Madani

HIGHLIGHTS OF THE STATE OF INDONESIA'S FORESTS 2018

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IN THIS REPORT

The State of Indonesia's Forests 2018 (SoIFO)

- SoIFO is a most anticipated publication where the Ministry of Environment and Forestry publishes the most recent data regarding forest and forest area, forest licenses, social forestry, and measures as well as results of efforts to reduce emissions from the forestry sector (REDD+). The publication also contains policy directions (including corrective measures) and reiterates paradigm of forest management of Indonesia, which according to the government is undergoing a "major shift" towards a new perspective of sustainability, which balances social, environmental, and economic development values[1] and towards a more community-oriented approach forest management.[2] Forest management regime is closely tied up to the political regime. Jokowi's administration focuses on among others infrastructure development, connectivity, law enforcement reform, and "developing from the periphery" with "Equitable Economy" or *Ekonomi Pemerataan* as one of its creeds. In this publication, it is mentioned that the MoEF is mandated with several agenda based on the President's vision and missions (*Nawacita*), which include law enforcement reform, productivity improvement at community level, improvement of economic autonomy by stimulating strategic sectors in domestic economy.[3] This vision seems to underlie the "paradigm shift" mentioned above: to cease looking at forest as only or primarily source of timber and to be more community-oriented in terms of forest management (both in production and conservation).
- The publication, supported by FAO and NICFI, was "the first policy and technical commentary on the forestry sector by the Government of Indonesia" and was cited as an effort at transparency regarding forestry programs and achievements. Through this publication, the Minister reaffirms its strong political commitment to control climate change at global and national level in which NDC is cited as "guidance to all economic sectors." The Minister also stated that multi-stakeholder engagement with grassroot communities and good governance are policy priorities for the government.

Forest area overview

- As per December 2017, terrestrial (land) forest area of Indonesia is claimed to be 120.6 million hectares (63 percent of Indonesian land). Forest area does not always have forest cover but will legally be maintained as permanent forest. Regarding forest cover, primary forest in Indonesia currently stands at 46.1 million hectares (all currently protected by the moratorium policy, except those located inside concessions/areas already encumbered with rights) while secondary forests number stands at 43.3 million hectares and timber plantation (cover) at 4.7 million hectares[4] (less than half of the concession area). Since the government classifies timber plantation as forest, the official forest cover number is around 94 million hectares, but based on the government's data, the natural forest stands at 89.4 million hectares. Forest cover data published by civil society tends to be less optimistic. For example, Forest Watch Indonesia's natural forest cover data stands at 82 million hectares in 2013.[5]

[1] Ministry of Environment and Forestry, "State of Indonesian Forest 2018 (SoIFO)," p. 137.
[2] Ibid, Preface.
[3] SoIFO, p. 34.
[4] DJPKTL 2018, cited in The State of Indonesia's Forests 2018, p.11.
[5] Forest Watch Indonesia, *Potret Keadaan Hutan Alam Indonesia*, 2014, retrieved 28 July 2018 from fwi.or.id/wp-content/uploads/2014/12/PKHI-2009-2013_update.pdf

- **Production forest**. Out of the vast area classified as forest area, the largest is classified as "production forest," which can be used for timber utilizations such as logging, timber plantation, and ecosystem restoration, which size is 68.8 million hectares or 57 percent from the whole forest area. Out of this size, an area of 30.6 million hectares have been given out to large-scale forest concessions with the largest being logging concessions (18.8 million hectares), followed by timber plantation (11.2 million hectares) and a not very significant number of ecosystem restoration concessions (0.62 million hectares), which attempts to restore logged over area in ex-logging concessions. Around 36 percent of natural forest concession holders is said to be not working at all due to dwindling profitability and social conflicts.[6] Regarding forest cover, according to official data, production forest area has 41.7 million hectares of natural forest cover (16.9 million hectares of primary forest and 24.8 million hectares of secondary forest) while 24.2 million hectares are not-forested and around 3 million hectares are timber plantation.[7]

Deforestation potentials

- **For new forest utilization permits.** Out of the 38.4 million hectares of production forest unencumbered by forest licenses, 5 million hectares has been allocated for new large-scale forest utilization permits[8] (in long-term forestry plan or RKTN, the target of timber plantation license increase alone reaches 4.4 million hectares). If the 5 million hectares of forest area allocated for new forest concessions have intact forest cover and they are given out to timber plantation, it will mean 'planned' deforestation exceeding the 'deforestation budget' set by NDC targets, which currently 'only' stands at 4.8 million hectares up to 2030.[9] Spatial analysis needs to be carried out, however, to figure out exactly how much of these 5 million hectares have intact forest cover because there is also a large size of non-forested area in production forest, which technically and legally is more suitable for development timber plantation (24.2 million hectares).
- **To be released from forest area.** Moreover, a number of 12.8 million hectares of production forest have been allocated as Convertible Production Forest (HPK), which is reserved to be released from forest area for non-forestry development purposes (e.g. plantations). The concerning thing is that among the 12.8 million hectares of HPK, 2.5 million hectares are primary forest and 3.8 million hectares are secondary forests, which face imminent threat because HPK does not have equal legal protection as permanent or limited production forest. Currently, the 2.5 million hectares of primary forest are temporarily protected from issuance of new licenses by the moratorium policy, which will end in July 2019. But there is no protection for the 3.8 million hectares of secondary forests classified as HPK, which can legally be released from forest area to be converted to 'non-forestry purposes.' Ideally, intact forests should not be classified as HPK and its status must be increased to enable protection for the forest cover. Most areas classified as HPK, however, have no forest cover, which size amounts to 6.5 million hectares.
- **Which is left out from the moratorium.** Many argue that the moratorium policy should be extended to secondary forests that are still intact and have no protection. The Minister of Environment and Forestry is publicly opposed to this idea since it will be an obstacle to Indonesian

[6] SoIFO, p. 116.
[7] SoIFO, p. 137.
[8] SoIFO, p. 115.
[9] Between 2018 to 2030, calculated based NDC targets to hold deforestation below 450,000 hectares/year up to 2020 and 325,000 hectares/year from 2021 to 2030.

development.[10] Currently, the 24.8 million hectares in production forest area, especially the 3.8 million hectares classified as HPK, are the least protected because the moratorium policy leaves them out of protection.

- **Natural forests outside forest area.** According to the government's own data, around 1.5 million hectares of primary forest and 5.4 million hectares of secondary forest (6.9 million hectares of natural forests combined) are located outside forest area (in area for other use or APL), which falls outside the jurisdiction of the MoEF. We don't know yet where these forests are and what is their protection status but these forests have no legal protection from deforestation for being located outside forest area.
- **From land swap policy.** According to a brief released by *Koalisi Anti Mafia Hutan* (Anti-Forest Mafia Coalition), the land swap policy issued by the government to facilitate land swap for timber and palm oil plantation companies, which 40 percent of concessions are designated as protection peat, has a serious deforestation potential because the allocated land swap area covers natural forests with the size of 362,390 hectares out of the allocated area of 921,230 hectares.[11] As we know, most of companies affected by the new peatland regulations are timber plantations and palm oil plantations. If the natural forests are given to them to swap for their concession areas designated as protection peat, it will mean instant deforestation. The largest natural forests allocated for land swap are in Aceh (69,481 hectares), Papua (65,759 hectares), and Central Kalimantan (48,314 hectares).[12]

Conservation and protection area

- The second largest forest area are categorized as conservation and protection forest, which combined size amounts to 51.8 million hectares (22.1 million hectares of conservation forest and 29.7 million hectares of protection forest). Conservation and protection forest area are home to around 27.7 million hectares of primary forest and 13.1 million hectares of secondary forest. The former has layered protection; first, Indonesia's forestry laws and then the moratorium policy. Secondary forests in these areas are legally protected (cannot be given to concession or released unless their status is first downgraded to HPK) although in practice many face encroachments. It is cited in SoIFO that around 10.8 million hectares of conservation and protection forest area has become non-forested.[13] In 2016-2017 deforestation data, 20 percent of deforestation occurred in conservation and protected forest area while deforestation of primary forest reached 40,000 hectares.[14] Moreover, around 0.4 million hectares of timber plantation are found in these areas, which are in violation of the law because all timber plantations should be located in production forest.

[10] https://www.reuters.com/article/us-rainforest-summit-siti/indonesia-environment-minister-rebuffs-groups-who-want-more-forest-preserved-idUSKBN1HU1HM retrieved 28 July 2018.
[11] Koalisi Anti-Mafia Hutan, "Perlindungan Gambut Bukan Alasan untuk Menghabiskan Hutan Alam Tersisa: Kebijakan Land Swap Berpotensi Deforestasi dari Aceh Hingga Papua" available on https://madaniberkelanjutan.id/2018/07/25/kebijakan-land-swap-dan-deforestasi-indonesia/
[12] Ibid.
[13] SoIFO, p. 11.
[14] DJPKTL, Infografis Deforestasi 2016-2017

Missing from analysis: forests inside concessions

- What is missing from the overview in the publication is analysis regarding natural forests located inside concessions. There are no segregated data for primary and secondary forests currently under concessions' control both inside and forest area (inside palm oil plantations, for example). FWI's analysis of natural forests distribution inside concessions reveal that around 3.9 million hectares of natural forests are in logging concessions, 2.7 million hectares in overlapping concessions, 2.2 million hectares are in mining concession, 0.87 million hectares in timber plantation concession, and 0.7 million hectares in palm oil plantations[15] (which could be the object of palm oil license evaluation if the palm oil moratorium policy ever sees the light of day). Given the vast area of natural forests inside concessions, efforts to protect them should be strengthened. However, currently the government's view is that they cannot stop entirely deforestation in the area because the areas and the trees have been legally assigned to the concessions. The government can only strengthen enforcement of regulations regarding sustainable forest management, which in Indonesia is called PHPL (*Pengelolaan Hutan Produksi Lestari*), for example through REDD+ inside logging and timber plantation concessions (through carbon sequestration/storage license), longer cutting cycles, environmentally friendly felling (reduced impact logging), and maintenance of High Conservation Value Forest (HCFV).[16] For natural forests inside concessions, we can say that market mechanism and pressure are more at play at the moment, for example through the NDPE (No Deforestation, No Peat, No Exploitation) policies of large logging, timber and palm oil plantation companies. There are efforts to protect more forests inside concessions done at sub-national level, for example in West Kalimantan where a Regional Regulation regarding Sustainable Land-Based Business Management was issued in March 2018. The Regulation stipulates that every concession holder must assign conservation area with a minimum size of 7 percent.[17]

[15] Forest Watch Indonesia, "Silang Sengkarut Pengelolaan Hutan dan Lahan di Indonesia", Desember 2017, diakses dari http://fwi.or.id/wp-content/uploads/2017/12/executivesummary8des17_final.pdf. Diakses 20 Juni 2018.
[16] SoIFO, p. 114.
[17] Regional Regulation of West Kalimantan No. 6 Year 2018 on Sustainable Land-Based Business Management, Article 3 Point (3).

Table 1. Size of forest area and forest functions per December 2017

No.	Category	Size (ha)	Forest and Land Cover (ha)				
			Primary	Secondary	Timber Plantation	Non-Forested	% of Forested Land
1	Total land area	188,000,000	-	-	-	-	50%
2	Total forest area (land and marine)	125,900,000	-	-	-	-	-
3	Forest area (land)	120,629,300	-	-	-	-	-
4	Forest area (marine conservation)	5,300,000	-	-	-	-	-
5	Natural forest cover (primary + secondary)	89,400,000	-	-	-	-	-
6	Production forest	68,829,300	-	-	-	-	-
7	Permanent production forest (HP)	29,200,000	4,700,000	9,700,000	2,700,000	12,200,000	58.3%
8	Limited production forest (HPT)	26,800,000	9,700,000	11,300,000	300,000	5,500,000	79.4%
9	*Convertible production forest (HPK)*	12,829,300	2,500,000	3,800,000	29,300	6,500,000	49.1%
10	Conservation forest (HK)	22,100,000	12,500,000	4,700,000	100,000	4,800,000	78.5%
11	Protection forest (HL)	29,700,000	15,200,000	8,400,000	300,000	5,800,000	80.6%)
12	Non-forest area (APL)	67,500,000	1,500,000	5,400,000	1,300,000	59,300,000	12%

Source: DJPKTL 2018 as cited in the State of Indonesia's Forests, 2018 (processed)
Note: Numbers presented in red are forests least protected.

Addressing drivers of deforestation and forest degradation

- In this publication, the government explains efforts to address driver of deforestation and forest degradation and some of the results, which have been the 'one-billion-dollar question' since the conception of Indonesia-Norway's Letter of Intent in 2010. In this publication, identified drivers of deforestation are as follows: (i) intensification of forest felling in timber concessions; (ii) conversion of forest area by other sectors, including agricultural expansion (estate crops); (iii) mining activities; (iv) plantations and transmigrations; (v) unsustainable forest management; (vi) illegal logging; (vii) encroachment; (viii) illegal land occupation in forest areas; and (ix) forest fires. Meanwhile, efforts to address them cited in this publication are as follows:

Moratorium policy

- The moratorium policy is cited in SoIFO as an "extremely significant policy" protecting around 66.4 million hectares of 'virgin' primary and peat forests. The moratorium is claimed to give additional protection to 51.5 million hectares of forests in conservation and protection forest area and is currently the only protection to 9.5 million hectares of primary natural forest that are unencumbered with licenses and stand in either in Production Forests or APL as well as 5.4 million hectares of peat forests that are unencumbered with licenses.[18] The publication says that in 2018 and 2019, the Presidential Instruction will be further revised (in June and December of each year), but this Presidential Instruction is actually only valid until July 2019, which is very close to election

[18] SoIFO, p. 33

time (April 2019). If there is a change of government regime, there is always a possibility that this policy, which is not included in the hierarchy of law and regulations, will be at risk.

- The last revision (Revision XIV) of moratorium map put a smaller number than the one recorded in SoIFO, namely 66,287,067 hectares, reduced by 40,041 hectares from Revision XIII.[19] The reduction was attributed to general factors: (i) confirmed licenses issued before the Presidential Instruction, (ii) spatial plan developments, and (iii) result of primary forest and peatland survey. The map uploaded by the Directorate General of Forestry, Planology, and Environmental Administration (PTKL) is in JPEG format that cannot be readily analyzed and there is no detailed explanation of where the reduction of or addition to moratorium areas are and whose/which licenses are exempted from the policy and what kind of "spatial plan developments" occur so that the public cannot verify whether the reductions are justified. Civil society is calling the government to: (i) also protect secondary forests from issuance of new license; (ii) upgrade the temporary status of the moratorium to permanent protection so that it could endure government change; and (iii) have an integrated roadmap towards zero deforestation that binds together existing measures to reduce deforestation and forest degradation.
- **Ministerial Regulation on Primary Forest and Peatland Governance Improvement?** In the latest Ministerial Decision on PIPPIB Revision XIV issued in May 2018, there is an additional provision (the 15th dictum) stating that "improvement of forest and peatland governance will be regulated in a separate Regulation of the Minister of Environment and Forestry."[20] This is a new clause in the PIPPIB revision and it is still unclear to us what regulation the dictum is referring to. The "governance improvement" part of the moratorium has been one of critical points of civil society because it has been unclear to us what are measures being taken to improve primary forest and peatland governance especially in the framework of moratorium and what are the results.

Forest and land fires control

- It can be said that the government's achievement in reducing forest and land fires is one of the biggest tangible results in reducing Indonesia's emissions in the forest and land sector. The burnt area declined from 2.6 million hectares in 2015 to 0.44 million hectares in 2016, to 0.165 million hectares in 2017[21], and until 23 July 2018, the burnt area is 4,666 hectares.[22] Early warning and prevention systems, rewards and punishment systems, improving field reviews, law enforcement, improved synergy between central and local government agencies, private sector participation, full participation of community, air operations, law enforcement and effective forest and land governance are cited as measures that contribute to the decline of forest and land fires aside from climatic factors.

[19] Peta Indikatif Penundaan Pemberian Izin Baru (PIPPIB Revisi XIV), retrieved 26 July 2018 from http://pktl.menlhk.go.id/?pg=p2530q2545o2610x2565r2620c2525&id=i2460c2465.
[20] Decision of Ministry of Environment and Forestry Number SK.3588/MENLHK-PTKL/IPSDH/PLA.1/5/2018 retrieved 16 July 2018 from http://webgis.dephut.go.id:8080/kemenhut/index.php/id/peta/pippib/61-pippib/329-indicative-moratorium-map-14th-revisi
[21] SoIFO, p. 47.
[22] https://lokadata.beritagar.id/chart/preview/luas-kebakaran-hutan-dan-lahan-ha-1532338226

REDD+ progress

- Description regarding REDD+ is only about REDD+ infrastructure: STRANAS, FREL, NFMS, SIS, MRV supported by NFMS, and Transparency Framework (The National Registry System), and the development of REDD+ funding instruments. There is no discussion regarding the result of REDD+ activities carried out so far or the link between REDD+ implementation and recognition of *adat* communities.

Technical implementation of REDD+

- For the future, the Ministry of Environment and Forestry has developed plans to improve the implementation of REDD+. To improve technical aspects of implementation, planned measures include updating the National Forest Monitoring System (NFMS); updating the forest carbon stock database (to include the strengthening of the National Forest Inventory/NFI); developing the Indonesian Emission Factor Data Base (EFDB); updating the methodology for calculating data on activities related to emissions to reduce the level of uncertainty; and including three REDD+ activities in future FREL submissions.

Enabling policies

- Improvement of policy framework related to REDD+ mentioned are: one-map policy, moratorium, an incentive system related to FLEGT licenses to ensure the legality of timber; measures to build capacities to manage and restore peat ecosystems; and policies related to social forestry. A ministerial regulation related to REDD+ implementation has been issued and a climate financing regulation is currently being drafted (no new update about this). Currently, the REDD+ has entered the bureaucratic pipeline and is quite difficult to monitor because information displayed in the National Registry System and Safeguards Information System about REDD+ projects are still far from comprehensive.
- **One map.** Indonesia's One map portal (Ina Geo-Portal) is expected to be launched in August 2018.[23] The government stated that some data will be able to be accessed for public and some cannot. In 2018, the implementation of this policy within the MoEF will involve: (i) Updating Forest Area Stipulation Maps (the results of boundary marking activities), to a scale of at least 1: 50,000; (ii) Integrating Forest Concession Areas maps to a scale of at least 1:50,000, (iii) Updating Community Plantation Forest maps to a scale of at least 1:50,000; (iv) Updating Special Purposes Forest Area maps to a scale of at least 1:50,000; (v) Updating Forest Resources Balance maps to a scale of at least 1:250,000; (vi) Updating Forest Area Designation maps to a scale of 1:50,000; (vii) Integrating the Zoning Map of National Parks to a scale of 1: 50,000; (viii) Integrating *Adat* Forest Maps to a scale of 1:50,000. Civil society needs access to these maps, including forest area stipulation maps and forest concession areas maps to be able to monitor deforestation. The public information law is not very specific regarding data that cannot be accessed by the public so that it is open to various interpretations leading to public information dispute. Even when civil society wins in the dispute like this, like in the case of FWI vs Ministry of Agrarian and Spatial Planning in

[23] https://nasional.kontan.co.id/news/badan-informasi-geospasial-rilis-ina-geoportal-pada-agustus-2018 retrieved 28 July 2018.

the case of palm oil plantation's HGU data in Kalimantan, the actual handing over of the data has not happened until now and there is no forcing power of the court to help expedite the process.[24]

- **Forest area gazettement.** As of June 2017, around 86 million hectares of the Forest Area had their boundaries marked, representing about 85 percent of the 101 million hectares target. However, there is no public record or report regarding resolution of third party rights (including community rights) in the gazettement process, which raises questions about the legitimacy of the gazettement results.

REDD+ Funding instrument

- Regarding funding instrument, it is stated in SoIFO that the government is now in the final stages of preparing the Presidential Decree on the establishment of BPDLH and its supporting systems. In anticipation of the imminent establishment of the BPDLH, the government is starting work ahead of time on the BPDLH's Strategy Business Plan, Standard for Services, and Systems for Financial Reporting. The objective of the establishment of BPDLH is primarily to manage and mobilize environmental funds from various sources, such as the multilateral and bilateral foreign assistance communities ("donors"), the private sector, and others. BPDLH is expected to adopt international standards in terms of revenue and fund management, and the distribution of funds obtained from various parties including communities, businesses, international agencies, foreign governments, local governments and the central government. The BPDLH will employ an asset management principle that separates assets from the fund manager (BPDLH) by utilizing a custodian bank as a trustee, all in the interest of accountability. Fund distribution by the BPDLH will be based on criteria and indicators determined by the BPDLH, by associated ministries and in consultation with potential donors. The funds could be distributed through different schemes, such as grants, loans, result based payments, a domestic carbon market, and other legal mechanisms. The BPDLH will have several funding windows to cater to different purposes such as nature conservation, climate change, and addressing environmental degradation. A REDD+ financing scheme has also been developed through Environment and Forestry Ministerial Regulation No. 70 of 2017 on the Implementation of REDD+. This regulates the distributions of expected benefits from REDD+ to various entities. A REDD+ Funding Instruments will be specifically addressed under the BPDLH.[25]

Peat ecosystem management

- **Peatland.** The government puts the number of peatland in Indonesia at proximately 15 million hectares.[26] There is one more term, namely KHG (Peat Hydrological Unit) or peat ecosystem, which is not all peat but disturbance of which will damage peat. The size of KHG that has already been mapped out by the government is 24.14 million hectares, with Sumatra having the largest KHG areas (9.16 million hectares), followed by Kalimantan (8.39 million hectares), Papua (6.53 million hectares), and Sulawesi (60,000 hectares).[27] Approximately 23.96 million hectares (almost all) of the nation's peat ecosystems are classified as damaged, with the level of damage ranging

[24] http://www.mongabay.co.id/2018/06/22/setahun-lebih-putusan-mahkamah-agung-atr-belum-buka-data-hgu-sawit/ retrieved 28 July 2018.
[25] SoIFO, p.65
[26] SoIFO, p. 15.
[27] Ibid.

from mild, to moderate, to severe and to very severe.[28] This is why peat restoration, combined with forest fires control, might be the most significant single measure to reduce emissions from forest and land sector.

Peat restoration

- An area of 2,492,527 hectares of peat ecosystem have been targeted by the government for restoration by 2020. This includes 684,638 hectares in Protected Zones (*Fungsi Lindung Ekosistem Gambut*, FLEG); 1,410,943 hectares in Licensed Cultivation Zones (*Fungsi Budidaya Ekosistem Gambut*, FBEG); and 396,943 hectares in Community Cultivation Zones (also in FBEG).[29]

Restoration of Peat Ecosystem in concession areas

- **Companies in peat ecosystem.** According to SoIFO, currently there are 99 timber plantation companies (with concession area of 5.6 million hectares), 1 logging company, and 9 ER companies operating in peat ecosystems. The 99 timber plantation companies operate on an area of protected peat ecosystem reaching 2.1 million hectares,[30] which they must restore and cease cultivating after one cycle. The largest protection peat currently in timber plantation concessions are in Riau (741,137 hectares), South Sumatra (405,023 hectares), and West Kalimantan (152,276 hectares).[31] If the total areas classified as protection peat exceeds 40 percent of their concession area, these companies can propose for a land swap, which areas has been allocated by the MoEF with the size of 921,230. Besides timber plantations, one logging company is located in peat ecosystem with an area of 44,595 hectares, of which 1,400 hectares are protected peat (FLEG). Meanwhile, nine ecosystem restoration concessions (IUPHHKRE) are located on 332,491 hectares of peat ecosystem. In these nine companies, areas with intact forest will be maintained, and areas with no trees must be restored by planting endemic species.[32]
- **Obligations**. In general, concession holders operating in peat ecosystem are required to restore damaged or burnt peat ecosystems in their concession areas, establish water table compliance points (places where water depths are to be measured manually or automatically), build rainfall monitoring stations, block canals (with or without spillways), build water gates and reservoirs, conduct rehabilitation through replanting of endemic (indigenous) plant species, as well as allow for the reintroduction of natural succession. In addition to submitting a Peat Ecosystem Restoration Plan, these companies must also present a revised ten-year Business Work Plans (*Rencana Kerja Usaha*, RKU) in which they must describe peat ecosystem restoration plan, peat hydrological function protection plan, and forest and land fire prevention and control facilities.[33]
- **Restoration progress.** As of December 2017, 45 (of the 99) HTI companies were involved in the restoration of 1,785,087 hectares of peat ecosystems in their concession areas, located in 115 Peat Hydrological Units, of which 1,105,742 hectares are protection peat (*Fungsi Lindung Ekosistem Gambut, FLEG*) while in 679,345 hectares, cultivation may proceed (*Fungsi Budidaya Ekosistem Gambut, FBEG*). Those 45 HTI companies will establish 3,932 Water Table Compliance Points (*Titik Penaatan Tinggi Muka Air Tanah*, TPTMAT) and equip them with 397 data

[28] SoIFO, p. 71.
[29] Ibid.
[30] SoIFO, p. 73.
[31] Ibid., h. 76
[32] Loc. Cit.
[33] Loc. Cit.

logger/automatic groundwater level monitoring devices, and 169 rainfall measurement stations. Companies are required to periodically make measurements and report findings to the Ministry of Environment and Forestry. In addition, companies are required to ensure that the groundwater has sunk no more than 0.4 meters below the surface. Of the 45 HTI companies, only 31 have compiled Peat Ecosystem Restoration Plans (*Rencana Pemulihan Ekosistem Gambut, RPEG*), in which they have agreed to block 3,943 canals (from 2017 to 2026), rehabilitate 21,286 hectares of peatland vegetation, perform enrich planting and promote natural succession on 518,418 hectares (see Table 2).[34]

Table 2. Restoration of Peat Ecosystems in Timber Plantation and Palm Oil Companies

	Industrial Plantation Forests	Oil Palm Plantations
Number of companies	45 companies	80 companies
Number of companies that have compiled RPEG	31 companies	49 companies
Peat ecosystems within the concession area	1,785,087 hectares	652,295 hectares
- Peat which must be protected (FLEG)	1,105,742 hectares	302,535 hectares
- Peat on which cultivation may occur (FBEG)	679,345 hectares	349,761 hectares
Number of Peat Hydrological Units (KHG) affected	115 KHG	74 KHG
Number of canals to block (2017 - 2026)	3,943 units	1,037 units
Number of Water Table Compliance Points (TPTMAT)	3,932 points	3,115 points
Number of data logger devices to be set up	397 units	279 units
Number of rainfall monitoring stations to be built	169 units	244 units
Rehabilitation areas:		
- Vegetation rehabilitation	21,286 hectares	-
- Enrichment planting and natural succession	518,418 hectares	-

Source: State of Indonesia's Forests 2018

Restoration of Peat Ecosystems on community Land

- Village communities play a potentially important role in sustainable peatland management by practicing zero burning land management and developing local commodities, fisheries, livestock, and honey and are expected to be able to contribute in important ways to peat restoration, and development of a sustainable peat-based economy. Communities have made significant progress towards developing peat rewetting infrastructure, including drilling wells, canal blocking, and canal filling. Community peat rewetting activities have been conducted so far in areas covering 270,000 hectares. The Ministry of Environment and Forestry has also conducted peatland restoration in community owned areas, blocking 178 canals to facilitate the rewetting of 3,067 hectares of peat ecosystems.[35]

[34] Op Cit.., p. 72.
[35] Ibid., p.74.

New peatland regulations

- Increased measures to protect peat and manage it in a more sustainable way are emphasized in this publication. Government Regulation No. 71/2014, amended with GR No. 57/2016 mandates no drainage, no burning, no land clearing in protected peat ecosystem This provision has been known as "peat moratorium" prohibiting new land clearing on peat areas until their status is assigned. If their status is assigned as cultivation peat, they can manage the peat in accordance with provisions in the GR, most notably by maintaining water table level at 40 centimeters below the surface. These provisions were contented by the industry for they prefer the 60 centimeters in regulations of Ministry of Regulation. But the legal provisions remain as they are though companies' compliance on the ground is hard to monitor.
- **Enforcement**. The most recent enforcement effort of the government regarding the new peatland regulations is the issuance of a warning letter by the Minister of Environment and Forestry on June 22 to two palm oil companies affiliated to the Salim Group (PT SKL and PT DRM) in Sintang, West Kalimantan, instructing them to stop committing peat violations. As a result of the warning letter, the president directors of the two palm oil companies in question have declared a halt to their new peat drainage practices. Despite the declaration, the ministry's law enforcement team continues to monitor their concessions.[36]

Forest Landscape Restoration

- Restoration has gained more ground in recent years especially with Bonn Challenge, which aims to restore 150 million hectares of global degraded land by 2020 and 350 million hectares by 2030 using forest landscape restoration approach (FLR).[37] GOI is not a pledger to the Bonn Challenge, but Asia Pulp and Paper is, pledging restoration of 1 million hectares.[38] However, land rehabilitation and forest restoration are integrated to the MoEF program as well as NDC implementation strategy, although less famous than avoidance of deforestation or peatland restoration.
- **Critical lands.** Currently, the number of critical lands in Indonesia stands at 24.3 million hectares (2013 data excluding Jakarta), including 15.5 million hectares of critical (degraded) land inside forest area.[39] The government has a target of restoring 1.25 million hectares of critical land from 2015 to 2018 and 0.5 million hectares from 2019. However, the current state budget allocated to the Directorate General of Watershed and Protection Forest Management (DJPDASHL), which is USD 2.9 billion for 5 years is far from sufficient and can only cover costs for rehabilitation of 200,000 hectares/year of critical land.[40] Meanwhile, NDC targets for land rehabilitation is set only at 800,000 hectares/year amounting to 12 million hectares by 2030. With international support, Indonesia's NDC mitigation ambition should be able to be increased by increasing the target for degraded land rehabilitation to at least 15.5 million hectares, covering all degraded land inside forest area. Regarding rehabilitation, community often finds support lacking to rehabilitate their own managed area, including areas given to them through social forestry licenses. Access of

[36] http://www.foresthints.news/minister-confirms-end-to-peat-drainage-by-two-companies retrieved 28 July 2018.
[37] http://www.bonnchallenge.org/content/challenge retrieved 28 July 2018.
[38] http://www.bonnchallenge.org/blog/indonesia-and-iucn-foster-regional-collaboration-restoration-and-bonn-challenge retrieved 28 July 2018.
[39] SoIFO, p. 75.
[40] Ibid.

community to rehabilitation funds and community participation in rehabilitation must be increased.

- **Funding opportunities.** There is a new opportunity to increase land rehabilitation and forest restoration in Indonesia. Since 2017, based on the Ministry of Finance Regulation, Revenue Sharing from the Reforestation Fund (*Dana Bagi Hasil Dana Reboisasi, DBH-DR*) has been distributed to provincial and district governments and can be used not only for reforestation and land rehabilitation, but also to support climate change mitigation and adaptation programs, social forestry schemes, and forest and land fires prevention and control. A wider range of activities that can be implemented using DBH-DR for 2018 is also listed in the Act on the National Budget of 2018, and includes forest protection and security, forest and land rehabilitation, prevention and control of forest and land fires, delineation of forest area boundaries, seed development, research and development, education and training, empowerment of communities in forest rehabilitation, facilitation, supervision, monitoring and control, management of Grand Forest Parks, tree planting in critical watershed areas, bamboo planting on riverbanks, and construction of soil and water conservation facilities. The total DBHDR for 2018 is IDR 1,645,031,286,000 or USD 121,213,308.[41] Currently, only 13 provinces have accessed this fund, namely Aceh, North Sumatra, West Sumatra, Riau, South Sumatra, West Kalimantan, Central Kalimantan, East Kalimantan, North Kalimantan, Central Sulawesi, South Sulawesi, Papua, and Papua Barat with the highest number in 2017-2018 went to Central, East, and North Kalimantan.[42]

Law enforcement

- As a measure to reduce emissions from deforestation and forest degradation, the government focuses law enforcement on three things: encroachment, illegal logging, and illegal trade in plants and wildlife. Aside from employing more laws at the same time using a multi-door approach, the MoEF has purportedly given out administrative sanctions against violating companies totaling 394 sanctions, with government-mandated corrective actions being the largest (231 times), written warnings 115 times, written reprimands 23 times, suspension of licenses 21 times, and revocation of licenses the smallest, 4 times in the period of 2015-2017.[43] Out of 4 licenses revoked, 3 were due to forest and land fires cases. Aside from that, a total of 402 cases are currently being processed in the court.[44] The total penalty and compensation obtained by the government from civil cases, however, is relatively small to the damages caused, only USD 1.2 billion.[45] One of the criticisms against the government in law enforcement are synergy between central and regional institutions, transparency in law enforcement, and accountability with weak monitoring of compliance of license holders at central and regional level and lack of capacity of law enforcers regarding environmental law, which often results in environmental cases being defeated in court.[46]

[41] SoIFO, p. 76.
[42] http://pattiro.org/2018/03/optimalisasi-penggunaan-dbh-dr-untuk-percepatan-perhutanan-sosial/ retrieved 28 July 2018.
[43] SoIFO, p. 40
[44] SoIFO, p. 41.
[45] SoIFO, p. 42.
[46] https://nasional.tempo.co/read/829588/begini-kritik-icel-soal-suramnya-penegakan-hukum-lingkungan retrieved 28 July 2018.

Forest and community rights

- There are approximately 25,863 villages located inside or around Forest Area with a population of 37.2 million consisting of about 9.2 million households, of which around 1.7 million are classified as poor. Out of this number, 6,381 villages are located inside or at the fringes of the nearly 22 million hectares of Conservation Forest[47] with restricted access to forest area. To correct inequality of forest resources control, the government implements agrarian reform and social forestry as one of the Ministry's priorities in the period of 2015-2019.

Social forestry

- In Jokowi's administration, customary forest recognition faced a legal breakthrough with the issuance of Minister of Regulation No. 32/2015 regarding "Private Forests," which include customary forest. Social forestry granting is also accelerated with the policy becoming a "super-charged" policy and one of the Ministry's priority policies.
- Social forestry licenses granted to communities have increased significantly over the past three years (2015 to 2018), especially for Village Forest (HD). Over this period, permits issued to communities have increased by 1,272,540.83 hectares, of which 821,412.61 hectares are for HD, 267,178.07 hectares are for HKm; 70,742.78 hectares are HTR; 72,318.13 hectares are for Forestry Partnerships; 16,510.90 hectares are Social Forestry Utilization Permits (IPHPS); and 24,378.34 hectares are *Adat* Forests (including licenses still in stipulation progress and allocated areas). Meanwhile, a hundred and fifty-two (152) claims had been made on 2.25 million hectares of *Adat* Forest, as of January 2018,[48] which means that customary forest recognition or stipulation is the slowest of all social forestry schemes, which has much to do with the slow progress of recognition of customary law communities or indigenous people as legal subjects.
- **Realization of social forestry**. Up until June 2018, the number of social forestry licenses granted to communities are as follows (out of the target of 4.38 million hectares in 2019):

Table 3. Realization of social forestry until June 2018

No.	Category	Size (ha)
1	Village forest (HD)	899,485
2	Community forestry (HKm)	420,903
3	Community timber plantation (HTR)	269,338
4	Forestry partnership (KK)	91,030
5	Customary forest (including those in stipulation progress)	24,378
Total		**1,705,134**
% of 2019 target achievement		**39%**

Source: State of Indonesia's Forests 2018 (Processed)

[47] SoIFO, p. 83.
[48] Ibid.

Customary (*Adat*) forest stipulation

- The process of stipulating *Adat* Forests is still ongoing. President Joko Widodo presented a document recognizing nine *Adat* Forests, covering a total area of more than 13,000 hectares, at the State Palace on 30 December 2016, the process of which took two years from the proposal of stipulation.[49] As of June 2018, there are 26 recognized *Adat* Forests across Indonesia, located in Jambi, Central Sulawesi, South Sulawesi, West Kalimantan, Banten, West Java and East Kalimantan provinces. This includes 21 *Adat* Forests whose status has been stipulated, covering a total area of 11,577 hectares; five *Adat* Forests which are currently in the process of being stipulated, covering an area of 2,174 hectares; and two *Adat* Forests that are still in the pipeline (still in allocation), covering an area of 10,627 hectares.
- According to civil society, stipulation of *Adat* forests is too slow and cumbersome and is sometimes taken hostage by political consideration.[50] As of January 2018, a hundred and fifty-two (152) claims had been made on 2.25 million hectares of *Adat* Forest. In order to accelerate the recognition of *Adat* Forests, identification of potential forests and technical reviews will be conducted, based on *adat* forest candidates having been put forward by the *Adat* Area Registration Board (*Badan Registrasi Wilayah Adat*, BRWA), and followed up by stakeholder meetings. Candidates will undergo verification processes, and these may result in the stipulation of new areas *Adat* Forest.[51]
- The National Coalition of Adat Forests consisting of among other HuMa, BRWA, and AMAN is pushing for the establishment of a reliable and responsive recognition system within the MoEF, which may survive administration or even regime change. Currently, the road to *adat* forest stipulation is long and windy for most customary communities because of the requirement of *Perda* (Regional Regulation) and/or Decision of District Head/Mayor stipulating them as legal subjects as well as their areas with map that must be recognized by the government. Civil society's data preparedness as well as strong institutions at the community level are also points that must be improved to expedite *adat* forests stipulation as well as coherency of regulations from the Forestry Law level to regulations at the regional level, which currently is still lacking.[52] The Coalition is also pushing the establishment of a team within the MoEF to oversee implementation of recommendations resulting from the National Coordination Meeting of *Adat* Forests held in January 2018, which among others mandate regional governments to conduct inventory and recognition of indigenous people groups and customary territories within their jurisdictions.[53]
- The list of customary forests stipulated or in the process of being stipulated can be seen in Table 4 below.

[49] Discussion with HuMa.
[50] Ibid.
[51] SoIFO, p. 94.
[52] Discussion with HuMa, June 2018.
[53] Ibid.

Table 4. *Adat* Forests formally stipulated, or in the stipulation process, as of June 2018

No	Name of *Adat* Forest	Location	Area (±Ha)
A	***Adat* Forests in the pipeline**		
1	Tombak Haminjon[a]	Pandumaan and Sipituhuta Villages, Pollung Subdistrict, Humbang Hasundutan District, North Sumatra	5,172
2	Forests prioritizing the development needs of the Suku Anak Dalam community group[a]	Sorolangun and Batanghari Districts, Jambi	5,455
B	***Adat* Forests in the process of being stipulated**		
1	Nenek Limo Hiang Tinggi Nenek Empat Betung Kuning Muara Air Dua	Hiang Tinggi, Hiang Karya, Hiang Sakti and Betung Kuning Hiang Villages, and Sitinjau Laut Subdistricts, Kerinci District, Jambi	645
2	Hulu Air Lempur Lekuk Limo Puluh Tumbi	Baru Lempur, Lempur Mudik, Manjuto Lempur, Lempur Tengah, and Lempur Hilir Villages, and Gunung Raya Subdistricts, Kerinci District, Jambi	745
3	Marena	Pekalobean & Singki Villages, Angeraja Subdistrict, Enrekang District, South Sulawesi	150
4	Orong	Buntu Bantaun & Rante Mario Villages, Malua Subdistrict, Enrekang District, South Sulawesi	40
5	Baringin	Baringin Village, Maiwa Subdistrict, Enrekang District, South Sulawesi	594
C	**Formally stipulated as *Adat* Forests**		
1	Bukit Sembahyang and Bukit Padun Gelanggang[b]	Air Terjun Village, Siulak Subdistrict, Kerinci District, Jambi	39
2	Bukit Tinggai[b]	Sungai Deras village, Air Hangat Subdistrict, Kerinci District, Jambi	41
3	Tigo Luhah Permenti Yang Berenam[b]	Pungut Mudik Village, Air Hangat Subdistrict, Kerinci District, Jambi	276
4	Tigo Luhah Kemantan[b]	Villages of Kemantan Kabalai, Kemantan Tinggi, Kemantan Mudik, Kemantan Raya, Kemantan Agung, Air Hangat Timur subdistrict, Kerinci District, Jambi	452
5	Marga Serampas[b]	Rantau Kermas Village, Jangkat Subdistrict, Merangin District, Jambi	130
6	Ammatoa Kajang[b]	Villages of Tana Towa, Pattiroang, Bonto Baji and Malleleng, Kajang Subdistrict, Bulukumba District, South Sulawesi	314
7	Wana Posangke[b]	Taronggo Village, Bungku Utara Subdistrict, Morowali Utara District, South Sulawesi	6,212

No	Name of *Adat* Forest	Location	Area (±Ha)
8	Kasepuhan Karang[b]	Jagaraksa Village, Muncang Subdistrict, Lebak District, Banten	486
9	Tawang Panyai[c]	Tapang Semadak Village, Sekadau Hilir Subdistrict, Sekadau District, West Kalimantan	41
10	Marena[c]	Marena Village, Kulawi Subdistrict, Sigi District, Central Sulawesi	756
11	Hemaq Beniung[c]	Juaq Asa village, Borong Tongkok Subdistrict, Kutai Barat District, East Kalimantan	49
12	Bukit Bujang[c]	Dusun Senamat Ulu Village, Batin III Ulu Subdistrict, Bungo District, Jambi	223
13	Belukar Panjang*[c]	Dusun Batu Kerbau Village, Pelepat Subdistrict, Bungo District, Jambi	326
14	Batu Kerbau[c]	Dusun Batu Kerbau Village, Pelepat Subdistrict, Bungo District, Jambi	323
15	Rimbo Penghulu Depati Gento Rajo[c]	Pulau Tengah Village, Jangkat Subdistrict, Merangin District, Jambi	525
16	Bukit Pintu Koto[c]	Ngaol Village, Tabir Barat Subdistrict, Merangin District, Jambi	278
17	Baru Pelepat[c]	Baru Pelepat Village, Pelepat Subdistrict, Bungo District, Jambi	821
18	Rimbo Bulim[d]	Rambah Village, Tanah Tumbuh Subdistrict, Bungo District, Jambi	40
19	Imbo Larangan Pematang Kulim and Imbo Larangan Inum Sakti[d]	Temenggung Village, Limun Subdistrict, Sarolangun District, Jambi	115
20	Pikul[d]	Sahan Village, Seluas Subdistrict, Bengkayang District, West Kalimantan	100
21	Leuweng Gede[d]	Kuta Hamlet, Karangpaningal Village, Tambaksari Subdistrict, Ciamis District, West Java	31
		Total	**24,378.34**

Notes: *"A"* Included in the pipeline in 2017; *"B"* formally stipulated in 2016; "C" formally stipulated in 2017; "D" formally stipulated in 2018; **adat* protection forest.
Source: KLHK 2018 as cited in the State of Indonesia's Forest 2018

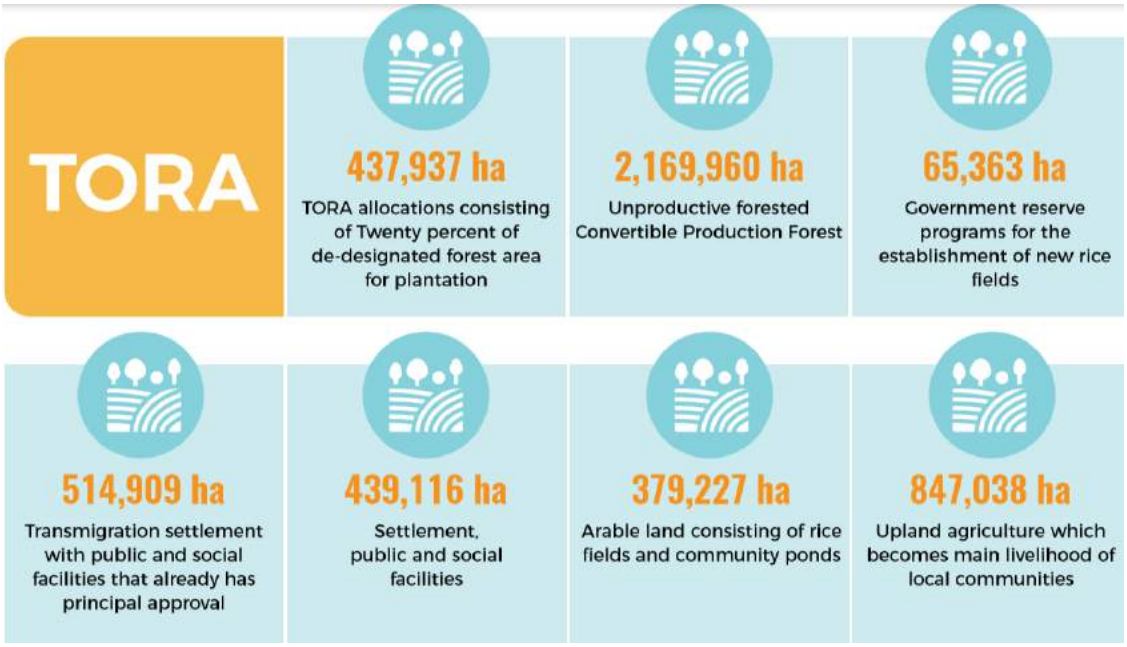
Agrarian reform

- Agrarian reform is another part of Equitable Economy policy besides social forestry. Out of the nine million hectares target of agrarian reform, half comes from redistribution of land for communities (half is legalization of existing land managed by communities). To implement the AR, the MoEF has identified and mapped forest area that will be released and redistributed to agrarian reform subjects. The size of forest area that will be released stands at 4.1 million hectares consisting of 2.17 million hectares of Convertible Production Forest which is no longer productive (the definition of "no longer productive" is still unclear until today), 0.07 million hectares reserved for the establishment of new rice fields, 0.44 million hectares are forest area that have been built into public and social facilities; a cluster of houses that are accessible by road, served by sewers and electricity, and with the trappings of a community, such as schools and

places of worship, 0.38 million hectares are forest area already cultivated (rice fields and/or fish ponds), 0.85 million hectares are forest area already used for dryland farms and containing springs upon which communities depend for their primary sources of water (see Figure 1). In 2018 and 2019, the government targets of releasing 3,384,643 hectares

- of forest area for TORA.

Figure 1. Classification of TORA originating from forest area



Source: The State of Indonesia's Forests 2018

- **New debt for agrarian reform**. The World Bank gives Indonesia a new loan of USD 200 million (IDR 2.9 trillion) for agrarian reform program under the "Program to Accelerate Agrarian Reform" or One Map Program. According to the Minister of Agrarian Reform and Spatial Planning, Sofyan Djalil, the loan will be used to modernize land administration service and advance the electronic Land Information System. The government has a target of registering all lands in Indonesia by 2025, which currently stands at 126 million parcels (only 51 million parcels have been registered). Mapping is targeted in agrarian reform priority areas and areas prone to forest and land fires due to land conflicts, among others are Riau, Jambi, South Sumatra, East Kalimantan, Central Kalimantan, West Kalimantan, and South Kalimantan.[54] *Konsorsium Pembaruan Agraria* (KPA) criticizes the mention of this loan as "agrarian reform" support because the programs that will be funded by the loan are certification or asset legalization of the current uncertified lands, not the real agrarian reform, which according to them is a fundamental change of land ownership structure, which currently favors a small fraction of society while farmers, peasants, and labors as

[54] https://www.cnbcindonesia.com/news/20180720185230-4-24688/bank-dunia-kucurkan-utang-rp-29-t-untuk-reformasi-agraria-ri retrieved 28 July 2018.

the majority have almost no land as means of production. KPA demands that agrarian reform as a constitutional mandate not be funded by loan.[55]

New paradigm of conservation area management

- Aside from agrarian reform and social forestry, community participation in conservation areas also becomes the attention of the government to improve community participation in forest management. Currently, Indonesia has 552 designated conservation areas covering 27.4 million hectares (including 5.3 million hectares of marine conservation area). Meanwhile, there are 6,381 villages living in the fringe of conservation forests, which access to forest resources is restricted due to the conservation status. In 2015-2019, the government has a program of increasing Designated Traditional Zones - Access to NTFP for communities covering an area of 62,000 hectares in National Parks for 4,812 households, 62 villages, and 15 National Parks. Aside from that, KPH or FMU with protection function is also mandated to facilitate community in utilizing NTFP and environmental services.[56] Currently, civil society is pushing for revision of the Conservation Law, which is too restrictive in terms of community access to forest land and resources and proposes Community-Conserved Area concept. However, the discussion of the revision is held down by the government itself, which seems to think that such revision is not needed at the time being.[57]

Emissions reduction

- This is the 'one-billion-dollar question' that the publication only partially addressed. Indonesia has developed a system for GHG emissions inventory called SIGN-SMART, but it does not explain much, especially regarding the progress of attainment of Indonesia's emissions reduction targets.[58] The publication reveals the following regarding the result of emissions reduction measures:

Table 5. Indonesia's average annual emission levels from 2000-2016

No.	Year/Period	Category	Emissions (GgCO2e)
1	2000-2016	Peat decomposition	304,377
2	2000-2016	Peat fires	243,374
3	2000-2016	Forestry sector	161,658
4	2000-2016	Forestry and peatland (including peat decomposition and peat fires)	709,409

Source: State of Indonesia's Forests 2018 (Processed)

[55] https://nasional.tempo.co/read/1110257/bpn-dan-bank-dunia-dituduh-sesatkan-info-soal-reforma-agraria retrieved 28 July 2018.
[56] SoIFO, p. 99
[57] https://sains.kompas.com/read/2018/05/02/190600123/revisi-uu-konservasi-sumber-daya-alam-klhk-ingin-sanksi-lebih-tegas retrieved 28 July 2018.
[58] See http://signsmart.menlhk.go.id/signsmart_new/web/home/emisi/index/kehutanan.

- Emissions reduction from peat fires is claimed to have declined 98 percent from 712,602 GgCO2e in 2015 to only 12,513 GgCO2e in 2017 and is attributed both to improved control measures and climatic factors.[59]
- During the period of 2013 to 2017, Indonesia cut its emissions by 358 MtCO2e, as a result of reductions in deforestation and degradation as measured against 1990 to 2012 baseline emissions. This was equal to a **20.4 percent** emission reduction against the baseline. The largest contribution was from avoiding deforestation activity, which accounted for 85 percent of total emission reductions, while reductions from degradation accounted for only 15 percent. Emissions from peat decomposition were above both the original as well as an adjusted baseline, and thus reduced Indonesia's overall emissions reductions. If emissions from peat decomposition against the adjusted baseline are included, total forest and land-based emissions reductions from 2013 to 2017 were 305 MtCO2e, with an annual average reduction of 61 MtCO2e73.[60] See Table 6 and 7 below.

Table 6. Reduction of emissions from deforestation and forest degradation 203-2017

	Emission Reduction (t CO_2e)					
	Deforestation	Forest degradation	Peat decomposition against the original baseline	Peat decomposition against an adjusted baseline	Total without peat	Total with peat (adjusted)
Average	61,054,319	10,570,143	- 22,646,035	- 7,030,866	71,624,462	60,993,597
Total	305,271,594	52,850,717	-113,230,175	-35,154,328	358,122,311	304,967,983

Source: MoEF 2018 as cited in The State of Indonesia's Forests 2018

Table 7. GHG emissions inventory from the forestry sector and its contribution to the NDC 2010-2015

Emission	Unit	Target 2030	2010	2011	2012	2013	2014	2015
Inventory LULUCF	Mton CO_2e		383	427	488	402	480	742
Inventory Peat fire	Mton CO_2e		51	189	207	205	499	803
Inventory Total	Mton CO_2e		434.79	616.34	694.98	607.33	979.42	1545.07
BAU	Mton CO_2e		646.55	769.25	770.84	767.69	766.42	765.09
Reduction from BAU	Mton CO_2e	497	211.76	152.92	75.86	160.36	-213.01	-779.98
Progress toward 2030	%	17.2	7.33	5.29	2.63	5.55	-7.37	-26.99

Source: DJPPI, 2018 as cited in The State of Indonesia's Forest 2018

[59] SoIFO, p. 63.
[60] Ibid.

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