LESSONS FROM REDD+ FOR ACHIEVING WATER, ENERGY AND FOOD SECURITY IN INDONESIA

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The Global Canopy Programme is a tropical forest think tank working to demonstrate the scientific, political and business case for safeguarding forests as natural capital that underpins water, food, energy, health and climate security for all. GCP works through its international networks – of forest communities, science experts, policymakers, and finance and corporate leaders – to gather evidence, spark insight, and catalyse action to halt forest loss and improve human livelihoods dependent on forests. Visit www.globalcanopy.org for more information.

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KEY FINDINGS

- Indonesia's national development plan reflects a willingness to achieve the country's climate emissions reductions goals. Furthermore, Indonesia's Intended Nationally Determined Contribution (INDC) outlines the strategic importance of building forest ecosystem resilience for water, energy and food security, directly aligning REDD+ with development goals.
- However, whilst climate policies clearly identify trade-offs (agricultural expansion) and synergies (watershed ecosystem services) with sector development plans, they are not similarly articulated or prioritised in sector development plans. This suggests an implementation gap in mainstreaming climate efforts into development plans.
- The national REDD+ strategy recognises that the success of REDD+ is contingent on engagement across sectors and scales. Yet, despite proactive efforts to engage other sectors through a range of initiatives, horizontal coordination (between ministries and government agencies) and vertical coordination (within ministries and agencies between local and national level) has been a significant challenge. However, it has had success stories, such as the central government's One Map and Integrated Licensing System initiatives, both of which address fundamental land use planning coordination issues.
- The institutional set-up of the REDD+ Managing Agency (BP REDD+) as an ad-hoc agency has hampered its implementation and coordination efforts; the new Peatland Restoration Agency will face similar challenges.
- A new willingness by private sector actors to make zero-deforestation commitments could support REDD+ goals, but potential conflicts between corporate sustainability initiatives and national laws need to be addressed.

1. INTRODUCTION

Indonesia has the third largest area of tropical rainforest on the planet, with 60% of its landmass - equivalent to 113.2 million hectares - covered by natural forests[1]. Yet it also has one of the highest rates of deforestation globally[2]. To date economic growth has been sustained through a strategy which builds on the use of Indonesia's abundant natural resources. Commodities comprise more than half of exports, and agriculture (15%) and mining (12%) are key parts of the national GDP. Agriculture is also vital for livelihoods, employing more than a third of the working population[3].

However, economic development has gone hand in hand with deforestation and forest degradation. From 2000 to 2012, Indonesia lost over 6 million hectares of primary forest, with deforestation rates increasing by 47,600 hectares per year on average[4]. Indonesia's lowland primary forests have long been a target for logging and subsequent conversion to higher value land uses such as oil palm plantation. The high rate of forest and peatland loss, coupled with the high carbon stocks in their soils and trees, made Indonesia the fifth largest global emitter of carbon dioxide in 2012[5]. Land use change and forestry accounted for approximately 63% of Indonesia's total Greenhouse Gas (GHG) emissions[6].

Yet alongside ambitious development targets to become a high-income country by 2030, the Government of Indonesia has also pledged significant emissions reductions targets that would require a reversal of the current increasing trends of forest and peatland loss. Central to Indonesia's development agenda are targets for achieving water, energy and food security for its growing population. In achieving these targets there is a growing recognition of the role of natural resources and their ecosystem services in underpinning water, energy and food systems.

"Indonesia's natural capital base is being eroded, with corresponding impacts on the country's food, water and energy security, and, ultimately, on the prosperity of all Indonesians." (Bappenas Green Growth Program[7])

This role was demonstrated by the forest and peatland fires that affected Indonesia and Malaysia in late 2015 and the resulting 'haze' crisis across the region, which severely impacted biodiversity, human health and the economy. In response, President Widodo established a new Peatland Restoration Agency to restore 2 million hectares of peatland by 2020 and impose a moratorium on new clearing, drainage and conversion of unopened peatland[8,9].

Indonesia's Intended Nationally Determined Contribution (INDC), submitted ahead of UNFCCC COP 21, identifies climate mitigation and adaptation as critical strategies in building resilience for natural resources and thus water, energy and food security.

"Climate change presents significant risks for Indonesia's natural resources that, will in turn, impact the production and distribution of food, water and energy. Therefore, the Government of Indonesia considers climate adaptation and mitigation efforts as an integrated concept that is essential for building resilience in safeguarding food, water and energy resources." (INDC)

Indonesia has already made notable strides to develop climate mitigation strategies that ensure the protection of its forests, notably through its high-level support for efforts to reduce emissions from deforestation and forest degradation (REDD+) since 2007. As one of its original proponents, Indonesia was one of the first countries to recognise that

efforts to address the drivers of deforestation would require an assessment of the many environmental, social, political and economic factors that drive land use change, and would necessitate a number of trade-offs between different land-based sectors.

An assessment of the challenges faced and tackled during the design and implementation of REDD+ in Indonesia is therefore instructive when analysing the potential pathways through which Indonesia could decouple itself from a business-as-usual development model and move towards coherent water, energy and food policies that support sustainable natural resource management, as set out in its INDC. While certain mechanisms and approaches trialled under REDD+ have proven very successful, yet others have gained little traction.

This report seeks to assess the extent to which (1) REDD+ objectives have been integrated into national development planning and (2) legal, regulatory and institutional reforms under the development of REDD+ have facilitated the improved governance of land-based sectors.

Date	Event	Relevant Notes	Type
2007	REDD+ mechanism adopted at CoP 13 in Bali		Multilateral Agreement
2009	Indonesia announces voluntary GHG emissions cuts	26% unilaterally and 41% international support by 2020 against business as usual scenario.	National initiative
2009	Indonesia introduces legal framework for REDD+	Covers REDD+ demonstration activities; REDD+ implementation procedures; and commercial licenses for forest carbon.	Regulation
2009	Indonesia's REDD+ Readiness Proposal approved by the FCPF		Multilateral Agreement
2010	Norway- Indonesia Letter of Intent	Norway will provide up to USD 1 billion to support Indonesia's REDD+ efforts. USD 200 million is earmarked for REDD+ Readiness and the remaining USD 800 million for performance-based payments on deforestation reductions.	Bilateral Agreement
2011	National Action Plan for Reducing GHG emissions (RAN-GRK)	Sets out basis for GHG emissions reductions; 87% are from the forestry and peat land sector.	Regulation
2011	REDD+ Taskforce	An ad hoc agency responsible for the development of REDD+ building blocks	Institution
2011	2 year moratorium on new licenses for primary natural forests and peat lands	As set out by Norway Indonesia Letter of Intent	Regulation
2011	One Map Initiative	The REDD+ Taskforce catalysed the One Map Initiative to create a single reference map for the country by bringing together geospatial information from 13 government agencies following the development of the Indicative Moratorium Map. This is now being taken up by the Geospatial Information Agency.	National initiative
2012	National REDD+ Strategy		Regulation

Date	Event	Relevant Notes	Icon
	REDD+ Regional Strategy and Action Plans (SRAP)	At the subnational level, the National REDD+ Strategy and National Greenhouse Action Plan are elaborated into Regional Strategy and Action Plans to enable adoption into Regional Government Work Plans and Regional Budgets. The secretariat of National and Regional Action Plan for the Reduction of Greenhouse Gases, under the national development planning ministry (BAPPENAS), is supporting the implementation of these plans.	Regulation
2012	Central Kalimantan selected as pilot province – signs MOU with BP REDD+ Agency	10 other REDD+ pioneer provinces	Regulation
2013	Moratorium extended until 2015		Regulation
2013	Guideline for REDD+ Mainstreaming into the Development Planning System	Produced by BAPPENAS and REDD+ Taskforce to support the mainstreaming of REDD+ into development planning as required under the National Climate Change Mitigation Plan.	National initiative
2013	The BP REDD+ Agency	An ad hoc agency, reporting directly to the President's Office, responsible for REDD+ implementation.	Institution
2014	The trading of Indonesia's certified emission reduction.		Regulation
2014	National Adaptation Plan – RAN API		Regulation
2015	Moratorium extended for second time until 2017		Regulation
2015	BP REDD+ Agency merged within the new Ministry of Environment and Forestry	In this new arrangement climate change issues including REDD+ will be the responsibility of the Directorate General on Climate Change Oversight.	Institution
2015	Intended nationally determined contribution (INDC) submission for CoP 21 in Paris.	Indonesia pledged to reduce emissions unilaterally by 29% (and by 41% with international assistance) against the BAU scenario by 2030.	Multilateral agreement
2015	Steering Committee on Climate Change	An ad-hoc agency to provide general direction on climate change mitigation and adaptation whilst the new Ministry of Environment and Forestry (MOEF) is established, including supporting the INDC preparation and strengthening inter ministry coordination on climate change issues.	Institution
2016	Peatland Restoration Agency	An ad hoc agency, reporting directly to the President's Office, charged with restoring 2 million hectares of peat land by 2020 and imposing a moratorium on new clearing, drainage and conversion of currently unopened peatland,. This agency will coordinate and facilitate peat restoration in Riau, Jambi, South Sumatra, West Kalimantan, Central Kalimantan, South Kalimantan and Papua Provinces.	Institution

Table 1: REDD+ development in Indonesia

2. HAVE REDD+ OBJECTIVES BEEN MAINSTREAMED WITHIN NATIONAL DEVELOPMENT PLANNING?

Indonesia's INDC states that development objectives, particularly water, energy and food security, are dependent on climate mitigation and adaptation efforts. In particular, it highlights the importance of climate mitigation and adaptation efforts that build the resilience of Indonesia's natural resources which underpin water, energy and food systems. This suggests REDD+ could play an important role in achieving this vision.

In informing the challenges and opportunities to realising this, the report evaluates the extent to which Indonesia's climate policy objectives, focussing on REDD+, are integrated in and supported by Indonesia's current 2015-2019 National Mid-term Development Plan (RPJMN).

In terms of climate policies and plans, this report reviews Indonesia's Climate Change Sectoral Roadmap, REDD+ National Strategy, National Action Plan for Climate Change Adaptation (RAN-API), and National Action Plan for Reducing Greenhouse Gas Emissions (RAN-GRK)[10]. This report refers to these as Indonesia's climate policies. In terms of national development plans, the report reviews the RPJMN and related water, energy and food sector strategic plans.

Cross-sectoral planning in Indonesia's climate change policies

Indonesia's climate policies generally do recognise the links between climate change mitigation and adaption, and the development objectives of other sectors. In particular, they acknowledge and seek to support the country's efforts to achieve water, energy and food security.

The climate policies clearly identify cross-sectoral coordination issues for forests and the water, energy and food sectors (Table 2). In terms of synergies, they recognise the role of forest conservation in the sustainable management of watershed catchments, and thus in supporting downstream agriculture and energy generation. They also recognise that addressing the drivers of deforestation outside the forest sector is critical to achieving emissions reductions targets. In managing this potential trade-off, they identify a number of strategies to reduce pressure on forests, including increasing productivity, no burning, utilising degraded land, and promoting value-added industries.

Mainstreaming climate change in Indonesia's National Mid-Term Development Plan

The RPJMN has taken into account climate change mitigation and adaptation issues as part of its strategic environmental analysis (RPJMN Book I) and in mainstreaming adaptation and mitigation in its sector development plan (RPJMN Book II). This is a step change from the previous national development plan. Furthermore, the RPJMN also directs government ministries and agencies to adopt a GHG emissions reduction target as one of their key performance indicators.

Water security

Planning for water security shows coherence with climate policies in adapting to increasing variations in water supply under climate change. Water security targets are very focussed on restoring watersheds through vegetation conservation and water infrastructure, such as irrigation, in upstream areas. This includes four national priority watersheds (Ciliwung, Citarum, Kapuas and Siak watersheds) and a further 26 priority watersheds.

The recognition of the role of forests as 'natural infrastructure' in restoring watersheds is very compatible with REDD+ goals. This includes targets for rehabilitating forest management units (FMUs) and promoting community participation in watershed restoration through establishing community forest, small-scale ecotourism and utilisation of NTFP.

Built infrastructure, including dams and irrigation networks, is vital for improving water supply for urban, agriculture and hydropower sectors. However, there are trade-offs with REDD+ goals as built infrastructure can cause deforestation. The construction of irrigation networks to support food production has cleared 110,571 hectares of forest to date, mostly in production and protection forests. Meanwhile, the anticipated construction of 51 dams in the period 2015-2019 is also expected to clear 11,524 hectares of forest, again mainly to support irrigation[11].

Case study: The Jatigede dam[12]

The Jatigede dam in West Java is the second largest dam in South East Asia. It will supply 3,599 m^3/second of drinking water and generate 110 megawatt of electricity from its hydropower plant. The dam will also irrigate around 90,000 hectares of rice fields in Cirebon, Indramayu and Majalengka districts, and will function as flood control for downstream areas.

However, the establishment of the Jatigede dam required the relocation of residents of 28 villages in five sub-districts, and drowned around 3,100 hectares of productive agricultural land and approximately 1,300 hectares of forest.

Energy security

Energy self-sufficiency targets to meet growing domestic demand and to increase renewable energy to 23% of the national energy mix by 2025 require significant investment in energy generation, particularly in geothermal, hydropower and biofuels. Whilst this investment in renewable energy is consistent with climate mitigation targets, there are potential trade-offs with forests and thus REDD+ goals.

The strategic plan of the Ministry of Energy and Mineral Resources (MEMR) identifies land availability and overlapping land allocations as a challenge for developing new and renewable energy, particularly for geothermal power plants and bioenergy. For example, out of 312 potential geothermal locations, around 31% are in conservation forests and 18% are in protected forest areas.

The RPJMN allows the use of forest area for hydropower development and energy infrastructure. More specifically, The Ministry of Environment and Forestry (MOEF), which is responsible for REDD+, recognises the energy sectors' need for land in its strategic plan and is collaborating with the MEMR on this issue. For example, the MOEF has allocated 100,000 hectares of production forest[13] area in Sumatra, Kalimantan and Papua for the development of energy estate crops, as well as further conservation forest areas for hydropower and geothermal plants. In contrast the MEMR's strategic plan does not explicitly mention the potential of utilising degraded land for biofuel production, although the MEMR has signed an MOU with districts in Kalimantan to pilot biofuel development on former mining areas.

Finally, whilst Indonesia's climate policies identify forest conservation in upstream watersheds as an important strategy in ensuring sufficient water supply for hydropower and geothermal plants, the energy sector strategic plan does not explicitly prioritise the role of forests as 'natural infrastructure' or recognise the risk to dams of sedimentation resulting from upstream deforestation and degradation.

Sectors other than forestry	Forestry Sectors
Agriculture	Policy synchronisation needed with a view to expansion of agricultural land and palm oil plantation as well as other sources of biofuel for enhancement of sinks and reducing emissions from deforestation
Mining	Open pit mining in the forest area, mining exploration in forests
Energy	Forest conversion to increase alternative energy supply (geothermal) in forest areas
Public Works, Water Resources	Priority for river catchment area rehabilitation and irrigation infrastructure development in forest area
Ocean and Fishery	Coordination of national park management and mangrove forest management
Transportation	Transportation infrastructure development in forest area
Industry	Wood supply industry (pulp & paper, timber)
Health	Spread of diseases linked to the impact of forest and mangrove forest conversion

Table 2: Cross-sectoral coordination challenges for forests with the water, energy and food sectors, redrawn from Indonesia's Climate Change Sectoral Roadmap.

Food security

Indonesia has ambitious targets to increase the production of rice, maize, soy, sugar, beef and fisheries products. Whilst there are targets to increase productivity, extensive land will also be required to fulfil these targets. Although there are plans to use degraded land, achieving these targets may well lead to the loss of large areas of forest, as has been the case in the past, particularly given other ambitious commodity and biofuel crop targets will also require land.

The Ministry of Agriculture (MOA) is in intensive discussions with the MOEF and the Ministry of Agrarian and Spatial Affairs to identify up to 2 million hectares of land for agricultural development. The goal is to utilise existing convertible production forest, of which Indonesia has more than 13 million hectares. Up to October 2015, the MOEF has issued 671 decrees for the conversion of approximately 6.6 million hectares of convertible production forest to oil palm, rubber, sugarcane, and cacao. In Java, the MOEF in collaboration with the MOA is utilising 100,000 hectares of state forest area for rice cultivation and a further 167,000 hectares for maize[14]. However, it is important to note that the suitability of convertible production forests for agricultural purposes varies, so the MOEF is implementing land suitability analysis in Indonesia's five main islands; it expects to publish the results in 2016[15].

Agricultural activities also utilise peatland area, although the current moratorium and peatland management plan has limited and will limit further loss. Whilst the agricultural sector identifies the need for sustainable and low carbon agriculture on peatland, the mega-rice project in Central Kalimantan demonstrates the challenges to implementing this. This project, initiated in 1996, aimed to utilise unproductive peatland to support Indonesia's rice self-sufficiency target. However, instead of increasing rice production, the project led to the destruction of the peatland ecosystem, leaving a massive area susceptible to fires and impacting the local population's income and health.

The strategic plan of the MOA recognises the potential of degraded land in former mining areas (mostly in forest areas), abandoned land and sub-optimal land for agricultural development, particularly for food crops. Up to March 2013, MOEF have issued several permits for mining exploration surveys over 2.6 million ha of forest area and exploitation permits over 382,500 ha of forest area. Although the data is not comprehensive, in particular with regards to the suitability of degraded land for agriculture, a number of studies have concluded that there is sufficient degraded land to meet agricultural production targets.

Finally, it is important to note that competing demands for land-use beyond food crops may result in the need for further agricultural expansion elsewhere. This is illustrated by rice, which is Indonesia's most important staple food. Despite ambitious development targets for self-sufficiency and efforts by the Government to increase the area of rice planted, the total area of rice field is decreasing due to conversion to other land uses such as settlements (particularly in Java) and oil palm plantations (outside of Java). This mostly occurs in the most productive rice fields and at a relatively high rate, approximately 100 thousand hectares/year, while the establishment of new rice fields is less than 50 thousand hectares/year[16].

Case study: Merauke Integrated Food and Energy Estate

In order to support its food and energy security targets, Indonesia is developing the Merauke Integrated Food and Energy Estate (MIFEE) in Papua. This programme was initiated in 2008, officially launched in 2010 and backed by President Jokowi in 2015. It allocates more than 1.2 million hectares of adat (customary) land (mostly forest), for food crops (50%), sugarcane (30%) and palm oil plantations (20%). Development is divided into three phases: 423,251 hectares from 2010-2014; 632,505 hectares from 2015-2019; and 227,077 hectares from 2020-2030. From this, MIFFE is expected to produce 1.95 million tons of rice; 2.02 million tons of maize; 167,000 tons of soy; 64,000 cattle heads; 2.5 million tons of sugar; and 937,000 tons of oil palm each year[17].

Marfai and Cahyadi (2012) analysed land suitability in four sub-districts (Merauke, Naukenjerai, Olikobel and Sota) in the border area of Merauke District and concluded that only Merauke Sub-district was suitable for rice cultivation. Drainage and flooding, due to their location in a swamp area, were the main constraints in the other sub-districts[18]. In addition, land conflicts have been reported, for instance, Medco Group obtained a permit for 360,000 hectares that enables it to clear 60% of the forest in this concession despite these forests being essential for the livelihoods of local indigenous peoples[19].

According to a report by Greenomics Indonesia, 406,718 hectares of the MIFEE total area was originally located in the moratorium map (of which 86% is on peatland) before the moratorium map's first six-monthly revision[20]. This illustrates issues with the moratorium, which gives exemptions to use forest for national development purposes, including food and energy production. However, in this case the exemption not only included rice, but also activities such as livestock that should not be included in moratorium exemptions[21].
In addition to MIFEE, the Government of Indonesia also plans to establish further food estates in West Kalimantan (1,400 hectares) and North Kalimantan (298,000 hectares) to increase rice production.

Key findings on the coherence of Indonesia's climate and development policy objectives

The analysis above shows that Indonesia's national development plan recognises the need to transition to a low carbon economy. In particular, the RPJMN recognises the role of forest conservation in watershed management, and thus food and energy production. However, there are still some clear trade-offs and inconsistencies between climate and development goals – particularly around the expansion of energy and agricultural production and forest conservation.

Indonesia's national development planning ministry (BAPPENAS), which is responsible for integrating climate change mitigation and adaptation efforts into development planning, emphasises that this is a long-term process, and that temporary trade-offs may appear during the transition from business-as-usual activities[22]. However, the analysis indicates that unless trade-offs are pro-actively addressed, then rather than disappearing these will have long-term impacts on the achievement on development and climate goals.

Climate policies successfully articulate a number of strategies to minimise these potential trade-offs, for example prioritising agricultural development on degraded land and no burning. However, whilst some of these strategies are reflected in land-use planning by other ministries and sectors, climate change mitigation objectives and strategies are not clearly articulated or prioritised in the relevant strategic sector plans. Addressing drivers of deforestation outside the forestry sector remains a key challenge; although discussions on allocating land between the MOEF and other ministries are ongoing, examples such as MIFEE illustrate the potential risks of trade-offs between forest conservation and national development priorities[23].

3. HAS THE DEVELOPMENT OF REDD+ FACILITATED HORIZONTAL AND VERTICAL COORDINATION?

The coherence analysis of Indonesia's climate and development policies has highlighted key areas of potential conflict that need to be addressed for climate mitigation and adaptation efforts to be integrated in development planning. Furthermore, while the review above looked at coherence at the national level, land use decisions are often made at the local scale, where province and district governments have significant authority over natural resource management. At this scale, land use decisions respond to local priorities and economic incentives, and the national plan has been described as a "menu" for local governments to select from.

This section reviews how the legal, regulatory and institutional reforms under the development of REDD+ have facilitated horizontal and vertical coordination within and between REDD+ and other land-based sectors.

National (RAN-GRK) and Regional (RAD-GRK) Action Plans for Greenhouse Gas Emissions Reductions

Following Indonesia's commitment to reduce GHG emissions by 26% by 2020, or by 41% with international assistance, the President issued Regulation No.61/2011 on the National Action Plan for Greenhouse Gas Emissions Reduction (RAN-GRK) to guide the implementation of emissions reductions in accordance with national development targets. Whilst the RAN-GRK covers multiple sectors, it identifies that 87% of emissions reductions need to come from the forestry and peatland sector. The Presidential Regulation further instructed the development of Regional Action Plans for Greenhouse Gas Emissions Reduction (RAD-GRK) at the provincial level[24]. In 2015, Indonesia's 33 provinces finalised their RAD-GRKs. Under this framework, provinces are also required to elaborate a Strategy and Action Plan for the Regional Implementation of REDD+ (SRAP) to enable the adoption of REDD+ into Regional Government Work Plans and Regional Budgets.

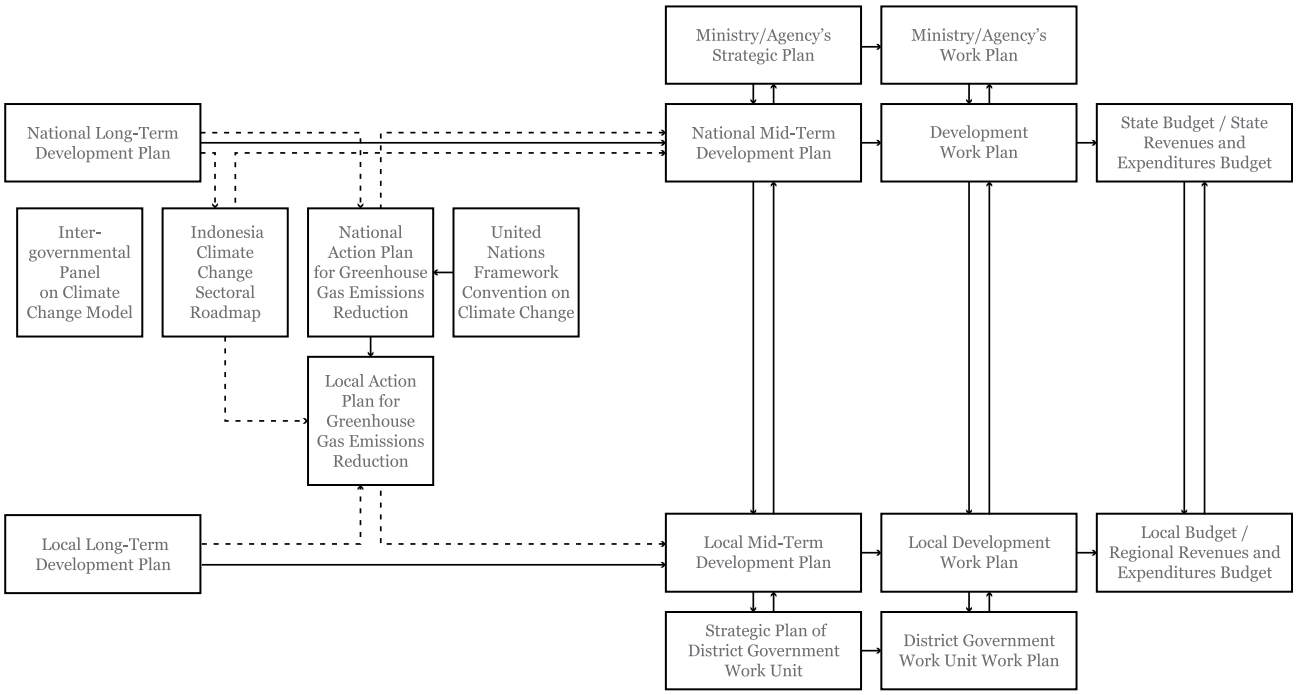

Figure 1. Coordination between national/regional development plans and RAN/RAD-GRK[29]

Horizontal coordination:

The Presidential Regulation No.61/2011 requires the Ministry of National Development Planning (BAPPENAS) to mainstream climate mitigation, including REDD+, into development planning at all government levels. In achieving this, RAN/RAD-GRKs are integral parts of the national and regional development planning process (Figure 2). To support this process, in 2013 BAPPENAS issued a 'Guideline for REDD+ Mainstreaming into the Development Planning System' and a 'Guideline for MP3EI Greening' in coordination with the REDD+ Taskforce[25]. Monitoring and reporting on the implementation of RAN-GRK follows the government mechanism for evaluating the implementation of the RPJMN. Each minister/head of government agencies submits a report to the Minister of National Development Planning alongside copies to the Minister of Finance and Minister of State Apparatus[26]. Furthermore, the Ministry of Finance requires all government ministries/agencies to earmark its budget allocation for activities that result in reduction of GHG emission and report it to the Ministry of Finance (Please see the finance subsection for further information about the government budget tracking system for climate change activities). Despite these horizontal coordination mechanisms, the policy coherence analysis in section 2 indicates that integrating land-use emissions reductions in development planning remains a challenge. Although the development of RAD-GRKs involved different sectors at the provincial and district level, particularly land-based sectors, they are not sufficiently integrated into province and district development plans. For example, Jagau et. al[27] concluded that RAD-GRKs had not been systematically integrated into development planning in Central Kalimantan Province, at either the provincial or district level.

Vertical coordination:

BAPPENAS also plays a key role in the coordination of RAD-GRKs through facilitating a RAN/RAD-GRK secretariat that oversees their formulation and implementation. Vertical coordination is through the internal BAPPENAS system, which has a consultative working relationship with all Development Planning Agencies (BAPPEDAs) at provincial and district level throughout Indonesia. The review of RAD-GRK integration into development planning in Central Kalimantan identified a gap at the district level, potentially exacerbated by the fact that there is no instruction from the provincial to the district governments that RAD-GRK should be used as a reference in the formulation of district development plans. Similarly to the horizontal coordination, vertical coordination of the monitoring and implementation of RAD-GRK follows the mechanism for the evaluation of the implementation of RPJMN[28]. The head of the district (bupati) reports the implementation of the RAD-GRK to the provincial government, based on inputs from relevant government agencies at the district level. The provincial government collects data from all of its districts and relevant government agencies before submitting the report to Minister of National Development Planning and copies to the Ministry of Finance and Ministry of Home Affairs.

The moratorium on new licenses in primary forests and peatlands

In 2011, the Government of Indonesia introduced a moratorium on new licenses in primary forests and peatlands, under REDD+ Readiness preparations outlined in the Norway-Indonesia Letter of Intent. This initial two-year moratorium was extended in both 2013 and 2015. An Indicative Moratorium Map, to be updated every six months, was developed by the Ministry of Forestry to guide implementation[30]. The development of the Moratorium Map highlighted the challenge of different agencies using different and often conflicting spatial datasets; this catalysed the REDD+ Taskforce's One Map Initiative (see below).

Horizontal coordination:

The moratorium has limited the expansion of agriculture, forestry and other land-based activities into primary forest and peatland areas. In doing so it has stimulated the utilisation of deforested and degraded land, as well as agricultural intensification. Whilst the moratorium has been viewed as a positive step in Indonesia's efforts to reduce deforestation, its effectiveness has been limited by its omission of secondary/ logged forests and forests outside of the state forest estate[31]; the exemption of all pre-existing industrial licenses; the ability to extend existing licences; and exemptions for national development priorities in the energy and agriculture sectors. These exemptions mean that deforestation has continued within the moratorium area[32, 33] Furthermore, a study by Kemitraan and Walhi, indicates that between 2011 (the date of the moratorium issuance) and 2013 (first moratorium renewal), the moratorium area has declined by 968,891 hectares across the four provinces of Riau, Jambi, South Sumatera, and Central Kalimantan'[34]. The exclusion of MOA from the moratorium instruction has been highlighted as an example of poor horizontal coordination amongst government agencies in the implementation of the moratorium at the district level[35].

Vertical coordination:

Research by WRI found poor understanding of the moratorium at the district scale, with limited information and technical guidance provided by the national government. The research found no clarity on the mandate, resources and guidance for monitoring the implementation of moratorium at the district level[36]. Awareness of the moratorium was lowest in district agriculture and land agencies, despite their critical role in mapping peatlands, indicating possible failures in horizontal as well as vertical coordination. These factors hampered the effectiveness of the moratorium to prevent further deforestation and degradation.

One Map Initiative

The One Map Initiative was established by the REDD+ Taskforce following the development of the Indicative Moratorium Map in 2011, which highlighted the challenge of different agencies using different and often conflicting spatial datasets.

Horizontal coordination:

The REDD+ Taskforce got the agreement of 13 other ministries to incorporate their data into the One Map Initiative. A national working group facilitates coordination and synergies across ministries and agencies in developing standards for the geospatial database. The national working group consists of 11 sub-working groups such as on water resource and watersheds, agricultural land resources and peatland mapping, climate change mapping, monitoring of sectoral permits and land status, etc. The One Map Initiative was strengthened by the Geospatial Law No.4/2011 that provides a mandate for the creation of a single map. The current administration further strengthened the importance of One Map in the country's economic development as part of its 8th economic stimulus package. The Government expects the One Map to help resolve overlapping land-use conflicts, and improve the reliability of information related to the location of economic activities, which will speed the land use licensing process[37].

Vertical coordination:

A national geoportal provides the opportunity for the public to provide geospatial information and also access the data provided[38]. The Alliance of Indigenous People and the Participatory Mapping Network are gathering community knowledge on forest land to provide a complete mapping of adat (customary) lands, as a consideration for the One Map development. However, there is no formal mandate to incorporate district and provincial maps into One Map, which represents a major potential barrier to its usefulness[39].

Measurement, Reporting and Verification (MRV)

In March 2015, MOEF launched the Indonesian National Carbon Accounting System. INCAS is designed as a systematic approach for MRV of GHG emissions, including for REDD+ activities. It has been used to produce annual accounts of GHG emissions and removals for all of Indonesia's forest and peatland from key REDD+ related activities for 2001-2012[40].

Horizontal coordination:

INCAS was developed by MOEF in collaboration with the National Institute of Aeronautics and Space and BP REDD+ Agency[41]. In expanding to cover GHG emissions from agriculture, forestry and other land-based sectors (AFOLU) INCAS will need datasets, expertise, and resources from all land-based sector and relevant government ministries/agencies, in particular the Ministry of Agriculture, BAPPENAS, and the Geospatial Information Agency. This need for effective horizontal coordination is recognised by the MOEF in the INCAS Roadmap, which highlights the need to create a legal basis for INCAS and formal cooperation agreement between key government agencies.

Vertical coordination:

INCAS was started as a pilot MRV system in Central Kalimantan. The pilot MRV system was developed by a collaboration between the Central Kalimantan MRV team and several government agencies at the national level, namely the Directorate General of Forestry Planning of MOEF, Forest Research and Development Agency of MOEF, National Institute of Aeronautics and Space, and the REDD+ Taskforce (that later transformed to BP REDD+). Lessons learned from the implementation in Central Kalimantan were drawn on to develop the existing INCAS system[42]. INCAS serves as a centralised national platform for MRV of GHG emissions and removals from the land based sector in Indonesia. As such, it will be able to generate sub-national GHG accounts and incorporate additional sub-national data[43].

Integrated Licensing System

Data from the MOEF indicates that in 2014 more than a third of Indonesia's forest area was under licences[44], mainly for oil palm, mining and timber. In Kalimantan this figure rose to 51%[45]. The BP REDD+ Agency led a programme on licensing governance reform, in order to improve the transparency and accountability of the licensing system, as a prerequisite for good spatial and land use planning[46,47]. In addressing such issues of overlapping licences the BP REDD+ advocated for an Integrated Licensing System that would enable the different government agencies involved in licensing to access one systematic database. In December 2014, the Government of Indonesia announced their intention to merge the Integrated Licensing System into a national one stop service under the Investment Coordinating Board (BKPM)[48]. The President of Indonesia launched the system in January 2015.

Horizontal coordination:

The REDD+ Agency's licensing governance programme included an action plan that involved multiple government ministries and agencies across the relevant land-based sectors. The programme also piloted the One Licensing System in Kalimantan, enabling access from the Ministries of Energy, Agriculture and Home Affairs. This pilot and related licensing audit led to the MOA to strengthen environmental governance within licensing regulations under Plantation Business Guidelines (MOA Regulation No. 98/2013)[49].

Under the new BKPM system, around 22 ministries/government agencies delegate their authority to the BKPM to implement investment related licensing[50]. To facilitate coordination, these ministries/government agencies have appointed liaison officers in the BKPM office who are responsible for verifying applications[51]. However, there are significant challenges for forestry licensing; several parties have raised concerns that the delegation of forestry authorities to the BKPM will potentially lead to the neglect of environmental considerations[52]. These concerns have led to the MOEF withdrawing 18 out of 35 licensing authorities that had been delegated to the BKPM. These include permits that are not linked to investment but also include the authority to give approval on the Environmental Impact Assessment[53].

Vertical coordination:

The BP REDD+ vision was for the Integrated Licensing System to support vertical coordination by enabling national government agencies to monitor and have proper oversight of sub-national licensing. Vertical coordination challenges linked to sub-national licensing are illustrated by the fact that 18 environmental permits are governed by regional authorities and not the BKPM.

Licences can be issued by the one stop license office at various levels of government in line with the location of the proposed business site with the relevant approval, for example at the national level based on authority delegation from ministries/head of government agencies; at the province level based on the authority delegation from the governor; and at the district level based on the authority delegation from the bupati. To monitor the progress of investment in Indonesia, BKPM has established a stratified monthly reporting system, from district to provincial and to national level. According to the BKPM, all provinces, 372 districts and 98 cities in Indonesia have the one-stop service office. To maintain coordination between national, provincial and district levels, the BKPM has an internal annual consolidation meeting known as Consolidation of Plan and Implementation of National Investment[54] as well as a stratified monthly reporting system, from district to provincial and to national level[55].

Forest Management Units

A Forest Management Unit (FMU) is a designated administration area for sustainable forest management, in line with its respective basic functions and zoning (including protection, production and conservation FMUs). FMUs were designed to address weak local governance and management due to weak or absent local forestry institutions on the ground[56]. The National REDD+ Strategy identified that a key priority for REDD+ implementation was to set up and operationalise a large number of FMUs, recognising that the goals of FMUs are aligned with REDD+, in particular the use of a multi-stakeholder process to establish FMUs, clear forest status and boundaries, and the objective of sustainable forest management. In 2014 there were 120 operational Units covering 16 million hectares. The RPJMN includes targets for 579 operational Forest Management Units by 2019.

Horizontal coordination:

FMUs can comprise multiple concessions and forest functions and as such their forest management plans require coordination across different stakeholders. In managing potentially different interests across the various actors and ensuring synergies across different activities, FMU management plans are formulated through a multi stakeholder process. FMUs function as the forest manager at the site level and monitor the performance of concessions located within the FMU. FMUs cannot issue any forest utilisation permits. Forestry licensing and administration process is held by the national or local government based on their respective function[57].

Vertical coordination:

Law No. 23/2014 on Regional Government stipulates that the implementation of forest governance and management plans of protection and production FMUs are under the authority of the provincial government. Meanwhile conservation FMUs are under the national government. FMU should formulate its long term management plan to guide the management of forest resources. FMU management objectives should be harmonised with national, provincial, and district level development objectives. In 2010, the Regional Technical Implementation Unit of FMU held a workshop on the lessons learned from KPH development. This workshop concluded that there were significant capacity and resource gaps limiting the establishment and effectiveness of FMU management organisations at the province/district level[58].

BP REDD+

The Government of Indonesia established the REDD+ Managing Agency (BP REDD+), an ad hoc agency reporting directly to the President's Office, in September 2013. BP REDD+ replaced the REDD+ Taskforce and was tasked with assisting the President in coordinating, synchronising, planning, facilitating, managing, monitoring, overseeing, and controlling REDD+ in Indonesia[59].

Horizontal coordination:

BP REDD+ was designed through a collaborative process involving relevant government ministries and agencies, which reflected the understanding that REDD+ objectives would only be achieved with strong coordination and collaboration between the agency and these ministries. However, several ministries considered BP REDD+, which is an ad-hoc agency, to have taken some of their authorities, and were therefore reluctant to fully support the agency. It was dissolved in 2015 with its functions being merged within the new Ministry of Environment and Forestry under the Directorate General of Climate Change Oversight. Whilst this mainstreams REDD+ within a powerful ministry, effective horizontal coordination will require a strong Director General to raise issues to ministerial level. Before BP REDD+ was dissolved, it laid important foundations for improvement of forest and land governance in Indonesia[60].

Vertical coordination:

BP REDD+ initiated the application of a jurisdictional approach to REDD+ implementation in Indonesia. The province, district, sub-district or village could be considered as "jurisdictions" within the Indonesian government system. The jurisdictional approach means that all programmes and activities that aim to reduce emissions from deforestation and forest degradation are planned and implemented within the existing jurisdictional structure of the country. The approach requires intensive collaboration across different levels of jurisdictions to ensure the alignment with national targets. BP REDD+ acknowledged that developing a jurisdictional approach needs strong partnerships between government, local communities, the private sector and development partners.

Peatland Restoration Agency

In response to the extensive forest and peat land fires in 2015, the President established the Peatland Restoration Agency in early 2016. The presidential regulation that established the Agency tasks it with coordinating and facilitating the restoration of two million hectares of peatlands in Riau, Jambi, South Sumatra, West Kalimantan, Central Kalimantan, South Kalimantan and Papua Provinces, by 2020[61]. It is a challenging task as most of the peatland in these provinces has been converted into agricultural commodity plantations, agricultural land, industrial forest plantations, shrimp ponds, etc.

The newly established Peatland Restoration Agency follows a similar model to BP REDD+ in reporting directly to the President and coming under the framework of Indonesia's cooperation with Norway. In implementing its task, the Agency will be supported by a technical steering team and expert group consisting of representatives of the government and ministries in land-based sectors, governors, scientists, professionals and communities. However, with its limited authority as a non-structural agency, the Agency will need strong support from relevant ministries at the national level and from every level of government, to translate the country's commitment to restore the two million hectares of peatland into action.

Domestic budget allocation

Presidential regulations on the RAN-GRK and RAN-API state that funding for their implementation will be sourced from the State Revenues and Expenditure Budget (APBN), the Regional Revenues and Expenditure Budget (APBD), and other legal and unbinding sources. Under this framework, the REDD+ National Strategy and SRAPs are expected to support national and regional governments to adopt REDD+ into their work plans and budgets. Following the publication of the RAN-GRK, the Ministry of Finance implemented a budget tracking system for climate mitigation activities. The system aims to determine the effectiveness and efficiency of state budget allocation in prioritising mitigation actions, while also engaging the private sector[62].

Horizontal coordination:

Seven ministries are legally required to implement budget tracking systems for climate mitigation activities, including the ministries covering the water, energy and food sectors (i.e. the Ministries of Agriculture, of Forestry, of Environment, of Energy and Mineral Resources, and of Public Works)[63]. However, currently there is little public information available on sector spending on mitigation activities.

Vertical coordination:

The national Government has a financial relationship with the local government to finance the implementation of government affairs delegated or assigned to the regions. Revenue transfer to local governments includes balancing funds (that consist of revenue sharing, the general allocation fund, and the special allocation fund), special autonomy funds, privileged funds and village funds[64]. An initial analysis by Forest Research and Development of MOEF identified revenue sharing and the special allocation fund as two potential mechanisms for distribution of benefits from REDD+[65,66].

However, a study in 2011 identified challenges in disbursing climate finance to local governments, as less than 5% of the total climate finance disbursed through domestic budget expenditures (the main instrument used to transfer money from the state budget) was distributed to local governments[67]. Outside of climate finance, but highly relevant to REDD+, a recent review by the Climate Policy Initiative review concluded that existing revenue transfer instruments may be indirectly incentivising local governments to develop land rather than intensify production. In particular, land and building taxes and non-income revenue from forest and mining provide large percentages of revenue for regions[68].

Bilateral and multilateral funding

Indonesia needs significant finance to to achieve its emission reduction targets, with several studies indicating a funding gap (Adelphi & GIZ[69], CPI[70], IFF[71]). Indonesia has received technical and financial support from donor countries and agencies for REDD+, including a Letter of Intent (LoI) signed by the governments of Norway and Indonesia in 2010, declaring Norway's intent to support Indonesia's REDD+ efforts through providing up to USD 1 billion. Of this, USD 200 million was earmarked for REDD+ Readiness, and the remaining USD 800 million for performance-based payments linked to reductions in deforestation.

Under the LoI Indonesia agreed to establish a fund for REDD+ (FREDDI) in addition to the already established Indonesia Climate Change Trust Fund (ICCTF). ICCTF was developed by BAPPENAS and the Ministry of Finance in 2009 to pool and coordinate funds from various sources, such as international donors and the private sector, to finance Indonesian climate change policies and programmes[72]. To date, FREDDI has not been operationalised and under the new institutional arrangements for REDD+, the future of FREDDI and its relationship with the ICCTF remains unclear.

Horizontal coordination:

Whilst the LoI agreement provided an important signal of support for REDD+, the amount of support is very small in comparison to the domestic budget and national economy. For example, export earnings from palm oil, a key driver of deforestation, reached USD 18.6 billion in 2015[73] and the Indonesian palm oil fund management body (the CPO Fund) raised USD 700 million in eight months. Furthermore, to date only USD 60 million under Norway's LoI has been disbursed. A report by the Overseas Development Institute calculated that the average annual REDD+ finance (2006-2014) was USD 165 million. In comparison the annual value of agricultural subsidies (2010-2012) was USD 27 billion and USD 79 million for biofuel subsidies (2009)[74].

More broadly in term of climate finance, there remains a coordination gap in the reporting of donor funds by ministries and agencies to the Ministry of Finance[75].

Vertical coordination:

Local governments receive bilateral and multilateral funding through the government transfer mechanism (see domestic budget allocation). Under the ICCTF, ministries and government agencies that act as executing agencies collaborate with local governments and other institutions at the provincial and district level to implement the projects[76]. REDD+ projects, such as under an Ecosystem Restoration License and implemented by NGO or CSO, can also receive direct external funding.

4. HAS THE DEVELOPMENT OF REDD+ INFLUENCED PRIVATE SECTOR ACTIONS?

During the development of REDD+ there has been a significant shift in private sector commitments to the sustainability of agricultural commodity production. The Indonesia Palm Oil Pledge, announced in 2014, pledges the production of deforestation-free palm oil and has been signed by five leading companies that cover 60% of Indonesia's palm oil exports. Meanwhile in the pulp and paper sector, both APRIL and APP, companies that cover 80% of Indonesia's trade in this sector, have made zero deforestation commitments. These are just two examples of a number of collective and individual sustainability commitments made by the corporate sector; other examples include commitments on zero deforestation, no burning, no conversion of peat land, and protections for areas of High Conservation Value (HCV) and/or High Carbon Stock (HCS).

The Government of Indonesia has registered concern over the impact of these commitments on small-holder farmers who may struggle to comply. Furthermore, HCV and HCS areas under zero deforestation commitments conflict with Indonesia's Plantation Law which requires companies to utilise all cultivated areas within six years and the updated Indonesian Sustainable Palm Oil (ISPO) regulation[77].

In addition, it is also important to note the shift in the forestry sector business, which previously focused on timber extraction, along with the drastic decline of timber potential in the natural forest as the result of the long history of timber extraction in Indonesia. Several businesses are currently managing production forest under forest restoration permits. Up to early 2016 the Ministry of Forestry and Environment had issued 14 forest restoration permits. Some businesses are also developing REDD+ projects and have even successfully sold carbon credits into the voluntary carbon market.

KATINGAN REDD+ PROJECT[78,79]

The Katingan Peatland Restoration and Conservation Project (known as the Katingan Project) was granted an Ecosystem Restoration Concession (ERC) license in 108,255 hectares of dense peat swamp forest located at Katingan and Kotawaringin Timur (Kotim) Districts, in Central Kalimantan in October 2013. The project is managed by PT Rimba Makmur Utama (PT.RMU) and is listed as a REDD+ Demonstration Activity.

The project initially applied for an ERC license for more than 203,570 hectares in 2009; demand from other land users, such as palm oil and mining businesses, within the proposed area led to delays in the licensing process and a reduction in the approved ERC area[80]. During this process the District Government allocated part of the area requested to nine mining companies and six oil palm companies[81]. This illustrates challenges of implementing REDD+ in face of powerful drivers of deforestation.

In terms of supporting water, energy and food security, the Project Design Document outlines activities to support local livelihoods, food and energy security. A cost benefit analysis for the originally proposed ERC by Green Growth Institute also identifies significant ecosystem services benefits under green growth, and hidden costs under the business-as-usual scenario of declining peat soil drainage over time with impacts to agricultural production.

Key findings on the role of REDD+ development in supporting horizontal and vertical coordination across land-based sectors

A focus on Indonesia's support for REDD+ development since 2007, reveals although REDD+ was primarily designed as a financial instrument, successes have emerged in terms of forest governance, including forest monitoring and the MRV system; a six-year moratorium on new licenses in primary forests; and initiating coordination efforts on land-use mapping and licensing.

Institutionally, however, structures and financing to deliver REDD+ remain weak or unproven. The institutional set up of BP REDD+ as an ad-hoc agency hampered effective implementation and created challenges for effective horizontal and vertical coordination. This was clearly illustrated by the comments of a number of other ministers after its disbanding, indicating BP REDD+ overstretched its authority and remit as an ad-hoc agency. Despite this, a number of innovative initiatives initiated by BP REDD+, including One Map and One Licencing, although still not fully implemented have been adopted by central government. These lessons are highly relevant to the future success of the Peatland Restoration Agency, which will face similar challenges as another ad-hoc agency.

Although difficult to attribute directly to REDD+ development, there has also been a momentum shift in private sector discourse and commitments around the sustainable production of agricultural commodities that have driven deforestation.

Finally, while the Presidential Regulation No.61/2011 on National Action Plan for Climate Mitigation provides a clear mechanism for the integration of climate goals (including REDD+) into national, sector and regional development planning, there are clear implementation gaps. These will need to be addressed for Indonesia to successfully deliver on its INDC vision.

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