Managing Peatlands to Cope with Climate Change: Indonesia's Experience

Ministry of Environment and Forestry Republic of Indonesia

Jakarta, March 2018

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# Foreword

For more than 40 years, in particular during El-Nino, a massive peat and forest fire is unavoidable and causing severe haze and along with the huge environmental economic and social costs. Hence, the current regime has set ultimate goals, which great changes: **No more peat and forest fires in Indonesia**. Indonesia has prioritized environmental strategy to restore degraded peatland while conserving the good ones with focus for alternative livelihood for communities reside within and surrounding peat areas. In addition, learning from the severe 2015 forest fires, the government has also undertaken firm legal actions by bringing responsible individuals and corporations before the law with both administrative and criminal accusation.

The results of the new approach in managing the drivers of fires are very significant. Indonesia has proven dramatic reduction of fire spots by 93.6% from 2015 to 2017. This achievement significantly led to reduction of emissions from forests and lands, including from peatlands. We can proudly claim emission from peat fires in 2017, which was 12,5 million tons CO2e, is equal to only 1.56% of emissions from peat fires in 2015. We keep maintaining our vigilance at all levels of government, from national to subnational at province and district untill village councils. We should also nurture the excellent support from all stakeholders, including the Civil Society and especially the private sector. This great achievement need to be continuously maintained and improved in the future.

Several other measures were also taken to improve peatland management, from issuing policy and regulations; developing institutional arrangements; conducting research and development; as well as providing incentives for conservation and sustainable management of peatlands. We also build international cooperation to foster global environmental benefits. Indonesia's active participation in the Global Peatland Initiative (GPI) should significantly contribute to the development for excellent platform for policymakers, scientists and private sector. We are keen to make Indonesia as an international centre of excellence and to share our experiences and lessons learned to global stakeholders.



Jakarta, March 2018

**Dr. Siti Nurbaya** Minister of Environment and Forestry Republic of Indonesia



Figure 1. Pristine Peatland of Indonesia, Giam Siak Biosphere Reserve, Riau Province (2017)

### Introduction

#### Managing Peatlands, to Cope with Climate Change: Indonesia's Experiences<sup>1</sup>

Indonesia has over 15 million ha of peatlands, which is over 12% of its forest land spreading across islands of Sumatra, Kalimantan, Sulawesi and Papua. This is the largest tropical peat land in the world, followed by Democratic Republic of Congo, with the peatland area reaches 9 million ha, and the Republic of Congo with the area reaches about 5.5 million ha (Miles et al., 2017).

Peatland can be defined as soil formed from the accumulation of organic matters such as the remnants of plant tissue that lasted for a long time (Kelompok Kerja Pengelolaan Lahan Gambut Nasional, 2006). According to Government Regulation (GR) No. 71 of 2014 that has been amended by GR No. 57 of 2016 on the Protection and Management of Peat Ecosystem, peatland is defined as a naturally occurring organic material of plant residues that decomposes imperfectly and accumulates in swamps. Furthermore, the regulation also defines peat ecosystem as the order of peatland components that forms an integrated system affecting one another and forming a balance, stability, and productivity.

As the home for the largest peatland areas, the local lives in harmony with peat. They have developed an environment sustainably method. As for example, the Dayaks and Banjareses, living in Kalimantan island continue preserving rotating farming system which maintain balance between utilization process to natural cycle (Suwardi et al., 2005). They divide the land use into zones comprising settlement, bushes, harvested paddy field (*jurungan*), dry paddy field (*pahumaan*), plantations, sacred zones, and protected zones (*kayuan*). Sacred zones are customary protected zones that should not be cleared for agricultural land. They also have what so called "Handils" a small canal only for access to their small agriculture areas without damaging peat hydrological system. Peat areas uses for subsistence only and conducted sustainably.

<sup>1.</sup> Policy Paper of the Indonesian Delegation at Global Peatlands Initiative: 3rd Meeting of Partners, Brazzaville 21 – 23 March 2018

In 1960's, as part of national transmigration program, many people from Java;- the most densely populated areas;- were moved to Kalimantan and Sumatra islands. Coupled with timber boom in 1970s, Sumatra and Kalimantan were also opened for logging followed by the development of industrial plantation forest and estate crop, especially oil palm, since 1990s. These two main drivers (transmigration and industrialisation of forest and peat areas) significantly cause peat degradation. It was estimated almost half of Indonesia's peatland have been degraded and mostly located in Sumatra and Kalimantan (Wahyunto et al. 2014 in Masganti, Wahyunto, Dariah, Nurhayati, & Yusuf, 2014; Setyawati et al., 2014). For more than 40 years, in particular during El-Nino, a massive peat and forest fire is unavoidable and causing severe haze and health problem in addition to other economic and social costs.



Considering the significance of Indonesia's peatlands for the environment as well as for the livelihoods of communities the surrounding the Indonesia area, has prioritized its environmental

Figure 2. Industrial Plantation Forest in Peatlands, Riau Province

strategy to restoring degraded peatland, conserving the remaining good peatland and providing alternative livelihood for communities living inside and surrounding peatland. Several measures were taken including issuing policy and regulations reflecting the commitment for better peatland management, developing institutional arrangements to deal with problems in peatland management, conducting research and development to better manage Indonesia's peatland, and providing incentives for conservation and sustainable management of peatland.

In addition, Indonesia is also strengthening its international cooperation to deal with peatland and fire management since it is not only important for domestic benefits, but also influential to global environmental benefits. One of Indonesian participation in international fora is the Global Peatland Initiative that provides an excellent platform for scientists, policymakers and private sector to share experiences and lesson learnt between the major tropical peat countries within the world and international centres of excellence.

## Indonesia's Peatland Governance

Governing a vast peatland across several islands in Indonesia is a huge task. In the past, Indonesia experienced unsustainable peatland management leading to the degradation of peatland and peat fires. Thinking over the negative impacts resulted from peat degradation and fires, the government of Indonesia has prioritized the protection and sustainable management of peatlands, including the restoration of heavily degraded peatlands.

Presidential Instruction No. 8 of 2015 on the Suspension of New



Figure 3. The Development of Policies and Regulations for Peatland and Fire Management

Licenses and the Improvement of Primary Forest and Peatland Governance or commonly referred to as *Inpres Moratorium* is a monumental decision reflecting the commitment of Indonesian government to reform its peatland and forest management. It has targeted the postponement of formal licenses for companies. The coverage of peatlands and primary forests affected by this policy has been mapped and update every six months. This political will has been supported or followed up by other regulations, including:

- Government Regulation No. 57 of 2016 on the Amendment of the Government Regulation No. 71 of 2014 on the Protection and Management of Peat Ecosystem;
- 2. Environment and Forestry Ministerial Regulation No. 15 of 2017 on the Procedures for Measuring Water Table in the Peat Ecosystem Management Area;

- 3. Environment and Forestry Ministerial Regulation No. 16 of 2017 on the Technical Guide for Recovering the Function of Peat Ecosystem; and
- Environment and Forestry Ministerial Decree No. 77/2015 on the Mechanisms to Deal with Burnt Area within Production Forest Concessions;
- Environment and Forestry Ministerial Regulation No. 17 of 2017 on the Amendment of the Environment and Forestry Ministerial Regulation No. 12 of 2015 on the Development of Industrial Plantation Forest.
- 6. Environment and Forestry Ministerial Decree No. 129 of 2017 on the Development of Peat Hydrological Unity Map
- 7. Environment and Forestry Ministerial Decree No. 130 of 2017 on the Development of Peat Ecosystem Function Map.

Government Regulation No. 57 of 2016 is intended to intensify the efforts for protecting and sustainably managing peatland, responding to the big peat fire in 2015. Environment and Forestry Ministerial Regulation No. 15 of 2017 guides the measurement of water table at the peat ecosystem management sites, while Environment and Forestry Ministerial Regulation No. 16 of 2017 is providing guidance to improve efforts for protecting vulnerable peat ecosystems. In addition, Environment and Forestry Ministerial Decrees No. 129 and 130 of 2017 classify peat hydrological unit as protection and cultivation areas



Figure 4. President Jokowi's visit for field directives to the Minister of Environment and Forestry, Chief of Army, and Chief of Police at a burnt peatland forest, Central Kalimantan September, 2015

Environment and Forestry Ministerial Decree No. 77/2015 guides the restoration of peat ecosystem in production forest. This regulation is an effort to have a better management of timber within Indonesia's peatlands. Furthermore, Environment and Forestry Ministerial Regulation No. 17 of 2017 provides directions for concession holders in restructuring and reforming their working areas. These regulations may be lesson learned for other countries such as Democratic Republic of Congo that now has about 20% of its peatlands under forest concessions, and approximately 53% of these are in the process (Miles et al., 2017).

The results of Indonesia's political will and commitment to implement sustainable management of peatland are dramatic. The extent of fire in 2017 decreased by 61.8% compared to fires in 2016 and by 93.6% compared to the extent of fire in 2015. Table 1 shows the reduction of the area burnt and number of hotspot during 2015 - 2017.

Table 1. The Extent of Burnt Area and Number of Hotspots from 2015 to 2017

Year	Number of Hotspot	Burnt Area (Ha)		
		Peat	Mineral	Total
2015	70,971	891,275	1,720,136	2,611,411
2016	2,844	97,787	340,576	438,363
2017	2,440	13,555	151,929	165,484

#### NUMBER OF HOTSPOTS



Figure 5. Number of Hotspots from 2015 to 2017

The success to reduce the number of hotspots and the area burnt during the last three years has led to the reduction of emissions from forests and lands, including from peatlands. Emissions from peat fires in 2017 was about 12,5 million tons CO2e or only 1.56% of emissions from peat fires in 2015 that reached 803 million tons CO2e. This is a big achievement that need to be maintained and institutionalized at all level of governments, from central to provincial and district until village governments.



Figure 6. Police lines by MoEF investigators, 2015

Policies and regulations developed for governing Indonesian peatland have also been supported by law enforcement implemented by the Ministry of Environment and Forestry and other law enforcement bodies. After big land and forest fires in 2015, about 500 cases have already been brought to justice and some of them have received sanctions, including a historic USD 1.2 billion fine to a private corporation proven to have committed crimes against the environment. This law enforcement does not only prevent others to do similar crimes, but also improves public trust in environmental law enforcement in Indonesia.



#### Burnt Area

# International Cooperation for Managing Peatland

As indicated in the previous section, Indonesia does not only work by itself to mitigate problems in relation to peat management and peat fires. We also communicate and collaborate with other countries and international agencies to stop peat degradation and prevent peat fires. In the Southeast Asia Region, as the ASEAN member, Indonesia has ratified the ASEAN Agreement on Transboundary Hazard Pollution (AATHP) through Law No. 26 of 2014 on AATHP Endorsement, dated 14 October 2014. AATHP aims to prevent and control cross-border smoke pollution as a result of land and/or forest fires particularly in peatlands that must be implemented through intensive national, regional and international efforts based on commitment, a spirit of partnership, and a tradition of solidarity to achieve peace, progress and prosperity among ASEAN countries.

The ASEAN Task Force on Peatlands (ATFP) was established to assist monitoring and supporting the implementation of the ASEAN Peatland Management Strategy (APMS 2016-2020). Its main role is to achieve the objectives of the APMS through overseeing the design and implementation of the ASEAN Program on Sustainable Management of Peatland Ecosystems (APSMPE 2014-2020) and other relevant program/projects and facilitating cooperation with relevant partners, and reporting the progress of APMS implementation to COM to AATHP.

An ASEAN cooperation project is the "Measurable Action for Haze-Free Southeast Asia" (MAHFSA) funded by the International Fund for Agricultural Development (IFAD) and involves Cambodia, Indonesia, Malaysia, Lao PDR, Philippines, Thailand and Viet Nam. The MAHFSA Initiative will help strengthen existing ASEAN coordinating mechanisms to engage all stakeholders, strengthen capacity, harmonize relevant programs and projects, and facilitate donor agencies to promote fog-free agriculture, sustainable management of peat swamp forests and implementation of ASEAN Haze Roadmap.

Figure 7. Peatland areas burnt from 2015 to 2017

At the international level, Indonesia is one of the three founding countries of the Global Peatlands Initiative, together Peru and the Republic of Congo, as well as 11 international organizations lead by the UN Environment. Among the members, Indonesia is the first ever country undertaking large scale peatland restorations. The establishment of GPI aims to protect peat from degradation based on long-term field research. The GPI undertakes a thorough assessment of the world's peat status and stored carbon where peat can help in achieving climate change mitigation as mandated by Paris Agreement. In addition, the GPI assists countries by strengthening knowledge and finding options for reducing peat degradation and improving sustainable peat management.



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# Best Practices of Peatland Management

Indonesia's peatlands have been utilized since the end of 19th Century. Prior to 1920, Dayak rural communities in South Kalimantan have begun to manage shallow peatlands in the area behind the river bank (back swamp) which they call the lawau and manage it for rain-fed rice fields (Suwardi et al., 2005). The river area is a fertile area because it is influenced by sediment runoff from rivers. Basically Dayak people are very environmentally friendly. In managing the land, they have a rotating farming system that always maintains a balance with the utilization process following a natural cycle (Suwardi et al., 2005). They divide the lands into zones comprising settlement, bushes, harvested paddy field (jurungan), dry paddy field (pahumaan), plantations, sacred zones, and protected zones (kayuan). Sacred zones are customary protected zones that should not be cleared for agricultural land. When the agricultural land has become infertile, they will move to look for similar land in other places. After being left for 1-7 years the former fields will become bush and after 7-12 years the bush will become a forest. They will reopen the former field after 30 years, when it has become a forest again. This is done continuously and sustainably.

In 1950's, Banjar people started to access peatland for farming (Suwardi et al., 2005). First, they build "handil", a main drainage canal. Handil is made upraised with a large river, and is usually an extension of the existing river branch that is excavated and extended to an annex land up to 4-10 km long. The depth of the canal may reach 1 meter, with 2 meter width. Handil serves as: (1) drainage canal; (2) irrigation; and (3) communication channel. Secondly, they build "parit", the secondary canal upraised to the handil and located every 30 meter along the handil. The depth and width of the parit are 1 m and 50 cm respectively. Using this traditional parit and handil, an excessive drain can be prevented and soil subsidence can be slowed. These are the example of how traditional knowledge and wisdom can manage peatland sustainably and prevent peat degradation that may lead to fires.