ALLREDDI

Accountability and Local Level Initiative to Reduce Emission from Deforestation and Degradation in Indonesia

Institutionalising emissions reduction as part of sustainable development planning at national and sub-national levels in Indonesia

Key issues

1. The success of climate-change mitigation actions is to be measured by the reduced emissions. The fulfilment of the commitment made by the Indonesian President of 26% reduction unilaterally plus an additional 15% through international support by 2020 can only be judged from the amount of emissions reduced by 2020 and the achievement of 7% economic growth.
2. Demonstrated emission reduction has to be attributable to the source of funding because of the political and socio-economical implications attached. Achieving unsupported emission reduction will position Indonesia as a true leader in climate-change mitigation. The outcome of internationally supported emission reductions will have implications for international mechanisms while the remaining emission reduction that can be traded will bring a significant economic benefit.
3. Forest products and land resources are sources of income and rural livelihoods. There are national and sub-national sustainable-development targets, some of which depend on forest products and/or land resources.
4. There are 'low-hanging fruit', especially related to unsustainable practices, which can reduce emissions without limiting opportunities to generate income and improve livelihoods, but there are also significant portions of emissions that are associated with some economic benefit and a smaller portion associated with high economic benefit. These issues cause variability in emissions reductions across landscapes.
5. The allocation of emission reduction targets for each sub-national level (province, district) should follow the 'fairness and efficiency' principle: 'efficiency' in terms of how much change in emission practices and 'fairness' in terms of rewards for those actually protecting the forest.

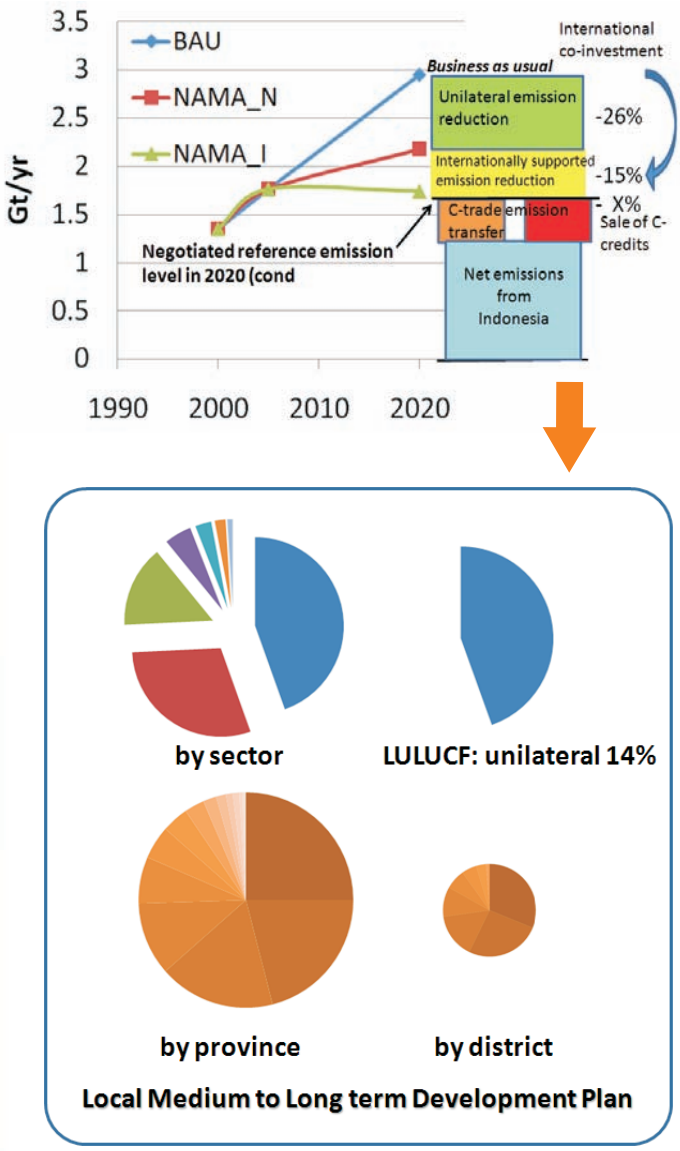

Figure 1. Emission reduction target with respect to agreed reference emission level at the national level across different funding mechanisms (top) translated into sector and geographic shares (bottom)

Context

1. Indonesia is a significant carbon emitter, especially from land use, land-use changes and forestry (LULUCF), in particular, from peatland
2. The potential for reducing emissions from LULUCF is high in Indonesia and the political will is strong with the commitment made by the President in 2009 to unilaterally reduce emissions by 26%, plus another 15% with international support, while still targeting 7% economic growth. This policy goal is often called low-carbon economic growth
3. The Letter of Intent between the governments of Indonesia and Norway for bilateral collaboration to establish a scheme to reduce emissions from deforestation and forest degradation and conserve natural forests (REDD+), firstly conducting demonstration activities on peatland, has pushed the process into high gear
4. Emission reductions from LULUCF across Indonesia are targeted to come from different geographical places and be funded by different mechanisms (Figure 1)
5. There are competing demands for land to achieve sustainable development and reduce emissions

REDD+, REALU and sustainable development

The contribution of the land-based economy (excluding minerals but including forestry, estates and agriculture) to the gross national product (GNP) was 15% in 2005, while the emissions contribution of LULUCF (agriculture, land-use changes, forestry and peat fires) was 55–79% (the largest among sectors) between 2000 and 2005 (Figure 2). Compared to the industry sector, which contributes 28% of GNP and 2.7% of emissions, the LULUCF sector's emissions per unit GNP is almost fifty times larger, indicating LULUCF's low productivity. Therefore, it is feasible at the national level to reduce emissions from LULUCF without losing too much economically.

However, while GNP is one important indicator, especially at the national level, others such as food security and employment generated by LULUCF (both in cash and in subsistence) are important, particularly at the local level. Unfortunately, data such as income share from the LULUCF sector and numbers of people who rely on it for their livelihoods are not available at a disaggregated scale across the county. When developing strategies to mitigate climate change by reducing emissions—through unilateral, multilateral or market mechanisms—the government must prioritise the need of the people for sustainable development.

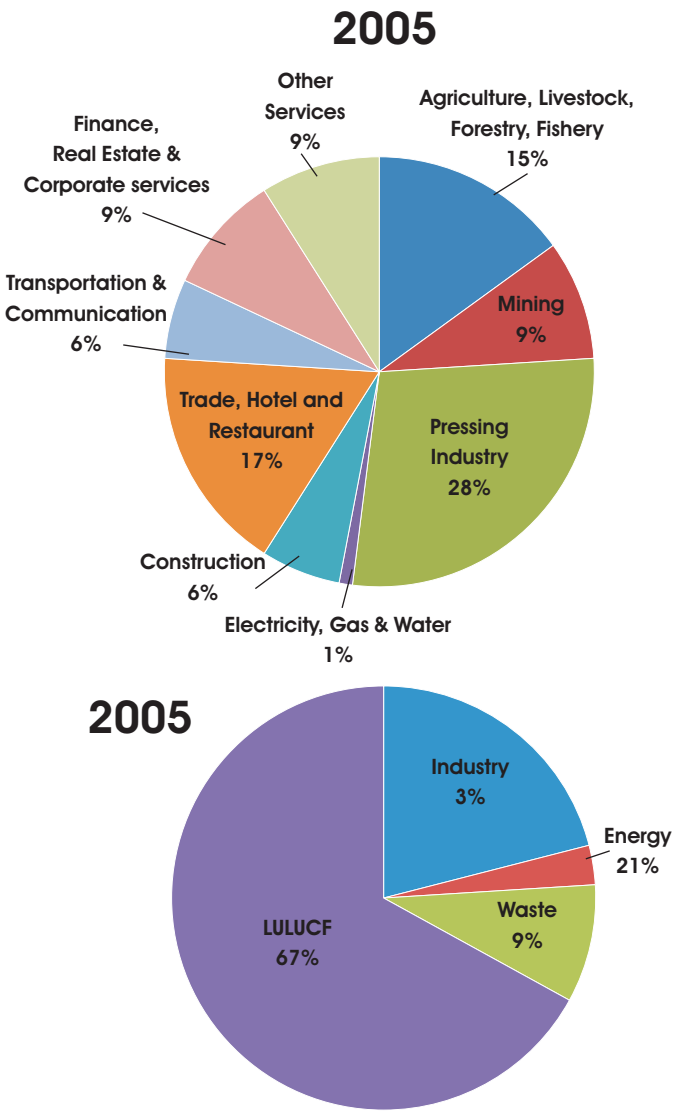

Figure 2. Left: Gross national product, 2005 (source: BPS 2006). Right: Emissions by sector, 2005 (source: SNC 2010)

A REDD+ scheme that includes peatland is planned to be the main mechanism for reducing emissions from LULUCF in Indonesia. The real scope of the mechanism is currently unclear: while non-forest land is not definitively excluded, draft strategies and action plans do not satisfactorily integrate it. In our previous work (Ekadinata et al. 2010) we showed that unless total emissions from all land uses are fully accounted and reduction strategies developed for them ('reducing emissions from all land uses' or REALU), there is a real danger that emissions will not be reduced.

A framework for aligning REALU within sustainable development planning at national and sub-national levels is necessary. The principle of sustainable development, which embraces five 'capitals' (financial, social, human, natural and physical), has been adopted globally. Development targets are set nationally and also locally. In the development plan, sectoral targets are also set, that is, how much growth is to be achieved in each sector. For the LULUCF sector, we can estimate emissions associated with the development target. Sustainable development targets

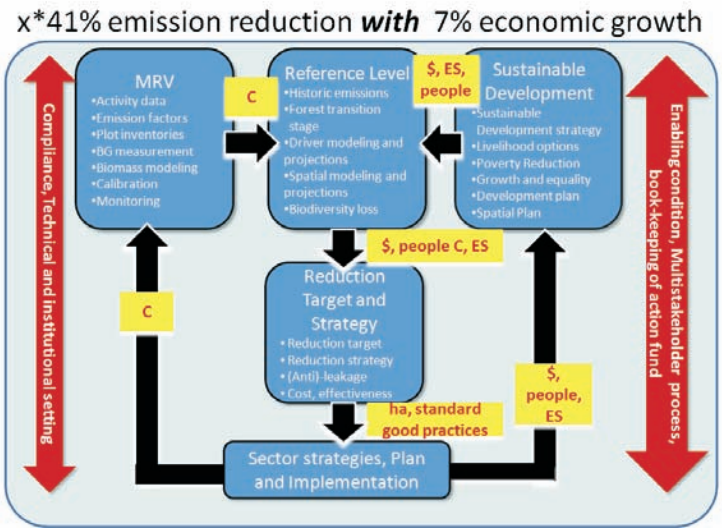

Figure 2. Aligning REALU (REDD+, peatland and all other land uses) within sustainable development planning

(such as economic growth, number of people alleviated from poverty, indicators of ecosystem services, infrastructure development, human development index) should be used as the basis for developing a reference level or baseline scenario for 'business as usual', together with common past and current drivers and practices. Anticipated investment and outcomes should be modelled and estimated (in terms such as dollars, numbers of people, carbon stock, biodiversity level).

From the baseline scenario, reduction targets and strategies could be set through a multistakeholder process employing the principle of free, prior and informed consent); all costs should be estimated, potential leakage should be anticipated and action plans should be formulated in terms of location, extent and activities on the ground. These project activities should be comprehensively reported and registered, in terms of financial and on-the-ground implementation, most likely by a new structure to be formed under the leadership of the president's development supervision and control unit (Unit Kerja Presiden bidang Pengawasan dan Pengendalian Pembangunan or UKP4), for example, a local REALU institution, and be compiled at the local level and aggregated in terms of sources of funding to be reported to the mirror REALU institution nationally.

Monitoring and evaluation of the impact of the overall development agenda, which REALU is part of, constitutes the feedback loop within sustainable development planning led by local government. The monitoring, reporting and verification (MRV) of emission reduction would be conducted by the local REALU institution and compiled by the national REALU institution.

The local REALU institution would, therefore, be able to link the source of funding, via a particular project's implementation reports, with real emission reductions within the project's boundaries and emission MRV.

Compilation at the national level would be enabled through a well-designed data and information flow.

- It is simplest to conduct accounting at national level up to Tier 2+ such that emissions can be estimated for each geographical region of Indonesia; real emission reduction beyond pilot or project areas can be monitored
- Within implementing areas, independent Tier 3 monitoring should be conducted and results synchronised with Tier 2+ national accounting
- Biodiversity indicators should be set and monitoring conducted in the project areas
- In parallel, all funding mechanisms should be recorded and aggregated to district level such that double-counting can be avoided
- Although the national emission reduction target has been set, as well as the portion from the LULUCF sector, allocation geographically is yet to be done
- Local emission reductions have to be accounted and compiled to be able to achieve the aggregated national reduction level and leakage has to have been absorbed.

Geographic variations in needs, potential and constraints in aligning REALU and sustainable development

The easiest way to allocate emission reduction targets at the sub-national level—or setting the reference emission level (REL)—is to use historic emissions data. However, this will create un-fairness for some provinces that have a large fraction of natural forest and a low rate of deforestation, for example, Papua. On the other hand, in provinces with higher deforestation rates, such as Riau, it would be easier to reach the targeted emission reduction in the future. The allocation of emission targets at sub-national level needs to follow the efficiency and fairness principle.

We propose a different method in setting REL for different forest transition stages. Across Indonesia, there are huge variations between districts in levels of development (Figure 4, left) and forest transition stages (current state of land-use and land-cover composition plus past trajectories of land-use and land-cover and, therefore, LULUCF emission levels) (Figure 4, right). These reflect variations in the need, potential and constraints in aligning REALU into sustainable development planning.

Figure 5 shows the stages of forest transition for districts in Indonesia, derived from the most recent composition of land use and land cover (2005), and the past trajectories of land use and land cover (1990, 2000 and 2005), which were produced by the ALLREDDI project (Ekadinata et al. 2010). Ideally, the most recent map should be closer in time to the period when policy is developed, however, in this case it was not possible.

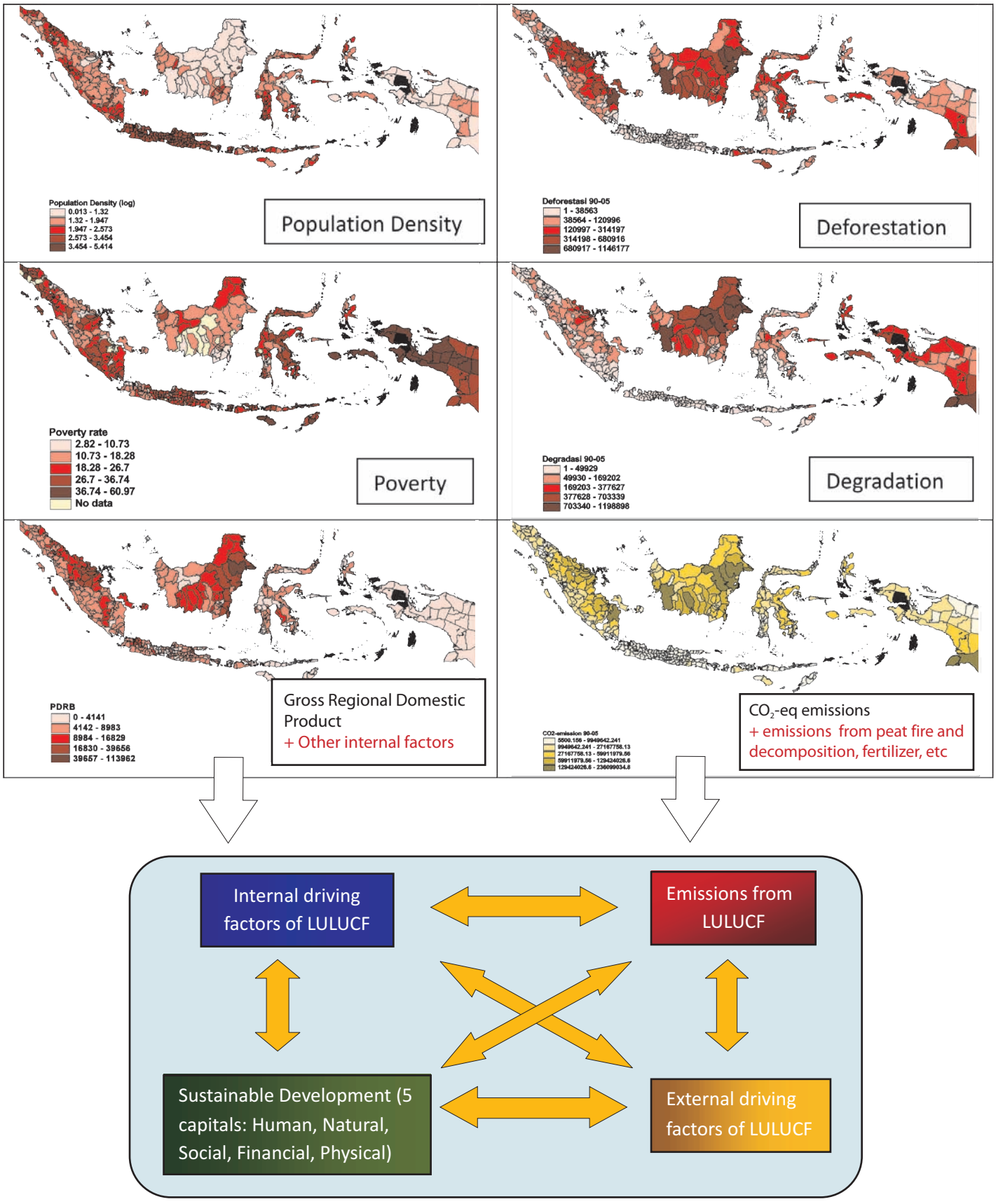

Figure 4. Local variations in sustainable development and LULUCF emissions are rooted in interactions between internal and external driving factors of LULUCF

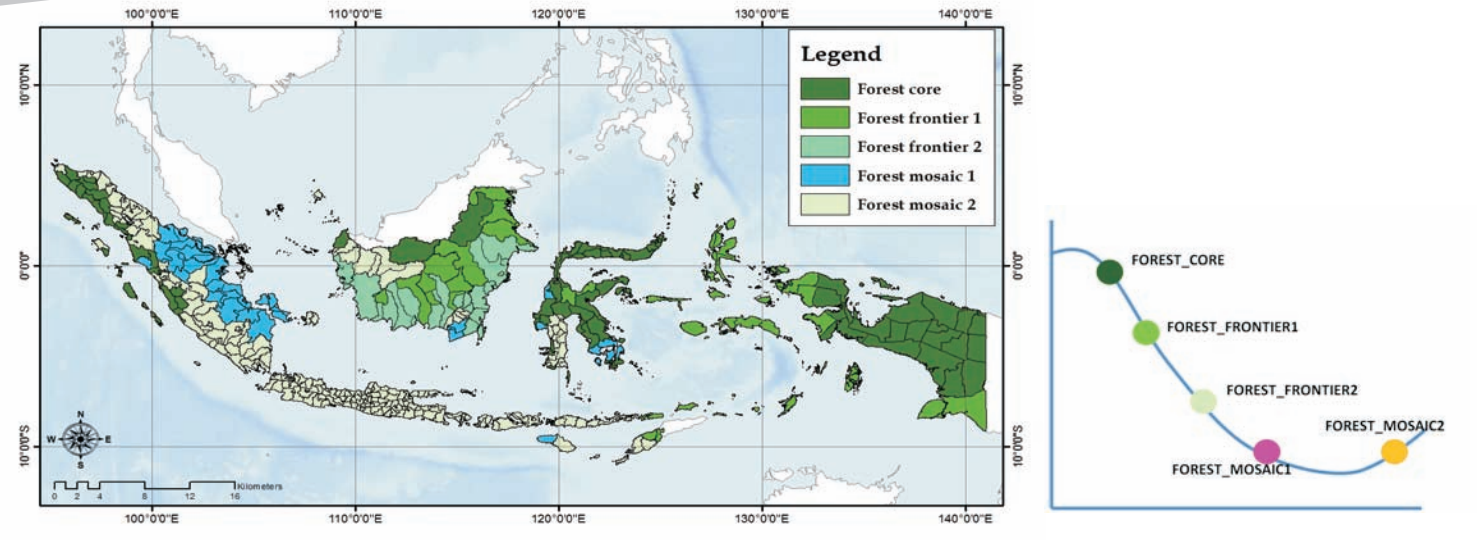

Figure 5. Forest transition stages of districts in Indonesia based on the state of land use and land cover in 2005 and trajectories of land use and land cover in 1990, 2000 and 2005 (left) within the forest transition curve (right)

The stages are not independent from demography, interactions between internal-external drivers, forest governance and physical conditions that determine access to market. We suggest five categories of forest transition in Indonesia.

1. Forest core: a large fraction of natural forest in a large block, with a small amount of subsistence agriculture for staple foods and some logging activities in lowland areas. Population density is low and the presence of external drivers of land-use change is limited, with minimal interactions between internal and external drivers.

2. Forest frontier 1: areas are largely forested, but fragmented, with mixed or degraded forest owing to logging. There is some large-scale conversion of degraded natural forest to estates and forest plantations and some subsistence agriculture and smallholder farming. Population density is low, with external drivers of land-use change dominating, who bring in labour from outside the area. Interactions between internal and external drivers are driven by the external drivers.

3. Forest frontier 2: areas of natural forest are less than half the total area and highly fragmented; most of the remaining forest is on rough terrain. Large-scale and smallholder conversion of forest to export-commodity production is common. Population density is medium, external drivers dominate but much less so compared to forest frontier 1. Interactions between external and internal drivers are more balanced.

4. Forest mosaics 1: areas of natural forest are very small and only found on the roughest terrain; some tree cover does exist but within agricultural landscapes. Population density is higher than 100 people/km^2. Higher intensity of land use and settlements dominates the trajectories of land use and land cover. Population density and competition for land increase and lead to high land rents. Land tenure is not clear in many places; markets for local agricultural products are accessible.

5. Forest mosaics 2: areas share similarities with forest mosaics 1 in terms of natural forest and population density, but the amount of tree cover (estates, forest plantations and agroforests) is higher than natural forest. Opportunities for income from non-land-based sectors increase. Land tenure is clear and markets for export commodities are accessible.

Within each stage of forest transition, the low-carbon development path can be defined, including the targets, strategies and costs of investment as the baseline, along with anticipated emissions. Fairness and efficiency should be the guiding principles in setting reference levels. These groupings of districts according to stages of forest transition can be used to set guidelines for establishing the reference emission level as part of a REALU approach to sustainable development.

1. Forward-looking for forest core: reducing degradation and deforestation
2. Driver modelling for forest frontier 1: reducing deforestation and degradation
3. Discounted historic emissions for forest frontier 2: rehabilitation, reducing deforestation and degradation
4. Historic emissions for forest mosaics 1 and forest mosaics 2: restocking, replanting and rehabilitation

Historic emissions

The historic emission rates are calculated for at least two past periods so that a linear projection can be derived from the two rates. We differentiated between forest frontier 2

and forest mosaics 1 and 2 because, in forest frontier 2 emissions are at their peak so setting these as the reference emission level would overestimate the baseline. The peaks for forest mosaics 1 and 2 were reached in the far past. In forest frontier 2, there is greater potential to achieve multiple benefits in reducing emissions from all land use. For example, the large area of degraded forest could be rehabilitated to achieve biodiversity maintenance as well as carbon sequestration. The discount factor would be negotiated between the district and national governments.

Driver modelling

Internal and external drivers of land-use change should be incorporated in the modelling so that future emission levels can be estimated. A set of variables such as population densities, poverty, gross regional products, forest transition stages, market access and existing estates and plantations could be taken as independent variables in the spatial econometric models of LULUCF at the district level.

Forward-looking allocation

Within this approach, local governments can entertain a plausible set of development scenarios within the existing land-use plan to achieve the development target based on the opportunities and capacities to implement such plans. Baseline emissions are estimated based on those scenarios. For example, 'conversion of 300 000 ha of remaining natural forest in the APL (areas for other uses) to oil palm in the next five years'.

Key messages

- Aligning REALU into sustainable development while taking into account local circumstances is crucial to avoid missing real emission reduction, affecting other ecosystem services and some elements of sustainable development having to pay the costs, most likely the farmers
- In setting the reference emission level, fairness and efficiency principles should be retained; historic and future projections of emissions under 'business as usual' should address sustainable development needs and forest transition stages
- Integrated sustainable land management at the local level can lead to real multiple benefits such as climate-change mitigation, adaptation, biodiversity maintenance, higher quality hydrological functions, the degrees of which are dependent on the forest transition stages, local capacities and governance and level of threats. Spatial land-use planning process that is integrative, inclusive and informed is crucial;
- Forming layers of institutions that are well-connected through sets of rules and regulations of data and information flow within the local and national governments, REALU institutions and implementing proponents is necessary for measuring emission reductions and their direct and indirect impact on development within different funding regimes.

ALLREDDI

Accountability and Local Level Initiative to Reduce Emission from Deforestation and Degradation (ALLREDDI) is a project implemented jointly by the World Agroforestry Centre and the Indonesian Government's Forest Planning Agency and involves partnership with Brawijaya University and the Indonesia Centre for Agricultural Land Resources Research and Development. The overall aim of the project is to assist Indonesia to account for land-use-based greenhouse gas emissions and to be ready to use international economic 'REDD' incentives for emission reduction in its decision making at the local and national levels.

There are specific objectives to be accomplished in its three-year implementation (2009–2011).

- Develop national carbon-accounting systems that comply with Tier 3 of the Intergovernmental Panel on Climate Change guidelines for agriculture, forestry and other land uses, complementing and maximising existing efforts
- Strengthen national and sub-national capacity in carbon accounting and monitoring
- Design operational mechanisms in five settings for REDD

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Data sources

Land-cover maps 1990, 2000 and 2005 produced by the ALLREDDI project in a collaboration between the World Agroforestry Centre and Direktorat Jenderal Planologi, Ministry of Forestry

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Emissions by sectors 2005, SNC

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