indonesian peatlands



Investment criteria proposed by SISTEMIQ



Incubator process proposed by SISTEMIQ

Figure 4.4.3.1. Outline of BRG's Investment Assessment Process

Sources : Presentation by Deputy1, BRG at Stakeholders Coordination Meeting in May 2017⁵⁸

⁵⁸ BRG. 2017. Struktur Fasilitas Investasi Restorasi Gambut. Presentasi Fasilitas Diskusi Kelompok di Diskusi Terfokus Merancang Skema Fasilitas dan Insentif Investasi Swasta dalam Restorasi Gambut (23 Mei 2017). (FGD (Deputy Bidang Perencanaan dan Kerjasama))

**Rice Estate Business Plan in BRG's Prioritized Peatland
Restoration Area in Pulpis District,
Central Kalimantan Province**

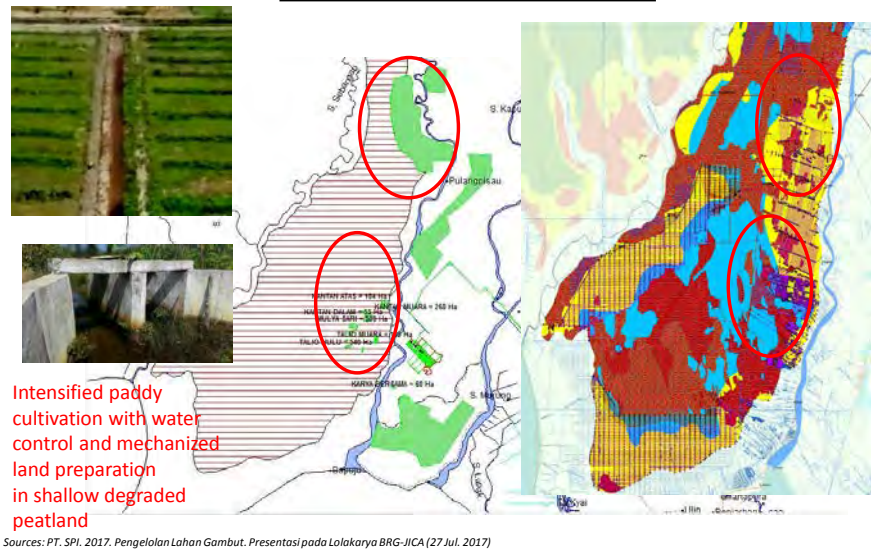


Figure 4.4.3.2. Outline on Benefit-sharing Based Rice Estate Business Plan in Pulpis District in Central Kalimantan Province

Sources: Modified using the presentation by PT SPI at Jakarta Peatland Investment Seminar (27 Jul. 2017)

(3) Environmental Service Business around the Boundary between Central Kalimantan Province and South Kalimantan Province

The cooperation between Bappenas and GGGI has conducted for finding potential business model, support for stakeholders discussion for integrated management of one KHG in Central Kalimantan. In the course of above cooperation, BRG held a workshop to do brainstorming for integrated management and cooperation in KHG Sungai Utar-Sungai Serapat where locates at the boundary between Central Kalimantan and South Kalimantan Provinces in Jun. 2017. In this KHG, there are Carbon Sink Business Concession and Ecosystem Restoration Business Concession in the State Forest Land, while there is a large scale of oil palm estate. BRG would like to seek regional development by public private partnership.

Those who concerns peatland restoration of both provinces mainly GGGI and ICCTF begins to seek to initiate feasibility study and finance, and will organize a working group to prepare apply to GCF by BRG. Private sink tanks and NGOs is prioritized to participate in working group to develop finance from GCF.

CHAPTER 5 PROPOSED COOPERATION PROGRAM

5.1 Reviews on Outputs of This Survey

5.1.1 Outputs per Component

(1) Trial of peatland monitoring in the targeted areas

This survey installed 14 water table measurement equipment at 14 locations (4 locations procured by JICA Indonesia Office in the previous survey, while 10 locations procured by this JICA Survey Mission) as to deliver major data to real-time peatland water table monitoring system developed by BRG under the cooperation with BPPT. This can contribute to develop quantitative evaluation of peatland restoration.

This survey also tried ToT training to stakeholders to develop the basis of ToT training to be conducted by BRG future.

(2) Profile survey in the targeted areas

As the result of the study by the consortium study team composed of 3 universities and 1 research institution, more than 20 commodity crops of potential was found. In the potential, concept of business models contributing to peatland restoration to be prioritized for investment projects was proposed as shown in table below.

Table 5.1.1.1 Concept of Peatland Restoration Business Models

No.	Commodity	Product	Potential Market	Location	Potential Partner
1.	• Paddy Rice	• Rice	• BULOG • Local Government Company • Private company	• OKI • Pulang Pisau	• PT. Sinar Pangan Indonesia • PT. Belitang Panen Raya
2.	• Betel Nut	• Dried nut	• Pakistan • India • China • Korea • Thailand	• OKI • MUBA • Pulang Pisau	• CV. Mutiara Pinang
3.	• Hibiscus canabius	• Fiber	• Automotive industry • Plastic based industry	• OKI • MUBA • Pulang Pisau • Kepulauan Meranti	• PT. Astra International • PT. Cahaya Perdana Plastik
4.	• Energy wood (Cerberra manghas, Vitex pusbencens, Melaleuca cajuputy)	• Wood pellet, charcoal, • Bioetanol	• Processing industry • Electricity company	• OKI • MUBA • Pulang Pisau	• PT. Pellet Biomass Indonesia • PT. Terregra Asia Energy
5.	• Coffee	• Green bean • Coffee powder	• International coffe markert	• OKI • MUBA • Kepulauan Meranti	• UD.Coffephile • UD. Kopiloka
6.	• Sago	• Sago powder • Mushroom from sago waste	• International food industry	• Kepulauan Meranti	• PT. NSP
7.	• Ecotourism and Melayu tribes tradition (water buffalo, "lebak lebung", purun handicraft)	• Ecotourism, souvenir	• ASEAN country (Malaysia, Singapore, etc)	• OKI • Kepulauan Meranti	• Genpi (Generasi pariwisata Sumsel)

Sources: Final Report for BRG-JICA Pre-Feasibility Study for Peatland Restoration Investment at Four Priority Areas in Indonesia. 2017 (as of Oct. 2017)

Integrated Corporate-based & Community-base Business in Partnership with Financial Institutions

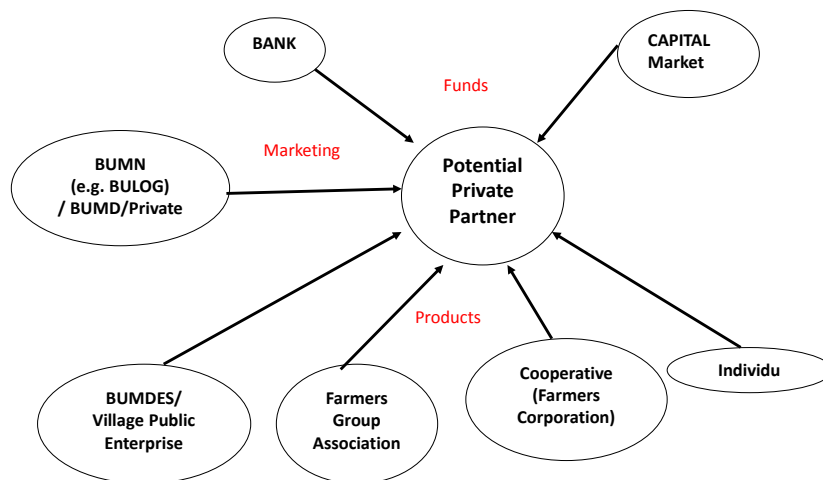


Figure 5.1.1.1. Concept of Institutional Arrangement for Peatland Restoration Business

Sources: Prepared using Final Report for BRG-JICA Pre-Feasibility Study for Peatland Restoration Investment at Four Priority Areas in Indonesia, 2017 (as of Oct. 2017)

As shown in the figure above, proposed institutional arrangement for peatland restoration business is covered by private enterprise procuring fund from financial institutions, producing products and service at the restoring peatland under partnership with individual or organized community and then marketing with state enterprise etc.

(3) Support to stakeholders coordination meetings for private sector investment facilitation

In order to facilitate private sector investment to peatland restoration, Special Economic Zones (KEK) for Peatland Restoration will be established per KHG as unit (boundary) where incentive and facility can be applied easily through stakeholders coordination meeting (7 times general meeting and 3 times specific with OJK from Feb. until Oct. 2017)

The Consortium Study Team has proposed the prioritized candidate sites for KEK concretely.

The meetings and seminars proposed the measure to strengthen community-based business by building the cooperation agreement with the domestic financial institutions and state enterprises.

Table 5.1.1.2 KHG Prioritized for Establishment of Special Economic Zones

No.	District	KEK	KHG
1.	Ogan Komering Ilir	Sugihan Saleh	Sugihan River – Saleh River
2.	Musi Banyuasin	Penimpahan Sungai Buntu Kecil	Air Hitam Laut River – Buntu Kecil River
3.	Kepulauan Meranti	Pulau Tebing Tinggi	Pulau Tebing Tinggi

4.	Pulang Pisau	Kahayan Sebangau	Kahayan River – Sebangau River
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Sources: *Final Report for BRG-JICA Pre-Feasibility Study for Peatland Restoration Investment at Four Priority Areas in Indonesia. 2017 (as of Oct. 2017)*

5.1.2 Future Utilization of Outputs

(1) Trial of peatland monitoring in the targeted areas

Registration water table measurement equipment as national assets is required to assure and execute maintenance and management budget. Meanwhile starting coordination to handover to the targeted actual implementers of peatland water table monitoring is important for BRG to prepare dissolution of BRG in future.

(2) Profile survey in the targeted areas

It is required to find potential investment projects of crops and services other than paddy, which started to prepare concrete investment example among the business model shown in above.

(3) Support to stakeholders coordination meetings for private sector investment facilitation

First of all establishing above mentioned Special Economic Zones is required. Meanwhile it will be important to examine how to secure government guarantee, which tends to become needs for Indonesian and international financial institutions. Specifically to examine funding from financial institutions, partnership with state enterprise for securing government guarantee, joint finance or assurance of buying of financial products will be required

5.2 Reviews on LULUCF Sectors

5.2.1 Response to Peatland Fires

Overview of LULUCF sector in Indonesia is re-reviewed as follows.

The one of most important problems in LULUCF in Indonesia can be said to be prevention of large scale of land and forest fires and haze. Since the end of 1980 era, such problems continue by occurring intermittently. Since the end of 1990 era, donors and ASEAN strengthened cooperation for forest fire controls but not yet developed solution models. The Indonesian government can not control such problems. 2015 became strong El Nino and strong dry condition resulted in large scale of fire outbreaks and haze disaster. In this year international concerns by donor etc. became higher again and incorporated peatland management problems into closing up peatland fire problems. The way of thinking that peatland control contribute to fire control is mainstreamed

In 2015, burnt area in South Sumatra and Central Kalimantan Provinces accounts for more than ones in Riau and West Kalimantan Provinces where usually have more HS distribution. In South Sumatra, West Kalimantan and South Kalimantan, burnt area in mineral soil accounts for more than ones in peatland.

Because forest and peatland fire tends to occur in the lower population density area, firefighting technique and system developed in high population area does not result in effective so far. Thus incorporating fire prevention and control into daily community-based land management is more efficient⁵⁹.

⁵⁹ Dit. PHKL in MoEF would like to mainstream community-based fire prevention and then seems to have a need to accelerate to develop community-based fire prevention model which can surely effective (according to the

Future JICA cooperation is requested to examine proposed program by emphasizing the perspective of reality of ground not only donors' trends in order to contribute to develop more appropriate and effective solution to Indonesia.

Table 5.2.1.1 Overview of Fire Prone Sites in 8 Fire Control Priority Provinces

Outline of Prioritized Area for Forest & Land Fire Control										
Prov.	Riau	Jambi	S. Sumatra	W. Kalimantan	C. Kalimantan	S. Kalimantan	E. Kalimantan	N. Kalimantan	Total	Remarks
HS in State Forest	More	More			More			N/A		
Drought correlation to El-Nino	No	Yes	Yes	No (Partly South)	No (Partly south)	No (Partly east)	Yes			
Burned Area 2015*1 (ha)	110,025 73,268 183,293	68,493 55,397 123,890	327,902 343,931 671,833	31,773 60,578 92,351	441,279 310,609 751,888	12,642 183,616 196,258	11,006 64,997 76,003			
<input type="checkbox"/> Peat <input type="checkbox"/> Mineral <input type="checkbox"/> Total							<input type="checkbox"/> Fewer by 2014 <input type="checkbox"/> No haze			
Fire prone district *2	13	6	4	11	10	5	5	2	56	Mean: 7 district/prov.
Fire Prone sub-district*1	42	37	18	80	23	21	22	8	251	
Fire Prone village*2	127	102	61	193	65	41	90	52	731	
Mean (sub-district/district)	3	6	5	7	2	4	4	4	5	
Mean (village/district)	10	17	15	18	7	8	18	26	13	
Mean (village/sub-district)	3	3	3	2	3	2	4	7	3	
First Priority KPH *3 (Burned 2015) (unit)	23	8	13	11	21	4	**	**	80	
Community peatland: First priority for monitoring & restoration (Only Dome & burned 2015)*3 (ha); []: district; <>: villages	0 [0] <0>	3,695 [5] <17>	30,854 [5] <55>	6,193 [4] <22>	113 [1] <1>	6,319 [5] <14>	983 [2] <3>	0 [0] <0>	48,157 [22] <112>	
Priority	2-2	1	1	2-4	2-1	3-1	2-3	3-2		

Sources: *1) Ministry of Environment and Forestry, Republic of Indonesia, 2015. Understanding Estimation of Emission From Land and Forest Fires in Indonesia 2015
*2: Surat Menteri LHK 5. 203/Menlhk/PP/4/2016; *3: Dit. RPPWPH, Ditjen. PK-TL, Jun. 2016; *3) Dit. PKG. 2016

Sources: JICA Survey Mission for Data Collection on Forest & Peatland Fire Control and Peatland Restoration, 2016

Sources: JICA Survey Mission for Data Collection on Forest & Peatland Fire Control and Peatland Restoration in Indonesia, 2016(as of Aug. 2016)⁶⁰

5.2.2 Response to Peatland Damage

BRG is planned to duty on planning and coordination in relation to restoration in restoration prioritized areas in the targeted 7 provinces just during 5 years. In its execution, BRG should cooperate with TRGD organized in provincial level and other ministries and agencies. While PKG which in charge of peatland management nationwide now covers only the area where BRG doesn't cover but is inferred to cover again after dissolution of BRG after 5 years duty in cooperation with Environmental Agency of local governments.

As discussed in 2.2.2 above, the implementers of peatland management (including water table monitoring) are "private sector" for private sector managed area and for outside of the private sector managed areas are "Forest Management Unit/KPH" and "Community Groups". The source of budget should be prepared by "private sector" for private sector managed area, and central and local government (environmental duty is the compulsory duty in local autonomy) for outside of the private sector managed areas. Actual operation in local administration has not yet realized outside of private sector managed sites.

interview the sub-director on fire prevention in Jun. 2017)

⁶⁰ Final Report of Data Collection Survey on Forest & Peatland Fire Control and Peatland Restoration in Indonesia (May 2017). Chap 2.2.1.

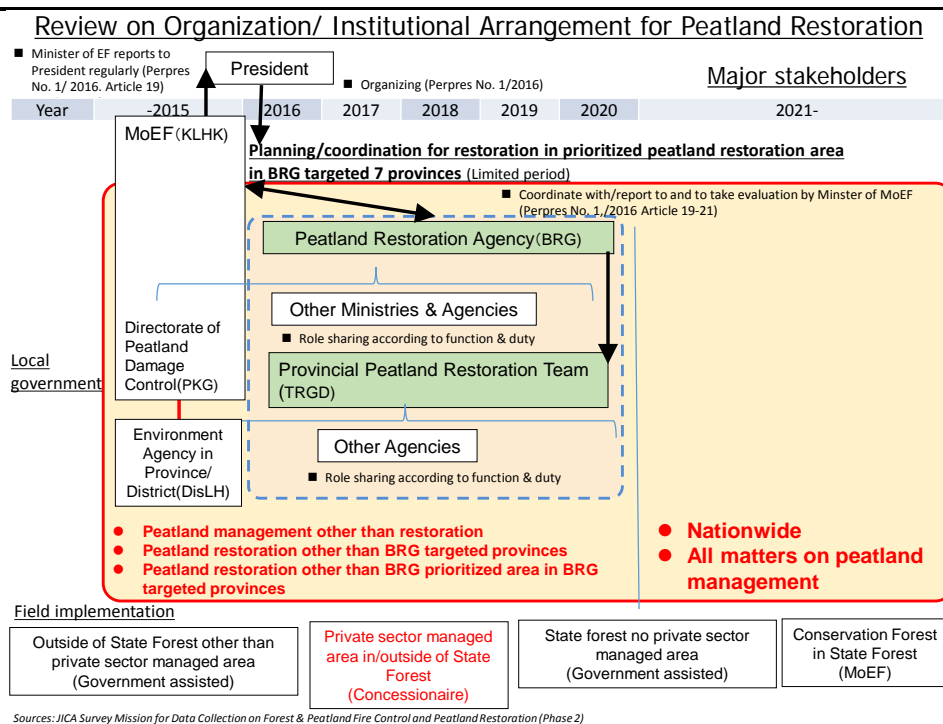


Figure 5.2.2.1. Overview of Organization and Institutional Arrangement on Peatland Restoration

Sources: JICA Survey Mission for Data Collection on Forest & Peatland Fire Control and Peatland Restoration in Indonesia (Phase 2)

Future JICA cooperation is requested to examine proposed program by reviewing the outputs from practices of community-based approaches in local government level from the perspective of restructuring cooperation on peatland management focusing on peatland technical institutions in central level as BRG and PKG of MoEF, in order to contribute to develop innovative policy and system⁶¹.

5.2.3 Response to Green Economic Growth

(1) Policy and regulatory framework on green economic growth

In Indonesia, development strategies for green economic growth are searched. The relevant policies, laws and regulations are as shown in table below.

Based on the stipulation on economic instrument in Law No. 2009 on Environmental Protection and Management, the government started to develop the policies, laws and regulations for green finance since 2014. According to New OJK Regulation No. 51, 2017, implementation of green finance will be required with phased approach from large entity.

⁶¹ “Indonesia-Japan Project for Development of REDD+ Implementation Mechanism (IJREDD+) has supported to examine monitoring system (including peatland water table) in provincial level in West Kalimantan Province and proposed the draft monitoring system based on the discussion with stakeholders (See Final Report of Consulting Team Completion Report [Apr. 2016]) The experiences from practices to try to develop using the proposal through project activities will contribute also to support institutionalization as policy and system development concerned with BRG jurisdiction areas. It is attention to activities in provincial level. And also the practical experiences in facilitating forest monitoring by community-groups in field-level activities of IJREDD+ is thought to be able to contribute to develop facilitation method to community-based monitoring in peatland monitoring too.

Table 5.2.3.1. Policy and Regulatory Framework for Green Economic Growth in Indonesia (Collected as of End of Jul. 2017)

Year	Policy/Regulations	Authorities	Summary/Feature
2009	Law No. 31, 2009 on Environmental Protection and Management ⁶²	KLH	<ul style="list-style-type: none"> ● Paragraph 8 stipulates economic instruments ● Article 42 requires the central & local government to establish the following economic instruments for environmental function protection. <ol style="list-style-type: none"> 1) Planning economic activity/ development 2) Environmental funding 3) Incentive/ Disincentive Including greening of financial institution and capital market, payment for environmental service, environmental insurance system and eco-labeling system
2014	Roadmap for Sustainable Finance in Indonesia 2015-2019 ⁶³	OJK	<ul style="list-style-type: none"> ● Classified into midterm: 2015-2019 and long term: 2020-2024 1) Mid-term: Strengthening of sustainable finance will focus on the basic regulatory framework and reporting system, increase understanding, knowledge and competence of the human resources in the financial services industry, provision of incentives and coordination with related agencies. The strategic activities related to peatland restoration are: <ol style="list-style-type: none"> a) Development of green finance products, green bonds and green index b) Green lending models for priority sector c) Campaign program to potential investors on green financial products 2) Long-term: Focusing on integrated risk management, corporate governance, bank rating, and the development of an integrated sustainable finance information system.
2015	Delivering Green Growth for a Prosperous Indonesia A Roadmap for Policy, Planning and Investment ⁶⁴	Bappenas-GGGI	<ul style="list-style-type: none"> ● The approaches related to peatland restoration are: <ol style="list-style-type: none"> 1) Renewable Natural Resources <ol style="list-style-type: none"> a) Improve forest and land management <ol style="list-style-type: none"> i. Scale up innovative models for forest and peatland management ii. Address degraded peatland and peatland fires b) Secure marine ecosystem c) Develop sustainable supply chain d) Progress towards food security 2) New Natural Capital-based Market <ol style="list-style-type: none"> a) Scale up ecotourism b) Identify new natural capital-based markets c) Establishment payment for ecosystem services d) Accelerate international and domestic carbon offsetting e) Mobilize forest carbon finance
2017	OJK Regulation on Application of Sustainable Finance to Financial Institution, Listed Company and Public Company ⁶⁵	OJK	<ul style="list-style-type: none"> ● Sustainable finance will be required by phased approach according to corporate ranking (Leading, foreign companies by 1 Jan. 2019 finally 1 Jan. 2015)(Article 2) ● Chap 2 stipulates application of sustainable finance. <ol style="list-style-type: none"> 1) It requires preparation of action plans on sustainable finance, implementation according to the action plan, communication of the action plan with shareholders etc. (Article 4-6) 2) It requires to prioritize funding to the projects classified as sustainable finance and financial instruments, enhancement or creation of investment portfolio and development of sustainable finance commodity/ service (Article 7)

⁶² Undang-undang No.32 Tahun 2009 tentang Perlindungan dan Pengelolaan Lingkungan Hidup (3 Oktober 2009)

⁶³ OJK. Roadmap Keuangan Berkelanjutan di Indonesia 2015-2019. 2014 (Desember)

⁶⁴ Bappenas and Global Green Growth Institute. 2015. Delivering Green Growth for a Prosperous Indonesia A Roadmap for Policy, Planning and Investment

⁶⁵ Peraturan Otoritas Jasa Keuangan Nomor 51/POJK.03/2017 tentang Penerapan Keuangan Berkelanjutan bagi Lembaga Jasa Keuangan, Emiten dan Perusahaan Publik (27 Juli 2017)

Year	Policy/Regulations	Authorities	Summary/Feature
			<p>3) In relation to peatland restoration: Renewable energy project (biomass power generation etc.), Sustainable agriculture (Organic farming, compost fertilizer production by independent business etc.), Environmental tourism (Tourism to improve bio-diversity etc.) also include sustainable finance (Supplements on Article 7)</p> <p>4) It requires part of CSR also assist to apply sustainable finance (Article 8)</p>
2017	Draft Governmental Regulation on Economic Instruments on Environmental Protection and Management	KLHK Now in State Secretariat	<ul style="list-style-type: none"> ● Planning authority: Directorate for Environmental Impact Prevention of Business and Activity, DG of Forestry Planning and Environmental Control, MoEF⁶⁶ ● To realize economic instruments of Paragraph 8 in Law No. 32 2009 on Environmental Protection and Management ● Basis/umbrella for all relevant ministries and agencies ● The details will be controlled by each ministerial regulation. <ol style="list-style-type: none"> a) To internalize the necessary fund to secure environmental protection b) To clarify principle of responsibility of environmental destroyer c) Incentive/Disincentive in tax system d) To realize payment of environmental service e) To consider in insurance

Sources: JICA Survey Mission for Data Collection on Forest & Peatland Fire Control and Peatland Restoration in Indonesia (Phase 2)(as of Jul. 2017)

Draft Governmental Regulation on Economic Instruments on Environmental Protection and Management is submitted by MoEF to State Secretariat to examine in cabinet, in order to enhance execution of Law No. 32, 2009 on Environmental Protection and Management. It is inferred that in future economic approaches for environmental protection and management will be accelerated all economic sectors.

(2) Institutional arrangement to facilitate green finance

The relevant authorities for facilitating green economic growth are similar with the authorities concerned with facilitation of corporate business investment in 4.3.1 above and community-based business investment in 4.3.3 above. This chapter focuses the outline of financial authorities in relation to green finance.

Table 5.2.3.2. Organization Concerned with Finance in Indonesia
(Collected as of End of Jul. 2017)

Organization	Summary/Feature	Remarks
Financial Service Authority (OJK)	<ul style="list-style-type: none"> ● To regulate. Supervise, examine and investigate financial service sector ● Independent entity reporting to the parliament ● Including banking, capital markets and non-bank financial institutions (including pension, insurance, finance companies, venture capital, guarantee companies and microfinance institutions) ● 8 regional office, OJK office in provincial level ● Bali Center for Sustainable Finance (newly established dated 12 Jul. 2017) 	
Indonesian Central Bank (BI)	<ul style="list-style-type: none"> ● To be responsible for monetary policy, macro prudential regulation, payment systems and foreign exchange 	

⁶⁶ Direktorat Pencegahan Dampak Lingkungan Kebijakan Wilayah dan Sektor, Direktorat Jenderal Palonlogo Kehutanan dan Tata Lingkungan, KLHK

Organization	Summary/Feature	Remarks
	<ul style="list-style-type: none"> To report to the parliament 	
Ministry of Finance (Kemenkeu)	<ul style="list-style-type: none"> To set and manage central government budget together with Bappenas To formulate, stipulate, implement financial policies Directorate General of Debt Management (Direktorat Jenderal Pengelolaan Utang) is responsible for government debt securities management 	
Indonesia Deposit Insurance Corporation (LPS)	<ul style="list-style-type: none"> All banks are obliged to become member of the deposit insurance system Bank deposits are insured up to IDR 2 billion. 	
Indonesian Stock Exchange / PT Bursa Efek Indonesia (BEI/IDX)	To monitor trading, settlement and listed companies' compliance	Private company
Indonesian Clearing and Guarantee Corporation (KPEI)	To act as a clearing and settlement guarantee institution for stock exchange transactions	Limited liability company
Indonesian Central Security Depository (KSEI)	To act as the only central depository for equity and corporate bonds in the Indonesian market	Limited liability company
Financial industry associations	<ul style="list-style-type: none"> Indonesian Securities Investor Association (Asosiasi Perusahaan Efek Indonesia) Indonesian Pension Fund Association (Asosiasi Dana Pensiun Indonesia) Association of Indonesian General Insurance Companies (Asosiasi Asuransi. Umum Indonesia) Indonesian Mutual Fund Managers Association (Asosiasi Pengelola Reksa Dana Indonesia) Indonesian Credit Card Association (Asosiasi Kartu Kredit Indonesia) 	

Sources: Prepared using UNEP. 2015. *toward a Sustainable Financial System in Indonesia.*

(3) Needs of capacity development of financial institutions on green finance

According to the study results on project finance as the case study of renewable energy sector that can easily understand potential for green investment⁶⁷, needs of capacity development to financial institutions are as follows.

- To develop guideline to implement project finance to the relevant project
- To develop tools and guideline to analyze and evaluate risks of the relevant project
- To implement training program on project finance to the relevant project and to incorporate such training into regular training to banks
- To collect and study cases of project finance of the relevant banks by access to banks
- To implement pilot project of relevant project by involving pilot banks that try to green finance⁶⁸
- To conduct technical assistance to banks who are interested in project finance of the relevant project

According to the discussion above, green lending and green bond have potential sources to develop fund procurement for peatland restoration business. For instance, a security

⁶⁷ OJK-GIZ.2017. *Kajian Project Finance untuk Pembiayaan Infrastruktur Hijau di Indonesia. Ringkasan Eksekutif.*

⁶⁸ OJK's Pilot Project Firestorm Movers on Sustainable Banking by 8 domestic banks: PT. Bank Artha Graha International Tbk., PT. Bank Central Asia Tbk., PT. Bank Pembangunan Daerah Jawa Barat dan Banten Tbk., PT. Bank Mandiri (Persero) Tbk., PT. Bank Muamalat Indonesia Tbk., PT. Bank Negara Indonesia (Persero) Tbk., PT. Bank Rakyat Indonesia (Persero) Tbk., PT. Bank BRI Syariah

company in bank group who has experience of investment model to project finance using PE (Private Equity)⁶⁹ is interested in a business contributing peatland restoration⁷⁰.

5.3 Revised Midterm Strategy/ Cooperation Program in Relation to LULCF Sectors

5.3.1 Strengthening of Approach to Support Privatization (Public-Private Partnership)

Based on the discussions above, in the proposed mid-term strategy “Integrated capacity development of stakeholders to contribute to mitigate emission from fires and haze disaster in Indonesia”, “privatization (public-private partnership)” approach (reddish box in the figure below) will be strengthened to develop the measures as business in collaboration with private sectors as follows.

Such approach aims at enhance effective cooperation by providing wider impact and more sustainable even in shorter time.

Proposed Midterm Cooperation Strategy

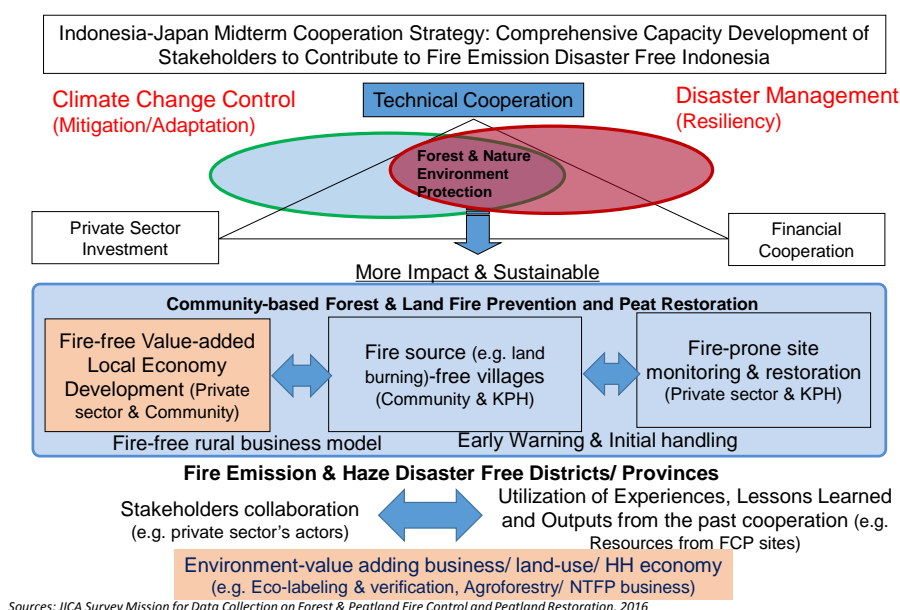


Figure 5.3.1.1. Draft Mid-term Cooperation Strategy in LULUCF Sector (Re-use of the Outputs of Phase 1)⁷¹

Sources: JICA Survey Mission for Data Collection on Forest & Peatland Fire Control and Peatland Restoration in Indonesia.2016

⁶⁹ To collect capital from investors to buy closed stock of special company for project management and to increase company value and then to sell

⁷⁰ For example PT.NSI of MS Bank Group, Japanese enterprise.

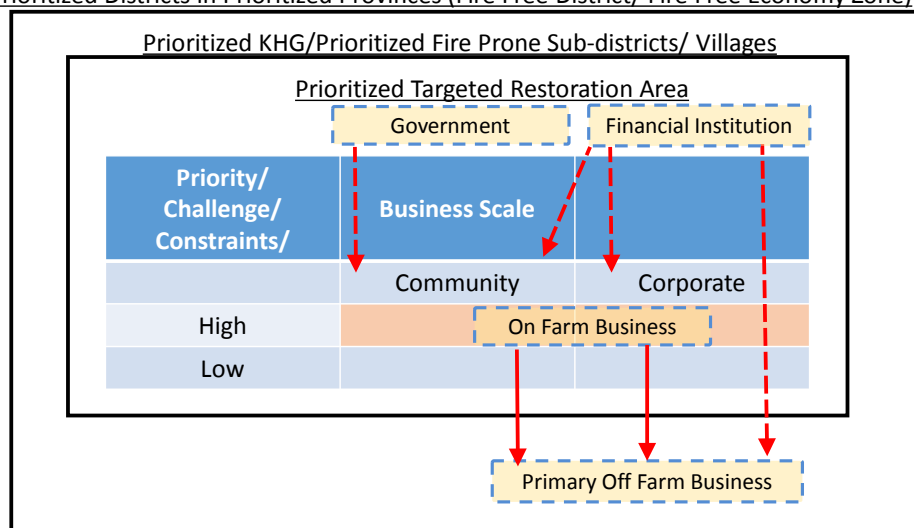
One idea is to issue a green bond named as “Haze Prevention Bond” with annual yield 7% in Indonesian Rupiah currency or 5% in US\$ issuing at Singapore for individual investors in ASEAN in cooperation with institution investors who collect capitals for individual investors.

⁷¹ Final Report of Data Collection Survey on Forest & Peatland Fire Control and Peatland Restoration in Indonesia (May 2017). Chap 2.2.1.

- a) Business in LULUCF sector is difficult to acquire return in short time and to be spread due to little effective, feasible and sustainable according to the perspective of community and corporate finance. So mainstreaming business model that internalize the environmental protection impact like higher water table as added value will be facilitated.
- b) Community-based business models to assure higher water table and without land burning at the fire prone peatland restoration sites will be developed and mainstreamed. At the investable sites, corporate-based business model will also be developed and mainstreamed.
- c) Community-based business is basically assisted by government but collaboration with financial institution will be mainstreamed not only to corporate-based business but also community-based business. Such partnership will also contribute to save government expenditure to measures for LULUCF sector too. In LULUCF sector in Indonesia, there is difficult to receive the request for JICA financial assistance especially grant aid. Thus partnership with financial institutions will contribute to scale up the outputs of technical cooperation, and further solution models to provide wide-area impacts.
- d) Corporate-based business in down stream which can buy and sell of the products and service as well as waste form the above up stream business will be mainstreamed with labeling showing without land burning and maintaining higher water table.
- e) Mainstreaming funding to the above business from the financial institutions, sustainability and spread of above businesses is enhanced.

Public-Private Investment Potential Classification

Prioritized Districts in Prioritized Provinces (Fire Free District/ Fire Free Economy Zone)

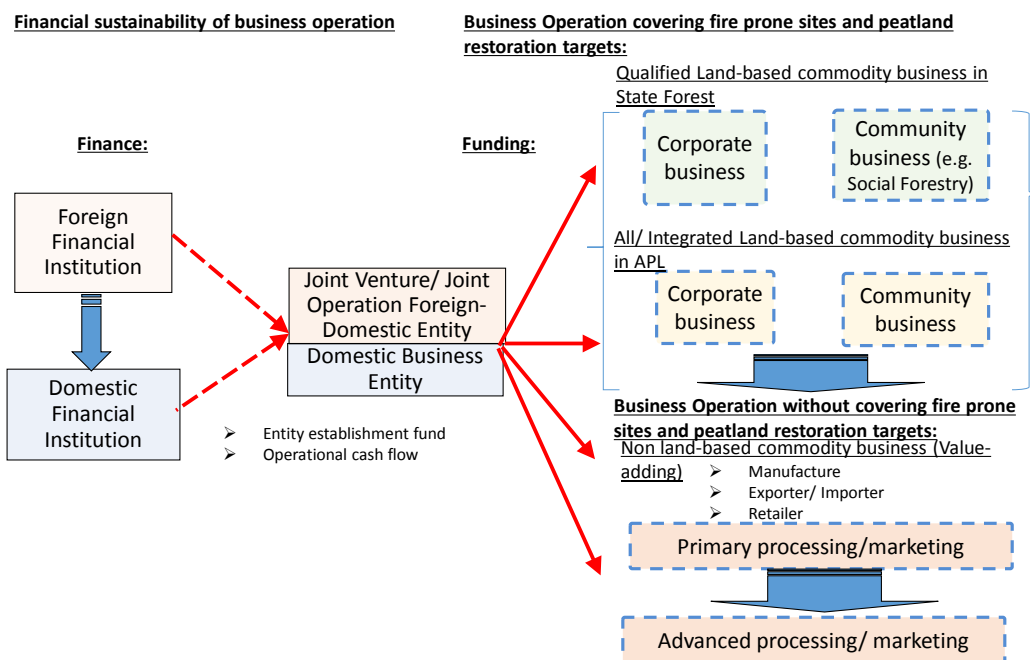


Sources: JICA Survey Mission for Data Collection on Forest & Peatland Fire Control and Peatland Restoration in Indonesia (Phase 2). 2017

Figure 5.3.1.2. Outline of Strengthening Privatization/ Public-Private Partnership in LULUCF Sector

Sources: JICA Survey Mission for Data Collection on Forest & Peatland Fire Control and Peatland Restoration in Indonesia (Phase 2)

Investment Potential to Business for Forest & Peatland Fire Prevention and Peatland Restoration



Sources: JICA Survey Mission for Data Collection on Forest & Peatland Fire Control and Peatland Restoration in Indonesia (Phase 2), 2017

Figure 5.3.1.3. Outline of Role of Financial Institution in LULUCF Sector

Sources: JICA Survey Mission for Data Collection on Forest & Peatland Fire Control and Peatland Restoration in Indonesia (Phase 2)

5.3.2 Proposed Revised Roadmap for Cooperation in LULUCF Sectors

Based on the discussions above, proposed roadmaps for future cooperation project formulation on forest and peatland fire prevention was modified to propose restructuring the roadmap for future cooperation project formulation in LULUCF sector as follows.

The following cooperation outputs will be aimed so as to achieve to develop solution to mitigate GHG emission and haze disaster during around 10 years till 2027.

- The technical authorities on peatland management are BRG and MoEF (Directorate of PKG and MRV). Firstly the cooperation on peatland was started by focusing on BRG and then with switching focus on MoEF in short time
- To response the needs to develop community-baed peatland management outside of private managed area assumed, the facilitation mothod/ social approach model (TPD model) developed in cooperation MoEF-JICA (FCP etc.) can be applicable in this meeds, as discussed in the Phase 1⁷². This model can contribute to tranform to behavior environmental friendly (fire prevention) without any external asistance in the peatland area with low population density and many fallow/unused lands, and is possilbe to contibute also to prevent reliance to outsiders in peatland restoration actions. It is requested to utilize the model in newly preparing “technical cooperation on community-baesd forest and peatland fire prevention”.

⁷² Final Report of Data Collection Survey on Forest & Peatland Fire Control and Peatland Restoration in Indonesia (May 2017). Chap 2.3.1.

Proposed Mid-term Roadmap for Future Cooperation in LULUCF Sector

(Haze Disaster Prevention & Mitigation of GHG Emission from Fire and Peat)

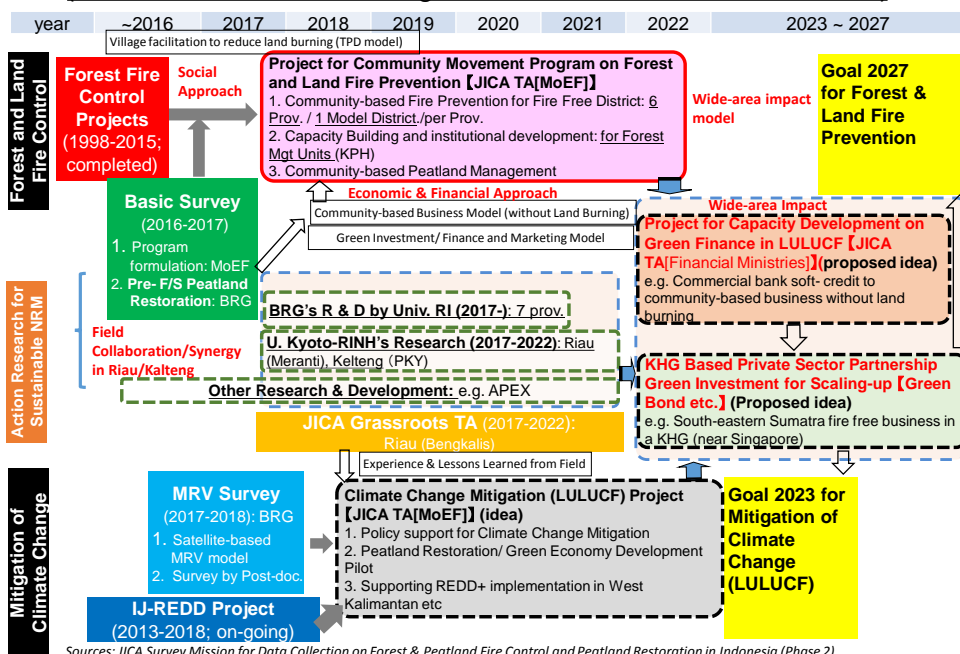


Figure 5.3.2.1. (Restructured Draft) Roadmap for Formulation of Future Cooperation in LULUCF Sector

Sources: JICA Survey Mission for Data Collection on Forest & Peatland Fire Control and Peatland Restoration in Indonesia (Phase 2)

- c) Meanwhile development business models, as well as supporting marketing and finance models for contributing to peatland restoration, which is just started to develop through this phase, will possible develop community-based business models contributing to reduce land burning behavior (cause of forest and land fire) and to restore peatland without any external assistance, and also supporting corporate investment/ marketing/ finance business models, when it will be continued to try and error.
- d) Through “Cooperation for Climate Change Mitigation”, development of method and system to very mitigation impact of GHG emission derived from rewetting and mitigation of peatland fire. This will contribute to build MRV to evaluate activeness of the Indonesian targets of GHG emission reduction.
- e) Action researches on natural resources management by the Japanese arcadias including the groups of Kyoto University in Riau will contribute to enhance development of “natural resources management” method with more effective, more impact and sustainable. Such outcome will produce synergy with cooperation for forest and peatland fire prevention and climate change mitigation.

Utilizing such outcome, enabling environment for investment by private sectors to forest and peatland fire prevention as well as peatland restoration which requires long-term effort will be mainstreamed for scaling-up cooperation outputs.

5.3.3 Proposed Method to Mainstream Community-based Peatland Restoration Business Model without Land Burning

The concept related to b) and c) in 5.3.2 above is drafted by incorporating on the reality of

ground obtained through FCP⁷³ like the background of land behavior in peatland area⁷⁴ into the information from the field in demonstration plot of land management without land burning (PLTB) in paddy field tried by BRG obtained through this phase⁷⁵. The concept below is implicated to be applicable to reduce land burning to fallow/unused land without any external assistance that can become major causes of peatland fires. But it is requested to continuously try and improve by also applying into other land use than paddy continuously and developing collaboration with corporate business. Utilization and further development of this concept is requested too in newly preparing technical cooperation “Project for Community Movement Program on Forest and Land Fire Prevention”.

As the figure below, lower population density leads to decrease labor force and social capitals. Lower population density is derived from lower land productivity. Such factor leads to increase fallow/unused land where having many combustible matters, and results in low social watch to such sites. This situation make people to use fire with uncontrolled that can became cause of fire. Such background is inferred to increase the trend of fire outbreaks in the fallow/unused land without sign of people⁷⁶.

Trends of Background of Land Burning Behavior in Peatland and Proposed Approach for Land Management without Burning/PLTB

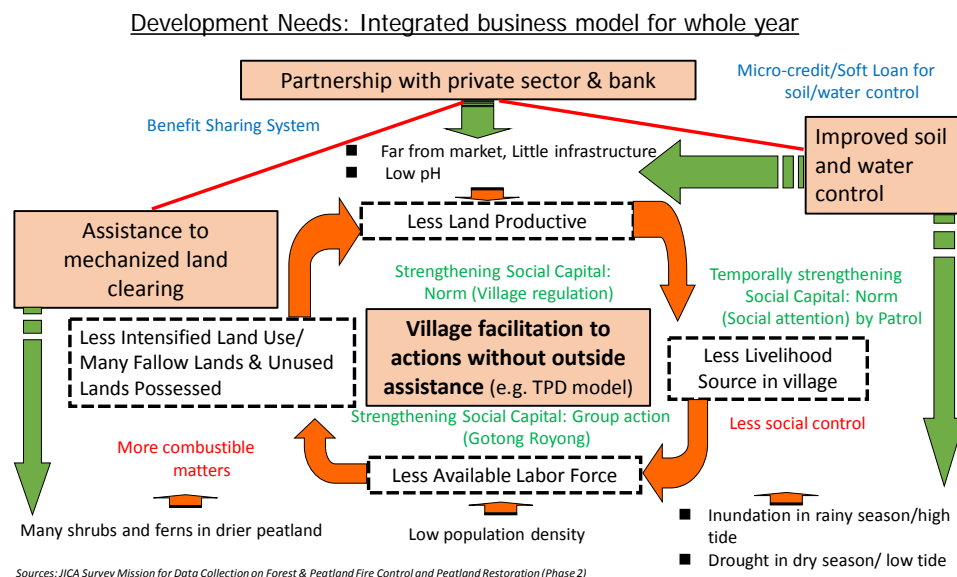


Figure 5.3.3.1. Overview of Background of Land Burning Behavior in Peatland and Proposed Approach to Mainstream Land Management without Land Burning Appropriate to Background

⁷³ KUNO Hiromitsu. 2015.FINAL REPORT Long-term Expert Services for Community-based Fire Prevention Village-based Land and Forest Fire Model: Implication of More Effective Method for Reducing GHG Emission and Haze Disaster Derived from Forest and Peatland Fires and Land Biomass Burning (*LAPORAN AKHIR Jasa Tenaga Ahli Jangka Panjang Pencegahan Kebakaran Berbasis Masyarakat Model Pencegahan Kebakaran Hutan dan Lahan Berbasis Desa: Implikasi Motode yang Lebih Efektif dalam Penurunan Emisi GRK dan Bencana Asap yang Berasal dari Kebakaran Hutan dan Lahan Gambut serta Pembakaran Biomassa*)

⁷⁴ In addition to fire use to reopen fallow/unused land, purpose of fire use for other than farming include to claim the land ownership, and to raise land price .

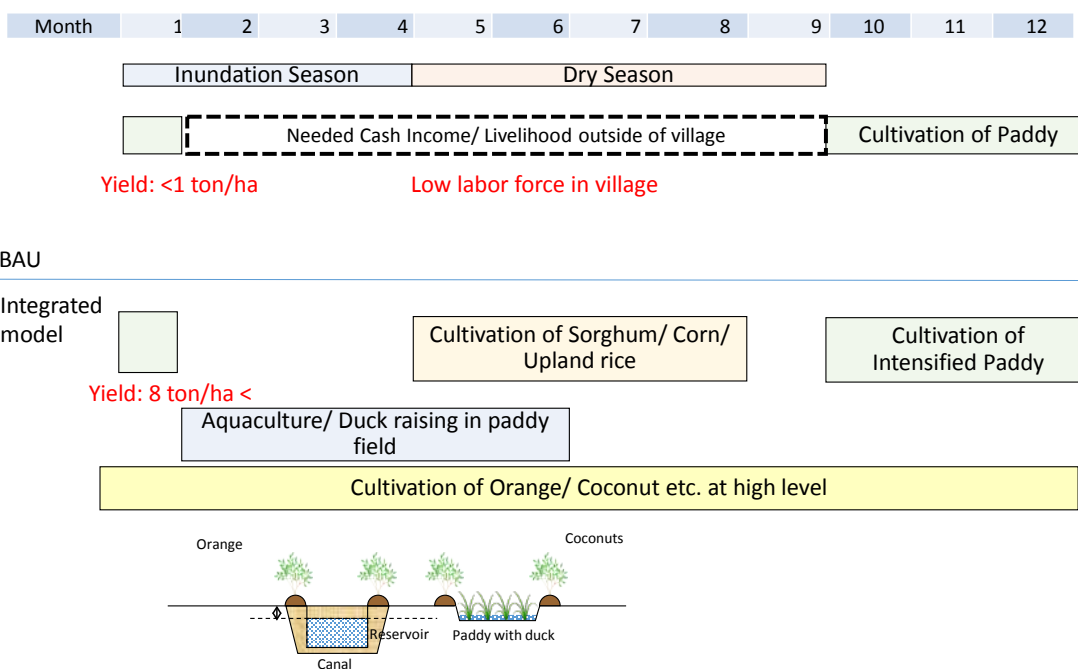
⁷⁵ Information from the local community through support and participatin in site monigoring and follow-up to demostration plot of PLTB conducted by BRG.

⁷⁶ In such sites, it is difficult to collect information observing starting fires, so the cause of fires tends to be tabacco.

Sources: JICA Survey Mission for Data Collection on Forest & Peatland Fire Control and Peatland Restoration in Indonesia (Phase 2)

Demonstration plots of Land Management without Burning (PLTB) tried by BRG applies decomposer to land cover waste from land preparation resulting in land preparation without land burning and neutralize pH so as to rice can be arable in peatland . But participating farmers are not expected to continue to cultivate paddy without any external assistance as discussed 2.2.3 above. This model doesn't indicate high sustainability. It is also difficult to extend to others without any external assistance. Such phenomena is inferred because the model is not appropriate the background of producing fallow/unused lands as the figure below. The model more appropriate to living pattern of community is required.

Needs of Integrated Land-based Business in Peatland Restoration



Sources: JICA Survey Mission for Data Collection on Forest & Peatland Fire Control and Peatland Restoration (Phase 2)

Figure 5.3.3.2. Overview of Background of Land Burning Behavior for Paddy Field in Pulipis District, Central Kalimantan Province Peatland and Proposed Land Management Model without Land Burning Appropriate to Background

Sources: JICA Survey Mission for Data Collection on Forest & Peatland Fire Control and Peatland Restoration in Indonesia (Phase 2)

It is implicated that such negative spiral mentioned above can be broken by just social approach like TPD model. But it is proposed to apply also economic and financial approach to transform community-based business model by collaborating corporate to continuous supporting mechanization and supporting by micro credit to enhance soil and water management.

The above mentioned approach is thought to contribute to develop more effective method to show fire prevention effect in whole district level, the needs of Directorate of Forest and Land Fire Control, MoEF. Applying also approach of Special Economic Zone, for instance as “Haze and Fire Free Economic Special Zone” can be tried in whole district level.

5.4 Proposed Cooperation to Assist Green Economic Growth in LULUCF Sectors

5.4.1 Cooperation with Economic Authorities Concerned on Capacity Development on Green Finance for Green Economic Growth in LULUCF Sectors

(1) Background of cooperation potential

As discussed above, in order to maintain sustainable corporate finance in land-based environmental business that is difficult to acquire return in short time, it is required to develop the capacity of financial institution who tends to hesitate to provide credit to land-based environmental business to understand and evaluation the business, system to mainstream finance to land-based environmental business and building insurance system to finance to land-based environmental business in long term.

The experiences through the activities in Phase 2 implicate cooperation potential with the following economic authorities to develop capacity needed discussed above.

- a) The members of Incentive and Facility for Peatland Restoration Investment supported in 4.1 above are the authorities concerned with economy and finance as well as investment facilitation. They tend to do active discussion to seek for realization of green economy. Especially Coordinating Ministry of Economy are positive to try to apply special economic zone to environmental protection and restoration. Future when the draft governmental regulation on economic instrument is expected to increase needs for green economy. So one of future cooperation strategy is based on this Coordinating Ministry.
- b) The other hand, Financial Service Authority has needs to cooperate and collaborate with other authority in development of sustainable finance for green economic growth due to limited personnel for sustainable finance. Now collaboration with BRG is searched to response to needs to prepare a finance guideline for peatland restoration. The first draft will be proposed by Consortium in Profile Surveys. Moreover JICA is also invited with other donors to OJK's launching of Bali Center for Sustainable Finance (12 Jul. 2017). There is information that OJK's express to search any cooperation with JICA in future in a launching remark⁷⁷.
- c) Deputy for Planning and Cooperation of BRG has a possibility to request budget of MDTF to continue and follow up the activities supported through Stakeholders Coordination Meetings in the Phase 2. Further development of this study outputs will be continued with other donors.

Taking into consideration above, one of strategies in mid-term is to formulate JICA technical cooperation on green finance to respond to needs of economic, finance and investment facilitation authorities utilizing and further developing the outputs from this study. This formulation can be integrated with the lessons learned from "JCM Cooperation" as well as with collaborating with progress of newly preparing technical cooperation "Climate Change Control Cooperation Phase 2".

(2) Cooperation contents

The followings are proposed cooperation contents to develop green finance contributing green economic growth in LULUCF sector. This cooperatoin can be based in Coordinating Ministry of Economy and involving the authorities concerned with green economy, green finance and green investment.

⁷⁷ Information from th personel of OJK at meeting with Consortium in Jul. 2017

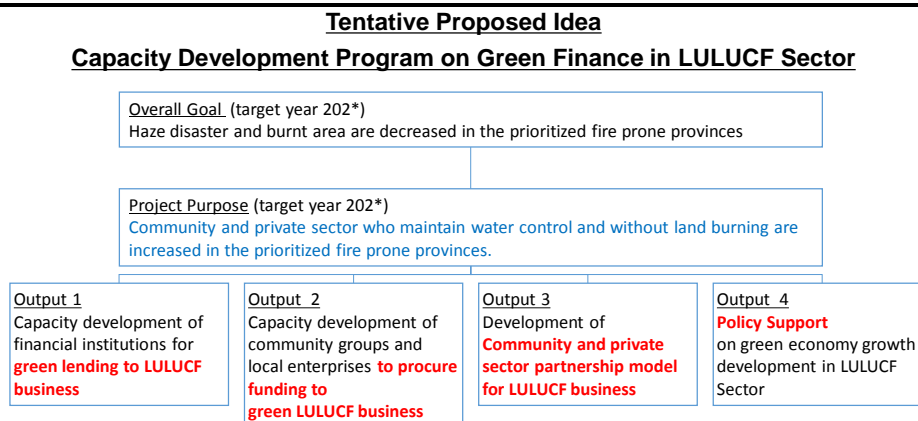


Figure 5.4.1.1. Proposed Image of PDM on Technical Cooperation on Capacity Development for Green Finance for Green Economic Growth in LULUCF Sector

Sources: JICA Survey Mission for Data Collection on Forest & Peatland Fire Control and Peatland Restoration in Indonesia (Phase 2)

5.4.2 KHG Based Integrated Green Investment by Public Private Partnership in LULUCF Sectors

(1) Background of cooperation potential

BRG held a workshop to do brainstorming for integrated management and cooperation for public-private partnership in KHG Sungai Utar-Sungai Serapat where locates at the boundaris 4 disticts in Central Kalimantan and South Kalimantan Provinces in Jun. 2017. Central level coordination will be important to implement protection and management of peatlands by local governments at KHG locating at the bounday of 2 province. In examing “Project for Community Movement Program on Forest and Land Fire Prevention” in Phase 1, Director of PKG emphasized the importance of integrated managment of KHG. In addition to needs of grant aid for building peatland monitoring system oustside of private managed sites in mid-term collected in the Phase 1, another needs to cope with integrated management of KHG as one of strategic cooperaion future.

Potential development to public-private partnership for integrated managment of whole KHG is as follows.

- a) There is information that in this budgeting to BRG, almost half of the requested budet mainly on Re-vetation has shifted to MoEF and then seems to be difficult to use the budget for saving the expenditure. Meanwhile it is also predicted to execute the planning budget from MDTF due to payment through Ministry of Finance with application to the World Bank rules⁷⁸.
- b) Taking into considertiaon such situation, it will be required to intrordue private funds that can flow faster in long term because it is difficult to complete restoration at 200 million ha of BRG’s peatland restoration targeted sites by donors’ assitance and natinal budget. Especially more than half of peatland restoration area belongs to concession area and concecesionire should bear cost for peatland restoration in thier area. Moreover to those area where concessionir gives back thire conccsion, immediate invesetement is requiried to implement business to prevent open access from the perspepive of governane of forest and peatland.

⁷⁸ Informaion as of 30 Jul. 2017

- c) To such areas, public funds like IFC and/or ADB led funds are requested to invite private financial institutions for syndicate lending to invest large scale funding to broad investment to land-based business contributing environmental protection not only peatland restoration and fire prevention but also mangrove protection and biodiversity conservation.
- (2) Cooperation contents
- a) One strategy is to build “Green Economy Development Support Mechanism” to support green economy in ASEAN States through ASEAN Cooperation.
- In addition to JICA, it is better to involve the Japanese public funding insitions (Japan Bank for Internatina Coopertaion etc.) and the private fuding and supporting institution (Development Bank of Japan etc.) as well as internatinal private funding insition (IFC etc.) and private banks who are interesetd in green fianance.
- In addition to directly funding, gurantee service should also strenghtend. Because the gurantee is imporant to negotiage funding and business in LULUCF sector especially small and midium sized enterprises is difficult to acquire better investement ranking or surplus finanical records that is requested in funding review.
- b) A KHG in a province in the Southern Sumatera in relation to haze disaster in Sigapore will be focuse to financial cooperation with the authorities concerned with green economy, green finance and green investment and private finance insitutions for green economic growth in LULUCF sector in the KHG by the integrated management.

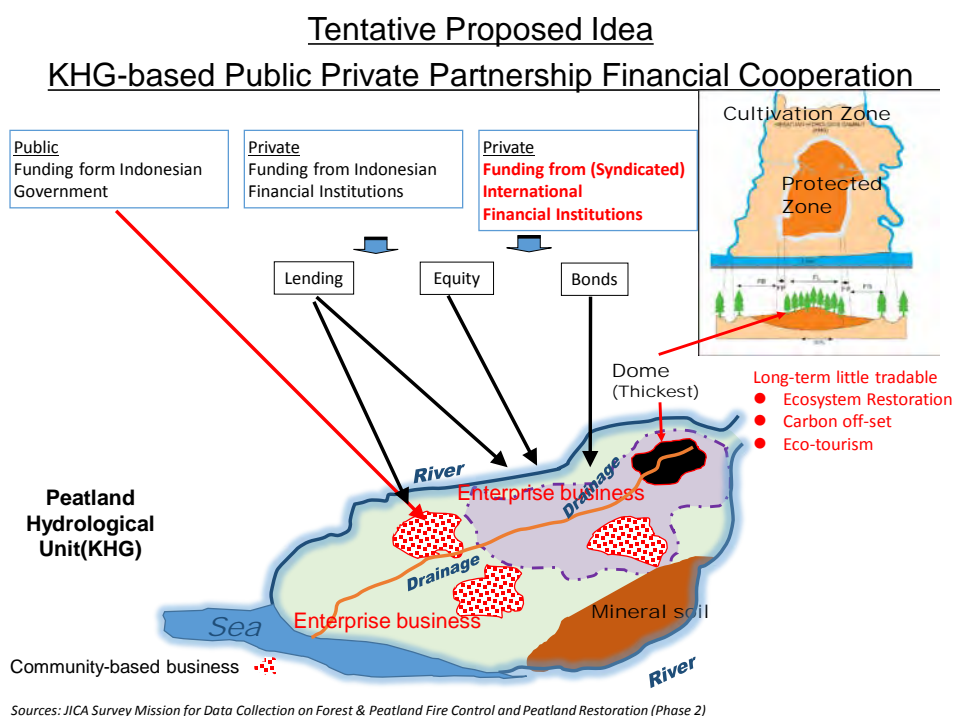


Figure 5.4.2.1. Proposed Image of KHG Based Integrated Green Investment by Public-Private Partnership in LULUCF Sector

Sources: JICA Survey Mission for Data Collection on Forest & Peatland Fire Control and Peatland Restoration in Indonesia (Phase 2)

**Data Collection Survey on
Forest & Peatland Fire Control
and Peatland Restoration
in Indonesia (Phase 2)**

**Final Report
<Annex>**

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1 Outline of Mission

1.1. Cooperation Plan

1.1.1 Minutes of Meetings (11 Nov. 2016)

MINUTES OF MEETINGS
BETWEEN
PEATLAND RESTORATION AGENCY
OF THE GOVERNMENT OF REPUBLIC OF INDONESIA,
JAPAN INTERNATIONAL COOPERATION AGENCY
FOR
BASIC INFORMATION SURVEY
ON
PEATLAND RESTORATION IN INDONESIA

Japan International Cooperation Agency (hereinafter referred to as "JICA") and Peatland Restoration Agency (hereinafter referred to as "BRG") had a series of discussions on the Preliminary Information Survey on Peatland Restoration in Indonesia.

As a result of the discussions, JICA and BRG agreed on the scope of the Preliminary Information Survey on Peatland Restoration as attached.

Marakkesh, November 11, 2016


Mr. Kenichi SHISHIDO
Senior Deputy Director General,
Global Environmental Department,
Japan International Cooperation
Agency


Ms. Myrna A. Safitri
Deputy for Education, Socialization,
Participation and Partnership
Peatland Restoration Agency,
Government of the Republic of
Indonesia

Witness:


Prof. Dr. Mitsuru OSAKI
Hokkaido University

ATTACHMENT

1. Background

Peatland Restoration Agency (BRG), established by Presidential Decree Number 1 of 2016, has main mission to accelerate the rehabilitation of degraded peatlands and restore their hydrological function in systematic, directed, integrated and comprehensive manner. BRG shall coordinate and facilitate the overall peatland restoration, including planning, controlling, mapping and determining zonation for protection and production, focusing those that have been damaged by the recent forest fires.

In carrying out its mandate, BRG shall coordinate and strengthen policy for peatland restoration, develop peatland restoration plan and cooperation, conduct peatland hydrological unit mapping, determine peatland zonation, construct re-wetting infrastructure, review permits and license over the peatland burnt areas and its management, carry out socialization and education on peat restoration measures, and supervise the construction, operation and maintenance of peat management infrastructure in the concession. Collaboration and support is required from all stakeholders, including the community groups, NGOs, universities, ministries and agencies, and private sectors. The international development partners and donors can play part towards achieving the goals according to their respective roles.

2. Purpose

This survey aims at producing peatland restoration options in the four priority districts which could be adopted or adapted to the other priority restoration areas.

3. Duration

One year from the date of signature

4. Target Area

The survey will be targeted at four priority districts;

- Kepulauan Meranti District (Riau Province)
- Ogan Komering Ilir District and Musi Banyuasin District (South Sumatera Province)
- Pulang Pisau District (Central Kalimantan Province)

5. Major activities

BRG and JICA agreed to conduct the activity in three major components as follows:

- 1) Set up trial measurement and monitoring for baseline peatland hydrological conditions of the target area;
- 2) Survey for preliminary feasibility assessment on biophysical and economy urgently required to facilitate peatland restoration investments;

3) Investment engagement meetings to promote peatland restoration to relevant stakeholders.

6. AOB

JICA and BRG recognized the importance of technical assistance (including technical support, survey methodology and investment engagement participations) based on the Memorandum of Understanding (MOU) among BRG, Hokkaido University, Kyoto University and Research Institute for Humanity and Nature (RIHN) signed in Jakarta on 10 August 2016.

(END)

1.1.2 Proposed Work Plan from BRG (28 Octv. 2016)



**BADAN RESTORASI GAMBUT
REPUBLIK INDONESIA**

Alamat: Gedung Kementerian Sekretariat Negara Lantai 2
Jl. Teuku Umar No. 10 JAKARTA 10350, Telp (021) 31901268

LTN : S.167/BRG-KB/10/2016 Jakarta, 28 October 2016
Attachment : 1 (one) exemplar
Subject : Proposal of Urgent Cooperation Action Plan 2016-2017
between BRG-JICA

To
**Leader of JICA Survey Mission for Data Collection on Forest & Peatland Fire Control
and Peatland Restoration in Indonesia/ Japan Forest Technology Association**
di
J A K A R T A

Dear Sir,

Regarding the results of dialogue between Head of BRG and the representative of JICA HQ's Mission headed by Mr. Shishido on 15 September 2016, we would like to propose **BRG-JICA Urgent Cooperation Action Plan**. This proposal has three major components as follows:

1. Trial baseline measurement and monitoring of peatland hydrological conditions of the target area;
2. Profiling surveys of the target area and quick preliminary feasibility study for facilitating peatland restoration by private business investment;
3. Stakeholders' coordination meetings to promote private business investment on peatland restoration.

We hope this cooperation can be started immediately, especially about the installation of water logger than can have field experience like SESAME, prior to mid-December.

We look forward to working together with you. Thank you for your attention and kind cooperation.

Sincerely,



NAZIR FOEAD

Head of Peatland Restoration Agency of Republic of Indonesia

CC:

1. Secretary of Peatland Restoration Agency of Republic of Indonesia
2. Archive

BRG-JICA Urgent Cooperation Action Plan (2016-2017):

Pre-feasibility Study for Peatland Restoration Investment in Four Most Prioritized Areas in Indonesia

TOR

BACKGROUND

Peatland Restoration Agency (/BRG), established by Presidential Decree Number 1 of 2016, has main mission to accelerate the recovery of degraded peatlands and restore their hydrological function in systematic, directed, integrated and comprehensive way. BRG has duties to carry out coordination function and strengthen the implementation of restoration works, planning control, mapping and determining protected zones and restoring peatlands which have been damaged by the recent forest fires.

BRG performs several steps for peatland restoration action. The first step that BRG has to do is adjusting the peatland zoning by scientific justification based on peat depth and how critical the area is, which help in identifying the target area for peatland restoration action. Peatlands have to be wet, and BRG is crucial to develop canal blocking to restore dry peatlands to be wet, and to stop peatlands being converted into drainage. Another important step is BRG has to lead on water management implementation based on peat hydrological unit to manage the hydrological ecosystem in peatlands in order to avoid the peatland degradation and to improve the quality of peatland ecosystem. BRG has to identify the best practices of re-vegetation in degraded peatlands which keeps the peatlands wet. To restore the livelihoods of local communities, BRG has to empower them. Last but not least, BRG must aware more on peat fires prevention and peat monitoring. BRG has developed work plan until 2020 for restoring 2 million hectares of peatlands. However, to achieve its goal, BRG needs strong support from community groups, NGOs, universities, ministries and agencies, and private sectors. Role of international partners and donors can play to support BRG towards the success for restoring 2 million hectares of peatlands.

OVERAL GOAL

This activity is a cooperation activity between JICA and the BRG which aim to develop economic models to contribute on climate change mitigation through peatland restoration activities.

OBJECTIVE

This cooperation activity is purposed to develop peatland restoration portfolio options prioritized in four districts which hopefully can be duplicated in other peatland restoration priority areas.

ACTIVITY TARGET AREA

The cooperation activity will be targeted to four priority districts, Kepulauan Meranti District (Riau Province), Ogan Komering Ilir District and Musi Banyuasin District (South Sumatera Province), and Pulang Pisau District (Central Kalimantan Province).

PERIOD

This activity will be conducted from December 2016 until May 2017.

MAJOR COMPONENT

BRG and JICA **Survey Mission** agreed to conduct the activity in three major components as follows,

1. Trial baseline measurement and monitoring of peatland hydrological conditions of the target area;
2. Profiling surveys of the target area and quick preliminary feasibility study for facilitating peatland restoration by private business investment;
3. Stakeholders' coordination meetings to promote private business investment on peatland restoration

WORK PLAN

No	Activity	Place	Expected Outcomes	Expected Output	Timeline	Implementer	Remarks
1	Trial baseline measurement and monitoring of peatland hydrological conditions of the target area						
1.1	Harmonization in national monitoring system	National	Minister of Environment and Forestry and Head of BRG hold a consensus dialog after coordination meetings	MOU between Ministry of Environment and Forestry and BRG on harmonization of peatland hydrological monitoring system	End of November 2016	BRG involves PKG, Ministry of Environment and Forestry	With Matrix on Sharing Task/ Responsibility in overall monitoring process.
1.2	Building consensus on detail monitoring plan (location, responsibility demarcation, etc.)	Four districts	Each party realized their own authority and responsibility on peatland restoration	MOU on peatland hydrological monitoring tasks (authority and responsibility) by each party	Beginning of December 2016	BRG involves UNSRI team	<p>a) BRG provides base peatland restoration map and water logger installation location plan maps (with coordinate) in seven KHG</p> <p>b) BRG should secure the place for water logger installation with TRGD</p>
1.3	Training of Trainers (TOT) for stakeholders on peatland hydrological monitoring	<p>a) Jakarta for in-house training</p> <p>b) Four districts while installing</p>	Capacity of stakeholders on peatland hydrological monitoring is built	Report on TOT on peatland hydrological monitoring	December 2016	UNSRI team involves BPPT	<p>a) BRG provides concept of TOT, budget for</p> <ul style="list-style-type: none"> ➤ All budget at Jakarta training ➤ Training at each district of trainers' transport and accommodation at four districts <p>b) JICA budget covers participants' transport and accommodation of training at each district</p>

1.4	Installing water logger real time to monitor peatland hydrological	Seven peat hydrological units (/KHG) in four districts	Peatland hydrological in seven KHG is monitored	Installed water logger real time in seven KHG (two units of equipment for each KHG); <u>SESAME due to various experiences in peatland environments</u>	December 2016 (E.g. 5-15 Dec.)	JICA Survey Mission involves vendor	<p>a) BRG provides budget for the representative of BRG/TRGD for installation (including tele-communication) and maintenance</p> <p>b) JICA budget cover procurement and installation of 14 units of water logger real time at the places secured by BRG/TRGD and trainers from vendor</p> <p>c) Official Transfer Document (Berita Acara Serah Terima): JICA Survey Mission-BRG; BRG-Local Government (TRGD)</p>
2 Profiling surveys of the target area and quick preliminary feasibility study for facilitating peatland restoration by private business investment							
2.1	Quick feasibility study on biophysical and economic on peatland restoration to develop peatland restoration portfolio	Four districts	Portfolio on peatland restoration based on biophysical and economic study is developed	Peatland restoration portfolio	December 2016	UNSRI team	This activity will be conducted by UNSRI team which consists of several experts from other universities and agencies
2.2	Related to point (2.1), conducting market research and cost benefit analysis on the proposed peatland-friendly species plantation development associated with potential business development	Four districts	Cost benefit analysis and market potential for peatland-friendly commodities are identified	Design on market for peatland-friendly commodities	January 2017	UNSRI team	This activity will be conducted by UNSRI team which consists of several experts from other universities and agencies

2.3	Identifying the location for implementing peatland restoration portfolio based on quick feasibility study	Four districts	Location for implementing peat restoration portfolio is mapped	Map on peatland restoration portfolio	January 2017	UNSRI team	This activity will be supervised by BRG
2.4	Designing and establishing demonstration plot for peat restoration	Four districts	Peat restoration implementation design is developed and demonstration plot for peat restoration is established	Design of demonstration plot for each district and demonstration plot in each district	January 2017	UNSRI team	This activity will be supervised by BRG
2.5	Monitoring and evaluation on demonstration plot	Four districts	Established demonstration plot is monitored and evaluated	Report on monitoring and evaluation for each demonstration plot	January - April 2017	UNSRI team supervised by BRG	This activity will be supervised by BRG
3	Stakeholders' coordination meetings to promote private business investment on peatland restoration						
3.1.	Regular coordination meetings	Jakarta	Investment environment is enhanced	Cooperation proposal from related ministries & agencies as well as business associations to enhance investment on peatland restoration	December 2016 (E.g. 1 Dec.); February (E.g. 1 Feb.) and April (E.g. 3 Apr.) 2017	BRG and JICA Survey Mission	a) JICA budget covers for meeting room and meals
3.2	International Symposium on 'Toward Integrated, Structured and Massive Peat Restoration Action In Indonesia'	Jakarta	Draft of cooperation action plan on peatland restoration developed by BRG and JICA is shared to	Cooperation proposal related to investment on peatland restoration	December 15&16, 2016	BRG and EO	a) BRG cooperates with several donors for implementing International Symposium b) JICA will be one of the donors

			audience during International Symposium				
3.3	Open Seminar 'Investment on Peatland Restoration'	Jakarta	Peatland restoration portfolio is shared to local investors	Business proposal from local (/Indonesian) investors on peatland restoration	March 2017 (E.g. 2 March)	BRG and JICA Survey Mission	BRG provides concept of Open Seminar, provides invitation letter for participants/ a) BRG provides budget for transport and accommodation for participants b) JICA budget covers for meeting room and meals
3.4	Open Seminar 'Investment on Peatland Restoration'	Tokyo	Peatland restoration portfolio is shared to Japan investors	Business proposal from Japan investors on peatland restoration	April, 2017 (E.g. 27 April)	BRG and JICA Survey Mission	JICA budget covers concept of Open Seminars, invitation letter for participants. a) BRG provides honorarium for Indonesian participants b) JICA budget covers airfare and accommodation for Indonesian participants;

RECAPITULATION BUDGET PLAN

No	Component	Total (Rp.)	Remarks
1	Trial baseline measurement and monitoring of peatland hydrological conditions of the target area	2,073,200,000	Managed by JICA Survey Mission
1.3	Training of Trainers (each district)	480,000,000	Except Training at Jakarta area (e.g. BPPT) and the airfare, accommodation fee and professional fee for trainers at each district that will be funded by BRG
1.4	Water logger real time procurement & installation	1,512,800,000	Depending on quotations
2	Profiling surveys of the target area and quick preliminary feasibility study for facilitating peatland restoration by private business investment	1,880,000,000	Subcontracted to UNSRI by JICA Survey Mission
2.1 2.2	Feasibility study on 1) Biophysical and economic on peatland restoration; and 2) Market potential and cost benefit analysis on the proposed peatland-friendly species plantation development	280,000,000	
2.3 2.5	Demonstration plot development	1,600,000,000	
3	Stakeholders' coordination meetings to promote private business investment on peatland restoration	625,000,000	Managed by JICA Survey Mission
3.1	Regular coordination meetings	150,000,000	This is the amount which BRG proposed to JICA
3.2	International Symposium on 'Toward Integrated, Structured and Massive Peat Restoration Action in Indonesia'	300,000,000	This is the amount which BRG proposed to JICA
3.3	Open Seminar 'Investment on Peatland Restoration' (Jakarta)	150,000,000	This is the amount which BRG proposed to JICA
3.4	Open Seminar 'Investment on Peatland Restoration' (Tokyo)	200,000,000	This is the amount which BRG proposed to JICA
Total		4,753,200,000	

Notes:

- 1) Basically all cost for mobilization of BRG personnel (including professional fees/ honorarium) should be covered by BRG.
- 2) The budget will be required to add to cover the cost for JICA Technical Implementer's Management and Survey Activities and other costs.

1.2. Coordination Meetings

1.2.1 March 31, 2017 <Watertable Monitoring Strengtening>

**Minutes of
Focus Group Discussion
Technical Meeting Development of Ground Water Level Monitoring System on Peatlands
Peatlands Restoration Agency Office, Gedung Sekretariat Negara Lantai 1 (Ruang OASE),
Jakarta Pusat
Friday, March 31, 2017**

Summary

Focus Group Discussion activity is conducted in order to discuss any technical aspects in research and developing ground water level monitoring system in peatlands and also to elaborate the cooperation and sinergy among the related agencies and guarantee the sustainability of the sytem itself. Focus Group Discussion is established by the cooperation between BRG, BPPT, PKG, and JICA. The discussion aims to gain solutions and recommendations related to the monitoring system which can be developed in peatlands and also proposed to the company and investor. The expected outcomes are the research and development elaboration of technical aspects in monitoring system and also the sinergy and sustainability of ideas. This meeting is attended by 17 participants from the related agencies in peatlands restoration.

FGD started by the welcome speech and a short explanation related to the discussion by the representative from BRG. Discussion session started with the presentation of discussion matters. The discussion matters are mentioned below:

- BRG concerns as one of important agency in peatlands restoration
- The proposal of tools/equipment that will be used in peatlands monitoring system

Subsequent to the presentation of introductory matters. Discussion continued by the proposal of SESAME tool for peatlands monitoring. Discussion matters are delivered by JICA Expert. The discussion matters include the detailed of SESAME tool for the benefit of peatlands restoration.

The next session is panel discussion. Panel discussion include Q&A session are discussing about the concrete steps that will be taken in the near future for peatlands restoration. Participant are already given the discussion matter which is including the background of discussion. This document will be proceed to be used as guidance in decision-making process related to development of peatlands monitoring system. Panel discussion is closed by delivering the summary of discussion.

Minutes of Meeting

Agenda overview:

- A. Welcome speech and directives
- Welcome speech
 - Directives

B. Discussion Panel 1

Explanation related to BRG target in developing monitoring system of peatlands and the presentation of ideas and also recommendations from JICA expert related to the SESAME tool.

C. Discussion Panel 2

Explanation of ideas from MORPALAGA tool and the discussion related to the concrete steps that will be taken in the near future.

D. Closing

Summary presentation and important notes related to the outcomes of discussion.

Welcome speech and directives

- Opening and thank remarks
- A short explanation of the background activity
- Explanation of the discussion matters

Welcome speech: Dr. Haris Gunawan

(Deputi Litbang BRG – Deputy Research and Development of BRG)

- ✓ Peatlands monitoring system is assigned to BRG mostly at Department 4.
- ✓ We should find the strategy to develop monitoring system
- ✓ BRG still learning from BPPT and international agency especially from Japan
- ✓ BRG needs help to strengthen and enhance this monitoring system
- ✓ BRG is a new agency who needs a broader cooperation with BPPT (who has been working with JICA)
- ✓ There are 2 things we would like to accomplish: practical needs to update and inform rapidly and accurately related to the peatlands conditions and strategy to build and develop this monitoring system
- ✓ This year BRG is assigned to monitor the peatlands condition in 23 KHG (spread on 6 provinces, except Papua)
- ✓ BRG has to install the ground equipment which is minimally represent the peatlands condition in 23 KHG
- ✓ BRG also would like to develop monitoring system which could cover broader area and build the models. This is the main reason why we need recommendation from Prof.Osaki
- ✓ Ground water level condition should be recognized from spots where SESAME and/or Morpalaga is located
- ✓ Prior to the installation of the tools, BRG should get the determination letter from the ministerial. This is based on ministerial regulation No.15 2017
- ✓ The selected tool/equipment is expected to recognize not only peatlands condition before and after the restoration but also could answer the needs of BRG to develop baseland carbon emission estimation
- ✓ State Budget has been allocated for this project
- ✓ Report and the installation of integrated monitoring system should be delivered to president before July
- ✓ Central control room is going to be build for this monitoring system
- ✓ The monitoring system is also expected for scientific development (expected output: international journal related to the monitoring system is published this year, on cooperation between BRG, BPPT and JICA)
- ✓ The combination from this technology is expected to increase BRG confidence in order to inform the peatlands condition and progress of the restoration to President
- ✓ We have 2 main speakers :
Prof. Mitsuro Osaki
Dr. Albert

Panel Discussion (Started at 9:24 AM)

1st Session

Facilitator: Abdul Karim, SE ME

(Kapokja Pengembangan Data dan Informasi-BRG/Head of Data and Information Development-BRG)

Discussion matters:

- ✓ Information system of peatlands monitoring that is going to be developed by BRG
- ✓ BRG has to consider the components that are going to be developed and stakeholders who already built this system such as; KLHK, PKG and BPPT
- ✓ Monitoring of ground water level is one of the most important components related to this system
- ✓ We are also going to discuss other possibilities related to this monitoring system which can be offered by BRG, and also considering the technology which has been controlled by stakeholder outside of BRG agency
- ✓ System that is going to be developed:

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- ✓ Ground water level monitoring in peatlands, BRG is going to install GWL equipment in some locations with telemetry system and also use one of providers then will be delivered to BRG's server
 - ✓ Water logger already being installed in peatlands location then will be transmitted through GSL and reach the server
 - ✓ KLHK and BPPT already developed this kind of system
 - ✓ We should find the method to integrate the server
 - ✓ Possibilities: join server, informasi dan aplikasi (BRG, BPPT dan KLHK)
 - ✓ Here are some possibilities that we could execute: join the server, information and application among these agencies (BRG, BPPT and KLHK)
 - ✓ The important things that we need to recognize in the short term are how many water logger already being installed and what agencies which is already used this tool.
 - ✓ We need to inventory the usage of water logger to gain information as quick as we can to be reported to president
 - ✓ Integrate the server, KLHK already built this system. But has not been used telemetry technology. KLHK is only using the data from companies and they're not providing real time data
 - ✓ BPPT is going to deal with the logger data from SESAME and/or Morpalaga
 - ✓ BRG is now going to develop the server. Do we need develop the server? Or we can use the existing server? BRG still needs to consider to built the server as personal storage to save the data related to peatlands utilization
 - ✓ In case BRG would like to integrate the data, do we have to uniform the data format?
 - ✓ Informations that we can gain from the tool are: ground water level, temperature, relative humidity, soil moisture, precipitation. Are there any more information that can be obtained from the tool? For example, the tool which is already being developed by BPPT; it is equipped with sensor to detect fire earlier.
 - ✓ This tool is also expected to predict the coverage of peatlands rewetting

Monitoring system that will be developed:

Ground water level monitoring with Morpalaga and SESAME is expected to develop early warning system of fire. Ground water level monitoring in peatlands can be developed with radar image ALOS PALSAR. We have to consider how possible this can be developed? If it possible, the installed tool in location is only used for reference and validation. BRG is going to make some boreholes to predict the groundwater conditions in peatlands through remote sensing. For the monitoring system related to the result of rewetting intervention which is done by the installation of canal partition or by the rewetting through the boreholes. Are they can be predicted by remote sensing? This could be so helpful to assess the work done by BRG.

Opening 2nd Session : (Mr. Kubo Hideyuki)

Data from the ground is provided and can be downloaded by the telemetry system. The challenge that we are facing now is how to integrate. And also in order to add the information we are going to use the satellite. The model of those kind of technology is not available yet. But the presentation from Prof.Osaki is going to answer how to integrate the system.

1st Speaker : Prof. Mitsuru Osaki

MRV System for Peatland Restoration

- ✓ As the form of next step from technology transfer that has been done for a long time between Indonesia-Jepang
- ✓ The principles: informatics – sharing information in one open platform
- ✓ Concrete approach through water, carbon and vegetation monitoring
- ✓ Local approach through land management
- ✓ Semi-concrete approach through the biomassa usage and analysing the market
- ✓ Key topic : MRV System on Ground-truth and Remote-sensing Survey in Peatland
Topics from MRV dan Mapping:

1) SESAME

MRV land survey to manage peatlands and estimation of carbon balance, SESAME can reduce the usage of excess instruments for land survey on targeted area. Lowest ground water level results a high number of hotspots, based on MODIS image. The solution is by executing rewetting of peatlands so we can keep the peat wet and prevent the fire. Ground water level monitoring and precipitation is already being done successfully.

2) Water Table Mapping / Pemetaan Muka Air

Ground water level prediction by using soil moisture simulation with WRF model in Indonesia. Use global data set of soil moisture. Basic training is already being executed with participants from 16 agencies. Manual of the peatlands tropical management is data collecting which consists of peatlands map, set of remote sensing data, measurement on the ground then analysis of the land coverage data, groundwater level and burn area. Those analysis of data can produce model carbon emission from peat decomposition and fire on peatlands. Dataset is updated everyday, WRF can read the data from FNL easily.

3) Canal Detection System

4) Topography for Dome Structure

5) Vegetation Mapping

Hyperspectral sensing by using HISUI, realtime sensing system by using LCTF.

6) Fire Inventory

Canal map and vegetation as basic information, long-term weather prediction in 6 months ahead by BMKG, groundwater level daily map, weekly prediction model on groundwater level by SESAME, estimation of the depth of fire by using PARSA II.

7) Network Systems / Sistem Jaringan

Some of SESAME network options in Indonesia; On-premises server, Amazon Web Service (AWS), Biznet GIO Cloud.

Dr. Haris Gunawan

- Ideas for integrated system as the form of cooperation between BRG and other institution is already clearly delivered by Prof.Osaki
- PKG could not attend this focus group discussion
- Concrete step and timeline have to be prepared for the state interests and the report could be delivered to Mr.President before July

Discussant: Dr. Bambang Setiadi

This FGD is technical meeting not a policy meeting. I was assigned to make sure that BRG is dealing with their tasks to restore peatlands perfectly. We have lots of problems in peatlands, it begins from the derivation of groundwater level and cause fire. BRG is mandated to report the occurrence of ground water level derivation, burn area and non-burnt area of peatlands. Basis of all these reports are the technology that we're discussing of. Target 2.4 million ha, 1.4 ha is protected area. The preparation is described on ministerial regulation No.57, 2017. BRG is mandated with a massive task to restore the derivation of groundwater level under 40 cm.

Issues:

There is no references for peatlands management in tropical country such as Indonesia. The targets are 4 districts with area coverage 600.000 ha, 104 villages, and 23 KHG.

Questions:

- How to integrate the technology?
- Are there any other information we could gain from the tool?
- How widespread the area could be covered by rewetting?
- Can we measure the groundwater level by using satellite?

Required reference by SESAME tool is hotspot, the depth of groundwater level is determining the amount of hotspot and conversely. Those are the strongest parameter. The ability of SESAME to predict can reach up to two months. SESAME could monitor the dome system which is one of the issue faced by BRG. There are two technology that SESAME and MORPALAGA. Issues/problems that faced by Mr. Abdul Karim is the selected tool should be proposed through a tender mechanism. The tender should be based on research and specifications required by BRG. I suggest to spot one or two covered area on peatlands, apply the usage of those tools (SESAME/Morpalaga) and compare which one is the best. If we chose one of the tools but it doesn't suit to our required specification, our action could be classified to criminal act. There is no other competitor towards this technology of SESAME and MORPALAGA. Now we are dealing with very limited time, we have to consider that time is one of the most limited factor.

Dr. Haris Gunawan :

Important notes;

- How to combine existed resource to quickly answer and giving solution in peatlands restoration both restoration that is succesfully executed or not.
- Information how technically the steps related to the proposal from Prof.Osaki and BRG's requirements.
- The result of this FGD should find a concrete follow-up as references how BRG build integrated monitoring system
- Presiden needs transformation from scientific data to something which is can be easily understood as concrete step. Simplification of information could be transform into visual display and those kind of visual information is highly requested for a quick policymaking
- On early July, there will be hundreds of GWL monitoring system installed in 23 KHG. At least half of this target is already being installed on June.
- The expected information is not only sourced from GWL but also from Prof.Osaki's ideas. The ideas could be applied in BRG's developing system of monitoring.

2nd Session

Facilitator: Dr. Eli Nur Nirmala Sari

2nd Speaker: Dr. Alberto

The first thing that we should make is system. In case BRG has instrument such as server and so on, system can be built in one month. The data required to build this system are only soil maps, and soil moisture. As the answer of president's request on July, we could report the progress. Data can be collected from the installed instrument. Soil moisture data from WRF and NCAR could be combined with the equipment, based on ideas presented by Prof.Osaki and those already corresponded to my idea. Based on this information we could predict how much carbon emission can be reduced through this restoration program. By using the existed data we can give the progress report and result without installing many instruments on the ground. The most important thing is build the system, but beside that by using the GWL information we could also start to develop FDRS. By using the existed data we could build insitu early warning system. It can be proceed from the data collected by MORPALAGA and/or SESAME.

Dr. Eli Nur Nirmala Sari

Requirements:

1. The instrument used should suit with the standards created by BRG
2. The instrument that will be proposed on tender mechanism should follow what BRG needed
3. Not only monitoring the GWL, GWL is one of the important parameter. Soil moisture on peatlands is also needed to monitor, the changes that is occur on peat such as, subsidence and canal conditions.
4. BRG is limited to install many tools on the ground, considering the accessibility of the location and also the budget
5. BRG should build and develop the model
6. BRG is going to make the system first for peatlands monitoring

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7. There is no guarantee that SESAME and/or MORPALAGA suit to the standards established by BRG
 8. The standards set forth by BRG will be announced

Related to the EWL (Early Warning System), canal visualisation is really needed to show the vulnerability of fire. We do need the data from today but also the prediction of peatlands conditions on a month ahead. Considering our limitation, it will be really helpful if we can build a modelling equipment. Methods that have been delivered by Prof.Osaki is really useful in carbon emission estimation, moreover if it can be applied in BRG's system. BRG is going to discuss with TRGD in every province to start build EWL with the technology presented by Prof.Osaki. BRG is only going to install 200 units this year. Methodology that will be used by BRG is a standard which has been set by KLHK. Methodolgy for carbon emission estimation which has been delivered by Prof.Osaki is really useful, moreover if we can apply and built it into our system.

Prof. Mitsuro Osaki :

International standard used must be given into this project. Considering that international publication will also be done by BRG. SESAME has international standard. We have some ideas for discussion, including the SESAME's ability in estimating carbon emission.

Dr. Eli Nur Nirmala Sari :

BRG has to make standardization on April. BRG has to give training and find the solution how to build this system. The challenges that companies are facing is the cost of equipment is really expensive. Some of them can not afford this. That is why modelling could be so useful as solution, so that we do not need to install many installation on the ground.

Mr. Witnyo

- The first thing we have to do is building the system. If BRG has the required instruments, the system can be developed in one month
- According to the information, we can count how many carbon could be restored
- Adopt early warning system based on GWL as the form of insitu data
- Dr.Haris is mandated to accelerate the procurement
- Personnel are also important thing that we have to notice. For collecting and reporting the data. From now on, we have to consider about the human resources who can do this job (local people training)
- Processes for the open meeting/tender take moreless about 2 months
- Concrete step that we could take in the near future is making and pointing specification and also standards.

Mr. Susilo

- Instrument that is going to be used is a tool to measure and make sure the peatlands restoration being done successfully or not
- I am worrying this haste cause mistake in decision-making
- We also have to notice about safety side
- We have to know about the overall system, that is our strategy
- We can use the exsisted data from installed water logger to build the system and give report to president
- Use the exsisted data, install the sample, give the report to minimize mistakes
- Any movement in procurement always dealing with some problems and issues, we have to consider every aspects.

Dr. Eli Nur Nirmala Sari

- The equipment budgeted for this project is expected to accommodate restoration area out of company's coverage
- BRG already installed 20 units, 12 units from BPPT and 8 Unit from JICA
- Obstacles found on the ground, some tools require GSM signals so that we need to move the location of tools from the important point to another point which is the signal available

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- BRG will choose the tool which could fulfill and accommodate what BRG needs
 - BRG responsible to do this processes as soon as possible
 - BRG also try to find another alternative, company is required to install detection tool of GWL even though it is not based on telemetry system
 - The step that will be taken is setting the standards off and giving some training. Any tools that will be installed on the ground should fulfill BRG's requirements
 - Company has many options of product, but still the system and its standards should follow what BRG has set off
 - On parallel, BRG is going to propose tender and also do those options as alternative way
 - The needs of procurement can be achieved, monitoring and also target is expected to be achieved too

Mr. Susilo

- The mechanism of procurement on the ground should has been set off by knowing the receiver. It necessary to establish MoU so we can guarantee the tool is not abandoned after we installed it.

Mr. Aris Pramudya (Balai Penelitian Agroklimat dan Teknologi Bogor)

- It is important to know the output from the installed tools
- According to Prof.Osaki's presentation, the output of SESAME are; GWL, precipitation and soil moisture data
- This data still need a tranformation or need a develop model related to hotspot and dryness. So that we are going to know on what level of groudwater the potential of fire could happen
- We have to consider that the value of GWL score is different depends on area
- Related to the tool installation, the limited signal is one of our big obstacle. The solution; we could establish the extrapolation from the spotted point to the point at the outside of spots.
- Related to the developing towards EWS, we can use the precipitation data, this is closely related to the dryness. BMKG always deliver the spatial information of this data
- Every 3 months, we analyse the row of dry days and we could inform the report of our analysis
- We also join the discussion with BMKG about the early-season predictions
- The beginning of dry season 90% falls on May-June 2017, so that expected the information we could gain on June give more pictures related to the dryness on peatlands

Dr. Eli Nur Nirmala Sari

- What have been delivered by Prof.Osaki is relevant and useful in monitoring and carbon emmission estimation system development
- Data that is required by president is a visual data. We can not accomplish the visualization by only using GWL. By developing the model which is proposed by Prof.Osaki, we can achieved a visualization of data.

Mr. Kubo Hideyuki

Recommendation as the form of concrete step:

- Fix the model before July, with the result an hour prior to and six hour prior to. Because the data only can be downloaded every 6 hours from NCARS.
- BPPT, BRG and PKG can directly assign person who will be in charge to fix the models. The person should know about programming, technical things and so on.

Mr. Abdul Karim SE, ME

- If only water logger still can be identified and we can download the result, this could be a short-term solutin for us
- On Monday, a tripartite meeting between BPPT, BRG and KLHK will be held.

Dr. Eli Nur Nirmala Sari

- The next meeting is necessary to be held on the third week of April with Prof.Osaki as the from of finalization of standards

-
- Communication with Prof.Osaki will constantly organized via email, so we can get the suggestions to make our standards

Summary of discussion:

- Standard for telemetry system will be made by BRG in cooperation with KLHK
- BRG, BPPT, and KLHK will finalize the standard
- Communication with Prof.Osaki will be done via email correspondence
- The next meeting/discussion will be held on the third week of April to finalize the standard
- Target: do not install too many tools/equipment on the ground and develop the model
- In Tokyo, Japan there will be held further discussion related to the technical steps that should be taken in the near future
- Setting up server should be done too in order to integrate the system
- We expect this project could be executed on time prior to the dry season

Closing

Dr. Haris Gunawan:

- Display should be installed on the end of June, or on the early week of July for the latest
- The cooperation between BMKG, BRG, BPPT and LAPAN should be accomplished for this display
- Concrete step that should be taken in parallel, include the realisation of installing 280 water logger
- At least half from total water logger should be installed and reported to presiden on early week of July

End of discussion.

1.2.2 April 3, 2017 <Investement Facilitation>

**Directed Discussion Group
Promoting Private Investment Facilitation scheme in Peatlands Restoration
Oria Hotel, Jakarta
Monday, April 3, 2017**

Minutes of Meeting

Agenda overview:

a. Opening and directives

- Opening
- Directives

b. Main Content

Presentation about opportunities and constraints in developing sago community-based businesses in Meranti Islands

c. Panel discussion

Presentation about incentive approach for investors / entrepreneurs in peat restoration activities, financing facilities for business approach and business models that contribute to peat restoration

d. Closing

Summary Submission and important notes about outcome of the meeting and gratitude to facilitator and participants.

Opening and Directives

- Welcome and gratitude to participants of the discussion
- Brief explanation about background activity
- Explanation about direction of the discussions and important notes

Facilitator opened the event by giving a speech and gratitude to participants and gave a brief

presentation on the agenda of discussions.

Facilitator: Dr Eli Nur Nirmala Sari

(Program Expert Deputy of Research and Development BRG)

Pembukaan: Dr Haris Gunawan

(Kapokja Deputy of Research and Development BRG RI)

This activity is a third event for equalizing steps and strategies in the development of investment, especially private sector. The purpose of this activity is to explore the theme to give thoughts and ideas in connection with the facilitation investment in peat land restoration activities. Peat Restoration Agency has a mandate 2M hectares and as calculated there is 2.4 Million hectares and 1.4 million hectares into the primary target or targets A, so with big potential the private sector role should be explored to play a role in peat land restoration.

Directives and important notes of discussion:

- Prepare mechanisms and strategies for the private sector (domestic and foreign) to invest in the peat land restoration
- Weakness of OJK version that investors prefer to invest in businesses that already-established in the market as well as infrastructure
- Challenge: create a document that can be translated among investors to be invested capital for peat land restoration
- Create a pilot one or two commodities which one of them is sago
- Solution to be observed that SCCM (Sustainable Commodity Compensation Mechanism) and Green Bond
- Make an investment guide for banks
- There is one concrete commodity that can receive one model of how the peat land restoration projects based on sago commodity can be used as an example and is developed for other commodities

The activity will be continued by a meeting with the private sector from Japan and Indonesia which will be conducted in May 2017

Main Content

Opportunities and Constraints in Developing Sago Community-based Businesses in Meranti Islands

Speaker : Drs. Irwan Nasir (Regent of Meranti Island)

Meranti island districts in Riau province Malacca Strait coast directly bordering to Malaysia. The strategic location in the Malacca Strait makes Meranti Islands bring the mission as a advanced and excel commercial district, and one that will be featured is sago.

Size of the community sago plantation is 38 614 ha with productivity 9 tons / ha / year with the number of community sago mill is 68 units. Sago is one of the power sources of food community. Sago has been processed into lempeng, sago noodles, brownies, rendang, sempolet, cendol etc. and has been made the sago jump event in the Bokor village that already can bring in tourists. Roof of the house and grounds of road construction made from sago leaf midrib (Uyung sago).

A. Opportunities

- Length Fiber Sago Meranti Varieties is superior seeds
- The forest area consists of 118 427 ha is still free and not burdened with any concessions
- Business and breakthroughs government has done is product 369 type of food products and get MURI record with most types of food products
- The area of sago development is still extensive
- Investments on dried sago processing and there is closeness with foreign investment
- The main business products that can developed soon is analog rice
- Preparation of liquid sugar from sago

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- Ujung (sago skin) can heating boilers and raw materials for furniture (flooring, roofing and table)
 - Repu sago can be used as animal feed
 - Sago Meranti almost 90% brought to Cirebon and in small quantities export to Malaysia

B. Constraints

- Many of the canal made to pull out the timber. The impact of peat water down to the sea and dry makes forest fires. Blocking the canal needs to be done
- Limited production road facilities making it difficult for farmers to distribution of goods
- Abrasion (10-25 M / yr). Conditions today, abrasion reach 500 m and reduce Meranti area of Indonesia and the islands. Solutions Breakwater
- Moratorium peat affect the potential of development area of sago.
- The lack of infrastructure
- Limited of community technology ability to process sago
- Limited access to markets monopolized by cooperatives in Cirebon
- Repu untapped and become waste

C. Expectation

- Revision of Presidential Decree No. 8 of 2015 concerning the delay granting new licenses and improving governance of natural forest and peat
- Growth of new investors who are interested in the downstream industry and sago waste treatment and renewable energy
- Meranti Islands can be designated as a national center for the development sago
- Support infrastructure and technologies as well as development capital sago in Kep.Meranti
- Presence of central government support

Sessions Questions, Answers, and Comment Session Main Content

Hanni Adiati, Msc

- The Papua sago Company only managed to export 1 container / month, sago investment still in early stage
- Related to the Sampoerna group, Sampoerna is the richest in Indonesia and damages caused by an error in selecting the location and management
- Business there are constraints rules, in forestry sago equated with wood so great fare and presentation does not comply with sago flour rendemen
- Nomenclature should be amended so the tax is not equated with wood
- Type of derivative sago in East Tebing Tinggi supervised by KPHP and will be supported for the increase in human resources and infrastructure
- Will be made parquet and the wall from sago skin and will be combined with nimbung will be a shingle and a gazebo that has been exported to Malaysia and Singapore
- Training should be enhanced to improve the human resource capacity of small industries
- Disconnect Syndication of sago flour is not easy but make their own market
- Many other opportunities for sago products. Sago can be used as a substitute for plastic for exclusive packaging and dry noodles
- Moratorium no relation with sago because endemic plants

Dr. Haris Gunawan

- The main target is to facilitate the sector to work because a base for community empowerment

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- Commodities sago already become consensus on the internal BRG into one of the commodities that are conditioned for the private sector wants
 - Sago is considered by investors and should translate such oil palm
 - Need to be delivered to investors that the Regent was very welcome with investments in Sago
 - Packaging and product markets sago still not touched

Bapak Utama (Wakil Masyarakat Sagu Indonesia)

- Formed Sago Indonesia consortium which has two main targets, namely in the form of instant glass noodles and biscuits such as sago glass slab (sagon) which had been coordinated by UNHCR and FAO which will be used to overcome the shortage of carbohydrate needs of refugees
- Ease granted by the State to facilitate the licensing and regulatory harmonization because frequent disharmony between central and local regulations

Panel Discussion

Presentation about incentive approach for investors / entrepreneurs in peat restoration activities, financing facilities for business approach and business models that contribute to peat restoration

Fasilitator :

Ir. C. Nugroho S Priyono, Msc

(Head of the Research Working Group Badan Restorasi Gambut)

Ir. Noviar, MBA

(Head of the Planning Working Group Badan Restorasi Gambut)

Hanni Adiati, Msc

(Special Staff of the Ministry of Environment and Forests)

Ir. C. Nugroho S Priyono, Msc

- There are several parties involved and especially for sago learned from Meranti
- Village fund which will support the activities

Ir. Noviar, MBA

- There are three terms of Restoration that Reweeting, revegetation and Revitalization
- Many other potential that can be developed as sago like silvofishery
- The management unit peat restoration there are several, including government agencies through the local budget, the private sector, people who have land, planted forests have an obligation to implement restoration

Hanni Adiati, Msc

- BRG formed because there is a crisis, causing damage to the ecosystem of peat land and forest fires and into emitter No. 3 in the world and their complaints and threats and environmental damage to neighboring countries and domestic
- Restoration delivered the need for legal discretion declaratory positioning of this crisis
- There are several barriers BRG and the legal field will design a solution
- As venture capital, there are some things that cannot be applied in Indonesia to restore peat land with only revitalization oil palm on peat land
- Funds that exist in the oil palm can support the restoration of peat non existing oil palm plantation with other types like jelutung, pepper, nutmeg, chilli and not monoculture
- Public Service Board which is already in the Secretary of State for accommodating foreign funds related to the environment will be entered into a single package and manager from KLHK and control from Ministry of Finance

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- People do not have the capital for collateral. There are two scheme, namely, grassroots and incentives
 - There are opportunities for the private incentives to develop commodity for peat restoration
 - Restoration of peatlands into plantations will be conducted Land Swap and replaced with mineral soil
 - Strategic Commodities exist in the realm of Coordinating Minister for Economy

Sessions Questions, Answers, and Comments

Staff Menko Perekonomian

- There is a section to discuss about implement restoration of peat in Meranti district
- Commitment to local and central government have a great effect
- Make piloting at Meranti District
- The model of cooperation can be added Private CSR, financial institutions, international organizations, ministries, agencies
- How could produce something already common perception and can be implemented with perfection
- It should be clear measurement when piloting

Ir. Noviar, MBA

- At 2017 will be made piloting for sago
- For the restoration not only R3, the main thing is the canal must be blocked and given incentives for people to want to keep
- Ideally, when the company set the location and there are canals, the company obliged to carry out restoration
- financing mechanisms have to be found for blocking canals
- Is there a possibility to get tax relief for PBB ?
- Restoration activities is the mandate for companies

Drs. Irwan Nasir

- Sago Existing Condition management of people in the district. Meranti, incentives for the exemption PBB is already happening and did not get any local taxes because people sago plantation planted in forest areas that do not have permits
- For the economic development of the people, there is no cooperative system because long harvest period can be up to 10 years
- Post-harvest needs to be considered because the natives wanted to build the plant but does not have capital
- Cooperation can be established after the harvest and provided capital to establish cooperative factory
- Easy to sell sago to be sold besides in Cirebon and Malaysia
- Need to be mapped constraints in public forests
- It should be given support like chilli
- Need affirmation policy alignment between the district and the city with the provincial government and moratorium law enforcement
- When UU 23 applied illegal logging rampant

Hanni Adiati, Msc

- Must fix livelihoods with an inventory
- If want restoration successful it is not just physical but social capital issues and illegal logging is a beginning problem

Pak Utama

- At Meranti island, sago plantations in forest areas

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- Sago is a clump
 - The role of private sector in the restoration of peat for restoration, revitalization and production
 - The government's role is dominant in restoration activities
 - After restoration and granted tenure in the private sector the responsibility in the private sector
 - Revitalization of the local residents and the private sector to invest
 - Local knowledge of socio-cultural and community role is the most important studies
 - Can keep the fish in canals and horticultural crops can be grown at embankments using volcanic ash
 - Protection of the State to investors ie the rule of law, equality between national and local policies, tax holiday, access to financial institutions

Staff pihak keuangan-pajak

- There are two kinds of PBB at local government level and central government
- Peat included in community plantations in forest areas into the productive land managed by the community and government can be taken a tax
- UU PBB written to productive land cannot be cultivated because such a thing like built public facilities is exempt and not taxable
- Facilities for the investment tax is set at PP No. 18 of 2015 and its implementation in PEMKA No. 89 in 2015 is mentioned about any field that gets the tax facility
- sago plantation has not been entered into the criteria to get the facility but can be changed by performed addendum
- Taxes are not authorized to determine what areas could be given tax facilities
- Facilities at PP No. 18 of 2015 contains sago (natural sago flour), but the locations are limited in Maluku, Papua and West Papua
- Mechanism of proposing a tax allowance through the builder sector and sago industry through by ministry of industry with director-general who handles through sago
- It is recommended to create a scheme of the sago industry business processes in peat land from planning to produce
- Tax allowance only have a term of 6 years and maximum 10 years

Tim Tata Ruang Kabupaten Meranti

- Need to performed to provide guidance in the community
- There is a non-concession forest areas which into illegal logging activities and the need to follow up immediately
- Need protection against sago farmers so that prices are not too fall
- Blocking canals must be carried out for all regions
- Community who does not have a lot of sago plantation anymore because it was debt bondage. Need to of special treatment for sago farmers because the bank instituted a reserve so the community will continue to apply debt bondage and need stimulants like intercropping

Closing

Dr Haris Gunawan

At 2015 due the haze, dispute 200 billion is lost. Need to process to reach the target and need inventory input and ideas. Keywords of this activity is a breakthrough that is a breakthrough SCCM and not only land-based and wait 10 years but also will sell services at sago plantations.

End of discussion.

**Technical Meeting
Preparation of TOT Water Upper High Monitoring Tool
Peat Telemetry System
Badan Restorasi Gambut Office, Graha Mandiri Jakarta
Thursday, April 27, 2017**

Minutes of Meeting

Agenda overview:

A. Welcome and referrals

- Greeting
- Referrals

B. Overview of Telemetry TMA monitoring system

C. Review of Standards for Peat land Management Systems

D. Revised Guide and Preparation of TMA Monitoring Tool Technical Guide for Telemetry System

E. Preparation for TOT activities

Technical related exposure to the implementation of TOT, the preparation of the agenda and the preparation of TOR

Opening

By: Eli Nur Nirmala Sari

BRG has water level monitoring activities with water level and real time. This activity needs to monitor real time standards with tools. TOT had been done before, but it is constrained because of expensive equipment and difficult to provided it in the field, so that the needed strategies for each company has the tools with the standards set by the BRG. The thing that needs to be done is to set up a standard tool that will be used in peat restoration and train in order to make the tool itself with predefined standards.

Overview of TMA telemetry monitoring system

By: Abdul Karim Mukharomah (Chair of the Data Development Working Group)

- There are several tools installed and there are 2 tools from Japan
- The installed now does not represent the area to be restored
- The 2017 update is 200 morpalaga and 80 other units
- 80 units will be converted into local products and it becomes a challenge, because of which has been installed 8 units and after checked only in Kalimantan show good results while the results in Riau are not good
- KLHK wants the server to be in KLHK so that the server in KLHK must be connected with the equipment to be installed, need further discussion to KLHK related to server and equipment standards
- KLHK asked BPPT to do system development
- Related to the auction will be the problem because it was 2 to 1 but after revised will be scheduled on May 2, submitted to BCA
- There are other options to be included in the e - catalog, if success get in to e-catalog then no need to use auction system
- The auction will be open to the public
- Before the auction, need a qualified tool that can give maximum results and include the type of sensor in use
- It is important to make a standard tool that will be used, whether the tool is a pressure sensor or ultrasonic sensor
- TOT target participants are required is in charge of businesses in the concession area and outside the concession, namely KPH
- Related to interface data, there is no funds available

Review of Standards of Peatland Monitoring Systems

By: Awalludin, MSi (BPPT)

- The mechanism of data transmission is: There is a tool in the field that will record data entered into the server and will be published via the internet
- Sensors are literally feel or perceive stimuli or stimulus and then converted into electrical signals that can be read, there is a physical quantity and can be measured
- There are 2 sensors that are active and passive and the same principle as satellites
- In a set unit that integrates existing sensors, the sensor element (solar cell and telemetry), the sensor system
- Selections phase: choose the amount of stimulus, specification of physical quantities, ensure the accuracy of the process, environmental considerations which will be installed, the sensor calibration
- Cyclic is a sensor behavior to the environment
- At the time of sensor selection, it is important to see the specification of sensor size, so that when the data entered can be seen the accuracy of incoming data
- All incoming data can be measured whether the data is accurate, precise and have a good quality
- Precise but inaccurate data can be caused by misalignment or in tool configuration and human error
- Precision is not good and is not accurate then the distribution of the data will not approach the normal value and the fluctuation is quite dynamic
- Not precise but accurate can be used as a type of data quality at the 2nd level because it is around the normal value but not precise and has a slightly away
- Precision and accuracy are good and tend to the normal region with small deviations

Presentation tools already made

By: Cecep Sujana

- In general the tool's brain can use arduino or mini computer and its power source in the field can use solar panel
- For data transmission can be used signal GSM / GPRS, WIFI or radio signals
- For display can use LCD
- The choices once made are carbon monoxide, oxygen, nitrogen and SO₂
- Regarding calibration there is usually a program as a benchmark
- If calibration with gas, there is already a standard gas before the data entered then the data will be calibrated with its standard gas
- Data control specification 2 does not use LCD

Revised Guide and Preparation of TMA Monitoring Tool Technical Guide for Telemetry System

- Related availability of tools in the country, tools is available but data results is less accurate
- The tools must be standard and must be implemented, not just simulation
- Standards are determined on the basis of restoration requirements rather than adapted to specific tool standards
- At the time of training it is important to mention the brand because it will determine the quality to be recommended to the participants
- Part of the standard tool will explained into the module and SOP how to make the tool
- An environmental approach will be used to view the accuracy of the data
- There will be an index alarm that will indicate if there is a problematic tool and adjusted for an indication of the quality index

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- How to ignore data that is not appropriate by way of interpolation of error data
 - The index alarm will compare data obtained with data outside the system

Preparation for TOT Activities

By:

- **Dr. Albertus Solomon**

- **Awalludin, M.Si**

- **Cecep Sujana**

- **Prabu Kresna Putra, ST**

- Standards must be calculated: water level, peat soil moisture, rainfall, temperature and humidity
- In a water management system, within the same fluctuation level of the deviation shall not exceed 10 cm
- Interval to take tidal data retrieval at least 1 hour. If far from tidal hence, minimum data taken once a day at 9 am before evaporation for recording and not averaged right.
- The delivery interval will refer to the temporal resolution, the extent to which the tool can respond to environmental surfaces. If the environment changes its temporal homogeneity 1 minute then the delivery interval is recorded at least 1 minute
- The more intense the data transmission the higher the operational cost
- The best data is the average data is not just data on that day only
- Data sent is not average data but overall data
- For sending data will be sent directly to the server
- For regions not covered by GSM signals can use WIFI or radio signal
- The data format depends on the resolution without rounding of previous numbers
- Data is stored in CSV format with 1 hour of internal data retrieval
- Pipe must be planted until mineral ground and sensor 2 meters from ground level
- When pipe at sinking conditions, using pressure sensors will not be a problem. Different if using ultrasonic sensors
- The price of ultrasonic sensors is cheaper than the price of pressure sensors, but it is more realistic to use pressure sensors in peat lands
- Need to make a pipe design so that no mud enters and damages the sensor membrane so data can change

Technical Implementation and preparation of TOT agenda

- There are 3 tools will be used in this activity. Tool 1 is used as a practice presentation tool, the second tool is used for demo in the field and the 3rd fragmented tools will be distributed to the participants so participants can assemble themselves
- TOT activities are assembling and installing in the field and ensuring the tool works properly
- Scenarios to be taken are 2 groups. One group worked on ultrasonic and another worked on the sensor pressure and there was a sensor to be used by the instructor
- Tools that are simulated in the class will be installed in the field
- TOT is expected for 5 days
- Technical installation of components to make RAB and will be submitted to each party and the sensor refers to the standard that has been agreed
- There will be a training module for participants and SOP (technical guidelines)
- Criteria participants: Can operate the computer, good communication technology / informatics system, understand IT / electro
- Maximum of 20 participants (there are 13 companies that are urgent)
- Combination of participants there are technical officers and officials at KASI level (policy makers)
- TOT will be held in South Sumatra at the end of June after Eid for 5 days

- There are 7 Instructor (Mr. Awalludin, Mr. Albert, Mr. Cecep, Mr. Adit, Mr. Syaiful, Mr. Prabu, Mr. Taufik)
- RAB submission deadline: Tuesday, May 2, 2017 (given the tool information will be purchased which, whether in Jakarta or indent) also include timeline of activities
- Standard tool deadline: Thursday, May 4, 2017

Closing

End of discussion

1.2.4 May 2, 2017 <Profile Study>

Coordination Meeting Peatland Restoration Agency Office, Graha Mandiri Jakarta Tuesday, 2 May 2017

Minutes of Meeting

Agenda overview:

- a. Opening remarks and introduction of participants
- b. Presentation from SystemIQ (Introduction and Project)
- c. Presentation from JICA (Introduction and Investment Model)
- d. Discussion of Investment Seminar in July 2017

Opening Remarks

In this session all participants introduced themselves.

Meeting attendance:

1. Mr. Haris Gunawan (BRG)
2. Mr. Kuno Hiromitsu (JICA Survey Mission)
3. Mr. Akihito Sakurai (JICA Survey Mission)
4. Mr. Edison Mansur (BRG)
5. Ms. Ronja Wolf (SystemIQ)
6. Mr. Stuart Rowland (SystemIQ)
7. Ms. Nur Arifatu Ulya (Center for Research and Development of Palembang Plantation Forest)

Introduction to SystemIQ

Speaker: Stuart Rowland

- SystemIQ supports project development in Indonesian peatland for sustainable which will help the economic for long term. Second is stable projects so not only 10 ha, 500 ha but project can be used 10000 ha or more.
- 6 million ha of Indonesian peatland has been lost since 1970s, from Borneo and Sumatera alone. More than 700Mt CO₂ was emitted to the atmosphere in 2015 mostly by forest fire in peatland area.
- Along with BRG we have been building pipeline for Indonesian peatland. We also conducted deep analysis, careful and detailed on the ground field work, working closely with project owners who knows the details of project area and supporting organizations which has been there before to gain a better and sufficient understanding of each project that will be done. The other thing we do is, we de-risk project by working with skilled and qualified human capital to ensure the ecological safety and sustainable of the economic development.

Mr. Haris

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- I wonder if you can input and give us resources?
 - Could I know the mechanism of this concept, is it already done in other area or could you give some success story in implemented this concept?

Mr Stuart

- Two things: we give technical assistant and business support for especially who trying in a larger project.
- We have not done the project in Indonesia but we already done the project in Norway.

Mr. Stuart

- We have not done the project in Indonesia but we already done the project in Norway.
- SystemIQ is still new but it basis is in Europe
- SystemIQ is already in Meranti and sago is a promising commodity in BRG site so I think we have to force the sago business development, not only based the community but also this kind of idea “compensation”.
- Based on peatland Incubator, sago is on stage 3 which is assessment activity and conducted field visits and deeper analysis.
- Before going to stage 3 we carried out stage 2 to identify the project and its potential alignment with investment strategy, criteria, and impact.
- If it is a good opportunity we can go through stage 4.

Mr. Kuno

- This structure, just for peatland incubator project? or can be implemented in other models?
- The structure is only for peatland incubator project. Maybe this incubator project needs to involved other party including JICA.

Mr. Stuart

- Back to stage two that we conducted initial research to better understand the potential impact, if we agree then we go to stage 3 which we come with full concept, conduct deeper analysis of the project including potential risks, green house gas emission and details impact, and stage 4 we start to do the project under partnership scenario, potential funding partners, and detailed feedback from the partners.

Ms. Ronja

- Essentially in the very first beginning we start with ideas, so we hear there is sago potential in the area then we go and see, what did they look like, what economic opportunity remains, then we start assessing the project.
- But in the very first beginning we starts with an idea, and then we take it step by step.
- Every step we assess more details and if we have an increasing detail number of criteria to assess, we look more detail at the site, we endorse the project, take it more forward, then if it is a really good opportunity we get to stage 4 which is concept note.
- We will already have a very detail idea of how to do the project, what is the outcome, what’s the impact, what is the risk, how can we mitigate the risk and what kind of funding type do we need from Japan and some of these.
- So this is why we say only after stage 4 we involved potential investor, because that is information that they need.
- They do not need the first idea of the project they need more information that’s why we have step twice, we collect more data and information and make a path up concept.

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- So this processes are looking for potential investor? After the stage performed so we can invite the investor?
 - So this project involves two things, one side is attract the investor and the other sides measuring the project.
 - The funds can be from public and private, sometimes it is even feasible to have one private and one public player, in other projects it might be more useful to do it only with public player or private player, it depends.
 - So right now, in the process better understanding funding mechanism and funding partners landscape in Indonesia.
 - So we are looking in two different partners that can even give funds or any kind of technically system support that we would need for a project.
 - And as project mature you will know that each project have different stages of development, we usually start with pre-feasibility study then do feasibility study then commercial pilots and if that is successful we can do another feasibility study for commercial scale up
 - This project have different stages of maturity and each stage you need different funding
 - For feasibility study we usually need a grants and for commercial scaled up we need like a loan or investment from public player, so each stage has different packages for funding.
 - SystemIQ is now identifying packages for each maturity stages of the project and finding partners that would be able to fund this certain packages.
 - Usually development finance institution like DFID, UK government an development finance institution or NICFI from Norway they would be able to give clans in certain range but not more than USD 5 million so this is okay for feasibility study
 - But when we go to commercial scale up of the project than we need private player and larger investment, probably some loans, in this case we will ask different investors.
 - Right now we are talking to different funding resources and trying to understand their requirements and criteria and what kind of project they are interested in and what is they can fund.

Mr. Kuno

- How many potential commercial funding for commercial scale up?

Ms. Ronja

- So far I do not know any private player in Europe that would invest in Indonesia, but if you have one I would really happy.

Ms. Nur

- Based on your experience how long the transition of the projects?

Mr. Stuart

- The project takes may be about a few years depends on the stage and project.

Mr Haris

- Can you tell us any experience in other country similar to this project?

Mr Stuart and Ms. Ronja

- These is a parallel activity that SystemIQ is also involve together with other partners and the funding comes from the UK government from DFID and they set up the program which is called partnership for forest across south east Asia but focus in Indonesia and also in Western Africa, actually it is a large scope project.
- The partnership forest set up for 5 years, now we are in 1.5 years.

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- For Incubator, SytemiQ is also work on it but it is different group not our group and also different tools.
 - The partnership forest focus on fighting deforestation and incubator focus on peatland protection and restoration but the set up of the whole incubator is almost the same.
 - They take it through stages like we have and also at some points of maturity of the project they have assess, they take them to DFID. In this case, they only have one investor, that is the difference to what we do. We bring them to different stages and then we are trying to find the best investor that will meet this project's requirements in the peatlands project.
 - And partnership forest has successfully work for 1.5 years focusing on forest project and they have to find the project that fit DFID funding with government because they only deliver the project to DFID or UK government fund.
 - But they have been very successful, they have already 3 concept notes that have received funding from DFID after stage 5. The process has been proven very successfully because after the criteria have been applied you can make sure that only the best project with the best return on investment, less impact, the best value for dollar spend come to this stage while asking for funding.

Mr Haris

- Commodity mechanism models, is it new or already existed before?

Mr Stuart

- This is can be said as a new project.

Mr. Kuno

- We need a real success case, on how to gain an investor from zero until become a successful bussiness. I want to hear a success story from zero to be able to invite investor?

Ms. Ronja and Mr. Stuart

- I think it can be related to ERC's they have manage to get support for management set up for ERC's concession, from ERC's that are currently active in Indonesia we have 8 of them that work together with partnership for forest and SystemIQ. They have been prove 2 stage where they get support from DFID and UK government for they intern management capacities, but DFID can not give grants.
- Success with he stages, Kattingan can be an examples as a success project in Indonesia.
- So far we have 2 investment committee meetings, in each committee meeting we will present one or two projets, then after the meeting they will be a decision wether we take the project forward or not.
- For Sago project it will much take longer, we just starting we can not see the result yet, because it depends on maturity stage. So we need to know the investment criteria, objectives, and funding mechanism of the project whether multi funds or multi nation should be discuss.
- Introduction and Investment Models from JICA

“JICA Mission for Data Collection Survey on Forest & Peatland Fire Control and Peatland Restoration in Indonesia (Phase 2)”

Speaker : Mr. Kuno Hiromitsu

- Pre-feasibility study for peatland restoration investment conducted in four most prioritized areas in Indonesia from December 2016 until August 2017.
- The goal of this project is to develop economic development models to contribute climate change mitigation by peatland restoration.

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- We have 3 major component in pre-feasibility study which are, trial baseline measurement and monitoring of peatland hydrological conditions of target area, profiling surveys of target area and quick preliminary feasibility study for facilitating peatland restoration by private business investment and stakeholders coordination meetings to promote private business investment.
 - We already conducted phase 1 and we are now in phase 2. There will be open seminar in July to promote peatland restoration to private business investor and SystemIQ may be can present the idea on July seminar.
 - Also in July we will enlarge funding proposal by the consortium team which come from local university and R&D.
 - This team were built as the institutional arrangement in this project. JICA study mission is mainly facilitate activity or meeting in peatland restoration between stakeholders and private business investor to achieve the goals on peatland restoration and raising community economy.

“Draft Ideas on Developing Activity Models on the to-be-restored Peatland”

Speaker : Mr. Akihito Sakurai

- Peatland restoration and community livelihood improvement can be done by combining environment improvement, food production such as rice and vegetables, canal blocking to prevent flood and energy securement by produce bioenergy material.
- JICA has been developed 5 models activity for peatland restoration in 4 prioritize district in Indonesia that can approach the goals.
- This 5 models need to be improved by many experience.
- The pictures of each model showed the peatlands condition before and after implementing activity models.
- Product resulting from this models such as agriculture products (paddy, fruits and vegetables), forest product (timber and non-timber), and livestock/ fishery.
- In addition the models also produce non-productive activity such as canal blocking and build the infrastructure to provide ecotourism for neighboring countries and nearest area.
- Lower picture is the image of ground water level before the project and after implementing this activity models for example performing canal blocking as fish are raised in the reservoir, and then the paddy will grow and duck are raised in the paddy as insect predator and also fertilizer. Gamel can be planted as bioenergy material tree to produce wood pellet.
- Based on this draft, investor can choose which models are suitable for the area. This idea can be implemented in Palangkaraya, Central Kalimantan.
- After canal blocking were build, then the activity continue with plant bioenergy materials along canals, and introduce horticulture/fruit tree with poultry. Poultry waste will be utilized as manure for horticulture.

Discussion session

- **Mr. Stuart**
- **Mr. Haris**
- **Ms. Ronja**

- Have the analysis of the area performed? The consortium team will do the analysis and how to scale it up.
- First one we need to successful in restoring peatland, so the models must show how to secure the water table and how to sustain its high water level.
- The major issues in peatland is the water table so the activity models needs to combine several crops or any activity model, because one business models can not sustain in community and community need a shortcut to sell the product to private sector or investor.

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- It is expected that investor around business models can access community economy, so from this idea we can review many approaches or ideas on how to secure high water tables and how to secure sustainability.
 - We have many research result that showed water table can reduce GHG emission, in addition besides selling the product we can also sell the carbon in carbon markets.

Mr. Haris Gunawan

- I expected that we can focus on one major commodity for example industrialize the sago.
- Because sago has many product to promote, not only raw sago but its derivative products such as sago powder or flour and noodles.
- In your business models people only sell the raw sago, if we adding the value by sell it derivative product or for fungi production it will be better.
- If we consider to improve the down stream and upstream, we will need less effort.
- We focus on some commodity/product that the community have known the regeneration.
- If we can quickly invite the investor, the program will soon implemented.
- So, the collaboration between JICA and SystemIQ hopefully will generate and have final ideaa for sago investment.

Mr. Stuart Rowland

- SystemIQ agreed with Mr. Haris, so we can conclude that the first point is to bring water table up in 10 years, second is to secured ten years income with higher economic value and the last point is how to add the value of sago production.

Mr. Haris Gunawan

- In Meranti the owner of the sago plantation usually a boss (private), the community is only a villager or worker. If we developed the peatland restoration, the community can involve in sago plantation and production as the owner of the land. How to add the value of sago production and scale up to 10.000 Ha, as said before in stage 3?
- So in stage 3 we working out of area, field visits and analysis are conducted to detail the information against the TAU's criteria and then we work with projects in concept notes. Before we working out with stage 3, we performed stage 1 and 2.
- For sago transition idea we need to talk to the local village head or local stakeholder.
- The sago transition full models will be shown in 1-2 months later.
- The funding or grants of project for example will channel from world bank to local government then to the project. The money can not channel directly.
- The incubation project obtains the data from local government.
- JICA and SystemIQ can integrated the idea, JICA and SystemIQ will share each other ideas in order to achieve the goals (knowledge shares), then BRG impact project can take to pilot plane.
- After that successful project can line up to the pipeline for potential funding.
- This project can corporate and synergize by adding carbon market with SCCCM work which will lead to carbon project
- SCCM is quite mature project it is initiated with feasibility study if the project is feasible the next stage is project reporting, after that the next step is to work on the project. Draft A has a larger impact than draft B.

Mr. Kuno

- So, Firstly JICA proposed to harmonize incubation process among international partner.

- Second one, to develop harmonize process we start the forum BRG and International partner.
- To carry out the forum JICA wants to involve in Incubation process among BRG and SystemIQ as an observer.

Discussion of Investment Seminar in July 2017

- Toward green investment by integrated food, water, renewable energy, environment business into community.
- Next July we hope that we can bridge potential investor, make investment engagement including strategy and criteria.
- PT. Rimba Raya may present their concept in July Seminar.
- And then in July we also create green investment facility to support the partnership business.
- We are going to audience to BKPM, and SystemIQ will involve as well before the next seminar on 3rd or 4th week of May.
- Some matured concept note/investment proposed in other Area in 4 prioritized districts in Indonesia are carbon credit business in Lampung, Fire free rice business in Central Kalimantan, and Sago transition in Riau.
- Fire free rice business developed in Pulau Pisau project may also be presented in July Seminar
- Participant for visitor Pulau Pisau in may need to be confirmed to Ms. Eli.
- One more participant want to collaborate with BRG and JICA but we do not know the project yet.
- We can map the project at the end of the seminar.

Closing

End of the meeting

1.2.5 May 4, 2017 <Profile Study>

**Coordination meeting JICA and BRG
Peatland Restoration Agency Office, Graha Mandiri Jakarta
Thursday, 4 May 2017**

Minutes of Meeting

Agenda overview:

- a. **Opening**
Opening speech was given by Mr. Nugroho from Deputy 4 BRG.
- b. **Discussion session**
The discussion were facilitated by Mr. Ngudiantoro from Sriwijaya University (UNSRI). The discussion were mostly discuss about the property rights of publication, technical matters regarding TOR work steps, coordination, and field standards, as well as the standard payment of honorarium.
- c. **Signing Contract between JICA and Consortium team.**

Opening

Mr. Nugroho (Deputy 4 BRG)

This meeting is prepared for the signing of a contract between the consortium and JICA, after the signing of the contract the next step of the project and what should be done by each party will be discussed. The current consortium leader team is Sriwijaya University comprising Riau University, Palangkaraya University and also the Forestry Research and Development Agency. The meeting will be started with discussion session lead by Mr. Ngudiantoro then the next session is signing a contract.

Discussion session

Facilitator: Mr. Ngudiantoro (UNSRI)

- Related to the Publication in article 10, property right of publication is in JICA.
- In article 11, if the other party wishes to publish the research, It must be with the acknowledgement and permission of JICA.
- The Government of Indonesia contributes to human resources, laboratories, etc.
- The mechanism for using publications is obtaining JICA permit for publishing and including JICA in acknowledgment.
- University of Riau (UNRI) will conduct a Feasibility Study in Riau Province, while Palangkaraya University will conduct study in Central Kalimantan area.
- I previously apologize that Mr. Robi could not attend this meeting due to another agenda, so it was represented by Mr. Yazid and Mr. Ngudiantoro.
- In relation to funding, funds will be covered by JICA on behalf of Mr. Robi in the form of blank (new) bank accounts in order to ease a fund flow during the project. Account will be closed right after this activity accomplish.
- If the fund flows through the institution, it might be resulted delays in fund disbursement, because slow performance of the bureaucracy, so that it is decided that funds from JICA will be channeled through new account.
- The signature of the contract is scheduled on May 2nd and May 6th.
- Regarding the plot demonstration, the demonstration plot will refer to the TOR with JICA if the R & D conducted a comparative study, then the comparative study should be equated with those listed in the TOR.
- There are 3 main activities that will be done, so that UNSRI, UNRI, UPR and LITBANG need to communicate.
- OKI, Muba, Meranti, and Pulau Pisau, the regional divisions are based on region not individual.
- The point of work step is that the work step becomes an indicator of achievement.
- The draft budget is charged to the consortium teams of each team, such as the consortium team from LITBANG, UNSRI, UPR and UNRI. The consortium team will meet three times a month.
- Consultation with JICA is required and will be scheduled at the beginning of each month.
- Field surveys, consumable goods and honoraria will be made by hour, one person per weeks and how many hours each week they work therefore it is not interfere academic duties, where most of the consortium team consists of academics who have an obligation to perform their obligations.
- The fifth point, related to the executive team member, each member is expected to include a cv, just the core team.
- The mentioned before will be the basis for the realization of the budget.
- The sixth point, related to the work meeting with BRG, the Meeting will be held 4 times outside this meeting, in which case there will be management fund and not from the consortium team fund. The total existing costs divided by 5, so each activity has a proportion of 20% including accommodation and travel cost. This is for quality assurance.
- Proof of financial will be collected and reported at the end of the activity
- Technical report and budget accountability report will be attached at the end of the activity.
- The sample form of the report will be a minutes of meeting form, the MoM will describe the activities that has been undertaken. Initial and final process will be record as MoM and will be the reference of this activity process.
- The basis of this activity is what is actually recorded on the field.
- On May 6th the inception record has to be made where the technical proposal will be detailed further in inception.

-
- JICA and BRG Collaboration, JICA requires a feasibility study that will represent the priority area of restoration project, so that consortium team are set up and consist of R & D center and universities.
 - Main output desired by JICA is feasibility study related to the potential of peat commodities, marketing prospects, and available markets.
 - JICA is preparing investors for this activity.

Mr. Nugroho

Mr. Toro has explained the process and mechanism, other consortium team can respond to what Mr. Toro has explained as well as if you have a question to ask.

Mr. Adhy

What kind of material explained during the community assistance?

Mr. Toro

- Community assistance materials include forest and land fires, peatland ecosystem and management, explanation of BRG, TRGD, water governance and others.
- Community assistance and each activity that has been carried out will be recorded in minutes of meeting or notes.
- The minutes of the activity will contain the time, place of activity, the participants, and the activities undertaken, the materials, and the questions. There will be an attachment containing the attendance list.
- Community assistance should be done before the tools were installed, so that the community can provide any input and suggestion if the point of installation tool is not appropriate. Because of some reason the installation were carried out before the community assistance, then come a questions such as who operates the tools and what to do with the tools, and answers to these questions are recorded in the minutes.
- The final section will include the documentation for both minutes and presentations.
- This is as an overview while conducting community assistance in the community, team of escort security will be made at the time of community assistance done.
- Community assistance is objected to introduce the origin of the tool, its function, the owner, and who is responsible of that to the community. Hopefully once community knew this information the community will keep the tool.
- Included in the community assistance activities, we will socialize about community themselves because there are some issues such as the consensus problem around the community.
- Certificates are also made as a proven document that the tools were installed with the consent and acknowledgement of the community.
- After the tool is installed then this tool will be granted to the government of Indonesia. It will require budget funds for data sent and maintenance. The consortium team serves as a facilitator to bridge communications related to this issue.

Mr. Adhy

In South Sumatra tools were installed in 4 different places how is the community assistance? Is it in one place or in each location?

Mr. Toro

Community assistance was carried out in each location of installation tool. The obstacle during the assistance was a high cost of consumption and transport for local community. At the beginning of the community assistance, village stakeholder and local government were emphasized to get more understanding about the project, then the village stakeholder and local government will disseminate it to the community, if all community were invited, the cost will be higher.

Mr. Edwin

R & D parties still confuse in community assistance process and function of TRGD in the region?

Mr. Toro

TRGD is involved to help delivering the material (such as giving opening speech and referrals) the materials will be explained by universities and R & D agency. Related the tool's operation, community in this case are involved as a keeper only, the tools will be operated by the technician.

Mr. Adhy

Is the tools are the same tools in Jatiluhur?

Mr. Kuno

Yes, it is the same tools, and what is being socialized to the community during community assistance is water governance not the tools.

Mr. Nughroho

In South Sumatra and Central Kalimantan, they have at least 2 models, for Riau the demonstration plot will adjust the location, and the discussion about the demonstration plot will be discuss later by Mr. Haris.

Mr. Adhy

BRG is expected to develop sago in Riau, and as long as the discussion with Mr. Toro there is no affirmation yet related kind of commodities that will be developed.

Summary of Mr. Adhy Presentation

In the feasibility study all kinds of sago was introduced both from the garden and refineries. From the plantation sector, the potential of sago is quite large, besides solid waste and liquid waste from the sago industry is also quite potential. Industrial waste refineries from sago has many benefits such as animal feed and fish, as well as bioenergy material or wood pellets. This feasibility study is not inclined to the sago product but the waste treatment from the main product. Demonstration plot is planned to assist the community in waste management training.

Mr. Yazid

Demonstration plot in this case is a land-based and non-land based. Feasibility study is understood as business models which starts at the end and finishes at the beginning. There is a lot of potential are generated but we have to look market availability, then the process and the technology will be reviewed.

Mr. Adhy

Feasibility study on Wood pellets from sago could be carried out, but there is also a part of sago utilize for furniture materials.

Mr. Kuno

However, feasibility study is needed to find the market, whether it is profitable or not. This business should be done by community and investors and also the offered business must be able to restore the peatland. These ideas can be concretized by the financial analysis that convinces investors and the existing marketing guarantees that will accommodate both locally and domestically.

Mr. Adhy

How is the demonstration plot? Is it based on community industries, Is it possible if he demonstration plot is sago packaging activity?

Mr. Toro

In the concept of JICA it is included in non-land base. But in the context of JICA study this concept cannot be performed because of limited time.

Mr. Nugroho

- If you have a plan to develop sago, feasibility has been studied, and its business opportunity the activity can be financed by the consortium, if only the concept that you convey were implemented with the relevant package. Mr. Kuno only delivered up to the stage of planning.
- This fund is only as a preliminary design, for its implementation, other packages are required align to relevant topics.
- For R & D, comparative studies can be conducted in the context of finding markets, and ensuring that developed commodities have their markets, as well as matching their production and market units.

Mr. Adhy

Sago is currently marketed to Cirebon, this sago commodity should not be limited to sago only (one commodity only), but all aspects such as tourism could be optimized on purpose to maintain the ground water level, the business benefits the community and private. It takes a variety of scenarios in this case .

Mr. Edwin

Related to the budget, it will be better if we made a standard, LITBANG itself refers to the standard state budget, what is the standard for this project?

Mr. Kuno

Please set how many needs and the written proof should be attached.

Mr. Toro

Any bills or notes of financial should be reported in financial report. Each team should have 2 copies of financial report, for example the original financial report is archived for consortium team record and the copy are given to Mr. Kuno.

Mr. Nugroho:

What if unexpected things happen that causes funds that have been budgeted is not enough? For example in one activity we use the state budget with daily expense 300,000 - 400,000 . The problem is the local transport. The SBU Standard, for example, is 800,000 but the real spend money in the field is 1.7 million. My suggestion is we meet the standard and bring the money back, by listing the funds 2 times for the rental, if the price of 1 rental is 800,000. This is done because the SBU's local transport fund is very low, so there is a need for flexibility in unexpected funds such as this case, so that the add cost might be applied.

Mr. Adhy

For transportation to meranti there are several roads, which way to follow? And is it possible if we use air transport in urgent situation?

Mr. Toro

Any roads can be used, but choose the economic one. If things such that happened written on the note, most importantly there is evidence or written proof of transportation.

Mr. Ici

Is the bank account new or existed account? There are 3 activities (community assistance, FS, and demonstration plot making) how is the report?

Mr. Toro

Mr. Robi suggests to create a new account so that it will be easier to distribute the funds. The report of each activity includes the design of activities referring to the TOR, then items in the TOR are recorded to facilitate the examination e.g. code 4.1.1 A for community assistance activities, and so on.

Mr. Adhy

A bank account created by personal name or institution name?

Mr. Toro

The new account, Mandiri bank account, and make sure that the account is empty with the individual name, or the name of the activity. It is also a good idea if it is made as the signature of 2 people is team leader and treasurer, or the name of activities with QQ individual names for example.

Presentation of JICA Models**Speaker: Mr. Sakurai**

- Under the consortium we develop some kind of models because i just drafted some possible activiy that we can performed with local community.
- The product in activity are listed as forest related product and also agricultural product such as fruit trees, coffee, rice or paddy, bioenergy materials, and coffee. Forest related products including sago palm, indigenous trees, indigenous plants, and non-timber forest product.
- Livestock and fishery such as water buffalo, chicken, duck, fish fodder cultivation and also non-productive activity are developed.
- This is the information of some models and what kind of possible activity in region.
- For example in Central Kalimantan we recommend to conduct a study. We do duck raising because duck can place inside paddy as insect predator and duck can be a fertilizer.
- After the information from mission official, they also recommend to combine paddy with fish raising also paddy with bioenergy material tree .
- I decide the models by using and based on market and these model should be improved depending of the function on each area. Finally we'd like to prepare this kind of model such as model 1 and model 2.
- In the beginning we start with blocking the canal by canal blocking so the water level will increase, then we can grow some plantation near the canal and and also we can grow bioenergy material tree in shallow peat along the canal. In this area we can introduce poultry inside the area.
- Model 3 develop water buffalo raising, of course buffalo need some kind of food so we introduce fodder cultivation.
- In model 2, in cultivated product we may need to make small amount on the peat for plantation and also for buffalo raising and fodder in model 3.
- Models can be applied both in large area or small area depends on location.
- May be in the site we resulting of some economic issues and we also consider in economic return so we concern about the site.
- We need to conduct some preparation work that take cost a so that we need to concern to economic return.
- In small area the economic value not so good.
- And if we work in concession area, we need to talk to concession holders,
- New area also can be utilize for some kind of economic utilities in line with peatland restoration.
- In that case we need to propose some kind of alternative timber business in peatland area and also some of non-timber forest product production can be applied in concession area such as apiculture, this is just sample so we would like you to consider more possible activity.
- The last one is peatland friendly ecotourism, in case of there are some school near peatland area but the students in the school not so familiar with the function of the peatland. So that this kind of eco-tourism can be applied.
- Some productive activity especially for Riau area, because it is near to Singapore and Malaysia we may be able to introduce some kind of eco-tourism area for neighboring country so in this case we introduce some kind of productive activity

we ensure agro eco-tourism, we may be able to introduce this area as recreational area.

- This type of models just an overview from our observation, we likely to consider what kind of activity can be introduced and combined in each area.
- Site of each activity such as sago plantation or fodder area depend on suitability of product in each area.
- The need of buffalo and plantation in the area has not been detailed yet.

Mr. Adhy

What kind of bioenergy material will planted in activity site?

Mr. Sakurai

This moment we talk about Gamal, gamal can use as wood pellet.

Mr. Adhy

If we plant gamal, for example after 3 years the tree will be cut and how about the soil condition after harvesting the wood? I think wood pellet can also made by agriculture waste such as from sago waste, sago agro planting may be better than gamal.

Mr. Sakurai

That's good also and may be it is good to plant that kind of tree. But in case in other area if there are no suitable trees for introducing in the area, gamal can be planted for producing wood pellet, it depends on the utilization.

Mr. Adhy

As I said before, from sago plantation industry waste can be used as wood pellet. Because the demand of wood pellet world is quite high and we have not utilized optimally.

Mr. Nugroho

There is a wood pellet factory in Wonosobo, wood pellet made from twigs while the main stem for wood industry. Wood pellet products then absorbed by Korea companies, because the regulation of fuel use in Korea does not allow the use of coal.

Mr. Toro

What pattern use for integrated activity models? It depends on local situation and local materials for canal blocking? Yesterday we discuss a lot about canal blocking, one structure needs hundreds of trees to be cut, and it should be considered if we used the wood material to build the canal blocking more trees need to be cut, some of us advice to buy woods from other area. Despite the material of canal blocking, your models are excellent and inspiring us on what pilot project that we will set up.

Mr. Yazid

In order to build the canal blocking we need so many local trees, so in which models that you proposed showed the plantation of local tree?

Mr. Sakurai

Actually I didn't improve that kind of activity but such kind of that activity can be included to the models. For example gamal tree can be replaced by other tree in other area, not only for bioenergy tree but also timber product.

Mr. Yazid

For example in South Sumatera the width of the canal 20-40 m u can imagine how many trees were being cut, and the length of the canal almost 15 km, how many canal blocking unit we should build? Canal blocking are build every 400 m, almost 40 canal blocking and times how many trees, it is about a hundred tree might be cut.

Mr. Sakurai

Actually I could not conclude the plantation nor timber tree, for example for this boundary area we can also plant timber tree, depends on the necessary, if we or they need timber tree we can change bioenergy tree to timber tree. So we can choose both of them.

Signing of A Contract

Mr. Nugroho

We reverse the agenda of the meeting, the first session is discussion and the next agenda is signing of a contract.

Some of the points discussed in the previous discussion are:

- General matters in this context, we concentrate on the issue of publication, Mr. Kuno has given an agreement that all constituents / consortiums could publish their publications on their research results by the terms that they inform JICA and put JICA in the acknowledgment on their publication, so there is no need to put co-authors and others.
- The discussion was productive lead by Mr. Toro, technical matters regarding TOR work steps, coordination, and field standards, about the executive team members and the standard payment of honorarium has been discussed.
- The Forum agreed that a coordination meeting is likely to be held in Jakarta, Palembang and other approved places, probably more in Jakarta.
- Another thing that has been discussed is about Substantive, it has been agreed that the result of our research for 4 months is feasibility study about potential commodity that can be developed in the area then also Mr. Sakurai presented some activity model or integrated activity which might be emphasized on potential commodity.
- The Consortium activity has been generated FS (Feasibility Study) of potential commodities and also the design of the development. Currently only until the design and has not been implemented yet.
- Regarding to integration of activities if the consortium get packages from partners on relevant topics, the implementation can use it, but the design and FS are using JICA model, if the topic they receive is irrelevant from this then it will be continued next year. But at least we have the facility to compose the FS and the design, I think that's the important thing we get at this meeting.

Mr. Haris

- The first, we would like to convey a few things related to information updates that have been submitted by Mr. Nugroho.
- Certainly this consortium team has been intensely discussing some information about the institution and we have agreed that the activities and work is led by minister and the implementation model of this activity or program is carried out by a consortium collaborative.
- Substantively I would like to highlight that the undertaken activities should have the update information. It has also been discussed with Prof Robi, the update is not only a things that feasible to be published but the newest update or result that are responded by the community, because the data is taken in the community.
- Plans to be undertaken and sampling selection need to be a matured stage such as determining the location and commodity being lifted not to replicate such as the existing documents in other reports.
- Plans to be performed and sampling selection need to be in a matured stage such as the determination of the location and the developed commodity should not be repeated or have replication as there are documents in other reports.
- Because this activity is not for the benefit of individuals but for the community in the sampling area so the concrete result on what the team has done has to arrive to the community.

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- It is expected that the team communicate intensely and with the support of JICA this becomes monumental for activities related to alternative breakthrough efforts.
 - I see that the pilot project is limited to design and not in form, is there any concrete result like the collection of 1000 seedlings or tree planting as much as 200? is there a form? According to Mr. Kuno information it is not there and also timing cannot be done because July is a very dry month if the planting is risky.
 - What if the procurement of seedling? Procurement of seedling can be done if there are seedling available.
 - The action research is indeed capturing problem solving and problems such as economic alternatives.
 - The need for BRG is very clear: tree seedlings. For example, if we want to develop sago in the area we should provide sago seedling, or other commodities such as wood, so there is a real and concrete form, is there a budget?

Mr. Kuno

If the cost and design studies are quickly completed, it can be done, but the problem is we have a less time. Related to procurement of seedling, if feasibility studies already exist, the market is available, the benefits are already calculated, nurseries can be carried out. But do not start the nursery activities without any evidence and trust based on the results of feasibility studies.

Mr. Haris

The forest specialization has its science and technology on how to develop it.

Mr. Kuno

It is not the science but its feasibility, its advantages, and the market. If the model meet the feasibility study criteria the nursery can be built.

Mr. Haris

- If so why do not we leave it to Gadjah Mada University and why we ask local university (UNSRI, UR, UPR). It is because this is semi feasibility study and the people involved have known the ins and outs also the potential of their regions. So that is not really necessary to do so and we only have to execute and package this as a research with existing data.
- We are not hypothetical, and if the sampling is in the community we just have to move it.
- If the project were carried out by the system proposed by JICA is a good idea, but it should be have a concrete result or real form in 3 months.

Ms. Hening

From the budget provided by Mr. Kuno, within 3 months if the feasibility of his study is completed in 1.5 months then in 1.5 months the action can be performed.

Mr. Nugroho

Both Community and us has already known the location and the project, we just look for the market, look for the value of measurement income, after that we can start the project soon.

Mr. Haris

- It is like the value change, the data obtained already half-finished, but after the field action upward such as market action has not been done.
- There are interesting breakthrough, such as the existing commodities in Palembang, Riau and Kalimantan, We could touch the market not through traditional markets but we make the market based on IT networks.

Mr. Edwin

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- It is like the development of cafes and emerging markets. But whether within 3 months we can ask farmers to plant the coffee is still impossible.
 - Hopefully the discussion result can his result can be followed up in November using another scheme.

Mr. Haris

I agree with what Mr. Nugroho has said, but I just want to add the concrete output as if a foot prints in this JICA project.

Mr. Yazid

Wood for construction such as the model presented by Mr. Sakurai can be applied in South Sumatera where the planted commodity is the gelam tree. And if we are going to make canal blocking we need a lot of wood and the market already exists that is BRG..

Ms. Hening

However, planting this wood requires at least 10 years.

Mr. Edwin

Forestry R & D center has an experience inn planting gelam tree (malaleuca or white paperbark), it is better to develop the plants by natural regeneration than planting in nursery. That's a problem in the field, but the harvest exceeds the natural regeneration. Farmers will collect it all, so it would be better if we manage it.

Mr. Haris

- It is one of the potential market / economy that is not from zero is gelam tree in South Sumatra. This gelam tree will be sampling in what village, whether the form is forestry approach such as silviculture technique or silviculture treatment approach with a nursery. These concrete result such as nursery can be use by BRG next year, so that there is continuity form of this JICA program.
- In Riau, for example, seedling of peat swamp forest trees is quite potential because it is very rare to find tree seedlings in the peat swamp forest in large quantities from nursery. It is then packaged not in traditional marketing but through the media and IT.
- Success story came from tourism activity, mass or social media can increase tourist coming to Raja Ampat and Komodo Island as much as 3000 tourists/year as a result of thematic KKN proposed by college students. The student is set to promote the area according to his field of expertise such as IT for promotion.

Ms. Hening

I would like to share the experience I encountered on the river duet Riau. When there is UNDP with KLHK, a large jerry can of honey in Riau river, purchased for 400,000. This honey is obtained from the forest then taken through a small truck and was bought by Malaysia. Honey bought by Malaysia then sold in the form of small packs in Indonesia as a snack for children and the selling price were increased. If you want a value change, a program such as daily school children drink honey every day initiated by the health service can be solve this problem. When there is a regulation that regulates it as well as assistance or training from the government for the processing of honey and its marketing it is not impossible that this market can develop and this is a challenge because it is located on peatland area.

Mr. Adhy

In Riau there is also a kind of honey named “klukut honey” derived from "stingless bee" with selling price in Malaysia about Rp 700,000/liter. At Meranti, Tanjung Pantai, Tanjung Sari, the community has started marketing this honey and asked experts to assist them on how to culture the bee. We will insert this activity in the program that we discuss yesterday in Palembang.

Mr. Haris

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- It can be carried out in the project, but the most important things is in 3 months there must be a concrete form of consortium work, which areas are more likely to develop a commodity must be reviewed, either in South Sumatra or Central Kalimantan, as well as the developed commodity can be a nursery of local fish.
 - Marketing system should be built, e.g. converting conventional market to IT based market. So that community know and see that there is a concrete result of consortium's work.

Ms Hening

Other products can also be made from gelam. Handicraft products such as handbags and hats with addition of style or decoration could increase the selling price. Then it sold in big city such as Jakarta and being promoted by mass or social media, I think it is quite a good business opportunity.

Mr. Haris

- Nursery is also important, the Deputy 2 could be a target of market. Large scale nursery has not existed nowadays, so nursery business is potential to be developed.
- Community's nursery is still a conventional, so it needs to be improved and given any advance science and technology.
- The market for seedling is BRG.
- The second example is fish nursery, if BRG project were succeeds, the canals can be filled with fish even though only until the seeding stage and not until the mature stage, but this still can be considered.
- At year-end science festivals, the consortium of 'Sandi 44' should be able to demonstrate the results of their work.
- The consortium team may decide the models, whether fish nursery, wood tree nursery, gamal seedling, Purun or honey can be decided through internal discussions. Therefore, the progress of the project is not only the collection of FS data approved by Mr. Nugroho (Deputy 4) and JICA through a long step, but we can combine it with the APBN and our shortcuts so that there is a concrete form, not just documents.
- I want to strengthen this team with de-feasibility study for 3 provinces.
- All that I have to say, I just want to have a concrete result. Hopefully all of us are still keep in touch. Maybe occasional meetings on the site will be better.

Signing a Contract

The signing of the agreement was conducted by JICA and the consortium team.

List of Participants

1. Mr. C. Nugroho SP.
2. Mr. Adhy Prayitno
3. Mr. Ici PK
4. Mr. Muhammad Yazid
5. Mr. Ngudiantoro
6. Ms. Hening Parlan
7. Mr. Kuno Hiromitsu
8. Mr. Akihito Sakurai
9. Mr. Haris Gunawan

Closing

End of the meeting

1.2.6 May 23, 2017 <Investement Facilitation>

Notes on

Annex-1-44

**Focus Group Discussion on
Designing Facilitation and Incentive Schemes for Private Investment in Peatland
Restoration
Oria Hotel, Jakarta
Tuesday, 23rd May 2017**

Minutes of Meeting

Agenda overview:

- a. Opening and Statements**
Opening
- b. Panel Discussion Session 1**
Presentation of case history on potential fisheries business, potential facilitation and incentives for investors related to peatland restoration as well as an integrated example of sago waste utilization. After the presentation, discussion on the design of facilities or business incentives that contribute to peat land restoration were carried out.
- c. Group Discussion**
Participants were divided into two groups based on the topics related to their field. Group A discussed on business scope that contributes to peatland restoration while group B discussed on the basic design of facilitation and incentives to increase financing on businesses that contribute to peatland restoration.
- d. Panel Discussion Session 2**
Submission of discussion result and continued with discussions on the next step or future action.
- e. Closing Remarks**
Important notes of the meeting, conveyed appreciation to participants and thanking the facilitators.

Opening and Statements

- Welcoming address from facilitator and organizer
- Brief explanation of background activities
- Explanation of the discussion activities and important notes

The facilitator commenced the event by giving a speech and thanking the participants as well as giving a brief presentation on the discussion agenda.

**Facilitator: Dr. Eli Nur Nirmala Sari
(Expert Program Deputy of Research and Development, BRG)**

**Opening: Dr. Haris Gunawan
(Kapokja Deputy of Research and Development, BRG)**

The 3rd FGDs were called as preparations aimed to encourage RAN, especially the private sector role in attracting business investment in the context of peatland restoration activities. This year there should be concrete steps that can be used as an investment pilot that minimizes the occurrence of damage and does not cause a fire on peatlands.

Important notes of discussion:

- In July 2017 there may be businesses that will make concrete investments of at least 8 billion
- Some economic opportunities in peatlands for example fish in South Kalimantan
- South Sumatra has a community wisdom that is fish business, Riau has the potential of sago, water in peat that can be used as mineral water and carbon trading
- This year there has been at least no concrete investment / investment in carbon-based peatland, commodities or land
- Discuss about leaflets or documents that can be socialized in July related to businesses in harvest that do not pose a fire risk can be implemented
- Participants could agree on how much can be targeted for investment this year

Proposed Concept Investment Engagement Seminar for Peatland Restoration

Speaker: Hiromitsu Kuno - JICA Mission

- To support peat restoration a preliminary feasibility study is underway to develop investment facilities in peat restoration in 4 districts and 3 provinces
- There are 3 approaches to strengthen water governance, business models that can help peat restoration, develop incentives for peat restoration
- In Japan incentives will be required before developing and opening
- It is expected that the parties in Indonesia can start creating facility schemes or incentives for investment including financing for industries
- Private investment potential is 1. Protected area that must be maintained and if there is HTI then after harvesting must be restored 2. Community-based business eg private can bridge the community business with market 3. Location of concession
- In business development there is a synchronization of public interest and private interests and short-term and long-term income. There are aspects of environmental services, land, water and energy
- Based on the usual cooperation plan, a seminar will be held in order to increase the investment of peat restoration which can be held in July
- Seminars are held to increase public interest in developing an investment climate for peat restoration
- Improvements are made to convey business concepts that help peat restoration, sharing incentive discussions for peat restoration
- The agenda that is expected after the opening is to create a private partnership for peat restoration and then there is time to create a green growth investment for private partnerships and communities to invest
- It is expected that today's FGD can convey concepts to increase investment in peat restoration.

Panel Discussion Session 1

Facilitator: Hanni Adiati, Msc

In everyday life we have enjoyed the results of the cultivation carried out in peat such as medicine containing more than 80% of its adhesive is sago flour, soun and cosmetic products from sago. It needs more attention that the restored peatlands can produce more and more environmentally friendly products.

Example of Integrated Sago Waste Utilization

Speaker: Prof. Dedy Sujerman (Founder of Agribusiness Based on Organic Waste)

- All organic waste can be used but sago has great potential to be an environmentally friendly and sustainable business
- Indonesia has a large comparative advantage due to high temperatures and high humidity and wetness
- Used flies, bacteria, miselum mushrooms, sago worms
- Indonesia is an agricultural country that has sago waste, the oil palm that produces the largest sago starch in the world
- Black Soldier Fly (BSF) is an agent that breaks down market waste, restaurants and households
- BSF flies can be used as animal feed
- Straw Mushroom just exist in Indonesia and is a great potential for business
- Mushroom waste can be used as feed ducks plus BSF flies
- Worms have 75% of protein and can be used as medicine and cosmetic ingredients
- Japan offers to provide 2 tons of worms per month and sago waste can be used as a medium for worm cultivation
- Potential high endemic sago mushroom fungus to be developed as a business opportunity that can also be developed in Meranti island
- Sago mushroom grows in the stem so it is not exposed to pesticides
- Wastes mushroom mixed soil can be used as organic fertilizer that can produce 27 tons of rice in 1 hectare area
- Can be developed sago mushroom
- Mushrooms have a 21% profit potential and BSF has a 64%

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- The advantage of worms has a 100%
 - It takes 1.5 billion for training
 - Investment of 3 billion agribusiness based on waste starting from mushroom, duck, organic fertilizer and organic farming by stimultan
 - Worms can be used for feed, medicine and cosmetics
 - The need for mushrooms in the world has a market share of 270 trillion and mushrooms can't be produced in other countries
 - Sago waste if fermented then the protein increases and can be used as animal feed
 - Mushrooms can be developed to herbs tofu, sausages and various meat substitutes processed

Examples of Potential Facilities and Incentives for Investors Relating to Peat Restoration

Speaker: Dendy Priyandi (Kasubdid representing Director of Facilities Facility Investment Coordinating Board)

- Incentives at BKPM are more specialization to industrialization
- BKPM only being executor of the existing regulation is not a policy maker
- Incentive facilitation that have been implemented: fiscal and non fiscal facilities
- Fiscal facilities: 1. exemption of import duty for the import of capital goods and merchandise, 2. tax allowance and tax holiday facilities,
- Non-fiscal facilities: licensing acceleration including 3 hour service, green line facility from BKPM recommendation so no need for physical examination in the field so that process is faster.
- Fiscal facilities for exemption of import duty are based on 3 legal bases:
- Regulation of the Minister of Finance No. 176 of 2009 related to the laws of industry and industry that produce services. For industry there is assistance from the government if necessary import of capital goods in realizing the industry then there is exemption of entrance fee for 2 years during period of facility period.
- Regulation of the Minister of Finance No. 66 which is more specific in the field of electric power business. There are exemption facilities of import duty.
- Changes to the Regulation of the Minister of Finance No. 110 which is No. 259 to the provision of facilities to the exemption of import duty to mining companies based on contract of work or contractual agreement.
- For businesses in the peatlands, there is more to do with tax allowance and tax holiday
- Tax allowance under Government Regulation No. 18 of 2015 which issues facilities for certain business and region. The facility is a 30% reduction in material income tax as a 5% annually cut 5% which is integrated with other facilities namely loss compensation and accelerated depreciation.
- Tax allowance process for 25 days.
- Tax holiday is limited with minimum investment value of 1 Trillion Rupiah or for telecommunication sector of 500 billion rupiah
- Tax holiday should be a pioneer company and can be 20-100% for a period of 5 -15 years.

Example of Potential Fishing Business by re-wetting the Peatland

Speaker: Mr. Donny - Sub-Directorate of Fisheries Resources, Representative of Directorate of Fish Resources Management, Ministry of Marine Affairs and Fisheries

- Currently no private sector has entered to the existing fish resource management sector on land, except those in Lake Toba.
- KKP has a policy that supports the peat restoration program named CBF.
- The purpose of CBF is to utilize public waters, perhaps peatland is included
- Stocking of fry or juveniles come from the cultivation.
- The target of CBF is public water body which fishery management is controlled by individuals or groups.
- Benefit of CBF:
- Utilization of water resources without disturbing the function and construction of water reservoir building (water body).

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- Utilization of fish by local or private communities. The private sector should involve the community in managing the partnership system. Management is controlled by individuals or legal entities.
 - Requirement for CBF:
 - Nursery or farm pond is public water, must be fertile and uncontaminated.
 - Have minimum facilities such as fry source and must be close to the seed/fry source to minimize operational costs.
 - There are CBF managers (CBF groups) that have been recognized by local government and local communities.
 - CBF's example: the harvested milkfish in Jatiluhur has a weight of 150-250 grams/ individual with a growing period of 4-6 months.
 - CBF is harvesting the fish without feeding, if it is developed on peatland, the fish do not need to be fed.
 - The business analysis at Pangandaran showed positive results: although the proportion of caught was only 25.25% but the profit earned was almost 100%.
 - In general, CBF can optimally produced if they meet the requirements of proper preparation, good management and well-maintained.
 - Preparation; CBF developed by private parties should involve local government and community, community are involved to prevent pilferage of fish, destruction and conflict. Furthermore, the procedure of selecting fish species and stocking up the fish harvesting must be agreed and prepared.
 - The government (KKP) plays a role in controlling CBF activities and the types of fish developed. The KKP should know all activity of the private sector on the peatlands which conducted CBF project.
 - Recommendation of fish species is obtained from the KKP as not all fish species can be stocked on peatlands.
 - The recommended types of fish are blue gourami (sepat), climbing perch (betok), snakehead murrel (gabus) dan giant gourami (gurame).
 - All fish managed by CBF should be reported to the Directorate General of Aquaculture or Directorate General of Capture Fisheries and will be submitted to the local Marine and Fisheries Office.
 - Another scheme that can be developed on peatland is "BEJE" which is a local wisdom in Kalimantan.
 - BEJE is a type of water insulation where the bulkhead will be lifted temporarily when water were raised while the fish will be harvested when the water were decrease.
 - Based on the working mechanism there are 3 types of BEJE:
 - Natural public, unmanaged terrestrial waters (public property)
 - Natural privat, managed by private or certain groups
 - Artificial
 - Natural private may be the best fit for peatland restoration projects. The canals in inline or outlet when water is rising or flooding will be closed so the fish can stay in the pond.
 - Simple analysis showed that the BEJE scheme generates a profit about 30%. If the juveniles of the fish were distributed as much as 100,000 with the price Rp 1000/individual, the cost for equipment was Rp 1,000,000 and the fish had 50% Survival Rate with 3 months of harvest cycle, then the net income earned by the public or private sector was Rp 64,000.
 - This scheme showed that the fishery business is quite promising.

Q&A Session (1)

Mr. Rubianto

- Nowadays chemicals such as fertilizers, herbicides and pesticides are on the critical level. The approach of back to natural microbe is very promising and we have tried that approach in a farmer demplot by using bacterial fertilizer derived from cow urine mixed with coconut water. It only cost Rp 300/ha and provided better production.
- The problem is the mindset of the farmers, we must work together to assure eco-friendly farming.

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- In Palembang there were rice, maize and watermelon farmers in tidal area, agricultural waste generated was burned and became a problem, if the waste was processed with microbes it would be very promising.
 - Change in mindset and policy is needed in order to make fish as the main commodity.
 - For Mr. Dendi, we are now looking for the ways on how to frame the business opportunities in peatland area to attract the investors.

Mr. Ahmad - UNRI

- What is the procedure if you want to involve foreign investors? For example with investments amounting 50 billion and probably not a big investment.

Mr. Agus – Directorate General of Plantation

- Since 2003 we have been doing organic farming and by 2016-2017 we have targeted 1000 organic villages.
- Regarding to utilization in peatlands frameworks, from 1000 villages, we have Liberica coffee community located on the peatlands in Tanjung Jabung Barat, Jambi.
- The problems faced by the farmers were the availability of fertilizers and seeds also their products have not been recognized by the investors.
- We may also need empowerment on making organic fertilizers. Perhaps these opportunities can be considered.

Mr. Dedi

- We should think “back to nature”, because world trends will lead to organic products. Therefore the idea on how to make organic fertilizer simultaneously came from that consideration.
- This products were expected to produce higher product compared to only fertilizer product and could reduce various negative impacts from waste.
- Sago will be a biofuel when fossil fuels were run out and its waste can be processed by 4 organisms.
- This coffee problem urgently requires organic fertilizer, this problem can also be solved by recycling the waste started from the fungi.
- Fungi production could also support existing industrial systems such as SRI, in the past SRI was fail due to the unavailability of organic fertilizers.

Mr. Donny

- This issue has been discussed in Coordinating Minister for Economic Affairs. The Coordinating Minister for the Economy also wants to change the public’s mindset from eating beef to fish. I will email the files to the Committee.
- Data analysis showed that fish protein is higher than other, moreover it also has a lower price.
- The government and industry players have to promote the importance of fish consumption for health.
- In 2017 we will revitalize the management of catch fisheries in 10 locations and by 2018 we want to plan in 20 locations.
- In 2017 some of project were located in same region with peatland restoration project such as Riau, Jambi, South Sumatera, West kalimantan and Central Kalimantan.
- One of our programs is local fish stocking (native species) such as blue gourami (sepat), climbing perch (betok), snakehead murrel (gabus) dan giant gourami (gurame) which can live in acid waters.

Mr. Dendi

- When we talk about incentives it will be fiscal and non-fiscal.
- Fiscal incentives will be utilized after the realization of the investment.
- The dominant parameters of facilitation before starting a business such as markets and other data should be explored, confirmed, and clarified.
- There is a special unit in charge of developing an investment climate to increase investment in Indonesia.

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- Easiness of setting up the business is one of the factors that could attract the investors to invest.
 - Clear and measurable procedures, markets and funds are the major factors considered by investors when starting a business compared to incentive facilities. Only a few investors such as Japan, Korea and China which more detailed to fiscal incentives.
 - Investment procedure associated with Mr. Dedi business field, if the type of investment is foreign investment, after all licensing such as principle and business license, facility and etc. has been fulfilled then establishment of business entity could be processed in Indonesia Investment Coordinating Board (BKPM center).
 - Domestic investment could be administered at BKPM or the Capital investment and one Stop Service Investment and Service Office (DPM-PTSP) in province or regional level.
 - Refers to local government regulations, FDI and domestic investment are still limited by the investment value of 10 billion to differentiate FDI and domestic investment.
 - After that there must be clarity in the field of business known as the closed or open KBLI business code based on Presidential Regulation no. 44 of the latest 2016 as a negative list of investments (DNI).
 - Investor will see KBLI and its business field. This is regulated in Presidential Decree No.40 of 2016.
 - One example of business on peatland is integrated pineapple farming with livestock by PT Great Giant Pineapple.
 - Most importantly, the business entity must have a principle permit, if the investment is more than 100 Billion or employ 1000 workers, the business owner can directly come to the BKPM office and will be served directly by bringing all requirements.
 - Requirements for opening the business are:
 - Clarity of business, sector, KBLI
 - After the establishment of a business entity, principal license will be issued (as granting of fiscal facilities for investor from the Government)
 - Later Business License will be obtained as permanent permit.
 - This facility might be used to import machinery equipment after the issuance of principle permit, when it is commercially ready (after a business license) then the enterprise can obtain other raw material facilities.

Ms. Hanni

- Three approaches (3R) in peatlands restoration:
 - Rewetting
 - Revegetation or natural succession
 - Revitalization, strengthening the economic community around peatland area
- As a result of the 2 million ha project, the BEJE was ruled out and the existing peatland ecosystems were damaged.
- Government regulation (PP) 57 of 2016 explains the task of the Peatland Restoration Agency (BRG) as an operational agency for peatland restoration.
- BRG has 4 deputies in synergy with the Ministry of Environment and Forestry.
- There are 7 priority province in peatland restoration: Riau, South Sumatra, South Kalimantan, Jambi, West Kalimantan, Central Kalimantan and Papua.

Q&A Session (2)

Mr. Kusumo Nugroho - Ministry of Agriculture

- The Ministry of Agriculture has MOL to develop eco-friendly farming, for example bio-activator made by farmers to accelerate decomposition.
- Indonesian Agency for Agricultural Research and Development has also produced a lot of bio-fertilizer.
- Sugar cane plantation framework in tidal areas including peat is inappropriate, peatland area is not suitable for sugarcane.
- Investors were still wondering about the sustainability of the business on peatlands regarding to Government regulation (PP) 57 on KHG.
- Is there any action from BKPM to participate in providing solutions to these problem? The investors were doubt whether the palm oil business is still feasible or not.

Mr. Rahmat Firdaus - Deputy Assistant of Forest Governance, Coordinating Ministry for Economic Affairs

- There are two main references that can guide us on this theme:
 1. The Little Forest Finance Book published by Australian Govt., UN REDD and UN ORCHID which contains forest management arrangements, equity, loans, bonds, grants and balance sheets, organizations related to forestry sector financing (cooperatives, non-profit international organizations, national public funds, trust fund for community organizations and environmentally friendly forestry activities and syntheses on good practices for the forestry sector including property, stock exchange, clearing, technical assistance, insurance, certification, environmentally friendly agreements, domestic laws and agreements, base prices and incentives taxes, that all of these factors constitute the content required in this discussion.
 2. Initiation of 3 States (Indonesia, Malaysia and Brunei Darussalam) in managing the Heart of Borneo Landscape. Many business plans, investment schemes are exemplified in Indonesia but were fast moving in 2 other countries. We were still trying to assess how Indonesia benefits from the other two countries.
- This integration in preventing forest and land fires can be seen in Kalimantan where communities maintain the core trees in harvesting rattan so that rattan can grow well at certain periods of time.
- This is one of promising alternative to NTFPs utilization.
- Regulation of the Minister of Trade No.35 of 2011 incriminates rattan farmers and causes bankruptcy of local farmers so that rattan exports are constrained.
- There should be an effort to review the regulations related to the government's partisanship and the management of the environment.
- Related to the Green Economy that would be implemented in July, it would be interesting if this continued to be national green economy policy.

Mr. Dendi

- There were several discussions about this regulation, we had submitted recommendations regarding the PP.
- Sustainability of investments in peatlands, if looked from the positive side there were Article 8E and Article 23 stating that if the permit had been issued and operated before the enactment of PP no. 71 of 2014 and the amendment of PP No. 57 of 2016 the permit remains valid until its expiration with obligatory to implement spatial layout of IUPHHK and HTI.
- The second case if the permit was issued before the enactment of PP no. 71 of 2014 and the amendment of PP No. 57 of 2016 but activity has not been performed hence the permit remain valid but not allowed to do land clearing, planting and had to make spatial adjustment and RHU-IUPHHK.
- It was incriminating that existing crops could be harvested one cycle and could not be replanted.
- There was injustice related to plant cycle.
- BKPM had a role in re-ensuring land that belongs to the peat moratorium, conveying the harvest restriction policy from one cycle to one business cycle.
- The palm oil industry should wait until 30 years until the efficient period of the plant where within 30 years it can be harvested several times. While the pulp and paper industry only had one cycle harvest.
- We tried to bridge and provide certainty and amenity for existing investors.
- Our recommendation are a 20-25 year oil palm cycle and can not be extend, also oil palm plantations must be sustainably managed.

Ms. Hanni

- Corruption Eradication Commission (KPK) had investigated the palm oil business in Indonesia, the irregularities would be exposed such as forest-land grabbing, illegal permits granted by regional government without recommendation of the Ministry of Agriculture, and without HGU from ATR BPN.
- In terms of company's age, they were worried because they must did replanting in their area. The cost of replanting was expensive and cause the company prefers influencing the

government to expand the oil palm plantation of about 5 million Ha. The enterprise must be orderly and planted in a fixed land.

- Ownership of palm oil stocks in Indonesia 80% is foreign-owned. The government was working with foreign corruption eradication commission in investigating this case.

Mr. Haris

- Peatland is wet because of its nature is a swamp.
- For 18 years, when there was a haze of human rights violated.
- The Government is looking for a solution to maintain the existing economic activities while preventing peat fires so that it needs to be evaluated and corrected.
- Peatland Restoration Agency was formed regarding to PP No 57.
- We are trying to change the nature of peat for that purpose.
- The economy derived from palm oil was beneficial but the country loses 220 trillion so that this restoration effort should be intensified.
- KHG is a Peatland hydrological unit composed of water located in mineral canals and domes used as a protected zone.
- Coordinating ministries is very progressive in looking at peatlands opportunities and I agree about the rattan business, although its productivity is not massive but it could prevent or reduce fire and expected to have premium price.

Ministry of Transmigration

- Based on my experience, peatland can be used after Y + 5 for planting food crops purpose.
- BRG might be able to invite the Ministry of Public Works and the Ministry of Village and Transmigration in discussions because they have experience in peatlands.
- Investors are still hesitant in investing.
- The first step was involving Ministry of Public Works in land management, then human resources entered, then after t + 3 crops can be planted.
- Projects that have been proved successful was in Lampung.

Mr. Utama Kajo

- There is no clarity from BRG related to location, land status, and whether the area has been managed (PU already entered) or not.
- These things are very important for investment, especially legality, as investors will be linked to banks, local governments as well as the community.
- This is what has not been discussed yet in previous meeting. Please show the specific location of the business unit, the area (ha), land status and tools using period.

Mr. Haris

- This will be answered in the discussion later with deputy 1 and related legal status there will be discussed in FGD with KLHK.

Group Discussion

Introduction

Speaker: Dr. Budi Wardana – Deputy for Planning and Cooperation, BRG

Structure of Investment Facilitation of Peat Restoration

- Determine the criteria for peatland restoration is the initial step in gathering idea of an project activity
- Peatland restoration is a cost factor so that peatland was not directly restored but we changed it for economic activities.
- Outcome of the activities should be able to contribute to the 2.5 million hectares peatland restoration target.
- The cost for peatland restoration is not fully funded by the state budget, so that new investment is needed for environmentally friendly peat utilization.

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- Existing concession holders can change the behavior of peatland used by changing the behavior of water management or changing their business model (e.g: pulp and paper become reducing carbon).
 - Restoration criteria are high level investment criteria, consisting of carbon impact, land impact area, social impact, scalability, and return over resources.
 - Carbon impact, there is a market opportunity in reducing carbon emissions.
 - Land impact area, there should be a number of land affected by the investment.
 - Social Impact, activities without social impact will not be sustainable.
 - Scalability, something built into the model must be in a larger scale or expanded in other areas with similar economic, social, and biophysical characteristics or some innovation could be added if the characteristics were different.
 - From the economic side it must generate return over resources.
 - Project screening from idea to investment is required (projects that can be invested economically).
 - The first stage of project idea starts from project identification and screening based on high level investment criteria.
 - In the second phase further study and field review related to the feasibility of the idea to enter to the idea development stage or the maturity stage which stating that the project is attractive to investors.
 - BRG has completed the idea identification stage of the sago management project at Meranti Islands in Riau Province, carbon compensation conducted by RSPO, REDD + project in Katingan and WWF Forest Honey.
 - There were several new projects has entered the idea entry such as bio-decomposers for rice development as well as projects in the fisheries sector.
 - The matrix will be constructed in Ideas screening phase which containing the location, summary of project description and activity.
 - Potential impact assessments will continue until 2020.
 - All High level criteria and impact of the entire project will be reviewed.
 - If all aspects were in green color, it means the impact of the activity is good.
 - Project that has been screened was the transition of sago plantations in KHG Tebing Tinggi, Riau.
 - Assessment of the idea score, sago plantation has a medium to high score, but has a low score on the business case criteria as there is no detailed business plan developed until now.
 - WWF forest honey project's score tends to be higher due to increased in community income from harvesting honey and the absence of forest clearance.
 - BRG has a role in monitoring, controlling activities, paneling and screening as well as seeking potential investment such as village fund (program of Mr. Jokowi), IFAD and Green Planet Fund.
 - BRG also approached existing funding sources such as OJK.

Group Discussion

- Group A discussed on business scope that contribute to peatland restoration consists of KLHK, Ministry of Agriculture, Ministry of Marine Affairs, Ministry of Tourism, Ministry of Industry, BKPM and BRG.
- Group B discussed on Facilitating and Insensitive Basic Design topics to increase financing for businesses contributing to peatland restoration comprising the Coordinating Ministry for the Economy, OJK, Ministry of Finance, BKPM, Ministry of Industry, Ministry of Trade and BRG.

Group A: Business Scope Contributing to Peatland Restoration

Facilitator: Prof. Robianto - Consortium Team UNSRI-UNRI-UPR-LITBANGHUT

- Commodities and services differentiated by wet peat, rather wet and dry
- Wet peat is suitable for stagnant commodities such as sago and rice
- Services that can be developed environment and ecotourism
- On the Ministry of Agriculture map there is land that should not be planted with palm but still planted so that there is overdrain governance of peat so that there is a fire
- Many people are still under poverty so there must be integrated management

-
- If the canal is made it will remove the most water and want block again
 - If water drops to minus 40 there will be a hotspot
 - Minus 40 should be maintained in accordance with the presidential mandate
 - Kepulauan Meranti daerah terluar, tertinggal dan terdepan adalah kemiskinan. Transmigrasi, menko, perikanan bisa ikut terlibat tetapi ditentukan siapa yang akan membuat matrix programnya
 - The burning of Padang Island due to slash and burn slaughter area
 - The problem of Meranti Islands is the outermost, lagging and leading region is poverty.
 - Transmigration, economic ministries, fisheries can be involved but determined who will make the matrix of the program
 - Restoration solution is the integration of ministry programs of related agencies
 - Communities in contact with forests are now encouraged to protect forests
 - KPH institutions are placed in front because of KPH at the site level
 - From the land tenure aspect depends on the management
 - In Riau there are 5000 ha of illegal oil palm plantations within TN Tesso Nilo area
 - If you want to open a peat land there should be water management planning with 2 approaches one of them is intensive shallow drainage
 - Palm oil, sago and palm commodities must be clear where they are
 - In managing the water system there are 3 levels: micro, macro, infrastructure
 - Burning is over drain overweight
 - Restoration does not have to use blocking channel but with its integrated approach is integration
 - The concept of social forestry, indigenous peoples will gain the land
 - If the restoration is in the peat then what needs to be done is to raise the water level

Ms. Happy – Director General PHPL Ministry of Environment and Forestry

- There are already 16 companies that have adopted a new paradigm that applies timber harvesting after ecosystem balance (20-30 years)
- While waiting for the ecosystem condition to be stable again the company is seeking non-timber forest products such as sago, rattan, sap, honey and ecotourism and carbon services
- From several existing companies, there are some companies that purely use the environmental services like PT Rimba Raya Konservasi and PT Limbah Makmur Utama that is carbon and non-timber forest products
- In restoration activities in addition to restoring its biodiversity as well as the stability of ecosystems that must be restored
- In addition to managed businesses there are ecological governance such as key species and wildlife corridors

Prabowo - Direktorat APLL Kementerian KLHK

- Linkages to the management of peat have been tried to cover the peat distribution with the FMU (Forest Units Processing) map of the existing peat land area in KPHL and KPHP. There are about 1.2 million ha in 20 KPHK, 5 KPHL and 15 KPHP
- There are 3 KPHs: KPH LINDUNG, KPH PRODUKSI, KPH Konservasi
- South Sumatera KPHL Banyuasin there are 13.000 Ha, in Jambi there is KPHL Beram Hitam River 13,6rb Ha, in Riau there are 3 KPHP, in Kalteng there is KPHL Kapuas area of approximately 94.000 ha
- FMUs to carry out their activities are encouraged to be able to independently manage forests with the management of NTFPs
- If future management of its business scope peat other than outside forest areas and communities, it is expected to be encouraged for the involvement of FMU in the business of peat restoration
- FMU is a site-level forest management
- Encouraging One KPH One Product program

Directorate of Environmental Services Conservation Forest

- Products from environmental services are almost identical only by region status

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- Activities that can be carried out in conservation areas for the utilization of environmental services in accordance with PP 108 of 2015, environmental services that can be utilized in conservation areas comprising nature tourism environmental services, water environment services, carbon environmental services, geothermal environmental services, environmental services Wind and solar environmental services (sun)
 - Existing ministerial regulations so that environmental service activities can be carried out are nature tourism environmental services, water environment services and geothermal environment services
 - Conservation areas that can be used as the utilization of environmental services namely National Parks and Nature Parks
 - Activities for the development of environmental tourism services without building facilities and environmental water services can be conducted in the wildlife reserve area
 - For the benefit of environmental services can only be done in the utilization zone
 - The obligation for the holder of the environmental services business license is required to provide protection and security in the area provided and in the vicinity including the activities of restoration and prevention of forest fires

Department of Plantation

- It should be agreed whether this is community land or business actor
- The first thing to highlight is the status of the land which should be a sign of the cultivation list
- What is worrisome if included in the scope of restoration turns out there are areas that enter into the area
- Community socialization related to non-oil commodity change due to restoration
- Coconut and sago commodities can contribute significantly to peatlands

Haningrum – Department Aquaculture

- Fisheries on peatlands there are 4 commodities namely sepat, gabus, gurame
- Lele and nila need special treatment such as calcification and pH below 7
- Ogan komering Ilir will be done TBF in peatlands

Mohammad Nur - Director General of Food Security of irrigated and swamp rice subdid

- Peat identic with tides and swamps and can be applied to organic swamp rice
- Organic rice can be for ecology and export

Department of Horticultura

- Horticultura has a high potential value both the land, or in the peat
- For peatlands need water management and peatland type appropriate with horticulture type C and D with water height of approximately 50 cm
- Examples of orange area development in peatlands focus on South Kalimantan, West and Central Kalimantan
- Horticultura can increase people's cashflow
- Land status used for the development of holticultura is land owned by the group and most of private land is not rent or HGU.

Mr. Utama Kajo

- If the problem of using the type of canal (wet / dry) is not completed then the private sector will not want to invest
- Who resolves canal issues? BRG or who? And where is it?
- If BRG has managed to restore damaged land due to what will the fire be returned? Because sago needs water? Sago stores water and is combined with Indonesia's future food barns (swampland)
- The private sector will not be able to invest if the land status remains unclear and has not been resolved
- Community land that has been successfully restored is expected to be distributed to indigenous and private communities to play a role in directing

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- It is expected that land restoration can be used as agrarian reform
 - The private sector does not want visibility but wants a baseline study of what is happening in the region

Mr. Haris - BRG

- BRG has a mandate of 2.49 million of land that will be restored with four criteria: burnt land by 2015, dome with canal, domes without canal and aquaculture zone and there is forest areas, APL, concession areas and community governance
- For concession areas, authority in the Ministry of Environment and Forestry or related Ministries
- BRG provides technical implementation of conservation of peat restoration and advice
- Directly undertaken by the BRG is in the community management room both APL and private status
- If the status in the concession area is the company that is obliged to carry out the restoration but through BRG guidance
- If the company does not restore it will be subject to sanctions

Group B: Scope Business Contribute to Peatland Restoration

Facilitator: Mr. Budi Wardana

- There are 2.5 million Ha of land to be restored, 1.4 million Ha is in the concession
- If we want to facilitate investment for sustainable peatland use, we should focus on 2 things:
 1. How investment facilitation could change the existing pattern of peatland use in forest concessions or ecosystem restoration concessions?
 2. How to encourage the peatlands management in plantation land, especially oil palm plantations?
- Idea notes that are being developed to arrive at the investment stage
- The discussion that will be conducted in this group is how to encourage investment facilitation in both concession and community areas.

Mr. Erdirio - Representative of Deputy 1 Coordinating Ministry for Economic Affairs

- Investment is more related to BKPM, while we are related to financing.
- Framing restoration activities should be in inclusive approach as this year the activities of each ministry and institution should embrace inclusive approach.
- The inclusive approach contains the value that the activities could increase community income, provide extensive employment opportunities, and reduce the number of poor people.
- Micro and small enterprises in the peatlands need clusters such as culinary, handicrafts, edutourism, conservation, processing industries, health, livestock, agriculture, honey bees, etc.
- Data clusters of this business can be used as a pilot.
- The government cooperates with banks to allocate 110 trillion rupiah for this financing and the government also allocated subsidy funds about 10 T.
- Small micro businesses are charged 9% interest rate and the deviation is subsidized by the government with the 10 T fund. In addition the president also suggested to lower interest rates for small medium enterprises.
- Other funds that can be used for peat financing are village funds, funds allocated by the government are around 1, 4 billion per village.
- At the central government level it is recommended that each ministry and agency and authority agency (OJK) when in a joint activity should have a SK POKJA from the head of the BRG.
- In pilot project area we ask the Governor or head of district to create a piloting working group with the decree of governor or head of district.
- Encouraged not only macro investments but also micro or small business investments to avoid social gap.
- So that there will be added value obtained from the project such as the number of small micro business in peatland, increase of income, number of labor that can be absorbed, and reduced number of poor society (there is social approach).

Mr. Budi

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- Regarding to the proposed of Decree of working group (SK POKJA) to encourage inclusive development we strongly support the proposal and we will discuss it.

Mr. Edi Setiawan - OJK

- Since the end of 2014 OJK has a financial roadmap policy
- OJK oversees commercial funds and becomes a transmission for a large number of non-commercial funds to better monitor and target
- The third type of fund was the mix fund, which is one level higher than the social fund or public fund, using commercial funds and social funds.
- Mixfund could be implemented on smallholder farmers who plant long-term crops, so farmers get additional funds for survival until the harvest time.
- OJK had performed capacity building to financial service institutions by introducing green business; After the introduction it was expected that LJK perspective might change.
- The Capacity building was structured but not massive.
- The introduced Green business include: green energy, green building, organic farming and ecotourism.
- OJK has not entered the BRG project because there is no guidance yet.
- The major guideline should include: introduces peatland related businesses and economic and risk assessments.
- After the guideline was made then the next stage was capacity building and piloting.
- To increase the participation of the financial services sector, OJK successfully invited 8 banks in this sustainable plan last year. On the next year the bank plans to invest some of its investment into the green sector. This is an opportunity.
- There should be two efforts: guiding the financial services sector and guiding the farmers.
- Farmers will be guided in the preparation of project proposals
- Previous experience, many banks received poor project proposals with inadequate feasibility studies as a consequence the credit was being stucked.
- The second cause is the absence of an accurate fund. For example: micro hydro project.
- OJK persuaded the financial sector to enter the green sector as well as government and business sectors will be invited to work together to solve the problems that occur in the field.
- In the future OJK will issue a rule requiring all sectors of financial services to support sustainable finance by applying the rule that all sectors of financial services are required to make sustainability reports.
- This will be the transparency of financial services activities in the green sector and as the data portfolio of banks that are categorized as green or social friendly.
- CSR funds can be set aside to finance sustainable fund programs.
- Mixed funds can be combined with BRG fund, furthermore BRG can work with many Financial service institutions (LJK) to produce models that can be replicated in some region.
- It is expected BRG's steps to cooperate and involve the LJK in optimizing commercial, social and mix funds.

Mr. Heru - Directorate General of Taxation

- Tax facilities for sago industry were available in PP no. 18 of 2015.
- Currently, the contents of PP No.18 of 2015 were being revised, this is an opportunity for BRG through ministry which hold BRG to propose the sector to be included in PP No.18 of 2005 as well as the reasons should be included, for example: propose tax allowance for sago industry in Meranti
- If you want to add other industries, the proposal could be included and the reason should be reinforced the proposal.

Mr. Dendi

- KPBU can be an example for this pilot project proposal.
- We can choose a pilot project/showcase project which representing various sectors. E.g.: Kuala Namu airport project.
- We could select the showcase project then we can make it as a joint project.

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- Related business fields to be added in PP no. 18 year 2005, when we will change the contents of the regulations there must be accompanied by a study that supports and there must be a leader who proposed.
 - The carbon trade project is regulated in Perpres 77, foreign investment could invest 50% in carbon trade with the classification of KBLU 02049, in Perpres no. 44 of 2016 it was set that 50% for foreigners.
 - It is no longer valid now which means it allowed 100% of foreign investment or 100% for domestic investment.
 - Tax allowance can be proposed as a facility to attract investors or may be social restoration and social services can be performed due to it has not been considered yet and given incentive stimulation.
 - This may be reviewed more deeply and becomes a showcase project to achieve something more concrete.
 - Tax allowance could be a new initiative that is more suitable for peatland and it could be proposed to BKM.
 - Tax allowance is relatively safer than tax holiday.

Mr. Budi

- How does this carbon trade maturity for restoration, rehabilitation and social forestry? Is there already a mechanism and approval by the Minister?

Ms. Hanni

- Regulation of the Minister related to carbon trade will be published in October.
- Until September we receive inquiries from the parties
- I have to check BKPM regulations that allow 100% share ownership while we have an obligation under the Paris Agreement to reduce 29% of carbon emissions which 17% from forestry sector while 11% from other sectors. This has been endorsed by Bapenas.
- This is unusual if the LHK Ministerial Regulation issues carbon trading limits for forest-based restoration while BKPM opens 100%.

Mr. Budi

- The potential to attract investors investing in peatland is quite huge.
- When the peatland exposed, the peat would release emissions annually and the restoration activities will likely increase the emissions.
- So that all wetting activities in peatland must be able to reduce the emissions.

Mr. Utama Kajo – Indonesia Chamber of Commerce and Industry (KADIN Indonesia)

- Rehabilitation of peatlands is a state obligation
- Potential and carbon trade are all true.
- Private sector wondering of the location and where the private sector will be placed.
- Private sector also need to be backed up and must be protected by the state and need legal standing.
- Private sectors always workwith banks and banks require the legality of the land where the business will be set up.
- The private sector can not work with individual capital, so we ask , if private sector were invited to involve there must be a clear and detailed location, definite width area and clear status, then the private will come to BKPM to get the licensing then we can propose it to the bank.
- Simply tell us the details of location, its status, then present it as map and document.
- If only FGD, it is less meaningful.

Mr. Budi

- There is already a list of locations, communities and partners in the 14 locations I mentioned before, in the next phase will be made the feasibility study.

Mr. Utama Kajo

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- We do not really need FS because we will plan what we will do there by ourselves.
 - We only need the location and what is happening there.
 - Requirements such as carbon impact, etc. are already common, so it might not be the feasibility study but the baseline study. Please show the baseline results.

Mr. Budi

- We will give it when the project concept is completed.
- Mr. Utama Kajo
- Land rehabilitation status and the actors must be clear.
- Land rehabilitation requires substantial funds, if we have to do rehabilitation it may take 70 years.
- Then it will be related to land value tax, customs duties, etc.

Mr. Budi

- IUPHHK RE permit generally has longer term period.

Mr. Yusuf (Deputy 3 BRG)

- This year BRG, especially Deputy 3, has a major program “peat caring village” targeting 75 villages and need village facilitators.
- I agree that the UKM sector is also important.
- There are many potential small businesses in the village and we need information regarding the financing scheme.
- One of the existing potentials in peatland is the VCO from coconut, for example: community in Jambi and it needs to be managed in groups.
- We need information on how to grow a micro business and how to integrate with village targets.
- The village government allocated approximately 1.4 billion for the activity.

Mr. Budi

- FGD penting untuk mempertemukan ide dan resource.

Mr. Erdirio

- The average potential of micro enterprises from 75 peat-caring villages can be input to seminars in July.
- The number of villages that can be financed and institutional strengthening and capacity building for microfinance institution in the village can be mentioned in the seminar.
- Community Assistance was good and perhaps assistance from the Ministry of Village can be included in the working group (POKJA).

Coordinating Ministry for Economic Affairs

- For Ms. Hanni about the new regulation, we can discuss it with BKPM then revised it and submitted to the Secretary General of KLHK then the Coordinating Ministry for Economic Affairs will revise it again.
- Every 2 years we revised the Investment Negative List (DNI).

Mr. Dendi

- Related to DNI, BKPM had regulated this through Presidential Regulation no. 77 regarding negative list of investment, then it changed to Presidential Regulation no. 44 of 2016 which carbon trade was regulated by a maximum foreign share investment about 50%.
- The DNI regulates open and closed businesses sector for investment.
- Carbon trade is essentially open business sector, now it is more liberal due to foreign investment percentage is not regulated.
- If it is not regulated, the assumption is that the business field is 100% open for FDI as well as domestic investment.
- This could be a reference to a Ministerial Regulation about the carbon trade.

Ms. Hanni

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- To strengthen the information related to carbon trade will be obtained from the companies.
 - We will have a meeting with Great Giant Pineapple, to find out company history in setting up the carbon trading, as well as ethical code and MoU.
 - It is also related to JCM that has been built up, it will be reviewed so that the carbon trade rules later will be aligned with JCM's ethical code.
 - This new regulation must be well-calculated regarding to reducing emission obligations.
 - We requested the data of Japanese companies who did the carbon trade including the concept and the rules to Mr. Kuno.

Mr. Budi

- There has been some potential for facilitation in peatland restoration based on the information submitted, unfortunately the potential was still spread over.
- There should be a change of land use model.
- In order to change the land use model there should be an investment.
- If later in KLHK study some companies had to change their business model totally then it would need some input from us especially.
- BRG had homework to ensure the location and activities in the restoration area so that the private sector could invest.
- This homework will be presented not only as the map but also the baseline study.

Panel Discussion Session 2

Results Presentation from Group B

Mr. Erdirio

- To ensure investment interest, Investment in peatlands should be proposed to include into opened sector, the businesses were listed then proposed to BKPM and coordinated by the Coordinating Ministry of Economy, especially the deputies 5 so that some types of investment in the sector can be opened whether to FDI or Domestic investment.
- A revision of a presidential regulation concerning tax relief in order to include this business to tax relief proposal.
- It was expected that the business proposal will be submitted in July.
- BRG had conducted guidance on 75 villages in which each village has been assisted.
- It is hoped that BRG will increase financing or assistance for 70,000 micro and small enterprises in 75 villages.
- Piloting should be conducted on the synergy of the development of clusters based on peat restoration as well as on the procedures for partnership between small and large companies, central government and local governments, domestic authorities and foreign authorities so that they can meet at pilot sites.
- The enterprises expect the definite locations that are ready to be offered to investors, especially the legal standing.

Ms. Hanni

- Rules on carbon trading procedures will be drafted and targeted to be completed by October.
- Data of Japanese companies conducting carbon trading in Indonesia, the concept and the rules will be given by Mr. Kuno.
- KLHK will have a dialogue with Great Giant Pineapple Company about carbon trading.

Mr. Erdirio

- We proposed SK POKJA from BRG head whose members consist of representatives from Ministries, Institutions, Authorities, and Universities.
- Ministry of Village need to be involved due to the disbursement of Dana Desa about 90 trillion to the village.
- Bank Indonesia (BI) could be involved as there are several commodities related to price stability and inflation and BI had a social program that can be integrated.
- This year the Policy Committee for UMKM in cooperation with 38 financial institutions allocates a budget of around 110 trillion for small enterprises and assistance if BRG already owns the micro-enterprise.

Results Presentation from Group A

- Discussion results a business scope that contributes to the restoration of peatlands, especially commodities, services and downstream industry integration.
- Downstream industry integration has not been widely responded because the enterprises want clarity of commodity, location, and land status.
- Existing Environmental services were natural tourism, water and geothermal.
- Commodities on restoration land were sago, coconut, palm, and palm.
- It was difficult to determine land ownership and responsible parties if the restoration map is unavailable.
- Palm restoration is improving its governance and requires the enterprises approach and approach from BRG.
- Coconut companies are not interested yet because the location is not clear.
- Commodity maps and baseline data are needed not a feasibility study.
- Management of all sectors whether the plantation or food were expected to affiliate in joint pilot area.
- A map will be provided so that the location is more specific.
- Integrated approach is required in the concept of restoration.

Ms. Eli

- FGD aimed to identify concrete investment concepts in peatland restoration.
- BRG cooperated with JICA to conduct feasibility study in purpose of answering questions arising from investors related to investments in peatlands.
- A concrete example of BRG's activities is the investment in rice development in shallow peat areas.
- The example of this business on a large scale has been implemented by PT Sinar Pangan Indonesia by developing a partnership. They rent community's land and community was given salary and the harvesting crops were divided.
- BRG was preparing a zero fire land management review with a decomposer.
- BRG was trying this program in 2 villages in Padoran Mulya village and Sebangau village.
- Before burning practice prohibition, dry grain yield occurred 1-2 ton per hectare, and after prohibition was applied the harvest yield was 50-75 kg resulting in food insecurity.
- To solve this problem BRG tried a non-burning management program with decomposers and targeted the yields of 6.5 tons/ha.
- This is the business models that we were expected.
- In July we targeted a concrete concept.

Mr. Robi

- Funds are widely distributed among ministries, private and public but those that do not yet exist are physical maps of, actor's maps and ministry maps in target areas especially in the village.
- We have to trace from problem map to solution map and cost sharing.
- I agreed with the POKJA but if the target was 2000 ha it is too wide.
- If the matrix was done then the POKJA can move.

Ms. Eli

- BRG worked based on KHG maps so it would be difficult in measuring if we used administrative maps.
- BRG also concerned about carbon emissions, we manage agricultural activities with the aim of producing a product eventhough the emissions generated will increase. However, this would be better than allowing the soil or land neglected and emitted the carbon, it would be worst if it was burned.
- This showed that restoring peatlands based on KHG is very important.
- In one KHG, the existing peat dome needs to be developed into a protected function, the area was planted and should not be disturbed to produce carbon capture, while in shallow peat areas

were managed for cultivation and could improve community economy so there is a trade off in one unit KHG.

- This will be performed also in KHG Sungai Utara and Sungai Serapat in cooperation with international agencies.

Closing Remarks

Mr. Haris

- It was very clear that this peatland restoration business can be run in 4 districts.
- It was expected that small and medium-sized businesses should be developed not only large-scale enterprises.
- Sago and honey are very prospective in Riau.
- In South Sumatra fish, purun, and gelam were very prospective, especially wood for the channel building.
- In Japan biomass-based fuels are being developed this is also an opportunity.
- It is expected that by 2018 this business can be performed and replicated in other districts.
- Carbon trade was being prepared for regulations and infrastructure.
- The water business in peatland could also be developed by reproduce the peat water into drinking water.
- In July it is expected that there will be a business profile of each target district.
- If feasible, FGDs can be conducted with the local governments in each of the target districts, so that local governments can be involved from the outset.
- Thank you for contributing ideas given to this FGD.
- Facilitation needs to be taken whether the business minds incorporated in the Indonesian Chamber of Commerce and Industry is the same as Mr. Kajo's opinion.

End of Discussion.

1.2.7 June 20, 2017 <Investment Facilitation>

Notes on

Discussion and Formation of Facility and Incentive Team on Designing Investment Scheme of Peatland Restoration

Morrissey Hotel, Jakarta

Thursday, 20th June 2017

Minutes of Meeting

Agenda overview:

- a. Opening and Statements**
 - Opening
 - Presentation from Mr. Kuno Hiromitsu about the summary of FGD activities as well as results and outcomes from FGD and consortium team meetings.
- b. Discussion and Team Formation**

Discussed on investment in peatland restoration and followed by team formation. Participants were divided into two teams (facility team and incentive team) according to the interests and expertise of the members.
- c. Closing remarks**

Important notes of the meeting and conveyed appreciation to participants and thanking the facilitators.

Opening

Facilitator: Ms. Hastin

- Welcoming address
- Brief explanation of background activity

Meeting Attendances:

1. Mr. C. Nugroho (BRG) – BRG
2. Mr. Haris Gunawan – BRG
3. Mr. Kuno Hiromitsu – JICA Mission
4. Mr. Widiyanto - KADIN
5. Ms. Ruth Mitha C N – Kemenko Perekonomian
6. Mr. Denny Latuconsina – Kemendag
7. Mr. Afif Rahmat – Kemendag
8. Mr. Rachmad Firdaus – Kemenko Perekonomian
9. Mr. Utama Kajo – KADIN/DRN
10. Mr. Bayu Putra – Kemenko Perekonomian (Deputi 1)
11. Ms. Ani Suryati – Kemenko Perekonomian (Deputi 5)
12. Mr. Rudy Prasetya – KADIN
13. Mr. Nugroho J. Sutanto – Kemenkeu
14. Mr. Gunawan Pribadi – Kemenko Perekonomian
15. Mr. Anke Dwi – Cultivate
16. Ms. Sri Endang N – BKPM
17. Mr. Haryo Y S – BKPM
18. Ms. Istiana Maftuchah – OJK
19. Mr. Rizky M – DJP
20. Ms. Adisty - Kemenkeu
21. Mr. Dendy A – BKPM
22. Mr. Ariawan C P – BKPM
23. Mr. Abdul Karim – BRG
24. Mr. Erdiriyo – Kemenko Perekonomian
25. Mr. Andi Ismail – BKPM
26. Mr. Nunung Nuryartoyo – IPB

Speaker: Mr. Haris Gunawan (BRG)

- Welcoming address.
- Brief explanation about BRG.
- Explanation of peatland conditions in Indonesia.
- Peatland restoration is one of the Government's efforts in mitigating the risk of fire.
- Peatland restoration was established in 7 priority provinces targeting 1000 villages which its economic development potential will be consider.
- BRG wants to develop peatland commodities to be attractive in investment and economically feasible.
- The meeting aimed to establish a facility team and incentive team that could support the promotion of peatland commodities and their investment opportunities.
- The nearest BRG agenda is the workshop related to finalization achievement in attracting business and investment in July.
- The workshop aimed to facilitate the BRG's study to be promoted to potential investors in Japan.
- BRG and Japan cooperation is prioritized in 4 districts (Meranti, OKI, Muba, and Pulang Pisau).
- I hope there were no conglomeration of individual interest, this pilot is aimed to support community welfare.

Summary of FGD on Facilitation and Incentive Schemes for Private Investment in Peatland Restoration and Consortium Meeting.**Speaker: Mr Hiromitsu Kuno (JICA Mission)**

- JICA mission facilitated preparations of coordination for peatland restoration and peatland fire study.
- There are 3 major components in this project :
 1. Reinforcing peatland hydrology
 2. Supporting research in conducting feasibility studies and model business concept for 4 prioritize district.

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3. Supporting stakeholder's coordination meeting in discussing and establishing incentives and facilities to increase investment on peatland restoration.
- Regular meetings, FGDs and workshops were conducted to support stakeholder's coordination.
 - Based on the recent workshop in Tokyo, it is necessary to improve the approach in attracting foreign investors.
 - FGD on 23 May focused on designing incentives and facilities to support related businesses in peatland restoration.
 - Important notes on FGD 23 May:
 1. Private needs especially land and social aspects must be considered
 2. Revised the regulations related to incentives and facilities in peatland restoration as well as established national demo plot for peatland restoration.
 3. The business model of peatland restoration is primarily community-based and partnership with the private sector.
 - We set up consortium team of local universities and R&D center focusing on potential of peatland inventory.
 - Summary of the meetings with the consortium:
 1. Potential commodities have been inventoried but must be improved on quantitative data, profit analysis and financing scheme
 2. Innovation in the peatland business is needed
 3. There's no clarity of businessmen target and business rules
 - There are 4 integrated aspects in developing business model: Cash flow, landscape aspect, 3R approach (rewetting, revegetation and revitalization), and community based business.
 - Due to a large cost of peatland restoration but hardly beneficial to production, change in mindset and providing facilities and incentives for investors is required.
 - Commodity overview based on inventory: sago, rice, maize, horticultural crops, fruits, liberica, or a combination of farms with MPTS for bioenergy or fodder.
 - In forest area we could develop HTI sago as HHBK, carbon trading, ecosystem restoration, or eco-tourism.
 - Outside the land, we could develop primary industry by recycling waste sago for mushroom cultivation or bio-energy.

Discussion and Formation of Facility and Incentive Team in Peatland Restoration

Facilitator: Mr. C. Nugroho (BRG)

- Mr. Kuno provided an opportunity for the consortium team to undertake a study of potential commodities in 4 districts.
- Consortium had presented their result regarding to commodities that can be offered to investors technically.
- The results need input from the meeting participants especially in financial sectors to make the information more holistic.
- Meeting participants are welcome to ask about the presentation or other things related to the topic.

Mr. Anke (Marketing Communication Consultant)

- Marketing is currently moving not only meets the needs and desires of consumers but met the anxiety and desires of the target market.
- Anxiety and desire from Japan including the benefits, payback period, social security, and convenience (product concept oriented).
- Products in peatland business should be interesting and irresistible offer by involving emotional factors besides technical factors.
- Challenges for peatland business are product innovation, where product innovation should meet market innovation.
- Innovation presented by Mr. Kuno must be understood by the market.

Mr. Rudy (KADIN)

- While the incentives were designed there must be clear and scalable concept so that it would financially attractive and worth to do.

Mr. Erdiriyo (Coordinating Ministry for Economic Affairs)

- Work plan can be created with stakeholders as well as their programs, targets, indicators and outcomes presented as integrated matrix. For example: OJK could bring financial institution for financing or cheap credit.
- While waiting for funds from foreign investors, financing in Indonesia or incentives from Ministry of Finance, BI or KADIN can be used.

Mr. C. Nugroho (BRG)

- Indigenous commodities of peat land valued lower than other commodities grown on peat (non-indigenous).
- Peatland commodity did not have financing and facilitation as crops commodity in peatland such as oil palm and rubber.
- Therefore we try to increase the economic value of that commodity by promoting it to investors.

Ms. Sri Endang (BKPM)

- There were some limitations of investment activity in attracting foreign investors
- Not all commodities especially agriculture commodity allowed to develop by foreign investor.
- Foreign investment activities for paddy commodities can only be over 25 ha and foreign ownership restriction is limited to 49%.
- There must be a certainty of commodities to be offered and regulations governing foreign ownership restrictions on these commodities.
- Then it will be reviewed whether the limit of ownership can attract foreign investors.
- Japanese investors generally invested in manufacturing and very rarely in primary industry.
- If the scheme were objected to attract foreign investors it is impossible on a small scale.

Mr. Rachmad Firdaus (Coordinating Ministry for Economic Affairs)

- A priority of village typology should be made, since the typology of each village is generally different so that the treatment given will be different.
- Organizing a priority for superior products.
- Production and conservation programs from KPH which involving communities can be used as a model for national demonstration plots.
- Besides a work plan, roadmap of investment development is also important.
- Project adoption management office is required to help managing social forestry and fire prevention.

Mr. C. Nugroho (BRG)

- FMU/KPH is more oriented to forest management while peatland management is oriented to KHG.
- Efforts to promote investment in FMU/KPH can be emulated.

Ms. Ani Suryani (Coordinating Ministry for Economic Affairs)

- There should be a straightforward overview of the business line that can be given to attract investors.
- Identification of existing facilities and incentives in the government is necessary before creating a new incentive.
- Investors are always asking what can be given to them.

Mr. C. Nugroho (BRG)

- We would like to obtain information on available and identifiable fiscal and non-fiscal incentives, pledged facilities for investors to be combined with the consortium team's findings.

Ms. Ani Suryani (Coordinating Ministry for Economic Affairs)

- Is it possible to developed peatland area as special economic region? If it became a special economic region there's a lot of facility could be obtained.

Mr. C. Nugroho (BRG)

- Questions for Mr. Kuno:
 - What attracts Japanese investors?
 - What are the chances of rice investment?
 - Which commodities that has a good prospective based on consortium findings?

Mr. Kuno (JICA Mission)

- Japanese investors were still afraid to enter the primary sector because it takes a long time and risky, therefore it needs incentives and facilities.
- If there was a tax relief of PPH, it might be attractive for investors.

Mr. C. Nugroho (BRG)

- There were two types of Japanese investors: starter investor and investors who invest on the ongoing business.
- The starter investor did not require complete information, they only need land status and the legal status must clear.
- The other types of investor required clear information, cash flow, PEP, facilities and incentives.
- Some local commodities that have not been able to be promoted and completed investment proposals could be developed for starter investor types.

Formation of Incentive Team and Facility Team**Facilitator: Mr. C. Nugroho (BRG)**

- In the invitation letter there were a personnel agreement and institution agreement where the agreement was intended to enable the meeting participants to join the team.
- The facility and incentive team will give input to the consortium team.
- The input will be collected in printed format or soft copy and then it will be combined with the consortium team concept.
- The submission of ideas from the facility and incentive team will be submitted by the consultant team. The consultant team will do the discussion with the consortium team to formulate the investment proposal or concept note.
- Furthermore the results will be elaborated with facility and incentive teams.
- Facility and incentive team will receive consequences for their works.

Mr. Haris Gunawan (BRG)

- We expect facilitation breakthrough: simple, solutional, implementable, and community based.

List of Facility Team and Incentive Team's member

No.	Facility Team	Institution*	Incentive Team	Institution
1	Widiyanto	KADIN	Rudi Prasetya	KADIN
2	Sri Endang	BKPM	Gunawan Pribadi	Kemenko Perekonomian
3	Deny	Kemendag	Afif	Kemendag
4	Rachmad	Kemenko Perekonomian	Ani Suryati	Kemenko Perekonomian
5	Nugroho	Kemenkeu	Dendy	BKPM
6	Haryo	BKPM	Erdiriyo	Kemenko Perekonomian
7	Ruth Mitha	Kemenko Perekonomian	Istiana	OJK
8	Rizky	DJP	Ariawan	BKPM

*BKPM: Investment Coordinating Board, DJP: Directorate General of Taxes, KADIN: Indonesia Chamber of Commerce and Industry, Kemendag: Ministry of Trade, Kemenkeu: Ministry of Finance, Kemenko Perekonomian: Coordinating Ministry for Economic Affairs, OJK: Financial Services Authority.

Mr. C. Nugroho (BRG)

- The Facility team will focus on the facilities to be provided
- The Incentive team will focus on the incentives to be provided

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- Each team member provides narration related to facilities and incentives (max. 2 sheets) according to their team topic.

Mr. Haryo (BKPM)

- It is important to understand the concept of a peatland restoration business.
- Land certainty and status were required related to access of funding and then the necessary incentives will be designed by knowing the KBLI/ISIC status.
- Sago industry already has the facility but for sago planting there is no facilitation.

Mr. C. Nugroho (BRG)

- Proposed model from consortium team has not been specific and need input.
- BRG did not have capacity to grant business license but BRG could facilitate it
- The peatland restoration business will be conducted on private land area as of 400.000 ha.
- Business permit facilities might be granted by KLHK but only for forest exploitation located in forest areas, while in private lands we might be used communal approaches.
- Notes from the facility team and incentive team will be collected on July 7th, notes were sent to hastin@brg.go.id Cc: nugroho.sp@brg.go.id.
- Notes will be collected and then were submitted to the consultant team.

Mr. Nunung (IPB)

- Sophisticated technology is required.
- Challenge: How to establish work-intensive investments that can absorb both the downstream and the upstream.
- There was a biogenetic product that can be developed.
- Out of the box idea and friendly environment investment are required.

Mr. Gunawan (Coordinating Ministry for Economic Affairs)

- If the commodity could not be decide yet, we could commence cooperation between the incentive team and the consortium team.
- Tax allowance: target at large investment value
- Incentive team and consortium team could collaborate for more comprehensive consideration.

Closing Remarks

Mr. Haris Gunawan (BRG)

- Any investment should be able to support community economic growth.
- Note: please convey confirmation and good communication efforts with the head of the institution regarding readiness to follow up on this proposal.
- There is no compulsion but we will be very helped by the input from facility team and incentive team.
- The idea of this team if possible should be out of the box.

End of discussion.

1.2.8 July 7, 2017 <Watertable Monitoring Strengtening>

**Agenda Technical Meeting
Preparation of Management of Peat Water Surface Monitoring Tool Telemetry System
Oria Hotel, Jakarta
Friday 7 July 2017**

Minutes of Meeting

Agenda overview:

- a. **Welcoming speech by Head of Deputy of Research and Development Peat Restoration Agency/BRG**

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- Welcoming Speech
 - Explanation of Agenda Overview
- b. Presentation by Mr. Hiromitsu Kuno from JICA**
Overview explanation on the cooperation and takeover scheme of SEMASE tool from JICA to BRG.
- c. Panel Discussion**
The participants discussed on the management scheme of SESAME tools that have been installed and appointed the formal manager who will be responsible in maintaining the tools in each installation locations.
- d. Closing by Head of Deputy of Research and Development of BRG**
Closing and directions from Head of Deputy of Research and Development of BRG.

Opening and Welcoming Speech from Deputy of Research and Development Dr. Haris Gunawan

- Welcoming speech and thanking the participants.
- Overview explanation of activity background
- Direction for discussion and important notes.

Important points of the speech:

- We want to open discussion related to the needs of SESAME tools and how we can manage the tools given to us in order it can be functioned as its purposes. This tool is a grant from Japan Government through JICA Mission with BRG and was handed over in a very prestigious forum which was COP 22 in Marrakesh. Until today, there are 15 tools have been installed in four regencies namely Meranti Regency, OKI Regency, Musi Banyuasin Regency and Pulau Pisau Regency.
- This tool is a breakthrough and innovation derived from a long research related to the needs of information of the peat main variable which is water. It is important because one of the main factor influencing peat fire and haze is water availability.
- Following up on this first collaboration, further cooperation was undertaken while attending an international conference of peat communities in Scotland. We are the first country to apply this tool in peat areas while other countries are still manual.
- It should be direction for us, in order the existing tools can be used as exercise because we will add in quantity to more than 300 tools outside the company's concessions. Therefore we need to get support from Sir and Madam related to the maintenance of the tools. BRG will be only 5 years old so we need to discuss and hear the opinion of Sir and Madam how the takeover, the transfer, and the management can run well for the tool to being used properly.
- BRG as it is known has a mandate to restore 2 million hectares of peat land and extends to 2.49 million hectares. One of the indicators of its success can be achieved with this tool, and we always convey the progress to the President and copy to Ministry of Environment and Forestry, the Vice President, Ministry of Economics Coordinator, Ministry of State Apparatus Empowerment and others.
- We are also pursued by the presidential palace to immediately install this tool in the palace for its monitor screen.
- Let us support the use of this tool so that the country's highest policy maker can respond immediately to peat land fires.
- We are currently managing site level managers and are being trained to specialize in water for peat restoration. We need to get support from Sir and Madam if later there are selected colleagues to develop the knowledge about this.
- It is also planned that this tool will also be refined with satellites so that nothing can be hidden about the water in our peat lands. This is an attempt to provide "spy" in the field.
- We hope that installation of this tool in the field will not impact economically to the economic activities in peat area.
- I thank Sir and Madam who have attended this meeting and share their ideas, recommendations as well as experiences for our better peat management.
- The event was officially opened.

Presentation on Cooperation Overview from JICA

Speaker : Hiromitsu Kuno (JICA)

Title : Overview of Peatland Water Control Monitoring Outside of Concession Area (Component 1)

Important Points:

- Our cooperation was started last year on preparation for fire prevention and since last year also we supported BRG in peat land restoration.
- We would like to share experiences related to this Water Surface Control Tool outside concession area.
- Our missions are as follows:
 - a. Strengthening peat water surface monitoring.
 - b. Supporting new business models in order peatland can still be utilized for economic activities.
 - c. Supporting multi-stakeholders cooperation to invest in peat land.
- This tool has several parts namely sensor to measure the water surface of peat, rainfall rate, soil moisture, and etc and Data logger and Internal Antenna to send the data. Usually the data is sent in every one hour. If the signal in the location is not strong, external antenna can be put on to support the data transmission.
- For the 1st step of our mission, this tool has been installed since last December. We have pointed temporary manager and the spare parts have been entrusted to them. In the regency level we have installed 2 of these tools in OKI Regency and 2 tools in Musi Banyuasin.
- For the 2nd step of our mission in South Sumatera province, we have installed 2 tools in Conservation Area Padang Sugihan, 1 in APL (Other Utilization Area) Riding Village Sub-district Pangkalan Lampam, OKI Regency and 1 in Limited Production Forest Pedamaran Kayu Agung. We also have installed external antenna in all of them.
- In Riau province, we have installed this tool in Meranti Regency in Forest Village Kepulauan Meranti FMU (Forest Management Unit). The spare parts are put in TGRD and later when the official manager has been determined, it will be handed to them. We also have installed external antenna since the signal in the location is not strong.
- In Central Kalimantan province we have installed the tools in four locations in which 2 tools in Forest Village in cooperation with BRG and 2 in Forest Village in Pulau Pisau Regency. The spare parts temporary has been put in TRGD and will be handed over to the official manager later on. For the APER we are still confuse whether the management is given to Manggala Agni because we are still worry if it is given to the village.
- In outside concession area, peat water surface is not clear and Local government also allocated small number of fund for peat management.
- We are still confuse in terms of which parties are responsible for peat restoration and related to peat water surface tool who is better to manage it? If the peat is dry what action that should be taken ?
- In July 10-11 2017 there will be training on Water Surface Monitoring and on 27 July 2017 will be held a workshop on Business Model Development for Peatland Restoration. It is expected that on that date will also be held a signing the tools takeover from JICA to BRG and from BRG to the official manager.
- We have some recommendation related to the dry peat:
 - Maintaining and increasing the water surface.
 - Increasing the category with early warning system.
 - Developing technical SOP for the action in dry peat land.
- Based on our experiences, this SESAME tool does not require much cost for the maintenance. The cost that must be spent is only data credits (pulsa) for transmission around 4 million Rupiahs per year. Since the installation from July 2017 until July 2018, the cost has been paid by JICA. But if the data produced is abnormal or if the tool is broken, we must send a team to the location to check and repair it and some cost is required for that purposes.

Panel Discussion

Facilitator: Mr. Abdul Karim (BRG)

Participants:

1. Wahyu Indraningsih (Ministry of Environment and Forestry)
 - A. Sulaiman (BPTD)

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2. Rachmad Firdaus (Ministry of Economic Coordinator)
 3. Yophi Handoko (Research Center for Climate Change of Kalimantan)
 4. Agus Wanto (DAOPS Pulau Pisau)
 5. Merty Ilona (Environment Department of Central Kalimantan)
 6. Tri Minarni (TRGD Kalteng)
 7. Genman (Center for Natural Resource Conservation South Sumatera)
 8. Yuliarsyah
 9. G. Ratih Indriarti (Environment and Forestry Department of Riau Province)
 10. Sunarno (Directorate General of Forest and Land Fire Management)
 11. Ari Kusnadi (Directorate General of Water Resources)
 12. Wahiddan Nurachman (Ditjen SDA PUPR)
 13. Susilo Hartoko (FMU Area V Mesuji)
 14. Tri Prayogi (Mangala Agni DAOPS OKI)
 15. Salim Jundan (FMU Lalan South Sumatera Province)
 16. Himawan Sutanto (Forestry Department of South Sumatera Province)
 17. Laut Tarigan (TRG South Sumatera)
 18. Denni Marta (Research Center for Climate Change of Sumatera)
 19. Risda (TRGD Riau)
 20. Tabroni (Research and Development Center for Environment and Forestry, Palembang)
 21. Haris Gunawan (BRG)

Directions from Facilitator Bapak Abdul Karim:

The target from this discussion was to obtain the official manager who will manage and be responsible for the 14 tools that have been installed, but 4 tools can be put aside because they are still not handed over, so there are 10 tools that should be discussed in details. Before we discuss further, let us hear a presentation from Ibu Ning from Ministry of Environment and Forestry.

Presentation from Ibu Ning (Ministry of Environment and Forestry) about Peat Control Damages:

Important points:

- Water surface monitoring of peat is done in the location which has and not has permission. The question is how the management in the place where there is no concession permit will be?
- Protection and management of peat are related to the laws regulation, for example the forest functions and level of damages. We have to consider these variables in the policies.
- The threshold for water surface monitoring is 0.4 meter, so the baseline is very rare. This is one of examples the distribution of responsibilities of peat restoration related to water surface seen from the forest functions:
 - Minister: The responsibility is in conservation forest.
 - Provincial/Regency/City governments are depend on their authorities: Protection Forest, Production Forest, Other Utilization Area, and Community land.
 - Stakeholders/concession owner in their respective business area.
- Water surface monitoring becomes one of criteria for peat restoration success. When the restoration is done using water management method, the water building must be built in the first six months and the water soil table must reach 0.4 meter in the next three months.
- Water surface measurement procedures related to the point of compliance should be considered related to the company complains since they fear of it. It is because one of the parameters is water level, so it can be a tool to know if their practice is in accordance with the law. So the company is afraid that suddenly there are parties who enter and take samples in their area. Therefore a point of compliance is needed and if the base is concession so the compliance point is 15% of the concession area. If the tools will be installed in Other Utilization Area, we have to see the location status, say for example it is a palm oil garden owned by community with registered status, so I think we can still install the tools in the area. I also think we can cooperate with them. However the incentives and institutional mechanism should be clear when we invite them to manage the tools. This forum is the opportunity to find mutual solutions since every local government can be varies, depending on who owns the land.

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- In the concession area, the compliance point is determined by Directorate General of Pollution Control and Environmental Damages, but how if it is outside concession area? In this case, there is mechanism to build related to where the tools will be installed, the responsible party, and how to monitor the tools. It is important due to the tools existence and its advantages.
 - In the concession area where to put the 15% of compliance point? Because there are water management zone, different contour, and different plantation width in the peat ecosystem. According to the expert, the water in peat is convex so if in the center has been 0.4 meter so the monitoring can be done. Therefore, the locations of tools inside and outside the concession must be clear.
 - In the concession area, it is also important to note about the certainty of location coordinate because it will influence to the permission.
 - Implementation of ground water measurements can be varies in each area depending on the kinds of power. If community groups want to be involved as a manager they must be legal at least until the village government. This is what we need to think together.
 - The purpose of monitoring activities can be different, whether for research or to respond to data. If it is for research activities, we can establish the criteria. Therefore we need to look at the purpose of the tools before we decide the location.
 - Institutional matter is also important related to the management and human resources, the funding and takeover mechanism. There was a given tool, the tools have lost but it is still recorded to be exist. I think we also need to invite the institution who will be responsible and with an agreement signed by the two parties.
 - Related to training of the trainer, when it is done, how we could maintain those experts? For example, in Ministry of Agriculture we have pest expert. We need to think the form of institution for them as an appreciation in order they are willing to work with local government.
 - We must think of monitoring and reporting mechanisms so that all lines can gain access to the information, as the data will be responded by hierarchy authorities.
 - Regarding the funding in the local government, in Law 32 does not have clauses related to peatland monitoring, but if we look at the derivatives of Law 32 and local government, there is actually a way to propose funding slots for the management of this tool in the clause of pollution control and environmental damages. The management of peat lands is regulated in PP 71 which is also derived from Law 32 on Environmental Protection so that the Law can be used as a reference for funding.

Questions From Mr. Abdul Karim Related to SESAME Tool Cooperation Scheme:

- For maintenance fund, does JICA cover for this year only or until next year also?
- Data from that tool will go to Japanese server or Klot, is it possible that after the handover of the tool, the data is also integrated into our server?
- For licensed concession areas, they are responsible for the territory, but if the area is outside the concession, does the authority in that area also has an obligation like those in the concession area? If yes, it means that we must also help them to make the tool useful.

Update from Mr. Rahmad Firdaus (Forest Governance of Ministry of Economy Coordinator):

- We greatly appreciate this activity, as the peatland issue was also discussed at the cabinet meeting on January 11 2017 at the state palace, and the coordination meeting at the Office of the Ministry of Economy Coordinator last April.
- It was presented by Mr. Kuno, the water level is one of the important instruments in fire early warning. We have compiled a grand design of fire prevention with the World Bank and the Associations from Germany. The required funds amount to 39 Trillion for fire prevention, and there are financing schemes from the World Bank and International Partnership for this prevention.
- In the Grand Design there is also a technology development plan for forest fire prevention.
- Related to reporting mechanisms, emergency forest fire posts are copied to Ministry of Economy Coordinator and we always make monthly reports based on their daily reports including hotspots, large of burnt area and ISPU. But for ISPU is rarely reported by the region except for Riau.
- Related to this tool who is responsible institution, is it DAOPS or FMU? Riau Province only has 4 DAOPS and its ability to serve some districts/cities is quiet difficult. If it refers to

Ministry of Environment and Forestry's Regulation No 15 mentioned the responsible party for the area is the holder of business license, FMU, or community group, so where does this DAOPS belong to? It seems that we should review it again.

- The water level of 0.4 meters is measured from the canal or in the field?
- In the Ministry of Environment and Forestry's Regulation the success of peat restoration are management, monitoring, etc., is it possible to add some criteria namely plant species, plant age, rainy and dry season?

Respond from Mrs. Ning (Ministry of Environment and Forestry):

- In response to Mr. Karim, how is mechanism if the tool located outside the concession? We need to be observed the field conditions, for example, if it is inside the plantation there will be gradual permit, well for plantations outside the concession permit may indeed have no permission but it could be registered. That's what we need to map, what kind of permit is meant. Deliniation is very complex so we need to observe also the society in that area.
- In response to Mr. Firdaus, the vice president said 0.4m it is an un-negotiable. Measurements are done in the center or in the middle of the peat, the concession area is divided into blocks and then there are drainages of various sizes. Measurements are made at its center point because the water will flow into the canals next to it. I want to tell you a bit of my experience: Mr. Directorate General of Plantation does not want to have water limit of 0.4m and He plans to change the regulation. I once asked the peatland concession owners whether anyone has ever measured the water level but no one answered has ever did it. Then the Director General of the plantation once invited several parties who had assisted the concession and faced with the hydrologist, I asked if there was a dead palm oil with 0.4 m water level, they answered yes, but when I asked the location and the data, no one replied.
- Related to the reporting mechanism, the root of the fire problem in peat lands is draining. The derivation of Government Regulation number 71 has a plan for protection and management of peat ecosystems and the 0.4m water level should be clear during the dry season. If indeed the power of monitoring is in Manggala Agni so why we do not give the responsibility to them. I think we have to adjust to the strengths in the region, the important thing is a synergy between report and action in the field, because the data reported is not only to be read but also to be responded.

Respond from Mr. Kuno:

- Responding related to maintenance funding: JICA has paid its maintenance fee for 1 year since it was installed (July 2017 to July 2018), after which maintenance costs are paid by managers with the amount of approximately 4 million per year. As I said before, this tool relatively does not burden the manager for the maintenance cost as long as it is not stolen or broken. But if it is broken or stolen, we have to send people to check the tool so that it needs fund for transport officer.
- Data is stored not on Japan's server but on Midori's server. Midori already has a MoU with Research and Development Center for Technology (BPPT), so if you want to hold the handover of data and server access maybe we should discuss it with BPPT.

Respond from Mr. Abdul Karim:

- Responding to the Mr. Kuno related data: The data is our concern because once when we wanted to access the data, we could not do it due to technical problem inside the server. The tools handover should also with the server so that we can have access to the data at any time in order the monitoring can be implemented properly and the tool becomes not wasted.

Respond from Mr. Kuno:

- In respond to the data server: It can be discussed further with Midori.

Respond from Ibu Ning (Ministry of Environment and Forestry):

- In terms of tool management, the initial funding should be clear when we should fund for the maintenance, because it is related to budget planning in government that cannot be purposed at any time, there is a schedule. If the proposal is late and not become priority, it might not be budgeted.

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- I think we should see the purpose of this tool, even though we have a MoU with BPPT but BPPT has no duty to respond the data, so there must be an institution that can respond to the data. Therefore, access to the data should be provided to anyone with hierarchy authorities. If the data access is given to the Central Government how can the local government access the data, whereas the local government is the closest party to the location and has responsibilities in the region. If those who have the responsibility but do not have real time data, it will be difficult to perform a quick response.

Respond from Mr. Tabroni (Research and Development, Ministry of Environment and Forestry, Palembang):

- We get a part to socialize this tool to the community and the community is told to keep this tool. But we must also think about our access and benefits to the community. Because if they cannot access the data, then how will they respond? If we also do not have access to the data, it will be difficult to answer questions from the community.

Respond from Mr. Sunarno (Directorate of Forest and Land Fire Control, Ministry of Environment and Forestry):

- One thing to emphasize is the security of the tool. I remember there was a tsunami monitoring tool that was a grant from abroad lost and the people who stole it actually did not know its function so they only sold it per kg. Therefore, it is necessary to think about the method of securing the tool.
- In addition to training of the trainer for water level monitoring, security personnel should also be given attention.
- For those who will follow the training of water level monitoring should be the people who will indeed involve directly to the field, and those who just want to participate but will not be in direct contact with technical activities in the field may not join it.
- For 1 of this SESAME tool how many hectares can it represent? And also to guarantee the function of the tool in every how long the calibration should be done?
- This 0.4 meter limit is already an extreme number that cannot be tolerated anymore because of from our experience, less than 0.4 meter the land has been burned.

Respond from Mr. Abdul Karim:

- Are Mr. Kuno able to answer this technical question?
- For the tools security, temporarily we use iron fence.
- For the security personnel, we still need to discuss it further.
- For the training is also become our consent. We need to recruit local people where the tool is installed.

Respond from Mr. Kuno :

- I do not really know about technical matters of the tools, but according to information from Midori, the tool maintenance is done once a year so it seems calibration is done simultaneously with the maintenance. This tool monitors the water level so that calibration does not need to be too often, in contrast to the water quality monitor sensors which are very sensitive that must be often calibrated.
- I think, there should be a community assistance to change the mindset of society to ensure the security of this tool.

Respond from Mr. Deni (Climate Change Agency of Sumatera):

- Related to the tools security, we have installed water quality tool in the Musi River which in fact is in the middle of the city but the tool is kept missing. On the Musi River the water level is very rapidly changing so it greatly affects the instrument sensors of the tool.
- I think there should be training for the tools maintenance in order we don't need to invite expert from Japan.
- The existing data can be overlaid so that we can see the existing resources in the area, for example where the nearest water location during a fire so that the actions we take can be more effective and efficient.
- Delegating the management to the region is not something light because the region has a small budget. The local government will not be able to oversee the tool because the location is far

enough. Tools installed in the middle of the city, they sometimes do not want to come to check, moreover in the middle of the forest. So many obstacles exist, but hopefully we can design a joint solution. We greatly appreciate this tool's grant as it is important for the prevention of forest and land fire.

- In Ogan Ilir within a month there might be 3 fires, so it may be necessary to check whether the tools can help to control forest and land fires. It also should be clear who can access the data because this information is important for everyone. Hopefully this tool can be shared to everyone so that we can minimize the fires in peatlands.

Respond from Mr. Abdul Karim:

- Maybe later Mr. Kuno can explain about this online access related password. We are also not an administrator so we cannot adjust the server to our needs, if we are the administrator we can set the server to anyone who need the access in the region. This means that if the tools are handed over but the system is not, it will just be useless, because we cannot provide the data access to the region.

Respond from Mr. Kuno:

- We have two websites, for public and for professionals. If it is for common society they only need a username and password to access the data. If they (Midori) propose the system administrator to be trained for example BRG, local government and others then after that we give the ID and finally they can get into the database system. If you want it quickly, the manufacturer can provide a public website. If you want to process the data we have to build the system administration.

Respond from Mr. Tabroni (Research and Development, Ministry of Environment and Forestry, Palembang):

- If we take the data from this tool for monthly then the data storage will be over memory, so we want to take daily data to be able to predict the events in the next day so we can prepare. The data should be taken by people in the area every day.

Respond from Mrs. Merti Ilona (Environment Department of Central Kalimantan):

- We can choose the responsibilities such as who is responsible for the physical, budget, monitoring, evaluation, and access.
- The community is the closest party to the tool, and which institution is nearest to the tool and has budget capabilities. We must see also who has interests with this tool.
- From the top, who is the party that has interests related to the water level. According to us is Director General of Pollution Control and Environmental Damages. Well, the budgeting should go there, then in the region where the budget goes for example if in Central Kalimantan, it is in the Environment Department, then the Environment Department that manages the funds can be channeled anywhere. In the village forest, the funds can be disbursed to FMU so those are responsible at the site level about the security of the tool. There should be incentives for the community to maintain the tool. Our obstacle is in budget, maybe Central Minister can have power about budget to be distributed to regions.

Update from Mr. Abdul Karim:

- The matrix needs to be displayed and we need to discuss it with the ones here.

Recapitulation of Readiness as Responsible Manager of SESAME Tool

No	Code	Location	Proposed Field Manager	Readiness
S1	OKI-1 (South Sumatera)	Conservation Genetic Peat Forest of BPPLHK (Research and Development Center of	BPPLHK, South Sumatera (Mr. Tabroni)	Basically we are ready, but when it is handed over to us there must be clarity in advance related to budget funds to support the management of the tool.

		Environment and Forestry)		
S2	OKI-2 (South Sumatera)	Other Utilization Area of Simpangtiga Village, Sub-district Tulung Selapan	DAOPS Manggala Agni III OKI	Not Willing to be the manager, because: <ul style="list-style-type: none"> • The far monitoring location. • It is not appropriate to be handed over to Manggala Agni since we are not an institution. • It is better for the management to be given to authorize institution in that area. • We recommend for the management to be given to Environment Department of OKI.
S3	MUBA-1 (South Sumatera)	Production Forest of FMU Lalan Mangsang Mendis	FMU of South Sumatera (Mr. Salim J)	<ul style="list-style-type: none"> • We really appreciate JICA for the tools grant which will be very useful for us. • I am personally ready and welcome to be the manager. However, before it is given to us, there must be a clear description of the responsibilities, the consequences, and the compensations. • As long as there is support to the responsibilities given, we welcome and ready to be the field manager.
S4	MUBA-2 (South Sumatera)	Production Forest of FMU Lalan Mangsang Mendis		
S5	PS-1 (South Sumatera)	Conservation Forest of Padang Sugihan	(Center for Conservation and Natural Resources) BKSDA South Sumatera	<ul style="list-style-type: none"> • Principally, we are ready to be the manager, but we cannot allocate the fund for the management since not all UPT (Technical Unit) of Conservation of Natural Resources and Its Ecosystem own the tools. • We recommend that BRG to make an official letter to Director General of Conservation of Natural Resources and Its Ecosystem about this matter, so when we propose for funds, we will not be questioned. • We do not have budget to take further field actions from the data obtained.
S6	PS-2R (South Sumatera)	Conservation Forest of Padang Sugihan		
S7	AS-1R (South Sumatera)	Other Utilization Area of Riding Village, Sub-district Pangkalan Lampam OKI	DAOPS Manggala Agni III OKI	Not Willing to be field manager.
S8	PT-1 (South Sumatera)	Limited Production Forest of Pedamaran Kayu Agung, FMU Area V Mesuji	FMU, South Sumatera	Not willing to be the field manager because we do not have budget for the management. The budget of Provincial Government is allocated more to Asian games 2018.
R1	ST	Village Forest, FMU Area of Kepulauan Meranti	Forestry Department of Riau Province	Not willing to be field manager and recommended for the management to be given to Regency under the Department of Environment.

R2	LK	FMU Area of Pulau Meranti, Lukun Village Sub-district Tebing Tinggi Timur, Kepulauan Meranti	Forestry Department of Riau Province	<ul style="list-style-type: none"> We are ready to be the field manager and will coordinate further with FMU and Bappeda. We need the budget details for the management to be proposed in the next year budgeting.
C1	SJ	Community land (Demplot PLTB BRG D2), Other Utilization Area of Sebangau Jaya Village, Sub-district Kahayan Kuala, Pulau Pisau.	DAOPS Manggala Agni Palangkaraya	<p>Represented by Climate Change Agency of Kalimantan</p> <ul style="list-style-type: none"> We just know about this SESAME tool here. DAOPS is an operational agency and not an institution, above it there is Climate Change Agency of Kalimantan. It will be better that this offered is discussed with DAOPS' higher institution. Our working area is not Palangkaraya but Kapuas. DAOPS cannot decide to be or not to be the field manager since it is not an institution. Climate Change Agency of Kalimantan recommends that the management is given to the Regency and DAOPS will voluntarily help them.
C2	PM	Community land (Demplot PLTB BRG D2), Other Utilization Area of Paduran Mulya Village, Sub-district Kahayan Kuala, Pulau Pisau.	DAOPS Manggala Agni Palangkaraya	<ul style="list-style-type: none"> Our working area is not Palangkaraya but Kapuas. DAOPS cannot decide to be or not to be the field manager since it is not an institution. Climate Change Agency of Kalimantan recommends that the management is given to the Regency and DAOPS will voluntarily help them.
C3	PM	Forest Village, Forest Village Area of Buntoi, Sub-district Malik, Pulau Pisau	Forestry Department of Central Kalimantan	<ul style="list-style-type: none"> Related to the responsibilities, how is the description and how about the funds? Related to the takeover asset, is there Clearance mechanism with Ministry of Finance or not? We cannot state our readiness before those matters mentioned are clear.
C4	MT	Forest Village, Area of Mantaren I Village, Sub-district Malik, Pulau Pisau	Forestry Department of Central Kalimantan	

Respond from Mr. Abdul Karim:

- When the fund budgeting and takeover issues have been cleared, are everyone ready to manage this tool?

Participants:

- We are ready.

Closing from Deputy of Research and Development: Dr. Haris Gunawan.

Important points:

- I thank for all the recommendations, information, thoughts and ideas from Sir and Madam for the perfection of this program.
- There must be a modality and resources related to this water level.
- This is a MoU between BRG and JICA automatically this activity is still a BRG's activity until 2020, but support from JICA when signed only until 2017. Confirmation from Mr. Kuno, this tool maintenance fee has been paid up to one year ahead. In the beginning, I also mentioned that we can still propose budgeting if BRG still survive until 2020. Therefore, the problem of budget relatively has solution, and we hope the cooperation to coordinate the funding.

- Some of our notes, in the time these tools are publicly accessible with android systems. This tool helps with the goal of reducing the smoke haze disaster and the ultimate goal to keep our peat from extinction as it is now. So we want to build a sense of belonging. We will do TOT approach to make our cadres in the field either in government or in society.
- This tool is different from the one in the MDRS BMKG. Accuracy of Data sent is near real data in the field. We also continue to exercise for further development so that the impact coverage can be answered, we will also immediately use satellite image analysis to support it.
- We very appreciate of Mrs. Wahyu Indraningsih, related to the confirmation of the water level of 0.4 meters which is final. I also want to take advantage of this forum for hospitality and enhance our friendship.
- We thank for Mr. Kuno and JICA for the support given to us.

End of discussion and event.

1.2.9 July 12, 2017 <Investement Facilitation>

**Agenda Focus Group Discussion
Facilitation and Incentive Schemes for Investment in Peat Restoration
Morissey Hotel, Jakarta
Wednesday 12 July 2017**

Minutes of Meeting

Agenda overview:

- a. Opening and direction from Deputy of Research and Development BRG**
 - Opening remarks
 - Directions
- b. Presentation from Mr. Hiromitsu Kuno from JICA**
Overview explanation on investment schemes in peat restoration land.
- c. Presentation of the Study Result by Consortium Teams**
Presentation on the result of consortium teams study in four priority Regencies.
- d. Presentation by Incentive Team, Fasilitation Team, and Consultant Team**
Presentation on the main recommendation of Incentive Team, Fasilitation Team, and Consultant Team related ti the result of consortium teams study.
- e. Panel Discussion**
The participants discussed about the schemes from consortium team study, and what need to complete before determining the business model and commodities that will be developed.
- f. Closing from Deputy of Research and Development BRG**
Closing remarks and direction from Deputy of Research and Development BRG.

Opening Remarks from Deputy of Research and Development of BRG Dr. Haris Gunawan

- Opening remarks and thanking the participants
- Overview explanation of activity background
- Explanation of discussion objectives and important notes

Important points:

- Thanking the participants for the attendance.
- As we all know that there are several attempts to offer some of peatland potentials to support the restoration efforts, one of which is through economic activity in a green economy scheme.
- If it is possible, we are ultimately eager to make concrete action in relation to supporting peatland restoration activities. Hopefully in the final meeting later, the results of some of our discussions have been more visible and can attract investors to invest their money.
- We initiated from various informations at the beginning, and today we will try to formulate it. We expect that this year we can see the real result to be reported to the President. On July 27,

2017 we will bring together investors from Japan to Indonesia in the form of workshops. And the plan is next October we will go to Osaka Japan to promote this peat land investment.

- We also hope that the business model will directly touch the community. For example, as in Japan, the conglomerate-scale industry is not dominated by a single monopolistic activity but also supported by household-scale activities. I think it will be very interesting if it can be implemented into one of the business models in our peat.
- We want to develop a different business schemes. That's why we need an out of the box idea.
- We are facilitated by JICA to create attractive business models that can attract investors.
- Today we meet 3 teams: Consortium team, incentive team and facilitation team and one additional the consultant team. The consortium team consisted of 4 educational and research institutions in each province (University of Sriwijaya, Research and Development Center for Forestry, Palembang, University of Riau, and University of Palangkaraya) accompanied by related ministries and business world.
- Hopefully at the end of July will be a momentum for us to be able to speak our ideas for the sake of investment and investors in the workshop forums.
- Let's keep together so that the business we will run can affect to the humid, wet peatlands, non-exotic vegetation and livelihoods of a prosperous society.
- BRG expresses very much gratitude for the thoughts of all participants who will be followed up for our business model and for our peatland.
- We will always exercise to develop an appropriate business model because peat restoration will not be successful without economic activities for society.
- The event was officially opened.

Presentation from JICA

Speaker: Hiromitsu Kuno

Title : Proposed Scope of Private Business Investment for Peatland Restoration

Important points:

- Peatland has great challenges such as vulnerable to fire and fluctuate water table.
- The biophysical aspects in peatland is also a problem;
 - Low pH leads to low plant productivity.
 - Low number of population because most of residents surrounding leave to the city for job opportunities, so the number of worker to manage peatland is lacking.
- There are some problems from the community for cultivation on peatlands due to the period suitable for crops only in October-January, while January-April the peatlands are relatively flooded and in April-October the land is very dry.
- The lack of people to manage peatlands causes peat burning to be the primary choice.
- Green investment can be divided into green business and financial services. Green businesses can be divided into land-based businesses consisting of businesses in forest areas and outside forest areas.
- Business schemes within forest areas can be ecosystem restoration, Non-Timber Forest Products (NTFP) and social forestry.
- We need financial services to finance our business and to manage business cash flow. Hopefully, there are green financial services that can be applied into our business model.
- In formulating a business plan, the things need to consider is that, the business plan must be in order to support peat restoration and the improvement of the peat environment.
- Forest areas that have no management rights and still open access are business opportunities for peat restoration.
- The business plan we propose for the Southern Pulang Pisau in the culture zone includes the following:
 - Profit sharing schemes with farmers.
 - Land clearing by mechanization, without using fire.
 - Increase local rice production from 10 tons / ha to 13 tons / ha.
 - Planting rice can improve the water system.
 - Cultivation in peat can also be used to raise pH and eliminate pyrite.
- Business plan in West Kalimantan, Southern Kubu Raya includes:
 - Buying an inactive Forest Plantation for business in the field of NTFP Sago.

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- Many sago bins can be made for charcoal for power generators that can be sold.
 - Sago can be made into Starch and sold.

Presentation of Progress Review from Consortium Team

Facilitator: Prof. Rubiyanto

Important points from Facilitator presentation:

- Our three tasks as a consortium team include:
 1. Socialization of SESAME tools in priority Regencies.
 2. Creating a business model of investment which is peat friendly.
 3. Looking for alternative business models for peatland restoration.
- Managing peat has many complex problems.
- The background of the business model development plan is peat fires, food security, peatland revitalization, restoration of 2.4 million hectares of peatlands, returning dry drainage to wet and creating sustainable peatland efforts.
- The cost of for fire prevention is 221 T, so we need to change the preventive measures to keep people prosperous and un-burnt peat.
- One of the potential crops in peatland is Jelutung: peat friendly and flood resistant.
- Most of the peatlands are dried and planted with rubber trees but the results are not good because the rubber cannot withstand the submerged.
- Example of the suitability of palm oil, peatlands are actually not suitable for palm oil but it is kept open and the wetlands are drained with canals. Now we want to make the dry land to be wet again.
- Commodities that can be cultivated in peatlands such as rice, watermelon and corn, a year can be 3 times planted with revenue up to 3 millions/ha.
- For this restoration business should be selected water resistant commodities.
- The water level at the setting point in 4 priority Regencies is -40 m.
- Dried peatlands are now being attempted to be wet again, with a hydrological restoration approach, revegetation and community empowerment.
- 42% of peatland in Pulang Pisau Regency located in Sebangau area and 39% of its peat is used for agriculture, forestry and fishery, but it has not yet prospered the community so now we will focus on it.
- Around 61% of peatlands in OKI are used for agriculture, forestry and fishery activities, so we will focus in that sectors.

Progress Presentation from UNSRI Consortium Team for MUBA Regency:

Speaker: Mr. Mudiyantoro

Important points:

- SESAME tool that has been installed in South Sumatera last year was 4 and now we have 4 pieces of newly installed tools, so now there are 8 in total. There are 4 PHUs priority namely PHU Punsu Kecil River (Muba Banyuasin), PHU Sibumbang-Sibatok, PHU Sughian-Lumpur, and PHU Sugihan-Saleh.
- In the Muba area there are quite a lot areas burnt in 2015 ago.
- A half Muba area has become palm oil and Forest Plantation concessions, only PHU Meran Kepayang and Desa Kepayang left. Land in Muba is Kepayang Village forest. The peat in the village is still in a good condition and now we are trying to avoid it from fire.
- We have coordinated with local village officials to inventory the villages potential, then we conducted field visits.
- The village forest of Kepayang is legalized by the Minister of Forestry Decree of 2013.
- Potentials of Kepayang village forest:
 - Area of 5700 ha is managed by LDH (Lembaga Desa Hutan/Village Forest Agency). Around 4952 ha of peat depth is 0.5-6.5 m, 14% is categorized as very deep peat, 55% of deep peat category, 28% of medium peat, and 3 % is very shallow peat category.
- Kepayang Village Forest area with around 300 ha of mineral land is used for rubber plantation, but there are many rubber plants burnt in the 2015 fire.
- There are 81 identified tree species, some of which are commercial commodities such as meranti, kranji and petaling.

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- Carbon stocks in high-density forest areas reached 294.5 ton/ha while in community rubber gardens aged 6 months were 76.2 ton/ha.
 - Timber (*Baccaurea sumatrana*) is wood with highest IVI value and the highest wood volume reached 76.4 m³.
 - The canal blocking program of BRG 2017 to minimize forest fires in Kepayang Village was allocated 7 blocks. The location of canal blocking construction has been confirmed by South Sumatera TRGD and the preparation of construction will be done on 24-28 July 2017. The construction of canal blocking will be done in early August by self-managed community group with Deputy II.
 - The canal that divides the village forest will be blocked with the expectation that apart from 7 blocks from Deputy II there will be more canal blocks from other sources also as to improve the water table in this area.
 - KPHP Lalan has an area of 12.685 ha with several important tree species such as swamp Pulai, Mersawa, Merulan, Terentang, Red Pinang, Durian Burung, Jelutung Rawa, Nyatoh and Negrin.
 - The potency of environmental services that can be developed are biodiversity protection, environmental rescue and protection and carbon sequestration as well as carbon stocks.
 - Other alternative utilizations of NTFPs are from forest plants, non-forest plants, and swamp fish cultivation.
 - Prioritized NTFPs for forest crops are kemenyan, leaf durian, asam payau, and large pandanus that are commonly found in village forests.
 - Prioritized NTFP from non-forest plantations are pineapple, rubber, cassava and banana.
 - In addition to the canal dividing KPHP lalan, there are still many small canals that will be blocked this year and used as models for swamp fisheries.
 - For areca nut plantations can be combined with pineapple in Agroforestry patterns.
 - In Muba there are not many choices because there are only 2 village forests.

Question from Mr. Utomo:

Potencies in Muba Regency are mostly flora and plants that now grow in dry conditions and later after the canal is blocked the area will be wet again. After wetting the canal, what plants can still grow? Are these plants identified before the fire which when the land is still wet or after the land is dried by canals?

Answers:

This plant grows long ago when the land was still wet and also can adapt to dry land. These species distribution is on dry land and peatland (wet). These selected plants can survive in these two different land conditions.

Presentation of Consortium Team for OKI Regency:

Important points:

- There are 5 PHUs in OKI Regency namely PHU Jeruju River - Mesuji River, PHU Lumpur River - Jeruju River, PHU Sibumbang River- Batok River, PHU Sugihan River - Lumpur River (the largest), and PHU Saleh River - Sugihan River (small parts in OKI Regency and mostly in Banyuasin Regency).
- Traditional community potency in peatland, one of them is fishery auction of lebak lebung. When the water in lebak is high, the fish goes and trapped into the lebak, then the auction is held and the winner can control and has the right of fish in the lebak. When the water is dry the fish stucked in lebak, harvested and the results are divided between the winner of the auction and the community.
- When the water in Lebak receded, the lebak used by the community as a rice field.
- Lebak rice potential: After the lebak dried, the ownership of the swamp returns to the owner before the auction. For the size of 60 m x 5 m with depth of 2 meters swamp, the potency is up to 50 kg of fish. As for the rice can be planted once a year. There is a government program to increase food peoduction by building irrigation there along the 300 meters. The irrigation is built in the place where business programs to increase the production of rice, corn, and soybeans existed.
- The irrigation has just been completed and has not been tested.

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- The potency of swamp plants: Brondong plants can be made into different handicrafts with purun so that it is potential for product diversification program.
 - The government needs to send an extension team to conduct social engineering in connection with the development of business models in OKI Regency peatlands.
 - Other potency is Swamp buffaloes with advantages: resource-based, plasma nutfah, local wisdom, the main livelihood of the people there, have multi-value added benefits, and open to innovation and investment.
 - Development of swamp buffalo: buffalo and feed nurseries. The problem that now exists is when the swamp is tide the buffalo can be grazed throughout the swamp but when entering the rice planting season then the buffalo can not be grazed (feed problems).
 - Utilization of swamp buffaloes: traditional gulo puan (wet crystal caramelised milk) foods, dadih (fermented buffalo milk), meat and samin oil.
 - Buffalo milk can be made into several processed products namely ice cream, milk candy, yogurt and pasteur milk. This is initiated because there is an excess of production that must be solved for the prosperity of society.
 - Most swamp buffalo business location is found in Pampangan sub-district.
 - The lebak lebung fishery has the advantages: it is local wisdom, resource-based, germplasm, supported by local regulations, fish products become an important industry for society, open for innovation and investment, and relevant to rewetting and revitalization of BRG.
 - In 1 sub-district there can be 60 swamp areas auctioned and the value in 2016 reaches 1.1 billion Rupiahs that goes into local government saves. Then 5% was taken for restocking and 2% for the sub-district, incentive to the people is in the form of utilization of the results. Land owners do profit sharing with auction winners and farmers get a share of 10-15%.
 - Cultivation of capture fisheries besides the waters of lebak lebung: sepat, gabus, and catfish.
 - The development of the lebak lebung fish cultivation can be very wide including many sub-districts.
 - The third proposed program is craft from purun: purun is one of the grasses in swamp area that can be used for various utilizations, one of them as craft raw materials such as bags, hats, key chain, and others. So far, the handicraft products are made based on order. OKI Regency Government has provided a promotion location. What is needed currently is promotion cooperation and technology input.
 - The other superior programs are optimization of wetland rice field which has wide potential and is the main livelihood of the community. Optimization is being attempted to be developed into 2 or 3 times planting period per year.
 - Lebak in South Sumatra has local varieties such as Pegagan rice, but currently we do not know whether the germplasm is still existed or not. The potency of such varieties are 3-5 tons/ha which makes the price expensive.
 - Other crops that can be developed are corn and soybeans.

Presentation from Consortium Team of Research and Development Center for Forestry, Palembang:

Speker: Mr. Edwin

Important points:

- Muba and OKI Regencies have different management and utilization histories. Peatlands have been regarded as backward areas and not cultivated.
- The last land use is dominated by Forestry Plantation Sinar Mas, there are also dominating and burning shrubs.
- Selecting a potential restoration location:
- PHU Sugihan River - Lumpur River has been largely used by Forestry Plantation concession but still has little gaps to manage for restoration.
- PHU Sibumbang River - Batok River is located close to Kayu Agung city. 3R potentials are in Limited Production Forest area of Pedamaran, which is still in shrubbery. 3R Potentials in the area is quite high, but for the third R (Revitalization) is somewhat less because it is in the middle of HGU but it has better access because it is close to the road.
- PHU Sugihan River - Saleh River has a fairly high Potential for 3R. This location has become the target area of several institutions.

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- Description of potential selected locations: PHU Sugihan River - Lumpur River has a thin peat, close to the transmigration area, PT BMH planting area, 600 ha for cultivation, partly intensive, and the community is well prepared for intensive agriculture.
 - The farmers are ready to manage the land, but the problem is the high capital.
 - The second potential area is Riding-Penyajab with a potential area of 1650 ha, peat depth <100 cm and 100-200 cm, the distance of the location with the village 15 minutes using the vehicles, the area of rice fields using sonor system.
 - In 2011 there was a permit to plant sugar cane in this area but rejected by the community because it was their rice field area.
 - In 2014 there was another permit for oil palm utilization. But they could not plant because the community refused it.
 - This area is a potential area because if it does not burn it will become dry shrub again which will be very vulnerable to fire.
 - The third potential location is Sepucuk - Pedamaran: PHU Sibumbang River - Batok River: the area reaches 10,000 ha, ex-burnt site, has excellent access which only 10 km from Kayu Agung City, the location near with demplot of Research and Development Center for Forestry, and has been used by the community for Pineapple on the roadside.
 - The burnt site is ready for planting but it is part of the peat dome (protected zone).
 - Potential restoration in OKI Sepucuk-Pedamaran: farmers already planted pineapples on the left and right of the road.
 - Exploration of business opportunity: learning from Tanjabbar Jambi area that has commodities such as Betel Nut and Tiberika Coffee, while from Lampung: pineapple.
 - In Tanjabbar the demand for betel nut fruit has increased greatly since the establishment of five factories. Farmers replaced rubber and palm oil with betel nut and pineapple. In the area has the same peat depth as in the OKI which is 2m.
 - In there we can cultivate betel nut and pineapple without making canals, and the prospects are still existed with the support of market investment.
 - The pineapple prospect is brighter, as Indonesia already able to export fresh pineapple to Italy.
 - Restoration business plan at Rengas Merah - Bukit Batu, PHU Sugihan River - Lumpur River: rice field, pineapple + betel nut, coffee + betel nut. The threat: concessionaires do not advocate perennial cultivation, BRG proponet prefers to R1 whereas society will put R3 frist.
 - For on-farm strategy at PHU Sugihan River - Lumpur River, with the same scheme, the challenge is high cost of transaction.
 - Business plan in Sepucuk - Pedamaran, PHU Sibumbang River - Batok River: 10.000 ha of land is very strategic for On Farm + Off Farm cultivation. The threat is that there are different interpretations related to protected zones and the unclear aspects of legality.

Presentation from Consortium Team of Kepulauan Meranti:

Speaker: Mr. Ahmad

Important points:

- About 90% of our target area is highly prone to fire.
- BRG targets 30,744 ha of peat restoration in 30 Villages in Meranti Regency.
- PHU Pulau Tebing Tinggi has about 82.5% deep peat so it is a dilemma for investment.
- Changes in land management status in Sub-district Tebing Tinggi Timur: PT NSP Concession 21,000 ha, and PT. LUM 11,000 ha.
- Changes in land status in Tebing Tinggi Timur sub-District to village forest grants. There should be clear guidelines for land management to be clear.
- Land-based investment: trade in ecosystem services such as tasik-based ecotourism and development of water treatment (eg water supply company) in Tanjung Village, Tebing Tinggi Barat sub-District. KPHP hopes that the location can be a fishing location but there should be restocking of fish seeds.
- Wood production: development of production forest for construction and carpentry woods in Lukun Village, Tebing Tinggi Timur sub-district with 500-800 ha (potential), sago growing is not optimal because of deep peat so it is diverted to construction timber. Land management is KPHP Tebing Tinggi - Lukun Village, human resources is exist but there is still no institutional and infrastructure.

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- The irony is that the former wooden barn area is now a deficit of wood. The community is confused of the utilization of the land.
 - Development of production forests for tree species for biomass. With the same characteristics as above, it can be harvested within 4 years. We imagine that there will be wood agroforestry with such a field for construction timber and another for fast-growing energy timber.
 - Land-based non-forestry investment: the potential of liberika coffee (organic coffee), a potential of 50 tons/month involving about 50 farmers. The locations of the program are in Teluk Buntal Village and Tanjung Gadai Village. In Tebing Tinggi Timur Sub-district was tried several times to cultivate the coffee but failed because the farmers were only given seeds without any assistance and extension. Actual land area in the village is 10 ha and potential land is 300-400 ha. The existing garden potential is only 20-60kg per month. There are already local varieties with a good quality.
 - Production of kelulut honey bee (meliponikultur) in the Village of Tanjung Sari, Tebing Tinggi Timur sub-districts. It is already sold and directly absorbed by the market in Malaysia at a price of 40 ringgit per liter. The problem is finding kelulut nest involves cutting down trees. A method or technology can be developed to break the nest artificially so without cutting down.
 - Sago-based investment: Locations in Sungai Tohor Village, Tebing Tinggi Timur sub-district, the production of sago flour is 70 tons/day in the form of wet sago, human resources are already half trained, institutions are already exist, no infrastructure. 1 kg of dried sago can be produced from 1.4 kg of wet sago.
 - Production of liquid sugar and granulated sugar: a demonstration plot has a capacity of 10 liters/day with sago as the raw materials, but there is a potential of conflict of interest, because there are already party who absorb the wet sago and they do not want to lose their raw materials.
 - Sago waste based investment: sirap production from uyung sago in Sungai Tohor Village and Lemang Village. The price of sirap on the market now is Rp 5,000 - 10,000 for ulin wood sirap. It is said that sirap from sago also has very good quality. Human resources and institutional are already exist with potential of 7-10 tons uyung/day from all village refineries. There is already a production capacity of 10,000 sirap/month with simple infrastructure and a market price of Rp 3,500-5,000.
 - Production of mushrooms in Tohor Village: potential resources of 20-30 tons of sago pulp from each village refinery. The manager is the Tohor river community. Human resources, institutions, and infrastructure do not exist yet.
 - Production of worms and fly larvae for livestock feed or fish. Actually for this program is heavy hearted because it involves the introduction of alien species.
 - 2 groups for criteria evaluation ie from BRG and from investors.

Presentation of Consortium Team of University of Palangkaraya:

Speaker: Mr. Ici

Important points:

- Pulang Pisau Regency is 92% covered by PHU.
- The burnt area in 2015 was around 160,000 ha but in 2016 was 109 ha.
- PHU Kahayan River - Sebangau River: mineral and peat soils with varying depths.
- The deepest peat is in the Tumbang Nusa area.
- Economic growth in 2015 was 7.8% with the most dominant sectors namely agriculture, forestry, and fisheries.
- Potentials offered for investment: paddy fields, especially irrigated rice and other land for chili, watermelon and long beans.
- Rubber plant in Pulang Pisau Regency with 24,293 ha and 70% of it is old rubber. We recommend rejuvenation for old rubber. Old rubber trees with potential 400 stems/ha that are not productive can be felled for furniture and others, so the land can be used to plant new rubber seedlings.
- Rubber productions in Pulang Pisau Regency are below the average rubber production in Central Kalimantan so it needs rejuvenation efforts.
- Optimizing the cultivation of laban: potential laban in Pulang Pisau Regency is 107,429 ha with potential of 1955 stems / ha. Laban can be used for charcoal. The price of the laban tree for charcoal now ranges from Rp 26,000 / stems.

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- Now there is no laban cultivation, just taking from nature. Economic analysis of laban cultivation for 20 years, with a discount factor of 16% / year will be feasible if the laban price per stem is Rp 55,000. However, if the laban price per stem is smaller than Rp 55,000, the cultivation business becomes unfeasible. The economic analysis does not include cost and income from thinning activities.
 - Optimization of gelam cultivation: the potential land for gelam cultivation is 60,126 ha. Gelam cultivation at a price of Rp 5,500 / stem is feasible, especially if it is made for charcoal.
 - Pelangeran wood cultivation which is already rare in nature. With a spacing of 2 m x 2 m, production in the 15th year can reach 0.2 m³ / stem. With the price of Rp 3.000.000 / m³ then the cultivation business is feasible to run.
 - Another economic potential is Alabio ducks growth.
 - Economic potential that can also be developed is capture fisheries in swamp areas. Now the fish in the area of Pulang Pisau regency are mostly sold in fresh form, so there is still a chance to develop fish derived products in the dry form.

Recommendation of Incentive Team, Facilitation Team, and Consultant Team

Facilitator: C. Nugroho S. Priyono

Direction from facilitator:

The four consortium teams have presented the results of their studies, but still in the biophysical aspect and not yet touch the incentives and financial aspects. The general picture of the consortium team has not yet been fully captured by the facilitation team and the incentive team, so the incentive and facilitation teams still need more detailed information to plan their incentives and facilitation recommendation. Now we will listen to the presentation of the consultation team who will try to provide some inputs and hopefully can be used by the facilitation team and incentive team to see the investment opportunities from the consortium team.

Presentation by Mr. Anke Dwi Saputra

Important points:

- One of the main elements in strategic selling is that we know how many target numbers we want to achieve. Until now I have not seen clearly, the main target revenue we want to achieve through the various planned business model.
- The target number should be clear to arise vibrations within the team to find ways to achieve those targets.
- The element of strategic selling is "how to make investors happy " in terms of providing what is needed and desired by investors.
- There should be an analysis of how the nature of investors we want to invite because it will affect their goals. The purpose of investors with regard to profit is high gain, low risk and stability. But there are also investors who want to invest because of value based/moral based, for example for humanity and environmental improvement.
- There should be clarity of what products are offered, in this case is the product champion because we can not offer many products at one time to the investor. It should be clear and what the main product focus and what kind of business model is offered to investors.
- Then there should be clarity about packet price and what kind of investment.
- Testimonials are also important elements for the promotion of a product.
- Recommendations:
 - Determine the product champion.
 - Prototype of existing and tangible and commercially viable products that sell in business.
 - There is documentation of its ultimate success in video form to attract investors.
 - What strategic issues will be sold to Japan.
- Investment Prospectus:
 - Testimonials from top Indonesian officials will make it better.
 - fact sheets.
 - Description of why investing in Indonesia.
 - Description of why invest in peatlands.
 - Description of the opportunities, support, and incentives that will be provided.
 - Description of the investment package offered.

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- Description of investment Steps.
 - Contact details that can be contacted.
 - Appendix.
 - Proposed concept of investor gath event in Osaka Japan:
 - If it is possible, a week or some time before the event, there is news in Japanese media about peatlands.
 - There is a presentation video at the beginning of the event.
 - Investors Invitation.
 - Commitment Letters.
 - Indonesia Culture Theme.

Respond from Facilitator:

I suggest to Mr. Kuno for the event on July 27, 2017, we can ask Mr. Anke and Mr. Nunung for input related to the format and concept of the event.

Presentation from Mr. Nunung Nuryartono (IPB)

Important points:

- Integrated area development can be emphasized in landbase and non-landbase management. Financial sector can go there and can be an investment capital for business model.
- The key to successful development of integrated areas: location, infrastructure, incentive, cost performance, and labor force.
- It is expected that there will be a realization of an eco-friendly regional economic program by creating linkages between backward and forward economies and creating efisiensi and competitiveness.
- The main target of the development of economic models in peatlands is to create jobs and incentives for economic prosperity for the people. Using local resources and environmentally friendly activities in peat.
- Economic activity in peatlands cannot be separated from regional and national economies.
- What we often forget in business development is institutional and institution set up, capacity and bureaucracy.
- What type of investment will be developed and what incentives and facilities are provided to investors.
- Fiscal and nonfiscal incentives related to what incentives are provided to investors and by what institutions.
- From the consortium team's explanation, the average business model offered is on-farm. However, do investors want to invest in the field? The risk is too high. Therefore, what should be considered is a business model for derivatives products such as from sago, chili, and the other plants, for example for purun plant how is the production capacity and the derivative products?
- A business model that can be developed is to use consumer demand pull approach that is driven business taken from consumers.

Respond from Facilitator:

I think from the presentation of the consultant team, it is now been clearer how to follow up the results of the consortium team. Next we listen to experience sharing from Mr. Utomo as a business practitioner.

Presentation by Mr. Utomo

Important points:

- There needs to be revitalization of peatlands after burning. Policies that need to be adjusted include:
- Regulations and mechanisms for peatland governance including the legal aspects.
- Accuracy of data on land includes biophysics, land status, and legal certainty.
- Compile detailed land-use priorities with respect to land character and detailed mapping.
- Digging and compiling information on socio-cultural conditions of the community to avoid conflicts.

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- Establish criteria for people who are entitled to use the land before establishing land for development by corporations.

Respond from Facilitator:

I proposed to Mr. Kuno to hold one more meeting for the facilitate the incentive team and the facilitation team explained in more detail the main points of their recommendation.

Panel Discussion

Facilitator: Dr. Budi Darmawan

Participants:

1. Utomo Icgo (Chamber of Commerce DRN)
2. Eko NM Saputro
3. Ngudiantoro (UNSRI)
4. Tabroni (Research and Development Center for Forestry, Palembang)
5. Rachmad Firdaus (Ministry of Economy Coordinator)
6. Ani Suryati (Kedep V Ministry of Economy Coordinator)
7. Ici P Kulu (Univ. Palangkaraya)
8. Anke (Cultivate)
9. Budi Wardhana (BRG)
10. Widiyatmo (Chamber of Commerce)
11. M. Yazid (UNSRI)
12. Edwin Martin (Research and Development Center for Forestry Palembang)
13. Yupin AD (Univ.Palangkaraya)
14. Rubiyanto (UNSRI)
15. Efendi Agus (Research and Development Center for Forestry Palembang)
16. Akihito Sakurai (JICA)
17. Gunawan Pribadi (Ministry of Economy Coordinator)
18. Haryo (BKPM)
19. Ariawan (BKPM, DPF)
20. Alexcius Winang (Ministry of Economy Coordinator)
21. Nirma Pratama (BKPM)
22. Bayu P (Ministry of Economy Coordinator)
23. Erdiriyo (M.Ekon)
24. C.Nugroho (BRG)

Direction from Facilitator:

What to look for next time? From the 4 consortium teams, there are still questions about how prepared and attractive the commodities are to investors? Where has the commodity developed? And what kind of business opportunities? If investors prefer off farm, how about on farm, can we make one package? What about the market? Agency or equipments required? How about the market infrastructure? How about the business actors, and whether in terms of production or financial institution have a different interest.

Equally important is the change of culture, if there is going to be intensification, there should be a change of culture and cultivation intensity. Then related to the aspects of sustainability, what if no one wants to buy again or the quality can not be maintained or the land can not produce more, whether the consortium team had arrived there? What is important for BRG is that we can support the good restoration either in the form of compensation, an alternative that encourages peatland utilization in order not to burn or not open new intact peat. Intensification can be a double-edged knife, may even trigger the expansion of land because people want to get the highest profits. What kind of value added should be put to keep it sustainable?

What emissions reductions are expected, and we expect there will be certified business model for the sake of income added. Another things is the inclusiveness, in the process, government does not include local people, inclusiveness also gurantee the sustainability. To ensure inclusiveness there must be an institution established. Attractiveness to financial market in order investors want to invest and the business model can be implemented.

Scalability can be extended in the scale of material transformation. Scalability also affects the

impact, whether large enough, whether if it is given directly to Off-site will immediately make people change their mindset. Scalability also requires different business models and will eventually result in different attractiveness for financial markets. What are the required regulatory incentives?

There should be research and development for potential products either on-site or off-site so that added value can be improved. There is also a need for development partners like JICA to support and increase investor interest.

Interruption from Mr. Utomo:

- For consortium teams: some commodities are nature-dependent commodities that can not guarantee industry sustainability.
- Related investment investors, Lebak Lebung is a local wisdom of society that must be maintained so that should not be proposed as investment object. This is because the local wisdom should be the right of the community that must be managed by the local community in accordance with its characteristics.
- There should be resilience between the business model concepts to be built with climate change so that businesses that run do not fall due to climate change.

Respond from Facilitator:

Now I give the chance for incentive team and facilitation team to deliver their thoughts:

Incentive Team:

- Peatlands are areas that have a very significant impact so it can be proposed to be a Special Economic Zone (SEZ) peat.
- There are special facilities and incentives if the peatlands become SEZ in accordance to Geovernment Act No. 96 of 2015 on SEZ Incentive Regulation.
- SEZ submissions can be started by ensuring the legal status of the land.
- 90% of investment fails due to land issues.
- For the management and business model plan on peatlands, there must be coordination with local governments because of the socio-cultural aspects of local communities and local regulations which better understood by local governments.
- From the four studies, the most porosed is agricultural sector so it can be synchronized with government programs for food security.

Respond from Facilitator:

We need to attach to certain government programs for incentives and facilities to be prepared better.

Facilitation Team (represented by BKPM):

- There is a lot of potential that can be offered, but before investors enter Indonesia, there must be adjusment to Standard Classification of Indonesian Business Field because there are rules and proportion in order later it is clear related to business model and incentives offered to investor.
- Investment to Indonesia at least Rp 10 Billion / USD 800,000.
- 'Facilities that have been issued in BKPM for example green line that cooperate with customs duty is acceleration for investment to enter Indonesia.
- 3 hours licensing service: investment license, RPTKA, INTA, APIT minimum investment of 10 Billion, NPUP for 1000 workers, License for land blocking.
- Facility to facilitate construction permit because in the regions Building Permit is difficult to obtained, through BKPM the Building Permit can all be directly dealt with construction permit.
- Tax allowance is being revised in its attachment is being finalized at Ministry of Economy Coordinator.

Respond from Facilitator:

We will focus for the next meeting on the financial aspect and the consortium teams will still be invited as observers.

Closing from Deputy for Research and Development (Dr. Haris Gunawan)

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- Thanks to the participants because our discussions are very productive and there are much enrichment we get.
 - Head of BKPM Mr. Lembong said that he will supervise this activity. He also said that investment in Indonesia is slow while there are many investment flows that want to enter Indonesia. This is a challenge for us.
 - We hope that all participants to remain strong and healthy for the next meetings.
 - Indonesia was able to have palm oil, so we must now be able to have restoration business.
 - Samsung can be very advanced because they have an intensive knowledge division of knowledge. If necessary we also learn from the success story in the peatlands outside the existing plant (palm) such as areca, pineapple, or coffee.
 - Related to branding, I think it will be very interesting for the economic development of products such as coffee restoration or pineapple restoration.
 - Downstream business also needs to be a note, because it seems that we in Indonesia do not very like downstream business and prefer to sell raw materials.
 - What kind of business model we offer, but local wisdom is also have to be preserved, but we may not forget if our society is so powerless that we need to support.

End of discussion and event.

1.2.10 July 25, 2017 <Investment Facilitation>

**Agenda Focus Group Discussion
Proposed Facilitation and Incentive Schemes for Investment in Peat Restoration
Oria Hotel, Jakarta
Tuesday, 25 July 2017**

Minutes of Meeting

Agenda overview:

- a. **Opening and direction from Deputy of Research and Development BRG**
 - Opening remarks
 - Directions
- b. **Presentation from Mr. Hiromitsu Kuno from JICA**
Overview explanation on Proposed Scope of Private Business Investment on Incentive/Facility for Peatland Restoration.
- c. **Presentation from Incentive and Facilitation Teams**
Presentation on the main recommendation from incentive, facilitation, and consultant teams.
- d. **Panel Discussion**
The participants discussed about the schemes from consortium team study, incentive and facilitation team and what need to complete before determining the business model and commodities that will be proposed in the meeting on July 27, 2017.
- e. **Closing from Deputy of Research and Development BRG**
Closing remarks and direction from Deputy of Research and Development BRG.

Opening Remarks from Deputy of Research and Development of BRG Dr. Haris Gunawan

- Opening remarks and thanking the participants
- Overview explanation of activity background
- Explanation of discussion objectives and important notes

Important points:

- Thanks to all participants for attending this meeting, the consortium team, the facilitation team, the incentive team, the related ministries and JICA.
- I would like to remind that this activity is a review package that will be updated and refined and will be completed when the target study is interesting and can be implemented.

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- Therefore, let us discuss deeper about our common mission to restore the peatland. This is our first exercise, so let us pack it in order this restoration scheme can be in accordance with our efforts in the context of development that stands for the people.
 - Indonesia, especially in peat, has a lot of natural resources and potential material from upstream to downstream that should be developed.
 - Our study is expected to be not only attractive to BRG or JICA but also can be implemented and bring prosperity to the people.
 - Today we will formulate the most appropriate facility and incentive schemes for business on peatlands. We will continue to test and guard the concept until it is fully implemented in the field.
 - I'm sure there must be many things we can explore and discuss about those expectations. Today we will hear the presentation from the incentive team and facilitation team regarding the most appropriate scheme to be implemented in the field.
 - In addition, the business or activity that we are going to make is not necessarily high but must be grounded, meaning that the results of these activities can be seen in a way that really benefits the community.
 - On July 27, 2017, we will meet again to prepare the best formulation by involving many parties, to agree on what kind of business scheme we will develop.
 - It is our hope that if in the previous meeting Mr. Deputy 1 delivered the basics target of peat restoration and how this business can contribute to the peatland restoration activities, of course the business we develop must be friendly and in accordance with the characteristics of swampy peat.
 - I thank JICA for facilitating this activity.
 - In Japan, when we start a business starting from big actors to small people are all happy. Because we are targeting Japanese investors in this restoration business, we hope that we can imitate the Japanese business and economic practices that involve the community in business activities, so that it does not spawn the new conglomeration and capitalism.
 - I think that the capitalism's hand is very difficult to defeat, but we must remain optimistic to be able to do it, especially for the business in peatland.
 - The Focused group discussion was opened.

Presentation by JICA

Speaker: Hiromitsu Kuno

Title : Proposed Scope of Private Business Investment on Incentive/Facility for Peatland Restoration

Important points:

- Action plan for promotion to Japan in October 2017.
- On July 27 we will conduct a workshop to facilitate our discussion with a larger forum on the concept of incentive and facilitation schemes for peat restoration.
- Starting from August to September 2017 BRG should start conducting an in-depth dialogue with Ministry of Economic Coordinator and Indonesia Investment Coordinating Board (BKPM).
- The consortium team must have completed their study and prepared the brochure to be promoted abroad.
- We must also immediately make a guideline draft for Green Business financing and begin the design of cooperation with financial institutions/financing.
- In mid-September we must already conduct the last FGD for October promotion in Osaka.
- On-farm business is a business that can touch the peatland restoration. However, for downstream businesses there must be a link between the business and peatland restoration activities, for example, the product is the result of peatland restoration or other, so it can be said that it is peatland restoration business.
- Financing may come from domestic institutions and foreign institutions.
- BRG targets are located in 7 provinces with 4 Priority Districts and we would like to touch the ex-fire area.
- Business on the restoration area can be On Farm Business with high priority, challenge, and problems as well as Off Farm Business.

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- Our recommendations are:
 - Improvement of local government regulation both provincial and district government, especially local regulation in 7 target provinces. This has been proposed to Pokja, one of which may be proposed for peatlands Special Economic Zone (SEZ).
 - We prioritize the business to touch the priority areas of fire and prone to fire.
 - On Farm Business is definitely related to vegetation, therefore the business that will be run must touch the rewetting aspect of peatland and water system.
 - We also have to consider about the scheme of facilities and incentives for financial institutions that support a peatland friendly business. This is a big challenge but we can think it over together.
 - Business schemes developed can be synergized with other government's programs such as food security or energy security.

Presentation from Facilitation and Incentive Teams

Presentation from Mrs. Ani Suryati/Facilitation team (Ministry of Economic Coordinator);

Important points:

- The Secretariat of SEZ is under the Ministry of Economy Coordinator, and its council is chaired by the President.
- After we discussed, we think maybe SEZ could be a scheme for peatland investment.
- SEZ appointment is authorized of the president.
- The implementation of SEZ in Indonesia refers to Act No. 39 of 2009 on Special Economic Zones.
- The basic concept of SEZ is not investment but on the preparation of regional areas in coordination with the central government. After the preparation of the area, then we start to create business activity within the area.
- The SEZ institutional framework is a national council chaired by the President.
- SEZ location criteria:
 - One of the advantages of SEZ is the support of the provincial and/or district/city government.
 - In accordance with provincial and district Spatial Plan. The thing that has been making SEZ falter is incompatibility with the Spatial Plan.
 - Located in a position close to the trade route. Well, for the peat it seems this criterion can be ruled out because peatlands have their own characteristics.
 - Has clear boundaries.
- Zones within SEZ: export processing (likely to be impossible for peatland), logistics, industry, technology (peatland may also come here), tourism (we can get to this category), energy, and other economies (it seems most likely we are getting here).
- Stages of SEZ implementation: Proposing, determining, developing, managing, and management evaluation.
- SEZ proponent may be a business entity, Regency/City government, Provincial Government, or Ministry/Institution. Looks like for the proposer, we can go to the Ministry/Institution ie BRG in cooperation with the Provincial Government or District Government.
- Proposed document: Proposed form, Power of attorney authority (BRG may join with provincial government in this case), Certificate of establishment of business entity (not necessary), SEZ development plan (eg in Morotai for fisheries and in Papua for mining), The detail map and width of proposed SEZ area (for the first stage is still not necessary), economic and financial feasibility studies, plans and financing sources, Environmental Impact Analysis, proposed SEZ operating period (can be submitted up to 80 years), location permit.
- Acceleration strategy: Preparation of SEZ formation on average takes 0-3 years. Strategic location and in accordance with the Spatial Plan can be processed more quickly.
- The SEZ formation evaluation stage if it is ready can be processed within 45 days.
- Scheme of SEZ formation: Can be from business entity with fund of the business entity and they are the manager. We propose that the proposer of this SEZ peatland is Local government and/or Ministry/Institution (BRG) because in that scheme we can build the area using State National Fund/Regional Fund and can use private government cooperation scheme if we lack of State fund. This cooperation scheme works as private party build the area since the

government does not have cash money and within 20 years the private party will be paid along with its profit benefits.

- Up to 2017 there are 11 SEZs formed from the target of 25 SEZs until 2019. These peatland SEZ can be proposed to the SEZ establishment category based on the new policy as per the president's commitment.
- The choice of investment should be observed so as not to overlap with government policy. We have experience in Morotai, there was investor from Taiwan who resigned to invest because it did not comply with the new policy.
- Facilities and incentives of SEZ: Licensing and non-licensing (one-stop integrated service); Taxation of customs and excise, traffic of goods, employment, immigration, land (Act number 2), DNI not applied.
- Reduction of Income Tax (PPH): Tax reduction/Tax Holiday for investment > Rp 1 Trillion reduction 20-100% for 10-25 years, for investment Rp 500 billion - Rp 1 Trillion reduction 20-100% for 5-15 years and Investment below Rp 500 billion tax deduction of 20-100% for 5-15 years. In addition, it will also receive Tax Allowance for outside the main activities.
- Employment: in SEZ a Wage Council was established and a Special Tripartite Working Unit, only 1 SP/SB forum in each company, ratification and renewal of RPTKA in SEZ, extension of IMTA in SEZ.
- Immigration: Visa on arrival for 30 days and extended for 5 times 30 days each.
- Land: Using the scheme of Law No. 22, the right to use can be extended for 80 years.
- There is a convenience of 3 hour investment permit.
- Our suggestions:
 - Prepare the basic requirements such as Spatial Plan and the land as they are the biggest obstacle.
 - Related to the financing in SEZ, there is no direct scheme of financial institutions to finance. However, maybe peatland can be an exception.
 - Peatlands are not possible for industry/factory so we can adjust the business with government programs such as food security. Adjusting with government programs such as new paddy field printing because peatlands have land and lots of water so the conditions are suitable. Besides it can be developed a farm that can also contribute to our economy, or an integrated soybean or corn in peatlands.
 - There are 7 provinces that are targeted for restoration with different physical conditions so that it must be adjusted the activities and business scheme when proposing the SEZ based on the characteristics of each region.

Presentation of Ibu Sri Endang Novitasari/Incentive Team from Head of Sub Directorate of Primary Sector Directorate of Deregulation of Capital Investment Dept. of Investment Climate, Investment Coordinating Board (BKPM):

Important points:

- Peatland ecosystem development policy. When the compilation of Government regulation number 57 year 2016 we were actively involved and strongly affected by the Law, especially related to the sustainability of investment activity. With this Law there are things that cause the sustainability of investment in Indonesia, especially in peatlands is disturbed. For example a change in the function of a cultivated zone to protected zone.
- One of the investment problems in Indonesia is legal uncertainty. This uncertainty will affect to the operating business and new business we invite.
- In the Law 57, it is stated that we may not open new land, especially if the land is in peat.
- Minister of Forestry's Regulation on limitation of activities on peatlands does not allow to open new land and there are restrictions related to activities on peatlands.
- BKPM is very supportive but we ask for legal certainty from the government so that the regulation does not overlap with the previous policy.
- From 7 provinces, there are 4 pilot project sites in priority districts.
- Several business fields whose indications are in the peat ecosystem, based on last year's investment both from local and foreign capital invested was heavily in food and plantation business. The possibility to capitalize on local and foreign capital is overwhelming.
- Most likely we are going to invite investors from Japan to get together to see if they can equally invest in peat restoration.

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- There are restrictions on foreign stocks ownership if it is not located in SEZ.
 - The SEZ scheme is an alternative to a negative list of investments: a policy of restricting certain fields that are declared closed to capital investment of either local or foreign investment.
 - There are areas that are only reserved for Small and Medium Enterprises (SMEs) such as rice under 25 ha, if more than 25 ha outside investment may come.
 - The field of business should be ascertained first and whether there are restrictions or not in the field. Do the foreign investors have no objection to the restrictions on foreign ownership?
 - The example we are trying to make for a scheme on peatland, such as freshwater fish is allowed to be 100% from foreign capital but the scheme must be partnership which means there must be a partnership with the community there in the form such as the provision of raw materials or others.
 - For rice and other crops cultivation, there is a maximum restriction of foreign capital in each business field. For example, the area below than 25 ha is reserved for SMEs (rice) and if the land area is more than 25 ha, foreign capital is 49% at maximum.
 - Small scale electricity generation (1-10 MW) foreign investment limitation maximum at 49%.
 - Business of Natural Tourism Objects outside the Conservation Area: foreign direct investment up to 67%.
 - Horticultural activities are very restrictive, maximum foreign capital only 30%.
 - There should be an explanation to the investor, how many percent they can invest and who will be their partner. We must also prepare who will cover the remaining capital because later they must form an Indonesian legal body to bind the foreign ownership.
 - Investment value for foreign investment: Local investment is not restricted. In SMEs Law no 20 Year 2008 foreign investment is categorized as medium business. Minimum value of foreign investment that goes to Indonesia is Rp 10 billion, under that number is devoted to domestic investment.
 - What about the land availability? Because there is a Law 71 year 2014 that does not allow the opening of new land. We also hope that the land for peat restoration activities must be clean and clear.
 - We are from BKPM can assist the promotion, but everything must be clear first, ranging from the type of business, the land, who is the partner and the restrictions of foreign ownership, and others.
 - One-stop integrated services to accelerate the investment in BKPM. If the selected scheme SEZ, there will be a delegation of all licensing authority from the center government to the administrator of the SEZ management, including the absence of negative investments except for those reserved for SMEs.
 - 3 hours service, with certain requirements, minimum investment criteria of 100 billion and/or employing at least 1000 workers.
 - The government issues tax amnesty, as long as there is a decree from the Directorate General of Tax, the companies are separated from the 100 billion and 1000 labor requirements for tax amnesty. The investors who will later invest in peat can be exempted over submission from BRG in order to invest.
 - Investment incentives:
 - Investment schemes based on investment and tax laws. There are several incentives and facilities offered such as tax holiday in the form of 20 years of exemption for certain projects, tax allowance for agriculture such as livestock, corn plantation, soybean plantation, tropical fruit and rice. Investor's consideration is what incentives will be obtained if they invest to Indonesia compared to other countries.

Panel Discussion

Facilitator: Mr. Nugroho

Participants:

1. Yuprin AD (UPR)
2. Robiyanto (UNSRI)
3. Ngudiantoro (UNSRI)
4. M. Yazid (UNSRI)
5. Ici P. Kulu (UPR)
6. Utama Kajo (Chamber of Commerce/DRN)

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7. Edwin Martin (Research and Development Center of Forestry, Palembang)
 8. Nur Arifatul U (Research and Development Center of Forestry Palembang)
 9. Adi Kunarso (Research and Development Center of Forestry Palembang)
 10. Sri Endang N (Indonesian Investment Coordinating Board)
 11. Dendy A (Indonesian Investment Coordinating Board)
 12. Nirma Pratama (Indonesian Investment Coordinating Board -Fasilitas)
 13. Ariawan OP (Indonesian Investment Coordinating Board -DPF)
 14. R. Mitha CN (Ministry of Economy Coordinating)
 15. Ani Suryati Ningsih (Ministry of Economy Coordinating)
 16. Ahmad (PSB-UR)
 17. Nurul Qomar (PSB-UR)
 18. Hastin
 19. Bayu P.G (Ministry of Economy Coordinating)
 20. Akihito Sakurai (JICA)
 21. Haris Gunawan (BRG)
 22. C. Nugroho SP (BRG)
 23. Nunung (IPB)
 24. Rachmad Firdaus (Ministry of Economy Coordinating)
 25. Shin-Ichi Aikawa (JICA)
 26. Rahmawati I. Wetadewi (BRG)
 27. Hiromitsu Kuno (JICA)

Directions from the Facilitator:

I want to review our process in the previous two meetings. Previously we agreed to give opportunity to the investment facility team and incentive team, to formulate the input. In the last meeting the consortium team has given exposure to its survey results but facilities and incentive teams have no chance to elaborate due to time constraints. The process is slow but it makes others aware of the mechanism and bureaucracy outside their field.

If we propose SEZ, there are facilities and convenience provided, there are some key questions, for example a business that will run is in the upstream/downstream and who is the partner? A lot of new important information delivered by Mrs. Ani and Mrs. Endang. We also agreed to bind the incentive and consortium teams with the help of a consultant team by Pak Nunung.

Important points from Dr. Nunung:

- SEZ is an alternative to be proposed and if it is agreed, BRG and the consortium team can begin to elaborate. The only question then arises is how much the scale that will be developed, so we know how much investment is needed, and we can know whether this should involve investment from local or foreign investment.
- What we have been talking about is a land based investment and which has not been touched and we need to discuss further is non-land based business. The development of this business need capital, well the question then whether for example this capital is owned entirely by domestic investors, but in the course of lack of capital, can we sell green bon to foreign parties, such as Japan.
- What we need to explore further for the model in the peatland restoration economy is non-land based business because of the need for capital there. Financial Services Authority (OJK) should also be informed because there are investment opportunities there.
- Wakatobi is destined for tourism and local governments have established a Tourism Authority Agency-similar to BRG (on peatland) where all tourism-related activities go into it including the related ministries.
- Hopefully if this concept works with its Green scheme it can be a role model and support the 2030 SDGs agenda. This activity may be able to become one of the indicators of SDGs and we can evaluate together.
- We agree on the peatland economic area, but what should be considered is how big the scale of activities, domestic and foreign investment needed, and if domestic capital requires additional investment whether it can sell green bon to foreign investors.

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- I also need to emphasize to the consortium team that when we want to do green economy it includes at least three aspects: social, economic, and environmental. Well, how these three things can be reflected in the proposed investment concept.
 - Ministry of Village also has (Village Owned Enterprises) BUMDES, our experience in Wakatobi there are 10 BUMDES who work together for tourism activities there. If one BUMDES alone has 800 million funds then 10 BUMDES is 8 Billion, well this is a big fund. So if we can cooperate with BUMDES in targeted areas, it can be significant capital strength of its own.

Respond from Facilitator:

- Business classification schemes should be adjusted to the consortium team's study by taking into account the scale, type of business which is based or non-land based, investment source whether domestic or abroad or in collaboration with BUMDES investments. It gives more choices for the investment strata, domestically, abroad, and now BUMDES. If BUMDES can be collaborated with an investment scheme I think it will be large enough the capital that can be collected to be used for the stagnant SEZ.
- Divide these domains and match them with conditions. it can be the conditions surveyed by the consortium team is improved first before investment or the field conditions in the existing level directly improved through investors investment.

Presentation of Consortium Team, Prof Robiyanto:

- We studied four priority districts. We must agree first if this business should support restoration, not anti-restoration/drying the peatland.
- Peat utilization should be integrated. We want the synergy of the parties, and this forum is an effort to bridge multi-stakeholder participation in role sharing and cost sharing.
- According to Ministry of Environment and Forestry, peatland has protection and cultivation function.
- The definition of PHU: there is a cultivation function in the river edges and a protective function in the middle of the peat dome, but it is opened. Well this is what must be searched a win win solution so that we can realize the green development.
- Target from deputy 1 is to restore 33 PHUs in 6 provinces. What we do now is about 4 PHU and only partially.
- BRG restoration approach: rewetting, re-vegetation, and revitalization livelihood.
- The problem minus 40 cm water table in the middle of peat (Gov's Regulation no 57 year 2016 and Minister of Forestry's regulation year 2017).
- In South Sumatera, restoration targets exist in two districts namely Muba and OKI. Restored land is a burnt area in 2015.
- 60% of MUBA economy is dominated by natural gas, agricultural sector is still small while the potential of the agricultural sector is large enough to be developed. The poverty rate in MUBA is 20%.
- What will be done by deputy II includes canals blocking, stakeholders KPA community, and village forest.
- OKI Regency: PHU Sugihan River - Salih River. Potential of fishery and farming is 61%. PHU Sibumbang River - Batok River main potentials: swamp buffalo, lebak lebung fishery, purun, food crops and horticulture, coffee liberika, areca and pineapple.
- For Lebak lebung fishery, UNESCO is interested to make it for tourism, so it can be a local wisdom tour. Fish products produced include smoked fish and salted fish. The national market already exists (Padang and Bandung) with demand exceeding the production capacity. Form of investment that can be done include product development, production process, and marketing cooperation (export).
- Development of Swamp Buffalo Industry can be used as Pasteur milk, yogurt, milk candy, ice cream, gulo puan, and curd. The forms of investment needed include product development, production, and marketing. The proposed business scale is small and medium.
- Another excellent program in OKI Regency is the development of purun handicrafts for various types of bags, hats, key chains, and others. The forms of investment that can be done include marketing cooperation. The development needs include production technology, coloring techniques, preservation techniques, and motives.

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- We can also follow Jambi, where a lot of palm oil is felled and replaced with betel nut plants. Provinces of NTB, NTT, and India need areca nut for dyes. The market is existed.
 - Leading peat-friendly commodities in Musi Banyuasin Regency: Kenaf, Pinang, Pineapple, Food Crops and Horticulture, Swamp Fisheries, and Environmental Services.
 - Field condition is dormant and will be made canal blocking.
 - Kenaf Commodities (*Hibiscus cannabinus*): adaptive (can be grown in dry land, wetlands, peat), easy to cultivate, two harvests a year (4-5 months with a capacity of 15-30 ton/ha), environmentally friendly, community-based. Kenaf can be used for pulp and paper, textile and carpet, dashboard, medium density fiber, bioplastic and biocomposite, oil spill, animal feed production.
 - The level of poverty in Meranti Regency is high. Approximately 90% of its area is highly prone to fire and 82.5% of its area is deep peatland.
 - If the community is still poor then the possibility of peatland to burn is very high.
 - Changes in the land status which was initially owned PT NSP and PT LUM, into village forests. There is a misunderstanding in the community as if the trees in the village forest may be felled.
 - Leading commodities of the Meranti Islands Peatlands: Coffee liberica, sago, liquid sugar, kenaf, environmental services/NTFPs, and timber.
 - Sago added value is still lacking and people want to have other added value from sago such as sago noodles, cereals and others. There are many sago refineries which produce much waste that usually is thrown away in the river.
 - The sago waste can be used as a medium for mushroom cultivation.
 - In the Tohor River village: a discussion with the community.
 - Profile and investment opportunities at PHU Kahayan River - Sebangau River, Pulang Pisau Regency Central Kalimantan: Central Kalimantan's food granary. Economic strength is in agriculture and fisheries.
 - PHU Selayar River - Sebangau River: one million hectares of peatland.
 - Integration commodities of Alabio duck, food crops and horticulture, balangeran and laban, kenaf and pineapple, betel nut, and swamp fisheries.
 - The way of harvest gelam is by burning the surrounding shrubs to avoid getting thorns. So as long as there is still gelam harvest, the area is still prone to fire. Gelam is used construction.
 - Rice field in Pulang Pisau Regency is still not optimal, planted once with a potential harvest of 2/3 tons. Then after harvesting the fields are abandoned into a scrub and opened again by burning.
 - We can follow Banyuasin Regency as example, there is rotation cropping during the rainy and dry seasons. For a year the commodities sold are different. There are commodities of rice, watermelon, corn, chicken, duck, and goat.
 - Rubber plants should be repaired so that people do not open the forests because rubber is the main economy.
 - Economic potential of laban wood is Rp 2 million/truck.
 - Mr. Mayor said that there is integrated economic development in Pulang Pisau Regency, if our business is combined with the program we can go to Regency Medium Period Development Plan (RPJMD).
 - Note: there must be an integrated peat restoration development. There should be a role sharing and cost sharing. The peat restoration management unit (UPRG) in the PHU should be agreed. It is necessary to draw up the Peatland Ecosystem Protection and Preservation Plan (RPPEG) at the District level in accordance with the RPJMD Districts, Provincial RPPEG and National RPPEG.
 - 20 years ago, there was forest, industry based and community based. We think the industry based now is no longer wood industry or palm oil but peat friendly industry.
 - We must adjust our program with Spatial Plan.

Presentation from the Financial Services Authority (OJK):

- Financial services institutions are engaged in risk management, the international standards refer to Basel.
- For this sustainable financial regulation, we are still in the capacity building stage to avoid any shock in its macro economy. So the regulation will be implemented gradually.

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- Since we at OJK are big book banks, books 3 and 4, we will be directly affected by this regulation in 2019. In 2020, we will begin to enter the capital market. We have also completed a study on green bon, whether the regulator may issue regulations on green bon. On the OJK website, there is a sustainable finance section, where the study results can be seen.
 - In 2018 hopefully if there is no obstacle, the green bon regulation will be published. This Green bon business process is very different from banking and non-bank financial industry. The capital market is disposure while banking is prudential.
 - Financial Services Institution and non-Financial Services Institution public companies, they submit their financial report to us every year but we do not have the right to ask it from them. We from OJK are only entitled to provide guidance so that the business can lead to sustainable finance.
 - There are two obligations that we will ask to emitem financial services institution and public companies. This regulation is new to the financial services institutions and the expert is very still less.
 - It is required to make a sustainable financial action plan. What action plan and PJSL fund is required.
 - The second is a sustainability report. The report is made as simple as possible because it will be submitted to the House of Parliament so that they understand the "language" of sustainable finance.
 - OJK already has 8 guidelines related to what kind of business and financing model that sustainable.
 - We are also guided by the Ministry of the Environment and Forestry and the Ministry of Industry, for example related to energy efficiency, peatland and others. What profit can I get from this business, so we have to provide an overview of the environmental and social values of it.
 - We once worked with GIZ related to financing pepper farmer in Bengkayang, we conducted training for financial services institutions. We tried to make a financial guideline for pepper farmers. Financial Institution especially banks, must be able to enter and create its supply-demand in the community.
 - We are assisted by JICA will make a financing guideline on this peatland.
 - For Green Bon, the previous commissioner had issued a policy of incorporating SMEs into the stock, later we need to discuss with BKPM, as making the regulation for SME into the stock is a big challenge.
 - For the implementation of this sustainable finance, we will discuss with the Ministry of Finance.
 - We also open for recommendation related to this Green Bon.

Respond from Mr. Nugroho:

- This sustainable financial-related information is very useful for us as an illustration for promoting business on this peatland matters.
- We enter the discussion session, at the end of this discussion we ask Mr. Nunung to give the final elaboration so we have an illustration of what we will bring to the upcoming 27th of July.

Respond from Mr. Utomo:

- My experience in the 70s on the east coast of Sumatra dominated by wetland, we did not succeed in developing cow farms because of cow lice. But buffalo might have a future.
- The coffee that has been discussed is coffee liberika, grow on the a bit wet land and not in the wetlands. The seeds are small and uneven, suitable for planting in eastern Sumatera and suitable for the Malaysian market but not in Sumatera, Japan, Europe or America. Liberika is good for the local economy but not prospective for national economy.
- Facilitation and incentives for investment:
 - No free taxes.
 - There should be a clear legal standing of the land.
 - Data availability is a State capital to assist the entrepreneur.

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- Ministry of Agriculture produces impara 3 seeds of rice in South Kalimantan. By cooperation with all research institution we can accelerate and support the restoration business.
 - I think that what investors want to hear tomorrow is government facilities and promises beside what we can do on peatlands.

Respond from Mr. Nugroho:

I give the opportunity to Mr. Dendy.

Respond from Mr. Dendy:

- Meranti District has become the largest sago producer in the world which also means the world's largest waste. The sago is 30% while the waste 70%. There are 96 big companies polluting the environment. If we manage this potential, we can be mushrooms and ducks exporter in the world. We are already able to make mushroom cultivation waste to be animal feed. We will be able to print for a very large business scale. The waste potential is very big. Sago waste can be made into mushroom growing media, duck feed, worms, organic fertilizer and fish feed. 20% of the waste can be used for mushroom media and 60% for duck feed. With this concept, it is expected that the farmers can be prosperous. With waste-based agribusiness, we do not need a highly educated workforce.

Respond from Mr. Nugroho:

- There is business integration, its relation to investment is rather difficult to categorize because there is business integration there, such as Pak Dendi who used the waste only.

Respond from Mr. Firdaus:

- From our initial meeting until today there are quite a lot progress, we will choose whether the business model is land based, commodity based or combined. It should be wrapped with the proper selection of places, such as the special economic zone of peat. I want to deliver two points:
 - With regard to the activity in 27th of July, perhaps the presentation can be more structurized and attractive, such as it can be started from the significance of the area analysis, then the other things.
 - The obstacles in SEZ development is the accordance with Spatial Plan both province and district. Because of its foundation are the Law of 2007 and Gov's regulation number 28 of 2008. What is feared by the local government is when the development of the area is different with the Spatial Plan. There is already a national strategic area of Gov's regulation no 28 of 2008. We should consider whether this SEZ area will intersect with government's strategic areas, our suggestion is we do inventory before proposing this SEZ region. Does BRG has the rights or able to propose national strategic area, because PHU is important to support the ecosystem sustainability.

Respond from Mr. Dendy:

- I would like to reaffirmed that SEZ might be a solution for peatland restoration, because from the positive side, the facilities and incentives related to this SEZ has been prepared by the government.

Respond from Mr. Nugroho:

- Additional note is Gov's regulation no 46 of 2013, the investment below 4.8 billion is only taxed 1%. This incentive can be very applicable to this business.

Respond from One of Participants:

- Related to SEZ, I think it can be offered at the event on 27 July. The question is the SEZ must have a manager. So that can be divided for the use of its territory. If there is no proposer, the management will be auctioned and difficult to control.
- The importance of offering a clear locus, maybe Mr. Dendy can re-address and sharpen the commodity that has been proposed by the consortium team whether it has categorized as the tax allowance and tax holiday commodities or not.

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- There are fixed areas that need middle to low cost. Actually we are in the government has a lot of financing schemes. This scheme may be offered to national entrepreneurs with a low classification.

Respond from Mr. Nugroho:

- Thanks to the information on the financing schemes.

Respond from Mr. Utomo:

- I hope that on the 27th July, we can already focus to 1 or 2 locations to be offered to investors. The commodities to be developed, knowledge based course that is on our list along with economic value and feasibility analysis. When the private party wants to invest, they must have something in mind related to what business they will do. After that we come into community empowerment through government funding scheme.

Respond from Mrs. Ani:

- I want to clarify and express that I agree with Mr. Utomo. We need to decide from all 4 format models we have, which one is the most suitable to use. I consulted with SEZ secretariat, there is one specificity about the environment and the cost for fire so please be careful. Then also look at which financing scheme is easiest for our business.

Respond from Prof. Robiyanto:

- The one who has juridical authority at the location of the study if the location is Other Utilization Zone (APL) is the Mayor/Regent. We do not have that authority. We cannot offer a location to investors because of the authority lies in the Regent. We only present the results of our study, its location and others. If the location is in FMU's area means that the authorized actor is FMU.

Respond from Mr. Utomo:

- I think it is better that we do not invite the investors in July 27. We have to finish our discussion first in our internal, and have further discussions with Regents, Ministry, FMU, and others. So we must make it clear related to the management and authority of the region. So the 27th of July event is not an investment forum but just coordination forum.

Respond from Prof. Robiyanto:

- Mr. Regent of Pulang Pisau is pleased to attend the 27th of July event. We agree to resolve internally. I agree that investors will not want if the authority is not clear. The location that we identify has been maximized according to the existing time table. But the authority remains in the Regents where the location will be developed.

Respond from Mr. Nugroho:

- The location is ready but has a different host/owner. We and Prof Robi will deliver the results of the study and overlaid with the rulers. So if investors want to invest in a certain area we will stay in coordination with the ruler.

Respond from One of Participants:

- In essence Mr. Utomo suggests that we should not invite investors. Therefore we have to discuss with the authorizes institutions so that later the ruler who will offer to investors. I agree the 27th July does not need to invite investors first.

Respond from Mr. Nugroho:

- We see and feel that what Mr. Utomo said is important, because we have a picture related to the desire of investors.

Respond from Dr. Nunung:

- I try to conclude but not simplify:

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- Consortium team is given a mandate to conduct studies, and there is an obligation for public hearings to convey their findings so that the date of July 27, 2017 it seems that not yet an investor forum, but a kind of public hearings.
 - It should be emphasized that activity on peatland is different from the usual investment, because there are certain problems such as environment and limited carriage capability. Therefore the approach is business as not as usual.
 - What approach we will use. When investors come, surely they will think what activities I am going to do. So we first mapped the activities, the location, and how it relates to the regulation and its process. These three things can be delivered later. Therefore, it is important that the approach is an appropriate area of incentives to be given to the government.
 - It could also be presented that the investment developed is zero waste product, such as sago and mushroom, I think it can provide its own incentives with environmentally friendly characteristics like this. We also need to say, which has not been much touched is the non-land based investment. I think this is interesting and can be delivered. Even we can deliver the potential of peatland tourism such as lebak lebung as fish production tourism.
 - The 27 July Forum later, my recommendation to complete Prof Robi, the presentation can be simplified and equated between regions, matrices already exist and can be equipped to facilitate the audience to understand.
 - Why is the BC ratio so low? Are you using BC or RC and how is the calculation. Because it is very low. Or we can use multi-commodity to make the BC ratio higher. Not forgetting also about the social environment aspect that can be equipped.
 - Characteristics and constraints can be presented at the beginning, what activities and locations and what facilities and incentives. The approach is not one by one but integrates various ministry actors. It is also interesting that this area is a poor area, how this is related to government programs to reduce poverty, whether or not the scheme which has been delivered can reduce poverty and increase income.

Respond from Mr. Utomo:

- At the end, we want to welfare the society.

Respond from Mr. Ngudiantoro:

- The problem in the peatlands of this study site is the community has limitations. The business schemes that we choose are already done by local community. The analysis conducted at the time of the survey was an analysis done by the community. Swamps can only be used 7-8 months for rice, the rest of the year they will go to peatland to take gelam, and the possibility of harvesting involves burning to clear the land.

Respond from Mr. Utomo:

- Investor may not enter to the community land, because if investors go there, it will disadvantage the community. I ask the Deputy to choose to invite investments into the damaged or non- community lands. I forbid for investors to enter community land and just go to damaged land for repairment.

Respond from Mr. Ngudiantoro:

- There are three segments of society related to Purun in OKI namely collectors, managers, craftsmen, but no one sells, here investors can enter.

Respond from Mr. Utomo:

- Well that's what we must keep Sir, as local wisdom, do not need investors there because it can be inputted technology assistance from the government. Do not let outside investment that can actually kill society's livelihood.

Closing from Deputy of Research and Development of BRG, Dr. Haris Gunawan:

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- BRG are very grateful and listen to the enrichment of the material and substance related to our shared plans to package the peat restoration as a business for the prosperity of the people. Do not let peat restoration only be healthy peat and good environment but the people remain poor.
 - That's why we have to metamorphose the business for better business.
 - What we want to develop is a layered green business. Because the haze really does affect us.
 - If Malaysia and Singapore they play in packaging and promotion. So we should be able to maximize it.
 - We collect the knowledge as much as possible regarding the development of this business model.
 - Example: Japan's peat water is made for spas, in Indonesia we have a lot of it. This is what we need to elaborate further. What knowledge enrichment and breakthroughs that can be generated.
 - On July 27th the format will be similar like this, but the participants are more than it, we also invite the local governments.
 - The final goal is a business meeting in Osaka, we expect Dr. Nunung and the team to package it and if it's necessary until the investment proposal.
 - Thank you for everyone's presence, hopefully we can find the right business and not too passing.

End of discussion and end of the event.

1.2.11 October 4, 2017 <Business Development>

Notes
Focus Group Discussion
Consortium Team for Business Development of Peat Restoration
Peatland Restoration Agency Office, Jakarta Pusat
Wednesday, 4 October 2017

Summary

FGD aims to discuss business models that can be developed on peat restoration areas or lands that can improve the financial and social welfare of the surrounding communities and can be a prospective business project to be offered at international forums and invite investors to invest in this sector.

The discussion was attended by 4 consortium teams from each district, representatives of the JICA survey mission, representatives from BRG and R&D of environmental and forestry sector. The consortium team has analyzed the potential commodities in each district. 4 major disctrict of this business development are Musi Banyuasin Regency, Ogan Komering Ilir Regency, Pulang Pisau Regency and Kepulauan Meranti. Observation and analysis resulted 21 potential commodities that will continue to be developed.

The discussion is expected to provide an output to a prospective business development model and can improve the welfare of the community by considering environmental aspects and succeeding the target of peat restoration. The FGD begins with a brief welcome and briefing discussion by representatives of R&D environmental and forestry sector. The discussion sessions began with the presentation of JICA and representatives of the consortium teams from each district. The matters presented are:

- Finalization of JICA's mission and project with BRG (Peatland Restoration Agency)
- Discuss leaflet and booklet preparation material on peat restoration business
- Prepare materials for delegates to be delivered at intetrnational meeting in Osaka

The next session was an open discussion. Generally discuss the realization and technical development of business models on peatlands. Selection of potential primary commodities to be sold on international markets as well as matters preparation for the next FGDs with local governments and BRG deputies.

Minutes of Meeting

Agenda overview:

- a. Speech and referrals
 - Speech
 - referrals
- b. Agenda 1
Draft finalization report and JICA survey mission and the presentation of each consortium representative
- c. Agenda 2
Discussion of booklet and leaflet matters
- d. Closing
Submission of summaries and important notes on meeting output.

Opening

Submission of referrals and outline discussion by Mr. Nugroho :

- Discuss finalization of JICA project and mission to be submitted by Mr. Hiromitsu Kuno and final report (draft)
- Discuss leaflet and booklet preparation matters on peat restoration business to be published with others in a short, easy and clear tool
- Prepare materials for delegates to be delivered at meeting in Osaka

Agenda 1

Referrals submitted by Mr. Hiromitsu Kuno :

- The final report presentation is made per district or representative of each consortium team area?
- The report focuses on the concept of general plans and commodities that are prioritized per KEK (Exclusive Economic Zone), as well as business concepts to be proposed
- Demonstration plots should be made in order to invite investors
- To do list: Site selection, priority commodities, investment per-KEK (EEZ), investment promotion, and business model formulation.

Presentation delivered by Mr. Ngudiantoro (Consortium-UNSRI)

- BRG-JICA (Phase II) Pre-feasibility in study for peatlands restoration investment
 - ✓ Priority restoration in Musi Banyuasin, SESAME tool used as monitoring tool
 - ✓ Draft revision result: Starting from fire incident at KHG in Musi Banyuasin, then selected potential location of peat restoration business, (3 areas allocation, HPL, HP, HL)
 - ✓ Secondary data is used and then the verification is executed in the field (dark color □ peat domes) data overlaid with fire data in 2015 seen in the concession area (peat restoration area)
 - ✓ Intersection was done with data of peat depth and fire, non-concession with the non-concessional forest that can be offered for the peat restoration business.

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- ✓ Overlay with existing boundary identification results selected potential locations
 - ✓ Further identification of potential commodities needs to be done to identify peat friendly commodities
 - ✓ Vegetation found; pinang, pineapple and other horticultural crops (including medicinal plants)
 - ✓ Potential of peat-friendly commodity business: In Merang Village 7,000 ha, Kepayang Village 5000 ha, Non-concession forest area 56,000 ha
 - ✓ Potential business; kenaf, beruk, gelam, pinang, pineapple, food crops, canal blocking-fishery
 - ✓ Business actors: community and corporations
 - ✓ Superiority of kenaf (*Hibiscus cannabinus*) :
 - suitable to be cultivated as conservation crop
 - able to grow in tropical and sub-tropical area
 - resistant on dry land and peatland
 - easy to cultivate
 - has short period of harvest time; can be harvested 2 times per year
 - the community has planted this species.
 - ✓ kenaf fiber → industry, raw material for automotive factory as material for cars interior
 - ✓ Demonstration plot of peat restoration (suggestion: share with BRG fund from APBN) insubstantial canal block will be damaged by people who lived in surrounding areas (fish cultivation) barrier can be maintained but must be economically profitable
 - ✓ We offer fish cultivation in the channel canal (offered also by the community)
 - ✓ The proposed business model; kenaf, areca nut, pineapple, agriculture food crops & horticulture, canal-blocking fisheries, beriang, gelam, environmental services related to carbon trading
 - ✓ The level of the kenaf business community to produce fiber; who offered to make a factory for the next stage of kenaf fiber marketing (the market)
 - ✓ HTI as a supplier of paper raw materials, kenaf has potential to replace acacia wood as paper raw material. This species can be a substitute commodity of HTI crops.
 - ✓ Kenaf is currently used as raw material for car interiors
 - ✓ Market driven or market demand shifting is difficult to control
 - ✓ The problem of kenaf production is in marketing
 - ✓ We expect that investors will come to take the yields of kenaf cultivation. So the production of kenaf could be sold.

Recommendations from Mr. Hiromitsu Kuno :

- Related to mapping of investment potential and business model. This project should describe business plan in detail
- Areas in the location are distributed to; HP Concessions, HP, HD, HP Non concessions, APL, HGU, Communities. In each field we look for investment potential and the right business model
- The best business model for deep peat is highly required
- Must be financially profitable to invite investors to invest
- Prepare a business model that has high profitability on the land with deep peat
- Only a few Japanese entrepreneurs are interested in investing in forest areas
- Most finance or joint venture investments are only in industrial estates. Beyond forest areas.
- Prepare a business model for all types of land both inside and outside of the forest area

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- Explain the potential and profitability of the business model (to convince investors)
 - Business concepts should be as detailed as possible
 - Factory and its markets, the concept should be made clearly (discuss how to build kenaf industry in Muba / South Sumatra)
 - Business concepts should be delivered clearly even it is not including financial analysis
 - Market guarantees should be promising
 - 99% of Japanese companies will not take risk to invest in non-concessions
 - Set targets; location of industry, production description to determine investor target (make it easier to clarify investment requirement)
 - Also consider that Kenaf plant is not endemic plant fiber plantation commodities. It has potential to be an invasive species
 - Notice how the deliver what kind of species kenaf is. Is it classified as tree or not? If this plant is wooden tree and not classified as grass or herbs
 - Basically, all wooden tree could be the raw material for paper, which distinguishes only by the yield produced
 - Create map of potential areas at each location

Bpk. Adi Kunarso (BP2LHK – Palembang)

- Problems in landbase and non-landbase. Relatively easy to do finance analysis in landbase area. In non-landbase financial analysis is related to business competition in the market. So, it was difficult to perform.
- In the concept which has been offered by. It is not separated between landbase and non-landbase
- In the report submitted the results of financial analysis in the landbase appeared, while in non-landbase feasible or not feasible from the results of financial analysis did not appear

Presentasi delivered by Mr. Edwin (BP2LHK - Palembang)

Peatland restoration plan in Kab. Ogan Komering Ilir

- In general there are 2 parts in OKI. They are focusing more on non-landbase and community base
- OKI has the most extensive area of forest fires by 2015
- Community activities; depend on swamp areas and peatland □ cultivating swamp paddy/rice, lebung system fisherman (marsh or lebak system fishery), take purun and process it from making mat, buffalo-animal husbandry in swamp areas. People are very dependent on swamp areas.
- Products which is resulted from the activities above; has not been able to meet the economic needs of the community. This issue increase the community's dependency on swamp/peatland areas.
- Lebak-lebung rice only harvest once a year and depends on the tidal season
- The market of refined products has not been provided much
- Product from purun depends on order
- Purun is still seen as a less commercial product. However, it has been processed in various forms of products.
- Swamp-based paddy rice (lebak-lebung) land rights is based on the land auction system
- At high tide, even if a person has authority to the land rights when the flood happened then it become public resources or is controlled by the government and auctioned in lebak-legung auction system.
- Target: Improving people's prosperity by providing market
- This study prioritizes what products the community can generate from the major commodities (fisheries, swamp buffalo, purun and swamp paddy/rice) and helps people to sale their products to the market

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- Fisheries has lots of potential from lebak-lebung system that can still be developed in order to gain added value
 - We offer better processing mechanism and marketing
 - Details of financial analysis already exists (in brochures / leaflets)
 - Milk production (swamp buffalo farming/) obtained not for industrialization, but if we want to help the community by varying the product then the products will increase
 - The business scale of the commodities above is only local and regional, so it is necessary to provide market for the products

Recommendation from Mr. Nugroho :

This business is a community-base business that has not been able to meet the needs of society, if investors would like to invest into this business could it change the position of this financial analysis status to be feasible to cultivate?

Which commodities are the most superior to be promoted?

Recommendation from Mr. Hiromitsu Kuno :

- The recommendations delivered by OKI consorsium remains unclear
- farms from swamp buffalo farms have no clear picture yet
- I emphasize the details that should be presented in the meeting in Osaka later
- If this business model can only be offered to local entrepreneurs, it is not suitable to be offered in Osaka
- Whether the entrepreneur already exists, the factory already exists or not. If it is from zero start then this concept still need to be developed and needs to be made more detailed concept
- there must be at least a financial plan to discuss
- If the availability of raw material depends on nature and can not be controlled. It means can not be cultivated.
- If you want to invite investors there should be number provided as an illustration
- Describe the production plan in details
- Content reported should also contain estimated figures and profits to invite investors
- The report submitted is not yet conclusive, the calculation of business plan is still unclear

Presentation delivered by Mr. Ahmad Rifqi (PSB – UR)

- Purun is the most suitable commodity to be proposed to international forum from OKI
- For OKI we carry land-based agroforestry. This system has been presented to OKI regent The existing situation of OKI peatlands :
 - Outside the HGU + active IUPHT area = swamp bush, remote, vulnerable to burn
 - The common perception (knowledge) that the cultivation of peasant farming in peatlands must be through drainage or canalization
 - Community activities in peat swamp still extraction (retrieval)
 - We would like to provide all kinds of portfolios from the common peat friendly and profitable
 - Investors are required to join on some parts; pinang, pineapple coffee processing and trading
- Most possible schemes for restoration areas will be offered
- Demonstration plots might use community-owned land with a combination or planting of other crops (using agroforestry systems)
- Industry can be built at OKI itself, with an integrated system. Investors is not required to stay at OKI

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- Discussion of industry placement can be done later after there are investors interested in the potential of the OKI
 - The investment can change the condition of the area

Recommendation from Mr. Hiromitsu Kuno :

- Assumption needs to be made: Assume where is the location of industry, and what is the selling price of the commodity
- If you would like to propose the design of the demonstration plot, it is better that the point has been determined.
- This study would like to propose or promote what kind of investment?
- Potential should be clearly stated, otherwise it will not be able to be brought to the international forum like in Osaka
- The market must be created
- Purun is not suitable to be proposed to an international forum
- The commodity matrix must be performed in more detail
- Commodity recommendations suitable for local or international markets should be clearer
 - We have no information about the market, so we can not recommend it as an export commodity. We have not seen its market potential yet (in this case: purun)

Mr. Ngudiantoro : There are 21 leading commodities.

Mr. Nugroho : Try to focus more on some commodities that can be promoted to the international market. The questions conveyed by Mr Kuno are so technical question has not been included in our table or matrix. Investors invited to this business should support the development of people and increase society's welfare.

Presentation delivered by Mr. Ici Piter (UPR)

- The recommendations given are food crops. Central Kalimantan is one of the main food crops producing regions
- Paddy rice becomes the main commodity, gelam timber can be utilized (endemic species) in almost all areas of the peat can be overgrown
- The results of our records; which can be cultivated locally; gelam, laban □ charcoal (factory and machine not yet available) the yields are moved to South Kalimantan, Balangeran, rubber, corn and horticulture rice (paddy).

Conclusion :

Commodities with the potential will be offered to international markets: gelam (biomass), liberica coffee and areca nut and sago waste, sequestration carbon, or environmental services through carbon trading mechanism, bio-energy from timber.

Presentation delivered by Mr. Adhy Prayitno (PSB – UR)

- Map of restoration targets □ investment plans for peatland restoration
- Peatland depth classification; shallow and deep peat
- Classification of peatland locations by zone; NSP, Forest village and non-NSP
- Shallow peat in the area of PT. NSP, engaged in waste treatment
- deep peat will suitable for plantation business
- Demonstration of coffee liberica plots from certified community managed seed sources has been implemented
- Sago waste business model; driven to be developed at a large-scale refinery PT. NSP or medium and small community and local businessmen
- Solid and liquid wastes (bark, fiber, can be used as fungus and fodder tables)
- Sago waste (agriculture residue) can be made as wood pellets material
- The wood pellet market is wide

- Sago has a midget characteristics similar to palm oil
- Food, feed, fertilizer, furniture, fuel. Sago can be classified into Multi Purpose Tree Species.

Closing Agenda 1 by Mr. Nugroho

Major commodity per areas need to be exposed but the point started for this study is still from commodities. Avoiding the repetition of territorial mention for it still use commodities as a starting point.

Agenda 2:

Preparation for booklet and leaflet matters

Preparation will be coordinated by BRG, data required for booklet and leaflet matters please send to Mbak Hastin. Chairman of the consortium team from each region as a supplier of data and key person. Leaflets and booklets will be distributed for discussion in Osaka. Booklet in English. Contains the list of commodities to be proposed in interntional meeting.

Mr. Hiromitsu Kuno : The booklet I recommend must be containing a summary of 21 commodities then new major commodities and list of commodities per location.

End of discussion. 16.45 WIB

1.2.12 October 5, 2017 <Investment Facilitation>

Notes

Focus Group Discussion

Focused Discussion on the Deepening of Opportunities and Scenarios of Investment Facilitation Implementation and Business Model of Peat Restoration through the Development of Exclusive Economic Zones in Ogan Komering Ilir Regency, Musi Banyuasin, Kepulauan Meranti and Pulang Pisau

**Hotel Morrissey Room Lecture 1-2, Jl. KH Wahid Hasyim, Jakarta Pusat
Thursday, 5th October 2017**

Summary

FGD aims to discuss business models that can be developed on peat restoration areas or lands that can improve the financial and social welfare of communities and can be a promising business project to be offered at international forums and invite investors to invest in this sector.

The discussion was attended by a consortium team from each district, representatives of JICA survey mission, representatives from BRG and LHK Research Institute and representatives from local government. The consortium team has analyzed the potential commodities in each district. 4 districts that are the focus of this business development are Musi Banyuasin Regency, Ogan Komering Ilir Regency, Pulang Pisau Regency and Meranti Islands. The results of observation and analysis yield 21 potential commodities that will continue to be developed.

This discussion is expected to provide an output to a prospective business development model and can improve the welfare of the community by taking into account environmental aspects and succeeding the target of peat restoration. The FGD begins with a brief welcome and briefing discussion by representatives of LHB's R & D. The discussion sessions began with the exposure of JICA and representatives of the consortium teams from each district. The material presented are:

- The opening address and referrals of the Deputy Peat Restoration Agency
- Symbolic handover from JICA survey team to local government
- Presentation of consortium team representatives on potential commodities

-
- Recommendations and responses from local governments on the potential of local commodities
 - Prepare materials for delegates to be delivered at meetings in Osaka

The next session is discussion session. Question and answer sessions generally discuss the implementation and technical development of business models on peatlands. Selection of potential primary commodities to be proposed in international markets as well as material preparation to be presented to the symposium in Osaka.

Minutes of Meeting

Agenda overview:

- a. Opening speech and referrals
 - Opening speech
 - Referrals
- b. Agenda 1
 - Presentation from the consorsium team and recommendation from the local government
- c. Agenda 2
 - Recommendation and suggestions from the experts
- d. Closing
 - Conclusion and important notes

Opening delivered by : Mrs. Nuning Dwi Puspa

Agenda :

- Handover of monitoring tools (witnessed by TRGD, provincial and district representatives)
- Group picture taking
- Referrals from Deputy/Chief of BRG
- Presentation delivered by consorsiumt team about the peatlands restoration business model
- Open discussion

Opening address and referrals from Deputy of BRG (Peatlands Restoration Agency) : Dr. Haris Gunawan

- The title of this FGD is determined through the long reflection of the realization of the mission
- The deepening, implementation, investment, business model and development of exclusive economic zones outlines today's discussions. These 4 points are expected to be implemented.
- These ideas should be implemented on the field
- Paradigm shifting should be done where coffee becomes a potential commodity as a new lifestyle
- Coffee restoration of peat (liberika coffee) can be a brand new coffee in the market
- Potential of the commodities will be detailed presented by the consortium team
- Related to the investment, it is inseparable from the problems of foreign investors and local communities
- Invited investors should be friendly and have willingness to build local communities
- Business meetings will be held in the near future

Presentation : Peatlands restoration business model delivered by Mr. C. Nugroho P and Mr. Ngudiantoro
(Consorsium team of BRG – Universities UNSRI, UN Palangkaraya, R&D and JICA)

-
- This step starts from a long process
 - Identification result of local potential commodities in peatlands, designing the implementation and perform classification of commodities that can be promoted to local, regional and international scales
 - Mismanagement in peatlands can lead to peatfires
 - BRG is ordered a mandate to restore of 2 million ha f peatlands in 5 years
 - Rewetting, revegetation, revitalitation is 3R motto of Peatlands Restoration Agency
 - Target of peat restoration activity 33 KHG (hydrological peat unit), 36 districts, 6 provinces.
 - Priority of peat restoration 2018; JICA has installed 4 tools at the early stages and 4 other tools will be installed later
 - From the commodities identified (OKI) :
 - buffalo swamp
 - Lebak lebung fisheries
 - Purun
 - Agriculture and horticulture crops
 - Beriangan
 - Gelam
 - Liberica coffee
 - Areca nut
 - Pineapple
 - Lebung paddy field optimalization
 - Pineapple and coffee liberica are the most important potential commodities
 - Identified commodities (Musi Banyuasin) :
 - Kenaf
 - Areca nut
 - Pineapple
 - Beriangan
 - Gelam
 - Result of identification (exist in village forest of Kepayang, Merang and Non concession area)
 - Identified commodities (Kepulauan Meranti) :
 - Liberica coffee
 - Sago waste (downstream of sago products, waste management of sago, potential for growth medium of mushroom, wood pellet)
 - Pulang Pisau commodities :
 - Gelam
 - Balangeran
 - Rubber
 - Itik
 - Agriculture and horticulture crops
 - Laban (firewood)

Notes :

- **An integrated peatland restoration development needs to be performed**
- **Role sharing dan cost sharing**
- **on every KHG needs to be agreed upon**
- **RPEG needs to be compiled**

Presentation delivered by Mr. Hiromitsu Kuno :

Draft final report: JICA survey mission for the collection of data on the prevention of forest fires and peatfires and peat restoration in Indonesia phase 2

-
- Summary of JICA survey mission activities of gravity; formulate the cooperation strategy of Indonesian government with Japan in relation to prevent peatfires and build a sustainable peatland management
 - Ideally; effort to maintain ground water level at peatlands area. Preliminary feasibility study to create a new business model
 - November 2016 Agreement in Marrakesh to support its next year's study (GWL monitoring, profit studies, creating business model concepts and supporting the coordination of stakeholders to foster an investment climate for peat restoration)
 - Basic design of ground water level data retrieval with telemetry system (SESAME Tool)
 - Build institutional corporation □ consortium
 - Component 2: 21 potential commodities; potential of local investment. Except 5 products, environmental and ecosystem services, carbon trading.
 - Component 3: FGD and coordination in Tokyo and Jakarta
 - Proposed scope of business investment related to incentives and facilities; revisions to the relevant ministerial regulation, synchronizing commodities of services / services that support peat restoration may encourage investment in peat restoration.
 - Local potential is emphasized in the communit-based business
 - Encourage BRG agreements with Banks to support investments in peat restoration to facilitate community financing support
 - Build a scheme of social forestry
 - Proposed provisional ideas: financial cooperation, KHG-based public-private partnership

Recommendations by Mr. Nunung N (Business Development and Investment IPB)

- Rapid progress from the consortium team
- 4 points emphasized by the deputy
- Deepening; the new policy to the 16 acceleration of investment and effort (being the starting point to leave) the president set up a task force in a well-synchronized area.
- Recommended business model; farmers' business follow-up (consolidation)
- Investor Business model; in one chart that can be submitted to the government and the investors
- These following points should be included in business model;
 - Value proposition (development of economic activity has specificity must considering to environmental aspect)
 - Elements and blocks in the business model of peat restoration development
 - Value creation that can be raised
 - institutional (corporate) approach is an optimistic that local governments support
- Creative economy ; fashion, foods dan crafts
- We have to develop a sustainable business model
- The context of digitalization in product development, the concept in the business of digitalization model is important and should be considered now
- I will create more detailed business model template so the business-flow will be clear
- Determination of customer, client, market
- Capacity will be developed in local scope
- What kind of corporation should be made?

Presentation delivered by Prof. Mizuno (Kyoto University)

(Peat Restoration and Development of Sago Industrial Center in Kepulauan Meranti)

- Rewetting and reforestation village

-
- Collaboration with local communities, strengthening community ownership rights, collaboration with BUMDes,
 - Ijon System; farmers are in debt to earn money and pay for it with sago produce at harvest time
 - Sago yield is sold to Chinese traders. So farmers get too attached in Ijon system
 - This system is found in Sulat Panjang area
 - Peat restoration; encourage people to plant sago
 - Transactions need to be made among the traders to stop the Ijon system

Presentation delivered by Mr. Irwan (Head of Kepulauan Meranti)

- Recommendation for Sago trading system :
- Indonesian Bureau of Logistics must be included in sago trading in Kepulauan Meranti, Ijon chain which occurs because all sago flour is sent to Cirebon and has not been paid so high sago price can not be bought and this is a fundamental problem that happened in sago trade system
- Sago can be harvested twice in three years, harvesting rotations that take a long time become the reason why people are not interested to plant sago
- The key solution : Indonesian Bureau of Logistics must be willing to accommodate the productions of community sago flour to be distributed to the market
- Other potential commodities: Mangroves (mangroves / swamps that become bufferzone sago to withstand erosion or coastal abrasion)
- The economic value of Avicenna is high
- Other commodities from Kepulauan Meranti that potential to be proposed to international market :
 - Sago flour
 - Avicenna firewoods (Export to Malaysia and Turki)
 - Coconut (Exported to Malaysia)
 - Swallow : many swiftlet nest in traditional sago refineries that can be sold
 - The area of forest fires planted with chili
 - Sago waste: Bark (uyung) used as the basic material of road construction on peat so the construction is stronger and durable
- Complaints from HTI companies in Kepulauan Meranti : with the enactment of Ministry of Forestry and Environment Regulation no. 16 year 2017 related to the harvesting system where it is not allowed to be planted on already harvested fields.

Presentation delivered by Beni Hernedi (Vice Head of Musi Banyuasin)

- The position of BRG is too far from the location of peat fires
- Determining business models have to consider and in accordance with the consideration of various aspects
- Major commodities proposed by Kab. Musi Banyuasin :
 - Swap paddy
 - Palm oil
 - Rubber
- Regions should not be used as various types trials of seedlings
- There must be a follow-up of the concrete steps taken as a solution to the problem
- Many paddy fields are converted to palm oil plantations because they are considered more profitable
- Business models should be tailored to the interests of the community
- Zoning of peatlands should be based on definitive peat data
- Communities perceive HTI (Sinarmas) have easy access to enter the peat so that corridor roads made by companies are used by communities to access peatlands and cultivate (illegal planting)

-
- BRG should establish district-level institutions
 - The legality of the managed lands, especially those carried out by the settled community, must be enforced
 - Business model should be considered to improve the welfare of the community

Highlight :

1. **Institutional approach should be including of mechanism, institution and PIC**
2. **Community governance legality**
3. **District-level institutions**

Presentation delivered by Mr. Tatang Sambas (DLH-OKI)

- should be able to answer the issues in particular areas of OKI; poverty and forest fires and the empowerment of peatlands
- There are land tenurial issues that are mostly owned by plantation companies and individuals
- Utilization of derivative products is still not maximized
- Regulations in peatlands need to be reviewed and amendment should be performed

OPEN DISCUSSION moderated by Mr. C. Nugroho P

Mrs Ani Suryati Ningsih (Indonesian Ministry of Economy) :

- In terms of investment and business, exclusive economic zones (EEZs) require the development of regional models based on local wisdom or local resources
- EEZ is not only in resource but also related to industry from upstream to downstream
- Industry development needs to be done to accommodate the results of UKMs and educate the community to become entrepreneurs
- Business scheme that SME-IKM-Industry needs to be built

Mr. Rachmad Firdaus (Indonesian Ministry of Economy) :

- Important thing to be considered: This program must be strong in business and need to strengthen the grand design and positioning of the importance of this activity
- Need a legal protection reference that has not been raised yet
- Among business models: a systematic scheme of backwards and forwards linkage is necessary
- Based on LHK Regulation No. 81 years 2016
 - It is necessary to specify whether activities are carried out on forest land or in peatlands
 - This regulation also regulates partnership of forest area utilization for food security
- The relationship of economic equity is very important to be considered
- From Indonesian Ministry of Environment and Forestry Regulation No. 81 years 2016 can be copied clusters forest area management for sugar
- There is a loss calculation in article 8E paragraph 1
- Land swap → No. 40 2017
- Ministry of environment and forestry regulation helps government facilitation to build the region
- Development of peat restoration must be inclusive. Includes aspects; ecological, social, environmental needs to increase
- Release of peatland status into manageable land needs to be sharpened to address the issue
- Subsidies for peat restoration programs reach 10 trillion
- 10 trillion for UMKM financing
- Consider the importance of digital-based infrastructure

-
- Business model must be equipped with clear cost structure

Mr. Dedy (Musi Banyuasin)

- Tertiary facilities; investment and incentives
- Projects should be packed in an informative memo
- Investment value related to business scheme and financing source
- Determine the PIC of the offered project (whether it will be submitted to the local government, central government or ministry)
- Exclusive Economic Zone: need to be done by performing parallel process. The procedure should start from now.
- Presidential Regulation no. 91 by 2017
- The momentum of ease of entrepreneurs in Indonesia. Changing cultural culture begins with the process of issuing permits

Mr. Najib Asmani (TRG Prov. Sumsel)

- Zone of peat restoration
- Commodity of income; fast, medium, low
- Companion team: 15 people from BRG
- Institution, technology, capital, obtaker
- South Sumatra peatland map is being prepared
- Corporate farming

Mr. Ngudiantoro (PSB – UNSRI Konsorsium)

- Concepts or business models that are built depart from the problem
- Initial feasibility study:
 - Investing in potential commodities
 - Ensure the location or status of the area
- build or use at the business level

Mr. Edwin Martin (BPLHK – Palembang)

- key words of this problem:
 - Forest fires
 - Peat friendly commodities
 - Local people
- The implementation aspect must be an exit strategy of this work

Closing remarks delivered by Dr. Haris Gunawan (Deputy of BRG)

- Post-meeting follow ups : implementation
 1. Agree to decide priority of EEZ Peat in Riau, Sumsel and Central Kalimantan
 2. JICA (Japan) as a partner who will accompany and support until this mission is completed
 3. Performing priority mapping
 4. EEZ at KHG
 5. Priority 4 districts in presidential regulations □ EEZbased EEZ pilot
 6. Create a business model / chart / matrix model
 7. The central government always puts the people first
 8. BRG will start working on site

Discussion ends at 12.55 Jakarta Time.

1.2.13 October 6, 2017 <Financing for Business>

Notes

Focus Group Discussions
FINANCING GUIDELINES FOR PEATLANDS RESTORATION
BUSINESS

9th Floor Radius Prawiro Tower, Building A Bank Indonesia
Friday, 6 October 2017

DRAFT FINANCING GUIDELINES FOR PEATLAND RESTORATION BUSINESS →
RECOMMENDATION OF FINANCIAL BUSINESS PEAT RESTORATION

Meeting participants :

OJK staff
BRG
JICA
Balitbang LHK - Palembang

The opening remarks was delivered by Mr. Edi S ABS DPNP (Financial Services Authority)

- Consortium does support the OJK policy to encourage the financial services sector to put attention to social aspects, improve the environment friendly sector
- The financial services sector makes principles, creates work plans, prepares public reports (sustainability reports)
- Effectively will be enacted 2 years into the future
- Work together to issue and publish the guidance regarding to the sectors that can be financed by financial institutions
- Guidelines that already published by OJK; palm oil, clean energy, renewable energy, green building, etc.
- Target : OJK and JICA work together to create business guidance for peat restoration (by using business-friendly language and not technical)
- Explain in advance the details about peat restoration business
- Percentage of return from the restoration of peat restoration must be clear and profitable
- Risks confronted by OJK, in green sector business is higher. Green sector business is new in financial support
- Provide the existing regulations related to peatlands, OJK does not have to search. Facilitate the financial services sector to provide finance support for the peatlands business sector
- The results of this program will be published and uploaded on the OJK website for an open access

Presentation delivered by Mrs. Nur Arifatul (R&D Environment and Forestry Palembang)

- Why peatlands restoration matters forest fire is the threat for sustainable development
- BRG offers 3 restoration schemes. They are: rewetting, revegetation (peudikultur / cultivation on peatlands), revitalization of community livelihoods.
- The program of a million hectares of rice in peatlands found its failure
- Peatlands can be found in some sub-tropical countries
- Current cultivation practices in peatlands; On the 70s peat including HPH concession areas, post-HPH peat land degradation era due to logging and recurrent forest and land fires, conversion to HTI, oil palm plantation, infrastructure development
- Peatlands degradation is irreversible. It takes long period of time to be restored.

REASONS WHY BUSINESS OPPORTUNITIES IN PEAT LANDS IS PROMISING

-
- Investment in the palm oil plantation with fire or losses incurred is not equal. Palm oil plantation brings more harm than good and benefit
 - Cultivation can be done in shallow peat by not changing the peat ecosystem drastically
 - Peat friendly commodities; in tanjabar district prov jambi.
 - Type; areca nut, liberica coffee, pineapple. Cultivated with mixed patterns
 - NB: which should be encouraged the use of areca nut agroindustry
 - Peat restoration business; community and industry
 - Areca nut is now only processed of till drying stage. Liberica coffee is only processed normally
 - Peatlands restoration business can be performed in landbase area and non-landbase area
 - Peatlands restoration business : new business sector, require big amount of investment, big risk and need investment support from other business actors
 - The role of investors and financial services institutions is very important
 - NB : it is required a team who work by only focusing in this sector
 - Government; assisted by BUMDES program, BLU
- **KUR (Kredit Usaha Rakyat)**
 - NB: educated community still able to pay high interest rate
 - Scheme 1; individual lending
 - Scheme 2; credit distribution through farmer groups or gapoktan
 - Scheme 3; involvement of local government (assistance and securities)
 - Sharia financing has a good prospect, to finance the community's business landbase
 - Revolving fund
 - Scheme of financing through PT Sarana Multi Infrastruktur (SMI) one of example financial support system that can be used

Recommendations from Mr. Edi S (OJK)

1. Map of peat demography in Indonesia is required and its ownership/tenurial status (to determine the strategy to be taken) so that investors can observe visually to the business determine how to approach to plantation / community-base plantation. A minimum potential landscape should be provided
2. The settlement is not only charged to funding. It is involving non-finance aspects to optimize their potential more efficient financial institutions to finance business groups
3. This business has not been developed, so the expectations of commercial or financial instutional still low because the percentage of return becomes very important for financial institutions another side to be considered; consideration of the current bank investment
4. This business should use mix funds grant, soft long and commercially
5. For initial stages mix funds is required to reduce risk, and used for guarantee
6. Approach should be performed should be performed with fellow gent from upstream-downstream rather than snapshot just to help farmers. This project is expected to have a large multiplier effect by OJK as a financial institution
7. Further funding schemes should be made; publishing green board in long term
8. If the project would like to be proposed as anational program, its potential should be maximized
9. The mechanism of conservation activities trade; the possibility of private sector to join or involved is still low. Most possible cooperation can be performed with local government

-
10. How much is the percentage of entire area that is ready to be planted/cultivated
 11. Risk management should be considered
 12. Business plan should be made as clear as possible
 13. This business plan is too general and it is limited to the introduction only
 14. Scheme of peat-friendly commodity derivative products add notes; (put concern on some major commodities)
 15. Give special color to commodities that can be distributed first and already exist in Indonesia
 16. Locate the area where coffee is planted and cultivated on a definitive map
 17. Try to be more informative
 18. Highlights the potential export commodities
 19. This information needs to be enriched
 20. Encourage / motivate investors to invest
 21. Make a comparison of investment costs for planting coffee and pineapple trees in peat and non-peatlands
 22. Create serial derivative products more definitive and detail
 23. The next version; financial guidance for commodities on peatlands
 24. The final project should involve the local government. OJK will support
 25. Problem of UKM; integrity, management, market access and quality product
 26. Assistance PIC will be given to NGO? Local Government? Community groups?
 27. OJK wants to support financing for this project/business plan
 28. Vol 2; financing coffee cultivation on peatlands
 29. Vol 3; financing of areca nut cultivation on peatlands
 30. Schemes 1 2 and 3 can be positioned behind
 31. the current stage status of this business model is still in initial stage, it is not possible to use commercial loan, mix fund to support is the solution.

Additional Recommendations by Mrs. Istiana Kasubag DPNP (Financial Services Authority)

1. on which part the calculation allows for financial services institutions to participate in this peat restoration business?
2. Business processes should be clear
3. In which part OJK can support finance, eg; costs for the seeds etc.
4. How's the possibility percentage for farmer to return the fund support?
5. Prioritize the commodity which has higher production and yield

Discussion end at 11:25 Jakarta Time

1.3. Seminars

1.3.1 April 11, 2017 <Tokyo>

**From Readiness to Actions:
Private Investment Seminar for Peatland Restoration in Indonesia
The University of Tokyo, Tokyo
Tuesday, 11 April 2017**

Session-1

Opening speech

Mr. Takahiro Morita (Deputy Director General, Forestry and Nature Conservation Group, Global Environment Department, JICA)

The recent trend of JICA's assistance and support has been to work with private companies and

academic institutions in order to promote sustainable development and climate change reduction and green economy promotion to improve the livelihood of the local residents. To promote green economy, private investment, which is the topic of today's seminar, is essential. We would like to invite the Japanese companies to contribute to the local economy of Indonesia with cutting-edge technology and promotion of new types of business.

Private investment needs are quite diverse within the peatland restoration. However, there are many information that is required for private investment. For example, what are the environment or requirements for the investment, who can be the partners in Indonesia, etc. In today's seminar, we would like to provide such important information in answer to your questions.

Keynote speech 1: National policies in Indonesia

Dr. Nur Masripatin, Director General of Climate Change, Ministry of Environment and Forestry (MoEF), Indonesia

At this opportunity, allow me to share with you about policy aspect in relation with land use sector in Indonesia, focusing on the nationally determined contribution of Indonesia and national policy approaches for peatland management. Indonesia has ratified the Paris Agreement through law Number 16 - 2016 and we also have submitted our first NDC in November 2016.

In our NDC, the forests sector play the significant role. In fact, the highest contribution of our NDC target will come from the forestry or land use sector. So, of the 29% of our NDC target, 70.2% of that will come from land-use, the land-use change sector, four areas of policy intervention and action reducing the deforestation rate of forest cover loss.

The second regulation is wood production in natural forests. The third will be increasing production in commercial plantation of forests through the increase of each productivity. The last is the one that is very much related to our discussion this morning: that is accepting the NDC's target for peatland restoration and land rehabilitation. The target that we set in our NDC for peatland is peat restoration achieving 90% of survival rate, and the area of peat restoration will reach two million by 2030.

We have substantially reviewed and also revised the government regulation on peatland so we have new regulations on the peatland, and a number of ministerial regulations have been put into effect as elaboration of the new revised government regulations on the peatland.

We encourage that all related activities to climate change be registered in our national registry system. With that, we could maintain the principle of transparency and clarity, and also understanding of our action, also, support received by us and support provided by our partner.

Keynote speech 2: Peatland restoration and green investment in Indonesia

Mr. Nazir Foead, Head, Peatland Restoration Agency (BRG), Indonesia

Today, I will expose an example of a business case, looking particularly on planting, plantations in peatland of crops, called sago.

Sago grows natively in peatland. They can stand wet conditions in peatland. Sago is like a palm. It needs 8–10 years to harvest. The sago palm has a myriad of possible applications, for food, polymers, pharmaceuticals, textile industries, and so on. The most common use of sago, the starch of course, is for food, both for domestic and international market. It's used as sago flour, sugar, noodles, jelly and many other forms.

Sago can grow in a wet area, so we need the peatland to be wet. All the drained peatland that have caused fires need to be rewetted, and if they are wet, the carbon emission can be reduced in the plantations of sago. So, the economies can benefit both from the sago production as well as from the carbon reduction.

I like to stress again that this is not about greenhouse gas emission, this is not about peatland restoration, but it can be also be beneficial for the economy in a sustainable manner, and sago had been tested by traditional communities' farmers, so it's not new agriculture. It has been used by the farmers in Indonesia, in Sumatra, in Kalimantan, as well as in Papua. What we need is to help, bringing up to a more efficient scale of industrial, economic scale perhaps, and access to the market.

Panel Presentation: Potential of private investment for peatland restoration in Indonesia

< Moderator > **Dr. Ken-ichi Abe, Professor, Research Institute for Humanity and Nature (RIHN)**

1. Economy and Green Investment in Indonesia

Dr. Kosuke Mizuno, Professor, Kyoto University

I'd like to talk about the overall Indonesian economy and the position of Japan's private investment in the environment sector in Indonesia.

The policy that's been released by the Indonesian government is to protect the environment. Let's look at the macroeconomic environment, which supports the government's drastic policy on conservation of the environment. And I would also like to share with you, the current situation in Indonesia.

Indonesia's growth rate is about 5% after the financial crisis in 2009. Although other countries suffered negative growth, Indonesia continued to perform well at around 4%, and Japan's investment to Indonesia grew. Personal consumption in Indonesia is strong, and this is a big difference from countries such as Brazil or Russia. This is the reason behind pro-environment policies in Indonesia.

The investment in the environment sector is also important for the Indonesian economy. Personal spending/consumption is also very strong. Export is improving, and the growth is very much driven by domestic demand. Indonesia made foreign direct investment law in 1967, and Japan's investment grew just after that.

We need to think about our private investment in Indonesia. The basic idea is rewetting and paludiculture. Paludiculture is turning dried peatland into wet peatland to promote the sustainable use of wetland by agriculture, forestry, and fishery. So, there is the business of agriculture, forestry, and fishery on peatland, and also, as was mentioned yesterday and today, sago cultivation is also one way of promoting paludiculture.

Here, what's important is to foster relationship with the local people. Taking advantage of the customs and knowledge of the local people is important. The business will only work if we can avoid conflicts with the local people. So, we need to really look long-term when doing business in Indonesia. We need to try and grow the strength, and the strong and attractive aspects, of Indonesia going forward.

2. Responsible Peatland Management that Providing Economic Opportunities in South Sumatra

Mr. Alex Noerdin, Governor of South Sumatra Province

The video is about the fire in South Sumatra in 2015. This is a real story. Indonesia had a very big fire in South Sumatra.

[Video presentation]

The steps to restore peatland in South Sumatra: one is priority to control land of forest fire, strengthening partnership of landscape management among public/private or landscape management, public-private people partnership, green growth development.

South Sumatra green growth is the first initiative in Indonesia managing sustainable landscapes, a breakthrough in bringing together the activities carried out by many modern stakeholders from various sectors collaborated with international donors directly, and by public-private people partnership. South Sumatra green growth plan will start to increase agriculture and forestry production, while protecting and restoring forest and peat, and ensure a contribution towards achieving the SDGs and NDCs national and regional models.

3. Financial scheme for private involvement in Peatland Restoration

Ms. Mari Yoshitaka, Chief Consultant, Mitsubishi UFJ Morgan Stanley Securities Co., Ltd.

Today in this symposium for peatland restoration, and how the private sector can contribute, I would like to talk about three financial schemes that can be useful.

The first scheme is the Green Climate Fund, which is created by the United Nations. The second is Green Bond, which is gaining a lot of attention in the market these days. The third is Adaptation Business Opportunity.

First, let me start with GCF, the Green Climate Fund. This was first established in UNFCCC COP 16, which was held in Cancun, Mexico. In order to create paradigm shifts in the response to climate change, a new fund, the Green Climate Fund, was created and this fund will be used for both mitigation and adaptation. Currently, there are 43 governments that have committed to GCF, and it is about USD\$10 billion.

For GCF, there are national designated authorities, or focal points, for each developing country, and it works through the accredited entities (AEs) to channel its resources. The GCF always has to work through the accredited entities. At the same time, there needs to be always approval from the National Designated Authority (NDA) in the developing countries. In this case, the NDA will be Ministry of Finance.

Next, I would like to talk about the green bond market. Green bond is a debt instrument, which means that you borrow the money and you have to repay the money. And the interest is what the investors are looking at.

If you are looking at, for example, if the investor buys the National Bond, they look at the interest rate, but this green bond focuses exclusively on green investments. And this is initially the funding for the World Bank to invest in green projects in developing nations.

You may think that the World Bank is using just the commitments from each nation, but actually, if you buy the World Bank bond through the regional bank, then you will be actually providing money to the World Bank. So, there are many types of investments, direct and indirect. So, who buys green bonds? Of course, these are life insurance companies, trust banks, and also private investors and retail investors.

And I believe that mitigation is very important, but so is adaptation, and I believe that for the private companies, adaptation could be a business opportunity. Up to now, I have been working very closely with private companies in promoting such investments, but this is very difficult, because the companies can only bear a certain amount of risk, and that is why awareness raising is essential.

You have to raise the motivation of the investors, and, as much as possible, the risk should be taken by the public sector to collaborate and mitigate the risk on the private side. I would like to do my best to sell this adaptation scheme to Japanese companies and investors, but what is most important is the close relationship and good matching of Indonesian partners with Japanese partners. No matter how hard the public sector works, there needs to be a close relationship between the Japanese and the Indonesian partners.

An NGO could be one stakeholder as well, and they could help in establishing such relationship between the partners on both sides. So, I would like to request to the Japanese government and the Indonesian government for such a strong matching scheme. Even if you are called for investment, private companies cannot go into areas with a high level of risk, and neither can financial institutions, so I hope that there could be a good pairing on both sides.

Panel Discussion: Opportunities and challenges of private Investment for peatland restoration in Indonesia

< Moderator > Dr. Ken-ichi Abe, Professor, Research Institute for Humanity and Nature (RIHN)

Q1) To have a more active investment, what are the schemes that allow such risk control?

A way to lower risk is something that is being demanded from the private sector. Different from energy, there is higher risk for agriculture — for example, a change in the weather. So, if there is a clarification of who and how much risk will be borne by a certain actor, this will make it easier for the private sector to come in.

And what is the guarantee scheme? For the financial institution to loan out money, it is a big problem if the private companies go bankrupt. But for the World Bank, there is no risk of bankruptcy. So, this makes it easier for the private companies to be involved in the initial investment.

Q2) Many Japanese people don't know about the peatland. So how should provinces such as South Sumatra attract investment from Japan? For people living in South Sumatra and Japanese businesses, is there a big opportunity for collaboration between the two?

More than 700,000 hectares of peatland forests we're damaged by the fires. About 300,000 hectares of them had already been supported by the GIZs from Germany, from the Netherlands,

from England, and from Norway. So, what happened with the 400,000 hectares, the rest? So, this is the opportunity when we would like to ask for help from Japan.

Q3) Why there is a lack of Japanese participation through GCF, or can you talk about future prospects as well?

In Japan, the environment is not ready yet, and the process is not completed: we're learning by doing, the fund just started, and everybody is in trial and error. And in this trial and error, we want to work together with the AE from Indonesia.

Q4) Is there any requests or demands to the Japanese companies and Japanese private investments?

At the World Economy Forum in Davos, we launched a financial scheme that can be used to support agriculture, assisting agriculture restoration and protection activities into one project. What is interesting is that this financial package is blending the grant and a loan or credits, maybe like the GCF.

Now, we would like to encourage Indonesian business entities to apply to that fund. I very much also welcome a join with the Japanese companies, or even Japanese investment. I would like to welcome and invite you to have a more detailed discussion with us. And even in a month, or two or three months, to go to visit Indonesia to look on the real situation. You can visit provinces like South Sumatra and meet the technical unit of the governor or the local businessmen, and discuss the possibility of investment in restorations and conservations.

Q5) Do you have some emerging ideas to support the green investment programs, particularly the small-scale enterprises coming from abroad or even locally? Or, if you already have a legally supporting paradigm, if you have please share with us.

Yes, we give support not only the very rich companies, but also the small-scale, not only the large-scale companies. The government of South Sumatra can give support and to facilitate whatever you need, even small companies, to invest or to support our province.

Q6) A sustainable supply chain is important when a company is trying to move from one industry to another; is there an opportunity for sago? I don't know how well you can balance sago and palm. How best to strike a balance between two different types of crops?

Sago is a native species in peatland. Well, I think palm oil is a species from West Africa, and they grow on dry soil. They can grow in peatland but not in perfect condition, while sago natively grows in peatland in Indonesia. So, it's a native species. The ecological impact, I believe, is zero, yes. Of course the best is to also adopt agroforestry mixed crops, which is not all sago, and traditionally the farmers in Riau, they all already mixed the crops.

I'd like to share also, there's one palm oil company in Indonesia and Riau which have done a pretty good job. They plant the palm oil in peatland and they put a lot of investment in managing the water. What interested me is that they are not only selling palm oil, they are also selling the water from the peatland as drinking water and mineral water. So, you can see the two commodities, selling water and also selling the palm oil. That shows that it is possible, and maybe also other crops — also to encourage them to not only put palm oil, but also to experiment on other crops.

Closing Remarks

Dr. Kosuke MIZUNO, Professor, Kyoto University

Indonesia aims to recover two million hectares of peatland. This is a very urgent global challenge that we need to face. Not just the Indonesian people, but also other people, since it's a global problem. We have to do our part; researchers have to do their part, as well as JICA, the private sector, businesses, and NGOs. We all have our strengths, so we need to make contributions through our strengths in order to restore two million hectares of peatland. And actually, this is a big opportunity.

There is immense opportunity going forward. And that's also the same for us in the academic field — we can write a lot of academic papers, and it is a big business opportunity for the private sector and also for the local people, because local people can improve their livelihoods. And also, friendship as well: through this, we can further deepen the friendship between the two countries. So, there are so many opportunities ahead of us.

**Workshop on Restoration Business Model of Peatland Areas in
Enhancing the Development of Green Economy
27 July 2017, Sari Pan Pacific Hotel**

Session-1

Opening speech, by Representative of JICA Indonesia

This is a good opportunity for us to learn and share the knowledge for inspiring future developments of business in Indonesia, especially in 4 districts: Meranti, Pulang Pisau, Ogan Komering Ilir (OKI) and Musi Banyuasin (Muba).

Indonesia's peatlands have become a source of greenhouse gas emissions through decomposition and fire. But now we need to change terminology so that peatlands become the carbon stock area, instead of the source of greenhouse gas emissions. The question is how do we change this situation? So far, we knew how to build channels blocking to maintain the water level in peatland area. We also knew that sago is a good commodity for peatland restoration. Unfortunately, we don't have both industrial and marketing system in place to support a large production of sago starch. So we need to take a further steps in exploring and finding the best way to create the systems. This is not only a challenge in Indonesia, but also a in worldwide.

JICA has been starting to collaborate with the Indonesian counterpart, including BRG, KLHK and BPPT for restoration and monitoring of peatlands. For example: The development of monitoring system by combining field data with satellite data; Design establishment of conservation and peat restoration, in Kalimantan and Sumatra; and Trial of peatlands business development with the government.

As time progresses, it is indicated that economic life in our business will be transformed. Indonesia needs to take part in the future, including demonstrate the business model of restoration on peatlands. Today, we will hear the experiences and lesson learnt of the 4 districts and will identify challenges and issues, so as to generate informative ideas for the next step.

Opening speech: Head of Peat Restoration Agency (BRG), Nasir Fuad

In Indonesia, the area of peatlands that must be restored is very large. From the 15 million hectares, over a half of the total area have been open. Some are well managed, some are poorly managed, and some are not managed.

To manage the peat restoration requires considerable effort and resources. If we only relies on the government resources, the help of government partners, whether aid from friendly countries or philanthropic foundations, are not enough. Entrepreneurs, including investors, have an important role in jointly restoring which also leads to cultivation on peatlands.

There have been some good examples done by some entrepreneurs related to cultivation on peatlands and the results are quite satisfactory. BRG wants to raise more forestry, forestry agriculture and other agriculture activities to attract business actors and interested parties for investment.

The Government of Indonesia, in particular the KLHK Minister, has already had a national policy for Greenhouse Gas (GHG) reduction. Cultivation activities in peatlands besides providing opportunities from commodities also have a big role for GHG decline. Currently, more incidents have been occurred due to extreme temperatures and fires. In the United States alone, 1.8 million hectares of forest has burned in 2017. This week, a tourist center in France was burned and caused 10 thousand people to be evacuated. It means, basically our activities can not escape from extreme weather changes and fires.

Above all, to cope with extreme weather is that we need a positive energy and extra effort, from government, companies, business actors, investors, communities, NGOs, and academics. BRG has worked with several universities in Indonesia and the world including Kyoto University Japan to conduct research on climate change. Hopefully this workshop opens up a lot of new ideas, thoughts,

and options for cultivating entrepreneurs in the future. Wishing all the results of the discussion brings a better future and positive thinking.

Session-2

Panel Discussion: Business Model for Peatlands Restoration

Moderator: Mr. Budi Wardhana

1. Pre-Feasibility Study for Peatland Restoration Investment in Four Most Prioritized Areas in Indonesia, Prof. Robiyanto, Koordinator Tim Konsorsium Universitas

In restoring the peat ecosystem we must have an understanding that the process includes four stages: revitalization, restoration, rehabilitation, and law enforcement. All stakeholders (academic institutions, government, industries and society must work together to achieve the goal.

The impacts of unsustainable peatland processing - forest and peat fires, including: economic losses of Rp. 221 Trillions, around 504,000 people in six provinces are exposed to acute respiratory infections, 5 million school students are excluded, greenhouse gas emissions up to 15.95 million tonnes of CO₂ emissions / day, and loss of habitat range of 2, 6 million hectares.

Success factors in the implementation of peat ecosystem recovery are influenced by: (1) synergy of the parties, (2) cooperation between KLHK, university, facilitator, local government and local community, (3) Cooperation scheme: MoU between KLHK dg University, fasilitator rekrutment from Local by university, fasilitator training by KLHK, RKM preparation by community with fasilitator, canal plumbing.

Below are profiles of 4 priority districts that are pilot areas for implementation of the peatland restoration business model:

OKI District:

Its main commodities are swamp buffalo, swamp fisheries, food crops and horticulture, liberica coffee, areca nut, and pineapple. The prospective product form for swamp buffalo commodities are fresh milk, yogurt, ice cream and milk candy. While processed products for capture fisheries and aquaculture are salted fish and smoked fish. On the other hand, areca nut demand has been increasing rapidly since the establishment of 5 ready-to-export processing plants, including young areca nuts for candy raw materials in China and Korea. Tanjabbar farmers, Jambi even replace rubber and oil palm plantations in peat with areca nut and pineapple. This is due to the stability of market prices and cheaper production costs. There are 4 different locations in OKI Regency with partnership and restoration schemes with partnership, i.e., Rengas Merah and surrounding areas, Riding, Penyajab, Pedamaran HPT, and APL Pedamaran-Pampangan.

Musi Banyuasin (MUBA) District:

The types of superior commodities in this regency are kenaf, areca nut, pineapple, food crops and horticulture, swamp fisheries and environmental services. Processed products from kenaf include: pulp and paper, textiles and carpets, dashboards, bioplastics and biocomposites, vegeta oil, and others. The main obstacle to kenaf cultivation is the limitedness of large companies.

Melawai Islands District:

Main commodities of Meranti Island district are coffee of liberica, sago, liquid sugar, kenaf, etc. The business investment ideas for liberal coffee are as follows:

- Investors help farmers to build new gardens with superior liberica coffee seedlings (LIM-1 and LIM-2) -great assistance related to farmers' services in restoration efforts
- Investors ask farmers to breed trees for damaged peat restoration
- Investors ask farmers to plant seeds produced on restored peatlands
- Investors are entitled to buy all the best coffee produced by the farmers and label the "peat restoration coffee"

Pulang Pisau District:

Leading commodities in Pulang Pisau regency are Integration of Alabio duck, food crops and horticulture, kenaf and pineapple, areca nut and swamp fishery. The process of peat restoration business model in Pulang Pisau is through the alignment of matrix of action plan of peat restoration

economic area with green development and vision, mission, strategy and development priority of Pulang Pisau regency. An example of the topic is the optimization of land use without burning - zero waste.

Specific notes on pre-feasibility for investment in peatland restoration are as follows:

- It needs an integrated peat restoration development
- It needs clear roles sharing and costs sharing
- Requires agreement regarding the management unit of peat restoration (UPRG) in KHG
- Requires preparation of RPPEG at district level in accordance with RPJMD Kabupaten, Provincial RPPEG and National RPPEG

2. Peatland Processing for Agricultural Land, Tim PT. Sinar Pangan Indonesia

The program has been running in Central Kalimantan and South Kalimantan.

The objectives of this peatland processing program are:

- Utilizing less productive peatlands, and
- Reducing the risk of land fires

Conditions:

- There is still a lot of unripened paddy field
- high risk of peatland fires
- limited ability of personnel and financial to work with the expected extent

Solutions:

- establish a system of farmer cooperation with counterparts
- management with industrialization system,
- financial provision to support the provision of infrastructure and work equipment

One of the programs that have been done is paddy field printing in Mulyasari, with the following steps:

- Opening new land for paddy fields. This needs to be done to clear the land from the remaining vegetation material
- Printing of agricultural land (paddy) follows the existing ownership of farmers
- Revamping of canals and roads to facilitate logistical pathways
- The need for assistance to work on the land, both the availability of equipment for industrialization and funding.

Broadly speaking, the steps of the peatland handling process, including:

- a. Checking the condition of the land based on the map of the restoration plan
- b. Identify the land ownership data included in the restoration plan
- c. Identify the pattern of paddy fields in the area
- d. Making blocking based on the condition of the land on the suitability of vegetation that can be planted refers to the availability of water
- e. Leveling data to plan the use of water gates and less possible use of water pumps in case of drought
- f. Logistic road, channel / canal and sluice roads for new land clearing
- g. Selection of vegetation that can be planted according to the condition of the land

3. Draft for Development of Special Economic Zone on Peatland Investment (KOENIG), Ani Suryati Ningsih, Kementerian Koordinator Bidang Perekonomian, Tim Insentif dan Fasilitas BRG

The basic concept of a special economic region/zone is the provision of facilities to the preparation of areas whose locations have access to global markets (access to ports and / or airports). The area is given a certain incentive to increase competitiveness with the surrounding countries. With increasing competitiveness, it is expected to attract investors to invest in the region.

The implementation of Special Economic Zone in Indonesia has been regulated in Law Number 39 Year 2009, as a mandate of Law no. 25 of 2007 on investment, with the following objectives:

- a. Increased investment through the preparation of areas that have geo-economic and geo-strategic advantages
- b. Optimization of industrial activities, exports, imports, and other economic activities that have high economic value
- c. The acceleration of regional development through the development of new economic growth centers for the balance of inter-regional development

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- d. The realization of a breakthrough model of regional development for economic growth, including industry, tourism, and trade so as to create jobs

The criteria for location of Special Economic Zone are:

- Support provision from provincial and / or district / local government
- The existence of conformity with the Spatial Plan (RTRW) and does not have the potential to disturb the protected area
- Located in a position close to international trade routes / close to international shipping lines in Indonesia or located in areas with the potential to have excellent resources
- Has a clear boundary

Zones within special economic zones, including: export processing, logistics, industry, technology development, tourism, energy and other economies.

Acceleration strategies for proposal process of SEZ establishment:

- Strategic location, in accordance with RTRW, and land has been mastered minimum land requirement for stage 1 of SEZ development
- Ensuring SEZ development vision
- Strived party originating from the Business Entity, both state-owned (BUMN) / BUMD / private
- Readiness of infrastructure support
- Have prospective anchor investors
- Prepare the requirements and submit the proposal in accordance with the procedures set forth in the legislation

Scheme of business entity establishment in SEZ development and management:

- If the proposer is a business entity, the development of the area includes land acquisition and physical construction borne by funding sources from business entities.
- If the proposer is a government (pemda / pemrov / ministry), the proposer builds the area through the source of APBN / APBD funds, then appoints the business entity as the manager through the tender, or appoints the BUMN / BUMD as the manager with equity.
- If the proposer is a government (pemda / pemrov / ministry), the proposer builds the area through a private government cooperation fund (PPP), then establishes the business entity winning the PPP tender as a manager

The SEZ development policy in Indonesia is directed to have an optimal contribution to the achievement of at least four components of national development priorities, namely:

- a. Building Indonesia from the suburbs by strengthening the regions and villages within the framework of the unitary State
- b. Improve the quality of human life of Indonesia
- c. Improve people's productivity and competitiveness in international markets
- d. Achieve economic independence by moving the strategic sectors of the domestic economy

Session-3: Group Discussion

Group 1

Theme: Community – Based Business Model in the Special Economic Zone of Peatland Restoration Investment

Facilitator: Hanni Adiati (KLHK) and Kuno Hiromitsu (JICA Mission)

Ideas and experiences sharing:

1. Joko Sulistyanto (KPHP Pulang Pisau)

The people of Pulang Pisau want something definite in the management of peat. The current trend in Pulpis is that the community is very enthusiastic to plant sengon (market need). The emphasis is (a) Is there a market certainty? (b) Is there legal certainty ?.

2. Prof. Robi

Experience socializing and working with the community: fostering the community of swampy farmers.

The academic community should always be in the field (technical assistance, social, economic). Do not come only when there is a project and then disappear when the project is completed, but must be sustainable in various forms of the program. So that people will respect and hear us, and get updates related to the latest data. Each stakeholder (ABCG) should work together, but the matrix must be clear, objective and appropriate on the ground, who does what!

3. Pak Fera

Prof. Robi speaks truly, that the facilitator must exist in each region. BRG should have a Peat Cares Village program. Of the hundreds of thousands of hectares in West Kalimantan, approximately 119 hectares of hectares are responsible for restoration in West Kalimantan, in unlicensed cultivation areas. Ownership of land is owned by only a handful of people who historically are the first to penetrate / open forests, farmers just borrow only.

Feedback to pack Fera:

KLHK approach is a forest area, if the forest area is owned by indigenous peoples, it is recognized as a customary forest status (listed in the Ministry of Home Affairs). The problem is if it is not recorded by MoHA, so it needs to be identified whether the area belongs to customary forest or not. If not customary forest can enter the social forest.

There are three questions we must answer together: Where, what business, and who does what?

The type of business chosen that has been grown in the community, if possible do not develop something that does not exist.

Who does what, these are identified whether on-farm or off-farm, land based or non land based. The characters of society living in the vicinity of peatlands are have no land, no skills, no access to venture capital, and no entrepreneurial nature. That's why we need entrepreneurs in off-farm for processing and marketing.

4. Pak Tanaka, NGO in Jepang

Providing input on appropriate technology aspects, with criteria: environmentally friendly, affordable costs, and in accordance with the characteristics and needs of local communities. For example: wastewater treatment. The NGO has developed TTG for biomass processing, especially for charcoal gasification.

5. Pak Deddy

He is developing waste-based agribusiness. Sago produces waste, and waste can be used media and organic fertilizers, in addition to Meranti also in South Kalimantan.

6. Pak

The emerging questions are:

- (a) Where the feasible location for a peatland restoration business system is established, with the following criteria: not entering the concession area;
- (b) When we can do it;
- (c) Who does what.

7. Pak Pasaribu, IPB

There is a brief overview of research on how profiles of advanced farmers. The results showed that the plant will be sustainable if there is diversification with periodic harvest that is not long, for example: planting chili, etc.

Diversification of agriculture is one of the approaches to the model of peat land restoration business.

8. Pak Yuprin

We can not order the people/communities to revegetate while the results are long. Supposedly, these lands are diversified with other products, such as fish, ducks, etc.

From economic calculations, the process of diversification is more advantageous when compared to one by one.

9. Pak Robi

The concept that we make must be multi commodity and multi effort

Conclusion:

The investment scheme for the peat land restoration business model should be affirmative and there are alignments, grass periods, low interest rates and buyers, not business as usual.

Group 2

Theme: Company – Based Business Model

The objectives of the discussion are:

- Looking for a suitable business model on peatlands,
- The type of commodity that can be sold and planted where
- What type of financial services will be used, and
- Who is the initiator

Adi Prayitno dari Pusat Studi Bencana – Anggota Konsorsium Universitas:

More friendly land base that has grown in Riau is plantation forest with sago commodity. This commodity has been planted PT National Sagu Prima, on an area of 11 thousand hectares in Pulau Tebing Tinggi located in the area of a peat dome with a peat depth of more than 3 meters. Of the 11,000 hectares of sago grown, 5000 hectares have been produced.

Deficiency:

- Intensification of agriculture is very massive
- Although sago is hydrology friendly, but prone to fire
- Productivity is lower than shallow peatlands

Challenge:

- It is worth considering the added value of sago plants, how to make SMEs that can create derivatives from sago plants, such as food products, sago cakes, etc.

Profesor Yazid:

Propose to discuss the problems on the ground before talking about who will invest. Because, many situations are intensified in the field, among them are:

- Burning area
- Degraded peat
- Land use issues
- Social culture (conflict with the community, the change of village boundaries from adat village to village)

Yanti, PT Sinar Pangan Indonesia

- PT SPI established in 2014, a rice crop commodity planted on an area of 1200 hectares
- In Central Kalimantan there are a lot of unplanted lands, especially in transmigration areas where there are already large rice fields (2010 and 2012) and unexplored rice fields are abandoned with bushes. In fact, there is an effort from the local people to plant, but the losses faced when the first planting is not contained. On average, each farmer has 15 hectares of paddy fields.
- PT SPI runs a Partnership System with farmers conducted as follows: profit sharing system where the land is managed for 5 years and leased Rp 500rb / hectare / year. The second year after harvest, farmers are given ½ blek or cans of 20kg per borong (1 ha, 28 - 35 borong)
- PT SPI targets rice productivity to reach 4 tons / ha
- Using superior varieties, resistant to immersion (inpari varieties 30 - harvest 6.4 tons/ha)
- Requires Rp.12 million / hectare for paddy field printing
- Profit: when planting rice at least 500 hectares area.
- Problem: Labor issues, hope the government can provide workable land. Manpower is needed. Bringing from Java, farm laborers who do not have land. From the foundation of the displaced, they are nurtured. They are given the land and salary. Self-help transmigration is come from the company.

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- Input from KLHK Sumsel: input of agrira reform should be given to people who want to manage the land, not for people who want to control the land.

Challenges:

- Infrastructure condition, mainly land is damaged. When the rainy season is impassable, eventually use the waterway
- Labor difficulties
- Difficulties when unloading land (some excavators are drowning in peatland)
- Labor issues, during this time to bring from Java: farm laborers who do not have land and from foundations of displaced people. They are nurtured, given the land, and salary.

Advantages:

- Support from local government
- The market is guaranteed because of cooperation with Bulog
- Land already exists
- The community is ready to cooperate,
- Profit oriented of the company can be count

Prof Adi Prayitno

- Presenting the scheme of an Integrated Sago Industry Agro Business
- Sago plant: 30 percent is sago starch and 70 percent is waste. If this waste is processed as an added value, it will be a big addition to farmers, and sago crops on peatlands become a promising business. Sago waste can be used for animal feed, fuel, furniture, and fertilizer. It would be good if sago refinery owners are not fixated on the production of sago flour.
- Need investment from upstream to downstream
- Need to build the model and this trial needs to be facilitated by the local government.

Ibu Ani Kemenkeu:

- PT SPI has prepared an integrated area
- PT SPI already has plans for the development of livestock, corn, and coffee. Currently, manure is imported from the outside. After the farm runs the need for manure can be fulfilled itself.
- The concept of PT SPI is clear and still carries the scheme of 'green investment'.
- PT SPI pattern can be modeled.
- In one special economic region there may be more than one commodity model.

UPT KLHK Sumsel:

There is a glimmer of hope from the model developed by PT Sinar pangan Indonesia. The most interesting of PT SPI is the partnership system used where he uses BUMDES and uses agricultural extension. PT SPI scheme can be used as the initial model used together.

Input for Pineapple and areca nut Commodities:

Pineapple:

- In the Ogan Komerang Ilir (OKI) District, the community has already planted pineapple on peat soil but no investors yet.
- Pineapple grown on peatlands favored by the local market: sour, sweet, and fresh
- In Lampung: pineapple plantation and trading already exists.

Areca nut:

- In Tanjung Jabung Barat: areca nut demand has increased rapidly since last 5 years for export.
- Why is areca nut: 3R, not business only, but also for restoration

Prof Gatot Supangkat from UMY:

- Sustainability of farming industry should be considered.
- Sustainability paradigm: ecologically viable, economically feasible, socially culturally feasible - the most important is the certainty of the status of the land.
- Establish a company whose shares are 80 percent owned by farmers.

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- In order to have a better income for both farmers and private company sectors, the partnership in the farm system should be upstream to downstream as a whole, not partially. This is because the highest value for farmers is in downstream.
 - Hope the recommendations of this workshop are not technical.

Summaries:

- Discusses the company's business model, but the result is a community-based company.
- Model: one large area model eg rice: 1200 hectares
- Initiation of program: sago (Merati), rice (Kalsel), pineapple and areca nut (South Sumatra)
- Challenges: local challenges - more on providing support, tax allowance etc.
- There are different conditions and properties of peat. Thus, one commodity is not enough to be offered to the investor.
- This is not business as usual, it should still pay attention to the preservation of the ecosystem.
- Infrastructure is always a potential problem for potential investors, so the government needs to intervene
- Capital should not expect capital from abroad.
- Need to create a mature investment scheme
- Seeking investment from the business world, but with the pattern of partnership with the community. Community empowerment, not conglomeration.
- One Homework: follow-up plan.

Additional input from Budi Wardhana:

Actually what is needed is a regional approach, because our peat is a landscape. In a single business model of landscape, the economic area approach is very important. In the landscape, it is clearly visible which areas that may be developed, has been developed and will be developed. For example, infrastructure access (plant construction sites, roads, offices etc) and energy resources must be clear. The unity of the direction of economic development makes the government easy to provide infrastructure (road infrastructure, market, and financial). We need to determine what infrastructure is suitable for the region.

This approach is similar to the approach that used for peatland management. Peat management approach is through KHG in which there are different types or groups of industry sectors. Each consortium has already provided a study on what commodities can be developed in the each respective area. Not all of this commodity enters the stage of industrialization. Probably it is still based on activities undertaken by community groups. Stages to separate which is more suitable to remain managed by the community and which has reached the stage that can be developed industrially, where the benefits by developing SEZ peat can be taken advantage of as much as possible can be developed, and arrange it into KEK.

Speaking of commodities, development considerations for commodities are up to the extent to which we know their development and utilization. Examples of sago cultivation in the Meranti Islands, the stage has not reached the final process, has not even formed the process of white temps as a food industry. The question is we want to move on an economic scale like what. Large economies of scale will need big investment and has big risk. Financial markets should also be considered. Although some incentives and facilitation for investment has been given but the risk still persists as it is a new product. It should also be prepared in our matrix of developing the economic area.

The expected input from this meeting is that each commodity or area that has been studied by the consortium has reached which stage to enter into the company's business form, where has its scope been? Where has its integration with other commodities been? It needs to be made in matrix form.

One thing that remains untouched is the non-marketable commodities in general. It is carbon. If we see, not all areas whose commodities can be processed into commodities consumed by the community, may be a region whose nature is based on the unity of the ecosystem is a protected function area. Restoration, rehabilitation and revegetation activities may be assessed on the basis of the carbon benefits resulting from the restoration work. This is what has not been discussed until now, but it is also important.

Session 4: Pleno Session

Results Discussion Group I: Community-Based Business in Special Economic Zone for Peat Restoration Investment

The conclusions of the discussion are as follows:

1. Regarding the business concept, the area of peat restoration in community level that attracted investors are as follows:

- Availability of support from banks and public service agencies such as financial institutions in KLHK or other agencies, as well as a support from private sectors and other financial institutions .
- There should be special government support ie low interest schemes. Low interest rates because the cash flow of business in peat restoration is very heavy
- There should be a period where it does not have to pay bank interest. Taking the example of the Public Service Board in KLHK there is a system of about 5-6 years interest free during the area is planted, after the new production plants pay interest.
- This business must have market guarantees. The community forest plantation program linked to the company that wants to buy is very exciting to the community. So the market guarantee from the government becomes a must.
- Businesses built should vary, diversify income. So there are revenues can be taken yearly, monthly, and maybe daily.

2. The steps:

- a. There are existing Social Forestry Working Groups in each provincy, including in peatlands and in the mineral areas. This institution can be utilized by BRG to synergize. Strengthening the business community through this working group, the data is also quite complete.
- b. Second Concept: BRG cooperates with banks, formulates investment projects at commodity level that are not burdensome to the public. BRG can also work with foreign donors where funds are held in national banks such as BRI for channeling so that the interest remains low at the community level.
- c. Preparation of investment: the location should be safe, has been rewetted and not burning.
- d. Maintenance of community groups that will do business, there must be technical assistance, social and marketing
- e. The identification of commodities must be careful that the commodities being sold can revitalize people's lives in the restored peatlands.

Result of group discussion II: Proposed Model

1. There are four existing models that are: rice, sago, pineapple and areca nut.
2. There are two business models that can be done, namely the Zone/Regional Business Model and the Commodity Business Model.

A. Regional Business Model:

- The model of this area is almost the same as that owned by BRG using KHG model.

Advantages of Regional Business Model:

- There are existing KHGs from BRG. BRG has about 33 KHG ready for the map and just put the business analysis on it.
- The government provides various facilities and incentives for activities in the region.
- Foreign ownership facilities in business activities located above this special economic area are longer.
- In one area can be many companies and can be many commodities. Further steps if we choose that option then needed as follows:
 - Required site selection based on proposed KHG.
 - It takes the administrative process in proposing the area to the government in consultation with the regional councils

-
- Complete business model certainty covers commodity type, business cycle, marketing, manpower etc and coincided with the administrative process.

Weakness of regional business model:

- The filing process is long
- Need spatial,
- Need the reappraised parties

B. Commodity Model

Currently that has been running is a commodity of rice, sago, pineapple, and areca nut

Advantages of Commodity models:

- environmentally friendly,
- ecosystem friendly peat,
- It is a product that can be developed by society at large,
- It can directly engage with private sector.

Weaknesses of Commodity models:

- There is a business analysis or economies of scale that can be done with investors
- (so in fact it is quite a lot, but business analysis or calculation of the ekomi scale does not exist yet)
- Need market analysis
- Need a socio-cultural analysis that supports the business base in order for this sustainability to be maintained.
- For rice commodities: need ready land, labor, road infrastructure.

3. Conclusion from Group 1 dan 2 are:

- Integrated farming,
- Need a partnership pattern

These two things should be knitted together.

Closing remarks

By Haris Gunawan, Deputy of Research and Development, BRG RI

Some things in today's workshop formulation need to be followed up before packaged more ready to be brought in the business growth economic forum to be held in Osaka, Japan.

The Government of Indonesia until 2019 has an investment target to be the most important drive in economic development. So this is very much in line with the Government of Indonesia's plan. Therefore the formulation leads to the establishment of Special Economic Zone of Investment and Green Economy Development. In order for us to become king in our own country and land.

Investment development should be appropriate to the economic scale of its activities, both small and medium enterprise development. The questions are, now we come to what stage and want to finish up to what stage? This is what has not been declared in this workshop.

There should be a target when it can be realized.

Event closed. #

2 Translation of Governmental Regulations Concerned on Peatland Restoration

2.1. PP No. 71/ 2014

PRESIDENT OF
THE REPUBLIC OF INDONESIA

INDONESIAN GOVERNMENT REGULATION
NUMBER 71 OF 2014
CONCERNING
PROTECTION AND MANAGEMENT OF PEATLAND ECOSYSTEMS

BY THE GRACE OF GOD ALMIGHTY

PRESIDENT OF THE REPUBLIC OF INDONESIA,

Considering : that in order to implement the provisions of Article 11, Article 12, Article 21 paragraph (3) point (f) and (5), Article 56, Article 57 paragraph (5), Article 75, and Article 83 of Act Number 32 of 2009 on Environmental Protection and Management, it is necessary to establish Government Regulation on the Protection and Management of Peatland Ecosystems;

In view of : 1. Article 5 paragraph (2) of the 1945 Constitution of the Republic of Indonesia;
2. Act Number 32 of 2009 on the Environmental Protection and Management (State Gazette of the Republic of Indonesia of 2009 Number 140, Supplement to State Gazette of the Republic of Indonesia Number 5059);

DECIDED

To stipulate : THE GOVERNMENT REGULATION CONCERNING PROTECTION AND MANAGEMENT OF PEATLAND ECOSYSTEMS

CHAPTER 1
GENERAL PROVISIONS

Article 1

In this Government Regulation:

1. Protection and Management of Peatland Ecosystems is a systematic and integrated effort made to preserve the functions of Peatland Ecosystems and prevent damage to them through planning, utilization, control, maintenance, monitoring, and law enforcement.
2. Peat is an organic material formed naturally from the remains of plants decomposed imperfectly and accumulating in the swamp.
3. Peatland Ecosystem is the order of Peat elements constituting a single complete entity, influencing each other in the form of balance, stability, and productivity.
4. Peatland Hydrological Entity is a Peatland Ecosystem located between two (2) rivers, between the river and the sea, and/or in the swamp.
5. Minister is the minister in charge of governmental affairs in the field of environmental protection and management.

Article 2

- (1) This environmental protection and management shall include that provided for the ecosystems of:
 - a. land for biomass production;
 - b. coral reef;
 - c. mangrove;
 - d. seagrass bed;
 - e. Peatland;
 - f. karst; and/or
 - g. others classified as such according to the advancement of science and knowledge.
- (2) This government regulation shall only regulate Peatland Ecosystem Protection and Management.
- (3) Provisions on the protection and management of ecosystems as referred to in paragraph (1) points (a), (b), (c), (d), (f), and (g) shall be regulated in a separate government regulation.

Article 3

Peatland Ecosystem Protection and Management as referred to in Article 2 paragraph (2) shall include:

- a. planning;
- b. utilization;
- c. control;
- d. maintenance;
- e. monitoring; and
- f. administrative sanction.

CHAPTER II

PLANNING

First Section

General

Article 4

The Planning of Peatland Ecosystem Protection and Management shall be made through such stages as:

- a. Peatland Ecosystem inventory;
- b. Peatland Ecosystem function determination; and
- c. Peatland Ecosystem Protection and Management plan drafting and stipulation.

Second Section

Peatland Ecosystem Inventory

Article 5

- (1) The Peatland Ecosystem inventory as referred to in Article 4 point (a) shall be performed by means of:
 - a. satellite image; and/or
 - b. aerial photograph.
- (2) The implementation of inventory as referred to in paragraph (1) shall be performed in consideration of the map indicating national Peatland Ecosystem distribution contained in the Appendix, which forms an integral part of this Government Regulation.

- (3) The Peatland Ecosystem inventory as referred to in paragraph (1) shall be performed by the Minister.

Article 6

- (1) The satellite image and/or aerial photograph as referred to in Article 5 paragraph (1) shall be interpreted through the following stages:
- a. delineating the satellite image and/or aerial photograph, which have been radiometrically and geometrically corrected to determine the position and borders of the Peatland Hydrologic Entity; and
 - b. placing the result of satellite image and/or aerial photograph delineation into the tentative map of Peatland Ecosystem Hydrological Entity at a minimum scale of 1:250,000.
- (2) The result of satellite image and/or aerial photograph interpretation as referred to in paragraph (1) shall be verified by field survey activity.
- (3) The field survey as referred to in paragraph (2) shall be made for verifying:
- a. the presence of Peatland Hydrological Entity; and
 - b. the Peatland Ecosystem characteristics.
- (4) The result of verification as referred to in paragraph (3) shall be evaluated to obtain a final map of Peatland Hydrologic Entity.
- (5) The final map of Peatland Hydrological Entity as referred to in paragraph (4) shall be presented at a minimum scale of 1:250,000.

Article 7

- (1) The final map of Peatland Hydrological Entity should at least contain data and information on:
- a. location, presence, and area of Peatland Hydrological Entity;
 - b. physical, chemical, and biological characteristics, hydrotopography, and sediment type underneath the Peat which include:
 1. point location or coordinate;
 2. land elevation;
 3. groundwater, inundation, or flooding;
 4. land cover, land use, and their conditions;
 5. existence of protected flora and fauna;
 6. natural and artificial drainage conditions;

7. water quality;
 8. overflow type;
 9. Peat thickness;
 10. Peat material weight proportion;
 11. Extent or damage level of Peat;
 12. substratum characteristics beneath the Peat layer; and
 13. land characteristics and pyrite layer depth.
- (2) The final map of Peatland Hydrological Entity as referred to in paragraph (1) shall be used as a reference to determine the function of Peatland Ecosystems.

Article 8

Further provisions on the implementation procedure of Peatland Ecosystem inventory shall be governed by a Ministerial Regulation.

Third Section

Peatland Ecosystem Function Determination

Article 9

- (1) The Peatland Ecosystem function determination as referred to in Article 4 point (b) shall be made by the Minister upon coordination with:
- a. the minister in charge of government affairs in the field of forestry and the one in charge of government affairs in the field of water resource and spatial zoning, in case the Peatland Ecosystems to be determined are located within a forest area; and
 - b. the minister in charge of government affairs in the field of water resource and spatial zoning, in case the Peatland Ecosystems to be determined are located outside a forest area.
- (2) The Peatland Ecosystem function as referred to in paragraph (1) shall include:
- a. Peatland Ecosystem protective function; and
 - b. Peatland Ecosystem cultivating function.
- (3) The Minister shall be required to determine the Peatland Ecosystem protective function area of at least thirty percent (30%) of the total Peatland Hydrological Entity area, located at the Peat dome peak and surrounding area.

- (4) In case, more than thirty percent (30%) of total Peat Hydrological Entity area as referred to in paragraph (3) there remains:
- a. Peat at three meters (3m) or more in thickness;
 - b. specific and/or endemic germ plasm;
 - c. protected species in accordance with the regulations of law; and/or
 - d. Peatland Ecosystems located within the protection area as determined in a regional spatial zoning plan, protected forest area, and conservation forest area,
- the Minister shall determine them to be Peatland Ecosystem protective function areas.
- (5) The Peatland Hydrological Entity area as referred to in paragraphs (3) and (4) shall be based on the final map of Peatland Hydrological Entity as referred to in Article 7.
- (6) In case the Peatland Ecosystems do not meet the provisions as referred to in paragraphs (3) and (4), the Minister shall determine them to be Peatland Ecosystem cultivating function areas.

Article 10

- (1) The Peatland Ecosystem function areas determined by the Minister to be Peatland Ecosystem protective and cultivating function areas as referred to in Article 9 shall be presented in the form of a Peatland Ecosystem function map.
- (2) The Peatland Ecosystem function map as referred to in paragraph (1) shall consist of:
- a. a national Peatland Ecosystem function map presented at a minimum scale of 1:250,000;
 - b. a provincial Peatland Ecosystem function map presented at a minimum scale of 1:100,000;
 - c. a regency¹/municipal Peatland Ecosystem function map presented at a minimum scale of 1:50,000.

Article 11

- (1) Any Peatland Ecosystems with cultivating function² can be changed into Peatland Ecosystems with protective function.³

¹ Translator's note: Indonesia's administrative divisions include provinces, regencies and municipalities. A regency, under the authority of a regent, is equivalent to a district.

² Translator's note: i.e., Peatland that has a production function, i.e. that can be exploited for business or other activity. Contrasting with peatland with a protection function, i.e. the function of which is to protect a natural resource.

³ Translator's note: i.e., protected Peatland, peatland that needs to be part of a protected area.

- (2) Such change of Peatland Ecosystem function as referred to in paragraph (1):
- a. shall be performed by the Minister; or
 - b. shall be based on the governor or regent/mayor's proposal according to their authority.
- (3) Such change of Peatland Ecosystem function as referred to in paragraph (1) can be made in the event:
- a. the Peatland Ecosystems meet the provisions as referred to in Article 9 paragraph (4) points (c) and (d);
 - b. an ecological urgency prevent environmental damage or make recovery efforts to and/or around the Peatland Ecosystems occur; and/or
 - c. an ecological urgency to make Peatland Ecosystem reservation efforts in a province or regency/municipality occurs.
- (4) The Peatland Ecosystem function change as referred to in paragraphs (1) and (2) shall be determined by the Minister upon coordination with:
- a. the minister in charge of government affairs in the field of forestry and the one in charge of government affairs in the field of water resource and spatial zoning, in case the Peatland Ecosystem function change to be determined is located within a forest area;
 - b. the minister in charge of government affairs in the field of water resource and spatial zoning, in case the Peatland Ecosystem function change to be determined is located outside a forest area; and
 - c. the governor and/or regent/mayor according to their authority.
- (5) In performing the coordination as referred to in paragraph (4), the Minister may establish a study team for Peatland Ecosystem function change.
- (6) Further provisions on the procedure to establish a study team for Peatland Ecosystem function change and the procedure to propose a Peatland Ecosystem function change by the governor or regent/mayor shall be governed by a Ministerial Regulation.

Article 12

Any Peatland Ecosystems determined to be protective or cultivating function areas shall be used as materials in the drafting and review of the regional spatial zoning plan together with the detailed plan.

Article 13

Further provisions on the procedure to determine Peatland Ecosystem function shall be governed by a Ministerial Regulation upon coordination with relevant minister(s).

Fourth Section

Peatland Ecosystem Protection and Management Plan Drafting and Stipulation

Article 14

- (1) The Peatland Ecosystem Protection and Management plan drafting as referred to in Article 4 point (c) shall include:
 - a. a national Peatland Ecosystem Protection and Management plan;
 - b. a provincial Peatland Ecosystem Protection and Management plan; and
 - c. a regency/municipal Peatland Ecosystem Protection and Management plan.
- (2) The national Peatland Ecosystem Protection and Management plan as referred to in paragraph (1) point (a) shall be drafted for cross-province Peatland Ecosystem Protection and Management.
- (3) The provincial Peatland Ecosystem Protection and Management plan as referred to in paragraph (1) point (b) shall be drafted for Protection and Management of Peatland Ecosystems located within provinces.
- (4) The regency/municipal Peatland Ecosystem Protection and Management plan as referred to in paragraph (1) point (c) shall be drafted for Protection and Management of Peatland Ecosystems located within regencies/municipalities.

Article 15

- (1) The national Peatland Ecosystem Protection and Management plan as referred to in Article 14 paragraph (1) point (a) shall be drafted based on the national Peatland Ecosystem function map as referred to in Article 10 paragraph (2) point (a).
- (2) The provincial Peatland Ecosystem Protection and Management plan as referred to in Article 14 paragraph (1) point (b) shall be drafted based on:
 - a. the national Peatland Ecosystem Protection and Management plan as referred to in paragraph (1); and
 - b. the provincial Peatland Ecosystem function map as referred to in Article 10 paragraph (2) point (b).
- (3) The regency/municipal Peatland Ecosystem Protection and Management plan as referred to in Article 14 paragraph (1) point (c) shall be drafted based on:

- a. the national Peatland Ecosystem Protection and Management plan as referred to in paragraph (1);
- b. the provincial Peatland Ecosystem Protection and Management plan as referred to in paragraph (2); and
- c. the regency/municipal Peatland Ecosystem function map as referred to in Article 10 paragraph (2) point (c).

Article 16

- (1) The national Peatland Ecosystem Protection and Management plan as referred to in Article 15 paragraph (1) shall be drafted and stipulated by the Minister upon coordination with:
 - a. the minister in charge of government affairs in the field of forestry; and
 - b. the minister in charge of government affairs in the field of water resources and spatial zoning.
- (2) The provincial Peatland Ecosystem Protection and Management plan as referred to in Article 15 paragraph (2) shall be drafted and stipulated by the governor.
- (3) The regency/municipal Peatland Ecosystem Protection and Management plan as referred to in Article 15 paragraph (3) shall be drafted and stipulated by the regent/mayor.
- (4) The stipulation of Peatland Ecosystem Protection and Management plan by a governor or regent/mayor as referred to in paragraphs (2) and (3) should obtain prior technical recommendation from the Minister.

Article 17

- (1) The Peatland Ecosystem Protection and Management plan should at least contain a plan for:
 - a. Peatland Ecosystem utilization and/or reservation;
 - b. Peatland Ecosystem quality and/or function maintenance and protection;
 - c. control, monitoring, and empowerment and conservation of Peatland Ecosystems;
 - and
 - d. adaptation to and mitigation of climate change.
- (2) The Peatland Ecosystem Protection and Management plan as referred to in paragraph (1) should consider:
 - a. character diversity and ecological function;
 - b. population distribution;

- c. potential natural resources distribution;
 - d. local wisdom;
 - e. public aspiration;
 - f. climate change; and
 - g. regional spatial zoning plan.
- (3) The Peatland Ecosystem Protection and Management plan forms a part of the environmental protection and management plan.

Article 18

- (1) In case Peatland Ecosystems with cultivating function are changed into Peatland Ecosystems with protective function as referred to in Article 11, the Peatland Ecosystem Protection and Management plan which has been stipulated as referred to in Article 16 should be changed.
- (2) The change in Peatland Ecosystem Protection and Management plan made by a governor or regent/mayor should obtain technical recommendation from the Minister.

Article 19

Further provisions on the procedure to draft, stipulate, and change a Peatland Ecosystem Protection and Management plan shall be governed by a Ministerial Regulation upon coordination with relevant minister(s).

CHAPTER III UTILIZATION

Article 20

- (1) The Peatland Ecosystem utilization shall be performed based on the national, provincial, and regency/municipal Peatland Ecosystem Protection and Management plans as referred to in Article 16.
- (2) The Peatland Ecosystem utilization as referred to in paragraph (1) can be applied to Peatland Ecosystems with both protective function and cultivating function.
- (3) The Peatland Ecosystem utilization as referred to in paragraph (2) shall be required to be performed by maintaining the Peat hydrologic function.

Article 21

- (1) Peatland Ecosystems with protective function as referred to in Article 20 paragraph (2) may be utilized in a limited fashion for activities in such fields as:
 - a. research;
 - b. science and knowledge;
 - c. education; and/or
 - d. environmental service.
- (2) Peatland Ecosystems with cultivating function may be utilized for all activities as per the Peatland Ecosystem Protection and Management plan.

CHAPTER IV

CONTROL

First Section

General

Article 22

- (1) The Peatland Ecosystem damage control shall be performed based on the national, provincial, and regency/municipal Peatland Ecosystem Protection and Management plans as referred to in Article 16.
- (2) The Peatland Ecosystem damage control shall consist of:
 - a. Peatland Ecosystem damage prevention;
 - b. Peatland Ecosystem damage response; and
 - c. Peatland Ecosystem damage recovery.

Second Section

Peatland Ecosystem Damage Prevention;

Article 23

- (1) Peatland Ecosystem damage may occur to:
 - a. Peatland Ecosystems with protective function; and
 - b. Peatland Ecosystems with cultivating function.
- (2) Peatland Ecosystems with protective function shall be declared damaged if the damage standard criteria are exceeded as follows:
 - a. an artificial drainage exists in the predetermined Peatland Ecosystems with protective function;

- b. pyrite and/or quartz sediments beneath the Peat layer are exposed; and/or
 - c. land cover area and/or volume in the predetermined Peatland Ecosystems with protective function are reduced.
- (3) Peatland Ecosystems with cultivating function shall be declared damaged if meeting the damage standard criteria as follows:
- a. the ground water level in the Peatland is greater than zero point four meter (0.4m) beneath the Peat surface; and/or
 - b. pyrite and/or quartz sediments beneath the Peat layer are exposed.

Article 24

- (1) The provisions on damage standard criteria of Peatland Ecosystems as referred to in Article 23 paragraph (3) shall be exempted from Peatland Ecosystems of less than one meter (1m) in thickness in the Peatland Ecosystems with cultivating function.
- (2) The damage standard criteria of Peatland Ecosystems of less than one meter (1m) in thickness in Peatland Ecosystems with cultivating function as referred to in paragraph (1) shall be stipulated in the environmental permit.

Article 25

- (1) The person in charge of businesses and/or activities utilizing Peatland Ecosystems with cultivating function, which is required to have an environmental impact assessment or an environmental management effort and environmental monitoring effort, shall be required to obtain an environmental permit from the Minister, governor, and/or regent/mayor as per their authorities.
- (2) The requirements and procedure to request an environmental permit as referred to in paragraph (1) shall be in accordance with the provisions of law.

Article 26

Anyone is prohibited from:

- a. opening land in Peatland Ecosystems with protective function;
- b. creating a drainage canal causing drought to the Peatland;
- c. burning any Peatland; and/or
- d. performing other activities which cause the damage standard criteria of Peatland Ecosystems to be exceeded as referred to in Article 23 paragraphs (2) and (3).

Third Section
Peatland Ecosystem Damage Response

Article 27

- (1) The person in charge of businesses and/or activities utilizing Peatland Ecosystem in such a way which causes damage(s) to the Peatland Ecosystems within or outside his/her business and/or activity areas shall be required to make a response as per his/her obligations under the environmental permit.
- (2) The Peatland Ecosystem damage response as referred to in paragraph (1) shall be required to be performed by the person in charge of businesses and/or activities that cause damages resulting from:
 - a. Peatland fire;
 - b. pyrite and/or quartz sediments being exposed;
 - c. drainage construction causing drought to the Peat; and/or
 - d. land opening in Peatland Ecosystems.
- (3) The Peatland Ecosystem damage response as referred to in paragraph (2) shall be performed by:
 - a. firefighting;
 - b. isolating the area in which the pyrite and/or quartz sediments are exposed;
 - c. constructing a dam overflow (tabat) or a water controlling construction; and/or
 - d. other methods causing no negative impacts on the Peatland Ecosystems.

Article 28

In case the person in charge of businesses and/or activities does not perform any damage response as referred to in Article 27 within at the latest twenty-four (24) hours from the time a damage incident is made known to him/her, the Minister, governor, or regent/mayor as per their authorities shall assign a third party to perform the damage response of Peatland Ecosystems at the expense of such person in charge of businesses and/or activities.

Article 29

- (1) In case the person in charge of businesses and/or activities does not perform any response, the costs charged to the person in charge of businesses and/or activities as referred to in Article 28 shall be calculated as an environmental loss.

- (2) The amount of environmental loss as referred to in paragraph (1) shall be determined based on agreement between Minister, governor, or regent/mayor and such person in charge of businesses and/or activities.

Fourth Section

Recovery

Article 30

- (1) The person in charge of businesses and/or activities utilizing the Peatland Ecosystem in such a way which causes damage(s) to the Peatland Ecosystems within or outside his/her business and/or activity areas shall be required to make a recovery as per his/her obligations under the environmental permit.
- (2) The recovery within and outside the business and/or activity areas as referred to in paragraph (1) must be performed by the person in charge of businesses and/or activities against the damage as referred to in Article 27 paragraph (2).
- (3) The recovery shall be performed by:
- a. rehabilitation;
 - b. restoration; and/or
 - c. other methods consistent with the advancement of science, knowledge, and technology.
- (4) Further provisions on the function recovery criteria of Peatland Ecosystems shall be governed by a Ministerial Regulation.

Article 31

In case the person in charge of businesses and/or activities does not make any Peatland Ecosystem function recovery as referred to in Article 30 within at the latest thirty (30) days from the date a damage incident is made known to him/her, the Minister, governor, or regent/mayor as per their authorities shall assign a third party to perform the Peatland Ecosystem function recovery at the expense of such person in charge of businesses and/or activities.

Article 32

- (1) In case the person in charge of businesses and/or activities does not perform any recovery, the costs charged to the person in charge of businesses and/or activities as referred to in Article 31 shall be calculated as an environmental loss.
- (2) The amount of environmental loss as referred to in paragraph (1) shall be determined based on agreement between Minister, governor, and/or regent/mayor and such person in charge of businesses and/or activities.

CHAPTER V
MAINTENANCE

Article 33

The Peatland Ecosystem maintenance as referred to in Article 17 paragraph (1) point (b) shall be performed by:

- a. reserving the Peatland Ecosystems; and/or
- b. conserving the Peatland Ecosystem function as a climate change impact controller.

Article 34

- (1) The Peatland Ecosystem reservation as referred to in Article 33 point (a) shall be established by the Minister, governor, or regent/mayor.
- (2) The Peatland Ecosystem reservation as referred to in paragraph (1) shall be established through the determination of Peatland Ecosystem which cannot be managed within a certain period of time.
- (3) The Peatland Ecosystem which cannot be managed within a certain period of time as referred to in paragraph (2) shall include:
 - a. Peatland Ecosystems with protective function the area of which is less than thirty percent (30%) of the total Peatland Hydrological Entity area in provinces or regencies/municipalities;
 - b. Peatland Ecosystems with cultivating function fifty percent (50%) of the area of which is exploited by business or activity for which a permit has been issued, and for which the exploitation exceeds the damage standard criteria as referred to in Article 23;
 - c. Peatland Ecosystems assigned for utilization moratorium under the regulations of law; and/or

- d. Peatland Ecosystems with cultivating function whose function has been changed to Peatland Ecosystems with protective function by the Minister as referred to in Article 11 paragraph (3) point (c).
- (4) The stipulation of Peatland Ecosystems which cannot be managed within a certain period of time as referred to in paragraph (2) shall be included in the national, provincial, and regency/municipal Peatland Ecosystem Protection and Management plans.

Article 35

- (1) The conservation of Peatland Ecosystem function as a climate change impact controller as referred to in Article 33 point (b) shall be performed by:
 - a. climate change mitigation effort; and
 - b. climate change adaptation effort.
- (2) The climate change mitigation and adaptation efforts as referred to in paragraph (1) shall be performed in accordance with regulations of law.

CHAPTER VI MONITORING

Article 36

- (1) The Minister, governor, or regent/mayor as per their authorities shall be required to monitor the compliance of the person in charge of businesses and/or activities of Peatland Ecosystem utilization with:
 - a. provisions on utilization, control, and maintenance of Peatland Ecosystems; and
 - b. requirements and obligations contained in the environmental permit.
- (2) The Minister, governor, or regent/mayor may delegate their authority in performing such monitoring to officials or technical institutions responsible for environmental protection and management.
- (3) In performing this monitoring, the Minister, governor, or regent/mayor shall assign an environmental monitoring official who is a functional official.

Article 37

- (1) The environmental monitoring official as referred to in Article 36 paragraph (3) shall be authorized to:
 - a. perform monitoring;
 - b. ask for information;

- c. make a copy of documents and/or make a note needed;
 - d. enter certain places;
 - e. take pictures;
 - f. make audio/visual recordings;
 - g. take samples;
 - h. examine equipment;
 - i. examine plants and/or means of transportation; and/or
 - j. stop certain violations.
- (2) In performing his/her duty, an environmental monitoring official may coordinate with state investigation officials.
- (3) The person in charge of businesses and/or activities shall be prohibited from hindering the performance of the environmental monitoring official's duties.

Article 38

- (1) The environmental monitoring official shall be a civil servant who meets the minimum rank requirement of junior superintendent of level/group IIIa.
- (2) In addition to the rank requirement referred to in paragraph (1), he/she should be a civil servant who passes environmental monitoring education and training.

Article 39

The provisions on the environmental monitoring official shall be governed with or based on the regulation of the minister in charge of government affairs in the field of state apparatus empowerment and bureaucracy reform.

CHAPTER VII ADMINISTRATIVE SANCTION

Article 40

- (1) The Minister, governor, or regent/mayor as per their authorities shall apply administrative sanctions.
- (2) The administrative sanctions as referred to in paragraph (1) shall consist of:
- a. written reprimand;
 - b. government coercion;
 - c. environmental permit freezing; or
 - d. environmental permit revocation.

- (3) The government coercion as referred to in paragraph (2) point (b) shall include:
- a. temporary activity cessation;
 - b. activity facility relocation;
 - c. drainage canal closure;
 - d. dismantlement;
 - e. seizure of goods or tools potentially causing any violation;
 - f. temporary cessation of all activities; and/or
 - g. other actions aiming at stopping violation and recovering environmental functions.

Article 41

Anyone violating the provisions of Article 26 shall be subject to government coercion as referred to in Article 40 paragraph (3).

Article 42

- (1) In case the violation of provisions of Article 26 is made by the person in charge of businesses and/or activities, the Minister, governor, or regent/mayor as per their authorities shall give an administrative sanction in the form of government coercion as referred to in Article 40 paragraph (3).
- (2) In case the person in charge of businesses and/or activities does not respond to the government coercion as referred to in paragraph (1), the Minister, governor, or regent/mayor as per their authorities shall pass an administrative sanction in the form of environmental permit freezing.
- (3) In case the person in charge of businesses and/or activities does not comply with the provisions in environmental permit freezing as referred to in paragraph (2), the Minister, governor, or regent/mayor as per their authorities shall pass an administrative sanction in the form of environmental permit revocation.
- (4) Further provisions on criteria and term of fulfillment of provisions on government coercion, environmental permit freezing, and environmental permit revocation shall be governed by a Ministerial Regulation.

Article 43

- (1) The person in charge of businesses and/or activities utilizing a Peatland Ecosystem in such a way which violates the provisions of Articles 27 and 28 shall be subject to an

administrative sanction in the form of government coercion as referred to in Article 40 paragraph (3).

- (2) In case the person in charge of businesses and/or activities utilizing a Peatland Ecosystem does not respond to the government coercion as referred to in paragraph (1), the Minister, governor, or regent/mayor shall pass an administrative sanction in the form of environmental permit freezing.
- (3) In case the person in charge of businesses and/or activities does not comply with the provisions in environmental permit freezing as referred to in paragraph (2), the Minister, governor, or regent/mayor as per their authorities shall pass an administrative sanction in the form of environmental permit revocation.
- (4) Further provisions on criteria and term of fulfillment of provisions on government coercion, environmental permit freezing, and environmental permit revocation shall be governed by a Ministerial Regulation.

Article 44

- (1) The person in charge of businesses and/or activities utilizing a Peatland Ecosystem in such a way which violates the provisions of Articles 30 and 31 shall be subject to an administrative sanction in the form of government coercion as referred to in Article 40 paragraph (3).
- (2) In case the person in charge of businesses and/or activities utilizing a Peatland Ecosystem does not respond to the government coercion as referred to in paragraph (1), the Minister, governor, or regent/mayor shall pass an administrative sanction in the form of environmental permit freezing.
- (3) In case the person in charge of businesses and/or activities utilizing a Peatland Ecosystem does not comply with the provisions in environmental permit freezing as referred to in paragraph (2), the Minister, governor, or regent/mayor shall pass an administrative sanction in the form of environmental permit revocation.
- (4) Further provisions on criteria and term of fulfillment of provisions on government coercion, environmental permit freezing, and environmental permit revocation shall be governed by a Ministerial Regulation.

CHAPTER VIII TRANSITIONAL PROVISIONS

Article 45

By the time this Government Regulation begins to be in full effect and force:

- a. the business and/or activity permit to utilize Peatland Ecosystems in Peatland Ecosystems with protective function, which has been issued prior to the effective date of, and the operation of, this Government Regulation, shall be declared to remain in effect until the expiry of such permit.
- b. the activity of utilizing Peatland Ecosystems with protective function, which has obtained a business and/or activity permit and has not performed any activities in the site, then, the business and/or activity permit shall remain in effect with the obligation to maintain the Peatland hydrologic functions.
- c. In case the holder of a business and/or activity permit has not performed his/her obligation to maintain the Peatland hydrologic functions as referred to in point (b) for two (2) years, the business and/or activity permit shall be revoked by the permit issuer.

CHAPTER IX
CONCLUDING PROVISIONS

Article 46

- (1) The Minister shall stipulate the Peatland Hydrological Entity map not later than two (2) years, calculated from the date on which this Government Regulation is stipulated.
- (2) The Minister shall stipulate the Peatland Ecosystems with protective and cultivating functions not later than two (2) years, calculated from the date on which the final map of Peatland Hydrological Entity is stipulated.

Article 47

This Government Regulation shall be in full effect and force as of the date it is promulgated.

For public cognizance, this Government Regulation shall be promulgated with its inclusion in the State Gazette of the Republic of Indonesia.

Stipulated in Jakarta
on 12 September 2014

PRESIDENT OF THE REPUBLIC OF
INDONESIA,

signed,

DR. H. SUSILO BAMBANG YUDHOYONO

Promulgated in Jakarta

on 15 September 2014

MINISTER OF LAW AND HUMAN RIGHTS OF
THE REPUBLIC OF INDONESIA,

signed.

AMIR SYAMSUDIN

STATE GAZETTE OF THE REPUBLIC OF INDONESIA YEAR 2014 NUMBER 209

Issued as a certified copy

MINISTRY OF STATE SECRETARIAT OF
THE REPUBLIC OF INDONESIA

Deputy for Laws

in Economic Field,

Lydia Silvanna Djaman

ELUCIDATION
OF
INDONESIAN GOVERNMENT REGULATION
NUMBER 71 OF 2014
CONCERNING

PROTECTION AND MANAGEMENT OF PEATLAND ECOSYSTEMS

I. GENERAL

A peatland has unique characteristics. In addition to serving as a component of wetlands and a component of land space, it also serves as a component of environment, located in the sovereign territory of Unitary State of the Republic of Indonesia. With such characteristics, a peatland serves varied functions in the national history of Indonesia, for example, as natural resources in the form of germ plasm and timber commodity, as a place for fish to live, and as a warehouse where carbon is stored, thus playing the role of climate balancer.

In order to prevent the peat function from changing, every country shares the same interest in maintaining and increasing this natural resource and climate balancer to provide the maximum benefit for people's welfare, both for current and future generations, for both national and global society. In order for the peatland to have sustainable benefits at the desired quality, Peatland Ecosystem Protection and Management programs have been essential.

The Peatland Ecosystem Protection and Management plan governs planning, utilization, control, maintenance, and administrative sanctions. The planning includes Peatland Ecosystem inventory, Peatland Ecosystem determination, and Peatland Ecosystem Protection and Management plan drafting and stipulation. The Peatland utilization is determined based on the Peatland Ecosystem Protection and Management plan. The damage control of Peatland Ecosystems is made by establishing damage standard criteria for Peatland Ecosystems and implementing environmental permit instruments for businesses and/or activities utilizing Peatland Ecosystems, which are required to have an environmental impact assessment as well as environmental management efforts and environmental monitoring efforts. The Peatland Ecosystem Protection and Management plan includes Peatland maintenance, administrative sanction implementation, and monitoring of the compliance of the person in charge of businesses and/or activities with this Government Regulation and the environmental permit.

II. ARTICLE BY ARTICLE

Article 1

Self-explanatory.

Article 2

Self-explanatory.

Article 3

Self-explanatory.

Article 4

Self-explanatory.

Article 5

Self-explanatory.

Article 6

Paragraph (1)

Point a

In delineating the satellite image which has been geometrically corrected, land system, soil, river network, and digital elevation maps are also used.

Point b

Self-explanatory.

Paragraph (2)

Self-explanatory.

Paragraph (3)

Self-explanatory.

Paragraph (4)

Self-explanatory.

Paragraph (5)

Self-explanatory.

Article 7

Self-explanatory.

Article 8

Self-explanatory.

Article 9

Paragraph (1)

Self-explanatory.

Paragraph (2)

Self-explanatory.

Paragraph (3)

Self-explanatory.

Paragraph (4)

Point a

Self-explanatory.

Point b

The term "endemic germ plasm" means a genetic resource found only in a certain region, site, habitat type, or certain islands, and it cannot be found naturally anywhere else.

Point c

Self-explanatory.

Point d

Self-explanatory.

Paragraph (5)

Self-explanatory.

Paragraph (6)

Self-explanatory.

Article 10

Self-explanatory.

Article 11

Self-explanatory.

Article 12

Self-explanatory.

Article 13

Self-explanatory.

Article 14

Self-explanatory.

Article 15

Self-explanatory.

Article 16

Self-explanatory.

Article 17

Self-explanatory.

Article 18

Self-explanatory.

Article 19

Self-explanatory.

Article 20

Self-explanatory.

Article 21

Paragraph (1)

Point a

Self-explanatory.

Point b

Self-explanatory.

Point c

The education in this provision excludes the provision of infrastructures for education.

Point d

The term "environmental service" means limited tourism and carbon trade.

The term "limited tourism" means any activity of visiting, observing, enjoying Peat uniqueness and plant and animal diversity existing within the Peatland Ecosystems.

Paragraph (2)

Self-explanatory.

Article 22

Self-explanatory.

Article 23

Paragraph (1)

Self-explanatory.

Paragraph (2)

Point a

Self-explanatory.

Point b

The term "pyrite sediment is exposed" means the pyrite sediment occurs or is discovered in the oxidation zone or it is no longer submerged in water.

The term "quartz sediment is exposed" means quartz is exposed to the surface or the quartz is no longer covered by the Peat layer.

Point c

Self-explanatory.

Paragraph (3)

Self-explanatory.

Article 24

Self-explanatory.

Article 25

Self-explanatory.

Article 26

Point a

Self-explanatory.

Point b

The term "drainage" means the canal directly flowing water out of the Peat Hydrologic Entity, such as when it flows water directly from the Peat Hydrological Entity to the river or sea.

Point c

Self-explanatory.

Point d

Self-explanatory.

Article 27

Self-explanatory.

Article 28

Self-explanatory.

Article 29

Self-explanatory.

Article 30

Paragraph (1)

Self-explanatory.

Paragraph (2)

Self-explanatory.

Paragraph (3)

Point a

The term "rehabilitation" means the recovery effort to restore the function and improve the Peatland Ecosystems can be performed, among other things, through revegetation.

Point b

The term "restoration" is a recovery effort to make the Peatland Ecosystems or parts thereof function once again like they did.

Point c

Self-explanatory.

Paragraph (4)

Self-explanatory.

Article 31

Self-explanatory.

Article 32

Self-explanatory.

Article 33

Self-explanatory.

Article 34

Self-explanatory.

Article 35

Self-explanatory.

Article 36

Self-explanatory.

Article 37

Self-explanatory.

Article 38

Self-explanatory.

Article 39

Self-explanatory.

Article 40

Self-explanatory.

Article 41

Self-explanatory.

Article 42

Self-explanatory.

Article 43

Self-explanatory.

Article 44

Self-explanatory.

Article 45

Self-explanatory.

Article 46

Self-explanatory.

Article 47

Self-explanatory.

SUPPLEMENT TO STATE GAZETTE OF THE REPUBLIC OF INDONESIA NUMBER
5580

PRESIDENT OF THE REPUBLIC OF INDONESIA

**REGULATION OF THE REPUBLIC OF INDONESIA
NO. 57 YEAR 2016**

**ON
AMENDMENT OF GOVERNMENT REGULATION NO. 71 YEAR 2014
ON PEAT ECOSYSTEM PROTECTION AND MANAGEMENT**

BY THE GRACE OF GOD ALMIGHTY

PRESIDENT OF THE REPUBLIC OF INDONESIA

- Considering:
- a. WHEREAS, peat ecosystem is vulnerable and the land had been damaged by forest and land fires in 2015, thus intensive efforts are necessary to protect and manage them;
 - b. WHEREAS, Government Regulation No. 71/2014 on Protection and Management of Peat Ecosystem needs to be enhanced to respond public legal development and needs;
 - c. WHEREAS, based on the consideration under point a and b hereof, it is necessary to stipulate Government Regulation No. 71/2014 on Protection and Management of Peat Ecosystem.
- In view of:
1. §5.2 of the Constitution of the Republic of Indonesia Year 1945;
 2. Law 32 of 2009 on Environmental Protection and Management (State Gazette of the Republic of Indonesia Year 2009 No. 140, Supplement of State Gazette of the Republic of Indonesia No. 5059);
 3. Government Regulation No. 71/2014 on Protection and Management of Peat Ecosystem (State Gazette of the Republic of Indonesia Year 2014 No. 209, Supplement of State Gazette of the Republic of Indonesia No. 5580).

DECIDES TO:

**Stipulate : GOVERNMENT REGULATION ON AMENDMENT OF
GOVERNMENT REGULATION NO. 71 YEAR 2014 ON PEAT
ECOSYSTEM PROTECTION AND MANAGEMENT.**

Article I

Several provisions under Government Regulation No. 71/2014 on Protection and Management of Peat Ecosystem (State Gazette of the Republic of Indonesia Year 2014 No. 209, Supplement of State Gazette of the Republic of Indonesia No. 5580) shall be amended into the following.

-
1. Provision of §1 point 2 thereof shall be amended into the following:

§1

The following definitions shall apply hereto.

1. Peat Ecosystem Protection and Management means systematic, integrated efforts carried out to preserve peat ecosystem functions and prevent against Peat Ecosystem damage, including planning, use, control, maintenance, supervision and law enforcement.
 2. Peat means organic materials naturally formed out of plant remainder not completely decomposed, of 50 cm thick or more and accumulated in swamps.
 3. Peat Ecosystem means an order of peat elements constituting one comprehensive, integrated unit and affecting one another in forming its balance, stability and productivity.
 4. Peat Hydrologic Unit means Peat Ecosystem situated between two (2) rivers, between river and sea, and/or in the swamp.
 5. Minister means the minister who administers governmental affairs in the field of environmental protection and management.
2. Provision of §9.3 thereof shall be amended into the following.

§9

- (1) Determination of Peat Ecosystem function under §4.b hereof shall be carried out by Minister upon coordination with:
 - a. minister administering governmental affairs on forestry and minister administering governmental affairs on water resources and spatial planning in case the peat ecosystem to be gazetted is located within forest area; and
 - b. minister administering governmental affairs on water resources and spatial planning in case the peat ecosystem to be gazetted is located outside forest area.
- (2) Peat Ecosystem function under paragraph (1) of this article hereof shall include:
 - a. Peat Ecosystem protection function; and
 - b. Peat Ecosystem cultivation function.

-
- (3) Minister shall set Peat Ecosystem protection function to cover at least thirty per cent (30%) of the total area of Peat Hydrologic Unit whose location starts from one (1) or more peat domes.
 - (4) In case the following areas are still found outside the coverage of 30% under paragraph (3) of this article hereof:
 - a. peat of three (3) metres thick or more;
 - b. specific and/or endemic germplasm;
 - c. species protected under applicable laws and regulation; and/or
 - d. Peat Ecosystem situated in protected area as gazetted in provincial/district/municipal spatial planning, protected forest area and conservation forest area,

Minister shall decide that the area delivers Peat Ecosystem protection function.

- (5) Area of Peat Hydrologic Unit under paragraph (3) and (4) of this article hereof shall be based on final map of Peat Hydrologic Unit provided under §7 hereof.
 - (6) Where Peat Ecosystem does not meet requirement under paragraph (3) and (4) of this article hereof, Minister shall gazette its Peat Ecosystem cultivation function.
3. Provision of §10.2 point b thereof shall be amended and point c be removed, thus §10 thereof shall read as follow.

§10

- (1) Peat Ecosystem function set by Minister as protection and cultivation functions as provided under §9 hereof shall be represented by Peat Ecosystem function map.
- (2) The Peat Ecosystem function map under paragraph (1) of this article hereof shall comprise:
 - a. national Peat Ecosystem function map presented with scale of at least 1:250,000;
 - b. provincial and district/municipal Peat Ecosystem function map presented with scale of at least 1:50,000;
 - c. *removed.*

-
4. Provision of §11.4 thereof shall be amended, while §11.5 and §11.6 thereof removed, thus §11 thereof shall read as follow.

§11

- (1) Peat Ecosystem with cultivation function may be converted into Peat Ecosystem with protection function.
 - (2) Conversion of the Peat Ecosystem under paragraph (1) of this article hereof shall be:
 - a. carried out by Minister; or
 - b. be based on governor or district head/mayor proposal, as the case may be, to Minister.
 - (3) The Peat Ecosystem function conversion under paragraph (1) of this article hereof shall be made based on the following reasons:
 - a. Peat Ecosystem meets the requirement provided under §9.4 point c and d;
 - b. due to ecologic urgency to take preventive or restorative measure in and/or around Peat Ecosystem; and/or
 - c. due to ecologic urgency to make effort to reserve Peat Ecosystem at provincial or district/municipality level.
 - (4) The Peat Ecosystem function conversion under paragraph (1) of this article hereof shall be authorised by Minister upon coordination with minister administering governmental affairs on water resources, minister administering governmental affairs on spatial planning, other relevant ministers, as well as governor and/or district head/mayor as the case may be.
 - (5) *Removed*
 - (6) *Removed.*
5. Provision of §14.3 thereof shall be amended, thus §14 thereof shall read as follow.

§14

- (1) The planning for Peat Ecosystem Protection and Management under §4 point c hereof shall include:
 - a. national plan of Peat Ecosystem Protection and Management;
 - b. provincial plan of Peat Ecosystem Protection and Management; and

-
- c. district/municipal plan of Peat Ecosystem Protection and Management.
- (2) The national plan of Peat Ecosystem Protection and Management under paragraph (1) point a of this article hereof shall be made for interprovincial Peat Ecosystem Protection and Management.
 - (3) The provincial plan of Peat Ecosystem Protection and Management under paragraph (1) point b of this article hereof shall be made for interdistrict/city Peat Ecosystem Protection and Management;
 - (4) The district/municipal plan of Peat Ecosystem Protection and Management under paragraph (1) point c of this article hereof shall be made for Peat Ecosystem Protection and Management in one single district/municipal territory.
6. Provision of §16.1, §16.2, §16.3 and §16.4 thereof shall be amended, thus §16 thereof shall read as follow.

§16

- (1) The national plan of Peat Ecosystem Protection and Management under §15.1 hereof shall be made and authorised by Minister upon coordination with:
 - a. minister administering governmental affairs on spatial planning;
 - b. minister administering governmental affairs on water resources;
 - c. minister administering governmental affairs on national planning and development; and
 - d. other relevant ministers
 - (2) The provincial plan of Peat Ecosystem Protection and Management under §15.2 hereof shall be made and authorised the relevant governor;
 - (3) The district/municipal plan of Peat Ecosystem Protection and Management under §15.3 hereof shall be made and authorised by district the relevant head/mayor.
 - (4) The authorisation of Peat Ecosystem Protection and Management under paragraph (2) and (3) of this article hereof shall be carried out upon prior technical consultation and approved by Minister.
7. Provision of §17.2 thereof shall be amended, thus §17 thereof shall read as follow.

§17

-
- (1) Peat Ecosystem Protection and Management plan shall contain at least the following:
 - a. Peat Ecosystem use and/or allocation;
 - b. Peat Ecosystem quality and/or function maintenance and protection;
 - c. Peat Ecosystem control, monitoring, and use and preservation; and
 - d. adaptation to and mitigation of climate change.

 - (2) The Peat Ecosystem Protection and Management Plan under paragraph (1) of this article hereof shall take into account:
 - a. diversity of physical and biophysical characteristics of the ecological functions;
 - b. distribution of natural resources potentials;
 - c. climate change;
 - d. population distribution;
 - e. local wisdom;
 - f. community aspiration;
 - g. provincial and/or district/municipal spatial plan; and
 - h. restorative efforts from Peat Ecosystem damage.

 - (3) Peat Ecosystem Protection and Management Plan shall be part of environmental protection and management plan.
8. Provision of §18.2 thereof shall be amended, thus §18 shall read as follow.

§18

- (1) In case where Peat Ecosystem with cultivation function is converted into Peat Ecosystem with protection function as provided under §11 hereof, the authorised Peat Ecosystem Protection and Management Plan under §16 hereof shall be adjusted.

 - (2) Adjustment of Peat Ecosystem Protection and Management Plan shall be conducted by governor or district head/mayor after technical consultation and Minister's approval.
9. One (1) article shall be inserted between §22 and §23, namely §22A that shall read as follow.

§22A

-
- (1) Peat Ecosystem damage prevention under §22.2 hereof shall be implemented using the following methods:
 - a. preparation of technical regulation;
 - b. development of early detection system;
 - c. strengthening of governmental institutional capacity and community endurance;
 - d. improvement of community legal awareness; and/or
 - e. securing fire-prone and previously burnt areas.

 - (2) The preparation of technical regulation as provided under point a of paragraph (1) of this article hereof shall cover:
 - a. authorisation of Peat Hydrologic Unit map as provided under §7 hereof;
 - b. authorisation of protection and cultivation functions, particularly in the Peat Hydrologic Unit area under §9 to §12 hereof; and
 - c. implementation of evaluation and audit of permit issuance for peatland use.

 - (3) Development of the early detection under point b of paragraph (1) of this article hereof shall include the following:
 - a. installation of one-off and continuous air quality monitoring device and use of various early detection technologies;
 - b. processing of information from a wide range of sources including community report; and
 - c. notification to community on potentials of land and forest fires occurrence.

 - (4) The strengthening of governmental institutional capacity and community endurance under point c of paragraph (1) of this article hereof shall include:
 - a. strengthening of coordination at central and local levels based on the applicable laws and regulations;
 - b. strengthening of institutional capacity on area management at site level of Forest Management Unit (FMU);
 - c. engagement of community elements including fire aware community, village community group, civil society organisation and volunteers based on the applicable laws and regulations;
 - d. strengthening of school institution in forest and land fire-prone areas by establishing environmentally aware student group under local government development; and

-
- e. training, assistance, access to public information, partnership pattern and development of mechanism of innovative corporate socially and environmentally responsible use to improve community economy.
10. Provision of point a of §23.3 hereof shall be amended and three (3) paragraphs added, namely paragraph (4), (5) and (6), thus §23 shall read as follow.

§23

- (1) Peat Ecosystem damage may strike:
 - a. Peat Ecosystem with protection function; and
 - b. Peat Ecosystem with cultivation function.

 - (2) Peat Ecosystem with protection function shall be declared to have been damaged when the following standard damage criteria are met:
 - a. manmade drainage is found in the authorised Peat Ecosystem with protection function;
 - b. pyrite and/or quartz sediments underlying the Peat layer are exposed; and/or
 - c. land cover area and/or volume in the authorised Peat Ecosystem with protection function shrinks;

 - (3) Peat Ecosystem with cultivation function shall be declared to have been damaged when the following standard damage criteria are met:
 - a. water table in the Peatland reaches more than zero point four (0.4) m below the Peat surface at point of compliance; and/or
 - b. pyrite and/or quartz sediments underlying the Peat layer are exposed.

 - (4) The water table measurement under point a of paragraph (3) of this article hereof shall be carried out at the instructed point of compliance.

 - (5) The point of compliance under paragraph (4) of this article hereof shall be set based on the land characteristics, topography, water management zone, canal and/or water system.

 - (6) Provision on procedure of water table measurement at point of compliance shall be regulated under Minister Regulation.
11. Provision of point a and c of §26 thereof shall be amended and added 1 (one) paragraph, namely paragraph (2), thus §26 thereof shall read as follow.

§26

- (1) No one shall:
 - a. clear any lands in Peat Ecosystem area until the establishment of zoning of protection and cultivation for particular plants;
 - b. construct drainage leading to dried Peat;
 - c. burn Peatland and/or allow fires to take place; and/or
 - d. carry out any other activities leading to exceed the Peat Ecosystem standard damage criteria under §23.2 and §23.3 hereof.
- (2) Further provision concerning the particular plants under point a of paragraph (1) of this article hereof shall be governed by Minister Regulation.

12. Provision of paragraph (3) and (4) of §30 thereof shall be amended, thus §30 thereof shall read as follow.

§30

- (1) Person in charge (PIC) of business and/or activity using Peat Ecosystem that causes damage to Peat Ecosystem within or outside the business concession and/or activity location shall carry out restoration in accordance with obligations provided under the environmental permit.
- (2) The restoration within and outside business concession and/or activity location under paragraph (1) of this article hereof shall be carried out by the business and/or activity PIC as provided under §27.2 hereof.
- (3) Restoration shall be carried out with the following:
 - a. natural succession;
 - b. rehabilitation;
 - c. restoration; and/or
 - d. other manners in line with scientific and technological advancement.
- (4) Further provision on technical guide to Peat Ecosystem function restoration shall be governed under Minister Regulation.

13. One (1) article shall be inserted between §30 and §31, namely §30A that shall read as follow.

§30A

-
- (1) The restoration under point c of §30.3 hereof shall be carried out using the following:
 - a. application of restoration techniques including water management on site level;
 - b. construction, operation and maintenance works including Peat rewetting infrastructure management; and/or
 - c. application of local wisdom-based cultivation.
 - (2) The restoration under paragraph (1) of this article hereof shall be carried out taking into account research and development and in accordance with scientific advancement and international perspective.
 - (3) Provision on technical guide to implementation of the activity under paragraph (1) of this article hereof shall be regulated by Minister Regulation.
14. Two (2) articles shall be inserted between §31 and §32, namely §31A and §31B that shall read as follow.

§31A

In case the restoration under §31 hereof is carried out due to fire and the business and/or activity PIC fails to restore Peat Ecosystem function as provided under §30 hereof within the period of thirty (30) days as of the date when the occurrence of fire was recognized, Minister, governor and district head/mayor shall coordinate to restore the Peat Ecosystem function at the expense of the PIC to cover field implementation costs.

§31B

- (1) In case of business concession and/or activity location where Peat has burnt, the Government may take actions to save and temporarily take over the previously burnt area.
- (2) The temporary takeover of the previously burnt area shall be carried out to allow verification by Minister.
- (3) Verification output may take form of the following:
 - a. further management by business and/or activity PIC; and
 - b. reduction of business concession and/or activity area.
- (4) Provision on procedure of takeover of previously burnt area by the Government under paragraph (1) of this article hereof shall be regulated by Minister Regulation.

-
15. One (1) article shall be inserted between §32 and §33, namely §32A that shall read as follow.

§32A

- (1) Restoration of ecosystem function in Peatland and peat forest other than the area under §30 hereof shall be the Government responsibility.
- (2) Restoration of ecosystem function in Peatland and peat forest areas belonging to other uses shall be local government responsibility.
- (3) Restoration of ecosystem function in Peatland and peat forest owned by community or customary law community shall be the community or customary law community responsibility.

16. Provision of §44.1 shall be amended, thus §44 shall read as follow.

§44

- (1) Any business and/or activity PIC using Peat Ecosystem in violation of §30, §31, and §31A hereof shall be punishable with administrative sanction charged by the Government as provided under §40.3 hereof.
- (2) In case the business and/or activity PIC using Peat Ecosystem fails to observe the Government charge under paragraph (1) of this article hereof, Minister, governor or district head/mayor shall charge temporary suspension of environmental permit as the administrative sanction.
- (3) In case the business and/or activity PIC using Peat Ecosystem fails to observe the temporary suspension of environmental permit under paragraph (2) of this article hereof, Minister, governor, or district head/mayor shall revoke the environmental permit as the administrative sanction.
- (4) Further provision on criteria and duration in complying with the Government charge, the suspension and the revocation of environmental permit shall be regulated by Minister Regulation.

Article II

This Government Regulation shall take effect as of the promulgation date.

For public cognizance, this Government Regulation shall be announced by publishing it in the State Gazette of the Republic of Indonesia.

**Stipulated in Jakarta
on 2 December 2016
PRESIDENT OF THE REPUBLIC OF
INDONESIA
JOKO WIDODO**

**Promulgated in Jakarta
on 6 December 2016
MINISTER OF LAW AND HUMAN RIGHTS
OF THE REPUBLIC OF INDONESIA
YASONNA H. LAOLY**

STATE GAZETTE OF THE REPUBLIC OF INDONESIA YEAR 2016 NO. 260

**Certified as true copy
MINISTRY OF STATE SECRETARY
OF THE REPUBLIC OF INDONESIA
Assistant Deputy of Economic Affairs,
Deputy of Law and Regulation
[name unreadable]**

**ELUCIDATION
OF
REGULATION OF THE REPUBLIC OF INDONESIA
NO. 57 YEAR 2016
ON
AMENDMENT OF GOVERNMENT REGULATION NO. 71 YEAR 2014
ON PEAT ECOSYSTEM PROTECTION AND MANAGEMENT**

I. GENERAL

Forest and land fires in Indonesia until October 2015, have reached an area of one million and seven hundred thousand (1,700,000) hectares. One of the causes of forest and land fires is mismanagement of business activities on peatland.

In accordance with the characteristics of the Peat Ecosystem, Peat hydrological areas should not be disturbed. This means that such areas should not be used for land use that may harm the Peat Hydrologic Unit functions.

As a matter of fact, great fires occur in Peatlands, particularly in South Sumatera, Central Kalimantan and some parts of Riau, Jambi and South Kalimantan Provinces, indicating extreme difficulty in extinguishing the fires.

Therefore, it is imperative that amendment be made to the Government Regulation No. 71/2014 on Peat Ecosystem Protection and Management.

II. ARTICLE BY ARTICLE

Article I

Point 1

Self-explanatory.

Point 2

§9

Paragraph (1)

Self-explanatory.

Paragraph (2)

Self-explanatory.

Paragraph (3)

Self-explanatory.

Paragraph (4)

-
- Point a
 - Self-explanatory.*
 - Point b
 - 'Endemic germplasm' shall mean genetic resources only found in particular area, location, habitat type or island, which are not naturally found in any other location.
 - Point c
 - Self-explanatory.*
 - Point d
 - Self-explanatory.*
 - Paragraph (5)
 - Self-explanatory.*
 - Paragraph (6)
 - Self-explanatory.*
 - Point 3
 - §10
 - Self-explanatory.*
 - Point 4
 - §11
 - Paragraph (1)
 - Self-explanatory.*
 - Paragraph (2)
 - Self-explanatory.*
 - Paragraph (3)
 - Point a
 - Self-explanatory.*
 - Point b
 - 'Ecologic urgency' shall include Peat Ecosystem having undergone fires and damage.
 - Point c
 - Self-explanatory.*
 - Paragraph (4)
 - Self-explanatory.*
 - Paragraph (5)
 - Removed.*
 - Paragraph (6)
 - Removed.*
 - Point 5
 - §14
 - Self-explanatory.*
 - Point 6
 - §16
 - Self-explanatory.*
 - Point 7
 - §17
 - Paragraph (1)
 - Self-explanatory.*
 - Paragraph (2)
 - Point a
 - Self-explanatory.*
 - Point b
 - Self-explanatory.*
 - Point c
 - Self-explanatory.*

-
- Point d
 - Self-explanatory.*
 - Point e
 - Self-explanatory.*
 - Point f
 - Self-explanatory.*
 - Point g
 - Self-explanatory.*
 - Point h
 - 'Peat Ecosystem damage' may be partly caused by forest and land fires.
 - Paragraph (3)
 - Self-explanatory.*
 - Point 8
 - §18
 - Self-explanatory.*
 - Point 9
 - §22A
 - Self-explanatory.*
 - Point 10
 - §23
 - Paragraph (1)
 - Self-explanatory.*
 - Paragraph (2)
 - Point a
 - Self-explanatory.*
 - Point b
 - 'Exposed pyrite sediments' shall mean that pyrite sediments come out or otherwise exposed to oxidation zone and no longer soaked by water.
 - 'Exposed quartz sediments' shall mean that quartz sediments are exposed out of the surface or quartz is no longer covered by peat layer.
 - Point c
 - Self-explanatory.*
 - Paragraph (3)
 - Point a
 - 'Point of compliance' shall mean location set as point for monitoring water table level in peatland.
 - Point b
 - Self-explanatory.*
 - Paragraph (4)
 - Self-explanatory.*
 - Paragraph (5)
 - Self-explanatory.*
 - Paragraph (6)
 - Self-explanatory.*
 - Point 11
 - §26
 - Paragraph (1)
 - Point a
 - Self-explanatory.*
 - Point b
 - 'Drainage' shall mean canals that directly flow water out of

Peat Hydrologic Unit, e.g. channelling water directly from Peat Hydrologic Unit to river or sea.

Point c

Sanction against ‘omission of fires’ shall be charged based on the applicable laws and regulations.

Point d

Self-explanatory.

Paragraph (2)

Point 12

§30

Paragraph (1)

‘Peat Ecosystem damage’ may be because of, among others, peat fires or natural disasters.

Paragraph (2)

Self-explanatory.

Paragraph (3)

Point a

‘Natural succession’ shall mean restoration without involving human intervention.

Point b

‘Rehabilitation’ shall mean restorative effort to restore Peat Ecosystem function through, among others, revegetation.

Point c

‘Restoration’ shall mean restorative effort to bring back the function of Peat Ecosystem or its parts to the initial condition.

Point d

Self-explanatory.

Paragraph (4)

Self-explanatory.

Point 13

§30A

Self-explanatory.

Point 14

§31A

Self-explanatory.

§31B

Self-explanatory.

Point 15

§32A

Self-explanatory.

Point 16

§44

Self-explanatory.

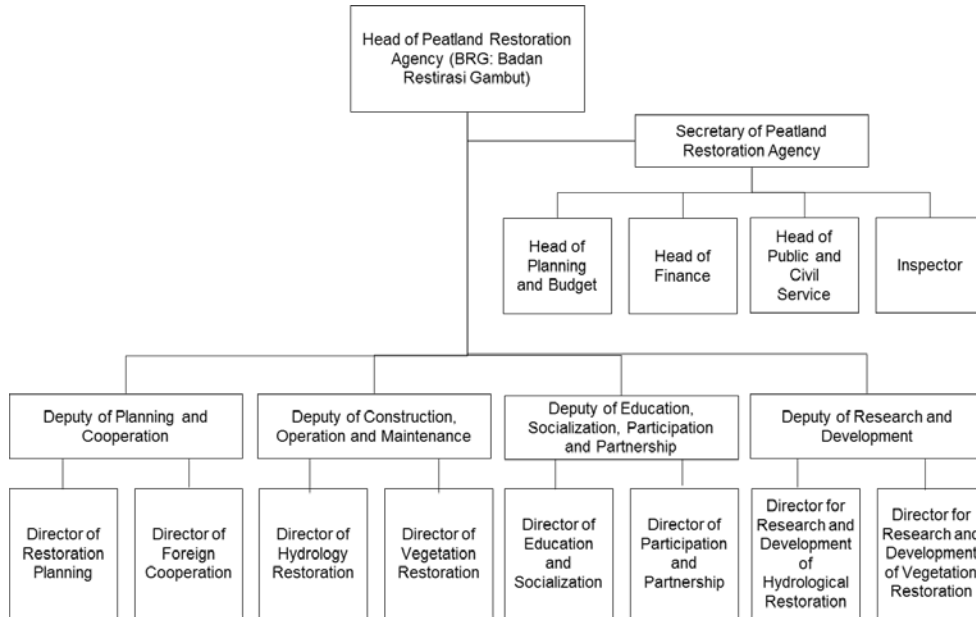
Article II

Self-explanatory.

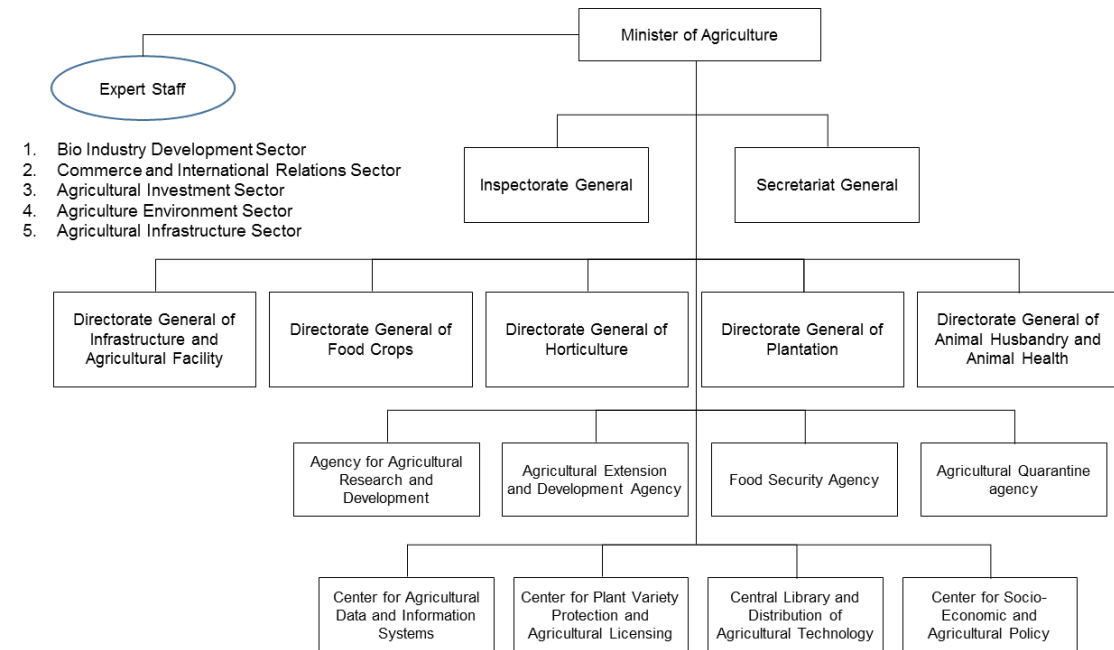
SUPPLEMENT TO STATE GAZETTE OF THE REPUBLIC OF INDONESIA NO. 5957

3 Organization Structures of Relevant Organization

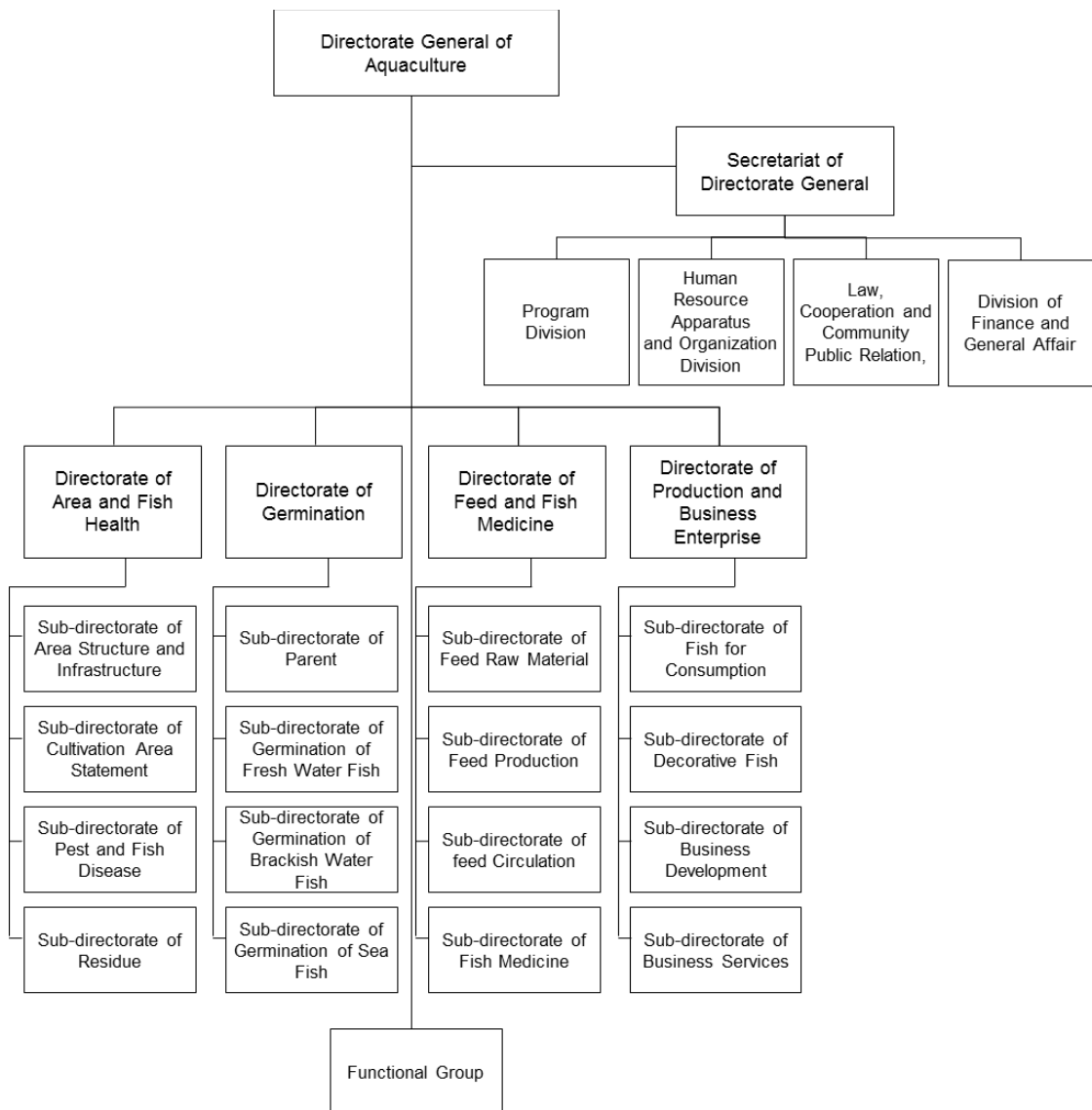
3.1. BRG/Peat Restoration Agency



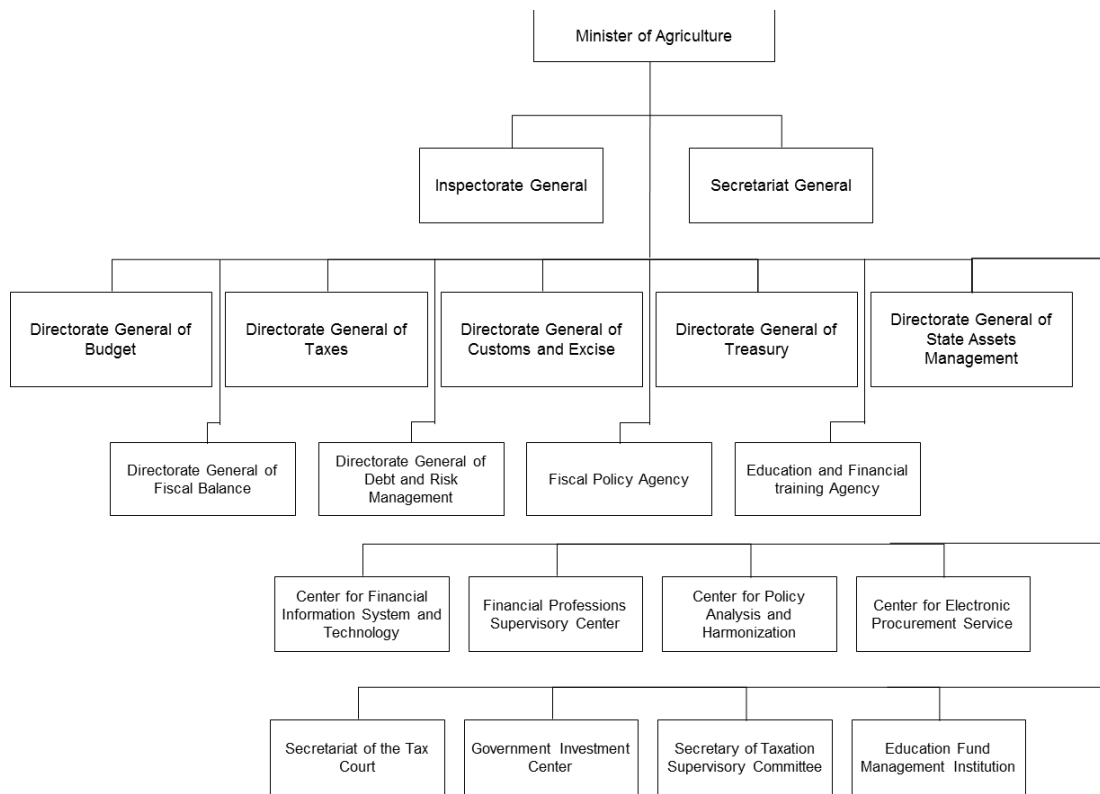
3.2. Ministry of Agriculture



3.3. Directorate General of Aquaculture, Ministry of Maritime Affairs and Fisheries



3.4. Ministry of Finance



4 Supporting Information of Profile Surveys

4.1 Introduction

Based on the results of the BRG-JICA Pre-Feasibility Study for Peatland Restoration Investment at Four Priority Areas in Indonesia, which are conducted the consortium of the three (3) universities in the target three provinces, the potential commodities crops and services in peatland environment have been identified for the target four (4) districts in three (3) provinces. Here are described the information on market analysis and cost-benefit analysis of each identified commodity and service.

4.2 Market Analysis of each Commodity

4.2.1 OKI District, South Sumatra Province

(1) Swamp Buffalo

“Gulo puan is the only product from swamp buffaloes that is produced and marketed from the area. Marketing is still limited in Palembang (Agung Mosque, Lemabang Market, and Pasar Ilir). Gulo puan business actors in OKI District sell products to Palembang on average once to twice a week, with shipping volume of 30-60 kg per shipment or sale. Consumers are limited since the product has not yet widely known, so the volume of market absorption is still limited. Its marketing distribution is still traditional and uses the path of relationship between individual producers and traders.

Pattern of gulo puan marketing chain in OKI District is done from producer or entrepreneur of gulo puan directly to trader in Palembang, which then proceeded from Palembang marketer to retailers in the area to reach the consumers. Generally, sales transactions between entrepreneurs gulo puan and traders take place in Terminal Jakabaring Palembang.

In general, there is no significant obstacle for gulo puan processors in marketing the product. The level of business competition for gulo puan processing between regions has not been seen. This is because the processed products of buffalo milk such as gulo puan newly known by the people of South Sumatra, so that the largest production market only in the area of South Sumatra Province. To increase the production, marketing, and popularity of processed products from buffalo milk, it is necessary to make buffalo milk processing technology into food products that have more economic value, popular and liked by everyone such as caramel milk candy, yoghurt drink and ice cream.

Price information is very important for manufacturers, including for gulo puan processors. From the survey conducted in the production center of gulo puan in OKI District, it was found that the price of fresh milk to be processed into gulo puan ranged from 15.000 to 20.000 rupiah per liter. After becoming gulo puan, then the price at the merchant level of 60.000 rupiah per kg and at the consumer level of 90.000 per kg.

(2) Swamp Fishery

The salted fish and smoked fish products from OKI District are mostly (90%) marketed outside the province, with the highest demand from Bandung, Bogor and Padang for salted fish, while Medan City for smoked fish. Nevertheless, there are still salted and smoked fish products marketed in the local market, with sales amounting to 10 % of total production. For local marketing, buyers generally come to the location directly, while sales to other regions are by sending by land transport to buyers outside the region.

Market expansion from production areas to other areas has tended to increase along with the better transportation facilities and infrastructure. The ordinal businessmen of the salted fish industry are able to sell salted fish products out of the region of 100 kg per day, delivered twice a week, with shipping volume of 300 kg per shipment or sale.

The marketing pattern of salted fish and smoked fish in OKI District is generally the same, that is through two marketing channels. First (95%) is from producers or entrepreneurs of salted fish and smoked fish directly to wholesalers in Bandung, Medan, and Padang area then proceed to retailers in the area to reach consumers. While the second marketing chain from producers directly to retailers or consumers who come to the location of the business (5 %).

In the marketing of salted fish and smoked fish, there are generally no significant constraints felt by businessmen, traders, or collectors. That is, for salted fish and smoked fish entrepreneurs, regardless of the product produced is always exhausted due to paid to the wholesalers and the demand has been stable, they generally already have a regular customer. The problem faced is the unavailability of a proper warehouse as storage place before being marketed to the merchant, so that the products cannot be stored long by producers. Each product that has dried directly packing and sent to a wholesaler outside the area.

Competitors of salted fish and smoked fish in OKI District between districts have not been seen yet. This is because the largest market outside the province, so the competition occurs at the national level, generally with salted fish and smoked fish products from Bengkulu, Jambi, North Sumatra, East Java and West Java.

Salted fish produced from OKI District has the specification of river fish with the most type of fish type sepat, while from other areas of the sea fish. Generally, salted fish and smoked fish processors have regular customers or outside fixed-field collectors. Whatever amount can be produced by salted fish processors and smoked fish can be accommodated by collectors or wholesalers outside the region. Therefore, the market for salted fish and smoked fish business is not the main problem.

Competition that may occur is the competition to get cheap fish raw materials and in sufficient quantities. This is because fishermen have two options to market their fish, which are marketed as fresh fish or processed into salted fish or smoked fish. In addition, the production of fresh fish that is not continuous, because depending on the season often makes it difficult for salted fish and smoked fish entrepreneurs to procure continuous raw materials at a stable price.

Thus, what should be done is how to fish entrepreneurs can keep the stock of raw materials in a long time and can produce salted fish and smoked fish quality and hygienic. Qualified, meaning not only process fish that have no economic value when sold in a fresh state.

Need to develop and enrich the type of dried fish produced. The low level of consumption per capita, the rising export value, the increasing number of catches, and the increasing of regional opening and the improvement of the transportation means provide an opportunity for salted fish and smoked fish entrepreneurs to keep increasing their production, both quantity and quality.

Market opportunities can also be created by expanding fish markets and diversifying salted fish and smoked fish both horizontally and vertically. Diversification of salted fish and smoked fish products means to enrich the type of fish that is processed into salted fish and smoked fish because it is still limited to fish for fish production, and catfish for the production of smoked fish. This needs to be done as one effort to share business risk. If the price of fresh fish drops, then process it into salted fish and smoked fish is an alternative that may be done. While the definition of vertical divesifikasi is developing salted fish and smoked fish products into downstream products that have higher added value than sold in the form of "asalan".

Price information is very important for producers, including for salted fish and smoked fish entrepreneurs. From the survey conducted in the production centers of salted fish and smoked fish in OKI District it was found that the price of fresh fish to be processed into salted fish ranged from 8.000 to 15.000 rupiah per kg with an average price of 10.000 rupiah per kg. As for catfish that will be smoked has a price 14.000 - 18.000 rupiah per kg, with the average price 16.000 rupiah per kg.

After becoming salted fish and smoked fish, the price at the consumer level averages 40.000 rupiah per kg for the salted fish, and 100.000 rupiah per kg for smoked fish. The selling price applies to marketing in local markets (buyers coming) as well as to buyers who are out of town. But the difference is that buyers who come to the location can choose the shape and quality of the existing salted fish, whereas if the buyers who produce salted fish are delivered on the spot, can not choose according to their wishes only.

(3) Purun

Processed purun products are generally made by order for a fixed activity. Product types, quantities, designs and motifs are adjusted to the taste and needs of the buyer. Thus, the distribution and marketing of purun processed products to date can be said to be closed. However, as one of the regional superior products, the local government has attempted to introduce and promote it through special outlets in the district capital.

Because the purun product is still based on order, the income from this business depends on the volume of ordering. Because the order depends on the event will take place, then the volume of ordering and craftsmen income also depends on the frequency and level of event.

Marketing method of purun handicraft in Ulak Kemang village still simple and conventional that is by waiting prospective buyer to come and ordering purun handicraft in the location and entrust some products

at place which have established cooperation that is “Toko Anisa”. Other than the product is exhibited at the local school cooperative. Because the product is influenced by business continuity, the product tends to have same motif but with different models and forms. Most of the purun handicraft demand in Ulak Kemang village comes from OKI local government through large orders.

As one of the handicraft business, this handicraft products need hand skill and tenacity, so the product has art and high sell value. Skill and tenacity of purun craftsmen in Ulak Kemang village is shown with their ability to fulfill the new model order, as long as the model comes from buyer. The weakness of the purun craftsmen is the lack of model innovation, because the craftsmen will create a new model when there is orders from buyers.

There is no competitor in purun handicraft between district yet. This is because the largest production market out of the province, so the competition occurs at the national level, in general the competitors are from West Java province, West Sumatera province and also Kalimantan island. However, purun handicrafts of OKI district often get orders from various countries and also private agencies.

In the meantime, the competition that occurs among craftsmen in OKI district and South Sumatera Province is not very clear. In general, purun handicraft business is dominated by Ulak Kemang village, Pampangan sub district. While in the Pedamaran area, the quality of the handicraft is still inferior to the craft produced by Ulak Kemang village. Regardless of the amount that can be generated by the handicraft entrepreneurs can be accommodated by merchant collector or wholesalers outside the region such as in “Toko Anisa”, Kayu Agung. Therefore, the market for handicrafts is not the main problem.

Competition might happen to get raw materials of purun and woven purun which ready to be made into handicraft. Problems related with the raw material are the process of taking purun plant that is usually can only take 10 bundles per day, so it is very difficult for purun craftsmen when getting a lot of orders.

Great opportunities can also be created by expanding markets and providing product variations resulting from purun handicrafts, both horizontally and vertically. This is needed as one effort to share business risks. Purun handicraft business has a huge opportunity to compete with other provinces because of its high selling value and market demand.

Purun’s craft is a handicraft product produced from simple and cheap raw materials but has artistic value. The average of purun handicraft products like a mat is sold at a price 25.000 –30.000 rupiah per pcs, purun bags at 40.000 –50.000 rupiah per pcs, purse at 25.000rupiah per pcs, sandals at 12.000 rupiah per pcs, pencil cases 7.000 rupiah per pcs. The difference of selling price is not only caused by the amount or raw material usage, but rather cause the model has a higher level of difficulty and art in the making process.

(4) Lowland Rice Field

Rice crops are generally marketed locally to meet local needs. This is because of the rice production in lowland is still low due to the planting can be done only once a year. When land optimization is successful and production can be increased, rice surplus increased and marketing can be expanded.

The income of lowland rice farmers is still low because farmers has not managed to overcome natural obstacles. If these natural constraints can be overcome with technology, then farmers can increase productivity and household farmers income can be improved.

Rice product produced by farmers in the form of dry grain harvest and it is sold to middlemen or collectors who come directly to the farmers' land. The price received by farmers ranges from 4.000 – 5.000 rupiah per kg of dry grain harvest.

There are generally no obstacles found by farmers in marketing rice production. That is, the production of rice must be sold and there must be demand from traders and middleman. But the harvest in the form of dry grain harvest is still very low price. If farmers can self-process their crops into rice and can market their rice directly to consumers without going through long marketing chains then farmers will be more profitable and the selling price of product is much higher.

(5) Liberica Coffee

Liberica coffee is one of the paludi culture options because it is suitable to be developed in peatlands. One of the peatlands that has developed liberica coffee is Tanjung Jabung Barat District, Jambi Province.

Liberica coffee has no specific market and the marketing system is still conventional. From farmers, coffee was collected by collectors and then taken to Kuala Tungkal (capital city of Tanjung Jabung Barat district). From Kuala Tungkal Liberica coffee will be marketed more widely. In addition to local buyers, there are also buyers who bring these products to Singapore and Malaysia. The market demand for liberica coffee is quite high. Therefore it needs special market innovation to raise the price. In Jambi, the price of liberica coffee is higher than Robusta and Arabica coffee, which is 25.000 rupiah per kg. There is only one cooperatives for one commodity, so that it can control the price.

The coffee produced can be divided into two types, which are unselected coffee and SOP coffee (selected coffee derived from red coffee beans). Coffee bean prices from farmers ranged from 37,000 to 38,000 rupiah per kg. They were purchased by middlemen, then from middlemen purchased by co-operatives with the price of 44,500-45,000 rupiah per kg. In the cooperatives, the price of unselected green bean was 46,000 rupiah per kg while SPO green bean was 100,000 rupiah per kg. The price of unselected coffee fruits was 3,000 rupiah per kg while the price of SOP coffee bean was 5,000 rupiah per kg.

The pre order for SOP coffee bean in the cooperatives could be reach 200 kg per month. However, sometimes this order cannot be fulfilled due to lack of coffee production, especially for the SOP type. This SOP coffee bean can be processed through 4 processes. Packaging of coffee in the marketing process is still not satisfactory, unless there is a special order for the exhibition or to be sent to another city.

(6) Betel/ Areca Palm

Betel palm is generally grown with an agroforestry pattern, with pineapple, palm oil, or coffee plant. Betel nut prices depend on and determined by the collectors. Betel nut in Tanjung Jabung Barat District has a good price after the presence of entrepreneurs from India and Malaysia who established the processing industry in Kuala Tungkal city especially the drying industry of Betel nut.

The price of betel nut depends on the quality, type, and post-harvest drying process. The betel nut should be dried in a clean and dry place, so the water content becomes quite low and the color remains brownish (not blackish). Based on these moisture levels, at the level of local exporters, betel nut can be classified into several qualities, i.e. 95, 90, 80, or ascertains. The main problem at the farmer level was the lack of quality of the betel nut because they do not know the best way of post-harvest processing. This results in the decline of betel nut prices.

In Kuala Tungkal city, particularly in Betara sub district, there is PT Aroma Jaya which already has business license for processing of young betel nut. However, operational license of this industry is not available yet. Until now, this company is in the process of physical development (infrastructure).

Young betel nut were exported to China and Korea (for candy raw materials), while old betel nut are exported to Pakistan (Karachi) and Thailand. The main destination country of betel nut that was exported to Pakistan and India. Exporters were indirectly ship to India because it will be taxed 200 percent. The 200 percent tax rate by the Indian government is intended to protect the price of betel nut at the local farmer level due to imported goods entered their country.

After the harvesting process, the farmer will split the betel nut into two parts. Furthermore, they will dry it under the sun for 1 or 2 days until the contents of the betel nut can be removed from the skin easily. After the betel nut is peeled off, the farmer will sell it to the collectors or directly to the local exporter in Kuala Tungkal city.

From local exporters, betel nut will be delivered to Jambi Province for further processing in the exporter's industries. All types of areca nut from the collectors are processed further, dried by oven, continuously sorted by quality, and finally packaged in sacks for export purposes.

At the farmer level, the price of young betel nut was 4000 - 5000 rupiah per kg, while the dry nut was 15,000 rupiah per kg. Moreover, this dried nut will be sold by the first collector at a price of 18,000 rupiah per kg. The first collectors will sell to the middle collectors in the sub districts (suppliers) at a price of 19,000-23,000 rupiah per kg. Furthermore, betel nut will be sold to local exporters.

Generally, marketing channels of betel nut was as follows:

- Farmers → Exporters,
- Farmers → First Collectors (Village Level) → Exporters,
- Farmers → First Collectors (Village Level) → Middle Collectors/Supplier (Sub district level) → Exporters

Grade of betel nut based on moisture content can be classified into 65-70, 70-75, 80-85, and 90-95 with price range 1200-1975 or 2000 USD. In general, farmers can only reach grade of 70-75. Furthermore, collectors, suppliers or local exporters will improve the grade of betel nut through the process of drying and sorting. In Jambi city there were approximately 35 companies of betel nut. There was also the Association of Betel Nut Entrepreneurs that exists in Jambi Province.

(7) Pineapple

Pineapple commodity has a big market prospect, both to fulfill requirement in domestic and abroad, in the form of fresh fruit and processed products. This can be seen from the projection of supply and demand of pineapples in 2017 -2019 conducted by the Center of Agricultural Information Systems and Data (2015), which the deficit in 2017 reached 17,149 tons and increased to 58,079 tons in 2019.

Farmers still market the crops in the form of fresh fruit, both with wholesale and retail systems. Therefore price is determined by buyer (middleman). With the post-harvest processing in the form of processed products is expected to increase the added value of pineapple. This has been done by PT Great Giant Pineapple (PT GGP) which process pineapple into various derivative products, such as canned food, juice, and enzyme bromelin which have high economic value.

In Lampung Province, there is PT GGP which has a land area of 32,000 ha and 19,000 ha of which are planted with pineapple, with a production amount of 90 tons per ha. Harvesting activities conducted in a day is 2,000 tons to meet the production needs of processed pineapple. Processed pineapple products are produced for export needs (100 %). At present, exports have been made to 60 countries, among them are countries in continental Europe, America, Asia, and the Middle East.

At this time PT GGP realized that the productivity of their land decreased and needed rest, so it cannot be continuously used to plant pineapple. Therefore, starting in 2018 will be a partnership with the community. However, the partnership model that will be applied has not been decided yet.

In addition to producing canned pineapple, PT GGP also sells pineapple in the form of fresh fruit. Fresh pineapple is sold approximately 13 kg per box, and in one box can contain 7-9 pieces. In addition to local sale (the Grade A), fresh fruit is also sold for export purposes, namely to Japan, Korea, and China.

The process of selling the crops is usually done on a whole sales basis, collecting traders will buy in bulk quantities some time before harvest. In one hectare on average will be hired at a price of 60 million to 80 million rupiah, depending on the size of the condition of fruit and fruit uniformity in the landscape with pineapple. There are two marketing chain of pineapple in Lampung Province in general namely:

- Farmers - Traders Gatherers - Large Traders in the District - Large Traders in Jakarta / Bali
- Farmers - Large Traders in the District - Large Traders in Jakarta / Bali

(8) Beriang and Gelam

Beriang and Gelam is a typical plant of peat land that is pioneer, so they have good enough ability of regeneration and growth. These plants are widely used by the community as firewood and limited construction timber. Woody plants (Beriang) are not only intended as conservation crop, but can also be harvested by copies method to preserve production, while the Gelam plants are harvested with selective logging system.

Beriang seedlings can be used natural seedling that grown in secondary forests or community gardens, or seeds obtained from the selected main tree. Beriang and Gelam seeds can be obtained by adding seeds

to the sowing beds and after germination (having 1 or 2 pairs of leaves) Is directly weaned into poly bags containing topsoil growing media and maintained in weaning beds for 3 - 4 months until ready to plant.

The nursery and sprinkling from the natural tillers takes the process of acclimatization in the form of plastic covering process. Natural seedlings removed about 5 cm in size with the number of leaves 3-4 pairs, then planted in poly bags and placed in a plastic lid for 1-2 months. The opening of the lid is done gradually for 2 weeks, then the seeds are kept as usual in the nursery until ready to plant.

Gelam and Beriangan that have been cultivated by the community in OKI District still rely on the maintenance of natural seedlings with maintenance in the form of thinning (population arrangement) and cleaning of weeds. For the need of cultivation of Gelam or Beriangan at a intensive specific location, seedlings cultivation can be done. Wooden and brass jugs are harvested according to the size of the product specifications that received by the market. For Gelam is done by selective cutting system, while Beriangan is done with coppices system, harvesting by selecting stems as the result of trubusan methods.

Market analysis and BCR are not performed in this activity. The cultivation of Beriangan and Gelam has a primary goal for peat revegetation and restoration, not for commercial purposes.

4.2.2 MUBA District, South Sumatra Province

Peat friendly superior commodities which potential to be developed in PHU of Sungai Air Hitam Laut – Sungai Buntu Kecil of MUBA District are kenaf, Areca nut, pineapple, food and horticultural crops, swamp fishery-canal blocking, and environmental service of carbon absorption.

Development pattern for superior commodities of Areca nut, pineapple, food and horticultural crops as well as swamp fishery is relatively similar to that of OKI District. Therefore, discussion on peat friendly superior commodities at MUBA District will be focused on kenaf commodity and environmental service of carbon absorption.

(1) Kenaf

Market prospect for kenaf plant is relatively promising because the market demand for fiber is relatively high. Moreover, harvest time for this plant is relatively short and is easily cultivated. According to Bambang Prayitno, kenaf plant grower from Malang of East Java, kenaf plant can be harvested within 3.5 months since its planting time. The higher yield will be achieved if kenaf plant is harvested at age of more than 3.5 months provided that sufficient water supply is available.

Demand for kenaf fiber is relatively high, but kenaf plant production is still limited because only few farmers that eager to cultivate this plant.

According to Bambang Prayitno, the price of kenaf fiber was depended on international fiber price. The current selling price of kenaf fiber is in the range of 9,000 to 20,000 rupiahs per kilogram. Its selling price can be drop to 8,000 rupiahs per kg during peak production period and can be increase up to 25,000 rupiahs per kg during low production period. Bambang could sold about 100 tons of kenaf fiber per month. He

also accommodates kenaf fiber from farmers around East Java so that his turnover could achieved 900 million rupiahs per month. Most of his kenaf fiber production was sold into automotive producers.

Other kenaf plant grower is Samsul Rusli in Samarinda, East Kalimantan. He had cultivated kenaf plant in area of 20 hectares. According to Samsul Rusli, kenaf plant should be cultivated on extensive area in order to achieve optimum kenaf fiber production. Samsul currently can produce about 10 tons of kenaf fiber per month with turnover of about 50 million rupiahs.

Bangun Sari Village in Kampar of Riau Province had been used as pilot village of kenaf plant by Plantation Council of Riau. Planting season for kenaf plant had been started in December 2013 by farmers group of Pematang Subur and the prime harvest was conducted in the end of April 2014 with planting period of 110 days. Average planting density of kenaf plant was 145 thousands per hectare and can produce 1.9 tons of kenaf fiber. The average buying price of kenaf fiber by PT Global Agrotek Nusantara as the collector was 5,000 rupiahs per kg so that each farmer can receive 9.5 millions rupiah per hectare.

Although kenaf plant cultivation is simple and profitable, but only few of farmers that interested to grow this plant. Farmers had difficulty in marketing of this kenaf fiber even though demand for kenaf fiber was relatively high. They had difficulty in developing of initial marketing network because most of buyers are big companies such as automotive industry.

There are some private companies in Indonesia that utilize kenaf fiber as main raw material such as PT Indonesia Nihon Seima in Tangerang which produce gunny sack and geotextile as well as PT Abadi Barindo Autotech (PT ABA) in Purwosari, Pasuruan of East Java Province which produce fiberboard for automotive industry which cover domestic and overseas markets. PT ABA needs kenaf fiber of about 3,000 tons per year, but this company only capable to fulfill of about 1,500 tons so that the rest should be imported from Vietnam. PT Global Agrotek Nusantara (PT GAN) currently as field management in Lamongan of East Java and Kutai of East Kalimantan and as fiber supplier to PT ABA had given production input credit without interest to farmers. PT GAN will directly deduct the credit received by farmers during fiber buying by PT GAN.

Japan automotive experts currently glance kenaf fiber as raw material for car trim production. Kenaf fiber in Japan and United States is mostly used as interior and chair for luxurious cars. Cars nowadays not only require the physical performance, but they should also light in weight and have high speed. Therefore, automotive experts had started to use lighter materials for several car components. Automotive experts nowadays select plastic because it is cheap, light, easily formed and has excellence strength. In addition, environmental issue also triggers automotive experts to develop alternative material because plastic is considered has potential as pollutant. Japan automotive experts currently glance kenaf fiber as raw material for car trim production. Kenaf fiber in Japan and United States is mostly used as interior and chair for luxurious cars. Kenaf fiber is easily formed and has excellence strength. Part of kenaf plant that is utilized for car's interior is skin of trunk which mainly contain fiber. Kenaf fiber is mixed with phenol and then it

is pressed under heating condition into flat slab similar to slices of triplex wood. Fiber slab is ready to be processed into interior materials of car such as filling material of chair and inner layer of car wall.

Kenaf plant can grow throughout year in Indonesia that has tropical climate. Some of Japanese companies are eager to enact Indonesia as kenaf fiber producer. One of the company that had been conducted trials at Balittas is PT ARACO. This company is one of first automotive company in the world that used kenaf fiber for interior of luxurious cars.

PT Araco was currently had imported kenaf fiber from Vietnam. Kenaf plant in Japan can only be cultivated one time per year due to winter season so that kenaf fiber should be imported from tropical countries. This company since the last three years had set up its branch in Indonesia because kenaf plant can be cultivated in Indonesia throughout the year.

There are four requirements that should be considered in industrial development of kenaf fiber for car interior. These requirements are as follows: supply should match with demand, quality should be match with stated requirement, cost of kenaf fiber should be competitive with cost of plastic material as well as kenaf fiber price offered by China and Vietnam as well on time delivery in order to prevent process interference for automotive industry itself.

PT Kaderaar Indonesia (KI) had classified kenaf fiber into A quality fiber which is used for luxurious car and B quality fiber which is used for car of Toyota Kijang class based on the quality standard. PT Toyota Astra Motor had produced about 5,000 units of Toyota Kijang per month. If one unit of Toyota Kijang requires 11 kg kenaf fiber, then 55 tons of kenaf fiber is required per month. However, this huge market potential cannot be fulfilled by Indonesia. In order to fulfill the demand for the whole year, kenaf should be planted and harvested for the whole year as well. Therefore, planting area should also be matched with kenaf planting for the whole year. In addition, spread seeds of superior variety that can be planted for the whole year should be provided. Because of limited agricultural land availability in Java island, then alternative for kenaf plant development is outside of Java island.

(2) Environmental Services

Specifically, in the production forest area, there is already a Regulation of the Minister of Forestry regulating the Business License for the Utilization of Environmental Services of Carbon Absorption and/or Carbon Saving namely Minister of Forestry Regulation no. P.36 Menhut-II 2009 that be settled on May 22, 2009. Business License for Utilization of Environmental Services in production forest is defined as a business license that give to utilize environmental services in production forest that have been granted permits or rights or which have not been burdened permission or rights. All above may be extended based on the evaluations results by the licensor.

Carbon absorption and/or carbon saving business is one of the most exciting business opportunities. This is not regardless from the global mechanisms associated with climate change agendas that require reducing of carbon emissions.

4.2.3 Kepulauan Meranti District, Riau Province

(1) Sago

Market prospect of sago is depending on its form during the selling. If sago is sold in form of stems or pieces, then it is only covering of local market such as within one village or between vicinity villages due to transportation difficulty and high cost. Buyers of sago pieces or stems usually are sago refineries owners which subsequently process sago pieces or stems into wet sago.

If sold as wet sago, then its market can be wider covering village up to district levels. For instance, wet sago produced in Sungai Tohor can be sold to Selat Panjang or even to Malaysia.

Sago commodity in form of sago starch can reach wider market. According to some information sources, most of sago starch produced in Kepulauan Meranti District was sold to Cirebon and sago starch from this city was further processed or resold to wider market.

Because sago starch has higher economic value, then the central government had plan to build integrated sago processing plant. This plant which worth 20 billions rupiah will have capacity to process hundreds of pieces per day and capable to process ready to sold products such as sago starch, liquid sugar, sago kerupuk, sago noddle and sago mutiara. The plan that will be put into effect within period of 2018-2020 at Sungai Tohor can absorb sago stems or pieces produced from community sago plantation as well as giving opportunity for community members to process their sago yield into products as previously cited. Development of this plant will be an asset for Sungai Tohor and will be managed by BUMDES as well as capable to absorb sago yield from community members plantation even in the simplest form, i.e. sago pieces.

(2) Straw Mushroom

Straw mushroom as food substance is extensively consumed especially in Southeast Asia or East Asia countries, including Indonesia. Therefore, market for straw mushroom is widely opened either domestic or overseas.

(3) Wood Pellet Industry

The prospect of this temporary wood pellet market is more abroad. Consumers of this product are industrial and home industries. South Korea is one example of a country that absorbs wood pellets from Indonesia. In addition to South Korea, many other countries have expressed their interest in wood pellets from Indonesia, such as China, Japan and various countries joined in the European Union.

(4) Liberica Coffee (*Coffea liberica* or *Coffea*)

Coffee is one of the most important drink commodity in the world produced by plant of *Coffea* spp. Coffee consumption is very extensive all over the world. As commerce commodity, coffee ranks second after crude oil. Although the biggest coffee market was found in developed countries, but this commodity is only produced in the developing countries especially which are located at equator region. Indonesia is the biggest coffee producer country which ranks fourth after Honduras, India and Ethiopia.

Coffee drinking culture is continuously developed resulting in increase of coffee consumer numbers and it is estimated that the world's demand for coffee will increase by 5 percent per year. The numbers of coffee consumer in Indonesia had increased significantly in the last ten years. According to Indonesian Coffee Industry and Exporter Association (AEKI), coffee consumption at domestic market in Indonesia currently had reach 1.6–1.7 kg per capita, whereas coffee consumption in the last ten years was only 0.8 kg per capita. This indicates high market potential either at domestic or overseas level.

Market for Liberica coffee is still widely opened, either at domestic or overseas level. Malaysia is the biggest importer of Liberica coffee produced in Indonesia. For example, about 80 percent of coffee yield from plantations at Sempian and Kedabu Rapat was exported into Malaysia country.

4.2.4 Pulang Pisau District, Central Kalimantan Province

(1) Gelam (*Melaleuca cajuputi*)

Gelam tree can be harvested when it is five years old, and can be sold locally in the form of logs both within Central Kalimantan Province and outside Central Kalimantan for example to South Kalimantan Province. The buyers are government, local communities, private companies. The price of Gelam wood is varied, depends on the size of diameter of the wood. The bigger the size of the wood the more expensive the price, and vice-versa.

The products made from Gelam wood have good prospect in international market., especially the charcoal of Gelam and wood pellet used for producing biomass energy. However, the problem is that the industry for developing the product is not available in Pulang Pisau Regency, Central Kalimantan province. Therefore, the it is strong suggested that the industry for processing the product of Gelam wood should be established in Pulang Pisau regency.

(2) Laban (*Vitex pinnata* L)

Laban tree can be harvested when it is reaching 7 years old after planting. It is sold in the form of log outside Central Kalimantan, i.e., to South Kalimantan province. Laban wood product has international prospect as it can be made into charcoal and wood pellet to produce biomass energy. However, the problem is that the industries for processing Laban wood to become various products, are not available in Pulang Pisau Regency.

(3) Balangeran (*Shorea balangeran* (Korth.))

Balangeran tree needs longer time to be harvested, 15 years after planting. Balangeran wood can be processed to produce various type of mechanic building materials. The Balangeran wood has good market prospective both inside and outside the Central Kalimantan province, for example, it is can be marketed in South Kalimantan province. The buyers are the local communities, government and also private companies.

(4) Rubber

Small scale rubber plantation managed by the local communities produces lumps of latex. The rubber tree can be tapped to produce latex when it is 7 years old after planting. Lumps of latex have can also be marketed both inside and outside Central Kalimantan, such as in South Kalimantan. The buyers are the middle traders as the collectors in village level, sub-district, regency, and province. Then it is sold to the companies which producing crumb rubber.

(5) Alabio Duck

Alabio ducks can produce eggs and meat. Alabio duck will produce eggs when it is 6-month old. while its meat can be harvested when it is 1 year old. Eggs and meat of dug can be marketed locally within Central Kalimantan province. The buyers are house hold families, middle man traders, and restaurant owners.

(6) Paddy Field Rice

Paddy field land is harvesting once in a year. Paddy field land is sold in local market within Central Kalimantan Province and also in regional market outside Central Kalimantan, such as in South Kalimantan Province. The buyers are the traders as collectors in the level of regency and province, and then processed to become rice and sold to the communities as the main staple food of local communities.

4.3 Cost Benefit Analysis by Commodity

4.3.1 OKI District, South Sumatra Province

(1) Swamp Buffalo

The calculation of financial aspects for the gulo puan business uses the following assumptions:

- The selection of business location is centered in Pampangan Sub District with the consideration that the production of gulo puan as raw material in this area is quite high and stable. People live around the river and make the business of swamp buffalo as the main livelihood, therefore, raw milk to support the development of gulo puan processing business in this region. There is a gulo processor who has been doing business for more than 10 years and involves a lot of locals, and this region is included in the target of peat restoration located in KHG Sibumbang River-Batok River;
- The acceptance of the gulo puan processing business is the result of multiplication between the selling price of gulo puan and the production. The amount of production used is based on the survey results, so it is assumed that the calculation with production scale of 30 kg (in June - October) per month and 60 kg (in November - May). The selling price uses the assumption of the prevailing selling price of 60.000 rupiah per kg. Thus the assumption of income for gulo puan business is 1.800,00 rupiah per month (in June - October), and 3.600.000 rupiah per month (in November - May)
- Investment costs do not take into account buildings and land as the majority is cultivated in processing houses.

In essence the cost of gulo puan business consists of investment and operational costs. The investment cost is the amount of money used by the entrepreneur or the gulo puan processing business investor as the initial capital in establishing the gulo puan business. Thus, in general any form of capital used for various activities undertaken during the gulo puan business has not resulted then the capital is called investment.

The investment cost of the gulo puan business consists of a plastic filter, aluminum pot, aluminum cauldron, wood stirrer, covered bucket, towel and cupak. While operational costs consist of buffalo milk, sugar, gas, labor and transportation.

The results of financial analysis with detail calculations are shown in the Attachment 1 1).

(2) Swamp Fishery

The calculation of financial aspects for salted fish and smoked fish business use the following assumptions:

- The selection of business location is centered in Pampangan Sub District with the consideration that the production of fresh fish as raw material in this area is quite high and stable, the people live around the river and make fishery business as main livelihood and expected to increase fisherman's income, In the form of fresh fish supporting the development of salted fish and smoked fish processing business in this region, at the location there are salted fish and smoked fish entrepreneurs who have been doing business for more than 10 years and involve many local people, and this region is included in the target of peat restoration which is at KHG Sibumbang River - Batok River.
- The acceptance of salted fish and smoked fish processing is the result of the multiplication of the selling price of salted fish and smoked fish with the production. The amount of production used is based on the survey results, so it is assumed that the calculation with the scale of production business of 100 kg per day for salted fish (3.000 kg per month) and 100 kg per day for smoked fish (3.000 kg per month). The selling price uses the prevailing selling price of 40.000 rupiah per kg for the salted fish, and 100.000 copies per kg for smoked fish. Thus the assumption of receipt for each business is 4.000.000 rupiah per day (120.000.000 rupiah per month) for salted fish, and 10.000.000 rupiah per day (300.000.000 rupiah per month), *ceteris paribus*.
- Investment costs do not take into account buildings and land because the majority is cultivated in the home of the entrepreneur and on the home page of the entrepreneur for drying and fumigating.

In essence the cost of processing salted fish and smoked fish consists of investment and operational costs. Investment Cost is the amount of money used by entrepreneurs or investors to process salted fish or smoked fish as initial capital in the establishment of salted fish or smoked fish processing business.

Thus, in general any form of capital used for various activities undertaken during the salted fish or smoke processing business has not produced, then the capital is called investment. This investment is a component of fixed costs in accordance with its economic age, salted fish and smoked fish processing business investment is determined for 5 years. The calculation of investment is done for 5 years with the consideration that the business of salted fish and smoked fish using investment equipment with the life of

wear for 5 years. The results of financial analysis with detail calculations are shown in the Attachment 1 2.

Investment cost of salted fish processing business is used to procure drum, basket, pond (para-para), and pillar (para-para). For the smoked fish business, the investment cost includes drums, baskets, and curing ovens. Operational costs are costs incurred that are influenced by factors of production. Operational costs used in salted fish and smoked fish processing are raw material cost, relief materials cost, and labor cost. From the cost incurred and the resulting production can be calculated income earned in the period of one month business. The results of financial analysis with detail calculations are shown in the Attachment 1 2).

(3) Purun handicraft

Calculation of financial aspect for this purun handicraft business use the following assumptions:

- The selection of business location is centered in Pampangan sub district with the consideration that the raw material in this region is quite high and stable, many people make woven purun as main raw material.
- Purun handicraft income is the result of multiplication between selling price of handicrafts per product with the price of each bag (45.000 rupiah per unit), pencil case (7.000 rupiah per unit), purse (25.000 rupiah per unit), key chain (3.000 rupiah per unit), and sandals (12.000 rupiah per unit). The amount of production based on survey results, so assumed the calculation of bags production (200 unit per day), purses (50 unit per day), pencil cases (20 unit per day), key chain (500 unit per day), sandals (500 unit per day), and hand held fan (500 unit per day) with 50 employees.
- Investment cost doesn't calculate building and land cost due to purun handicraft activities can be done at the chair of group home.

The cost of purun handicraft business consist of investment cost and operational cost. The investment cost is the amount of money used by entrepreneurs or investors as initial capital in the establishment of purun handicraft. So, in general any form of capital used for various activities undertaken during the purun craft business doesn't produce then the capital called investment.

Investment is a component of fixed costs accordance with its economic time, purun business investment is determined for 3 years. Investment is calculated for 3 years consider that purun craft business uses the investment tools with 3 years life time.

Investment cost of purun handicraft business consist of scissors, needles and stainless ruler. Operational costs are the costs incurred that are influenced by production factors. The operational costs which are used in the purun handicraft business is the cost of raw materials, cost of supporting materials and other operational. The results of financial analysis with detail calculations are shown in the Attachment 1 3).

(4) Lowland Swamp Paddy

The calculation of financial aspects for rice farming in lowland swamp area uses the following assumptions:

- The selection of business location is centered in Pampangan sub district with the consideration that the lowland swamp area in Pampangan subdistrict can represent the rice farming of lowland swamp in OKI district and the region is one of target of peat restoration.
- Lowland swamp farming income is the result of multiplication between selling price of dry grain harvest. The amount of production based on survey results, so assumed the calculation of land area used for 2,5 hectares, production per hectare of 4 tons. Selling price uses the prevailing price is 4.000 rupiah per kg dry grain harvest. Thus assuming the acceptance of rice farming of 40.000.000 rupiah per planting season.
- Land investment cost is not taken into the calculation because the majority of farming is an inheritance land of parents.

The cost of paddy rice farming consists of investment and operational costs. Investment cost is the amount of money that used by farmers as initial capital in rice farming. Thus, in general any form of capital used for various activities undertaken during the rice farming business has not yielded, then the capital is called investment.

This investment is a component of fixed costs in accordance with its economic life, investment on rice farming is determined for 5 years. Investment calculation is done for 1 year with the consideration that the rice farming business using the investment equipment with 1 year life time.

Investment cost of rice farming business is boat and machetes. Operational costs are costs incurred that are influenced by factors of production. The operational costs used in the rice farming business are the cost of fertilizer use, the cost of the use of chemicals, and labor. The results of financial analysis with detail calculations are shown in the Attachment 1 4).

(5) Liberica Coffee

Commodities: Coffee and Betel Nut

The combination of coffee and betel nut can be chosen as alternative commodities to cultivate on peatlands. Both of these commodities are quite adaptive on the peatlands. The information of the feasibility of this business can be gained by utilize cost-benefit analysis.

Coffee grown on peatlands will begin to bear fruit at the age of 2.5-3 years and reach the peak of the fruiting period at the age of 5-10 years. After that, the coffee plant will bear fruit normally until the age of 25 years. The average productivity of coffee is 560 kg per ha per year. This figure is in the form of coffee beans that have been peeled and dried (dried peeled beans). The price of dried peeled coffee beans ranges from 20,000 to 25,000 rupiah per kg and fresh fruit ranges from 3,000 to 5,000 rupiah per kg.

Meanwhile, betel nut plants on peatlands will start flowering on the age of 4 years. Betel nut plants reach the normal fruiting period on the age of 5 or 5.5 years and attain the peak of fruiting period on the age of 9 to 15 years. The price of dried betel nut ranges from 12,000 to 13,000 rupiah per kg.

Feasibility analysis of the combination of coffee and betel nut has done by calculating NPV, BCR, and IRR. These indicators are calculated on 11 % of interest rate level. The period of the analysis was conducted for 25 years. The result of calculation showed that the use of peatlands for the cultivation of these two commodities is financially feasible as indicated by NPV (positive value), BCR (more than 1) and IRR (above the interest rate). The results of financial analysis with detail calculations are shown in the Attachment 1 5).

(6) Betel/Areca Palm

Commodities: Betel Nut and Paddy/Corn

In addition to coffee, betel nut on peatlands also can be combined with agricultural crops, such as paddy and corn. Both of agricultural commodities can be planted alternately within one year during the betel nut cycle (25 years). By applying this cultivation pattern, the yields will be obtained by harvest of paddy and harvest of corn per year while the cycle period or during 25 years.

Cropping pattern for this combination applies Surjan system. The land for planting betel nut made in the form of bundle as wide as 3 meters and the distance between two bundles is 10 meters. By applying this pattern, the number of betel nut tree which is embedded in one hectare of land is 528 stems and there is an area of 8,000 m² for paddy or corn cultivation.

To get the business feasibility of this cultivation pattern, the cost-benefit analysis has been done by using indicators of NPV, BCR, and IRR. The business analysis of this cultivation pattern is also used 25 years of cycle and 11 percent of interest rate. The results of financial analysis with detail calculations are shown in the Attachment 1 6).

The results of the analysis, as shown in Table 4.4.8., presented that the pattern of mixed cropping between betel nut with rice/corn is financially feasible. At 11 % of interest rate level, the mixed cropping of betel nut with paddy/corn is predicted to provide benefits as indicated by NPV (a positive value), BCR (more than one) and IRR (above interest rate).

(7) Pineapple

Commodities: Pineapple and Areca nut

Another use of peat swamp land by the community is the pattern of pineapple and Areca nut cultivation. Areca nut planted with a distance of 3 x 12 meters with the number of plants as much as 278 stems. Pineapples are planted with a distance of 30 x 100 cm, so the number of plants in one area per hectare of 21,500 stems.

The cost of plant investment at the beginning of the year to the immature plant consists of the cost of land clearing and processing, planting and planting, planting, fertilizing, and crop planting. Non-plant

investment costs in the form of land purchase, purchase of farm equipment, harvesting and processing costs. The cost of land opening and processing is a joint cost between pineapple and areca nut plants.

Pineapple will be harvested every 9 months to 1 year. The business analysis was performed by calculating the NPV, BCR, and IRR values during the 25-year cycle. The analysis was performed at an interest rate of 11 percent. The results of financial analysis with detail calculations are shown in the Attachment 1 7).

Based on the results of the analysis can be stated that the cultivation of pineapple plants with areca nut in peat lands is financially feasible. At a real interest rate of 11%, the exploitation of pineapple and areca nut is able to provide benefits with positive NPV values, BCR values of more than one, and IRR above the interest rate.

4.3.2 MUBA District, South Sumatra Province

(1) Kenaf

Kenaf plant can be cultivated by using intercropping system, either on the side lines of main crop (for instance forest wood) or with other crops having similar growing period (for instance corn). Kenaf plant cultivation is economically can give benefit for community members which in turn can increase economic status of community or farmers income.

4.3.3 Kepulauan Meranti District, Riau Province

(1) Sago

Sago is sold by community members in several forms and the simplest forms are consisted of plant stem and stem pieces. The price of sago plant was in the range of 250,000 to 400,000 rupiahs per stem depending on its length and weight. The price of sago pieces was in the range of 35,000 to 45.000 rupiahs per piece.

Other sago products are consisted of wet sago or paste sago which produced from sago flour extraction of stem pith having price of 1,800 to 2,000 rupiahs per kg. Each sago pieces will produce wet sago of 25-30 percent from piece weight. Wet sago with weight of 25 to 30 kg will be produced from 100 kg of piece. If wet sago is further processed into sago flour, then its price will increase by 250-300 percent from wet sago price, i.e. in the range of 4,500 to 6,000 rupiahs per kg.

However, numbers of sago plant equipped with drying facilities are limited and can only be used by the owners. Small fraction of wet sago produced by community members was processed into traditional foods such as sago noodle, egg sago and lipid sago which are usually marketed within villages up to districts.

For the development of sago garden that can increase the income of the community can be diversified sago with wood Selumar. Selumar wood is very useful for construction and carpentry purposes. Selumar wood has a high growth incubation and can be harvested at the age of 10 with minimal plant maintenance, so it does not cost a lot.

The model of diversifying sago palm and Selumar gardens in forested areas, especially in the Village Forest permits and unlicensed areas managed directly by KPHP Tebing Tinggi, needs to be done with the Partnership model with the company. Companies that potential to be invited to partner is PT. NSP is still short of raw materials to meet the production capacity of the plant that has been built on Pulau Tebing Tinggi. At present, besides being supplied from its own concession area, it also accommodates community sago from Indragiri Hilir Regency and Siak Regency. PT. NSP can act as avalis (loan guarantor) or as a financier, provide technical guidance, and accommodate the production of tual sago. With the form of partnership model between forest manager and PT. NSP then the degraded peat areas can be restored.

The financial viability of diversifying sago palm and hectares plantations per hectare for 20 years with detail calculations are shown in the Attachment 2 1):

(2) Straw Mushroom

Potential of sago pith utilization as cultivation medium for straw mushroom has two positive impacts at once, i.e. reducing the pollutant substance to environment and creating new livelihood source for community members. Market for straw mushroom is widely opened either in domestic or overseas. The price of straw mushroom in Indonesia was generally in the range of 25,000 to 40,000 rupiahs per kg.

Economic analysis of straw mushroom production had been done by Dedi Suyerman. Calculation obtained by using sample of his pilot plant with detail calculations are shown in the Attachment 2 2).

(3) Wood Pellet Industry

Sago waste in the form of stem bark reaches \pm 739.000 ton/year. With the amount of raw materials it can produce \pm 465.000 tons of wood pellets/year. The potential of raw materials and production can grow 20 wood pellet factories with an average production capacity of 6 tons/hour or about 23 thousand tons/year. Detail calculations are shown in the Attachment 2 3)

(4) Liberica Coffee (*Coffea liberica* or *Coffea*)

Liberica coffee from Sempian and Kedabu Rapat nowadays was recognized as one of the best quality coffee from Indonesia. The price of this coffee in form of green bean was in the range of 40,000 to 50,000 rupiahs per kg, whereas its price in form of roasted bean was in the range of 120,000 to 130,000 rupiahs per kg.

Potential development for Liberica coffee is still exist although condition of coffee cultivation and marketing nowadays was very apprehensive. The success found at Sempian and Kedabu Rapat showed that proper management of coffee plantation could increase its productivity in the range of 8,000 to 10,000 kg green bean/ha/year. If the threshold of coffee seeds into green bean is only 10 percent, then plantation productivity of Liberica coffee farmer is in the range of 800 to 1,000 kg/ha/year which equivalent to income magnitude of 36,000,000 to 45,000,000 rupiahs per year. The results of financial analysis with detail calculations are shown in the Attachment 2 4).

4.3.4 Pulang Pisau District, Central Kalimantan Province

(1) Gelam (*Melaleuca cajuputi*)

There are economic benefits to plant Gelam trees on the peatland as listed below:

- Gelam wood has important role for house construction and building as well as utilized for pole wood foundation and supporting material during concrete casting.
- Gelam wood is used as cerucuk (Banjar language) or supporting material during construction of fly over road and crossing bridge.
- Gelam wood as “siring” (temporary soil buffer) for road or house yard.
- Gelam wood as raw material for art craft such as cigarette ashtray.
- Gelam wood as raw material for saw mill, charcoal making and charcoal briquette.

Gelam sold in form of round wood (log) was only 52 % and the remaining of 48 % was washed away even though this wood waste can be used as raw material for charcoal making. Charcoal price was 2,500 rupiah per kg so that the selling value differences between log wood and log wood charcoal was 11,589 rupiahs per stem (selling price of round wood (log) is 5,500 rupiahs per stem and selling price of charcoal is 17,089 rupiahs per stem, not included charcoal cost making).

Based on the information above, economic analysis was consisted of enterprise scale component, investment cost, Net Present Value (NPV), Benefit Cost Ratio (BCR) and Payback Period (PBP). The results of financial analysis with detail calculations are shown in the Attachment 3 1).

(2) Laban (*Vitex pinnata* L)

Laban tree is called kalapapa in Dayak language. Laban wood is used as raw material for industries of interior design, furniture, house construction and charcoal making. Leaves and roots of Laban tree can be utilized as herbal medicine. Laban wood sold in form of round wood (log) is only 70% and the remaining 30% is wasted away, even though this wood waste can be used as raw material for charcoal making and other products. Charcoal price was 4,000 rupiah per kg so that the selling value differences between log wood and log wood charcoal was 33,333 rupiahs per stem (selling price of log wood is 26,667 rupiahs per wood stem and selling price of charcoal is 60,000 rupiahs per wood stem, not included charcoal production cost).

The results of financial analysis with detail calculations are shown in the Attachment 3 2).

(3) Balangeran (*Shorea balangeran* (Korth.))

Only few of community members cultivate Balangeran tree, although Balangeran wood is highly demanded. This is estimated due to long cutting harvest time of this tree (more than 20 years) so that community members tend to choose quick yield trees such as Balangeran (*Dyera polyphylla*) to tap its sap, rubber and oil palm. Balangeran wood was currently difficult to be found in market due to continuous exploitation without offset by planting effort, resulting in scarcity of balangeran natural population as had already occurred for other wood types in peat swamp, for instance Ramin wood (*Gonystyllus bancanus*).

This was indicated by less natural stands of Balangeran trees having good potential. Price of Balangeran wood was 3 million rupiahs per m³.

The results of financial analysis with detail calculations are shown in the Attachment 3 3).

(4) Rubber

Economic analysis was consisted of enterprise scale component, investment cost, Net Present Value (NPV), Benefit Cost Ratio (BCR) and Payback Period (PBP). The results of financial analysis with detail calculations are shown in the Attachment 3 4).

(5) Alabio Duck

Alabio duck can properly grow and flourish on wet land. There are several steps that should be considered in raising of alabio duck as follows:

- Location Selection.

Suitable location for alabio duck raising is site covered by trees or it can be an open area which is close to the coast or mountain. This location should receive full sun light every day and the surface can be covered by stones or grasses.

- Cages Making.

One duck ideally requires area of 0.25m² or there are 4 ducks in 1 m² area. For raising of 100 ducks, cages area should be ±24 m². These cages can be built in yard area which ease duck raising or controlling.

- Seeds Provision and Raising.

Duck seeds was bought from Alabio Subdistrict at 2 months of age with price of 40,000 rupiahs per duck. The most important aspect for Alabio duck raising is feeding. This feed substances are consisted of rice bran, ilung, kayapu, giyanggang and lilies.

- Harvest or Egg Production.

Alabio duck starts to produce egg at age of 5-6 months with productive age of 2 years and egg production period of 18 months. Egg production will be decrease in line with the increase of duck's age.

Economic analysis was consisted of enterprise scale component, investment cost, Net Present Value (NPV), Benefit Cost Ratio (BCR) and Payback Period (PBP). The results of financial analysis with detail calculations are shown in the Attachment 3 5).

(6) Paddy Field Rice

Economic analysis was consisted of enterprise scale component, investment cost, Net Present Value (NPV), Benefit Cost Ratio (BCR) and Payback Period (PBP). The results of financial analysis with detail calculations are shown in the Attachment 3 6).

4.3.5 Services applicable to all the target areas

(1) Environmental Services

The mechanism for reducing emissions from deforestation and forest degradation in the developing countries has been agreed by the parties in the 13th climate change conference (COP 13) in Bali, known as REDD (Reducing Emission from Deforestation and Forest Degradation).

REDD benefit and cost assessments have been conducted in several countries, such as Silva-Chavez (2005) in Bolivia, Osafo (2005) in Ghana, Nepstad, et al. (2007) in Brazil, Bellassen and Gitz (2008) in Cameroon, as well as Karky and Skutsch (2009) in Nepal. Bellassen and Gitz (2008) conducted a study on primary forest with a utilization choices as forest conservation; wood extraction; or forest conversion into agricultural cultivation area. While Karky and Skutsch (2009) conducted profitability analysis on community forest.

Evaluation of the benefits and costs of reducing emissions from deforestation and forest degradation in Indonesia that are part of a global level of analysis have been conducted by Grieg-Gran (2008). While the study at the level of management units is conducted by the Forestry Research Institute of Palembang (2010) in the industrial plantation forest management unit of PT. Bumi Bumi Andalas Wood Industries (HTI PT SBA WI), South Sumatera.

At discount rate 10 % in 8 years, timber concession at PT. SBA WI is not feasible because it shows negative NPV, BCR less than one, and IRR less than 10 %. However, if forest exploitation is intended for CO₂ emission reduction services or for timber and carbon concessions simultaneously, the results are profitable.

The HTI Exploitation Break-Even Cost of PT. SBA WI in an effort to reduce emissions from deforestation and forest degradation is 14,932 rupiah equivalent to 1.61 USD. These costs are quite competitive compared to the cost of reducing emissions in some other tropical countries, as well as compared to the prevailing carbon price in the voluntary market.

Attachment: Detail Calculation of Cost-Benefit Analyses of each Business Model

(1) Attachment 1: OKI District, South Sumatra Province

1) Swamp buffalo

INVESTMENT COST								
NO	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE (Rp)	PRICE	ECONOMIC AGE (MONTH)	DEPRECIATION COST	RESIDUAL VALUE
1 Production Equipment								
	Plastic filter	1	unit	30,000	30,000	12	2,500	-
	Aluminum pan	1	unit	100,000	100,000	12	8,333	-
	Aluminum frying pan	1	unit	150,000	150,000	12	12,500	-
	Wood stirrer	1	unit	100,000	100,000	12	8,333	-
	Gas stove	1	unit	250,000	250,000	12	20,833	-
	Total				630,000		52,500	

OPERATIONAL COST							
Production (June-Oct)							
NO	DESCRIPTION	QUANTITY/WEUNIT	UNIT PRICE (RP)	COST/WEEK H	COST/MONT	COST/5 MONTHS	
1	Milk	8 liter	20,000	160,000	640,000	3,200,000	
2	Sugar	2 kg	10,000	20,000	80,000	400,000	
3	Gas	1 unit	25,000	25,000	100,000	500,000	
4	Labor	1 people	50,000	50,000	200,000	1,000,000	
5	Transportation			40,000	160,000	800,000	
	TOTAL			295,000	1,180,000	5,900,000	

OPERATIONAL COST							
Production (Nov-May)							
NO	DESCRIPTION	QUANTITY/WEUNIT	UNIT PRICE	COST/WEEK H	COST/MONT	COST/7 MONTHS	
1	Milk	20 liter	15,000	300,000	1,200,000	8,400,000	
2	Sugar	5 kg	10,000	50,000	200,000	1,400,000	
3	Gas	1 unit	25,000	25,000	100,000	700,000	
4	Labor	1 People	50,000	50,000	200,000	1,400,000	
5	Transportation			40,000	160,000	1,120,000	
	TOTAL			465,000	1,860,000	13,020,000	

SUMMARY OF OPERATIONAL COST		
1 year		
No	Description	Total
1	June-October	5,900,000
2	November-May	13,020,000
	Total	18,920,000

Production						
NO	DESCRIPTION	QUANTITY	UNIT	PRICE (/kg)	REVENUE (Rp/Month)	REVENUE (Rp/Year)
1	Jun - Oct (5 months)	30	kg	60,000	1,800,000	9,000,000
2	Nov - May (7 months)	60	kg	60,000	3,600,000	25,200,000
	Total				5,400,000	34,200,000

June-Oct unit price 60,000
variable cost per unit 9,833 6 50,167

Nov-May unit price 60,000 8
variable cost per unit 7,750 52,250

PROJECTION OF REVENUES AND COSTS OF "GULO PUAN"														
NO	DESCRIPTION	MONTH												TOTAL
		0	1	2	3	4	5	6	7	8	9	10	11	
1	Revenue													
	a. Sales		3,600,000	3,600,000	3,600,000	3,600,000	3,600,000	1,800,000	1,800,000	1,800,000	1,800,000	1,800,000	3,600,000	3,600,000
	b. Residual Value													
	Total		3,600,000	3,600,000	3,600,000	3,600,000	3,600,000	1,800,000	1,800,000	1,800,000	1,800,000	1,800,000	3,600,000	3,600,000
														34,200,000
2	Cost													
	a. Investment													
	Production Equipments	52,500												
	Total A	52,500												
	b. Operational Cost													
	Milk		1,200,000	1,200,000	1,200,000	1,200,000	1,200,000	640,000	640,000	640,000	640,000	640,000	1,200,000	1,200,000
	Sugar		200,000	200,000	200,000	200,000	200,000	80,000	80,000	80,000	80,000	80,000	200,000	200,000
	Gas		100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
	Labor		200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000
	Transportation		160,000	160,000	160,000	160,000	160,000	160,000	160,000	160,000	160,000	160,000	160,000	160,000
	Total B		1,860,000	1,860,000	1,860,000	1,860,000	1,860,000	1,180,000	1,180,000	1,180,000	1,180,000	1,180,000	1,860,000	1,860,000
	Total A+B	52,500	1,860,000	1,860,000	1,860,000	1,860,000	1,860,000	1,180,000	1,180,000	1,180,000	1,180,000	1,180,000	1,860,000	1,860,000
														18,920,000
3	Revenue													
	Production of Gulo Puan		3,600,000	3,600,000	3,600,000	3,600,000	3,600,000	1,800,000	1,800,000	1,800,000	1,800,000	1,800,000	3,600,000	3,600,000
4	Income		1,740,000	1,740,000	1,740,000	1,740,000	1,740,000	620,000	620,000	620,000	620,000	620,000	1,740,000	1,740,000
	Tax (10%)		174,000	174,000	174,000	174,000	174,000	62,000	62,000	62,000	62,000	62,000	174,000	174,000
	Net income		1,566,000	1,566,000	1,566,000	1,566,000	1,566,000	558,000	558,000	558,000	558,000	558,000	1,566,000	1,566,000

BEP (rupiah) 62,791
 BEP (Unit) 1.05

60,287
 1.00

RC Ratio	Overall (12 month)	1.81
	June-October (5 month)	1.53
	November-May (7 month)	1.94

2) Swamp Fishery

a) Salted Fish Business

Investment Cost

No.	Description	Quantity	Price (Rp)	Total Cost (Rp)	Economic Age (month)	Depreciation cost (Rp/month)
1	Drums	20	250,000	5,000,000	12	416,667
2	Empty / Para-Para	60	50,000	3,000,000	60	50,000
3	Pillars of fish / Para-Para	60	50,000	3,000,000	36	83,333
4	Basket	20	50,000	1,000,000	12	83,333
	TOTAL			12,000,000		633,333

Operational Cost

No.	Description	Quantity	Unit	Unit Price (Rp)	Total Cost (Rp)
1	Fresh fish (raw materials)	9,000	kg	10,000	90,000,000
2	Salt (supporting materials)	2,250	kg	500	1,125,000
3	Cardboard (weight capacity: 50 Kg)	60	unit	6,000	360,000
4	Rope and Sealer (roll)	15	rolls	30,000	450,000
5	Labor				
	Cleaning fresh fish	9,000	kg	500	4,500,000
	Salting and drying	120	manday	35,000	4,200,000
6	Packaging	90	manday	60,000	5,400,000
7	Shipping	60	boxes	80,000	4,800,000
	Total				110,835,000

Income

Total Cost	111,468,333
Total Production (Kg)	3,000
Selling Price (Rp/Kg)	40,000
Total Revenue (Rp/month)	120,000,000
Total Income (Rp/month)	8,531,667
R/C	1.08

b) Smoked Fish Business

Investment Cost

Description	Quantity	Unit Price	Total Cost	Economic age (month)	Depreciation cost (Rp/month)
Drum	20	250,000	5,000,000	12	416,667
Concrete Oven capacity 1 ton	1	10,000,000	10,000,000	36	277,778
Baskets	20	50,000	1,000,000	12	83,333
Baking tool (for smoking)	20	100,000	2,000,000	24	83,333
Total			18,000,000		861,111

Operational Cost

No.	Description	Quantity	Unit	Unit Price	Total Cost
1	Fresh Fish (raw material)	9000	kg	16,000	144,000,000
2	Firewood	30	day	300,000	9,000,000
3	Cardboard (capacity: 50 Kg)	120	unit	6,000	720,000
4	Rope and Sealer (roll)	30	rolls	30,000	900,000
5	Labor				
	Cleaning Fresh Fish	9000	kg	500	4,500,000
	Smoking	90	manday	60,000	5,400,000
	Packaging	90	manday	60,000	5,400,000
6	Shipping	120	boxes	80,000	9,600,000
	Total				179,520,000

Income

Total Cost (Rp)	180,381,111
Total Production (Kg)	3,000
Selling Price (Rp/Kg)	100,000
Total Revenue (Rp/month)	300,000,000
Total Income (Rp/month)	119,618,889
R/C	1.663

3) Purun Handicraft

Investment Cost

No.	Description	Quantity	Unit	Unit Price (Rp/Unit)	Price	Economic Age (year)	Economic Age (month)	Depreciation (year)	Depreciation (month)		Residual Value (1 year)
1	Scissor	50	unit	12,000	600,000	2	24	300,000	25,000	25,000	300,000
2	Needle	50	unit	1,700	85,000	1	12	85,000	7,083	7,083	-
3	Ruler	50	unit	12,500	625,000	3	36	208,333	17,361	17,361	416,667
Total					1,310,000			593,333	49,444		716,667

Operational Cost

No.	Description	Quantity	Unit	Unit Price	Value
A	Main Materials				
1	webbing of purun	1,950	sheet	30,000	58,500,000
2	Purun (buttons)	4	sope	5,000	20,000
	Total				58,520,000
B	Supporting materials				
1	carton (layer)	3,720	sheet	8,000	29,760,000
2	colouring	4	bottle	60,000	240,000
3	rubber sandal base 1x1 m	600	sheet	150,000	90,000,000
4	aibon glue	5	can	32,000	160,000
5	newspaper (design)	1,050	bundle	1,000	1,050,000
6	carton (design)	4,200	sheet	4,000	16,800,000
7	fox glue	3	pack	10,000	30,000
8	sewings	5	set	48,000	240,000
9	kerosene	2	liter	4,500	9,000
10	zippers	1,500	unit	7,000	10,500,000
11	fabric furing	900	meter	4,000	3,600,000
12	fabric batik	25	m2	20,000	500,000
13	bamboo	15,000	stem	150	2,250,000
14	hanging key	105	gross	40,000	4,200,000
	Total				159,339,000
C	Operational				
1	Electricity	1	month	200,000	200,000
2	Labor	50	people	750,000	37,500,000
3	Wages sewing	53,100	unit	3,000	159,300,000
	Total				197,000,000
	Contingency 10%				41,485,900
	Total				456,344,900

Revenue per Month

No.	Product	Quantity	Unit	Unit price	Revenue	Unit per day	Income
1	bag	6,000	unit	45,000	270,000,000	200	
2	purse	1,500	unit	25,000	37,500,000	50	
3	pencil case	600	unit	7,000	4,200,000	20	
4	key chain	15,000	unit	3,000	45,000,000	500	
5	sandals	15,000	unit	15,000	225,000,000	500	
6	hand held fan	15,000	unit	7,000	105,000,000	500	
	TOTAL	53,100	unit		686,700,000		230,355,100

PROJECTION OF BENEFIT AND COST OF PURUN CRAFT

NO	DESCRIPTION	MONTH												TOTAL	
		0	1	2	3	4	5	6	7	8	9	10	11		12
A	Income of Depreciation		230,355,100	230,355,100	230,355,100	230,355,100	230,355,100	230,355,100	230,355,100	230,355,100	230,355,100	230,355,100	230,355,100	231,071,767	2,764,977,867
	1 Revenue	0	686,700,000	686,700,000	686,700,000	686,700,000	686,700,000	686,700,000	686,700,000	686,700,000	686,700,000	686,700,000	686,700,000	686,700,000	8,240,400,000
	2 Residual Value													716,667	716,667
	TOTAL	0	686,700,000	686,700,000	686,700,000	686,700,000	686,700,000	686,700,000	686,700,000	686,700,000	686,700,000	686,700,000	686,700,000	687,416,667	8,241,116,667
B	Fixed Cost														-
	1 Investment	1,310,000													1,310,000
	2 Depreciation	-													-
C	Variable Cost														-
	1 The main materials		58,520,000	58,520,000	58,520,000	58,520,000	58,520,000	58,520,000	58,520,000	58,520,000	58,520,000	58,520,000	58,520,000	58,520,000	702,240,000
	2 Supporting materials		159,339,000	159,339,000	159,339,000	159,339,000	159,339,000	159,339,000	159,339,000	159,339,000	159,339,000	159,339,000	159,339,000	159,339,000	1,912,068,000
	3 Operational		197,000,000	197,000,000	197,000,000	197,000,000	197,000,000	197,000,000	197,000,000	197,000,000	197,000,000	197,000,000	197,000,000	197,000,000	2,364,000,000
	Contingency 10%		41,485,900	41,485,900	41,485,900	41,485,900	41,485,900	41,485,900	41,485,900	41,485,900	41,485,900	41,485,900	41,485,900	41,485,900	497,830,800
	TOTAL		456,344,900	456,344,900	456,344,900	456,344,900	456,344,900	456,344,900	456,344,900	456,344,900	456,344,900	456,344,900	456,344,900	456,344,900	5,476,138,800
	TOTAL FC+VC	1,310,000	456,344,900	456,344,900	456,344,900	456,344,900	456,344,900	456,344,900	456,344,900	456,344,900	456,344,900	456,344,900	456,344,900	456,344,900	5,477,448,800
	TOTAL Depr+VC	-	456,344,900	456,344,900	456,344,900	456,344,900	456,344,900	456,344,900	456,344,900	456,344,900	456,344,900	456,344,900	456,344,900	456,344,900	5,476,138,800
	BC Ratio	0.50479301		0.50											
	RC Ratio	1.504423008		1.50											

4) Swampy paddy production

Investment Cost (2.5 ha)

No.	Investment Cost	Volume(Unit)	Price (Rp)	Total Cost (Rp)	Economic Age (year)	Depreciation cost (year)
1	Boat (Unit)	1	6,000,000	6,000,000	4	1,500,000
2	Cleaver	2	80,000	160,000	2	80,000
	Investment cost total			6,160,000		1,580,000

Operational Cost (2.5 ha)

No.	Operational Cost	Volume	Unit	Price (Rp)	Total Cost (Rp)
1	Seeds				
	Ciherang	10	kg	17,000	170,000
	Indramayu	10	kg	17,000	170,000
	Sub Total				340,000
2	Fertilizer				
	Urea	3	sack	115,000	345,000
	NPK	3	sack	160,000	480,000
	Sub Total				825,000
3	Herbicide and Insecticide				
	Round-Up	3	litre	13,000	39,000
	Remasol	2	litre	30,000	60,000
	Bimastar	2	litre	30,000	60,000
	Rakus	30	pack	5,000	150,000
	Sub Total				309,000
4	Labor				
	Land Clearing	1	pack	7,200,000	7,200,000
	Planting	1	pack	8,400,000	8,400,000
	Fertilization	1	pack	840,000	840,000
	Crop	1	pack	2,500,000	2,500,000
	Sub Total				18,940,000
	Total Operational Cost				20,414,000

Income (2.5 ha)

Total Cost (Rp)	21,994,000
Production (4,000 Kg/ ha)	10,000
Selling Price (Rp/ Kg)	4,000
Revenue (Rp)	40,000,000
Income (Rp)	18,006,000
R/ C	1.82

Cash flow of plantation combination of betel nut and coffee per hectare for 25 year

No	Description	Years														
		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
A	Direct investment															
1	Land preparation															
a	Land preparation: seedling (arecanut and coffee), planting	17,000,000.00														
b	Land	30,000,000.00														
c	Embroidery plant (labor, herbicide,)		1,950,000.00													
2																
	Total	47,000,000.00	1,950,000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	Maintenance															
1	Fertilizing and maintenance															
a.	Fertilizing :															
a.	Ponska															
b.	Urea															
b.	Labor															
2	Herbicide															
a.	Herbicide		550,000.00	550,000.00	550,000.00	550,000.00	550,000.00	550,000.00	550,000.00	550,000.00	550,000.00	550,000.00	550,000.00	550,000.00	550,000.00	550,000.00
b.	Labor		210,000.00	210,000.00	210,000.00	210,000.00	210,000.00	210,000.00	210,000.00	210,000.00	210,000.00	210,000.00	210,000.00	210,000.00	210,000.00	210,000.00
	Total	0.00	760,000.00	760,000.00	760,000.00	760,000.00	760,000.00	760,000.00	760,000.00	760,000.00	760,000.00	760,000.00	760,000.00	760,000.00	760,000.00	760,000.00
B	Fix Investment															
1	equipment	200,000.00	0.00	200,000.00	0.00	200,000.00	0.00	200,000.00	0.00	200,000.00	0.00	200,000.00	0.00	200,000.00	0.00	200,000.00
2																
	Total	200,000.00	0.00	200,000.00	0.00	200,000.00	0.00	200,000.00	0.00	200,000.00	0.00	200,000.00	0.00	200,000.00	0.00	200,000.00
	Harvesting coffee	0.00	0.00	0.00	200,000.00	300,000.00	600,000.00	700,000.00	800,000.00	800,000.00	800,000.00	700,000.00	700,000.00	600,000.00	700,000.00	700,000.00
	Harvesting areca nut	0.00	0.00	0.00	0.00	0.00	0.00	360,000.00	840,000.00	1,200,000.00	1,440,000.00	1,800,000.00	1,800,000.00	1,680,000.00	1,800,000.00	1,800,000.00
	Coffee processing				300,000.00	450,000.00	900,000.00	1,050,000.00	1,200,000.00	1,200,000.00	1,200,000.00	1,050,000.00	1,050,000.00	1,050,000.00	900,000.00	1,050,000.00
	Total	0.00	0.00	0.00	500,000.00	750,000.00	1,500,000.00	2,110,000.00	2,840,000.00	3,200,000.00	3,440,000.00	3,550,000.00	3,550,000.00	3,430,000.00	3,300,000.00	3,550,000.00
	Total Cost	47,200,000.00	2,710,000.00	960,000.00	1,260,000.00	1,710,000.00	2,260,000.00	3,070,000.00	3,600,000.00	4,160,000.00	4,200,000.00	4,510,000.00	4,310,000.00	4,390,000.00	4,060,000.00	4,510,000.00
C	Revenue															
a	Plant															
	Coffee	-	-	-	4,000,000	6,000,000	12,000,000	14,000,000	16,000,000	16,000,000	16,000,000	14,000,000	14,000,000	14,000,000	12,000,000	14,000,000
b	Plant															
	Areca nut	-	-	-	-	-	-	3,600,000	8,400,000	12,000,000	14,400,000	18,000,000	18,000,000	16,800,000	18,000,000	18,000,000
	Total	0.00	0.00	0.00	4,000,000.00	6,000,000.00	12,000,000.00	17,600,000.00	24,400,000.00	28,000,000.00	30,400,000.00	32,000,000.00	32,000,000.00	30,800,000.00	30,000,000.00	32,000,000.00
	Saldo	-47,200,000.00	-2,710,000.00	-960,000.00	2,740,000.00	4,290,000.00	9,740,000.00	14,530,000.00	20,800,000.00	23,840,000.00	26,200,000.00	27,490,000.00	27,690,000.00	26,410,000.00	25,940,000.00	27,490,000.00
	Discount Factor (DF=11%)	1.00	0.91	0.81	0.73	0.68	0.59	0.53	0.48	0.43	0.39	0.35	0.32	0.29	0.26	0.23
	Discount Cost (DC)	47,200,000.00	2,463,636.36	779,157.54	921,301.14	1,167,953.01	1,341,200.00	1,641,347.37	1,733,970.28	1,805,134.22	1,641,884.04	1,588,352.00	1,367,491.08	1,254,841.22	1,045,507.88	1,046,296.66
	Discount Benefit (DB)	0.00	0.00	0.00	2,924,765.53	4,098,080.73	7,121,415.94	9,409,678.72	11,752,465.23	12,149,941.90	11,884,113.05	11,269,903.32	10,153,066.05	8,803,897.37	7,725,427.67	7,423,834.39
	NPV															
	BCR															
	IRR															

Cashflow of plantation combination of paddy rice/maize and betel nut per hectare for 25 year

No.	Description	Year												
		1	2	3	4	5	6	7	8	9	10	11	12	13
COST														
A.	Planting investment													
	Paddy													
	-land preparation	2,710,000	2,710,000	2,710,000	2,710,000	2,710,000	2,710,000	2,710,000	2,710,000	2,710,000	2,710,000	2,710,000	2,710,000	2,710,000
	-planting	788,000	788,000	788,000	788,000	788,000	788,000	788,000	788,000	788,000	788,000	788,000	788,000	788,000
	-maintaining	900,000	900,000	900,000	900,000	900,000	900,000	900,000	900,000	900,000	900,000	900,000	900,000	900,000
	Amount of paddy	4,398,000	4,398,000	4,398,000	4,398,000	4,398,000	4,398,000	4,398,000	4,398,000	4,398,000	4,398,000	4,398,000	4,398,000	4,398,000
	Batel nut													
	- embroidery plant	520,000												
	Amount of betel nut	520,000												
	Maize													
	-land preparation and planting	1,600,000	1,600,000	1,600,000	1,600,000	1,600,000	1,600,000	1,600,000	1,600,000	1,600,000	1,600,000	1,600,000	1,600,000	1,600,000
	-maintaining	4,563,200	4,563,200	4,563,200	4,563,200	4,563,200	4,563,200	4,563,200	4,563,200	4,563,200	4,563,200	4,563,200	4,563,200	4,563,200
	-Amount of Maize	6,163,200	6,163,200	6,163,200	6,163,200	6,163,200	6,163,200	6,163,200	6,163,200	6,163,200	6,163,200	6,163,200	6,163,200	6,163,200
	Amount of A	11,081,200	10,561,200	10,561,200	10,561,200	10,561,200	10,561,200	10,561,200	10,561,200	10,561,200	10,561,200	10,561,200	10,561,200	10,561,200
B.	Non planting investment													
	Paddy													
	-harvesting	3,720,000	3,720,000	3,720,000	3,720,000	3,720,000	3,720,000	3,720,000	3,720,000	3,720,000	3,720,000	3,720,000	3,720,000	3,720,000
	-land preparation equipment	510,000						510,000						510,000
	-harvesting equipment 1	1,200,000						1,200,000						1,200,000
	-harvesting equipment 2	600,000						600,000						600,000
	Amount of paddy	6,030,000	3,720,000	3,720,000	3,720,000	3,720,000	6,030,000	3,720,000	3,720,000	3,720,000	3,720,000	6,030,000	3,720,000	3,720,000
	Batel nut													
	-harvesting						452,571	452,571	452,571	452,571	452,571	452,571	452,571	452,571
	-equipment	520,000					520,000					520,000		520,000
	Amount of betel nut	520,000					972,571	452,571	452,571	452,571	452,571	972,571	452,571	452,571
	-land	30,000,000												
	Amount of B	36,550,000	3,720,000	3,720,000	3,720,000	3,720,000	7,002,571	4,172,571	4,172,571	4,172,571	4,172,571	7,002,571	4,172,571	4,172,571
	Sum of A + B	47,631,200	14,281,200	14,281,200	14,281,200	14,281,200	17,563,771	14,733,771	14,733,771	14,733,771	14,733,771	17,563,771	14,733,771	14,733,771
BENEFIT														
C	Batel nut				8,553,600	17,962,560	27,371,520	27,371,520	27,371,520	34,214,400	34,214,400	34,214,400	34,214,400	34,214,400
	Maize	35,840,000	35,840,000	35,840,000	35,840,000	35,840,000	35,840,000	35,840,000	35,840,000	35,840,000	35,840,000	35,840,000	35,840,000	35,840,000
	Paddy	20,400,000	20,400,000	20,400,000	20,400,000	20,400,000	20,400,000	20,400,000	20,400,000	20,400,000	20,400,000	20,400,000	20,400,000	20,400,000
	Amount C	56,240,000	56,240,000	56,240,000	64,793,600	74,202,560	83,611,520	83,611,520	83,611,520	90,454,400	90,454,400	90,454,400	90,454,400	90,454,400
	TOTAL COST	47,631,200	14,281,200	14,281,200	14,281,200	14,281,200	17,563,771	14,733,771	14,733,771	14,733,771	14,733,771	17,563,771	14,733,771	14,733,771
	TOTAL BENEFIT	56,240,000	56,240,000	56,240,000	64,793,600	74,202,560	83,611,520	83,611,520	83,611,520	90,454,400	90,454,400	90,454,400	90,454,400	90,454,400
	SALDO	8,608,800	41,958,800	41,958,800	50,512,400	59,921,360	66,047,749	68,877,749	68,877,749	75,720,629	75,720,629	72,890,629	75,720,629	75,720,629
	DISCOUNT FACTOR (DF=11%)	0.900900901	0.811622433	0.731191381	0.658730974	0.593451328	0.534640836	0.481658411	0.433926496	0.390924771	0.352184479	0.317283314	0.285840824	0.257514256
	DISCOUNTED COST (DC)	42,910,991	11,590,942	10,442,290	9,407,469	8,475,197	9,390,309	7,096,645	6,393,374	5,759,796	5,189,006	5,572,692	4,211,513	3,794,156
	DISCOUNTED BENEFIT (DB)	50,666,667	45,645,646	41,122,203	42,681,551	44,035,608	44,702,133	40,272,192	36,281,254	35,360,866	31,856,636	28,699,672	25,855,560	23,293,297
	NPV (DB-DC)													
	BCR													
	IRR													

6) Areca nuts and Paddy/ Maize

Cashflow of plantation combination of paddy rice/maize and betel nut per hectare for 25 year

No.	Description	Year											Total	Residu	Netto			
		14	15	16	17	18	19	20	21	22	23	24				25		
COST																		
A.	Planting investment																	
	Paddy																	
	-land preparation	2,710,000	2,710,000	2,710,000	2,710,000	2,710,000	2,710,000	2,710,000	2,710,000	2,710,000	2,710,000	2,710,000	2,710,000	67,750,000			67,750,000	
	-planting	788,000	788,000	788,000	788,000	788,000	788,000	788,000	788,000	788,000	788,000	788,000	788,000	19,700,000			19,700,000	
	-maintaining	900,000	900,000	900,000	900,000	900,000	900,000	900,000	900,000	900,000	900,000	900,000	900,000	22,500,000				
	Amount of paddy	4,398,000	4,398,000	4,398,000	4,398,000	4,398,000	4,398,000	4,398,000	4,398,000	4,398,000	4,398,000	4,398,000	4,398,000	109,950,000				
	Batel nut																	
	- embroidery plant													520,000				
	Amount of betel nut													520,000				
	Maize																	
	-land preparation and planting	1,600,000	1,600,000	1,600,000	1,600,000	1,600,000	1,600,000	1,600,000	1,600,000	1,600,000	1,600,000	1,600,000	1,600,000	40,000,000				
	-maintaining	4,563,200	4,563,200	4,563,200	4,563,200	4,563,200	4,563,200	4,563,200	4,563,200	4,563,200	4,563,200	4,563,200	4,563,200	114,080,000				
	-Amount of Maize	6,163,200	6,163,200	6,163,200	6,163,200	6,163,200	6,163,200	6,163,200	6,163,200	6,163,200	6,163,200	6,163,200	6,163,200	154,080,000				
	Amount of A	10,561,200	10,561,200	10,561,200	10,561,200	10,561,200	10,561,200	10,561,200	10,561,200	10,561,200	10,561,200	10,561,200	10,561,200	106,132,000		-	106,132,000	
B.	Non planting investment																	
	Paddy																	
	-harvesting	3,720,000	3,720,000	3,720,000	3,720,000	3,720,000	3,720,000	3,720,000	3,720,000	3,720,000	3,720,000	3,720,000	3,720,000	93,000,000			93,000,000	
	-land preparation equipment			510,000						510,000				2,550,000				
	-harvesting equipment 1			1,200,000						1,200,000				6,000,000			6,000,000	
	-harvesting equipment 2			600,000						600,000				3,000,000			3,000,000	
	Amount of paddy	3,720,000	3,720,000	6,030,000	3,720,000	3,720,000	3,720,000	3,720,000	6,030,000	3,720,000	3,720,000	3,720,000	3,720,000	104,550,000				
	Batel nut																	
	-harvesting	452,571	452,571	452,571	452,571	452,571	452,571	452,571	452,571	452,571	452,571	452,571	452,571	9,051,429				
	-equipment			520,000						520,000				2,600,000				
	Amount of betel nut	452,571	452,571	972,571	452,571	452,571	452,571	452,571	972,571	452,571	452,571	452,571	452,571	11,651,429				
	-land													30,000,000			30,000,000	
	Amount of B	4,172,571	4,172,571	7,002,571	4,172,571	4,172,571	4,172,571	4,172,571	7,002,571	4,172,571	4,172,571	4,172,571	4,172,571	262,402,857			262,402,857	
	Sum of A + B	14,733,771	14,733,771	17,563,771	14,733,771	14,733,771	14,733,771	14,733,771	17,563,771	14,733,771	14,733,771	14,733,771	14,733,771	368,534,857			368,534,857	
BENEFIT																		
C	Batel nut	19,958,400	34,214,400	27,371,520	27,371,520	27,371,520	27,371,520	27,371,520	27,371,520	27,371,520	27,371,520	27,371,520	27,371,520	596,185,920				
	Maize	35,840,000	35,840,000	35,840,000	35,840,000	35,840,000	35,840,000	35,840,000	35,840,000	35,840,000	35,840,000	35,840,000	35,840,000	896,000,000				
	Paddy	20,400,000	20,400,000	20,400,000	20,400,000	20,400,000	20,400,000	20,400,000	20,400,000	20,400,000	20,400,000	20,400,000	35,840,000	525,440,000			525,440,000	
	Amount C	76,198,400	90,454,400	83,611,520	83,611,520	83,611,520	83,611,520	83,611,520	83,611,520	83,611,520	83,611,520	83,611,520	72,206,720	99,051,520			2,017,625,920	
	TOTAL COST	14,733,771	14,733,771	17,563,771	14,733,771	14,733,771	14,733,771	14,733,771	17,563,771	14,733,771	14,733,771	14,733,771	14,733,771	368,534,857			368,534,857	
	TOTAL BENEFIT	76,198,400	90,454,400	83,611,520	83,611,520	83,611,520	83,611,520	83,611,520	83,611,520	83,611,520	83,611,520	83,611,520	72,206,720	99,051,520			2,017,625,920	
	SALDO	61,464,629	75,720,629	66,047,749	68,877,749	68,877,749	68,877,749	68,877,749	66,047,749	68,877,749	68,877,749	68,877,749	57,472,949	84,317,749			1,649,091,063	
	DISCOUNT FACTOR (DF=11%)	0.231994825	0.209004347	0.188292204	0.169632616	0.152822177	0.137677637	0.124033907	0.111742259	0.100668701	0.090692524	0.081704976	0.073608087					
	DISCOUNTED COST (DC)	3,418,159	3,079,422	3,307,121	2,499,328	2,251,647	2,028,511	1,827,487	1,962,615	1,483,230	1,336,243	1,203,822	1,084,525	116,656,020				
	DISCOUNTED BENEFIT (DB)	17,677,634	18,905,363	15,743,397	14,183,241	12,777,695	11,511,436	10,370,664	9,342,940	8,417,063	7,582,940	5,899,648	7,290,993	412,624,755				
	NPV (DB-DC)													295,968,735				
	BCR													3.537106411				
	IRR													0.309152106				

Cash Flow of plantation combination of Areca nut Pineapple per hectar for 25 year

7) Pineapple and Areca nuts

No.	Description	Year												
		1	2	3	4	5	6	7	8	9	10	11	12	13
COST														
A. Planting Investment														
Pineapple														
	-Land preparation and planting	800,000			800,000			800,000			800,000			800,000
	Planting	10,912,000			10,912,000			10,912,000			10,912,000			10,912,000
	Maintenance	7,632,000			7,632,000			7,632,000			7,632,000			7,632,000
	Amount of Pineapple	19,344,000			19,344,000			19,344,000			19,344,000			19,344,000
Betel nut														
	- Land preparation and seedling	3,010,000												
	-Embroidery	256,000												
	- Maintenance	180,640	180,640	180,640	180,640	180,640	180,640	180,640	180,640	180,640	180,640	180,640	180,640	180,640
	Amount of betel nut	3,446,640	180,640	180,640	180,640	180,640	180,640	180,640	180,640	180,640	180,640	180,640	180,640	180,640
	Amount of A	22,790,640	180,640	180,640	19,524,640	180,640	180,640	19,524,640	180,640	180,640	19,524,640	180,640	180,640	19,524,640
B. Non investment planting														
Pineapple														
	-Equipment	320,000					320,000				320,000			320,000
	Amount of pineapple	320,000					320,000				320,000			320,000
Betel nut														
	-Harvesting			452,571	452,571	452,571	452,571	452,571	452,571	452,571	452,571	452,571	452,571	452,571
	- Equipment	104,000					104,000				104,000			104,000
	Amount of betelnut	104,000		452,571	452,571	556,571	452,571	452,571	452,571	452,571	556,571	452,571	452,571	452,571
	- Land	30,000,000												
	Amount of B	30,424,000			452,571	452,571	876,571	452,571	452,571	452,571	452,571	876,571	452,571	452,571
	Sum of A+B	53,214,640	180,640	180,640	19,977,211	633,211	1,057,211	19,977,211	633,211	633,211	19,977,211	1,057,211	633,211	19,977,211
BENEFIT														
C	Betel nut				8,553,600	17,962,560	27,371,520	27,371,520	27,371,520	34,214,400	34,214,400	34,214,400	34,214,400	34,214,400
	Pineapple	48,000,000	48,000,000	48,000,000	48,000,000	48,000,000	48,000,000	48,000,000	48,000,000	48,000,000	48,000,000	48,000,000	48,000,000	48,000,000
	Amount of C	48,000,000	48,000,000	48,000,000	56,553,600	65,962,560	75,371,520	75,371,520	75,371,520	82,214,400	82,214,400	82,214,400	82,214,400	82,214,400
	Total Cost	53,214,640	180,640	180,640	19,977,211	633,211	1,057,211	19,977,211	633,211	633,211	19,977,211	1,057,211	633,211	19,977,211
	Total Revenue	48,000,000	48,000,000	48,000,000	56,553,600	65,962,560	75,371,520	75,371,520	75,371,520	82,214,400	82,214,400	82,214,400	82,214,400	82,214,400
	SALDO	-5,214,640	47,819,360	47,819,360	36,576,389	65,329,349	74,314,309	55,394,309	74,738,309	81,581,189	62,237,189	81,157,189	81,581,189	62,237,189
	DISCOUNT FACTOR (DF=11%)	0.9009	0.8116	0.7312	0.6587	0.5935	0.5346	0.4817	0.4339	0.3909	0.3522	0.3173	0.2858	0.2575
	DISCOUNTED COST (DC)	47,941,117	146,611	132,082	13,159,608	375,780	565,228	9,622,192	274,767	247,538	7,035,664	335,436	180,998	5,144,417
	DISCOUNTED BENEFIT (DB)	43,243,243	38,957,877	35,097,186	37,253,608	39,145,569	40,296,692	36,303,327	32,705,700	32,139,646	28,954,636	26,085,257	23,500,232	21,171,380
	NPV (DB-DC)													
	BCR													
	IRR													

No.	Description	Year												Amount	Residu	Netto
		14	15	16	17	18	19	20	21	22	23	24	25			
COST																
A. Planting Investment																
Pineapple																
	-Land preparation and planting			800,000			800,000			800,000			800,000	7,200,000		7,200,000
	Planting			10,912,000			10,912,000			10,912,000			10,912,000	98,208,000		98,208,000
	Maintenance			7,632,000			7,632,000			7,632,000			7,632,000	68,688,000		
	Amount of Pineapple			19,344,000			19,344,000			19,344,000			19,344,000	174,096,000		
Betel nut																
	- Land preparation and seedling													3,010,000		
	-Embroidery													256,000		
	- Maintenance	180,640	180,640	180,640	180,640	180,640	180,640	180,640	180,640	180,640	180,640	180,640	180,640	4,516,000		
	Amount of betel nut	180,640	180,640	180,640	180,640	180,640	180,640	180,640	180,640	180,640	180,640	180,640	180,640	7,782,000		
	Amount of A	180,640	180,640	19,524,640	180,640	180,640	19,524,640	180,640	180,640	19,524,640	180,640	180,640	19,524,640	82,448,400	0	82,448,400
B. Non investment planting																
Pineapple																
	-Equipment			320,000					320,000					1,600,000		1,600,000
	Amount of pineapple			320,000					320,000					1,600,000		
Betel nut																
	-Harvesting	452,571	452,571	452,571	452,571	452,571	452,571	452,571	452,571	452,571	452,571	452,571	452,571	9,956,571		
	- Equipment			104,000					104,000					520,000		
	Amount of betelnut	452,571	452,571	556,571	452,571	452,571	452,571	452,571	556,571	452,571	452,571	452,571	452,571	10,476,571		
	- Land													30,000,000		30,000,000
	Amount of B	452,571	452,571	876,571	452,571	452,571	452,571	452,571	876,571	452,571	452,571	452,571	452,571	54,153,143		54,153,143
	Sum of A+B	633,211	633,211	20,401,211	633,211	633,211	19,977,211	633,211	1,057,211	19,977,211	633,211	633,211	19,977,211	136,601,543		136,601,543
BENEFIT																
C																
	Betel nut	19,958,400	34,214,400	27,371,520	27,371,520	27,371,520	27,371,520	27,371,520	27,371,520	27,371,520	27,371,520	15,966,720	27,371,520	596,185,920		
	Pineapple	48,000,000	48,000,000	48,000,000	48,000,000	48,000,000	48,000,000	48,000,000	48,000,000	48,000,000	48,000,000	48,000,000	48,000,000	1,200,000,000		
	Amount of C	67,958,400	82,214,400	75,371,520	75,371,520	75,371,520	75,371,520	75,371,520	75,371,520	75,371,520	75,371,520	63,966,720	75,371,520	1,796,185,920		1,796,185,920
	Total Cost	633,211	633,211	20,401,211	633,211	633,211	19,977,211	633,211	1,057,211	19,977,211	633,211	633,211	19,977,211	136,601,543		136,601,543
	Total Revenue	67,958,400	82,214,400	75,371,520	75,371,520	75,371,520	75,371,520	75,371,520	75,371,520	75,371,520	75,371,520	63,966,720	75,371,520	1,796,185,920		1,796,185,920
	SALDO	67,325,189	81,581,189	54,970,309	74,738,309	74,738,309	55,394,309	74,738,309	74,314,309	55,394,309	74,738,309	63,333,509	55,394,309	1,659,584,377		
	DISCOUNT FACTOR (DF=11%)	0.2320	0.2090	0.1883	0.1696	0.1528	0.1377	0.1240	0.1117	0.1007	0.0907	0.0817	0.0736			
	DISCOUNTED COST (DC)	146,902	132,344	3,841,389	107,413	96,769	2,750,415	78,540	118,135	2,011,080	57,428	51,737	1,470,484	79,500,588		
	DISCOUNTED BENEFIT (DB)	15,765,997	17,183,167	14,191,870	12,785,468	11,518,440	10,376,973	9,348,624	8,422,184	7,587,553	6,835,633	5,226,399	5,547,953	364,097,483		
	NPV (DB-DC)													284,596,894		
	BCR													4.5798087		
	IRR													32.1%		

(2) Attachment 2: Kepulauan Meranti District, Riau Province

1) Sago Palm and Semular Tree Mixed farming

Assumptions

1. Suitable land (1 ha as the smallest unit of land) is available
2. Sago palm is mixed-cropped with selumar (a fast-growing native tree species)
3. Sago palm is planted with a spacing system of 9 m x 9 m, creating a population of 124 palm seedlings/ha.
4. Selumar is planted between two neighbouring sago palms (in a regular distance of 4.5 m to the
5. Sago palm can be harvested at the latest 15 years after planting
6. About a half (50%) of the selumar can be harvested 7 years after planting (up to 247 trees/ha)
7. Each sago palm tree produces at least 8 tuals and the price of each tual is Rp 42.000,-
8. Each 7 year-old selumar log will be priced Rp 800.000,-
9. There is no cost for using the land (no land rental)

Component	Cost (Rp)	Total	Investment		
			Year ke-0	Year ke-10	Year ke-20
Decline of Equipments					
Spade	100000	4	400,000	400,000	400,000
Rope/line	1000	200	200,000		
Machete	20000	5	100,000	100,000	100,000
Permanent Cost			700,000	500,000	500,000

Decline of equipments	70,000
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B. Variable Cost of Sago Palm-Selumar Mixed Farming

No	Component	Unit	Cost (Rp)	Number of Units	Total (Rp)									
					Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8-11	Year 12-20
A	Input													
1	Supporting cane	Canes	500	500	250,000									
2	Sago seedling	Seedling	10,000	135	1,354,568									
3	Selumar seedling	Seedling	10,000	394	3,943,704									
	Production Cost													
1	Fertilizer (Urea)	Kg	2,500	100	250,000									
2	Fertilizer SP 36	Kg	3,500	100	350,000									
3	Fertilizer NPK	Kg	4,500	100	450,000									
B	Man Power													
1	Land clearance	Ha	500,000	1	500,000	-	-	-	-					
2	Digging boundary ponds	Ha	500,000	1	500,000									
3	Digging planting holes	Man-day	100,000	4	400,000									
4	Planting of seedlings	Man-day	100,000	4	400,000									
5	Substitutive planting of seedlings	Man-day	100,000	2	200,000	200,000	200,000	-	-					
6	Weeding	Ha	500,000	4	2,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000
7	Pest control	Man-day	100,000	5	500,000	500,000	500,000							
8	Pond maintenance	Man-day	100,000	2	200,000		200,000				200,000			200,000
9	Cluster care (pruning)	Man-day	100,000	2	200,000			400,000	400,000	400,000	400,000	400,000	400,000	400,000
10	Fertilizer application	Man-day	100,000	5	500,000									
11	Harvest of selumar trees	Man-day	100,000	20								2,000,000		
12	Harvest of sago palm trees	Log	15,000	60										900,000
Total					11,998,272	1,700,000	1,900,000	1,400,000	1,400,000	1,400,000	1,600,000	3,400,000	1,400,000	2,500,000

Income

Year	Cost			Sago Palm Harvest (Logs/ha)	Price (Rp/log)	Selumar Harvest (Logs/ha)	Price (Rp/log)	Total Price (Rp)	Cash Flow (Rp)
	Permanent Cost (Rp)	Variable Cost (Rp)	Total (Rp)						
0	700,000	11,998,272	12,698,272	-	-	-	-	-	(12,698,272)
1	-	1,700,000	1,700,000	-	-	-	-	-	(1,700,000)
2	-	1,900,000	1,900,000	-	-	-	-	-	(1,900,000)
3	-	1,400,000	1,400,000	-	-	-	-	-	(1,400,000)
4	-	1,400,000	1,400,000	-	-	-	-	-	(1,400,000)
5	-	1,400,000	1,400,000	-	-	-	-	-	(1,400,000)
6	-	1,600,000	1,600,000	-	-	-	-	-	(1,600,000)
7	-	3,400,000	3,400,000	-	-	247	400,000	98,765,432	95,365,432
8	-	1,400,000	1,400,000	-	-	-	-	-	(1,400,000)
9	-	1,470,000	1,470,000	-	-	-	-	-	(1,470,000)
10	500,000	1,470,000	1,970,000	-	-	-	-	-	(1,970,000)
11	-	1,470,000	1,470,000	-	-	-	-	-	(1,470,000)
12	-	2,500,000	2,500,000	-	-	-	-	-	(2,500,000)
13	-	2,570,000	2,570,000	-	-	-	-	-	(2,570,000)
14	-	2,570,000	2,570,000	-	-	-	-	-	(2,570,000)
15	-	2,570,000	2,570,000	20	336,000	-	-	6,720,000	4,150,000
16	-	2,570,000	2,570,000	20	336,000	-	-	6,720,000	4,150,000
17	-	2,570,000	2,570,000	20	336,000	-	-	6,720,000	4,150,000
18	-	2,570,000	2,570,000	20	336,000	-	-	6,720,000	4,150,000
19	-	2,570,000	2,570,000	20	336,000	-	-	6,720,000	4,150,000
20	500,000	2,570,000	3,070,000	20	336,000	85	2,000,000	177,675,556	174,605,556
Total	1,700,000	53,668,272	55,368,272	120	2,016,000	332	2,400,000	310,040,988	254,672,716

Percentage of permanent cost	3.07
Percentage of variable cost	96.93
Total cost	55,368,272

Assumptions

- Suitable land (1 ha as the smallest unit of land) is available
- Sago palm is mixed-cropped with selumar (a fast-growing native tree species)
- Sago palm is planted with a spacing system of 9 m x 9 m, creating a population of 124 palm seedlings/ha.
- Selumar is planted between two neighbouring sago palms (in a regular distance of 4.5 m to the palm), creating a population of 370 tree seedlings/ha
- Sago palm can be harvested at the latest 15 years after planting
- About a half (50%) of the selumar can be harvested 7 years after planting (up to 247 trees/ha)
- Each sago palm tree produces at least 8 tuals and the price of each tual is Rp 42,000,-
- Each 7 year-old selumar log will be priced Rp 800,000,-
- There is no cost for using the land (no land rental)

Year	Cost	Income	DF (16%)	Net Income	Present Value NI	Present Value Cost	Present Value Cash Income
0	12,698,272	-	1.000	(12,698,272)	(12,698,272)	12,698,272	-
1	1,700,000	-	0.862	(1,700,000)	(1,465,517)	1,465,517	-
2	1,900,000	-	0.743	(1,900,000)	(1,412,010)	1,412,010	-
3	1,400,000	-	0.641	(1,400,000)	(896,921)	896,921	-
4	1,400,000	-	0.552	(1,400,000)	(773,208)	773,208	-
5	1,400,000	-	0.476	(1,400,000)	(666,558)	666,558	-
6	1,600,000	-	0.410	(1,600,000)	(656,708)	656,708	-
7	3,400,000	98,765,432	0.354	95,365,432	33,743,106	1,203,020	34,946,126.41
8	1,400,000	-	0.305	(1,400,000)	(427,036)	427,036	-
9	1,470,000	-	0.263	(1,470,000)	(386,541)	386,541	-
10	1,970,000	-	0.227	(1,970,000)	(446,567)	446,567	-
11	1,470,000	-	0.195	(1,470,000)	(287,263)	287,263	-
12	2,500,000	-	0.168	(2,500,000)	(421,157)	421,157	-
13	2,570,000	-	0.145	(2,570,000)	(373,232)	373,232	-
14	2,570,000	-	0.125	(2,570,000)	(321,752)	321,752	-
15	2,570,000	6,720,000	0.108	4,150,000	447,897	277,372	725,269.53
16	2,570,000	6,720,000	0.093	4,150,000	386,118	239,114	625,232.36
17	2,570,000	6,720,000	0.080	4,150,000	332,861	206,133	538,993.41
18	2,570,000	6,720,000	0.069	4,150,000	286,949	177,701	464,649.49
19	2,570,000	6,720,000	0.060	4,150,000	247,370	153,190	400,559.91
20	3,070,000	177,675,556	0.051	174,605,556	8,972,186	157,753	9,129,939.46
Total	55,368,272	310,040,988		254,672,716	23,183,746	23,647,024	46,830,771

NPV	23,183,746
IRR	10.74%
RCR	1.98
BCR	0.98

2) Straw Mushroom with usage of Sago Waste

Assumption

*Based on 4 incubation chambers with a medium of 5000 kg sago palm pith dregs

Expenses

No.	Component	Unit	Price (Rp)	Numebr of Units	Cost (Rp)			
					Month 0	Month 1	Month 3	Month 4
A	Construction of Incubation Chambers (4 units)							
1	Bamboo pole	Pole	10,000	250	2,500,000			
2	Nail 10	Kg	20,000	20	400,000			
3	Nail 7	Kg	20,000	3	60,000			
4	Nail 4	Kg	20,000	7	140,000			
5	Brick	Piece	750	1500	1,125,000			
6	Plastic PE	Kg	45,000	40	1,800,000			
7	Plastic tape	Roll	15,000	3	45,000			
8	Plastic rope/line	Roll	85,000	6	510,000			
9	Plastic terpoline	Sheet	200,000	4	800,000			
10	Man power	Man-day	100,000	40	4,000,000			
	Total					11,380,000		
B	Equipments							
1	Drum	Unit	200,000	3	600,000			
2	Hose	Meter	15,000	15	225,000			
3	Terpoline	Unit	400,000	3	1,200,000			
4	Sprayer	Unit	250,000	1	250,000			
5	Thermometer	Unit	100,000	1	100,000			
6	Hydrometer	Unit	200,000	1	200,000			
7	PH-meter	Unit	200,000	1	200,000			
8	Hook	Unit	80,000	1	80,000			
9	Pengki	Unit	10,000	3	30,000			
10	Bucket	Unit	40,000	5	200,000			
	Total					3,085,000		
Sum of Investment Cost						14,465,000		
C	Additional Cost							
1	Pith dregs	Kg	100	5,000		500,000	500,000	500,000
2	Cotton	Kg	4,000	200		800,000	800,000	800,000
3	Urea	Kg	3,500	5		17,500	17,500	17,500
4	Chalk	Kg	20,000	5		100,000	100,000	100,000
5	Grinded rice husk	Kg	4,000	120		480,000	480,000	480,000
6	Bibit	Set	100,000	6		600,000	600,000	600,000
7	Molase	Liter	10,000	5		50,000	50,000	50,000
8	Alcohol	Liter	35,000	1		35,000	35,000	35,000
9	Wood planks	Set	200,000	1		200,000	200,000	200,000
10	Man power	Man-day	100,000	40		4,000,000	4,000,000	4,000,000
	Jumlah Modal Kerja					6,782,500	6,782,500	6,782,500

Assumption

*Based on 4 incubation chambers with a medium of 5000 kg sago palm pith dregs

Profit

Month	Expense (Rp)	Harvest of Mushrooms (kg)	Price of Mushrooms (Rp/kg)	Pith Dregs (kg)	Price of Pith Dregs (Rp/kg)	Income (Rp)			Profit (Rp)
						Mushroom	Puth Dregs	Total	
0	14,465,000	0	0	0	0	-	-	-	(14,465,000)
1	6,782,500	600	25,000	3,500	500	15,000,000	1,750,000	16,750,000	9,967,500
2	6,782,500	600	25,000	3,500	500	15,000,000	1,750,000	16,750,000	9,967,500
3	6,782,500	600	25,000	3,500	500	15,000,000	1,750,000	16,750,000	9,967,500
4	6,782,500	600	25,000	3,500	500	15,000,000	1,750,000	16,750,000	9,967,500
5	6,782,500	600	25,000	3,500	500	15,000,000	1,750,000	16,750,000	9,967,500
6	6,782,500	600	25,000	3,500	500	15,000,000	1,750,000	16,750,000	9,967,500
7	6,782,500	600	25,000	3,500	500	15,000,000	1,750,000	16,750,000	9,967,500
8	6,782,500	600	25,000	3,500	500	15,000,000	1,750,000	16,750,000	9,967,500
9	6,782,500	600	25,000	3,500	500	15,000,000	1,750,000	16,750,000	9,967,500
10	6,782,500	600	25,000	3,500	500	15,000,000	1,750,000	16,750,000	9,967,500
11	6,782,500	600	25,000	3,500	500	15,000,000	1,750,000	16,750,000	9,967,500
12	6,782,500	600	25,000	3,500	500	15,000,000	1,750,000	16,750,000	9,967,500
Total	95,855,000	7,200	300,000	42,000	6,000	180,000,000	21,000,000	201,000,000	105,145,000

RCR	2.10
BCR	1.10

3) Wood Pellet with usage of Sago Waste

Annual production of sago flour	198,162,000	Kg
Estimate of sago palm trees cut annually	1,321,080	Palm trees
	1,056,864,000	Kg
Raw material available	739,804,800	Kg
Bark (30% of the log)	317,059,200	Kg
Pith dregs (40% of the log)	422,745,600	Kg
Conversion rate to wood pellet	465,020,160	Kg
Bark (80%)	253,647,360	Kg
Pith dregs (50%)	211,372,800	Kg
Potential number of mills with a capacity of 6 ton/hour	21	Unit
Price of wood pellet	1,400	Rp/Kg
Potential brutto income	651,028,224,000	Rp/year

Total production in the district	198,162	Ton
Estimate of sago palm trees cut annually	1,321,080	Logs
Wet weight of sago palm log	1,056,864	Ton
Raw material available	739,805	Ton
Bark (30% x log's weight)	317,059	Ton
Residual mass of the pith (40%)	422,746	Ton
Conversion rate to wood pellet	465,020	Ton
Bark (80%)	253,647	Ton
Pith dregs (50%)	211,373	Ton
Potential number of mills with a capacity of 6 ton/hour	20.55	Unit
Price of wood pellet	1,400	Rp/Kg
Potential brutto income	651,028,224	Rp.000/tahun

Estimate of sago bark and pith dregs in Kepulauan Meranti District

No.	Subdistrict	Production of Flour	Number of Mills	Estimate of Palm Trees	Raw material potentially available (ton/year)		
					Bark (30%)	Pith Dregs (40%)	Total
Subdistricts within KHG Pulau Tebing Tinggi					271,170	361,560	632,730
1	Tebing Tinggi	2,754	3	18,360	5,508	7,344	12,852
2	Tebing Tinggi Barat	61,317	32	408,780	122,634	163,512	286,146
3	Tebing Tinggi Timur	71,514	17	476,760	143,028	190,704	333,732
Other subdistricts					125,154	166,872	292,026
4	Rangsang	2,358	1	15,720	4,716	6,288	11,004
5	Rangsang Barat	1,485	-	9,900	2,970	3,960	6,930
6	Merbau	13,185	5	87,900	26,370	35,160	61,530
7	Pulau Merbau	7,209	1	48,060	14,418	19,224	33,642
8	Rangsang Pesisir	14,535	4	96,900	29,070	38,760	67,830
9	Tasik Putri Puyu	23,805	4	158,700	47,610	63,480	111,090
Total					396,324	528,432	924,756

Sago paste (eq. to 2 x sago flour)	396,324	
Conversion rate of sago log to sago paste (30%)	1,321,080	
Bark (30% of sago palm log)	396,324	674
Pith dregs (40% of sago palm log)	528,432	898

Cost and Income

Mill's processing capacity	6	Ton/hour		
Working hour	20	Hours/day		
Working day	25	Days/month		
Monthly demand for raw material	3,000	Ton/month		
Annual demand for raw material	36,000	Ton/year	36,000,000	Kg/year

(Rp. 000)

No.	Komponen	Unit	Volume	Cost/Unit	Total
1	Land for establishing a mill	Ha	4	250,000	1,000,000
2	Construction of mill, storage, and fence	M2	1200	3,000	3,600,000
3	Wood processing machine (cap. 6 ton/hour)	Set	1	3,000,000	3,000,000
4	Mini loader (cap. 2 ton)	Unit	2	175,000	350,000
5	Forklift. (cap 3-5 ton)	Unit	2	150,000	300,000
6	Balance (cap. 15 ton)	Unit	1	500,000	500,000
7	Truck	Unit	2	350,000	700,000
8	Pickup	Unit	1	350,000	350,000
9	Operational car	Unit	1	400,000	400,000
10	Genset 850 kVA	Set	1	1,000,000	1,000,000
11	Others (consultant fee, permit, legal process etc.)	%	7	11,200,000	784,000
12	Total Investment Cost				11,984,000
13	Estimate of annual operational cost				21,587,563
14	Estimate of annual income	Rp/year			30,240,000
	Production of wood pellet (60% of the mill's capacity)	Kg/year	21,600,000		
	Price of wood pellet	Rp/Kg	1,400		

Assumptions:

- Annual sago flour production in Kepulauan Meranti District (available statistics) 198,162,000 Kg/year
- Estimate of the number of sago palm trees cut annually 1,321,080 Sago palm trees 1,056,864,000 Kg
- Proportion of sago palm bark produced annually 317,059,200 Kg 739,804,800 Kg of raw material
- Proportion of sago pith dregs produced annually 422,745,600 Kg WP
- Processing capacity of wood-pellet mill 6,000 Kg/hour 36,000,000 Kg/tahun
- Price of wood pellet 1,400 Rp/kg Demand of mill with a capacity of 6 ton/hour 20.55

Year	Cost	Income	DF (16%)	Net Income	Present Value NI	Present Value Cost	Present Value Case Income
0	11,984,000,000	-	1.000	(11,984,000,000)	(11,984,000,000)	11,984,000,000	-
1	21,587,563,333	30,240,000,000	0.862	8,652,436,667	7,458,997,126	18,609,968,391	26,068,965,517.24
2	21,587,563,333	30,240,000,000	0.743	8,652,436,667	6,430,169,937	16,043,076,199	22,473,246,135.55
3	21,587,563,333	30,240,000,000	0.641	8,652,436,667	5,543,249,945	13,830,238,103	19,373,488,047.89
4	21,587,563,333	30,240,000,000	0.552	8,652,436,667	4,778,663,746	11,922,619,054	16,701,282,799.91
5	21,587,563,333	30,240,000,000	0.476	8,652,436,667	4,119,537,712	10,278,119,874	14,397,657,586.13
6	21,587,563,333	30,240,000,000	0.410	8,652,436,667	3,551,325,614	8,860,448,167	12,411,773,781.14
7	21,587,563,333	30,240,000,000	0.354	8,652,436,667	3,061,487,598	7,638,317,386	10,699,804,983.74
8	21,587,563,333	30,240,000,000	0.305	8,652,436,667	2,639,213,447	6,584,756,367	9,223,969,813.57
9	21,587,563,333	30,240,000,000	0.263	8,652,436,667	2,275,184,006	5,676,514,109	7,951,698,115.15
10	21,587,563,333	30,240,000,000	0.227	8,652,436,667	1,961,365,522	4,893,546,646	6,854,912,168.23
Total	227,859,633,333	302,400,000,000		74,540,366,667	29,835,194,653	116,321,604,296	146,156,798,949

NPV	29,835,194,653
IRR	48.17%
RCR	1.26
BCR	0.26

4) Liberica Coffee Farming

Assumptions:

1. Coconut plot (1 ha) to be enriched with liberica coffee is already available (with coconut palm as shade trees)
2. There is no sharing of production cost between coffee and the crop used as shade trees
3. Reinvestment is to be done every 10 years
4. Liberica coffee starts producing at the age 4 years old and its productivity declines after reaching the age of 20 years old.
5. Number of coffee seedling planted will be 880 seedlings/ha with additional seedlings (10%) to replace dying ones.
6. Price of liberica coffee berries is Rp 3000,-/kg.
7. Pests (esp. wild boars and monkeys) can be effectively controlled.

A. Cost of Liberica Coffee Farming

Component	Cost (Rp)	Number	Investment	
			Year 1	Year 10
Sprayer	350	2 units	700,000	700,000
Spade	50	10 units	500,000	500,000
Fork	50	8 units	400,000	400,000
Water pump & water hose	1,000,000	1 unit	1,000,000	1,000,000
Ember	25	10 units	250,000	250,000
Sickle	20	5 units	100,000	100,000
Supporting cane	500	1.600 units	800,000	-
Permanent cost			3,750,000	2,950,000
Total Investment Cost				

Decline of equipments			375,000
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B. Cost Analysis of Liberica Coffee Farming (unit land of 1 ha)

No	Component	Unit	Cost (Rp)	Number of Units	Total (Rp)								
					Year 0	Year 1	Year 2	Year 3	Year 4	Year 18	Year 19	Year 20	
A	Input												
1	Supporting cane	Cane	500	800	400,000								
2	Coffee seedling	Seedling	9,000	880	7,920,000								
B	Supporting materials & equipments												
1	Penyusutan alat					375,000	375,000	375,000	375,000				
2	Organic fertilizer	Kg	1,000	800	800,000	800,000	800,000	800,000	800,000				
C	Man power												
1	Land preparation	Man-day	100,000	4	400,000	-	-	-	-				
2	Making of planting holes	Man-day	100,000	4	400,000	-	-	-	-				
3	Planting of seedlings	Man-day	100,000	4	400,000	-	-	-	-				
4	Substitutive planting	Man-day	100,000	2		200,000	-	-	-				
5	Tilling	Man-day	100,000	2	200,000	200,000	200,000	200,000	200,000				
6	Fertilizer application	Man-day	100,000	2	200,000	200,000	200,000	200,000	200,000				
7	Weeding	Man-day	100,000	2	200,000	200,000	200,000	200,000	200,000				
8	Pest control	Man-day	100,000	4	400,000	400,000	400,000	400,000	400,000				
9	Pruning	Man-day	100,000	4	400,000	400,000	400,000	400,000	400,000				
10	harvesting	Man-day	100,000	20					2,000,000	2,000,000	2,000,000	2,000,000	
Total					11,720,000	2,775,000	2,575,000	2,575,000	4,575,000	2,000,000	2,000,000	2,000,000	

C. Net Income of Liberica Coffee Farming (on 1-ha land)

Year	Total Harvest (kg)	Price of Coffee* (Rp)	Income (Rp)	Expense (Rp)	Profit (Rp)
0	0	0	0	11,720,000	(11,720,000)
1	0	0	0	2,775,000	(2,775,000)
2	0	0	0	2,575,000	(2,575,000)
3	0	0	0	2,575,000	(2,575,000)
4	4000	3,000	12,000,000	4,575,000	7,425,000
5	5000	3,000	15,000,000	4,575,000	10,425,000
6	6000	3,000	18,000,000	4,575,000	13,425,000
7	7000	3,000	21,000,000	4,575,000	16,425,000
8	8000	3,000	24,000,000	4,575,000	19,425,000
9	9000	3,000	27,000,000	4,575,000	22,425,000
10	10000	3,000	30,000,000	4,575,000	25,425,000
11	11000	3,000	33,000,000	4,575,000	28,425,000
12	10000	3,000	30,000,000	4,575,000	25,425,000
13	9500	3,000	28,500,000	4,575,000	23,925,000
14	8500	3,000	25,500,000	4,575,000	20,925,000
15	8000	3,000	24,000,000	4,575,000	19,425,000
16	7500	3,000	22,500,000	4,575,000	17,925,000
17	7000	3,000	21,000,000	2,000,000	19,000,000
18	6000	3,000	18,000,000	2,000,000	16,000,000
19	4500	3,000	13,500,000	2,000,000	11,500,000
20	4250	3,000	12,750,000	2,000,000	10,750,000
Total			375,750,000	87,120,000	288,630,000

*Fresh berries

Assumptions:

1. Coconut plot (1 ha) to be enriched with liberica coffee is already available (with coconut palm as shade trees)
2. There is no sharing of production cost between coffee and the crop used as shade trees
3. Reinvestment is to be done every 10 years
4. Liberica coffee starts producing at the age 4 years old and its productivity declines after reaching the age of 20 years old.
5. Number of coffee seedling planted will be 880 seedlings/ha with additional seedlings (10%) to replace dying ones.
6. Price of liberica coffee berries is Rp 3000,-/kg.
7. Pests (esp. wild boars and monkeys) can be effectively controlled.

Year	Cost	Income	DF (16%)	Net Income	Present Value NI	Present Value Cost	Present Value Cash Income
0	11,720,000	0	1	-11,720,000	-11,720,000	11,720,000	0
1	2,775,000	0	1	-2,775,000	-2,392,241	2,392,241	0
2	2,575,000	0	1	-2,575,000	-1,913,644	1,913,644	0
3	2,575,000	0	1	-2,575,000	-1,649,694	1,649,694	0
4	4,575,000	12,000,000	1	7,425,000	4,100,761	2,526,732	6,627,493
5	4,575,000	15,000,000	0	10,425,000	4,963,478	2,178,217	7,141,695
6	4,575,000	18,000,000	0	13,425,000	5,510,187	1,877,773	7,387,961
7	4,575,000	21,000,000	0	16,425,000	5,811,650	1,618,770	7,430,420
8	4,575,000	24,000,000	0	19,425,000	5,925,119	1,395,491	7,320,611
9	4,575,000	27,000,000	0	22,425,000	5,896,721	1,203,010	7,099,730
10	4,575,000	30,000,000	0	25,425,000	5,763,431	1,037,077	6,800,508
11	4,575,000	33,000,000	0	28,425,000	5,554,725	894,032	6,448,758
12	4,575,000	30,000,000	0	25,425,000	4,283,168	770,718	5,053,885
13	4,575,000	28,500,000	0	23,925,000	3,474,546	664,412	4,138,958
14	4,575,000	25,500,000	0	20,925,000	2,619,712	572,769	3,192,481
15	4,575,000	24,000,000	0	19,425,000	2,096,482	493,766	2,590,248
16	4,575,000	22,500,000	0	17,925,000	1,667,751	425,660	2,093,412
17	2,000,000	21,000,000	0	19,000,000	1,523,940	160,415	1,684,354
18	2,000,000	18,000,000	0	16,000,000	1,106,308	138,289	1,244,597
19	2,000,000	13,500,000	0	11,500,000	685,482	119,214	804,696
20	2,000,000	12,750,000	0	10,750,000	552,394	102,771	655,165
Total	87,120,000	375,750,000		288,630,000	43,860,277	33,854,695	77,714,973

NPV	43,860,277.37
IRR	16.61%
RCR	2.30
BCR	1.30

(3) Attachment 1: Pulang Pisau District, Central Kalimantan Province

1) Gelam (*Melaleuca cajuputi*) plantation

Tabel 1. Budidaya Tanaman Gelam per Hektar

Umur Proyek (Tahun)	Nilai Lahan (Rp)	Penyusutan Lahan (Rp.)	Bibit (batang)	Harga (@ Rp)	Nilai (Rp.)	Pembersihan Lahan (Rp)	Penanaman (Btg)	Harga (@ Rp)	Nilai (Rp.)	Pemeliharaan (Rp.)	Jumlah Biaya (Rp.)
0	10,000,000		11,000	1,000	11,000,000	5,000,000	10,000	1,500	15,000,000		41,000,000
1		454,545								1,500,000	1,500,000
2		454,545								1,500,000	1,500,000
3		454,545								1,500,000	1,500,000
4		454,545								1,500,000	1,500,000
5		454,545								1,500,000	1,500,000
Total	10,000,000	2,272,727	11,000		11,000,000	5,000,000	10,000		15,000,000	7,500,000	48,500,000

Tabel 2. Perkiraan Penerimaan Budidaya Tanaman Gelam

Umur Tanaman (Tahun)	Produksi (Btg)	Harga (Rp)	Total Penerimaan (Rp)	Kumulatif Penerimaan (Rp)
1			0	0
2			0	0
3			0	0
4			0	0
5	25,000	5,500	137,500,000	137,500,000
Total	25,000	5,500	137,500,000	

Tabel 3. Proyeksi Laba-Rugi Budidaya Tanaman Gelam

Umur Proyek (Tahun)	Pengeluaran (Rp)	Penerimaan (Rp)	Surplus/ Defisit (Rp)	Kumulatif Surplus (Rp)	Pay Back Period
0	41,000,000	0	-41,000,000	-41,000,000	
1	1,500,000	0	-1,500,000	-42,500,000	
2	1,500,000	0	-1,500,000	-44,000,000	
3	1,500,000	0	-1,500,000	-45,500,000	
4	1,500,000	0	-1,500,000	-47,000,000	
5	1,500,000	137,500,000	136,000,000	89,000,000	*****
Total	48,500,000	137,500,000	89,000,000	-	-

Tabel 4. Analisis Kelayakan Budidaya Tanaman Gelam

Umur Proyek (Tahun)	DF	PV Pengeluaran	PV Penerimaan
0	1.0000	41,000,000	0
1	0.8621	1,684,953	0
2	0.7432	1,452,546	0
3	0.6407	1,252,195	0
4	0.5523	1,079,478	0
5	0.4761	930,585	65,465,540
Total		47,399,756	65,465,540
	NPV	18,065,784	
	BCR	1.38	

2) Laban (*Vitex pinnata* L) plantation

Tabel 1. Budidaya Tanaman Laban per Hektar

Umur Proyek (Tahun)	Nilai Lahan (Rp)	Penyusutan			Nilai (Rp.)	Pembersihan		Harga (@ Rp)	Nilai (Rp.)	Pemeliharaan (Rp.)	Jumlah Biaya (Rp.)
		Lahan (Rp.)	Bibit (batang)	Harga (@ Rp)		Lahan (Rp)	Penanaman (Btg)				
0	20,000,000		2,700	1,000	2,700,000	5,000,000	10,000	1,500	15,000,000		42,700,000
1		909,091								1,500,000	1,500,000
2		909,091								1,500,000	1,500,000
3		909,091								1,500,000	1,500,000
4		909,091								1,500,000	1,500,000
5		909,091								1,500,000	1,500,000
6		909,091								1,500,000	1,500,000
7		909,091								1,500,000	1,500,000
8		909,091								1,500,000	1,500,000
9		909,091								1,500,000	1,500,000
10		909,091								1,500,000	1,500,000
11		909,091								1,500,000	1,500,000
12		909,091								1,500,000	1,500,000
13		909,091								1,500,000	1,500,000
14		909,091								1,500,000	1,500,000
15		909,091								1,500,000	1,500,000
16		909,091								1,500,000	1,500,000
17		909,091								1,500,000	1,500,000
18		909,091								1,500,000	1,500,000
19		909,091								1,500,000	1,500,000
20		909,091								1,500,000	1,500,000
Total	20,000,000	18,181,818	2,700		2,700,000	5,000,000	10,000			15,000,000	30,000,000

Tabel 2. Perkiraan Penerimaan Budidaya Tanaman Laban

Umur Tanaman (Tahun)	Produksi (Btg)	Harga (Rp)	Total Penerimaan (Rp)	Kumulatif Penerimaan (Rp)
5			0	0
6			0	0
7	1,250	55,000	68,750,000	68,750,000
8	1,250	55,000	68,750,000	137,500,000
9			0	137,500,000
10			0	137,500,000
11			0	137,500,000
12			0	137,500,000
13			0	137,500,000
14	1,250	55,000	68,750,000	206,250,000
15	1,250	55,000	68,750,000	275,000,000
16			0	275,000,000
17			0	275,000,000
18			0	275,000,000
19			0	275,000,000
20	1,250	55,000	68,750,000	343,750,000
Total	6,250	275,000	343,750,000	

Tabel 3. Proyeksi Laba-Rugi Budidaya Tanaman Laban

Umur Proyek (Tahun)	Pengeluaran (Rp)	Penerimaan (Rp)	Surplus/ Defisit (Rp)	Kumulatif Surplus (Rp)	Pay Back Period
0	42,700,000	0	-42,700,000	-42,700,000	
1	1,500,000	0	-1,500,000	-44,200,000	
2	1,500,000	0	-1,500,000	-45,700,000	
3	1,500,000	0	-1,500,000	-47,200,000	
4	1,500,000	0	-1,500,000	-48,700,000	
5	1,500,000	0	-1,500,000	-50,200,000	
6	1,500,000	0	-1,500,000	-51,700,000	
7	1,500,000	68,750,000	67,250,000	15,550,000	*****
8	1,500,000	68,750,000	67,250,000	82,800,000	
9	1,500,000	0	-1,500,000	81,300,000	
10	1,500,000	0	-1,500,000	79,800,000	
11	1,500,000	0	-1,500,000	78,300,000	
12	1,500,000	0	-1,500,000	76,800,000	
13	1,500,000	0	-1,500,000	75,300,000	
14	1,500,000	68,750,000	67,250,000	142,550,000	
15	1,500,000	68,750,000	67,250,000	209,800,000	
16	1,500,000	0	-1,500,000	208,300,000	
17	1,500,000	0	-1,500,000	206,800,000	
18	1,500,000	0	-1,500,000	205,300,000	Pendapatan
19	1,500,000	0	-1,500,000	203,800,000	per bulan
20	1,500,000	68,750,000	67,250,000	271,050,000	1,129,375
Total	30,000,000	343,750,000	313,750,000	-	-

Tabel 4. Analisis Kelayakan Budidaya Tanaman Laban

Umur Proyek (Tahun)	DF 0.16	PV Pengeluaran	PV Penerimaan
0	1.0000	42,700,000	0
1	0.8621	2,076,803	0
2	0.7432	1,790,347	0
3	0.6407	1,543,403	0
4	0.5523	1,330,519	0
5	0.4761	1,147,000	0
6	0.4104	988,793	0
7	0.3538	852,408	24,325,780
8	0.3050	734,834	20,970,500
9	0.2630	633,478	0
10	0.2267	546,101	0
11	0.1954	470,777	0
12	0.1685	405,842	0
13	0.1452	349,864	0
14	0.1252	301,607	8,607,179
15	0.1079	260,006	7,419,982
16	0.0930	224,143	0
17	0.0802	193,227	0
18	0.0691	166,575	0
19	0.0596	143,599	0
20	0.0514	123,792	3,532,750
Total		56,983,117	64,856,192
	NPV	7,873,075	
	BCR	1.14	

3) Balangeran (*Shorea balangeran* (Korth.)) plantation

Tabel 1. Budidaya Tanaman Balangeran per Hektar

Umur Proyek (Tahun)	Nilai Lahan (Rp)	Penyusutan		Harga (@ Rp)	Nilai (Rp.)	Pembersihan		Penanaman		Nilai (Rp.)	Pemeliharaan (Rp.)	Jumlah Biaya (Rp.)
		Lahan (Rp.)	Bibit (batang)			Lahan (Rp)	Harga (@ Rp)					
0	10,000,000		5,000	2,000	10,000,000	5,000,000	5,000	1,500	7,500,000			32,500,000
1		454,545									1,500,000	1,500,000
2		454,545									1,500,000	1,500,000
3		454,545									1,500,000	1,500,000
4		454,545									1,500,000	1,500,000
5		454,545									1,500,000	1,500,000
6		454,545									1,500,000	1,500,000
7		454,545									1,500,000	1,500,000
8		454,545									1,500,000	1,500,000
9		454,545									1,500,000	1,500,000
10		454,545									1,500,000	1,500,000
11		454,545									1,500,000	1,500,000
12		454,545									1,500,000	1,500,000
13		454,545									1,500,000	1,500,000
14		454,545									1,500,000	1,500,000
15		454,545									1,500,000	1,500,000
16		454,545									1,500,000	1,500,000
17		454,545									1,500,000	1,500,000
18		454,545									1,500,000	1,500,000
19		454,545									1,500,000	1,500,000
20		454,545									1,500,000	1,500,000
Total	10,000,000	9,090,909	5,000		10,000,000	5,000,000	5,000		7,500,000		30,000,000	62,500,000

Tabel 2. Perkiraan Penerimaan Budidaya Tanaman Balangeran

Umur Tanaman (Tahun)	Produksi (m3)	Harga (@]Rp)	Total Penerimaan (Rp)	Kumulatif Penerimaan (Rp)
5			0	0
6			0	0
7			0	0
8			0	0
9			0	0
10			0	0
11			0	0
12			0	0
13			0	0
14			0	0
15	250	3,000,000	750,000,000	750,000,000
16			0	750,000,000
17			0	750,000,000
18			0	750,000,000
19			0	750,000,000
20	250	3,000,000	750,000,000	1,500,000,000
Total	500		1,500,000,000	

Tabel 3. Proyeksi Laba-Rugi Budidaya Tanaman Balangeran

Umur Proyek (Tahun)	Pengeluaran (Rp)	Penerimaan (Rp)	Surplus/ Defisit (Rp)	Kumulatif Surplus (Rp)	Pay Back Period
0	32,500,000	0	-32,500,000	-32,500,000	
1	1,500,000	0	-1,500,000	-34,000,000	
2	1,500,000	0	-1,500,000	-35,500,000	
3	1,500,000	0	-1,500,000	-37,000,000	
4	1,500,000	0	-1,500,000	-38,500,000	
5	1,500,000	0	-1,500,000	-40,000,000	
6	1,500,000	0	-1,500,000	-41,500,000	
7	1,500,000	0	-1,500,000	-43,000,000	
8	1,500,000	0	-1,500,000	-44,500,000	
9	1,500,000	0	-1,500,000	-46,000,000	
10	1,500,000	0	-1,500,000	-47,500,000	
11	1,500,000	0	-1,500,000	-49,000,000	
12	1,500,000	0	-1,500,000	-50,500,000	
13	1,500,000	0	-1,500,000	-52,000,000	
14	1,500,000	0	-1,500,000	-53,500,000	
15	1,500,000	750,000,000	748,500,000	695,000,000	*****
16	1,500,000	0	-1,500,000	693,500,000	
17	1,500,000	0	-1,500,000	692,000,000	
18	1,500,000	0	-1,500,000	690,500,000	Pendapatan
19	1,500,000	0	-1,500,000	689,000,000	per bulan
20	1,500,000	750,000,000	748,500,000	1,437,500,000	5,989,583
Total	30,000,000	1,500,000,000	1,437,500,000	-	-

Tabel 4. Analisis Kelayakan Budidaya Tanaman Balangeran

Umur Proyek (Tahun)	DF 0.16	PV Pengeluaran	PV Penerimaan
0	1.0000	32,500,000	0
1	0.8621	1,684,953	0
2	0.7432	1,452,546	0
3	0.6407	1,252,195	0
4	0.5523	1,079,478	0
5	0.4761	930,585	0
6	0.4104	802,228	0
7	0.3538	691,576	0
8	0.3050	596,186	0
9	0.2630	513,954	0
10	0.2267	443,063	0
11	0.1954	381,951	0
12	0.1685	329,268	0
13	0.1452	283,852	0
14	0.1252	244,700	0
15	0.1079	210,948	80,945,260
16	0.0930	181,852	0
17	0.0802	156,769	0
18	0.0691	135,146	0
19	0.0596	116,505	0
20	0.0514	100,435	38,539,092
Total		44,088,189	119,484,353
NPV		75,396,164	
BCR		2.71	

4) Plantation and production of Rubber tree

Tabel 1. Budidaya Tanaman Karet per Hektar

Umur Proyek (Tahun)	Nilai			Pembersihan			Penanaman			Pemeliharaan (Rp.)	Panen (Rp.)	Jumlah Biaya (Rp.)
	Lahan (Rp)	Bibit (batang)	Harga (@ Rp)	Nilai (Rp.)	Lahan (Rp)	(Btg)	Harga (@ Rp)	Nilai (Rp.)				
0	20,000,000	450	1,000	450,000	5,000,000	450	1,500	675,000			26,125,000	
1									1,730,000		1,730,000	
2									1,730,000		1,730,000	
3									1,730,000		1,730,000	
4									1,730,000		1,730,000	
5									1,730,000		1,730,000	
6									1,730,000		1,730,000	
7									1,730,000	2,281,250	4,011,250	
8									1,730,000	2,281,250	4,011,250	
9									1,730,000	2,281,250	4,011,250	
10									1,730,000	2,281,250	4,011,250	
11									1,730,000	2,281,250	4,011,250	
12									1,730,000	2,281,250	4,011,250	
13									1,730,000	2,281,250	4,011,250	
14									1,730,000	2,281,250	4,011,250	
15									1,730,000	2,281,250	4,011,250	
16									1,730,000	2,281,250	4,011,250	
17									1,730,000	2,281,250	4,011,250	
18									1,730,000	2,281,250	4,011,250	
19									1,730,000	2,281,250	4,011,250	
20									1,730,000	2,281,250	4,011,250	
21									1,730,000	2,281,250	4,011,250	
22									1,730,000	2,281,250	4,011,250	
23									1,730,000	2,281,250	4,011,250	
24									1,730,000	2,281,250	4,011,250	
25									1,730,000	2,281,250	4,011,250	
Total	20,000,000	450		450,000	5,000,000	450		675,000	43,250,000		112,718,750	

Tabel 2. Perkiraan Penerimaan Budidaya Tanaman Karet

Umur Tanaman (Tahun)	Produksi (kg)	Harga (@ Rp)	Total Penerimaan (Rp)	Kumulatif Penerimaan (Rp)
7	2,738	6,000	16,425,000	16,425,000
8	2,938	6,000	17,625,000	34,050,000
9	3,138	6,000	18,825,000	52,875,000
10	3,338	6,000	20,025,000	72,900,000
11	3,538	6,000	21,225,000	94,125,000
12	3,738	6,000	22,425,000	116,550,000
13	3,938	6,000	23,625,000	140,175,000
14	4,138	6,000	24,825,000	165,000,000
15	4,338	6,000	26,025,000	191,025,000
16	4,138	6,000	24,825,000	215,850,000
17	3,938	6,000	23,625,000	239,475,000
18	3,738	6,000	22,425,000	261,900,000
19	3,538	6,000	21,225,000	283,125,000
20	3,338	6,000	20,025,000	303,150,000
21	3,138	6,000	18,825,000	321,975,000
22	2,938	6,000	17,625,000	339,600,000
23	2,738	6,000	16,425,000	356,025,000
24	2,538	6,000	15,225,000	371,250,000
25	2,338	6,000	14,025,000	385,275,000
Total	64,213		385,275,000	

Tabel 3. Proyeksi Laba-Rugi Budidaya Tanaman Karet

Umur Proyek (Tahun)	Pengeluaran (Rp)	Penerimaan (Rp)	Surplus/ Defisit (Rp)	Kumulatif Surplus (Rp)	Pay Back Period
0	26,125,000	0	-26,125,000	-26,125,000	
1	1,730,000	0	-1,730,000	-27,855,000	
2	1,730,000	0	-1,730,000	-29,585,000	
3	1,730,000	0	-1,730,000	-31,315,000	
4	1,730,000	0	-1,730,000	-33,045,000	
5	1,730,000	0	-1,730,000	-34,775,000	
6	1,730,000	0	-1,730,000	-36,505,000	
7	4,011,250	16,425,000	12,413,750	-24,091,250	
8	4,011,250	17,625,000	13,613,750	-10,477,500	
9	4,011,250	18,825,000	14,813,750	4,336,250	****
10	4,011,250	20,025,000	16,013,750	20,350,000	
11	4,011,250	21,225,000	17,213,750	37,563,750	
12	4,011,250	22,425,000	18,413,750	55,977,500	
13	4,011,250	23,625,000	19,613,750	75,591,250	
14	4,011,250	24,825,000	20,813,750	96,405,000	
15	4,011,250	26,025,000	22,013,750	118,418,750	
16	4,011,250	24,825,000	20,813,750	139,232,500	
17	4,011,250	23,625,000	19,613,750	158,846,250	
18	4,011,250	22,425,000	18,413,750	177,260,000	
19	4,011,250	21,225,000	17,213,750	194,473,750	
20	4,011,250	20,025,000	16,013,750	210,487,500	
21	4,011,250	18,825,000	14,813,750	225,301,250	
22	4,011,250	17,625,000	13,613,750	238,915,000	
23	4,011,250	16,425,000	12,413,750	251,328,750	
24	4,011,250	15,225,000	11,213,750	262,542,500	
25	4,011,250	14,025,000	10,013,750	272,556,250	
Total	86,593,750	385,275,000	272,556,250	-	-

Tabel 4. Analisis Kelayakan Budidaya Tanaman Karet

Umur Proyek (Tahun)	DF 0.16	PV Pengeluaran	PV Penerimaan
0	1.0000	26,125,000	0
1	0.8621	1,491,379	0
2	0.7432	1,285,672	0
3	0.6407	1,108,338	0
4	0.5523	955,464	0
5	0.4761	823,676	0
6	0.4104	710,065	0
7	0.3538	1,419,299	5,811,650
8	0.3050	1,223,533	5,376,074
9	0.2630	1,054,770	4,950,090
10	0.2267	909,285	4,539,339
11	0.1954	783,866	4,147,724
12	0.1685	675,747	3,777,779
13	0.1452	582,540	3,430,978
14	0.1252	502,190	3,107,974
15	0.1079	432,922	2,808,801
16	0.0930	373,209	2,309,731
17	0.0802	321,732	1,894,899
18	0.0691	277,355	1,550,560
19	0.0596	239,099	1,265,161
20	0.0514	206,120	1,028,994
21	0.0443	177,690	833,906
22	0.0382	153,181	673,059
23	0.0329	132,052	540,719
24	0.0284	113,838	432,081
25	0.0245	98,136	343,126
Total		42,176,156	48,822,645
	NPV	6,646,489	
	BCR	1.16	

5) Raising of Alabio Duck

Tabel 1. Biaya Pemeliharaan Itik Alabio

Umur Proyek (Bulan)	Nilai Kandang (Rp)	Penyusutan Kandang (Rp.)	Bibit (ekor)	Harga (@ Rp)	Nilai (Rp.)	Broiler (kg)	Harga (@ Rp)	Nilai (Rp.)	Dedak (kg)	Harga (@ Rp)	Nilai (Rp.)	Jumlah Biaya (Rp.)
0	2,000,000		100	40,000	4,000,000							6,000,000
1		90,909				20	8,000	160,000	50	5,000	250,000	410,000
2		90,909				30	8,000	240,000	80	5,000	400,000	640,000
3		90,909							100	5,000	500,000	500,000
4		90,909							200	5,000	1,000,000	1,000,000
5		90,909							350	5,000	1,750,000	1,750,000
6		90,909							350	5,000	1,750,000	1,750,000
7		90,909							350	5,000	1,750,000	1,750,000
8		90,909							350	5,000	1,750,000	1,750,000
9		90,909							350	5,000	1,750,000	1,750,000
10		90,909							350	5,000	1,750,000	1,750,000
11		90,909							350	5,000	1,750,000	1,750,000
12		90,909							350	5,000	1,750,000	1,750,000
13		90,909							350	5,000	1,750,000	1,750,000
14		90,909							350	5,000	1,750,000	1,750,000
15		90,909							350	5,000	1,750,000	1,750,000
16		90,909							350	5,000	1,750,000	1,750,000
17		90,909							350	5,000	1,750,000	1,750,000
18		90,909							350	5,000	1,750,000	1,750,000
19		90,909							350	5,000	1,750,000	1,750,000
20		90,909							350	5,000	1,750,000	1,750,000
21		90,909							350	5,000	1,750,000	1,750,000
22		90,909							350	5,000	1,750,000	1,750,000
Total	2,000,000	2,000,000	100	40,000	4,000,000	50	16,000	400,000	6,730	110,000	33,650,000	40,050,000

Tabel 2. Perkiraan Penerimaan Telor Itik Alabio

Umur Proyek (Bulan)	Umur Itik Bulan ke-	Produksi Telor/ Hari/100 ekor (Butir)	Produksi Telor/ Bulan (Butir)	Produksi Daging (Kg)	Harga Telor (Rp/Butir)	Harga Daging (Rp/Kg)	Penerimaan Telor (Rp)	Penerimaan Daging (Rp)	Total Penerimaan (Rp)	Kumulatif Penerimaan (Rp)
4	6	45	1,350		2,000		2,700,000	0	2,700,000	2,700,000
5	7	70	2,100		2,000		4,200,000	0	4,200,000	6,900,000
6	8	90	2,700		2,000		5,400,000	0	5,400,000	12,300,000
7	9	92	2,760		2,000		5,520,000	0	5,520,000	17,820,000
8	10	89	2,670		2,000		5,340,000	0	5,340,000	23,160,000
9	11	87	2,610		2,000		5,220,000	0	5,220,000	28,380,000
10	12	84	2,520		2,000		5,040,000	0	5,040,000	33,420,000
11	13	81	2,430		2,000		4,860,000	0	4,860,000	38,280,000
12	14	77	2,310		2,000		4,620,000	0	4,620,000	42,900,000
13	15	75	2,250		2,000		4,500,000	0	4,500,000	47,400,000
14	16	72	2,160		2,000		4,320,000	0	4,320,000	51,720,000
15	17	70	2,100		2,000		4,200,000	0	4,200,000	55,920,000
16	18	68	2,040		2,000		4,080,000	0	4,080,000	60,000,000
17	19	65	1,950		2,000		3,900,000	0	3,900,000	63,900,000
18	20	62	1,860		2,000		3,720,000	0	3,720,000	67,620,000
19	21	58	1,740		2,000		3,480,000	0	3,480,000	71,100,000
20	22	54	1,620		2,000		3,240,000	0	3,240,000	74,340,000
21	23	48	1,440		2,000		2,880,000	0	2,880,000	77,220,000
22	24	42	1,260	160	2,000	70,000	2,520,000	11,200,000	13,720,000	90,940,000
		1,329	39,870	160	38,000	70,000	79,740,000	11,200,000	90,940,000	

Tabel 3. Proyeksi Laba-Rugi Pemeliharaan Itik Alabio

Umur Proyek (Bulan)	Pengeluaran (Rp)	Penerimaan (Rp)	Surplus/ Defisit (Rp)	Kumulatif Surplus (Rp)	Pay Back Period
0	6,000,000	0	-6,000,000	-6,000,000	
1	410,000	0	-410,000	-6,410,000	
2	640,000	0	-640,000	-7,050,000	
3	500,000	0	-500,000	-7,550,000	
4	1,000,000	2,700,000	1,700,000	-5,850,000	
5	1,750,000	4,200,000	2,450,000	-3,400,000	
6	1,750,000	5,400,000	3,650,000	250,000	*****
7	1,750,000	5,520,000	3,770,000	4,020,000	
8	1,750,000	5,340,000	3,590,000	7,610,000	
9	1,750,000	5,220,000	3,470,000	11,080,000	
10	1,750,000	5,040,000	3,290,000	14,370,000	
11	1,750,000	4,860,000	3,110,000	17,480,000	
12	1,750,000	4,620,000	2,870,000	20,350,000	
13	1,750,000	4,500,000	2,750,000	23,100,000	
14	1,750,000	4,320,000	2,570,000	25,670,000	
15	1,750,000	4,200,000	2,450,000	28,120,000	
16	1,750,000	4,080,000	2,330,000	30,450,000	
17	1,750,000	3,900,000	2,150,000	32,600,000	
18	1,750,000	3,720,000	1,970,000	34,570,000	
19	1,750,000	3,480,000	1,730,000	36,300,000	
20	1,750,000	3,240,000	1,490,000	37,790,000	Pendapatan
21	1,750,000	2,880,000	1,130,000	38,920,000	per bulan
22	1,750,000	13,720,000	11,970,000	50,890,000	2,313,182
Total	40,050,000	90,940,000	50,890,000	-	-

Tabel 4. Analisis Kelayakan Pemeliharaan Itik Alabio

Umur Proyek (Bulan)	DF 0.013	PV Pengeluaran	PV Penerimaan
0	1.0000	6,000,000	0
1	0.9868	494,318	0
2	0.9739	711,801	0
3	0.9610	567,889	0
4	0.9484	1,034,616	2,560,675
5	0.9359	1,722,942	3,930,861
6	0.9236	1,700,272	4,987,464
7	0.9115	1,677,900	5,031,214
8	0.8995	1,655,822	4,803,111
9	0.8876	1,634,035	4,633,397
10	0.8759	1,612,535	4,414,762
11	0.8644	1,591,317	4,201,077
12	0.8530	1,570,379	3,941,069
13	0.8418	1,549,716	3,788,194
14	0.8307	1,529,325	3,588,816
15	0.8198	1,509,202	3,443,217
16	0.8090	1,489,344	3,300,828
17	0.7984	1,469,748	3,113,687
18	0.7879	1,450,409	2,930,900
19	0.7775	1,431,324	2,705,733
20	0.7673	1,412,491	2,485,985
21	0.7572	1,393,906	2,180,688
22	0.7472	1,375,565	10,251,865
Total		36,584,856	76,293,543
	NPV	39,708,686	
	BCR	2.09	

6) Production of paddy

1	Biaya	Jumlah	Satuan	Harga/unit (Rp)	Nilai (Rp)
a	Pembelian alat				
	Cangkul	2	unit	60,000	120,000
	Parang	2	unit	75,000	150,000
	Sprayer	1	unit	450,000	450,000
	Sabit	3	unit	50,000	150,000
					870,000
	Penyusutan alat				310,000
b	Pembelian bahan				
	Herbisida	6	liter	60,000	360,000
	Benih	30	kg	15,000	450,000
	Urea	150	kg	5,000	750,000
					1,560,000
c	Tenaga kerja				
	Persiapan lahan	15	HOK	75,000	1,125,000
	Penanaman	10	HOK	75,000	750,000
	Pemeliharaan	9	HOK	75,000	675,000
	Panen	15	HOK	75,000	1,125,000
	Perontokan	7	HOK	75,000	525,000
	Pembersihan	6	HOK	75,000	450,000
	Penjemuran	4	HOK	75,000	300,000
					4,950,000
	Total biaya				6,820,000
2	Produksi				
a	Padi	980	kg	6,000	5,880,000
b	Jagung	225	tongkol	2,000	450,000
c	Ubi kayu	300	kg	3,000	900,000
d	Sayuran	150	ikat	1,000	150,000
	Total Manfaat				7,380,000
	BCR				1.08
	NPV				560,000

5 Summary on Green Finance

Green finance can be understood as financing of investments that provide environmental benefits in the broader context of environmentally sustainable development¹. Such investments are called "green investments", and they include not only climate related investments but also the others such as waste processing and recycling, biodiversity protection, water sanitation, industrial pollution control, etc. (Figure 5.1)².

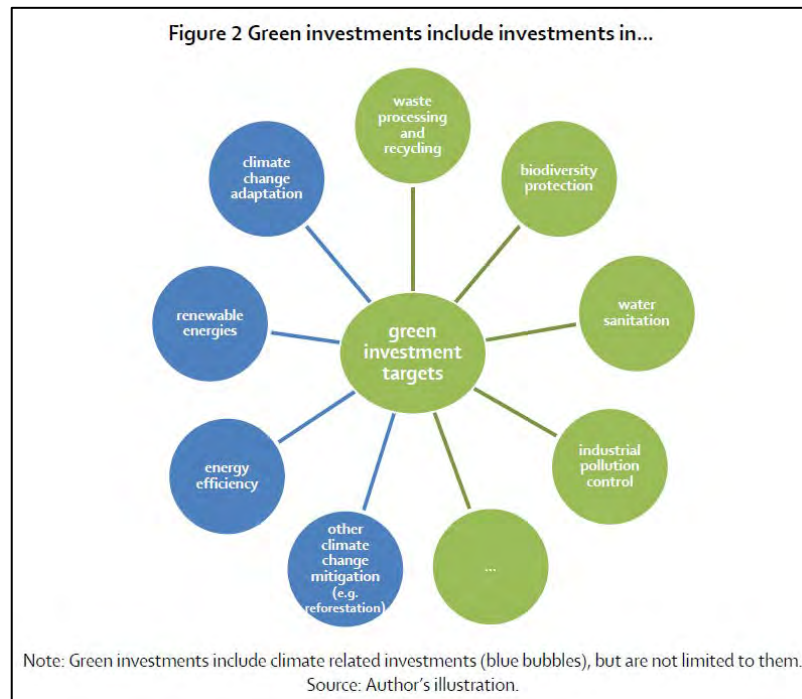


Figure 5.1 The scope of green investment targets.

Source: Definition of Green Finance. Nannette Lindenberg, 2014

Recently, some financial systems are developed to be specialized into the green investment, and one of the leading example is Green Bond. Green Bonds are any type of bond instrument where the proceeds will be exclusively applied to finance or re-finance, in part or in full, new and/or existing eligible Green Projects and which are aligned with the four core components of the Green Bond Principles (GBP)³.

The GBP are voluntary process guidelines that recommend transparency and disclosure and promote integrity in the development of the Green Bond market by clarifying the approach for issuance of a Green Bond. The GBP have four core components:

1. Use of Proceeds
2. Process for Project Evaluation and Selection
3. Management of Proceeds
4. Reporting

Annual issuance of Green Bonds grows rapidly, and it is estimated to reach about 150 billion

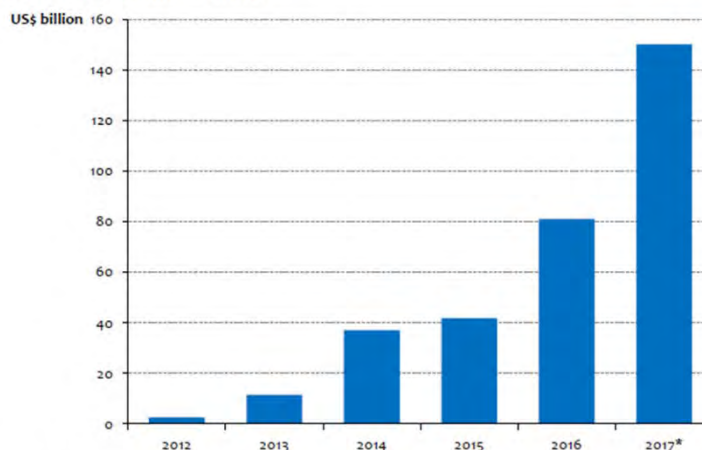
¹ G20 Green finance synthesis report. G20 Green Finance Study Group, 2016

² Definition of Green Finance. Nannette Lindenberg, 2014

³ The Green Bond Principles 2017. International Capital Market Association, 2017

dollars in 2017 (Figure 5.2)⁴. However, further growth is expected in the future.

FIGURE 1: GREEN BONDS ANNUAL ISSUANCE



Source: Climate Bonds Initiative; *Climate Bonds Initiative estimated value for 2017

Figure 5.2 Green bonds annual issuance.

Source: Green Finance Progress Report. UN environment, 2017

A large and liquid green bonds market can support countries in achieving the targets (Nationally Determined Contribution: NDCs) set out in the Paris Climate Agreement. Global climate leaders have recently set a milestone of 1 trillion dollars in green bonds by 2020 (Figure 5.3)⁵.



Figure 5.3 Growth targets of Green Bonds market.

Source: Green Bonds Policy: Highlights from Q1-Q2 2017. Climate Bonds Initiative, 2017

The most commonly used types of projects supported or expected to be supported by the Green Bond market are as follows⁶:

1. Renewable energy
2. Energy efficiency
3. Pollution prevention and control
4. Environmentally sustainable management of living natural resources and land use
5. Terrestrial and aquatic biodiversity conservation

⁴ Green Finance Progress Report. UN environment, 2017

⁵ Green Bonds Policy: Highlights from Q1-Q2 2017. Climate Bonds Initiative, 2017

⁶ The Green Bond Principles 2017. International Capital Market Association, 2017

6. Clean transportation
7. Sustainable water and wastewater management
8. Climate change adaptation
9. Eco-efficient and/or circular economy adapted products, production technologies and processes
10. Green buildings which meet regional, national or internationally recognized standards or certifications

However, in actuality, 80% of the Green Bonds were invested in Energy, Building & Industry and Transport sectors (Figure 5.4)⁷. On the other hand, only 2.1% were invested in Agriculture & Forestry sector and most of them belonged to Multi-sector. The low proportion in Agriculture & Forestry sector is also found in case the other climate-aligned funds are taken into account (Figure 5.5).

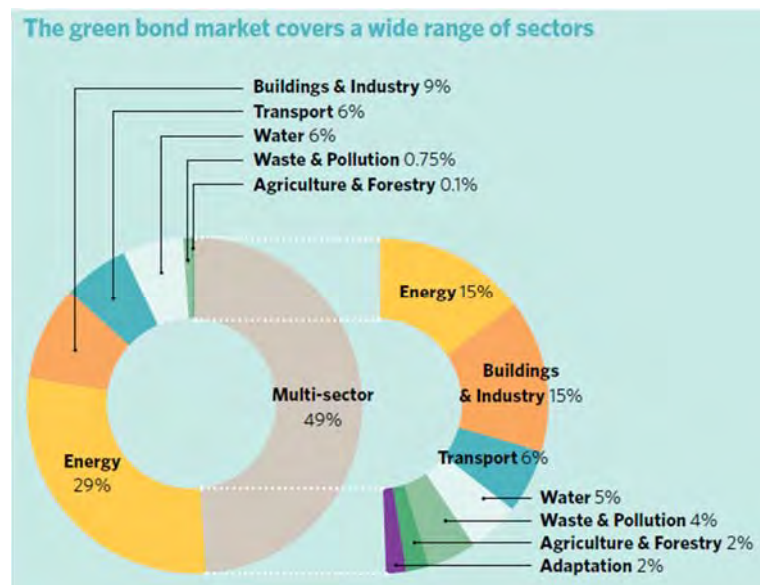


Figure 5.4 Proportion of each sector supported by Green Bonds.

Source: Bonds and Climate Change: The state of market 2016. Climate Bond Initiative, 2016

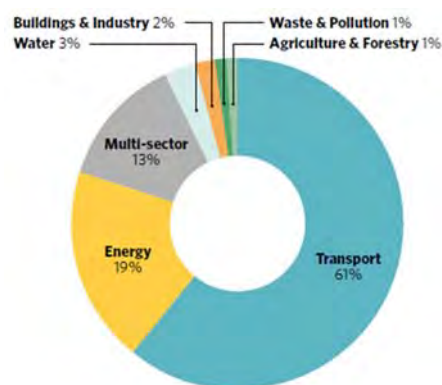


Figure 5.5 Proportion of each sector supported by Climate-aligned Bonds that include the Green Bonds.

Source: Bonds and Climate Change: The state of market 2016. Climate Bond Initiative, 2016

⁷ Bonds and Climate Change: The state of market 2016. Climate Bond Initiative, 2016

These are far from the proportion of source of greenhouse-gas emission where Agriculture, Forestry and Other Land Use (AFOLU) occupy about 25% of the total amount (Figure 5.6)⁸. Therefore, in the context of climate change mitigation, investment to the Agriculture & Forestry sector would be insufficient.

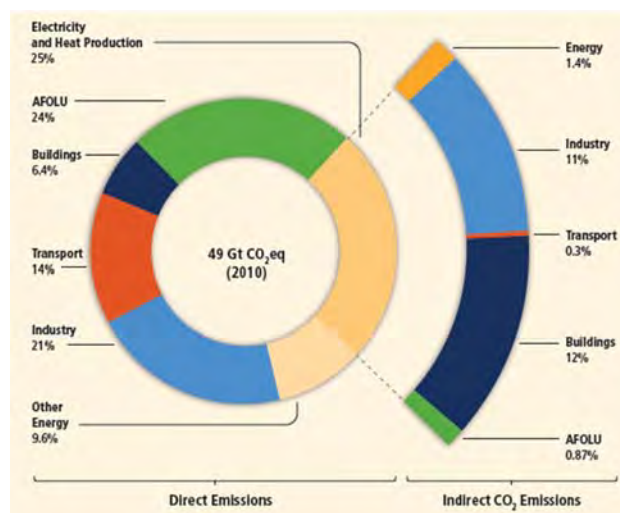


Figure 5.6 Greenhouse-gas emissions by economic sectors in 2010.

Source: Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. IPCC, 2014

Forest bonds can play a powerful role in financing forest preservation as the policy landscape, globally and within countries, takes shape⁹. However, sufficient investment has not been obtained under present circumstances. Carbon markets are an important source of cash flows that could be used to back a bond, but they are not yet reliable enough.

Therefore, Forest bonds should not rely solely on forest carbon revenue and could potentially be linked to income from other ecosystem service markets, sustainable timber and agricultural markets, regulation (e.g. taxes, liability regulation), and forest-friendly lending (e.g. to ecosystem-dependent small- and medium-sized enterprises).

Building a feasible business model would be indispensable for attracting investment to the Agriculture & Forestry sector. Green Bonds and/or the other Bonds would become a candidate to finance the activities.

⁸ Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. IPCC, 2014

⁹ Unlocking Forest Bonds: A High-Level Workshop on Innovative Finance for Tropical Forests. Cranford et al., 2011

6 List of Collected References

No.	The Name of Collected Reference	Publisher	Form	Type				Classification: JR: Public, CR () Private with a limited time	Note by JICA library
				Collected documents	Expert- making documents	JICA's documents	Others		
Peatland Restoration (PR)									
1	Decree of the Head of Peatland Restoration Agency No. SK 05/BRG/Kpts/2016 on the Establishment of the Indicative Map for Peat Restoration	Badan Restorasi gambut (BRG)	Digital	1				JR • CR ()	
2	Circular Letter of Head of Peatland Restoration Agency No. SE 02/KB/11/2016 on Tutorial for Pre arrangement of Peat land in the area of Forest Product Utilization License in Production Forest	Badan Restorasi gambut (BRG)	Digital	1				JR • CR ()	
3	Ministerial Decree of Environmental and Forestry No. P.14/MenLHK/Setjen/Kum.1/2/2017 on Procedures of Inventory and Determination of Peat Ecosystem Function	Badan Restorasi gambut (BRG)	Digital	1				JR • CR ()	
4	Ministerial Decree of Environmental and Forestry No. P.15/MenLHK/Setjen/Kum.1/2/2017 on Procedures for Measuring groundwater levels at the point of Peat Ecosystem Planning	Ministry of Environment and Forestry	Digital	1				JR • CR ()	
5	Ministerial Decree of Environmental and Forestry No. P.16/MenLHK/Setjen/Kum.1/2/2017 concerning Technical Guidelines for Restoration of Peat Ecosystem Function	Ministry of Environment and Forestry	Digital	1				JR • CR ()	
6	Ministerial Decree of Environmental and Forestry No. P.17/MenLHK/Setjen/Kum.1/2/2017 On Amendment to Ministerial Decree of Environmental and Forestry No.12/MenLHK-II/2015 on the Development of Industrial Plantation Forest	Ministry of Environment and Forestry	Digital	1				JR • CR ()	

No.	The Name of Collected Reference	Publisher	Form	Type				Classification: JR: Public, CR () Private with a limited time	Note by JICA library
				Collected documents	Expert- making documents	JICA's documents	Others		
7	Decree of Head of Peatland Restoration Agency No. P.3/KB BRG-SB/11/2016 on Procedures for Verification and Location Determination For Responsible Peatland Restoration Effort	Badan Restorasi gambut (BRG)	Digital	1				JR • CR ()	
8	Government Regulation No. 71 of 2014 on Protection and Management of Peat Ecosystem	Government of Indonesia	Digital	1				JR • CR ()	
9	Government Regulation No. 57 of 2016 on Change of Governmental Regulation No. 71 of 2014 on Protection and Management of Peat Ecosystem	Government of Indonesia	Digital	1				JR • CR ()	
10	Development `prospect of Some Alternative Species in Wetland Area	Forest Research and Development Innovation Agency, MOEF	Digital	1				JR • CR ()	
11	Guidance and Procedures for Nursery Development in Peatlands	Badan Restorasi gambut (BRG)	Digital	1				JR • CR ()	
12	Guidance and Procedures for Forest Cultivation at Peat Swamp	Badan Restorasi gambut (BRG)	Digital	1				JR • CR ()	
13	Guidelines and Procedures for Planting in Peatlands and Maintenance	Badan Restorasi gambut (BRG)	Digital	1				JR • CR ()	
14	Technical Guideline of Peatland Revegetation	Badan Restorasi gambut (BRG)	Digital	1				JR • CR ()	
15	Rencana Strategis Badan Restorasi Gambut 2016-2020	Badan Restorasi gambut (BRG)	Digital	1				JR • CR ()	
16	Peraturan Presiden Republik Indonesia Nomor 1 Tahun 2016 tentang Badan Restorasi Gambut	Government of Indonesia	Digital	1				JR • CR ()	

No.	The Name of Collected Reference	Publisher	Form	Type				Classification: JR: Public, CR () Private with a limited time	Note by JICA library
				Collected documents	Expert- making documents	JICA's documents	Others		
17	Undang-undang No.32 Tahun 2009 tentang Perlindungan dan Pengelolaan Lingkungan Hidup	Government of Indonesia	Digital	1				JR • CR ()	
18	Peraturan Pemerintah Republik Indonesia Nomor 71 Tahun 2014 tentang Perlindungan dan Pengelolaan Ekosistem Gambut	Government of Indonesia	Digital	1				JR • CR ()	
19	Peraturan Pemerintah Republik Indonesia Nomor 57 Tahun 2016 tentang Perubahan atas Peraturan Pemerintah Nomor 71 Tahun 2014 tentang Perlindungan dan Pengelolaan Ekosistem Gambut	Government of Indonesia	Digital	1				JR • CR ()	
20	Peraturan Menteri Lingkungan Hidup dan Kehutanan Republik Indonesia Nomor P.15/Menlhk/Setjen/Kum.1/2/2017 tentang Tata Cara Pengukuran Muka Air Tanah di Titik Penaatan Ekosistem Gambut	Government of Indonesia	Digital	1				JR • CR ()	
21	Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor P.14/MenLHK/Setjen/Kum.1/2/2017 tentang Tata Cara Inventarisasi dan Penetapan Fungsi Ekosistem Gambut	Government of Indonesia	Digital	1				JR • CR ()	
22	Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor P.16/MenLHK/Setjen/Kum.1/2/2017 tentang Pedoman Teknis Pemulihan Fungsi Ekosistem Gambut	Government of Indonesia	Digital	1				JR • CR ()	
23	平成 22 年度 CDM/JI 事業調査「インドネシア・泥炭管理 NAMA 実現可能性調査」報告書	環境省	Digital	1				JR • CR ()	
24	PEAT-CO2, Assessment of CO2 emissions from drained peatlands in SE Asia	Delft Hydraulics	Digital	1				JR • CR ()	
Forest Management (FM)									
1	Challenges of GPP & Eco-Labeling; Indonesia Perspectives - The International Symposium on GPP and Eco-Labeling towards Sustainable Consumption &	Directorate for Standardization and	Digital	1				JR • CR ()	

No.	The Name of Collected Reference	Publisher	Form	Type				Classification: JR: Public, CR () Private with a limited time	Note by JICA library
				Collected documents	Expert- making documents	JICA's documents	Others		
	Production Tokyo, Japan, 11-12 December 2014	Technology Ministry of Environment and Forestry							
2	Ministerial Decree of Forestry No. P.36/Menhut-II/2009 on Procedures for Licensing of Commercial Utilization of Carbon Sequestration and/or Storage in Production and Protected Forests	Ministry of Forestry	Digital	1				JR • CR ()	
3	Decree of the Minister of Environment and Forestry No. P.9/Menlhk-II/2015 on Procedures for Granting, Extension of working area and Extension of Business License for Timber Forest Product Utilization in Natural Forest, Utilization License Timber Forest Ecosystem Restoration or Permit utilization of Wood Forest Plantation Industry in Production Forest	Direktur Jenderal Pengelolaan Hutan Produksi Lestari, Ministry Of Environment And Forestry	Digital	1				JR • CR ()	
4	Decree of the Director General of Sustainable Production Forest Management No. P.10/PHPL-SET/2015 on Guidelines for Preparation, Assessment and Approval of Work Plan, Annual Work Plan on Business Work Chart of Utilization License for Timber Forest Ecosystem Restoration	Direktur Jenderal Pengelolaan Hutan Produksi Lestari, Ministry Of Environment And Forestry	Digital	1				JR • CR ()	
5	Decree of the Minister of Forestry No. P8/Menhut-II/2014 on Restrictions Area of Utilization License Timber Forest Products (IUPHHK) in Natural Forests, Utilization License Timber Forest Products Industrial Plant Forest or Ecosystem Restoration in Production Forest	Moinistry of Forestry	Digital	1				JR • CR ()	
6	Decree of the Director General of Sustainable Production Forest Management No. P.9/SFM-SET/2015 on Technical Guidelines on Ecosystem Restoration Periodic Forest Inventory (Ihbre) On Utilization License	Ministry of Environment and Forestry	Digital	1				JR • CR ()	

No.	The Name of Collected Reference	Publisher	Form	Type				Classification: JR: Public, CR () Private with a limited time	Note by JICA library
				Collected documents	Expert- making documents	JICA's documents	Others		
	for Timber Forest Products of Ecosystem Restoration (IUPHHK- Re) in Natural Forests in Production Forest								
7	Ministerial Decree of Forestry No.P.31/Menhut-II/2014 on Procedures for Granting and Extension of the work area of Utilization License Timber Forest Products in Natural Forests, Forest Timber Utilization License for Ecosystem Restoration or Business License for Utilization of Wood Forest Industrial Plant in Production Forest	Ministry of Forestry	Digital	1				JR • CR ()	
8	Ministerial Decree of Forestry No. P. 64/Menhut-II/2014 on Application of Silviculture in the Area of Business License for Utilization of Ecosystem Restoration Forest in Production Forest	Ministry of Forestry	Digital	1				JR • CR ()	
9	Ministerial Decree of Forestry No. P. 66/Menhut-II/2014 on Periodic Forest Inventory and Work Plan on Utilization License Timber Forest Ecosystem Restoration	Ministry Of Forestry	Digital	1				JR • CR ()	
10	Ministerial Decree of ForestryNo. P.76/Menhut-II/2014 on Determination of the Amount of Forest Utilization Permit Fee	Ministry of Forestry	Digital	1				JR • CR ()	
11	Recapitulation of Utilization License Timber Forest Ecosystem Restoration (IUPHHK- Re) Year 2017		Digital	1				JR • CR ()	
12	Law No. 41 of 1999 on Forestry	President of the Republic of Indonesia	Digital	1				JR • CR ()	
13	Law No. 19 of 2004 on the Stipulation of Government Regulation in Lieu of Law No. 1 of 2004 on the Amendment of Act No. 41 of 1999 on Forestry	President of the Republic of Indonesia	Digital	1				JR • CR ()	

No.	The Name of Collected Reference	Publisher	Form	Type				Classification: JR: Public, CR () Private with a limited time	Note by JICA library
				Collected documents	Expert- making documents	JICA's documents	Others		
14	Law No. 32 of 2009 on the Protection and Environmental Management	President of the Republic of Indonesia	Digital	1				JR • CR ()	
15	Law No. 18 of 2013 on the Prevention and Eradication of Forest Destruction	President of the Republic of Indonesia	Digital	1				JR • CR ()	
16	Law No. 23 of 2014 on the Regional Government as Several times amended the latest by Law No. 9 of 2015 on the second amendment to Law No. 23 of 2014 on Local Government	President of the Republic of Indonesia	Digital	1				JR • CR ()	
17	Law No. 37 of 2014 on Soil and Water Conservation	President of the Republic of Indonesia	Digital	1				JR • CR ()	
18	Government Regulation in Lieu of Law No. 1 of 2004 on the Amendment of Act No. 41 of 1999 on Forestry	President of the Republic of Indonesia	Digital	1				JR • CR ()	
19	Government Regulation No. 27 of 2012 on Environmental Permits	President of the Republic of Indonesia	Digital	1				JR • CR ()	
20	Ministerial Decree of Environment and Forestry No. P.1/MENLHK-II/2015 on Amendment Ministerial Decree of Environment and Forestry No. P.97/Menhut-II/2014 on Delegation of Authority Provision of Licensing and Non licenses on the Environment and Forestry In Implementation of the framework of One Stop to the Head of the Investment Coordinating Board	Ministry of Environment and Forestry	Digital	1				JR • CR ()	
21	Ministerial Decree of Environment No. 5 of 2012 on Types of Business Plan and/or Activity and Mandatory to conduct EIA	Ministry of Environment and Forestry	Digital	1				JR • CR ()	
22	Ministerial Decree of the Environment No. 16 of 2012 on Guidelines for the Preparation document to Environment	Ministry of Environment and Forestry	Digital	1				JR • CR ()	

No.	The Name of Collected Reference	Publisher	Form	Type				Classification: JR: Public, CR () Private with a limited time	Note by JICA library
				Collected documents	Expert- making documents	JICA's documents	Others		
23	Ministerial Decree of Environment No. 08 of 2013 on the Procedure of Assessment and Examination of Documents Environment and Environmental Permit Issuance	Ministry of Environment and Forestry	Digital	1				JR • CR ()	
24	Ministerial Decree of Environment and Forestry No. P.7/MENLHK-II/2015 on Technical Guidelines for Licensing and Non Granting licenses on the Environment and Forestry in the Implementation of One Stop Services	Ministry of Environment and Forestry	Digital	1				JR • CR ()	
25	Ministerial Decree of Environment and Forestry No. P.08/MENLHK-II/2015 on Second Revision of Ministerial Decree of Forestry No. P.36/ Menhut-II/2009 on Procedures for Licensing of sequestration and / or storage of carbon in Production Forest and Forest protected	Ministry of Environment and Forestry	Digital	1				JR • CR ()	
26	Ministerial Decree of Environment and Forestry No. P.12/MENLHK-II/2015 on Industrial Plantation Forest Development	Ministry of Environment and Forestry	Digital	1				JR • CR ()	
27	Ministerial Decree of Environment and Forestry No. P.13/MENLHK-II/2015 on Business License for Forest Product Primary Industry	Ministry of Environment and Forestry	Digital	1				JR • CR ()	
28	Ministerial Decree of Environment and Forestry No. P.14/MENLHK-II/2015 on the Procedures for Granting Permit Silvopastura Area Utilization in Production Forest	Ministry of Environment and Forestry	Digital	1				JR • CR ()	
29	Ministerial Decree of Environment and Forestry No. P.17/Menlhk/Setjen/Kum.1/2/2017 on Changes to Ministerial Decree of Environment and Forestry No. P.12/Menlhk-II/2015 on Industrial Forest Plantation	Ministry of Environment and Forestry	Digital	1				JR • CR ()	

No.	The Name of Collected Reference	Publisher	Form	Type				Classification: JR: Public, CR () Private with a limited time	Note by JICA library
				Collected documents	Expert- making documents	JICA's documents	Others		
	Development								
30	Decree of Director General of Sustainable Production Forest Management No. P.21/PHPL/SET/Kum.0/12/2016 on guidelines for monitoring and evaluation of successful ecosystem restoration in production forest	Director General of Sustainable Production Forest Management	Digital	1				JR・CR ()	
31	Regulation of The Minister of Environment and Forestry of The Republic Of Indonesia Number P.40/Menlhk/Setjen/Kum.1/ 6/2017 On Government Facilities on Industrial Plant Forest Businesses in the Framework of Protection and Ecosystem Management	Ministry of Environment and Forestry	Digital	1				JR・CR ()	
32	Gerunggang (<i>Cratoxylum arborencens</i> Blume.) and Terentang (<i>Camptosperma coriaceum</i> Jack.), Trees for Peatland	Kementerian Kehutanan, Badan Penelitian dan Pengembangan Hutan, Pusat Penelitian dan Pengembangan Peningkatan Produktivitas Hutan	Digital	1				JR・CR ()	
33	平成 27 年度地球温暖化問題等対策調査事業（途上国における森林の減少・劣化の防止等への我が国企業の貢献可視化に向けた実現可能性調査事業）報告書	経済産業省	Digital	1				JR・CR ()	
34	Short Communication: Selected medicinal plants in East and North Kalimantan (Indonesia) against <i>Propionibacterium acnes</i>	Enos Tangke Arung, et al.	Digital	1				JR・CR ()	
Agriculture (AG)									
1	Ministerial Decree of Agriculture No. 26/Permentan/HK.140/04/2015 on Conditions, Procedures and	Ministry of Agriculture	Digital	1				JR・CR ()	

No.	The Name of Collected Reference	Publisher	Form	Type				Classification: JR: Public, CR () Private with a limited time	Note by JICA library
				Collected documents	Expert- making documents	JICA's documents	Others		
	Standard Operating Procedures Technical Recommendation Permit Granting in farming								
2	Ministerial Decree of Agriculture No. 70/Permentan/PD.200/6/2014 on Guidance on Licensing Horticulture Cultivation	Ministry of Agriculture	Digital	1				JR • CR ()	
3	Ministerial Decree of Agriculture No. 98/Permentan/OT.140/9/2013 on Guidance on Licensing for Plantation Business	Ministry of Agriculture	Digital	1				JR • CR ()	
4	Ministerial Decree of Agriculture No. 29/Permentan/OT.140/5/2016 on Amendment of Ministerial Decree of Agriculture No. 98/Permentan/OT.140/9/2013 on Guidance on Licensing for Plantation Business	Ministry of Agriculture	Digital	1				JR • CR ()	
5	Decision of Minister of Agriculture No. 1312/Kpts/KP.340/12/2014 on Delegation of Authority granting business licenses in the Field of Agriculture in the Context of Investment to the Head of the Investment Coordinating Board	Ministry of Agriculture	Digital	1				JR • CR ()	
6	Decision of Minister of Agriculture No. 511/Kpts/PD.310/9/2006 on Kinds of Plants Fostered by the Directorate General of Plantation, Directorate General of Food Crops, and Directorate General of Horticulture	Ministry of Agriculture	Digital	1				JR • CR ()	
7	Decision of Minister of Agriculture No. 3599/Kpts/KP.310/10/2009 on Amendment on Annex I in Decision of Minister of Agriculture No. 511/Kpts/PD.310/9/2006 About Kinds of Plants Fostered by the Directorate General of Plantation, Directorate General of Food Crops, and Directorate General Horticulture	Ministry of Agriculture	Digital	1				JR • CR ()	

No.	The Name of Collected Reference	Publisher	Form	Type				Classification: JR: Public, CR () Private with a limited time	Note by JICA library
				Collected documents	Expert- making documents	JICA's documents	Others		
8	Government Regulation No. 18 of 2010 on the Crop Cultivation	Government of Indonesia	Digital	1				JR • CR ()	
9	Law No. 39 of 2014 on Gardening	Government of Indonesia	Digital	1				JR • CR ()	
10	Law No. 13 of 2010 on Horticulture	Government of Indonesia	Digital	1				JR • CR ()	
11	Law No. 12 of 1992 on Plant Cultivation System	Government of Indonesia	Digital	1				JR • CR ()	
12	Law No. 18 of 2009 on Animal Husbandry and Animal Health	Government of Indonesia	Digital	1				JR • CR ()	
13	Law No. 41 of 2014 on the Amendment of Law No. 18 of 2009 on Animal Husbandry and Animal Health	Government of Indonesia	Digital	1				JR • CR ()	
14	Law No. 41 of 2009 on the Protection of Agricultural Land Sustainable Food	Government of Indonesia	Digital	1				JR • CR ()	
15	Decision of Minister Of Agriculture No. 511/Kpts/Pd.310/9/2006 on Commodity Type Plants Fostered by Directorate General of Plantation, Directorate General of Crops and Horticulture	Ministry of Agriculture	Digital	1				JR • CR ()	
16	Ministerial Decree of Agriculture No. 07/Permentan/Ot.140/2/2012 on Technical Guidelines of Criteria and Requirements for Area, Land and Agricultural Land Reserve for Sustainable Food Agriculture	Ministry of Agriculture	Digital	1				JR • CR ()	
17	Ministerial Decree of Agriculture No. 14/Permentan/Pl.110/2/2009 on Guidelines for Utilization of Peat Land for Palm Oil	Ministry of Agriculture	Digital	1				JR • CR ()	

No.	The Name of Collected Reference	Publisher	Form	Type				Classification: JR: Public, CR () Private with a limited time	Note by JICA library
				Collected documents	Expert- making documents	JICA's documents	Others		
18	Guide for Applicant Geographical Indications (GI)	EU-Indonesian Trade Cooperation Facility	Digital	1				JR • CR ()	
19	Description of New Superior Variety of Rice	Badan Penelitian dan Pengembangan Pertanian, Kementerian Pertanian	Digital	1				JR • CR ()	
20	Sago Palm (<i>Metroxylon sagu</i> Rottb.) Planting on Big Scale	Badan Penelitian dan Pengembangan, Kehutanan dan Perkebunan	Digital	1				JR • CR ()	
21	Potential of Sago Plant (<i>Metroxylon</i> sp.) to Support Food Security in Indonesia	Parama Tirta W.W.K, Novita Indrianti, Riyanti Ekafitri	Digital	1				JR • CR ()	
22	Regulation of The Minister of Agriculture of The Republic of Indonesia Number 98/Permentan/OT.140/9/2013 concerning Guidelines for Plantation Permit	Ministry of Agriculture	Digital	1				JR • CR ()	
23	Coffee-based Agroforestry as an Alternative to Improve Local Livelihoods in Peat Landscapes of Sumatra	Muhammad Sofiyuddin, Janudianto, Jasnari, and Noviana Khususiyah	Digital	1				JR • CR ()	
24	Assessment of Profitability of Land Use Systems in Tanjung Jabung Barat District, Jambi Province, Indonesia	Muhammad Sofiyuddin, Arief Rahmanulloh, S. Suyanto	Digital	1				JR • CR ()	
25	Sustainable Water and Carbon Management For Coastal Rice Farming Peatland In Indonesia	Akihiko Hirayama, <i>at al.</i>	Digital	1				JR • CR ()	
26	Water and Carbon Management For Mitigation In Degraded Tropical Peatland Rice Scheme	Akihiko Hirayama, <i>at al.</i>	Digital	1				JR • CR ()	
Investment (IV)									

No.	The Name of Collected Reference	Publisher	Form	Type				Classification: JR: Public, CR () Private with a limited time	Note by JICA library
				Collected documents	Expert- making documents	JICA's documents	Others		
1	Law on Investment (Law No. 25 of 2007)	President of the Republic of Indonesia	Digital	1				JR • CR ()	
2	Presidential Decree No. 44 of 2016 on Lists of Business Fields that are Closed to and Business Fields that are Open with Conditions to Investment	President of the Republic of Indonesia	Digital	1				JR • CR ()	
3	Ministerial Decree of Finance No. 159/PMK.010/2015 on Provision for Corporate Income Tax Reduction Facility	Ministry of Finance	Digital	1				JR • CR ()	
4	Decree of Head of Investment Coordinating Board No. 18 of 2015 on Amendments to the Decree of Head of Investment Coordinating Board No. 8 of 2015 on the procedure for requesting income tax facilities for investments in certain business sectors and/or in a particular area	BKPM	Digital	1				JR • CR ()	
5	Decree of Head of Investment Coordinating Board No 19 of 2015 on the Amendment of Decree of Head of Investment Coordinating Board No. 13 of 2015 on the procedure for requesting the provision of facilities for corporate income tax reduction	BKPM	Digital	1				JR • CR ()	
6	Decree of Head of Investment Coordinating Board No. 14 of 2015 on Guidelines and Procedures Permit Investment Principles	BKPM	Digital	1				JR • CR ()	
7	Decree of Head of Investment Coordinating Board No. 15 of 2015 on Guidelines and Procedures for Licensing and Non licensing Investment	BKPM	Digital	1				JR • CR ()	
8	Decree of Head of Investment Coordinating Board No. 6 of 2016 on Amendment of Decree of Head of Investment Coordinating Board No. 14 of 2015 on Guidelines and Procedures Permit Investment Principles	BKPM	Digital	1				JR • CR ()	

No.	The Name of Collected Reference	Publisher	Form	Type				Classification: JR: Public, CR () Private with a limited time	Note by JICA library
				Collected documents	Expert- making documents	JICA's documents	Others		
9	Presidential Decree No. 39 of 2014 on the List of Business Fields Closed and Business Sectors Opened with Reservation in the Investment Sector	President of the Republic of Indonesia	Digital	1				JR • CR ()	
10	Law on Trade (Law No. 7 of 2014)	President of the Republic of Indonesia	Digital	1				JR • CR ()	
11	Decree of Head of Investment Coordinating Board No. 13 of 2015 on Application Procedures For Facilities Income Tax Reduction For Agency	BKPM	Digital	1				JR • CR ()	
12	Launch of Program for Green Economic Growth Phase II of Government of Indonesia and GGGI	BKPM	Digital	1				JR • CR ()	
13	Fiscal Facilities in order to Investment	Badan Koordinasi Penanaman Modal (BKPM)	Digital	1				JR • CR ()	
14	Private Role in Development Ecosystem Restoration in Indonesia	Utilization Planning Directorate and Business Areas Directorate General of Forest Utilization	Digital	1				JR • CR ()	
15	Ministerial Decree of Finance No. 76/PMK.011/2012 on Amendment to Ministerial Decree of Finance No. 176/PMK.011/2009 on Exemption from Import Duty on Import of Machinery as well as Goods and Materials for Development or Industrial Development in the Framework of Investment	Ministry of Finance	Digital	1				JR • CR ()	
16	Governmental Regulation No. 9 of 2016 on Amendment of Governmental Regulation No. 18 of 2015 on Income Tax Facility for Investment in Specific Business and/or Specific Regions	President of the Republic of Indonesia	Digital	1				JR • CR ()	

No.	The Name of Collected Reference	Publisher	Form	Type				Classification: JR: Public, CR () Private with a limited time	Note by JICA library
				Collected documents	Expert- making documents	JICA's documents	Others		
17	Government Regulation No. 18 of 2015 on the Income Tax Facility for Investment in Specific Business and/or in Specific Locations	President of the Republic of Indonesia	Digital	1				JR • CR ()	
18	Ministerial Decree of Finance No. 144/PMK.011/2012 on Facilitation of Income Tax for Investment in Specific Business Sector and/or in Specific Locations	Ministry of Finance	Digital	1				JR • CR ()	
19	Ministerial Decree of Finance No. 89/PMK.010/2015 on Procedures for Provision of Income Tax Facilities for Investment in Specific Business Fields and / or in Specific Regions and Transfer of Assets and Sanctions for Domestic Agency Taxpayers Income Tax Facilities	Ministry of Finance	Digital	1				JR • CR ()	
20	Ministerial Decree of Finance No. 159/PMK.010/2015 on Giving Facilities of Income Tax Development	Ministry of Finance	Digital	1				JR • CR ()	
21	Ministerial Decree of Finance No. 176/PMK.011/2009 on Exemption from Import Duty on Import of Machinery as well as Goods and Materials for Development or Industrial Development in the Framework of Investment	Ministry of Finance	Digital	1				JR • CR ()	
22	Decree of Head of Investment Coordinating Board No. 8 of 2015 on Application Procedures of Income Tax Facilities for Capital Investment in Certain Business Fields and/or Certain Regions	BKPM	Digital	1				JR • CR ()	
23	Decree of Head of Investment Coordinating Board No. 10 of 2016 on the Implementation and Guidelines of Implementation of Deconcentration in Control of Implementation of Capital Investment by 2017	BKPM	Digital	1				JR • CR ()	
24	Decree of Head of Investment Coordinating Board No. 16 of 2015 on Guidelines and Procedures for Investment Facility Services	BKPM	Digital	1				JR • CR ()	

No.	The Name of Collected Reference	Publisher	Form	Type				Classification: JR: Public, CR () Private with a limited time	Note by JICA library
				Collected documents	Expert- making documents	JICA's documents	Others		
25	Decree of Head of Investment Coordinating Board No. 17 of 2015 on Guidelines and Procedures for Controlling the Implementation of Investment	BKPM	Digital	1				JR・CR ()	
26	Presidential Decree No. 36 of 2010 on Lists of Business Fields that are Closed to and Business Fields that are Open with Conditions to Investment	President of the Republic of Indonesia	Digital	1				JR・CR ()	
27	Presidential Decree No. 77 Of 2007 On Amendment To Presidential Regulation Number 77 Year 2007 Regarding List Of Business Fields Closed And Open Business Fields With Requirements In The Field Of Investment	President of the Republic of Indonesia	Digital	1				JR・CR ()	
28	DNI Seminar (2nd) For Japanese Companies on Presidential Regulation Number 44 of 2016 concerning List of Business Fields Closed to Investment and Business Fields Open, with Condition, to Investment	BKPM	Digital	1				JR・CR ()	
29	JICA 投資セミナー「インドネシアの投資環境の現状」	BKPM Japan Desk JICA Expert	Digital	1				JR・CR ()	
30	Presidential Decree of the Republic of Indonesia Number 77 of 2007 concerning the List of Closed Business Fields and Opened Business Fields with Conditions in the Field of Investment	Government of Indonesia	Digital	1				JR・CR ()	
31	Government Regulation of the Republic of Indonesia Number 20 of 1994 concerning Share Ownership in Companies Established in the Framework of Foreign Investment	Government of Indonesia	Digital	1				JR・CR ()	
32	Regulation of the Minister of Finance of the Republic of Indonesia Number 112 / Pmk.05 / 2015 Concerning Tariff of Service of Public Service Agency of Forest Development Financing Center at Ministry of	Ministry of Finance	Digital	1				JR・CR ()	

No.	The Name of Collected Reference	Publisher	Form	Type				Classification: JR: Public, CR () Private with a limited time	Note by JICA library
				Collected documents	Expert- making documents	JICA's documents	Others		
	Environment and Forestry								
33	Revolving Fund for Financing Forestry Business	BLU PUA ST P2H Kementerian LHK	Digital	1				JR • CR ()	
34	Regulation of the Minister of Environment and Forestry of the Republic of Indonesia Number: P.59 / Menlhk-Setjen / 2015 on Procedures for Distribution and Revolving Revolving for Forest and Land Rehabilitation Activities	Ministry of Environment and Forestry	Digital	1				JR • CR ()	
35	The Green Bond Principles 2017	ICMA	Digital	1				JR • CR ()	
36	The Social Bond Principles 2017	ICMA	Digital	1				JR • CR ()	
37	The Sustainability Bond Guidelines 2017	ICMA	Digital	1				JR • CR ()	
38	グリーンボンドガイドライン 2017 年版	環境省	Digital	1				JR • CR ()	
39	Regulation of the Minister of Finance of the Republic of Indonesia Number 104/Pmk.010/2016 concerning Taxation, Customs and Excise Tax on Special Economic Zone	Ministry of Finance	Digital	1				JR • CR ()	
40	Law of the Republic of Indonesia Number 39 Year 2009 regarding Special Economic Zones	Government of Indonesia	Digital	1				JR • CR ()	
41	Government Regulation of the Republic of Indonesia Number 96 of 2015 concerning the Facility and Easiness in Special Economic Zone	Government of Indonesia	Digital	1				JR • CR ()	

No.	The Name of Collected Reference	Publisher	Form	Type				Classification: JR: Public, CR () Private with a limited time	Note by JICA library
				Collected documents	Expert- making documents	JICA's documents	Others		
42	Peraturan Pemerintah Republik Indonesia Nomor 46 Tahun 2013 tentang Pajak Penghasilan atas Penghasilan dari Usaha yang Diterima atau Diperole Wajib Pajak yang Memiliki Peredana Bruto Tertentu	Government of Indonesia	Digital	1				JR • CR ()	
43	Towards a Sustainable Financial System in Indonesia.	UNEP	Digital	1				JR • CR ()	
44	Delivering Green Growth for a Prosperous Indonesia A Roadmap for Policy, Planning and Investment	Government of Indonesia	Digital	1				JR • CR ()	
45	Peraturan Otoritas Jasa Keuangan Nomor 51/POJK.03/2017 tentang Penerapan Keuangan Berkelanjutan bagi Lembaga Jasa Keuangan, Emiten dan Perusahaan Publik	Government of Indonesia	Digital	1				JR • CR ()	
46	G20 Green Finance Synthesis Report	G20 Green Finance Study Group	Digital	1				JR • CR ()	
47	Definition of Green Finance	Nannette Lindenberg, German Development Institute	Digital	1				JR • CR ()	
48	Green Finance Progress Report	UN Environment	Digital	1				JR • CR ()	
49	Green Bonds Policy: Highlights from Q1-Q2 2017	Climate Bonds Initiative	Digital	1				JR • CR ()	
50	Bonds and Climate Change: The State of the Market in 2016	Climate Bonds Initiative	Digital	1				JR • CR ()	
Livelihood (LH)									
1	Agroforestry on peatlands: combining productive and protective functions as part of	World Agroforestry Centre Southeast Asia Regional	Digital	1				JR • CR ()	

No.	The Name of Collected Reference	Publisher	Form	Type				Classification: JR: Public, CR () Private with a limited time	Note by JICA library
				Collected documents	Expert- making documents	JICA's documents	Others		
	restoration: World Agroforestry Centre (ICRAF) Policy Brief No. 70	Program in collaboration with the ASEAN Working Group on Social Forestry							
2	Agroforestry Techniques On Peatland In Sabaru Village, Palangkaraya	Yanarita, Johanna M. Rotinsulu	Digital	1				JR • CR ()	
3	Ministerial Decree of Environment and Forestry No. P.83/Menlhk/Setjen/Kum.1/10/2016 on Social Forestry	Ministry of Environment and Forestry	Digital	1				JR • CR ()	
4	Decree of the Director General of Social Forestry and Environment Partnership No. P.11/PSKL/SET/PSL.0/11/2016 on Guidelines for Verification of Village Forest Application	Director General of Social Forestry and Environmental Partnership	Digital	1				JR • CR ()	
5	Decree of the Director General of Social Forestry and Environment Partnership No. P.12/PSKL/SET/PSL.0/11/2016 on Guidelines for Verification of Permit Application of Commercial Utilization of Community Forest (UPHKm)	Director General of Social Forestry and Environmental Partnership	Digital	1				JR • CR ()	
6	Decree of the Director General of Social Forestry and Environment Partnership No. P.13/PSKL/SET/PSL.0/11/2016 on Guidelines for Verification of Permit Application of Utilization Timber Forest Product in The People Plantation Forest (IUPHHk-Htr)	Director General of Social Forestry and Environmental Partnership	Digital	1				JR • CR ()	
7	Decree of the Director General of Social Forestry and Environment Partnership No. P.14/PSKL/SET/PSL.0/11/2016 on Guideline of Facilitation, Formation and Rules for Accelerating the Working Group of Social Forestry (POKJA PPS)	Director General of Social Forestry and Environmental Partnership	Digital	1				JR • CR ()	
8	Decree of the Director General of Social Forestry and Environment Partnership No. P.15/PSKL/SET/PSL.0/11	Director General of Social Forestry and	Digital	1				JR • CR ()	

No.	The Name of Collected Reference	Publisher	Form	Type				Classification: JR: Public, CR () Private with a limited time	Note by JICA library
				Collected documents	Expert- making documents	JICA's documents	Others		
	/2016 on Guideline for Social Forestry Online Service	Environmental Partnership							
9	Decree of the Director General of Social Forestry and Environment Partnership No. P.16/PSKL/SET/PSL. 0/11/2016 on Guideline for Village Forest Management Plan, Management Plan of Business Plan of Community Forestry utilization and Work Plan of Business License of Timber Product of People Plantation Forest	Director General of Social Forestry and Environmental Partnership	Digital	1				JR • CR ()	
10	Decree of the Director General of Social Forestry and Environment Partnership No. P.17/PSKL/SET/PSL. 0/11/2016 on Guideline on Forest Community Activities	Director General of Social Forestry and Environmental Partnership	Digital	1				JR • CR ()	
11	Decree of the Director General of Social Forestry and Environment Partnership No. P.16/PSKL/SET/PSL. 0/11/2016 on Guideline for Cooperation Agreement Draft Preparation	Director General of Social Forestry and Environmental Partnership	Digital	1				JR • CR ()	
12	Ministerial Decree of Marine and Fisheries No. PER.18/MEN/2012 on Guidelines for Preparing the Plan of Development Planning Minapolitan Area	Ministry of Marine and Fishery	Digital	1				JR • CR ()	
13	Ministerial Decree of Marine and Fisheries No. 35/KEPMEN-KP/2013 on Stipulation of Minapolitan Region	Ministry of Marine and Fishery	Digital	1				JR • CR ()	
14	Decision of the Director General of Aquaculture No. 111A/KEP-DJPB/2015 on Location of Integrated Minapolitan Area Based Aquaculture Production Center 2016	Director General of Aquaculture, Ministry of Marine and Fishery	Digital	1				JR • CR ()	
15	Scaling Up of Innovative Rice-Fish Farming in Indonesia and Its Dissemination in Indonesian Rice-Fish	Directorate General of Aquaculture, Ministry of Marine Affairs and Fisheries	Digital	1				JR • CR ()	

No.	The Name of Collected Reference	Publisher	Form	Type				Classification: JR: Public, CR () Private with a limited time	Note by JICA library
				Collected documents	Expert- making documents	JICA's documents	Others		
16	Law No. 41 of 2014 on Amendment to Law No. 18 of 2009 on Animal Livestock and Health	Government of Indonesia	Digital	1				JR • CR ()	
17	Law No. 18 of 2009 on Animal Husbandry and Animal Health	Government of Indonesia	Digital	1				JR • CR ()	
18	Government Regulation No. 48 of 2011 on Genetic Resources of Animals and Livestocking	Government of Indonesia	Digital	1				JR • CR ()	
19	Decree of the Director General of Fishery No. 30/PER-DJPB/2016 on Technical Guidelines for Minapadi Cultivation Activity in 2016	Directorate General of Fishery, Ministry of Marine Affairs and Fisheries	Digital	1				JR • CR ()	
20	Assessment of Profitability of Land Use Systems in Tanjung Jabung Barat District, Jambi Province, Indonesia	Muhammad Sofiyuddin, Arief Rahmanulloh, S. Suyanto	Digital	1				JR • CR ()	
21	Morphological Characterization and Identification of Coffee liberica Callus of Somatic Embryogenesis Propagation	Fitria Ardiyani	Digital	1				JR • CR ()	
22	Minapadi	Directorate General of Aquaculture, Directorate of Production, Ministry of Aquaculture	Digital	1				JR • CR ()	
23	Decree of the Minister of Agriculture of the Republic of Indonesia Number 360/Kpts/PK.040/6/2015 on Release of Alabimaster-1 Agrinak Duck	Ministry of Agriculture	Digital	1				JR • CR ()	
24	Decree of the Minister of Agriculture No. 2834/Kpts/LB.430/8/2012 on the Establishment of Kerinci Duck	Ministry of Agriculture	Digital	1				JR • CR ()	
25	Decree of the Minister of Agriculture of the Republic of Indonesia Number 274/Kpts/SR.120/2/2014 on the	Ministry of Agriculture	Digital	1				JR • CR ()	

No.	The Name of Collected Reference	Publisher	Form	Type				Classification: JR: Public, CR () Private with a limited time	Note by JICA library
				Collected documents	Expert- making documents	JICA's documents	Others		
	Release of Chicken Kub-1								
26	Cultivation of Alfalfa Medicago Sativa	Direktorat Pakan Ternak, Ditjen Peternakan dan Keswan	Digital	1				JR • CR ()	
27	Indigofera Cultivation As Feed Source	Direktorat Pakan, Direktorat Jenderal Peternakan dan Kesehatan Hewan	Digital	1				JR • CR ()	
28	Setaka Grass Cultivation	Direktorat Pakan Ternak, Ditjen Peternakan dan Keswan	Digital	1				JR • CR ()	
29	Development of HPT in Swamp Land	Direktorat Pakan Ternak, Ditjen Peternakan dan Keswan	Digital	1				JR • CR ()	
30	Coffee: History, Botany, Production Process, Processing, Downstream Products, and Partnership Systems	Gadjah Mada University Press	Digital	1				JR • CR ()	
31	Regulation of the Minister of Marine Affairs and Fisheries of the Republic of Indonesia No. PER.12/MEN/2010 on Minapolitan	Minister of Marine Affairs and Fisheries	Digital	1				JR • CR ()	
32	Swamp Jelutung	World Agroforestry Centre (ICRAF)	Digital	1				JR • CR ()	
33	Paludiculture Prospect of Indonesia Peat Ecosystem	Forda Press	Digital	1				JR • CR ()	
34	Benefits Of Sagu Plant (Metroxylon Sp) In Food Supplying And In Environmental Quality Control	Bambang Hariyanto, BPPT	Digital	1				JR • CR ()	

No.	The Name of Collected Reference	Publisher	Form	Type				Classification: JR: Public, CR () Private with a limited time	Note by JICA library
				Collected documents	Expert- making documents	JICA's documents	Others		
35	サゴでん粉をめぐる現状と将来	Masanori Okazaki, ALIC	Digital	1				JR・CR ()	
36	Pt. Saripati Semudun Jaya (Pt Spsj) & The Sago Opportunity	Pt. Saripati Semudun Jaya	Digital	1				JR・CR ()	
Climate Change (CC)									
1	Indonesia's greenhouse gas abatement cost curve	Enos Tangke Arung, et al	Digital	1				JR・CR ()	
2	Updating Indonesia's Greenhouse Gas Abatement Cost Curve	Dewan Nasional Perubahan Iklim, Indonesia	Digital	1				JR・CR ()	
3	Update of Indonesia's GHG Abatement Cost Curve: LULUCF and Peat	National Council on Climate Change	Digital	1				JR・CR ()	
4	PEAT-CO2: Assessment of CO2 emissions from drained peatlands in SE Asia (Delft Hydraulics report Q3943)	Farhan Helmy International Workshop on Forest Carbon Emission	Digital	1				JR・CR ()	
5	An Assessment of opportunities for reducing emissions from all land uses – Vietnam preparing for REDD. Final National Report. ASB Partnership for the Tropical Forest Margins	Hooijer, A., Silvius, M., Wösten, H. and Page, S.	Digital	1				JR・CR ()	
6	FY 2015 Feasibility Study for the Joint Crediting Mechanism for Reduced Emissions from Deforestation and forest Degradation-Plus in Developing Countries (Feasibility Study on the REDD+ Project with minimizing forest disturbances by enhanced diversity and competitiveness of wood products including wood chips)	Hoang Minh Ha Ph.D, et al.	Digital	1				JR・CR ()	

No.	The Name of Collected Reference	Publisher	Form	Type				Classification: JR: Public, CR () Private with a limited time	Note by JICA library
				Collected documents	Expert- making documents	JICA's documents	Others		
7	Feasibility Study on Sustainable Peatland Management in Indonesia under NAMAs - Peatland mitigation in coastal lowlands -	Kanematsu Corporation Japan NUS	Digital	1				JR • CR ()	
8	Viet Nam's Submission on Reference Levels for REDD+ Results Based Payments under the UNFCCC	Shimizu Corporation Supported by Global Centre Foundation, Japan, Ministry of Environment, Japan	Digital	1				JR • CR ()	
9	Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change	IPCC	Digital	1				JR • CR ()	
Others (OT)									
1	Law No. 18 of 2009 on Animal Husbandry and Animal Health	Government of Indonesia	Digital	1				JR • CR ()	
2	Menteri Kelautan dan Perikanan Republik Indonesia Nomor PER.18/MEN/2012 tentang Pedoman Penyusunan Rencana Induk Pengembangan Kawasan Minapolitan	Government of Indonesia	Digital	1				JR • CR ()	
3	Menteri Kelautan dan Perikanan Republik Indonesia Nomor 35/KEPMEN-KP/2013 tentang Penetapan Kawasan Minapolitan	Government of Indonesia	Digital	1				JR • CR ()	
4	Roadmap Keuangan Berkelanjutan di Indonesia 2015-2019	OJK	Digital	1				JR • CR ()	

7 List of Interviewees

No	Name	Organization	Position	Topics
1	Hendrian Sufrika	BLH, Meranti regency	Staff	Survey on candidate location of SESAME in Meranti
2	Fitriansah Putra	BLH, Meranti regency	Staff	Survey on candidate location of SESAME in Meranti
3	Erfauzi	BPBD, Meranti regency	Controlling and Readiness section/ Kasi Pencegahan dan Kesiap Siagaan	Survey on candidate location of SESAME in Meranti
4	Sufir Edi	BPBD, Meranti regency	Secretary	Survey on candidate location of SESAME in Meranti
5	Samsi	Tenan village, Tebing Tinggi Barat sub-district	Village head (Kepala Desa)	Survey on candidate location of SESAME in Meranti
6	Ruslan	Alai village, Tebing Tinggi Barat sub-district	Village head (Kepala Desa)	Survey on candidate location of SESAME in Meranti
7	Kukuh Riyanto	Alai village, Tebing Tinggi Barat sub-district	Kasubbid Penatausahaan	Survey on candidate location of SESAME in Meranti
8	Rahmat	BAPPEDA, Meranti regency		Survey on candidate location of SESAME in Meranti
9	Mukhtarom Bakhru	BAPPEDA, Meranti regency	Staff	Survey on candidate location of SESAME in Meranti
10	Irzal Fakhroz	BAPPEDA, Meranti regency	Staff	Survey on candidate location of SESAME in Meranti
11	Iskandari	Kecamatan Tebing Tinggi Timor	Kasi PMD	Survey on candidate location of SESAME in Meranti
12	Lukman	Lukun village, Tebing Tinggi Timor sub-district	Village head (Kepala Desa)	Survey on candidate location of SESAME in Meranti
13	Khairul Azhar	Lukun village, Tebing Tinggi Timor sub-district	Secretaris desa	Survey on candidate location of SESAME in Meranti
14	Amran	Lukun village, Tebing Tinggi Timor sub-district	Ketua BRG desa Lukun	Survey on candidate location of SESAME in Meranti
15	Hanung Harimba Rachman	BKPM (Indonesian Investment Coordinating Agency)	Director of Planning for Agribusiness and Natural Resources	Survey on investment
16	Hani Sitti Nuroniah	Agency of Research Development and Innovation	Researcher of Forest Research and Development Center	Survey on possible tree species into peatland
17	Rina Bogidarmanti, M.Si	Agency of Research Development and Innovation	Researcher of Forest Research and Development Center	Survey on possible tree species into peatland

No	Name	Organization	Position	Topics
18	Hesti Lestari Tata	Agency of Research Development and Innovation	Researcher of Forest Research and Development Center	Survey on possible tree species into peatland
19	Darwo	Agency of Research Development and Innovation	Researcher of Forest Research and Development Center	Survey on possible tree species into peatland
20	Silvi	Directorate Environmental Services Business and Non-Timber Forest Product from Production Forest	Section Head of Ecosystem Restoration, Sub Directorate of Ecosystem Restoration and Area utilization	Survey on possible tree species into peatland
21	Karsono	Directorate Environmental Services Business and Non-Timber Forest Product from Production Forest	Staff, Ecosystem Restoration, Sub Directorate of Ecosystem Restoration and Area utilization	Survey on possible tree species into peatland
22	Sultana Marpaing	Directorate Environmental Services Business and Non-Timber Forest Product from Production Forest	Staff, Ecosystem Restoration, Sub Directorate of Ecosystem Restoration and Area utilization	Survey on possible NTFP into peatland
23	Veronica	Directorate Environmental Services Business and Non-Timber Forest Product from Production Forest	Staff, Ecosystem Restoration, Sub Directorate of Ecosystem Restoration and Area utilization	Survey on possible NTFP into peatland
24	Ibrahim MM	Directorate of Production Business	Head of Sub Directorate of Workplan of Plantation on Production Forest Business	Survey on plantation
25	Anastasia Maria Listianingsih	Directorate Environmental Services Business and Non-Timber Forest Product in Production Forest	Head of Sub Directorate of Assessment of Business Performance	Survey on possible NTFP into peatland
26	Tony Rianto	Directorate Environmental Services Business and Non-Timber Forest Product in Production Forest	Staff, Sub Directorate of Assessment of Business Performance	Survey on possible NTFP into peatland
27	Wahyu Utami T.	Directorate of Peat Degradation Control, Directorate General of Pollution and Environmental Degradation Control	Head Section of Prevention and Monitoring	Survey on regulation on peatland restoration
28	Mr. Farid Bahar	APINDO	Adviser for APINDO/ Adviser for Minister of Agriculture (former DG of Food Crop, Ministry of Agriculture)	Survey on possible investor to peatland restoration
29	Yulinda	Directorate General of Social Forestry and Environment Partnership	Head of Sub-directorate of Partnership Preparation, Directorate of Social Forestry and Area Preparation	Survey on social forestry system

No	Name	Organization	Position	Topics
30	Gento Widayanto	Directorate General of Estate, Min of Agriculture	Sub-directorate of Business disruption, Climate Change Effect and Fire Control (Subdit gangguan Usaha, Dampak Perubahan Iklim dan Pencegahan Kebakaran (GUDPIPK))	Possible agriculture crops
31	Rudyan Kopot	Indonesian Chamber of Commerce and Industry (KADIN)	Chairman of Permanent Committee on Plantation	Survey on possible investor to peatland restoration
32	Irwanda Hamdani S.	Indonesian Chamber of Commerce and Industry (KADIN)	Deputy Head of Permanent Committee Information Technology and Communication for Agribusiness	Survey on possible investor to peatland restoration
33	Eddy Martono	Indonesian Chamber of Commerce and Industry (KADIN)		Survey on possible investor to peatland restoration
34	Widiyanto	Indonesian Chamber of Commerce and Industry (KADIN)		Survey on possible investor to peatland restoration
35	Utama Kajo	Indonesian Chamber of Commerce and Industry (KADIN)	Food and Agriculture Development	Sago Development on peat land
36	Ir. Fauziah M Hasani	Directorate of Animal Breeding and Production	Head of Animal Resource Management Subdivision	Survey on livestock to peatland
37	Ir. Elia Diany	Directorate of Animal Breeding and Production	Head of Animal Resource Utilization Scheme	Survey on livestock to peatland
38	Ian Sofyan	Directorate of Animal Breeding and Production	Functional Staff	Survey on livestock to peatland
39	Chalid Talib	Center for Animal research and Development	Animal Genetic and management researcher	Survey on livestock to peatland
40	<u>Wisri Puastuti</u>	Center for Animal research and Development	Ruminative Nutrition Researcher	Survey on livestock to peatland
41	Fahmuddin Agus	Indonesian Soil Research Institute	Soil Management and Conservation Specialist	Agriculture plant for peat land
42	Any Mulyani	Center of Agriculture Land Resource Research		Agriculture plant for peat land
43	Tri Astuti Andayani	DG of Livestock and Animal Health service, Min of Agric	Head of Feed Stuff, Directorate of Animal Feed,	Survey on livestock to peatland
44	Friska	DG of Livestock and Animal Health service, Min of Agric	staff of Forage Division	Survey on livestock to peatland
45	Noor Sanjoyo	DG of Food Crop Min of Agriculture	Head of Section in Directorate of Cereal	Paddy for peatland
46	Darma	Min of MAF	Head of Public Relation of DG of Aqua Culture	Fish culture for peatland
47	Desie Yudhia	Min of MAF	Head of Environmental Rehabilitation, Directorate	Fish culture development policy

No	Name	Organization	Position	Topics
			of Regional Development and Fish Health DG of Aqua Culture	
48	Nasrul	Min of MAF	Technical Guidance on Fish Culture	Fish culture for peatland
49	Norio Yamazaki (山崎紀雄)	BKPM (Indonesian Investment Coordinating Agency)	Investment Promotion Policy Adviser (JICA)	Survey on investment
50	Amane Kameda (亀田 周)	Japan external Trade Organization (JETRO)	Senior Director	Survey on possible Japanese investors
51	Rahidi	Dinas LHK Riau Province	Head of Section of Extension and Community Empowerment	Meranti Survey coordination
52	Muhamad	Dinas LHK Riau Province	Restoration staff	Meranti Survey coordination
53	Fajri	Dinas LHK Riau Province	Restoration staff	Meranti Survey coordination
54	Ady Prayitno	University of Riau	Pusat Studi Bencana	Meranti Survey coordination
55	Sigit Sutikno	University of Riau	Pusat Studi Bencana	Meranti Survey coordination
56	Febriady	Dinas LHK Meranti District	Secretary of Dinas	Meranti Survey coordination
57	Hendrian	Dinas LHK Meranti District	Staff	Meranti Survey coordination
58	Muhtarom	Bappedda Meranti District	Staff	Meranti Survey coordination
59	Sarifudin	Sub District of Tebing Tinggi Timur Office	Secretary	Surey for site installation
60	Khaidir	Sendanu Darul Ihsan Village	Village head	Surey for site installation
61	M. Yasir	Sendanu Darul Ihsan Village	Village secretary	Surey for site installation
62	Hernandi Jamal	Sungai Tohor Village	Village secretary	Surey for site installation
63	Khairul Azhar	Lukun Village	Village secretary	Surey for site installation
64	Nao Tanaka (田中 直)	Asian People's Exchange (APEX)	Executive Director	Survey on bioenergy
65	Stuart Rowland	SystemIQ	Associates	Survey on investment scheme
66	Ronja Wolf	SystemIQ	Associates	Survey on investment scheme
67	Heri Susanto	Coordination Ministry on Economy	Deputy Assistant for Investment and Finance Institution Deputy of Macro Economy and Finance Coordination/ Deputy 1	Survey on investment scheme
68	Eni Widiyanti	Coordination Ministry on Economy	Head of Banking Division, Deputy of Macro Economy and Finance Coordination	Survey on investment scheme

No	Name	Organization	Position	Topics
69	Daru Darmojo	Ministry of Environment and Forestry	Head of General Financing Division, Center of Environment and Forestry Financing	Survey on investment facility
70	Karman	Ministry of Environment and Forestry	Head of Forestry Financing Analysis Division Center of Environment and Forestry Financing,	Survey on investment facility
71	Dendy	Investment Coordination Board (BKPM)	Director of Facility	Survey on investment facility
72	Ocki Chrisnadiyah	DG of Taxes, Ministry of Finance	Sub Directorate of Corporate Income Tax Regulation, Directorate of Taxes Regulation II	Survey on investment facility
73	Rizky Mukhlisin	DG of Taxes, Ministry of Finance	Sub Directorate of Corporate Income Tax Regulation, Directorate of Taxes Regulation II	Survey on investment facility
74	Tetsuo Takatsugu	Nikko Securities Indonesia	Vice President Director	Survey on financial scheme to peatland restoration
75	Tenorio Triananda	Nikko Securities Indonesia	Senior Manager, Fund Management	Survey on financial scheme to peatland restoration
76	Ismal Novel	Nikko Securities Indonesia	Technical Adviser, International Investment Banking	Survey on financial scheme to peatland restoration
77	Emil Akbar	SMBC Indonesia	Assistant Vice President of Corporate Banking Department I	Survey on financial scheme to peatland restoration
78	Ms. Liza Rahayu	SMBC Indonesia	Assistant Vice President of Corporate Banking Department I	Survey on financial scheme to peatland restoration
79	Yu Toshida	JETRO Jakarta Office	Senior Director	Survey on possible investment to peatland restoration
80	Naoto Akune	YL Forest Co., Ltd./ PT. Yamamoto Asri	President Director	Investment seminar in Jakarta
81	Noriko Asayama	Iluka Collage Co., Ltd.	CEO	Investment seminar in Jakarta
82	Suryanti	PT. Sinar Pangan Indonesia	Director	Investment seminar in Jakarta