TECHNICAL REPORT

Indonesia's Ministry of Forestry
International Tropical Timber Organization
RED-PD 007/09 Rev. 2 (F)
Enhancing Forest Carbon Stock to Reduce Emissions from Deforestation and Degradation through Sustainable Forest Management (SFM) Initiatives in Indonesia

SUSTAINABLE FOREST MANAGEMENT, FOREST BASED CARBON, CARBON STOCK, CO_2 SEQUESTRATION AND GREEN PRODUCTS IN ORDER TO REDUCE EMISSIONS FROM DEFORESTATION AND FOREST DEGRADATION

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Enhancing Forest Carbon Stock
to Reduce Emission from Deforestation and Degradation
through Sustainable Forest Management (SFM) Initiatives
in Indonesia

Host Government: Indonesia

Executing Agency:
Directorate of Production Forest Use and Business
Directorate-General of Forestry Business Management
Ministry of Forestry

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Executive Summary

Managing forest resources in sustainable manner is responsibility of every nation to secure its long-term development. Improper management of this resource will lead to failure of the forest to provide sustainable goods and services for meeting our present and future needs. Indonesia as the second largest forested tropical country in the world, in the last 10 years has lost its forest with rate of about 1.5 million hectares per year. The largest lost occurred during the transition period (1996-2000), from new order era to reformation era with deforestation rate of about 3.5 million hectare per year. By 2009, the remaining forested land in Indonesia was about 52% and more than half of the forests are secondary forest with various level of degradation.

To ensure Indonesian forest able to provide sustainable goods and services at present and in the future, Government of Indonesia has developed a number of new policies and regulations and programs as efforts to achieve sustainable forest management. Following the commitment of reducing 26% of GHG emission from BAU by 2020, these efforts are expected to directly or indirectly contribute the reduction of greenhouse gas emissions. To gain international recognition on the efforts implemented by Indonesia in reducing its emission from deforestation and forest degradation (REDD) through the improvement of its forest management practices, Indonesia needs to follow international agreements on REDD+ as defined in Decision 1/CP.16. Four elements of REDD+ frameworks that should be fulfilled include (i) the availability of **National strategy or action plans** for REDD+**,** (ii) National **forest reference emission level (FREL) and/or forest reference level (FRL)** required to measure the achievement of the country in reducing their emission from the implementation of the strategy and action plans, (iii) **Robust and transparent national forest monitoring system** required to measure and to report the effectiveness of the implementation of the strategy and action plans and (iv) **system for providing information on how the safeguards** are being addressed and respected throughout the implementation of the strategy and action plans.

1. Key Policies and Action Plans for SFM under the framework of REDD+

Government of Indonesia has developed at least five key policies and action plans in achieving sustainable forest management under the framework of REDD+. **First** is the improving institutional system for managing forest resources, through the establishment of forest management unit (FMU) in all forest areas. **Second** is introducing mandatory forest certification systems for limiting trading of illegal logs and pushing adoption of sustainable management practices in production forests. **Third** is reducing dependency on natural forests in meeting wood demands through accelerating establishment of timber plantation on community lands and state lands and enhancing sink through restoration of production forests ecosystem and land rehabilitation. **Fourth** is reducing pressure on natural forest through optimizing the use of land and improving land productivity. **Fifth** is issuing financing/incentive policies and development of financing system to support the four plans. The following sections describe briefly these four key policies and actions.

In the Strategic Plan of Ministry of Forestry for 2010-2014, Government of Indonesia targeted to establish 60 FMUs in 5 years (12 units per year). Following the emission reduction commitment, this target is doubled to 120 FMUs (24 units per year) as defined in the National Action Plan for Reducing GHG emission (Bappenas, 2011). However, with total number of 600 FMUs that needs to be established throughout Indonesia, the time required to complete the establishment of FMU all over Indonesia would be 25 years. Acceleration of the establishment of FMUs may be required. The use of Debt Nature Swap (DNS) scheme to accelerate the establishment of FMUs including the development of management capacity of the FMUs should be explored.

In the development of the FMU, concession holders (either on estate and plantation forest) located within FMU should be involved in developing FMU Long Term Management Plan. The existence of communities within the FMU should also be accommodated by coordinating sectors in reviewing forest area and conducting participatory mapping with community in delineating the area, assisting community to legally access the forest area and providing support for the community (accessing funding) in establishing forest-based economic activities. FMU should be given more authority in managing forest area. In this regards, FMU should take the form of BLUD (*Badan Layanan Umum Daerah*-Local Service Unit). To enable this, amendment of the BLUD regulation is required.

Introducing mandatory forest certification systems is expected to improve the management of forest resources by management units (*concessionaires*). However, the progress is still slow. Up to June 2011, only 230 certificates have been granted covering total area of about 19 million ha of the 32 million hectares. Most of the certificates also fall under poor category. To accelerate the adoption of these certification system, government of Indonesia needs to provide provision of incentive and disincentives for management units with good performance and bad performance (SFM and non-SFM units), and allowing non-SFM units to improve their performance by planning and conducting concrete actions within clear timeline to meet SFM. Development of carbon accounting system to evaluate the performance of the management units in minimizing forest degradation will also be required. In addition, the issuance of regulations which promote forest good behavior and reduce inefficiency of bureaucracy, encourage professionalism in forest management, push high responsibility of management units in using their given rights and authorities and implement improvement program in organization capacity and forest management skill including resolving land uncertainty issues (tenure and spatial layout), are also important to accelerate the achievement of SFM.

In reducing the dependency on natural forests for wood supply and enhancing sink, Government of Indonesia has pushed the establishment of timber plantation (HTI) through the use of severe degraded forest, promoted the restoration of production forest ecosystem and accelerated land rehabilitation programs. HTI is growing rapidly with total area more than 9.4 million hectares and targeted to grow to about 15.9 million hectares by 2030, however total area that have been planted is still less than 5 million hectares due to social problems, particularly land tenurial issues. Community forest management programs (CFM) does not show significant development even though the Ministry of Forestry has set up high target, i.e. 7.9 million hectares. Up to 2011, area that has been granted with licenses for CFM was only about 120 thousand hectares. Similarly, restoration of production forest ecosystem (IUPHHK-RE) also progress very slowly. At present, total area of are that have been granted with IUPPHK-RE was only 185,005 ha, while there are about 20 million hectares of production forest need to be restored. Program for sink enhancement through land rehabilitation programs (GERHAN) is also planned to be increased from 300 thousand to 580 thousands hectare per year. The program is expected to rehabilitate about 11.6 million ha f degraded land until 2030. However, the tree

survival rate of the GERHAN was still very low. Based on evaluation to 2006/07 GERHAN program implemented in West Java, the planted trees that can survive to form forest stand was only about 20%.

Reducing pressure on natural forest by optimizing land use, improving land productivity and community livelihood has also received serious attention from the Government of Indonesia. Some policies to support the program have been issued. Among others, the policies include (i) enforcement of plantation companies to engage community in their plantation as plasma farmers under Minister of Agriculture Regulation No. 26/Permentan/OT.140/2/2007, (ii) programs to support small holder farmers to improve crop productivity and (iii) changes of forest functions. Changing function of forested conversion forest to production forest, and non-forested production forest to conversion which later can be released for non-forest based activities (mainly for agriculture plantation) might reduce future deforestation.

To increase the successfulness of the above four key policies and actions, some incentive policies may need to be considered. These include (i) financing policies for the acceleration of FMU establishment, (ii) incentive policies for the certification system, (iii) financing and incentive policy for accelerating the establishment of timber plantation on degraded land and CFM for sink enhancement, and (iv) incentive and financing policies for conserving forest carbon and land swap (change of forest function to save forested land).

To accelerate the establishment of effective FMU, Ministry of Forestry may need to develop Roadmap on the Establishment of the all FMUs. Government of Indonesia may negotiate with donor countries to use Debt-Nature Swap (DNS) scheme to secure budget to support the establishment of the FMU. Roadmap for the establishment of FMU may include at least the following aspects (i) Development of criteria and indicator for prioritizing forest area for FMUs establishment, (ii) Strategy on FMU institutional capacity building, (iii) Development of strategic work plan of the FMU and (iv) Monitoring and evaluation system.

Incentive system for mandatory certification may also need to be expanded, particularly for small business entity. At present, government has provided support for small holder company via Government Budget (APBN) to cover the cost for certification. This subsidy is still not enough as the cost for producing one unit product from certified timber is still higher than the one used illegal ones. In this regards, the incentive[1] for small holder may need to increase so that the price of certified wood product can compete with the non-certified one. At the same time the awareness rising programs for community for consuming certified wood products have to be promoted. The subsidy can be gradually reduced when domestic market for certified wood products increases. This type of policy could be also negotiated for Debt Nature Swap program.

Incentive policies for accelerating timber plantation on degraded land and sink enhancement may need to consider land tenurial issues. In many cases, degraded lands granted to concessionaires are normally being used or claimed by communities. In this regards, government needs to create incentive system for permit holders in handling this land conflict problem and the types of the incentive may be varied depending on level of conflicts. The incentive could be in the form of reducing or exemption of administration/retribution fees for certain period of time. This type of incentive system may also need to be applied for encouraging private sector to apply for IUPHHK-RE.

[1] Incentive could also be given in form of direct inputs subsidy

For accelerating the CFM programs, government may need to simplify the process of getting permit and that of accessing fund from the BLU-P3H (General Service Agency providing financial supports for CFM). Policy allowing for transferring the funds to a financing system relatively easy to be accessed by community is required. Two types of financing systems that can be generated at regional level and may meet this need are 'Blending Financing and 'Hybrid Micro Financing systems'. Blending Financing System is a financing system that synergizes all financial sources such as CSR funding, government funding such as state budget (APBN) and local government budget (APBD) funds, banking and international funding. This system can help leverage private funding, and supports regional development by supporting community activities in urban agriculture and agro-forestry including building human resource capacity through assistance and training activities.

For encouraging forest carbon conservation and implementation of land swap, there are two types of incentive and financing policies that could be introduced. First is special allocation fund (Dana Alokasi Kusus, DAK) for conservation. This policy is incentive from National Government to Local Government that commit to conserve forest for environmental services. This policy will be accomodated in the revision of Act No. 33/2004. Second is fiscal balance law to enforcing "liability rule". At present, the fiscal balance law regulates the benefit sharing of natural resources extraction between national and local governments, as well as among local governments. The magnitude of sharing depends on the magnitude income come from the extraction of natural resources. The higher number of the natural resources extracted by certain region, the bigger benefit sharing received by the region. Revision of the existing fiscal balance law to be a more green fiscal balance is needed to avoid over exploitation and further destruction of natural resources in the regions.

2. Development of Reference Emission Level/Reference Level (REL/RL)

Development of Reference Emission Level/Reference Level (REL/RL) is a fundamental step in the implementation of SFM under the framework of REDD+. REL/RL is required for evaluating the performance of a party in reducing emission from deforestation and forest degradation. The incentive being rewarded to REDD participating countries will be based on the magnitude of reduction of the emission from the REL/RL. In the SB 28 decision, **Reference Emissions Levels** (REL) is developed based on historical data, taking into account, inter alia, trends, starting dates and the length of the reference period, availability and reliability of historical data, and other specific national circumstances. This decision indicates clearly that party to the UNFCCC can use specific national circumstances to define its REL, meaning that the approach for defining REL may vary between parties depending on the specific condition of the Party. This implies that the REL/RL established at sub-National level *may not need to be the same as that used at national level*. Therefore, negotiation process for defining REL/RL at sub-national level needs to be set up.

According to Decision 4/CP.5 regarding Methodological guidance for activities relating to REDD+ in developing countries, it is essential for Indonesia to improve its National Forest Inventory to be robust and transparent to produce reliable data required for the development of REL/RL. By having robust and transparent National Forest Information System and the results are available and suitable for review, REL developed by Indonesia can be recognized by the international community as basis to measure performance of Indonesia in implementing (REDD+). Following decision 1/CP.16 that developing country Parties should submit *biennial update reports* (BUR) containing updates of national greenhouse gas inventories, including a national inventory report and information on mitigation actions including needs and support received, the developed REL/RL may be reported under the BUR. The adoption of RLs will establish a measure of performance by quantifying emission reductions. Monitoring data would

be disclosed and submitted to the UNFCCC secretariat to record the progress of Indonesia in reducing emissions.

Government of Indonesia up to know has not officially declared its national reference emission level (REL) and an official document describing transparently approach and methodology, source of data including uncertainty assessment accessible by public is not available yet. Nevertheless, the Ministry of Forestry has conducted a series of consultation with local government in disseminating the National Reference Emission Level from Deforestation and estimation of reference emission level as well as amount of emission that need to be reduced to meet the 26% and 41% of emission reduction target (ERT) for each province. REL for each province has been developed based on historical emission. Using the historical emission may not be fair for regions (sub-national) that have low historical emission as their emissions are likely to exceed the historical rate in the future following their needs for more land. Therefore, applying the different approach for defining REL for all regions (sub-national) will be more appropriate for Indonesia.

In addition to REL/RL for deforestation, Government Indonesia also need to develop reference for forest degradation to measure effectiveness of the policies and action programs on forest management in reducing forest degradation and reference for sink enhancement to measure the effectiveness of the policies and program on land rehabilitation and reforestation including the use of degraded forests for timber plantation for increasing sinks. Data from forest certification systems involving on-the-ground auditing in combination with carbon stock data collected under the national forest inventory system is potential to be used for developing REL for forest degradation. Reference for sink-enhancement can also be developed using historical data on realization of land rehabilitation (GERHAN or RHL), CFM, and timber plantation establishment on degraded land. Efforts to improve the management of these data including system for quality assurance and quality control (QA/QC) should be prioritized as part of process for developing robust and transparent National Forest Information System.

3. Emission Reduction Potential and Socio-Economic Benefits from the implementation of SFM under the Framework of REDD+

Potential emission reduction resulted from the implementation of the policies and action plans in the period of 2012-2025 may reach 6.75 Gt CO_2 cumulatively. The potential emission can be achieved if all enabling conditions are in place. These include (i) FMUs being established can function effectively, (ii) lands for the implementation of sink enhancement are safe and conflict-free, (iii) good climate investment (e.g. consistency in policy and permit process, and credit access), and (iv) field facilitators/extension services for supporting community in implementing CFM available. Economic benefit gained from emission reduction depends on values of the carbon. Using price of about 5 USD/t CO_2, the potential benefit obtained from emission reduction may reach 30 billion USD. In addition to carbon, there are many other benefits that can be gained from the implementation of SFM under the framework of REDD, such as hydrology services, biodiversity, continuous supply of timbers and non-timber forest products etc. It is estimated that the economic benefit from carbon was only 18% of the total benefit.

4. Development of System for Measuring, Reporting and Verifying (MRV) GHG Emission Reduction

Establishment of a transparent and credible system to measure, report and verify (MRV) results of emission reduction from the implementation REDD+ strategy and actions is an important step for getting international recognition. Based on COP decision, important elements of the MRV are (i) national standards and best practice for measuring changes in forest covers and forest carbon stocks, (ii) governance, regulatory and quality assurance and quality control (QA/QC) of the MRV system at National and Sub-national level, (iii) entities responsible for the periodic calculation of the national and sub-national land-based emissions including determination of REL/RL, reporting performance results and data archiving system, (iv) synchronization of national efforts and international accreditation of MRV and independent verification and (v) registry system required for the technology, capacity building and funding that support the performance of REDD +.

Government of Indonesia through REDD+ Task Force has designed institutional framework of REDD+ MRV. Institutions and agencies responsible for conducting measurement and monitoring will not be new institutions as there are already a number of institutions implementing the measurement and monitoring the land and forest resources. The main issues that need to be addressed in developing the existing system for supporting the MRV system are (i) inconsistency in methodology used for measuring and monitoring land/forest cover change, (ii) no standardized land/forest cover classification, (iii) limited number of sampling plot, (iv) limited data accessibility, (v) database spread in many institutions, and (v) no systematic system for QA/QC. Ministry of Forestry with REDD+ Task Force may need to set up strategies and actions for addressing these issues.

5. Development of Safeguard Information System

Following the Decision 1/CP.16, developing country in the implementation of actions for REDD+ should develop safeguard information system (SIS). Safeguards are primarily designed to prevent harm in program implementation but can also support delivery of positive benefits and sustainable development goals. In Indonesian forestry sector, there are a number of policy instruments that are directly related to REDD safeguard which include Environmental impact assessment (AMDAL), Certification on SFM Performance Evaluation and Validity of Wood Legality, PGI (Partnership Governance Index), a comprehensive measure to evaluate democratic governance performance of province in Indonesia which include transparency, fairness, efficiency and effectiveness. Other instruments applied outside government include also available such as HCVF (High conservation value forest), FPIC (Free Prior Informed consent), SESA (Strategic Environmental and Social Safeguards Assessment) etc. Therefore, development of Information System for Safeguard REDD+ should be integrated and synergized with these existing systems as this will make REDD+ safeguard can be implemented effectively at various level and avoid cost that might be higher than the benefit gains from the REDD+. Based on assessment to indicators used in SFM/SVLK certification, there are compatibility between SFM/SVLK indicators and REDD+ MRV/safeguard components. However, some adjustments are needed to make the current certification system fully compatible with MRV and safeguard of REDD+.

6. Conclusion

Policies, strategies and actions for achieving sustainable forest management system in Indonesia are all in line with the REDD+ activities. Implementation of the strategies and actions has big potential for reducing the GHG emission. To gain international recognition on the

resulted emission reduction, Indonesia needs to define its reference emission levels, to have robust and transparent national forest monitoring system including system for providing information on how the safeguards are being addressed and respected throughout the implementation of the strategy and action plans. The existing forest database, institutional system for data collection and forest certification system are good assets to meet these requirements. However, these need further improvement.

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1 Introduction

1.1. Background

Managing forest resources in sustainable manner is responsibility of every nation to secure its long-term development. Improper management of this resource will lead to failure of the forest to provide sustainable goods and services for meeting our present and future needs. In reality, many nations particularly in the tropics and subtropics do not manage their forest resources. Indonesia as one of forested tropical country has lost its forest cover quite rapidly (FWI, 2011). In the period between 1990 and 2009, Indonesia has lost about 34.5 million ha (Kemenhut, 2012). The highest lost of forest occurred in the period of between 1996 and 2000, i.e. during the transition period from new order era (before 1999) to reformation era (after 1999) with deforestation rate of about 3.5 million hectares per year. During the reformation era, the rate of deforestation decreased substantially (Figure 1.1).

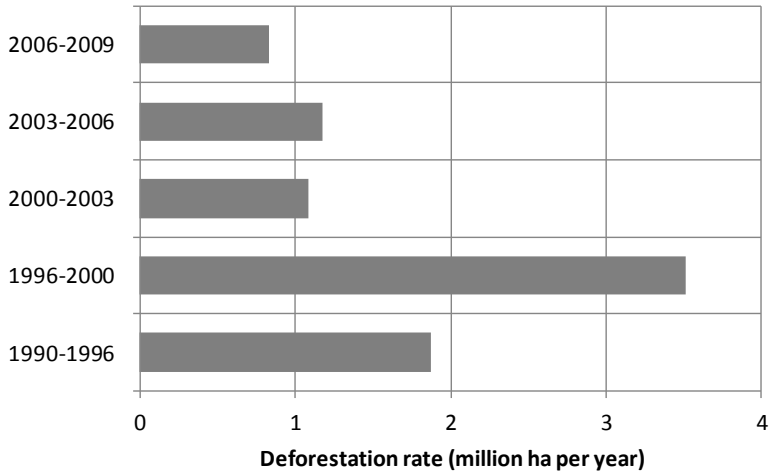

Figure 1.1. Rate of forest lost in the period of 1991-2009 (based on interpretation of Satellite Images of Landsat 7 ETM+, Kemenhut, 2012)

Deforestation and forest degradation occurred in all types of forest functions, i.e. production forest, convertible production forest, protection forest and conservation Forest. Production forest is aimed for timber and non-timber production. Convertible production forest (HPK) is designated to be used for non-forest based activities such as agriculture, settlement etc. Thus this forest can be converted later to non-forest area (APL). Protection forest is designated to serve life support system, maintain hydrological system, prevent of flood, erosion control, seawater intrusion, and maintain soil fertility. Meanwhile, conservation forest is designated for conservation purposes as defined in Act No. 5/1990 1 (Sanctuary Reserve area, Nature conservation, and Game Hunting Park). The highest

rate of deforestation occurred in production and convertible production forests. Among islands, the rapid decrease in forest area occurred in Sumatra and Kalimantan.

The main drivers of deforestation and degradation varied among islands. In the early 1980s, the main driver of deforestation in Sumatra was the development of settlement through transmigration program, while in Kalimantan it was mainly due to excessive timber harvesting (MoE, 2003). It is believed that logging is not responsible for the deforestation of Indonesian forest. However road network system developed during timber harvesting opened the access of community to the forest. The attractiveness of timber product to be harvested, high agriculture income and open access market, have increased the insecurity of the forest. Combination of high logging extraction coupled with community encroachment have caused high rate of forest degradation and deforestation. By 2009, the remaining forested land in Indonesia was about 52% and more than half of the forests are secondary forest with various level of degradation (Figure 1.2).

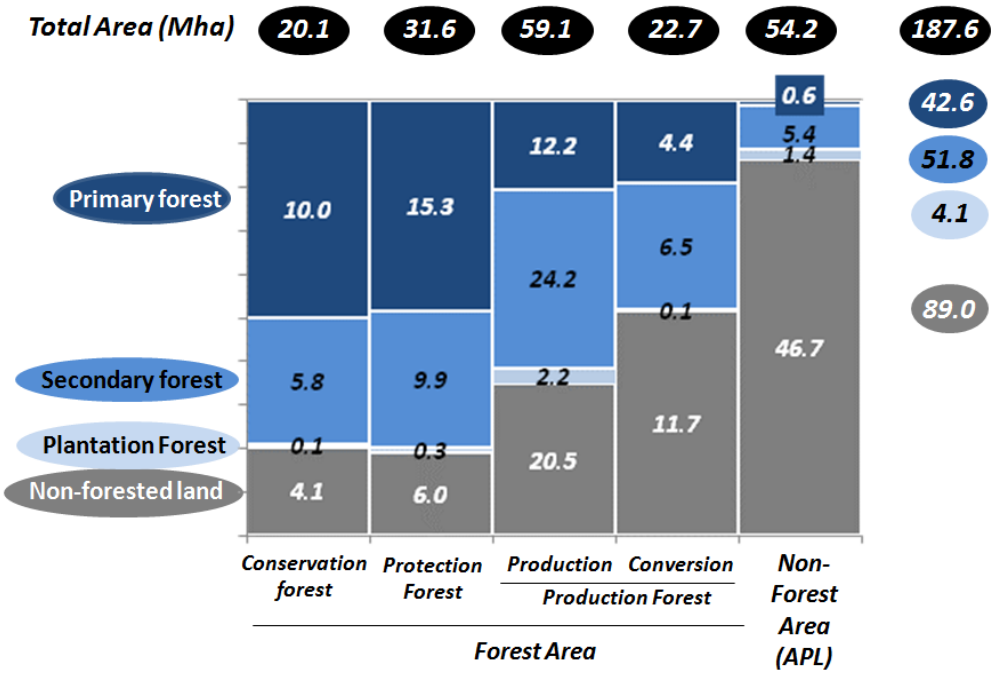

Figure 1.2. Area and condition of forest by forest function and in non-forest area (Based on data from Ditjenplan, 2011)

The consequences of shrinking forests on the global climate have been known. It contributes significantly to the increase of greenhouse gases (GHG) in the atmosphere. In the 2nd Indonesian National Communication to the UNFCCC (MoE, 2010), the GHG emission from land use change and forest (LUCF) including peatland from Indonesia was found to be the major contributor to the total national GHG emission. Between 2000 and 2005, the average annual emission from this sector was about 0.94 Gt CO2e (59% of the total national emission). Under the business as usual (BAU) practices, the emission from this sector will continue to increase and may reach 1.57 Gt CO2e by 2020. The share of this sector to the total national emission may decrease slightly to 53% as the contribution of the energy sector to the total emission will increase (Figure 1.3).

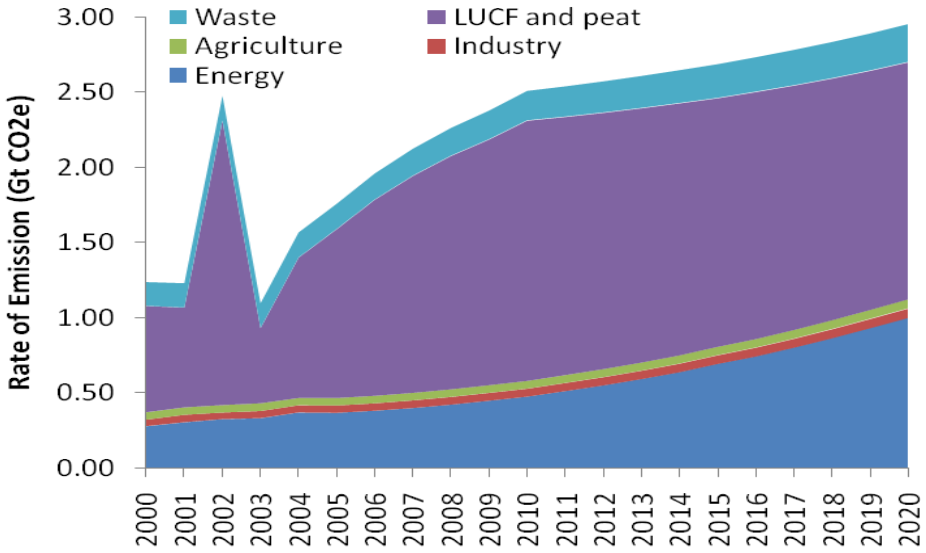

Figure 1.3. Historical and future projection of emission from all sectors in Indonesia (drawn based on MoE, 2010).

To support the world's commitment to mitigating climate change as agreed at the Bali COP under long cooperative action, the GOI in G-20 Pittsburgh and COP15 announced a non-binding emission reduction target (ERT) of 26 % below BAU levels by 2020 as part of its Unilateral National Appropriate Mitigation Actions (Unilateral NAMA) and an additional emission reduction target of 15% with support from developed countries (total 41%). The efforts to reduce the sectors' emission are started in 2011. LUCF (including peat) sector is expected to be the main contributor towards meeting the 26 percent ERT with the contribution of about 88% of the total target (Figure 1.4). This is equivalent to emission reduction of about 0.675 Gt CO2e for the 26% ERT or 1.064 Gt CO2e for the 41% ERT.

In this regards, Government of Indonesia has set up a number of new policies and regulations to as efforts to achieve sustainable forest management. This report reviews the policies and action plans for achieving sustainable forest management and at the same time reduce emission from deforestation and forest degradations, and increase the role of forest conservation and enhancement of forest carbon stock (REDD+).

1.2. Structure of the Report

In the past, forest management in Indonesia was focused only on the achievement of sustained timber yield. In the early 1990s, the paradigm of SFM has changed, i.e. promoting sustained yield principle. SFM emphasizes the need for balancing between sustained yield (timber and non-timber) and sustained social-environment. Thus in SFM, the management of forest must be able to manage various forest products (goods and services) to meet the people needs while social and environmental condition improves. A number of policies, regulations and programs have been issued by the government of Indonesia for improving its forest management. However the

effectiveness of the implementation of the policies, regulation and programs in reducing rate of deforestation and forest degradation has not met the expectation yet.

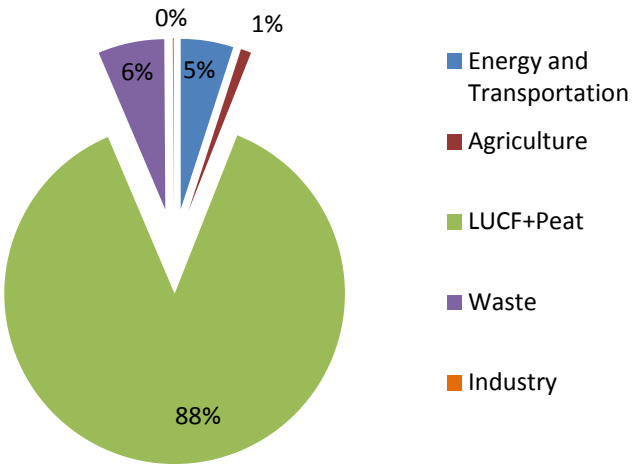

Figure 1.4. Expected share of each sector to the ERT (Drawn based on Appendices of President Regulation No. 61/ 2011 on National Action Plan for Reducing GHG Emission)

Following the commitment of reducing 26% of GHG emission from BAU by 2020, Government of Indonesia issued a number of policies, regulations and programs related to forest management which are expected to directly or indirectly contribute the reduction of its emissions. To gain international recognition on the efforts implemented by Indonesia in reducing its emission from deforestation and forest degradation (REDD) through the improvement of its forest management practices, Indonesia needs to follow international agreements on REDD+.

In Decision 1/CP.16, developing country Parties aiming to undertake the REDD+ activities are encouraged to develop four elements, in accordance with national circumstances and respective capabilities. The four elements are the following:

1. National strategy or action plan. Efforts to synchronize policies in all level as well as establishing appropriate regulation for real emission reduction are very important as forestry sector can not solely reduce its emission from land use change as there is interdependency with other sectors, such as agriculture, mining, public infrastructure and others.
2. National forest reference emission level (FREL) and/or forest reference level (FRL). These references will be needed to assess the achievement of the country in reducing their emission from the activities and also as a basis in defining the level of support or incentive.
3. Robust and transparent national forest monitoring system including reporting of the REDD+ activities. This system is required to measure and to report the effectiveness of the implementation of policy and action plans on emission reduction from the reference emission.

4. System for providing information on how the safeguards are being addressed and respected throughout the implementation of the REDD+ activities while respecting sovereignty.

Based on the above four elements and in line with the objectives of this assignment under the Activity 1.1 of the ITTO Red-PD 007/09 Rev. 2 (F), this report is divided into five main chapters as summarized in Figure 1.5. The main chapters are the following:

1. Review of a number of key policies and/or action plans related to forest management that will contribute directly or indirectly to the GHG emission reduction.
2. Review of progress made by Indonesia in the development of FREL/FRL and gaps.
3. GHG emission reduction potential and socio-economic benefits from the implementation of SFM under the framework of REDD+.
4. Development of system for measuring emission reduction, reporting and verifying (MRV) the resulted emission reduction and.
5. Development of Information system to safeguard the implementation of policies/action plans.

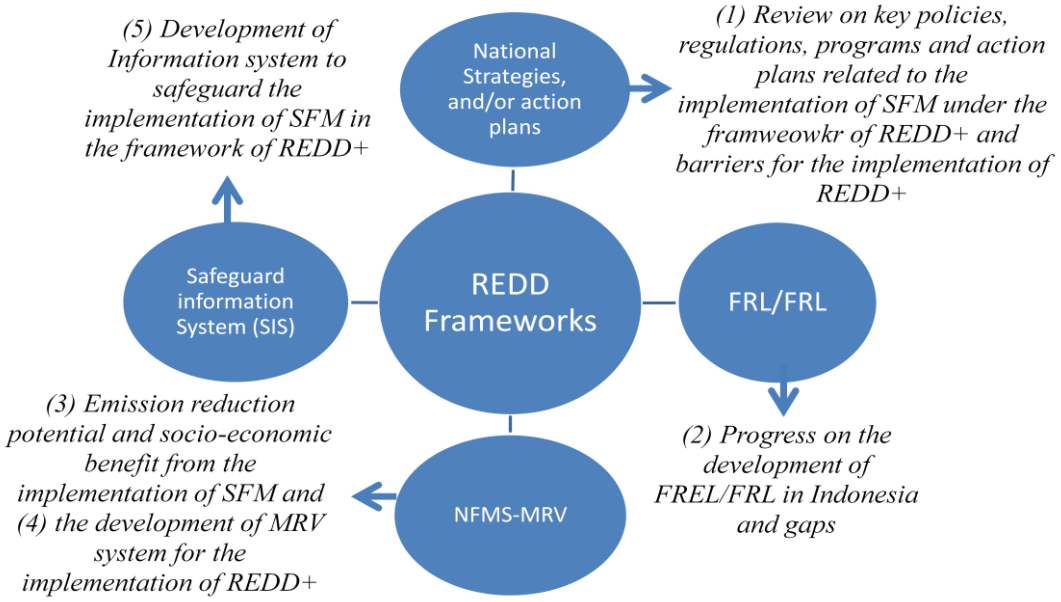

Figure 1.5. Four elements of REDD+ framework and scope of analysis

2 Key Policies on Forest Managements under the Framework of REDD+

2.1. Review of Indonesian Policies related to REDD+

In the last ten years, forestry faced considerable challenges which demand for refocus and reorientation of its policies. In responding to these challenges, Ministry of Forestry sector has set up five priority policies. The five policies include;

(1) Combating illegal logging and its associated illegal trade;

(2) Restructuring forestry industry and enhancement of timber plantation;

(3) Enhancement of forest rehabilitation and conservation programs;

(4) Improving of local communities livelihood and,

(5) Securing forest areas.

These five priority policies are expected to improve the management of forest resources in sustainable manner and to directly reduce the level of GHG emissions from the sector.

These five priority policies have been translated into long, medium and short term planning, i.e. Strategic Plan of Ministry of Forestry 2010-2014 (Kemenhut, 2010a), Road Map for the Revitalization of Forest Industry (Dephut, 2007), and the Five Year Forestry Plan. In the Five-Year Forestry Plan (2010-2014), the Ministry of Forestry has put priorities in the eight programs and one of the priority programs has specifically mentioned mitigation and adaptation to climate change. The eight priority programs include (Kemenhut, 2010a): (1) Strengthening forest designation to secure forest areas, (2) Rehabilitation of degraded forest and watershed, (3) Forest protection and fire management, (4) Conservation of biological diversity, (5) Revitalisation of forest utilisation and forest industries, (6) Empowerment of indigenous peoples and local communities, (7) Mitigation and adaptation to climate change, and (8) Strengthening forest institution.

Within the policy context, there are several regulations that either has existed or newly issued across sectors which will be contribute to sustainable forest management. The new spatial planning legislation in Act 26/2007 for example requires local government to progressively revise their spatial plans and to do Strategic Environmental Assessment [SEA] to improve framework of thinking in developing the spatial plan as mandated by the Act no. 32/2009. According to the spatial plan Act, principally the land-use management has to be implemented with environmental concepts and considering the optimal utilization.

Government regulation PP 6/2007 and its revision PP 3/2008 also provides a framework for licensing the use of forest land for a range of environmental services as well as timber products. Further these two regulations (PP 6 and PP 3) also accommodate a greater range of community interest through licenses for Community Plantation Forest (Hutan Tanaman Rakyat), Community Forest (Hutan Kemasyarakatan/HKM), and Customary Forest (Hutan Adat). There are many other policies and regulations that have been issued and indirectly support the implementation of REDD+ activities as presented in Table 2.1.

Table 2.1. Regulations directly or indirectly related to REDD implementation

			Connection to REDD+				
No	**Regulations**	**Programs**	**1**	**2**	**3**	**4**	**5**
1	Forestry Ministerial Decree: No. 4795/Kpts-II/2002	Sustainable Forest Management Certification (mandatory and voluntary)				√	
2	Forestry Ministerial Decree No. 663/Menhut-II/2009	Planting Movement in Indonesia or Gerakan Indonesia Menanam (79 million hectare)- initiated in Kemayoran					√
3	Forestry Ministerial Decree No. 188/419/Kpts/013/2008	Planting by women or "*gerakan wanita menanam*" (10 million)					√
4	P.20/Menhut- II/2009	One man one tree (Omot)					√
5	P.21/Menhut-II/2010	Planting of One Billion Indonesian Trees (Penanaman 1 Milyar Pohon)					√
6	Forestry Ministerial Decree No.349/Kpts-II/2003	GERHAN					√
7	P.25/Menhut-II/2010	Implementation of Land and Forest Rehabilitation					√
8	P.49/Menhut-II/2008	Partnership planting with community organization					√
9	Forestry Ministerial Decree No.20/Kpts-II/2001	Planting of 500,000 hectares/years					√
10	P.24/Menhut-II/2010	Guideline for the Implementation of seed nursery for community forest					√
11	P.18/Menhut-II/2004 and SK.159/Menhut-II/2004	Ecosystem Restoration in Production Forest		√			
12	(*President instruction*) Inpres 4/2005, Forestry Ministerial Decree No. 456/Menhut-VII/2004	Illegal logging		√			
13	P.13/Menhut-II/2009	HTI and HTR					√
14	P.52/Menhut-II/2009	FMU for National Park			√		
15	Forestry Ministerial Decree No. 4795/Kpts-II/2002	FMU (private and state owned-company)- The establishment of Industrial Plantation Forests, especially for the production of pulp for paper production (HPH and HTI)		√			√
16	Forestry Ministerial Decree No. 456/Menhut-VII/2004	Business Improvement Program for community living surrounds the forest	√	√			
17	P.23/Menhut-II/2007 & P.49/Menhut-II/2008	Corporate Social Responsibility of HTI **(**MHBM and Community Forest with Partnership program/*Hutan Rakyat Pola Kemitraan*)					√
18	Forestry Ministerial Decree No.37/Menhut-II/2007	*Program Bina Desa Hutan* (Forest village improvement program) by IUPHHK/HA		√		√	√
19	Forestry Ministerial Decree No. 456/Menhut-VII/2004	Community Empowerment Program surround IUPHHK HTI with partnership program (*Program Pemberdayaan Masyarakat di Sekitar Areal IUPHHK HTI melalui kemitraan*)		√		√	√

20	Forestry Ministerial Decree No. 622/Kpts II/1995 and No. 31/ 2001	Forest Community Program (*Program HKm*)				√	√
21	Forestry Ministerial Decree No.691/Kpts-II/1991	Program for Increasing the Economy of Local Community living surround conservation areas (*Program Peningkatan Ekonomi Masyarakat di Sekitar Kawasan Konservasi)*	√	√	√		
22	Forestry Ministerial Decree No. 456/Menhut-VII/2004	*Program pemantapan potensi SDA* (Program for nature resources security)					√
23	Surat edaran Direktur Jenderal Pengelolaan Hutan Produksi No. 274/VI-PHA/2001 tanggal 23 Februari 2001	Implementation of RIL		√		√	
24	Forestry Ministerial Decree No. 423/Menhut-II/2004	Peatland rehabilitation					√
25	Forestry Ministerial Decree No.121/Menhut-II/2007	The implementation of multisystem silviculture		√		√	
26	PP6/2006 and amended in PP3/2008	Timber Legality and Assurance System		√		√	
27	Forest Minister Regulation No. 19/2004	Collaborative Management of Protected Areas (*Kolaborasi Pengelolaan Kawasan Lindung)*	√	√	√		
28	Forestry Ministerial Decree No. 63/Menhut-II/2009	National Program for Strengthening Independent Community					√
29	Minstry of Environment Decree No. 3 Year 2006	Program Towards Green Indonesia *(Menuju Indonesia Hijau/MIH*)					√
30	Government Regulation (*Peraturan Pemerintah)* No. 3/2008	Implement land swaps where possible to retain high carbon value forest and peats while allocating alternative land for new plantation	√				
31	Act No. 32/2009	Restoration of peat land					√
32	Decree of Ministry of Forestry and Plantation No. 146 Year 1999	Land reclamation within forest estate					√
33	Decree of Ministry of Forestry and Plantation No. 146 Year 1999	Land rehabilitation and reclamation					√
34	Decree of Ministry of Forestry No. 47/Kpts-II/1998	Areas With Special Purposes) or *KDTI (Kawasan Dengan Tujuan Istimewa)*		√		√	√
35	Government Regulation (PP) No. 10/2010	Procedure for allotment and change of forest function	√				
36	Directorate General BPK has issued Regulation No. 03/2010	Guideline to sustainable forest management		√			

Note: 1: Deforestation, 2: Forest degradation, 3: Forest Conservation, 4: SFM and 5: Sink Enhancement

Other regulations directly issued for supporting the implementation of REDD+ are Ministry Forestry Regulation No. P.68/Menhut-II/2008 regarding the Establishment of Demonstration Activities for Reduced Carbon Emission from Deforestation and Forest Degradation, P.30/Menhut-II/2009 regarding Procedure for implementation of REDD and under P. 36/Menhut-II/2009 regarding procedures for Licensing of Commercial Utilization of Carbon Sequestration and/or Storage in

Production and Protected Forests, Presidential Instruction 10/2011 regarding New Permit Delays and Improving Governance Primary Forest and Peat Land.

The issuance of the policies and the regulations so far has not achieved the optimal impact on the improvement of forest management. There are a number of factors causing the sector failure in meeting the sustainable principles in managing the forest resources. The key factors include absence of management units in many parts of forest area, inadequate funding and human resources for the preparation, implementation and monitoring of forest management plans, disharmony among acts and regulations related to forest management (e.g. inconsistency between sustainable forest management principles and generating maximum income from natural resources extraction; Act 33/2004, Act 41/1999 and Act 32/2009), limited attention and concern of government and communities on services and environmental values of forest, and lack of law enforcement.

The following sections described briefly the key policies, programs and action plans considered to have direct impact on sustainable forest managements which lead to lower emission.

2.2. Key Policies and Action Plans for Sustainable Forest Management

Key policies and actions being implemented by Government of Indonesia in achieving sustainable forest management can be grouped into five different aspects. First is the improving institutional system for managing forest resources, through the establishment of forest management unit (FMU) in all forest areas. Second is introducing mandatory forest certification systems for limiting trading of illegal logs and pushing adoption of sustainable management practices in production forests. Third is reducing dependency on natural forests in meeting wood demands through accelerating establishment of timber plantation on community lands and state lands and enhancing sink through restoration of production forests ecosystem and land rehabilitation. Fourth is reducing pressure on natural forest through optimizing the use of land and improving land productivity. Fifth is issuing financing/incentive policies and development of financing system to support the four plans. The following sections describe briefly these four key policies and actions.

2.2.1. Forest Management Units (FMU)

Underlying causes of deforestation and forest degradation intermingle in complex processes, which are difficult to separate. This includes long drought period and characteristics of land that are rich in mineral resources but susceptible to fire interlink with management practices as well as political decision and economical considerations in the allocation of land uses, its utilizations and enforcement of rules. Keys to drivers of deforestation in Indonesia might originate from forestry sector and also from outside the forestry sector. They both intend to pursue the goal of national development in forms of economical growth, political stability as well as social equity and ecological sustainability. It is difficult to identify which key driver that come first and further stimulate the emergences of others. Some key drivers observed from current practices and have consequences on land use and land cover change are (i) forest fire, (ii) Logging, (iii) timber plantation, (iv) agriculture expansion, (v) mining, and (vi) political administration expansion.

Establishment of Forest Management Unit (FMU) at site level has been considered as a prioritized program for improving management of forest resources and controlling deforestation and

forest degradation. Nugroho et al. (2011) states that the urgency of FMU development especially outside Java[1] is driven by the fact that:

1. Intensive management of forest resource at site level is required as mandated by Act No. 41 Year 1999 on Forestry states that "All forests within the territory of the Republic of Indonesia , including natural resources contained therein is controlled by the State for the greatest prosperity of the people
2. Management of forest resources given to the private sector through the licensing mechanism for forest (IUPHH) has limited time and when it is over the forest area becomes unmanaged. In addition, nature of the transfer of rights to holders of the license also required close monitoring from government over the behavior of the license holders.
3. Many of investment for land and forest rehabilitation implemented in forest area (GERHAN) often fail as due to the absence of manager in the site who will manage the maintenance of the planted trees.
4. Programs for giving access to public in playing active role in managing forest resources such as Community-based Plantation Forest (HTR), Village Forest and Community Forestry (Hkm) are slowly realized, due to the absence of companion at the implementation level.

The term of FMU has actually been known since the issuance of Law No. 41/1999 on Forestry, later reaffirmed in PP No. 44 year 2004 on Forestry Planning, and PP No. 6 Year 2007 jo PP 3 Year 2008 concerning Forest Management Plan and Forest Utilization. Other regulations that link with the development of FMU are:

1. PP 38/2007 concerning Administration Sharing between Central, Province and District/Municipal Government.
2. PP 41/2007 concerning Local Government Offices Organization.
3. Forestry Ministry Decree (Permenhut) No. P. 6/Menhut-II/2009 concerning Forest Management Unit Development.
4. Forestry Ministry Decree (Permenhut) No. P. 6/Menhut-II/2010 concerning Norm, Standard, Procedure and Criteria of Forest Management for Protection Forest Management Unit and Production Forest Management Unit.
5. Minister of Domestic Affair's Decree (Permendagri) No. 61/2010 concerning Organization and Governance Rules for Protection Forest Management Unit and Production Forest Management Unit at Local Government Level.

According to PP. 6 / 2007 jo PP. 3 / 2008, duties and functions of the FMU are

1. Implementing management of forest resources which includes forest arrangement and management plan; utilization of forest area and resources; rehabilitation and reclamation of forest area, and protection and conservation of forest area.
2. Translating national, provincial, district/city forest policy to be implemented at site level.
3. Implementing forest management activities in the region starting from planning, organizing, implementing and monitoring and control.
4. Implementing the monitoring and the assessment of implementation forest management activities in its territory.
5. Opening investment opportunities to support the achievement of forest management objectives.

[1] FMU had already exist long before in all forest area in Java under the management of State Forest Company Perum Perhutani and called KPH (*Kesatuan Pemangku Hutan*)

Nurochmat (2011) recommended that the institutional forms of FMUs may not need to be homogenous across regions. They could be different depend on the specific characteristic of the regions (considering human resources, socio-economic, cultural, and/or physical characteristics). However, this will not be easy to be realized considering the fact that there is different contextual setting between Forestry Law 41/1999 and Regional Governance Law 22/1999 (then replaced by Law 32/2004). In the Forestry Law 41/1999, the formulation of FMU is deconcentration, while in the Regional Governance Law, the management of forest is placed as one of the authority shifted to the region called devolution. Therefore, the most realistic option for choosing the instition of FMU is delegation. Delegation is positioned in between deconcentration and devolution[2] (Figure 2.1).

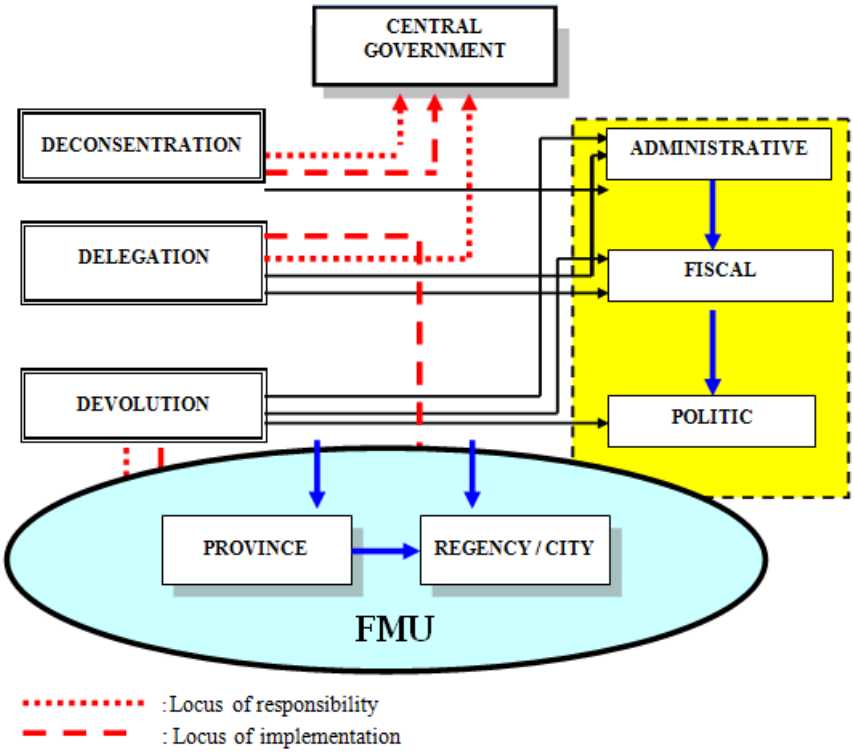

Figure 2.1. Alternative distribution of authority and scope of decentralization (Nurrochmat and Hasan, 2010).

The establishment of FMU will be done through the formation of FMU model. This model will be used as lesson ground to form effective and efficient FMU. At present, total number of FMU model which have been established are 53 units (Kementerian Kehutanan, 2011). Of all the FMU areas already established, only 15 FMUs already have management institutions, all of which are in the form of technical implementing units (UPTD) of the forestry service at provincial or regency level (Kartodihardjo et al., 2011). It appears that UPTD organizational structures may not be adequate to fulfill the basic tasks and functions of the FMU as a forest management agency. On the basis of Minister of Home Affairs Regulation No. 61/2010, to make the FMU organization accountable to the Governor or Regent, the UPTD need to be transformed into agency which is accountable to Governor or Regent, rather than to the head of the forestry service (Kartodihardjo et al., 2011). The

[2] Deconcentration is transfer of administration tasks to central officer in the region but decision making is still on central government, but the location is in the region. Devolution is "shifting power" power from central government to local government. Delegation is transfer of part of central government authorities to local government, but the implementation is still the responsibility of central government (Nurrochmat, 2011)

relationship between the FMU organization and the forestry service, other regional apparatus organizations, regional forestry agencies, and license holders, is developed based on the principles of coordination, integration and synchronization at the locus of an FMU area.

In total number of FMU that need to be established throughout Indonesia is about 600 units. In the Strategic Plan of Ministry of Forestry for 2010-2014, number of FMUs to be established per year was 12 units or 60 units in 5 years. Whereas in the National Action Plan for Reducing GHG emission (Appendix of Presidential Regulation 61/2011), within this period the target is increased to 120 units. With total number of 600 FMUs, the time required to complete the establishment of FMU all over Indonesia would be 25 years. In the Strategic Plan of Ministry of Forestry, the proposed budget for establishing one unit of FMU per year is about 6 billion USD. Based on discussion with Director of Forest and Water Resource Division of National Planning and Development Agency (BAPPENAS), each FMU can be allocated 6-8 billion IDR per year for 5 years. It is expected that within the 5 years, the FMU can play role and function effectively. However, so far the fund being allocated for development of one FMU is only 1.5 billion IDR considering capacity of human resources and managerial. Development of capacity of the human resources will become crucial for the acceleration of the establishment of the FMU.

Limited resources for the establishment of effective FMU is quite distinct in many regions. As an example is FMU Model for Production Forest (KPHP) at Lakitan, Musi Rawas District at South Sumatra Province which was form through Minister of Forest Decree No. 790 /2009 covering area of about 77 thousand hectare. Taking also into consideration the Minister of Domestic Affair's Decree (Permendagri) No. 61/2010, the Regent of the Musi Rawas District issued Regent's Regulation No. 27/2010 on the formulation of KPHP Lakitan's Organization, i.e. as a Local Technical Implementation Unit (Unit Pelaksana Teknis Daerah - UPTD) under the district's Forestry Office. The number of staff of the KPHP Lakitan is only five staffs consisting of one Head of KPHP, one head of its administrative division, and three staffs. This is far from enough to make the KPHP to become effective entity.

On the other hand, many of KPHP areas have also been occupied by communities and concessionaires. Based on data from MoF and BPS (2009 in Kartodihardjo et al., 2011), in 2008 there were about 9,808 villages in the forest land area where 38% in the protected forest area (HL), 17% in the forest-conservation (HK), 33% in production forest (HP) and 13% in convertible production forest (HPK). Due to the increase of population in the coming decades, without propel policies in addressing this issue, deforestation due to agriculture encroachment as well as forest degradation due to illegal logging may continue to increase. In the case of KPHP Lakitan for example, about 75% of the areas are already occupied. Thus the development of KPHP Lakitan should be emphasized on conflict resolution between parties utilize the land, including the community. Based on the discussion conducted by CER Indonesia team, some of key issues that need to be addressed by the FMU include (CER and CCAP, 2011):

1. Increasing number and enhancing capacity of human resources of FMU institutions
2. Creating FMU institutions that have more authority in managing forest area
3. Improving coordination between sectors in regions where FMU located to define area's boundary.
4. Involving concession holders (either on estate and plantation forest) located within FMU region in developing FMU Long Term Management Plan.
5. In FMUs where communities have already been occupied, there is a need to accommodate the existence of community inside forest area by (i) coordinating sectors in reviewing forest area and conducting participatory mapping with community in delineating the area, (ii) assisting community to legally access the forest area and providing support for the community (accessing funding) in establishing forest-based economic activities either though Community Forest Plantation (Hutan Tanaman Rakyat), Village forest (Hutan Desa) and Community Forestry (Hutan Kemasyarakatan).

In term of giving more authority to FMU, based on inputs from local stakeholders, FMU which currently is only authorized to manage state forest area should also be given authority to manage non-forest area (CER and CCAP, 2010). By giving this authority, FMU can assist in managing REDD activities both within and outside forest areas. FMU should take the form of BLUD (Badan Layanan Umum Daerah-Local Service Unit; see Box 1). Unfortunately, the current regulation on BLUD does not allow such an arrangement. To enable this, amendment of the BLUD regulation is required. This process will involve at least three ministries, i.e. Ministry of Domestic Affairs, Ministry of Forestry, and Agency for National Development Planning (BAPPENAS).

2.2.2. Forest Certification System

Unsustainable practices of forest management by Forest Concessionaires or the so-called "Hak Pengusahaan Hutan" (HPH), which is owned privately or managed under State Owned Enterprises or "Badan Usaha Milik Pemerintah" (BUMN) has caused severe degradation on Indonesian forests. Based on current wood industry capacity, timber production from natural forests is not enough and this has led to the increase in illegal logging activities. It is estimated that an additional supply of timber from illegal logging may be equal to that from the legal logging. The highest logging activities occurred in production forests (60%) and then in the protected forest (30%) and forest conservation (10%). The level of illegal logging is estimated to be very high in the non-concession forest area of production forests (Tim Pokja Kementrian Kehutanan, 2010).

In order to reduce illegal logging trading and to push application of sustainable forest management practices, Government of Indonesia has established Timber Legality Assurance System (TLAS) thought the issuance of Minister of Forest Regulation Number P.38/Menhut-II/2009 on Standard for Evaluating Performance of Implementation of Sustainable Production Forest Management (PK-PHPL) and Verification of Legality of Logs (SVLK). This regulation is then followed by the issuance of Directorate General of Production Forest Regulation Number P.06/VI-Set/2009 and P2/VI-Set/2010. The establishment of Timber Legality Assurance System (TLAS) was done by involving multi-stakeholders, i.e. in the process of developing standards for verifying legality of logs (SVLK) and institutional mechanisms. In TLAS, the assessment and verification was done by independent third party, i.e. Entity for Evaluation of Performance and Independent Verifier (LP and VI) accredited by National Accreditation Committee (KAN). Other independent third party such as Civil Society Organization and NGOs do the monitoring, i.e. for accommodating complaint from communities to the results of works from the LP and VI (Figure 2.2). With such process, TLAS will meet the good governance principles (transparency, accountability and participatory), credibility (do not include government institution) and representativeness.

As shown in Figure 2.2, PK-PHPL is mandatory for all permit holders in state forests and private forests (Hutan Milik) and SVLK is mandatory for all permit holders in state forests (IUPHHK-HA, IPPHHK-HT, IUPHHK-RE, HKm, and HTR), private forests (Hutan Rakyat or HR), and all upstream and downstream wood industries (IUIPHHK). In principle, permit holders who already have certificate of PHPL will not require to have SVLK. Validity of the certificate is only for 3 years and every year it subject to surveillance. Up to January 2011, total forest areas that have been granted for IUPHHK-HA, IUPHHK-HT and IUPHHK-RE were 24,877,255 ha, 9,393,535 ha and 185,005 ha respectively, HTR and HKm were 631,628 and 43,387 ha respectively (Pokja Kebijakan Kepmenhut, 2010). Total area of HR was about 1,570,315 ha (Rusolono and Tiryana, 2011).

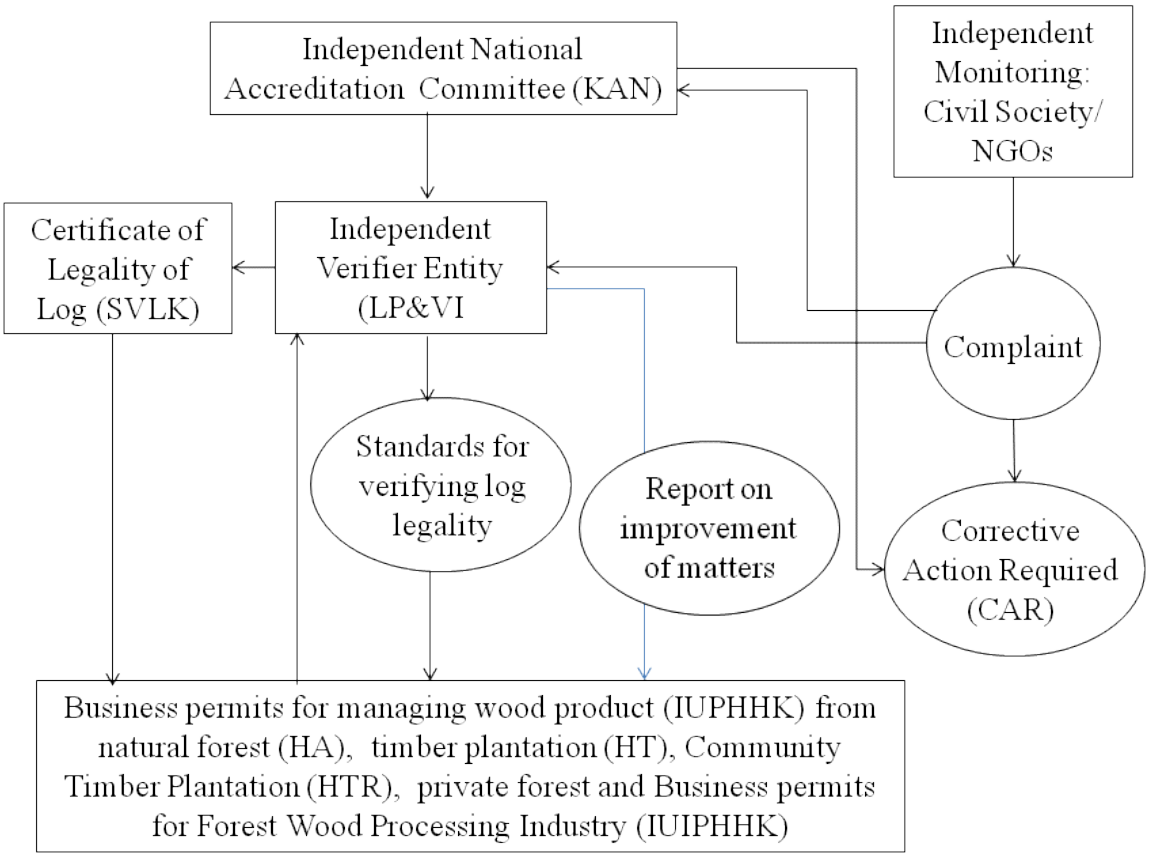

Figure 2.2. Framework of the Minister of Forest Regulation Number P.38/Menhut-II/2009

In addition to the mandatory certification, there are also some voluntary certification of SFM using standard Lembaga Ecolabelling Indonesia (LEI) Indonesia, Forest Stewardship Council (FSC), and some others. However, the progress of the implementation of certification is quite slow. Up to June 2011 total number of companies who already have mandatory certification of SFM was only 230 certificates covering total area of about 19 million ha and for voluntary certification were only 25 certificates (Table 2.2). According to Bahruni (2011) a number of factors that need attentions for accelerating the achievement of SFM are:

1. Governance and regulations which promote forest good behavior and reduce inefficiency of bureaucracy, encourage professionalism in forest management, push high responsibility of forest management units in using their given rights and authorities and implement improvement program in organization capacity and forest management skill including resolving land uncertainty issues (tenure and spatial layout).
2. Provision of incentive and disincentives for forest management units with good performance and bad performance (SFM and non-SFM units), and allowing non-SFM units to improve their performance by planning and conducting concrete actions within clear timeline to meet SFM.
3. Development of carbon accounting system to evaluate the performance of forest management units in minimizing forest degradation.

Nugroho et al. (2011) stated that the government may also need to revisit the SFM performance indicators used by forest management units that have different nature of activities, i.e. between management of forest resources (IPHHK-HA) and management of forest ecosystem (IUPHHK-RE). Different from IPHHK-HA, holders of IUPHHK-RE will have no cash inflow for a number

of years until forests are restored as the timber will be harvested after reaching the equilibrium of ecosystems (e.g. 35 years). Applying for the certification will increase the cost while the IUPHHK-RE holders are burdened with the obligation to pay various fees as apply to IUPHHKHA. It is understandable that none of IUPHHK-RE (restoration of ecosystem) holders apply for the mandatory certification.

Table 2.2. Number of companies who already have certification of SFM

Category	Total Concession Area (ha)[1]	Mandatory Certificates (up to June 2011)[2]		Voluntary Certificates (up to June 2011)[3]	
		Number	**Area (ha)**	**Number**	**Area (ha)**
IUPHHK-HA	22,710,256	140	14,225,443	5	834,452
- Very good-good	*na*	*31*	*3,449,955*	*na*	*na*
- Average	*na*	*35*	*3,307,789*	*na*	*na*
- Poor or expire	*na*	*74*	*7,467,699*	*na*	*na*
IUPHHK-HT	9,963,770	90	4,914,301	3	544,705
- Good	*na*	*19*	*2,499,280*	*na*	*na*
- Expire	*na*	*71*	*2,415,021*	*na*	*na*
HR	1,570,315	Na	na	17	242,931

Source: 1Ditjen BUK (2011), 2Bahruni (2011), and 3Rusolono and Tiryana (2011)

On the other hand, to conserve forest particularly forested land in forest area that have been released for non-forest based activities, Government of Indonesian also plan to apply mandatory certification system for palm oil called Indonesian Sustainable Palm Oil (ISPO). With this policy, all palm oil plantation companies will be obliged to conserve High Conservation Values (HCV) areas in their concession and to apply good practices in reducing GHG emissions. This policy is expected also to reduce deforestation. The ISPO will be officially effective as of March 2012 and it is targeted that all oil palm plantation companies will obtain the ISPO certificates by 2014. ISPO is launched to speed up the implementation of sustainable palm oil. ISPO is the same as existing sustainable standard RSPO (Roundtable Sustainable Palm Oil), the only different is that ISPO is compulsory while RSPO is voluntary. Companies that have been certified by RSPO can receive ISPO certification after fulfilling some additional criteria. The regulation of ISPO is define in Minister of Agriculture Regulation No. 19/Permentan/OT.140/3/2011. ISPO is a response of Government of Indonesia to meet increasing demand of market for sustainable and green products and participate in mitigating climate change.

The mandatory certification system may also be followed by other non-forest based activities that may directly affect forest resources such as mining. It has been well known that Indonesian forests store mineral deposits underneath which are needed to develop the country. Rights to use the resources are granted by the government through the scheme of 'pinjam pakai' or land leasing for certain period of time. Mining of the deposit starts by clear off not only woody biomass of the forest but also other biomasses stored underneath the soil. The activities produces high emission which will be difficult to restore them back as fertility of the soil will be gone. In many cases, most of forest areas left by the mining after the termination of its permit are under heavily degraded condition.

To ensure the implementation of sustainable management principles and community economic development in exploiting natural resources (including mining), Government of Indonesia is also in the process of drafting Government Regulation of Protecting Atmosphere Function (PP Perlindungan Fungsi Atmosphere) initiated by the Ministry of Environment (2012). With the issuance of this regulation, all entities obliged to have Environmental Impact Assessment (EIA) would be

request to also assess level of GHG emission released from their business activities if all related regulations to environmental management is well implemented. Once the level of GHG emission is defined and estimated, this level of emission will be treated as 'emission cap' of these entities. By knowing the volume of production and emission cap, each entity can produce amount of GHG release to produce one unit of its product. Introduction of an emissions cap for companies is very important to ensure the implementation of sustainable management principles. Companies that release more than the allowable emissions (emission cap) shall offset the excess.

2.2.3. Reduction of Dependency on Natural Forests for Wood Supply and Sink Enhancement

In meeting wood demand, Indonesia already has begun to issue Timber Forest Product Utilization License (TPFUL) since early 1970s, called as forest management right particularly for timber (forest concession or HPH). The highest number of concessions was in 1980 which is more than 500 units of concession with an area of 60 million hectares. After the enactment of Law No. 41 of 1999, forest concessions (HPH) renamed as IUPHHK. Until now, the number of holders of IUPHHK for natural forests (HA) is declining to only about 256 units IUPHHKHA. On the contrary IUPHHK for timber plantation (HT) increased from only a dozen units to 215 units by 2011 and community timber plantation (HTR) is also emerging with newly established plantation of about 0.63 million hectares involving more of 63 000 heads of households (HH).

HTI Management Unit is currently growing rapidly with total area more than 9.4 million hectares and targeted to grow to about 15.9 million hectares by 2030 (RKTN; Kemenhut, 2011). While community forest management (CFM) does not show significant development even though the Ministry of Forestry has set up high target (Table 2.3). So far IUPHHK-HTR that has been issued was only less than 100,000 hectares. Similarly both HKm and Village Forest also do not show significant improvement (Table 2.3). The schemes of HKm and HTR aim to revitalize the traditional wood-processing sector such as plywood and sawn-timber, in addition to increase the supply of raw materials for round-wood and paper and pulpwood industries. The program will enrich stock of carbon inside forest area by plantation activities done by smallholder farmers. It is expected by 2016 the plantations will meet its target to rehabilitate and improve productivity of degraded 5.4 million hectares of forest lands. Enrichment of carbon stock could be strengthened by investing the expansion of agroforestry system into the HKM and HTR schemes. On the other hand, private forest (Hutan Rakyat or HR) increased significantly only in Java, which is now reaching approximately 2.8 million hectares with production of about 6 million m3 timbers per year. HR will continue to expand along with the proliferation of timber processing industry.

Table 2.3. Target, allocation, verification and license issuance of Community Based Forestry up to 2010

Community Based Forestry Program	Target up to 2014 (Ha)	Allocation (Ha)	Verification (Ha)	License Issuance by Ministry of Forestry (Ha)	License Issuance by Governor/ Head of District (Ha)
Community Forestry (HKm)	2.000.000	400.000	203.573	80.181	**30.485,55**
Community Forest Plantation (HTR)	5.400.000	631.628			**90.414,89**
Forest Village (HD)	500.000	179.187	144.730	13.351	**10.310,00**
Total	**7.900.000**	**1.210.815**		**93.532**	**120.910,44**

Source: Sub-Direktorat HKm, HD dan HTR Kemenhut RI (2010)

For increasing carbon sequestration, Government of Indonesia has also implemented a number of programs for rehabilitating the degraded forest and lands. At present due to the unsustainable practices of forest management, about 57.52 million hectares of production forest have been degraded (Purnama & Daryanto 2006). The level of degradation can be categorized into four (Table 2.4). Production forests under category 2 and 3 are expected to be allocated for restoration of production forest ecosystem. Up to know, total area of degraded production forests that have been granted with IUPPHK-RE was only 185,005 ha. To increase the interest of private sector to invest in the restoration of production forest ecosystem (IUPHHK-RE), Government may need to revisit its policy and regulations as RE activity has different nature of activities with IPHHK-HA. An incentive system should also be introduced.

As previously mentioned, the holders of IUPHHK-RE may not have cash inflow for a number of years until forests are restored as the timber will be harvested after reaching the equilibrium of ecosystems (e.g. 35 years). On the other hand, before the business permit issued, they are burdened with the obligation to pay many fees as apply to IUPHHKHA. In most cases, the holders of IUPHHK-RE can survive as they received grants from foreign donors who request for preservation of the forest ecosystem. Nugroho et al (2011) recommended restructuring the regulations on forest ecosystem restoration by involving the managers of ecosystem restoration, government and society. First is that ecosystem restoration business is not profit-oriented business so that the treatments should be different from IUPHHKHA. Second, the current regulations PP. 3/2007 jo PP No.03/2008 and ministers regulations) should be revised to incorporate fundamental substantial changes, particularly on rights and obligations of license holders. Third is introducing incentives system for holders of IUPHHK-RE as they actually carry out government obligation in restoring, conserving and preserving forests that nearly have no beneficial products.

Table 2.4. Condition of Production Forest (Purnama & Daryanto 2006).

Category	Production Forest Condition	Area (million ha)
1	Production forests with good condition and now are still under management of concessionaires (IUPHHK-HA)	28.27
2	Production forests with relatively good condition and open access (no concessionaires operates in the area)	12.98
3	Production forest with medium level of degradation and open access (no concessionaires operates in the area)	7.14
4	Production forest with high level of degradation and have been allocated for establishment of timber plantation	9.13
TOTAL		57.52

Policy to prioritize the use of degraded forest for establishment of timber plantation will enhance sink as carbon stock of timber plantation is much higher than the degraded land and forest. In addition, government for many years has also implement program for rehabilitating lands in forest area (program reforestasi) and non-forest area (program penghijauan). In the last ten years, government of Indonesia has accelerated this program through GERHAN (Gerakan Rehabilitasi Lahan dan Hutan). In the period of between 2003 and 2008, total areas planted through GERHAN reached 1,767,559 ha or equivalent to about 300 thousand hectares per year, or almost double than those implemented before this period. In National Forestry Plan (RKTN; Kemenhut, 2011), it is estimated that total degraded land in forest area that need to be rehabilitated until 2030 is about 11.6 million ha. Therefore, rehabilitation of degraded land will be accelerated. Annually, it is targeted that at least 580 thousand hectare of degraded land are planted for rehabilitation.

Based on past experience in the implementation of the land rehabilitation program, it was found that the level of success of this program is still low due to lack of maintenance system (see Box

1) and no responsible management unit exists to maintain the planted trees. Without changing strategy in the implementation of GERHAN, the target being defined in the RKTN will not be achieved. For future program the targeted area for GERHAN should be implemented in area where the FMU already exist and whenever possible, its implementation should be integrated with CBFM program.

BOX 1
SURVIVAL RATE OF TREES UNDER GERHAN PROGRAM

Based on assessment conducted by an independent consultant, PT Equality Indonesia on GERHAN Program implemented in 2006/2007 at West Java Province, it was found that the planted trees that can survive and form forest stand was only 20% even the total area planted over 80% of the target. On average based on evaluation in 13 districts in West Java Province, realization of GERHAN program reached 84%, but the ones that survive were only about 53% (Note: *based on regulation from the Ministry of Forestry, the GERHAN program is considered to be successful if the survival rate over 56%, without considering the condition of the trees*). Further evaluation indicated that of the 53% the survived trees with healthy condition were only 42%. Based on this condition, number of trees that can survive until forest stand on average will be about 18% (0.84*0.53*0.42).

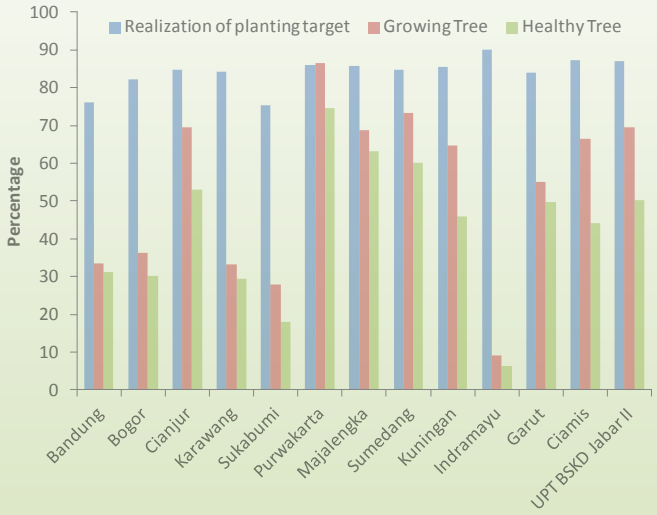

Figure 2.3. Percentage of realization of planting area, survive trees and healthy trees (analyzed from data of PT. Equality Indonesia, 2007)

Based on observation, implementation of GERHAN program in Java islands was relatively better than those outside Java. Considering these findings, it can be estimated that the level of success of GERHAN program may be around 20%. If there is no change in the implementation system of the GERHAN program, with average planting rate of about 300 thousand hectare per year, GERHAN areas which are able to form forest stand will be only 60 thousand hectare.

2.2.4. Reduction of Pressure on Natural Forest by Optimizing Land Use, Improving Land Productivity and Community Livelihood

In many regions, conversion of forest is mainly for agriculture activities either by community of by company. Community normally encroached to forest area illegally for planting annual crops or plantation, while company converted the forest to agriculture plantation after having permit. The encroachment occurred in all forest function, but mainly in production forests. Therefore, many of forest area are not covered by forest. On the other hand, Ministry of Forestry releases conversion forest to local government to be used for non forest based activities where part of the area is still covered by forest while the other part is already deforested and use by community. This condition often creates conflict between community and company when local government issued permit to a company to use the land for plantation. Local government normally leaves the problem to company to solve and this create high social cost for the company. When this problem is not properly handled by company, community will find new land and do encroachment again. In other case, communities expand their agriculture land through encroachment when their demand for land increases as the number of family increases. Looking at this condition, pressure on natural forest will continue if integrated efforts across related ministries and local governments are not in place.

Policies and potential programs that have been discussed and proposed by stakeholders in reducing threat on natural forests and deforestation include the following:

1. Enforcing plantation companies to engage community in their plantation as plasma farmers. Regulation on this is already available, i.e. Minister of Agriculture Regulation No. 26/Permentan/OT.140/2/2007 about Guidance on Permit for Agriculture Plantation. In this regulation every plantation company is obligued to establish plasma plantation at least 20% of the total plantation area. However, many companies have not met this obligation. Following the implementation of mandatory certification system for plantations such as ISPO for palm oil (see section 3), all companies is very likely to meet their obligation. In the case, where a company has already used all its land for plantation, the company will need to find land outside their plantation. If agriculture plantation commodities are allowed to be planted in forest area, this can be nicely integrated with community based forest management (CBFM) program such as Community Timber Plantation (HTR), Community Forest (HKm), Hutan Desa (Village Forest). At present, one of agriculture plantation commodity allowed to be planted in forest area is rubber tree, while palm oil is still not allowed. In South Sumatra, HTR program has been implemented in reforesting production forest area using rubber tree.

2. Supporting small holder farmer to improve crop productivity. Most of communities which occupy forest area for agriculture activities are poor farmers and has little knowledge in good agriculture practices. For example, based on discussion with farmers who occupy Kerinci Seblat National Park (KSNP) in South Sumatra, it was stated that community tended to expand their agriculture lands to meet food demand and income of their family as their family growing. By increasing crop productivity, the demand for land is expected to decrease (see Box 3). Creation of other alternative income for this community as well as their institutional capacity can increase the the effectiveness of this program in reducing pressure on the forest. Development of synergy or integration of community empowerment programs from various sector and private (CSR) would be needed to enhance the effectiveness of this program.

3. Changing forest function and optimizing the use of non-forested land for agriculture activities. As shown in Figure 1.2, more than 10 Mha of land in conversion forest are forested land, while about 20 Mha land in Production forests are non-forested land. In non-forest area, almost 7 Mha are forested land. Changing functions of forested

conversion forest to production forest, and non-forested production forest to conversion forest which later can be released for non-forest based activities (mainly for agriculture plantation) or swapping forested land in APL with non-forested conversion forest, would reduce future deforestation. Based on discussion with staff of Planning Agency at Central Kalimantan Province, swapping forested land in non-forest area with non-forested production forest will be very difficult. It is suggested that before this land-swap policy is applied, the status of non-forested production should be change first to conversion forest. Joint Minister Decree may be needed to implement this policy (Ministry of Forestry, Ministry of Internal Affair and National Land Agency). New direction on the utilization of forest area has been issued by the Ministry of Forestry in the RKTN (National Forestry Plan for 2011-2030) and this may need to be revisited if the policy is to be implemented. This land swap policy will also be potential to be integrated with mandatory certification and CFM programs. Obligation for agriculture plantation companies to develop plasma plantation with community with minimum area of about 20% of the total plantation may need additional lands. If agriculture plantation commodities are allowed to be planted in forest area, there is no need to change the status of forest function, and this program can be integrated with the CFM programs. Collaboration between Ministry of Forestry and Ministry of Agriculture is required to facilitate this program.

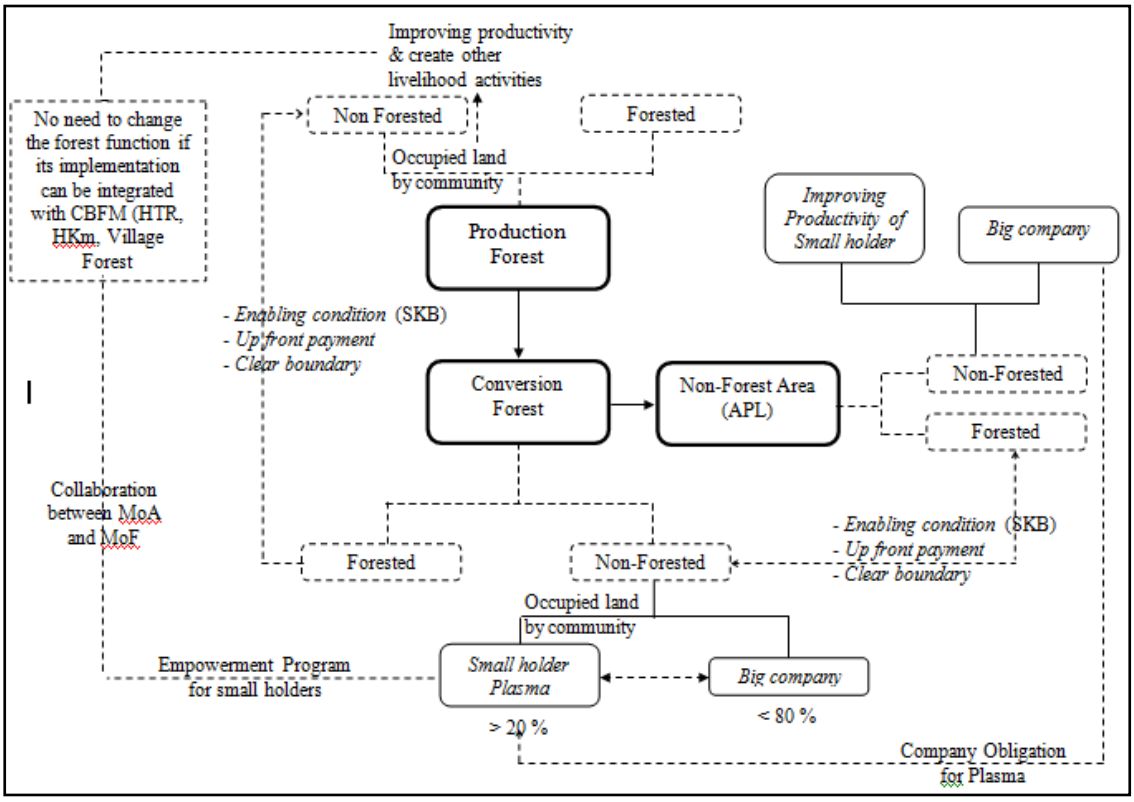

Figure 2.4. Process for implementation of policy and program for reducing threat on natural forest and rate of deforestation (modified from Boer et al., 2012)

BOX 2

REDUCING PRESSURE ON KERINCI SEBLAT NATIONAL PARK

Source: CER Indonesia and CCAP (2011)

Kerinci Seblat National Park (KSNP) is one of is a part of the Bukit Barisan Mountain Range, stretching north to south along Sumatra Island. The park's location makes KSNP one of the richest conservation areas in terms of biodiversity. However, KSNP is under great threat of deforestation and forest degradation. A number of square kilometers of forest have been lost annually in the national park, severely reducing the natural environment for animals and other forest dwelling life. The main drivers of deforestation and forest degradation in KSNP are encroachment by the community for agricultural activities, illegal logging, and fires (Figure 2.5).

Figure 2.5. (a) Slash and Burn Activity in KSNP, (b): Agricultural Land inside KSNP

Most of the villagers surrounding KSNP are involved in agricultural activities such as rubber and coffee production. Each household has 1 to 25 ha of land for agriculture; although illegal, some of this is done inside the KSNP area. Villagers enter the park because they need a large amount of land for agriculture. The productivity of coffee is very low, i.e. only 0.4 ton/ha or about one twentieth of normal yield (6-10 ton/ha). By increasing productivity of the crop just up to 4 t/ha will reduce the demand for land by ten times from the usual one. At least there are four programs that can be implemented for improving communities' agriculture practices, namely (i) improving seed quality as the usual practices community get seed from forest or from their garden, (ii) improving maintenance and inputs as the usual practices do not use fertilizer, and no regular weeding and spraying, (iii) improving timing for harvesting to improve quality of coffee as in usual practices farmers tends to harvest the coffee before it gets mature, and (iv) improving post harvest management.

By enhancing capacity of farmer for improving agriculture practices could increase productivity and their income, and thereby reduce the demand for land. This can be expected to reduce deforestation in KSNP. Strong assistance for the community will be essential to maintain KSNP.

2.2.5. Financing and Incentive Policies for Supporting the Implementation of SFM and REDD+

To support the implementation of the above four key policies and actions, there are a number of financing and incentive policies that may need to be considered. These include (i) financing policies for the acceleration of FMU establishment, (ii) incentive policies for the certification system, (iii) financing and incentive policy for accelerating the establishment of timber plantation on

degraded land and CFM for sink enhancement, and (iv) incentive and financing policies for conserving forest carbon and land swap.

2.2.5.1 Financial Policy for Development of FMUs

As discussed above, total number of FMUs that need to be established in Indonesia is about 600 units. Following target defined in the National Action Plan for Reducing GHG emission (Appendix President Regulation 61/2011) within 5 years (2010-2014), total FMUs will be established is 120 units. With total number of 600 FMUs, the time required to complete the establishment of FMU all over Indonesia would be 25 years. It is long process, with assumption that rate of deforestation in the future under the absence of FMUs follow historical rate, within the next 25 years, about 25 Mha of forest may be lost. Following Bappenas's assumption that the cost for establishing an FMU with self funded capacity is 40 billion IDR (five years) total cost required for the 600 units will be about 24 trillion IDR or 2.7 billion USD. Considering that this program will be a key for the success of REDD+, acceleration of FMUs establishment is necessary. Clear Roadmap on the Establishment of the all FMUs should be developed with secure budget. Government of Indonesia may negotiate with donor countries to use Debt-Nature Swap (DNS) scheme to secure budget to support the establishment of the FMU.

Roadmap for the establishment of FMU may include at least the following aspects (i) Development of criteria and indicator for prioritizing forest area for FMUs establishment, (ii) Strategy on FMU institutional capacity building, (iii) Development of strategic work plan of the FMU and (iv) Monitoring and evaluation system. The first aspect is very important to develop as level of risk and problems vary across regions. The availability of criteria and indicator will help the government in putting priority where FMU should be first established and ensure the presence of FMU will have significant impact on the improvement of performance in forest management or keep good forest management system to continue. The second aspect refers to steps of actions that would be implemented in developing capacity of the FMU organization. The third aspect refers to readiness of the FMU to carry out its role and function and the fourth aspect refer to development of system to monitor and evaluate the performance of the FMU which will be needed for the development of improvement plan of the FMU. Kartodihardjo et al. (2011) proposed at least eight criteria for evaluating the FMU development performance, namely: (1) area stability, (2) forest use planning, (3) management plan, (4) organizational capacity, (5) inter-strata relations within government and regulations, (6) investment mechanism, (7) availability of access and community rights, and (8) forestry dispute settlement mechanism. In each typology indicators need to be developed for these criteria.

In term of FMU organization capacity, capacity development should enable the FMU to be forestry professionalism and able (i) to perform management that can produce economic value from forest utilization that is balanced with the conservation, protection, and social functions of the forest, (ii) to develop investments and provide work opportunities, (iii) to prepare spatial-based planning and monitoring/evaluation, (iv) to protect forest interests (including the public interest in the forest), (v) to respond to the range of local, national and global forest management impacts (for example: the forest's role in mitigating global climate change, and (vi) to adjust to local conditions/typology as well as strategic environmental changes affecting forest management (Kartodihardjo et al., 2011).

2.2.5.2 Incentive System for Certification

As discussed above, Government of Indonesia has issued a number of mandatory certification systems. These mandatory certification systems as mentioned previously are applied for all forest management/business entities (from large to small scale), namely IUPHHK-HA, IUPHHK-HT, IUPHHK-

RE and Community Forest Management (CFM)[3] namely HTR and HKm (with permit utilization) and or Village Forest/Adat Forest (with management rights), and Hutan Rakyat (Private Forest, forest management on a land owned) as well as wood industries. For Community Based-Forest Management entities, obligation for doing certification may add burden as this will increase cost of production. On the other hand, some also argued the effectiveness of applying mandatory forest certification system, such as SFM/SVLK, in reducing illegal logging may also not be significant as the certified company only able to manage the illegal activities within its company site, while market for illegal wood still exist.

Applying same rules for IUPHHK-RE (ecosystem restoration) as applied to other wood business forest activities in certification process may also be contra-productive. In the IUPHHK-RE, forest management units (concessionaires) are not allowed to do wood logging until forest reaches equilibrium conditions (may take time for about 35 years). Thus in the short term, the will be non cash inflow to the concessionaires. While at present, treatments in term of fee and procedure for getting the permit (IUPHHK-RE) are similar to IUPHHK-HA (HPH) and IUPHHK-HT (timber plantation) as well as obligation for having certification. Without changing this policy, interest of private to do investment for production forest ecosystem restoration will be very low. Based on data from Purnama & Daryanto (2006), there are more than 10 million ha of production forest are suitable for IUPHHK-RE while until now total area of degraded production forests granted with IUPPHK-RE was only 185,005 ha.

Another mandatory certification system for agriculture plantation such ISPO which will oblige plantation companies to develop plasma farmer with minimum area of 20% of the total area of the plantation will also face dilemma. For new plantation may not be difficult to establish such plasma, however for old plantation this will be difficult as all their plantation area already planted. The only alternative ways is to find additional lands to be used for plasma (see section 2.2.4). This will be very costly if no support mechanism from government.

Considering the above dilemma, incentive system for certification may need to be expanded. Some of potential incentive policies in supporting the mandatory certification system may include the following:

1. Expanding type of incentive for small business entity in getting certification. In the context of SVLK, program for increasing awareness of community on the importance of using certified wood product for saving environment should be progressively implemented. In reality, many wood consumers in developing nations do not care too much on this issue, the consumer are more interested in buying cheaper products. Based on discussion with stakeholder in East Java, price of illegal wood could be half of that the legal ones, so that wood products produced from these will be much cheaper. At present, government has provided support for small holder company via Government Budget (APBN) to cover the cost for certification. This subsidy is still not enough as the cost for producing one unit product from certified timber is still higher than the one used illegal ones. In this regards, the incentive[4] for small holder may need to increase so that the price of certified wood product can compete with the non-certified one. At the same time the awareness rising programs for community for consuming certified wood products have to be promoted. The subsidy can be gradually reduced when domestic market for certified wood products increases. This type of policy could be also negotiated for Debt Nature Swap program.

[3] Community Forest Management (CFM) combines two things: a type of resource (forest) and a group of owner/manager (community). CFM term broadly for referring into a various different forms: Participatory Forest Management (PFM), Joint Forest Management (JFM), joint forest management (forest co-management), and Community-based Forest Management (CBFM).

[4] Incentive could also be given in form of direct inputs subsidy

2. Providing subsidy for business entities focusing on ecosystem restoration in having the mandatory certification.
3. Providing incentive for plantation companies in getting lands for plasma farmers as support for the company in meeting certification obligations. Implementation of this policy could be integrated with CFM programs (see Figure 2.3).

2.2.5.3 Incentive and Financial Policy for Accelerating the Establishment of Timber Plantation on Degraded Land and CFM for Sink Enhancement

Many of degraded lands and abandoned degraded in forest area are claimed by community. When permit for using the land have been granted to an entity, conflict on the land normally emerge between the entity and the communities. For this reason, private entities is in preferable to use forested land in forest area for timber plantation as these areas normally have no or less conflict (not community claim on the land). Ideally, government should issue permit on safe and conflict-free forest areas. However, in most cases this is not the case and the permit holders have to solve this land conflict problem. Level of conflict varies between regions, and social cost that have to be covered by the permits holder in the establishment of plantation will also vary. To high social cost prevent the permit holders to establish plantation. In this regards, government needs to create incentive system for permit holders in handling this land conflict problem and the types of the incentive may be varied depending on level of conflicts. The incentive could be in the form of reducing or exemption of administration/retribution fees for certain period of time. With this incentive policy establishment of timber plantation in degraded land can be accelerated and the dependency on natural forest for supplying wood will also reduce.

In managing the land conflict issue, the MoF also implements CFM program. The program gives access and right to communities to use the forest area or formalize/legalize the use of the land by the community. The communities have to apply for getting the permits (HTR, HKm, Village and Adat Forests). However process for getting the permits is too complex for communities and it is also lengthy process. Without any assistance from their partners, communities are mostly unable to have the permits. Financial support from government to communities in implementing the CFM is also available via BLU-P3H (General Service Agency). Amount of funding available for supporting the CFM is also huge, i.e. over a billion of USD. However the absorption of fund is also very low, less than 1%. Simplifying the process of getting permit and accessing fund from the BLU-P3H will also be crucial for accelerating the implementation of the CFM. As mentioned above, up to know the realization of the CFM program is far from target (see Table 2.3).

Acceleration of the ecosystem restoration program which will have significant contribution to sink enhancement also need incentive from government. Incentive in form of reducing administration/retribution fees for certain period or exemption from some of administration/retribution fees is recommended.

2.2.5.4 Incentive and Financial policies for Conserving Forest Carbon and Land Swap

Implementation of land swap policies and exchange of forest functions in order to avoid deforestation (conserving carbon stock in forest) will need incentive and financial policy supports. Nurrohmat (2011) proposed a number of incentive and financial policy for supporting local government in implementing the policies. These include:

1. Finanial policy on special allocation fund (Dana Alokasi Kusus, DAK) for conservation. This policy is an incentive from National Government to Local Government that commits to conserve forest for environmental services. Special allocation fund given to the conservation region should compensate the benefit loss coming from natural resources

extraction or forest land conversion (conversion value). Ministry of Finance plan to accommodate this in revision of Act No. 33/2004 (Ministry of Finance, 2011).

2. Revision of fiscal balance law to enforcing "liability rule". The present fiscal balance law regulates the benefit sharing of natural resources extraction between national and local governments, as well as among local governments. The magnitude of sharing depends on the magnitude income come from the extraction of natural resources. In this case, the higher number of the natural resources extracted by certain region, the bigger benefit sharing received by the region. Revision of the existing fiscal balance law to be a more green fiscal balance is needed to avoid over exploitation and further destruction of natural resources in the regions due to short-term economic interest. A green fiscal balance shall give a proportional attention both in the reward side and in the punishment side to ensure the sustainability of nature resources management.

From above discussion, it is quite clear that the issue of forest boundary (safe and conflict-free forest areas) and policy on the issuance of permit on the use forest area are two factors that will contribute to the achievement of SFM and REDD+ implementation. Development of boundaries between non-forest and forest areas needs acceleration. In regards with the forest boundary issues, Kemenhut (2011) reported that up to 2010 length of boundary between forest and non-forest area and between forest functions reach 281,873 km covering area of about 14,238,516 Ha or about 10% of total forest area of Indonesia. This condition is considered as one of important factor causing conflict of land right and access in all provinces. At present there are about 22.5-24.4 Mha of forest area in conflict and number of villages within forest area reach 19,420 villages (Dephut and BPS, 2009 in Kartodihardjo et al., 2011).

The cost of developing forest boundary is quite expensive. Following the regulation from the MoF, cost for changing forest functions which include developing forest boundary is 3.4 billion IDR per 12,000 ha. To reduce the cost, the process of the development of the forest boundary could be integrated with the development of FMU and conducted through participatory mapping process. In line with recommendation from Kartodihardjo et al. (2011), in addressing this boundary issue in connection with FMU establishment, there are several strategic directives that should be adopted depending on conditions in the FMU. These directive include

1. Localization of all areas that have serious tenurial conflict into areas of non-effective production as a transitional policy, and gradually building a collaboration to optimize achievement of sustainable forest management objectives.
2. Development of micro spatial arrangements together with the community in order to reach mutual agreement with the community on the utilization norms for each spatial function.
3. Recommendation of legal settlement through the mechanism of revising the spatial arrangements in areas with serious tenurial conflict that is unlikely to be retained as forest areas.
4. Accommodation of community access to forest resources by re-arranging the norms for utilizing such resources in accordance with sustainability principles.
5. Development of a mechanism for recognizing community management rights in areas of serious/minor tenurial conflict in the context of sustainable forest management. This mechanism serves as the basis for FMU managers to prepare licensing recommendations for communities
6. Engagement of law enforcement for all issues relating to illegal activities.

Another important key factor for achieving SFM is availability and accessibility of funds for supporting SFM practices, particularly for engagement of communities in CFM. With the current system, the available fund to support CFM managed by the BLU-P3H as discussed above is not easily

accessed by community due to the administration procedure. Policy allowing for transferring the funds to a financing system relatively easy to be accessed by community is required. Two types of financing systems that can be generated at regional level and may meet this need are 'Blending Financing and 'Hybrid Micro Financing systems' (CER Indonesia and CCAP 2010). Blending Financing System is a financing system that synergizes all financial sources such as CSR funding, government funding such as state budget (APBN) and local government budget (APBD) funds, banking and international funding. This system can help leverage private funding, and supports regional development by supporting community activities in urban agriculture and agro-forestry including building human resource capacity through assistance and training activities.

Unlike the Blending Financing model, the Hybrid Micro Financing system will utilize more government funds than private funds. Funding to support CFM (HTR, HKm, HD/HAd), which is currently managed by BLU-P3H would be part of this financing system. In this system, government funds can be accessed by communities as capital fund assistance in the form of business credit. This system will require credit assurance institutions (LPKD – Local Credit Assurance Institution). The LPKD will provide government guarantees to banks so that if farmers are unable to pay on time, the LPKD will cover the credit and the farmers would pay later following rules as stated in Presidential Regulation No. 2/2008. This credit assurance institution has been developed in a few regions. The presence of this credit assurance institution is expected to support small to medium scale community business investments. Figure 2.4 presents the structure of the financing models and the connection with CSR and FMU. In the context of REDD+, both Blending Financing and Hybrid Micro Financing systems should provide positive incentives (low interest, tax deduction, concessional investment, etc.) for communities who propose activities that result in emissions reductions from deforestation and degradation, conserving forest carbon, sustainable forest management practices and sink enhancement.

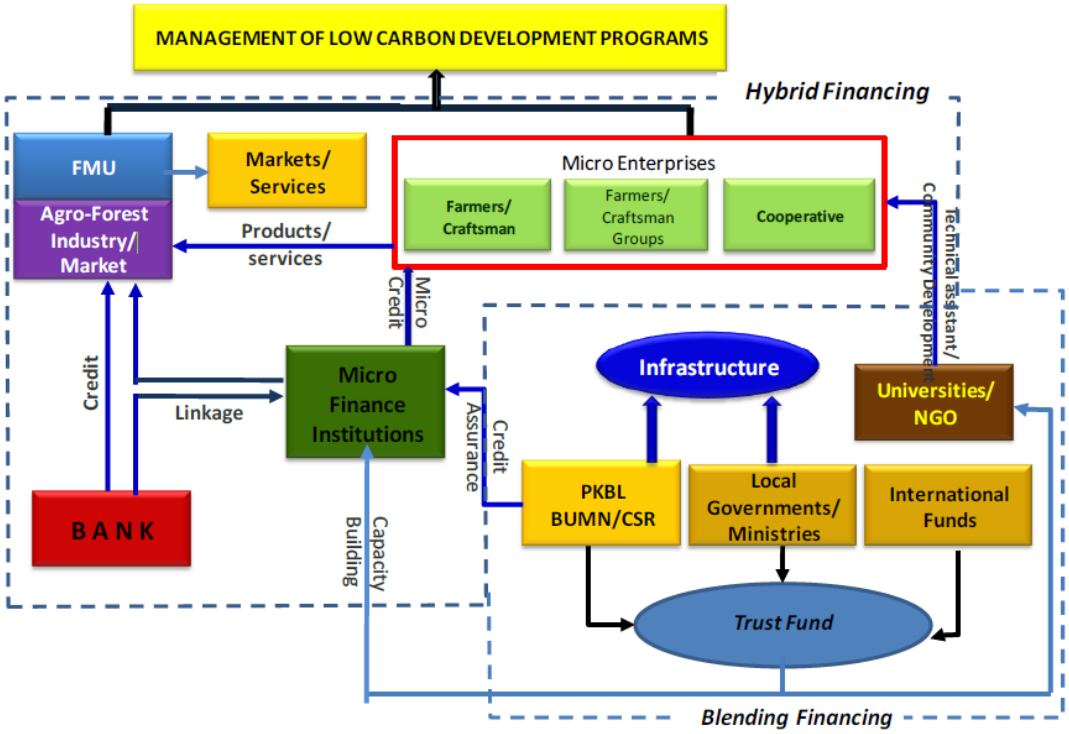

Figure 2.6. Structure of Financing Systems to Support Low Carbon Development (SFM and REDD+)

3 Development of Reference Emission Level/Reference Level (REL/RL)

3.1. Basic Concept and COP Decisions on REL/RL

Measuring emission reductions from deforestation and degradation as a result of implementing policy and action plans requires developing a reference scenario, or baseline, against which future emissions can be compared. Terminology for defining baseline for REDD is commonly called as reference emission level (REL) while for REDD+ called as reference level (RL)[5]. Thus REL/RL is a fundamental step in evaluating the performance of a party in reducing emission from deforestation and forest degradation. The incentive being rewarded to REDD participating countries will be based on the magnitude of reduction of the emission from the REL. Thus the REL is level of emission that would occur in the future when no incentive system for reducing the emission from deforestation and forest degradation or no incentive from a "REDD" mechanism. REL does not necessarily refer to a continuation of the current emission into the future it simply draws a distinction between what would happen in a world without an incentive and a world with an incentive.

In the SB 28 decision describes Reference Emissions Levels (REL) as "Means to establish reference emission levels, based on historical data, taking into account, inter alia, trends, starting dates and the length of the reference period, availability and reliability of historical data, and other specific national circumstances". This decision indicates clearly that party to the UNFCCC can use specific national circumstances to define its REL, meaning that the approach for defining REL may vary between parties depending on the specific condition of the Party. In addition, historical information used as basis for projecting future emission under the absence of REDD+ policy should be reliable and meet certain level of accuracy.

In Decision 4/CP.5 regarding Methodological guidance for activities relating to REDD+ in developing countries, it is stated that developing countries who will implement REDD+ are required to establish, according to national circumstances and capabilities, a robust and transparent national forest monitoring systems and, if appropriate, sub-national systems as part of national monitoring systems. The monitoring system should:

(i) Use a combination of remote sensing and ground-based forest carbon inventory approaches for estimating, as appropriate, anthropogenic forest-related greenhouse gas emissions by sources and removals by sinks, forest carbon stocks and forest area changes;

(ii) Provide estimates that are transparent, consistent, as far as possible accurate, and that reduce uncertainties, taking into account national capabilities and capacities;

(iii) Are transparent and their results are available and suitable for review as agreed by the Conference of the Parties.

Thus, it is essential for Indonesia to improve its National Forest Inventory to be robust and transparent to produce reliable data required for the development of REL/RL. By having robust and

[5] In the current text of COP decision, the Reference Emission Level/Reference Level (REL/RL) has been changed to Forest Reference Emission Level (FREL)/Forest Reference Level (RFL)

transparent National Forest Information System and the results are available and suitable for review, REL developed by Indonesia can be recognized by the international community as basis to measure performance of Indonesia in reducing its emission from deforestation and forest degradation in developing countries, and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks (REDD+). Following decision 1/CP.16 that developing country Parties should submit biennial update reports (BUR) containing updates of national greenhouse gas inventories, including a national inventory report and information on mitigation actions including needs and support received, the developed REL may be reported under the BUR. The adoption of RLs will establish a measure of performance by quantifying emission reductions. Monitoring data would be disclosed and submitted to the UNFCCC secretariat to record the progress of Indonesia in reducing emissions.

At least there are three reference levels that need to be developed by Government Indonesia to measure effectiveness of the above policies and actions. First is reference for deforestation to measure the effectiveness of the policies and program in maintaining carbon in conservation and protection forests and reducing rate of forest conversion to non-forest lands. Second is reference for forest degradation to measure effectiveness of the policies and action programs on forest management in reducing forest degradation. Third is reference for sink enhancement to measure the effectiveness of the policies and program on land rehabilitation and reforestation including the use of degraded forests for timber plantation for increasing sinks. All these three references later could be integrated into national reference level.

Government of Indonesia up to know has not officially declared its national reference emission level (REL) and an official document describing transparently approach and methodology, source of data including uncertainty assessment accessible by public is not available yet. Nevertheless, the Ministry of Forestry has conducted a series of consultation with local government in disseminating the National Reference Emission Level from Deforestation and estimation of reference emission level as well as amount of emission that need to be reduced to meet the 26% and 41% of emission reduction target (ERT) for each province. At the same time, a number of provinces and district and private entities with support from various donors are also developing reference emission level with various approaches.

The following section discusses briefly the progress of Indonesia in developing REL/RL at national and sub-national level and gaps need to be filled in to develop robust and transparent national forest inventory based on the current available system.

3.2. Development of National and Sub-National REL/RL

There are three possible approaches for establishing the REL (TCG, 2009). First is extrapolated historical emission. In this approach, it is assumed that without the presence of incentive system, the future emission from deforestation and forest degradation will be the same as historical emissions. Thus, the historical emission is a perfect guide to project emission to the future, and therefore simply extrapolates historical emission into the future. The second is adjusted historical. In this approach, historical information is a good but imperfect guide, and therefore adjusts historical emission considering the future change of factors that may affect the deforestation and forest degradation. Adjusted historical reference emission levels require historical data and various “adjustment factors”. Third is forward-looking. In this approach, the only way to understand future emissions is to model the future, taking into account factors that drive and constrain emissions from land use (which might or might not include the consideration of historical data). Forward-looking reference emission levels require various data inputs and calculations that depend on the construction of the tool itself.

As decided by the Conference of the Party, REDD is a country commitment and the process how emission reduction being conducted is up to the country. The recognition of international communities to the achievement made by a country in reducing the emission may be seen at the country level. Indonesia has declared that REDD is national mechanism with sub-national implementation. The implication of this in related to the REL/RL is that Indonesia should declare its national REL/RL including document describing transparently approach and methodology, source of data including uncertainty assessment accessible by public and suitable for review as agreed by the COP. In this regards, the REL/RL developed at sub-national level does not have to be the same as that used at national level, but it could be adjusted considering sub-national circumstances. Adopting historical deforestation only in defining the REL by a region (province/district) that has low deforestation rate but still has large forest may not be realistic as this will limit future development process of the province.

The important aspect that should be considered in developing sub-national REL is that the use of different approaches by sub-nationals should not result in higher REL than that defined at national level. To ensure this condition, special attention need to be given to regions that still have large forest with high and low deforestation rates. Policy on development of sub-national REL/RL should be fair and accommodate the future land demand of the regions to support their economic development. In this regards, the sub-national REL may need to refer to national average of deforestation. Figure 3.1 provide illustration how REL at provincial level should be developed and ensure that the integrated REL off all provinces will not be higher than the national REL. In this example, provinces that have deforestation rate above national average cannot use their historical deforestation rate as their Reference level, but they should use the national average. While provinces that have historical deforestation rate lower than the national average, can set up the REL higher than their historical deforestation rate but it should not be more than the national average.

Figure 3.1 shows that rate of deforestation at Riau Province should be reduced down to below 0.32% per year in order to get REDD benefits. In the National Action Plan for Reducing GHG emission, the Ministry of Forestry (2012) has defined reference emission level for each province and Riau Province is a province with the highest REL (Figure 3.2). This implies that Riau province still allows emitting high amount of CO2. While other provinces given with low REL but still have large forest area (e.g. Kaltim, Papua, Papua Barat and Maluku, c.f. Fig. 3.1 and 3.2) may not be able to limit their emission below its REL due to their high demand for land in the future. These will at the end not reduce the national deforestation rate below the national REL. Therefore, there is a need to revisit the criteria in defining provincial REL and to conduct further negotiation with local government in determining the sub-national REL and integrate with the process of spatial plan revision.

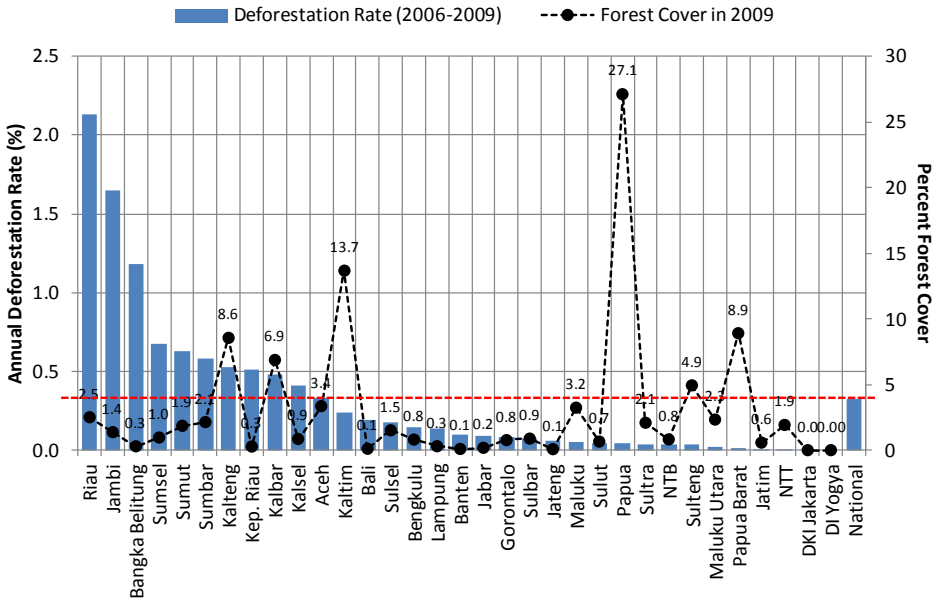

Figure 3.1. Historical deforestation rate of provinces in the period of 2006-2009 and percent of forest cover relative to the national forest cover (Calculated based on Ditjenplan, 2011). Note: Reference period for the development of REL can be decided by the National Government depend on availability and reliability of historical data and national circumstances. Considering the availability and reliability of data, Indonesia may use reference period starting from 2000 to 2009.

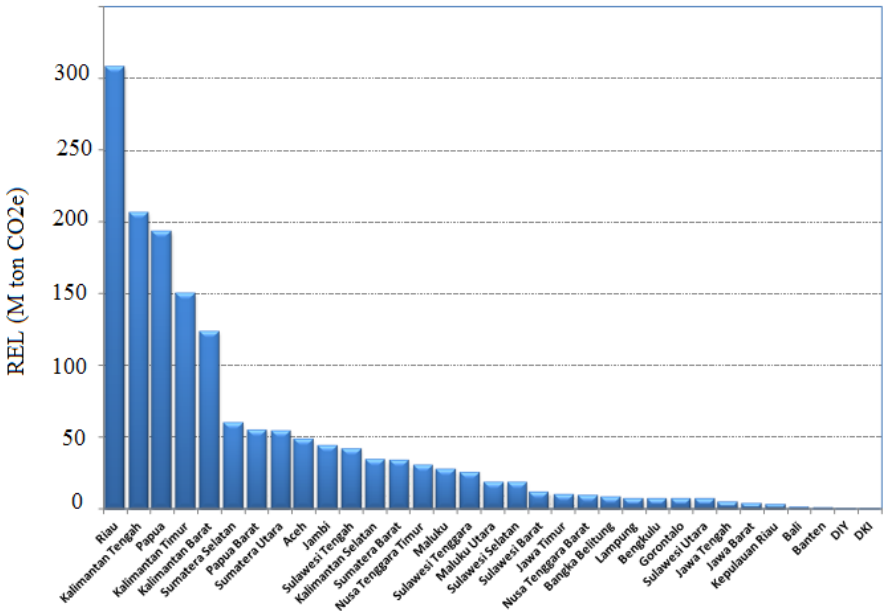

Figure 3.2. Reference Emission Level for Land Use Change and Forestry by Provinces (Kemenhut, 2012)

Another alternative approach that might be potential to be used in defining national and sub-national REL/RL is using forest transition concept. In this concept, future forest cover in the country should not fall below a threshold (or called reference level). The threshold value is determined based on historical change of forest cover and its relationship with the change of driving factors that affect the change, e.g. population density (see Box 3). Once the threshold is defined, level of forest area that would be maintained above the threshold could be negotiated with local governments considering the local circumstances (e.g. proportion of conservation, protection, production and conversion forests, spatial plan, stage of development, and level of dependency on forest). This should be used as basis for national government in determining level of incentive should be given to local governments in supporting its target for maintaining forest cover above the threshold as negotiated.

Efforts for developing REL/RK at Sub-National level exist in a number of provinces and districts supported by various donors. Most of the efforts are part of REDD demonstration activities (DAs). Most of DAs used historical approach in which the future emission from deforestation will follow historical emissions. Some DAs also evaluate the use of different approaches in defining REL/RL. For example, ALLREDDI (Accountability and Local Level Initiative to Reduce Emission from Deforestation and Degradation in Indonesia) implemented by ICRAF has tested three approaches (historical approach, modeling of deforestation drivers, and forward looking) in developing the REL at district level and engage the local government in designing and developing the REL/RL (Dewi et al., 2010). All local governments targeted by the ALLREDDI project have tested the forward looking allocation approach. In this approach, local governments can develop 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. For example, local government can set up a number of scenarios in deciding alternative used of remaining natural forest in the APL (areas for other uses) in the next five years. In this context the existing land use is treated as baseline and other as alternative scenarios that can lead to lower emission development path without scarifying the local development target. So far, no guideline exists so far to guide the sub-national level in selecting appropriate approach in developing REL/RL.

In many cases, the development of REL only referred to the change of forest to others (deforestation), and did not account for emission resulted from forest degradation. This is primarily due to difficulties in differentiating the level of forest degradation from satellite data and the availability of carbon stock data associated with the degraded forests. The available methods may not have the resolution to differentiate between conventional logging and improved logging practices; thus these methods may not be able to be used for remote monitoring of improved forest management practices that generate emissions reductions per unit area logged.

However, the availability of REL for forest degradation is very important to evaluate the effectiveness of strategies or actions plan in reducing emission from the degradation. As discussed above, Indonesia has issued policy and implemented strategies that can reduce forest degradation but reference to measure the effectiveness of the policies and action in reducing forest degradation is not available yet.

BOX 3

FOREST TRANSITION CONCEPT AND ITS POTENTIAL APPLICATION FOR DEVELOPING REFERENCE LEVEL AT NATIONAL LEVEL

Source: Boer (2008)

The SB 28 decision (ref) describes Reference Emissions Levels (REL) as "*means to establish reference emission levels, based on historical data, taking into account, inter alia, trends, starting dates and the length of the reference period, availability and reliability of historical data, and other specific national circumstances*. In the case for a region where forest cover is still high while historical emission from deforestation is very small or negligible, the use of the historical emissions alone in projecting future emission from DD under the absence of REDD may lower the potential of the region to participate in REDD as this region will not get large gains from carbon credit. This may discourage the region to participate in REDD. Therefore, in this case specific national circumstances should be taken into account. In Indonesia context, the future emission from deforestation could consider district land use plan. However, it will be difficult to justify which spatial plan that considers the emission reduction from DD in its development and which one is not. On the other hand the land use plan of the district is also subject to revision for every 5 years making the development of REL becoming more difficult.

Risk of *perverse incentives* would also be high. Perverse incentives would apply if a regional government were to decide – after following a land use decision making process which had permitted extensive deforestation and forest degradation - to follow an economic development which conserved all remaining forest. The change in land use would reflect a large number of REDD credits because of the marked reduction against BAU. Conversely where a regional government had followed a development pathways which had retained extensive areas of forest, adoption of REDD would result in a relatively smaller number of credits because the land use decisions would not produce large gains against BAU.

Considering this dilemmatic problem, national circumstances that may be used for setting up REL are the following:

1. Act No. 26/2007 on Spatial Plan Regulation (*UU Penataan Ruang*) and Act No. 41/99 on Forestry (*UU Pokok Kehutanan*) state that the total forest area that must be maintained is at least 30% of the total area of the watershed and/or island considering the condition of the ecosystem. These regulations encourage the districts to propose to the Ministry of Forestry to release some of the forest area to become non-forest area or APL (*Area Penggunaan Lain or Kawasan Budidaya non-Kehutanan*). Many proposals from districts to the Ministry of Forestry to release more of forest land for APL. Using this condition, it can be argue that without REDD, the conversion of forest will continue until the minimum level is reached. In other world, all carbon stock in forested land on the top of 30% would be released to the atmosphere in the future.
2. TGHK (*Tata Guna Hutan Kesepakatan*) has categorized forest land into four categories namely (i) protection forest (HL), (ii) conservation forest (HK), (iii) production forest (HP) and (iv) convertible production forest (HPK). In this case, in the future under the absence of REDD, all forested land in HP will subject to degradation while those in HPK will be converted to non-forest area. The release of forest area for conversion to other land uses is regulated under a number regulations such as Decree of the Minister of Agriculture 178/Kpts/Um/4/1975- Guidance for changing forest area boundary, Decree of the Minister of Agriculture 764/Kpts/Um/10/1980- Release of forest area for agriculture plantation, animal husbandry, fishery and food crops, Decree of Forestry Director General 54/Kpts/DJ/I/1981 – Guidance for the Release of forest area for agriculture plantation, animal husbandry, fishery and food crops etc.
3. Considering the fact that population density is strongly correlated with deforestation rate, with the correlation increasing with the number of rural landless families (Ludeke et al. 1990; Reis and Margulis (op. cit.), 1991; Adger and Brown 1994; Harrington 1996; Sisk et al. 1994; Kaimowitz 1997; Ochoa-Gaona and Gonzales-Espinosa 2000), the population density may be used as one of consideration that can be taken into account in developing REL. The relationship between population density and percentage of forest cover in tropical Asian countries is presented in Figures 3.3 (left). Using district data, it was found that significant relationship between population density and forest fraction also exist (See Figure 3.3 right). In connection with regulation defined in point 1 above, many districts with low population density have forest fraction of less then 30%. Conversely, there are some districts with high population density having high forest cover. The first situation may be link with progressive expansion of big agriculture plantations (see point 2 of the regulation).

BOX 3 CONTINUE

Taking into account the above three national conditions, the following conceptual approach is proposed to develop National REL. In developing the concept, 'forest transition' phenomena is taken into account, where deforestation rates from one period to another will change according to the level of economic development and resource scarcity, among other factors as shown in Figure 3.4 This figure illustrates that before the country reach the transition phase, the forest will continue to decrease. Most of developed countries have passed transition point, while least developed and developing countries are still in the rapid deforestation rate. With REDD, it is expected that the developing countries can maintain and manage their forest such that the transition point is reached before that forest fraction fall below the reference (the dashed straight line), i.e. the dashed curve line. This framework discusses how the reference is set up under Indonesian context.

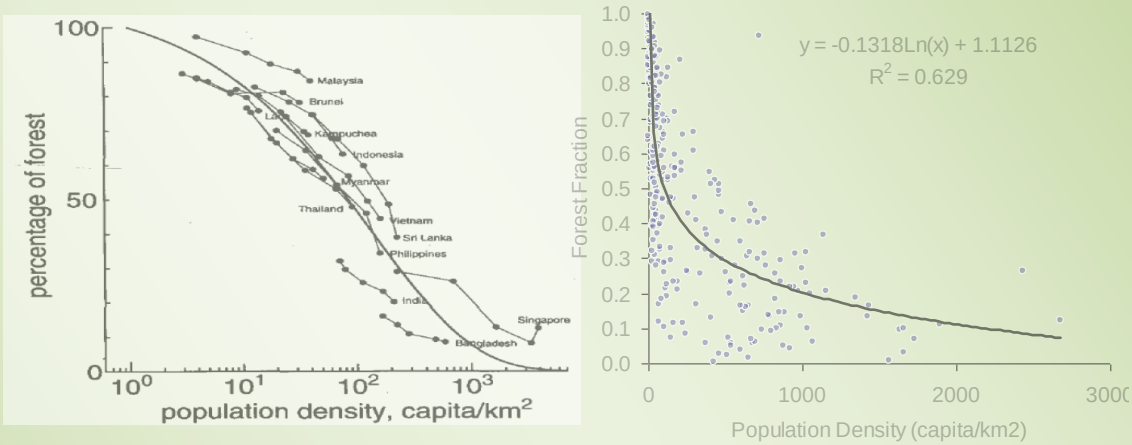

Figure 3.3. Relationship between fraction of forest cover with population density in Asian Countries (left; adapted from Matsuoka et al, 1994) and in Indonesia (right; adapted from Murdiyarso et al., 2004). Note: dot in the left figure represents a district.

In this framework, the forest transition is developed based on population density at island level following the Act No. 26/2007 on Spatial Plan Regulation (*UU Penataan Ruang*) and Act No. 41/99 on Forestry (*UU Pokok Kehutanan*) and also the existence of other policies and regulations for releasing forest for other uses. Based on data of forest fraction and population density of 1950, 1982, 1985, 1997 and 2005 taken from various sources, it was found that most of islands have not reached transition point except for Java (Figure 3.4). In Java the transition period occurred in 2000. Outside Java, deforestation occurred at higher rate. The forest fraction decreased rapidly with slight increase in population density. This is primarily due to the rapid development of agriculture plantation outside Java. If the relationship between population density and forest fraction is developed at this island level, it is suggested that the transition point will occur when the population density in that island is about 50 persons per km^2, or at the time of forest fraction is about 20% (Figure 3.3).

If only population density at district level is taken into account (see Figure 3.3) considering what was happening in Java (Figure 3.5), the reference for forest fraction will be 10%. Thus there are three possible Reference Levels could be proposed namely 10%, 20% or 30%. With reference 1, the potential emission reduction from avoiding deforestation would be about 15 billion ton CO_2 while with the Reference 2 and 3, the potential REDD carbon credit would be about 25 billion and 35 billion ton CO_2 respectively. The consequence of the adoption of any figure for the reference is that local governments in island with forest cover of less than the reference will not be eligible to get benefit from REDD. To encourage regions with forest cover of less than the reference, central government may need to create incentive system for regions which provide large contribution in increasing forest cover above the reference level. Implementation of this policy might be integrated with the low carbon development policy of the local governments.

BOX 3 CONTINUE

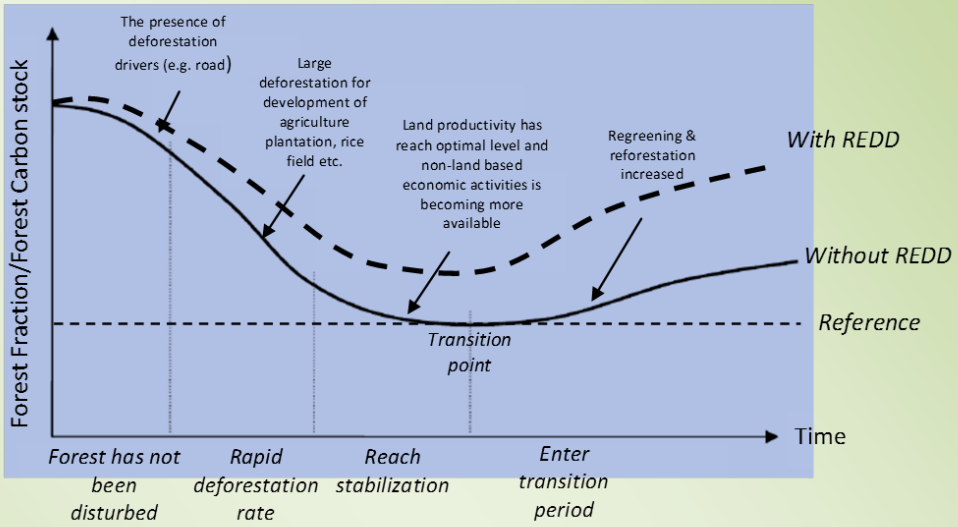

Figure 3.4. Forest transition concept

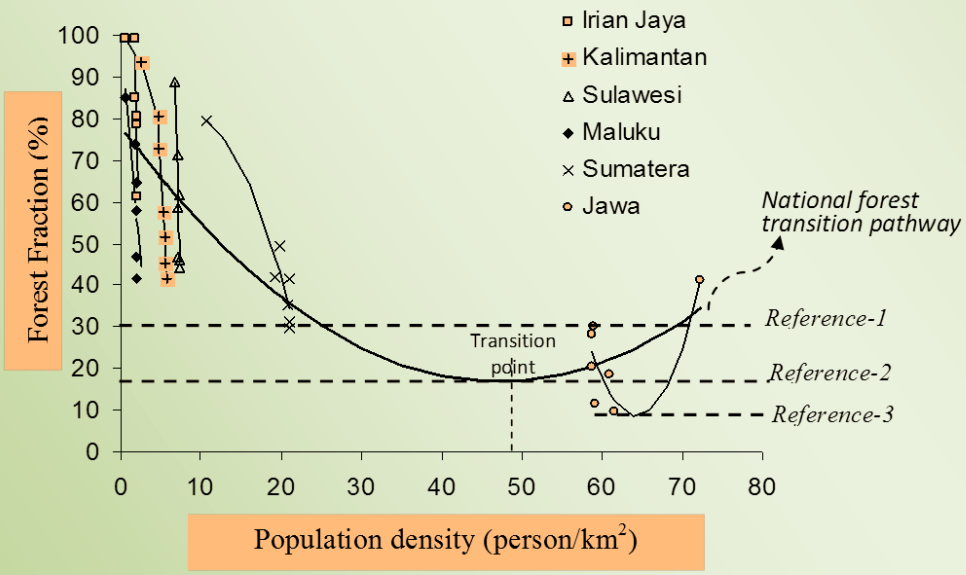

Figure 3.5. Development of REL using forest transition concept considering national circumstances (Boer, 2008)

Data from forest certification systems involving on-the-ground auditing in combination with carbon stock data collected under the national forest inventory system is potential to be used for developing REL for forest degradation. From a number of case studies, it is quite clear that it is very possible to develop REL for forest degradation (see Box 4 and Box 5). The main challenges are to collect and to store data of forest carbon from all concessionaires with different category of certification. Referring to Table B4.1 of Box 4, it is suggested the rate of stand loss in non-SFM units is more than double of that of SFM, i.e. 4.13 m3 ha-1 y-1 for non-SFM and 1.85 4.13 m3 ha-1 y-1 in SFM units. The big difference between SFM and non-SFM may be due to high rate of illegal logging and encroachment in the non-SFM units. From historical data, it is shown that many of forest concessions (IUPHHK) fall under category of non-SFMs (see Table 2.2). This means that the loss of carbon due to high rate of logging (both legal and illegal) still occurs in many concessions.

Furthermore, baseline for sink-enhancement can also be developed using historical data on realization of land rehabilitation (GERHAN or RHL), CFM, and timber plantation establishment. Similar to REL for deforestation, the main issue is defining reference period and starting date for development of reference (baseline). So far, there is no decision regarding starting date and length of reference period to be adopted for the development of REL for sink enhancement.

Working Group on Forest Policy (Kemenhut 2010b) has applied simple approach for developing REL/RL or Baseline for national deforestation, forest degradation and sink enhancement. The approach is using historical data and a number of assumption developed based on national circumstances. The REL/RL for deforestation, degradation and sink enhancement along with assumption used by the Working Group is given in Table 3.1. Following the assumption given in Table 3.1, it was estimated that the rate of emission under the baseline scenario (Reference Level) in 2009-2011 was about 0.66 Gt CO2e per year and then in the following period decreased (Figure 3.8)[6]. The decreased is mainly due to the establishment of FMU.

Looking at current progress, almost all current activities related to REL/RL development have been carried out directly by the initiator at the sub-national level. Nevertheless, no clear mechanism or approaches being used to share information on the results of implementation. There is no policy or guideline or robust mechanism from national to sub-national or vice versa to collect and integrate the data from the REL/RL processes and make them available for the relevant stakeholders. There is also an issue on the diverse understanding and capacity across regions and it is therefore difficult to attain common understanding among actors. Although mitigation program has been outlined within each of the sector, no clear institutional mechanism yet how the integration REL/RL data from sub-national into the national level or deciding the approach and methodology used for developing the REL/RL.

[6] The estimation of the emission following the IPCC Methodology and emission from peat land is not included.

BOX 4

REL FOR FOREST DEGRADATION: CASE 1

Source: Bahruni (2011)

Case 1: Impact of Sustainable Forest Management (SFM) Practices on Carbon Stock Change

Based on data collected by Bahruni (2011) from five concessions (three concessions with SFM certification and two non-SFM certification), it is quite clear that implementation of SFM practices can reduce emission from forest degradation. In non-SFM concessions, the volume of wood extracted relative to the annual allowable cut decreased significantly from year to year indicating continue degradation of the forest while in SFM concession, it is relatively constant (Figure 3.6). Rate of forest degradation in SFM concessions was found to be between 0.17% and 0.37% per year and non-SFM between 2.35% and 2.61% per year and this equivalent to CO_2 emission reduction of 9.76 tCO_2 ha^{-1} $year^{-1}$ (Table 3.1)

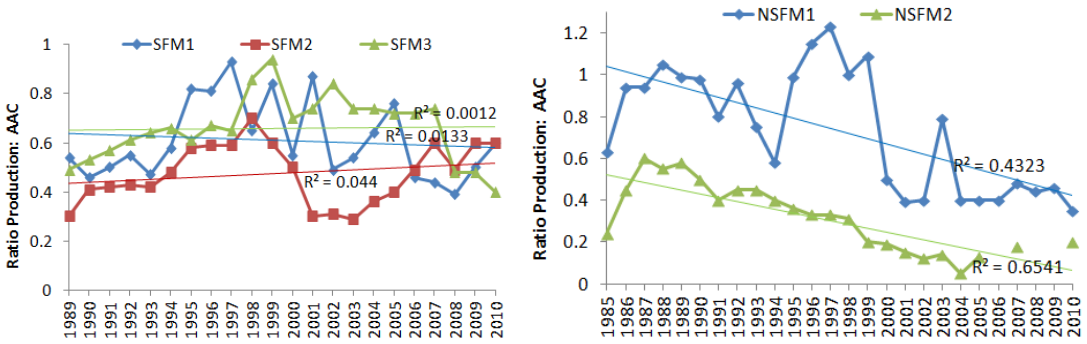

Figure 3.6. Ratio between volume of wood extraction and annual allowable cut in SFN and non-SFM concessions

Table 3.1. Estimated CO2 emission reduction from forest degradation

Time period	The rate of degradation (%)		
	SFM	Non SFM	Difference SFM & Non SFM
1992-2011	0.37	2.35	1.98
2000-2011	0.17	2.61	2.44
The Benefit of SFM		1992-2011	2000-2011
The reduction of loss stand (m^3/ha-yr)		1.85	2.28
The reduction of emission forest carbon (tC/ha-yr)		2.16	2.66
The reduction of emission forest carbon (tCO2/ha-yr)		7.93	9.76

BOX 5

REL FOR FOREST DEGRADATION: CASE 2

Source: Rusolono & Tiryana (2011)

Case 1: Impact of SFM and Changing Silviculture Practices On Carbon Stock Change

The measurement of impact of SFM and changing logging practices on forest degradation was conducted in Sari Bumi Kusuma. The analysis was to assess the rate of forest degradation between concessions not applying practices and applying SFM practices as well as concessions applying different silviculture practices. The analysis was conducted based on data from PT. Sari Bumi Kusuma and rate of deforestation in Central Kalimantan from 1985 and 1997. In many cases, lack of efforts from concessionaires to improve their community development program for community living surrounding forest has resulted in high degradation in forest area (due to illegal logging and agriculture encroachment). Silvilculture practices being examines are:

1. Selective logging (TPTI), i.e. logging is only applied to trees with diameter of more than 50 cm
2. Intensive silviculture (TPTJ), i.e. all concessions area was divided into a number of rows with widths of 3 and 17 m. The two rows are arranged next to each others. Rows with width of 3 m will be clear cut and the row with width of 17 cm will be selective logging.
3. Combination of TPTI and TPTJ, i.e. half of the concession area applied TPTI and another half applied TPTJ.
4. Similar to number 3, but the AAC was reduce by 25%

From the analysis it was found that applying good silviculture practices can reduce emission from forest degradation between 83 and 125 t CO_2 ha^{-1} $year^{-1}$ for the 30 year cycle period relative to the baseline case (Figure 3.7). TPTI+TPTJ with 75% AAC give the highest emission reduction but it not significantly different from TPTI. The baseline case assumed that concession applied TPTI but expose to encroachment with rate of 2.2% per year.

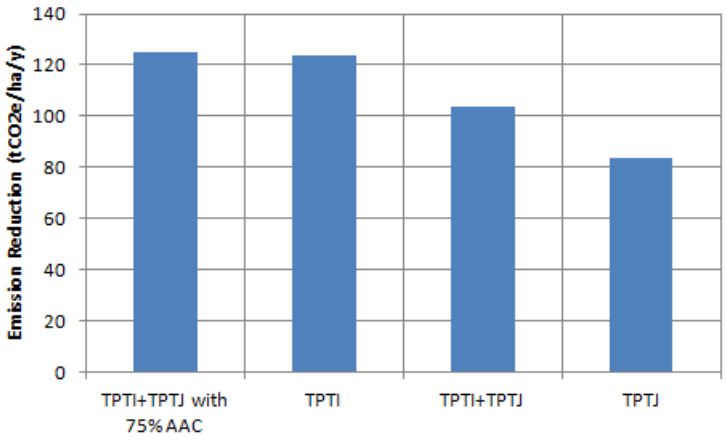

Figure 3.7. Emission reduction from implementation of TPTI, TPTJ, (TPTI+TPTJ) and (TPTI+TPTJ) with 75% AAC

Table 3.2. REL/RL for deforestation, degradation and sink enhancement proposed by the Working Group on Forest Policy (2010)

Assumption	Assumption	2009-11	2012-15	2016-20	2020-25	Total '09-'25
Planned Deforestation (000 ha/yr)[1]	All forested land in conversion forest will be released in the future for non-forest based activities	642	642	642	642	10272
Unplanned Deforestation (000 ha/yr)[1]	Deforestation rate is the same as historical rate that occurred in period 2000-2009 until 2011, i.e. about 1.5 million ha per year. Unplanned deforestation is calculated as historical rate minus planned deforestation. After 2011, the rate is decreasing linearly with the number of FMU development. Rate of FMU development is 12 units per year.	860	688	516	344	8772
Forest Degradation (million m^3/yr)	Rate of wood harvesting from natural forest following APHI[2] scenario and illegal harvesting is assumed to be the same as legal harvesting up to 2011. After 2011, the rate is decreasing linearly following FMU development	13.43	15.37	18.54	23.31	297.58
Sink Enhancement for HTI (000 ha/yr)	Rate of HTI development is assumed the same as historical rate.	150	150	150	150	2400
HTR (000 ha/yr)	HTR will be established only in areas that have been allocated for 2009 based on Ministry Forestry Decree. Effective area that can be planted only 40% of the allocated	10	10	10	10	160
HKm/HD (000 ha/yr)	HKm and HD will be implemented only in area that have been allocated based on Minister of Forestry Decree in 2010	5	5	5	5	80
HR (000 ha/yr)	Development of HR will be mainly in Java and it is estimated about 800 thousand ha is still available (GNKL-PBNU, 2009).	40	40	40	40	640
RHL (000 ha/yr)	Rate of planting is the same as historical rate of GERHAN between 2003 and 2008 and survival rate until 2011 is the same as that of West Java, i.e. 25% and then increase to 50% in 2016-20 and to 75% in 2021-25 as a result of FMU development	300	300	300	300	4800

Note: [1]Planned and unplanned deforestation are deforestation that occurred in conversion forest and other forest areas, respectively.

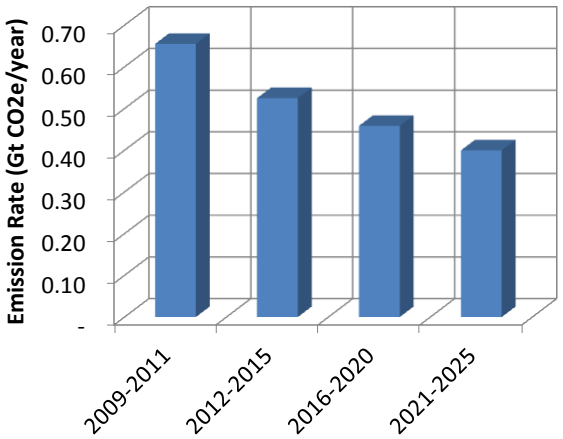

Figure 3.8. Estimated national RL (deforestation, forest degradation and sink enhancement) following assumption developed by the Working Group on Forest Policy (2010)

4 Emission Reduction Potential and Socio-Economic Benefits from the implementation of SFM under the Framework of REDD+

Implementation of strategy and action programs described in Chapter 2 will result in emission reduction and also socio-economic benefit. The Working Group on Forest Policy (Kemenhut, 2010b) has estimated the potential emission reduction from the implementation of mitigation scenario. The rate of deforestation, forest degradation and sink enhancement activities under the mitigation scenario is presented in Table 4.1. It was found that with the implementation of the strategies will result in significant emission reduction nationally (Figure 4.1). Cumulatively in the period between 2012 and 2025, total GHG emission reduction would reach 6.75 Gt CO2. The potential emission can be achieved if all enabling conditions are in place. These include (i) FMUs being established can function effectively, (ii) lands for the implementation of sink enhancement are safe and conflict-free, (iii) good climate investment (e.g. consistency in policy and permit process, and credit access), and (iv) field facilitators/extension services for supporting community in implementing CFM available.

Table 4.1. Rate of deforestation, degradation and sink enhancement under mitigation scenario

Assumption	Assumption	2009-11	2012-15	2016-20	2020-25	Total '09-'25
Planned Deforestation (000 ha/yr)[1]	About 50% of forested land in conversion forest will be conserved by changing the status of conversion forest into production forest	321	321	321	321	5136
Unplanned Deforestation (000 ha/yr)[1]	Deforestation rate can be reduced by 35% from the baseline rate. The effectiveness of reducing deforestation is assumed to increase as the capacity of FMUs improve with time.	688	516	258	86	5160
Forest Degradation (wood harvesting million m^3/yr)	Illegal logging will decrease from the baseline	13.12	15.06	18.23	23.00	292.62
Sink Enhancement for HTI (000 ha/yr)	Rate of HTI development is doubled than the baseline and this will meet government target	300	300	300	300	4800
HTR (000 ha/yr)	HTR could be established in 50% of all effective allocated land for the program. Total land allocated for HTR is 5 Mha, locations close to community was only 4 Mha and effective land can be planted was 40% of this land	50	50	50	50	800
HKm/HD (000 ha/yr)	All lands allocated for HKm and HD can be planted	10	10	10	10	160
HR (000 ha/yr)	Planting rate can be increased by 225% from the baseline as institutional capacity and land status outside Java improved	90	90	90	90	1440
RHL (000 ha/yr)	Rate of planting is doubled from the baseline and the survival rate is the same as the baseline	500	500	500	500	8000

Note: [1]Planned and unplanned deforestation are deforestation that occurred in conversion forest and other forest areas respectively.

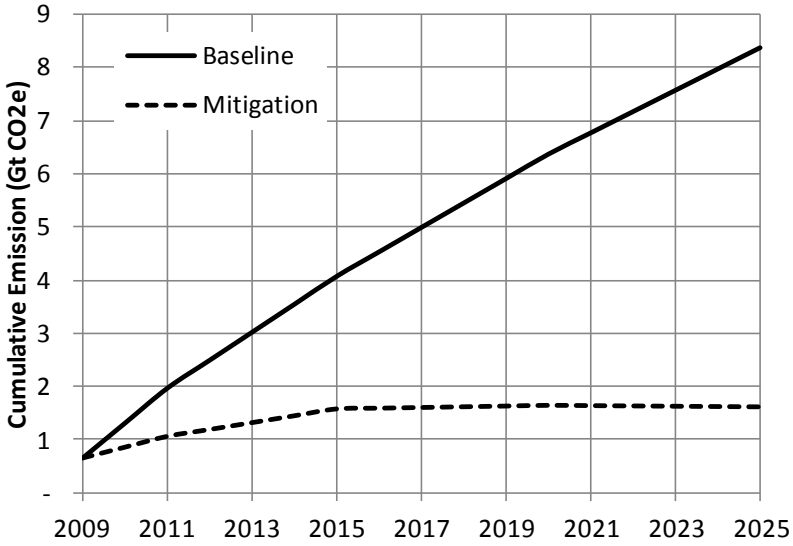

Figure 4.1. Cumulative emission under baseline and mitigation scenario (Kemenhut, 2010b)

Benefit gained from emission reduction depends on economic values of the carbon. Using price of about 5 USD/t CO2, the potential benefit obtained from emission reduction will be very significant. It will reach about 30 billion USD. In addition, there are many other benefits that can be gained from the implementation of REDD+ activities, such as hydrology services, biodiversity, continuous supply of timbers and non-timber forest products etc. Bahruni (2011) has estimated the private and public benefits from implementing SFM. Based on analysis from a number of SFM and non-SFM unit managements (concessionaires), he found that the benefits of SFM on private sector in the period 2000-2011 could reach IDR 337,000/ha-yr, while the benefits to the public sector during the same period could reach IDR 299,000/ha-yr thus the total benefits for the two sectors would be about IDR 631,000/ha-yr (Table 4.2). Based on progress until 2011, the unit of management in natural forest that have SFM certification reach 31 units (4,499,995 ha), while non-SFM are still very high, i.e. 109 units covering forest area of 10,775,448 ha. Using the estimate benefit given in Table 4.2, total benefits expected from SFM nationally may reach IDR 2.84 trillion/yr. On the other hand, the estimated loss from the implementation of non-SFM practices would reach IDR 6.80 trillion per year. These findings clearly indicated that implementation of SFM under the framework REDD+ will give higher benefits as emission reduction generated from the SFM will also have economic value. As discussed above, to gain international recognition, development of REL/RL including system for measuring, reporting and verifying the emission reduction from implementation of SFM under the framework of REDD+ should be prioritized.

Table 4.2. Estimation of benefit from SFM on private and public sector (Bahruni, 2011)

Benefit of SFM	1992-2011	2000-2011
Reduction of forest stand (m3/ha-yr)	1.85	2.28
Reduction of emission (tC/ha-yr)	2.16	2.66
Value of emission reduction (IDR/ha-yr)	97,069	119,800
Avoiding the loss of profit from wood (IDR/ha-yr)	176,127	217,372
Prevention loss of State income from Non-Tax (IDR/ha-yr)	213,431	263,413
Prevention loss of Non timber forest products (IDR/ha-yr) #)	24,031	29,659
Prevention loss of hydrology function (IDR/ha-yr) #)	5,039	6,219
Prevention loss of Option Value & Existence Value Biodiversity (IDR/ha-yr) #)	127	157
Total Benefit from SFM (IDR/ha-yr)	**511,301**	**631,038**

5 Development of System for Measuring, Reporting and Verifying (MRV) GHG Emission Reduction

As previously mentioned, establishment of a transparent and credible system to measure, report and verify (MRV) results of emission reduction from the implementation REDD+ strategy and actions is an important step for getting international recognition. Based on decision 2/CP.13, aspects that need to be done related to measurement and reporting are:

(a) Identification of drivers of deforestation and forest degradation resulting in emissions and also the means to address these;

(b) Identification of activities within the country that result in reduced emissions and increased removals, and stabilization of forest carbon stocks;

(c) Utilization of the most recent Intergovernmental Panel on Climate Change guidance and guidelines, as appropriate, as a basis for estimating anthropogenic forest-related greenhouse gas emissions by sources and removals by sinks, forest carbon stocks and forest area changes;

(d) Establishment of robust and transparent national forest monitoring systems and, if appropriate, sub-national systems as part of national monitoring systems according to national circumstances and capabilities.

Following the above decision, important elements that should be developed for the establishment of the MRV include (i) national standards and best practice for measuring changes in forest covers and forest carbon stocks, (ii) governance, regulatory and quality assurance and quality control (QA/QC) of the MRV system at National and Sub-national level, (iii) entities responsible for the periodic calculation of the national and sub-national land-based emissions including determination of REL/RL, reporting performance results and data archiving system, (iv) synchronization of national efforts and international accreditation of MRV and independent verification and (v) registry system required for the technology, capacity building and funding that support the performance of REDD +. In regard to these issues, Government of Indonesia through REDD+ Task Force has designed institutional framework of REDD+ MRV as shown in Figure 5.1.

Figure 5.1 shows that the system for measuring and monitoring the change of forest covers and carbon stock and soil carbon and driver of deforestation and degradation will be established at two level, namely at national and sub-national (site level). The approaches and methodologies are standardized by responsible agencies following the IPCC guideline. At present, three standards have been issued namely (i) SNI 7724:2011 on measurement and calculation of carbon stock, (ii) SNI 7725:2011 on development of allometric equations and SNI 7645 on land cover classification. The results of measurement and monitoring are reported to National MRV institution. The National MRV will do quality control the quality (QC) and an independent evaluator will be appointed to do quality assurance (QA). This process is conducted to ensure that the measurements and monitoring are implemented consistent with international standard developed by the IPCC, accurate, transparent in which all supporting document and process are archived, complete in which all sources and sink fully are counted and comparable. Through this process the result of measurement and monitoring are available and suitable for review by international as agreed by the Conference of the Parties

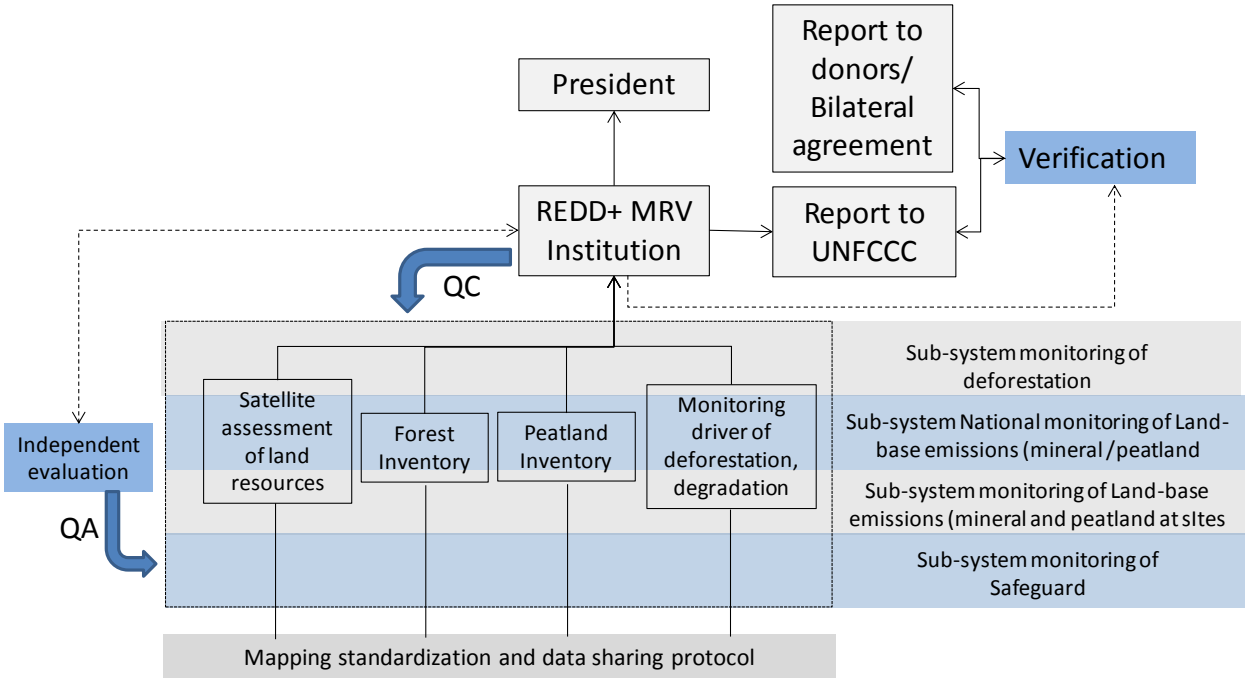

Figure 5.1. Institutional framework for REDD+ MRV (REDD Task Force, 2012)

Institutions and agencies responsible for conducting measurement and monitoring will not be new institutions. This is based on facts that there are already a number of institutions implementing the measurement and monitoring the land and forest resources (Table 5.1 and 5.2). The main issues for developing the existing system for supporting the NRV system are (i) inconsistency in methodology used for measuring and monitoring land/forest cover change, (ii) no standardized land/forest cover classification, (iii) limited number of sampling plot, (iv) limited data accessibility, (v) database spread in many institutions, and (v) no systematic system for QA/QC.

Referring to Table 5.2, it can be seen clearly that measurement and monitoring system for forest carbon stock at site level (at FMU level) is already available. Improved forest inventory system supported by PUP is available in FMUs or holders of IUPHHK that have been certified either for SVLK/SFM. However, this system has not been integrated with or used for the development of national MRV system. Integration of the monitoring system developed by FMUs and holders of IUPHHK with the national MRV is required to measure how effective the mandatory certification policy (SVLK/SFM; see section 2.2) in contributing to the reduction of GHG emission. Therefore, the development of the national MRV should carefully identify existing forest and carbon monitoring system applied by forest management units.

Figure 5.2 presents possible integration of certification process and MRV institution. System that integrates carbon data from various FMUs and IUPHHK holders and NFI can be potentially used for developing the reference level. Ministry of Forestry as a centre institution in collecting and managing forest data should set up system that integrates the data from NFI and FMUs and provide the data for establishing the REL for forest degradation. Once the REL is defined, the impact of implementing mandatory certification on reducing emission from deforestation can be easily measured and monitor. All the certified FMUs that measured and monitor carbon stock in the plots send the data to the MoF to be stored in the database system and used for quantifying the emission

reduction. By applying mandatory certification, it is expected that number of certified forest units will increase from time to time and more data from forest units will be available. The system should be able to quantify emission reduction against the REL resulted from the improvement of forest management practices conducted by the forest managements units either at single unit or multiple units. The policy on mandatory certification or revitalization of certification system should also be reported as an effort for reducing emission from deforestation and stated in the Biennial Update Report (BUR) and finally reported in the national communication (NATCOM) to the UNFCCC.

Table 5.1. Agencies and institutions involve in measuring and monitoring the land/forest cover

Agencies and Institutions	Types of measurement and monitoring
Ministry of Forestry, managed by Directorate General of Forestry Planning (Ditjenplan)	Provide various land use map related to forest land uses and other mapping information. Some of accessible information include (i) Distribution Map for tree stand potency within forestry and estate, (ii) Map for Land Cover / Forest Condition, (iii) Directional Map for Forest Management Unit Allocation, (iv) Map for Indonesia-Malaysia Border, (v) Deforestation Map, (vi) Distribution Map for Forest Concessionaires, (vii) Map for Land Conversion to Estate, (viii) Map for Forest Estate Designation, (ix) Map for Forest Land Use Agreement, (x) Map for identification of Land and Forest Rehabilitation Location, (xi) Map for Forest Protection and Conservation, (xii) Map for Forest Protection and Conservation (for each location), and (xiii) Coding for Forestry Digital Map. The maps produce in certain time interval
Agency Geospatial Information (before called as Bakosurtanal)	BAKOSURTANAL provides Topography Map and various Thematic Maps. Information of all data and maps can be found in the following site: http://www.bakosurtanal.go.id/bakosurtanal/peta-tematik/. Available thematic maps includes: Lahan Basah (Wetlands), Kawasan Konservasi (Conservation Area), Potensi Kawasan Lindung (Potency of Protected Area), Ekosistim (Ecosystem), Lahan Kritis (Critical Lands), and Daerah Aliran Sungai (Watershed Area); etc. Maps are available with a range of acale 1: 25,000 to 1: 2,500,000. The maps produce not on continue basis
Ministry of Agriculture, managed by National Agency for Land Resources	Provide Digital and Analog Land Resources Maps (*Peta Sumberdaya Lahan*), Soil characteristics maps (physical, chemical and biological characteristics), Plantation area and changes, Cropland area and changes and type of management applied. Maps are derived from survey, plot sampling and analysis of remote sensing data (Landsat ETM, JERS, ASTER, ALOS AVNIR-2). The program have been started since early 1960s. Scale of maps varies from 1:10,000 to 1: 250,000. These map provided not on continue basis
Ministry of Environment	Land cover maps for a few years to support the implementation of Toward Green Indonesia program (started in 2006). These map provided not on continue basis
LAPAN	Yearly land cover map data from 2009-2009 developed through collabration with MoF under the **INCAS** Project (supported by AUSAid) using Ikonos, SPOT & MODIS data.
Other agencies (FAO, ICRAF, WRI, CIFOR, WWF, Wetland International, universities)	Provide spatial data on land and forest resources in some locations, however, approaches and metholdologies used varies between agencies. Maps produce not on continue basis.

Table 5.2. Agencies and institutions involve in measuring and monitoring the soil and carbon stock

Agencies and Institutions	Types of measurement and monitoring
Ministry of Forestry, managed Directorate General of Forestry Planning (Ditjenplan) and Forest and Research Development Agency (FORDA)	Forest carbon stock as part of National Forest Inventory (NFI). The NFI was started in 1989 with 2735 permanent and temporer sampling plots throughout Indonesia. Size of plot 1 ha and sampling point at space 20 x 20 km. NFI also records number of trees by species, and diameter class. Quality of data is relatively good
Forest Management Units and holders of IUPHHK	Regular overall forest inventory, i.e. forest stand data similar to NFI reported regularly every 10 years. Sampling plots are in the form of square plot with area of 0.25 hectare (width 20 m and length 125 m), while in plantation forest the plot in the form circle with size depend on age tree class. Quality of data is relatively good from some FMUs
Forest Management Units and holders of IUPHHK	Stand inventory before logging (ITSP-Inventarisasi Tegakan Sebelum Penebangan). The activities include recording, labeling trees on working block as part of activities in developing annual work plan of the logging companies. Trees being measured are ones with diameter breast height of more than 20 cm. This is only done in logging blocks. Quality of data is relatively good from some FMUs
Forest Management Units and holders of IUPHHK	Inventory of Left standing Trees (*Inventarisasi Tegakan Tinggal or ITT*), activities for measuring and recording remaining trees after logging which include species composition. Quality of data is relatively good from some FMUs
Forest Management Units and holders of IUPHHK	Logging data of all species from logging block
Forest Management Units and holders of IUPHHK	Tree data from permanent block developed 1-3 years after logging to monitor the mean annual increment of the remaining trees in the logging block. This is required for having certification. Every concessionaire is obliged to develop (*Petak Ukur Permanen-PUP*). Number of PUP that must to be established in a FMU is 6 plots for dryland natural forest 16 PUP for wetland natural forest. The size of the PUP is minimum 200 m x 200 m and within the PUP there should be observation plot with size 100x100m to measure diameter, height and species of trees that have diameter of more than 10 cm.
Ministry of Agriculture	Soil carbon data including peat
LAPAN (National Institute of Aeronautics and Space-Remote Sensing Affairs)	Data on national carbon assessment using remote sensing. Carbon stock changes and degradation are estimated using equations relating forest biomass with remote sensing derived vegetation index
Other agencies (universities and research agencies)	Various kind of forest and soil carbon data from different locations. For example IPB (Bogor Agriculture University) under STORMA project has developed a long-term plot for biomass and CO_2 fluxes measurement at different intensity of canopy cover (reference or intact forest sites against degraded forest and non-forest land use) in Lore Lindu National Park and its surrounding area. Database is available at Storma's official website: http://www.storma.de. Under JSPS-LIPI-IPB Core University project, IPB had conducted a long term research at Central Kalimantan on measurement of CO_2 emission from a drained peatland forest; effect of water table and fire occurance on CO_2 emission, peat depth, and CH_4 emission were also measured.

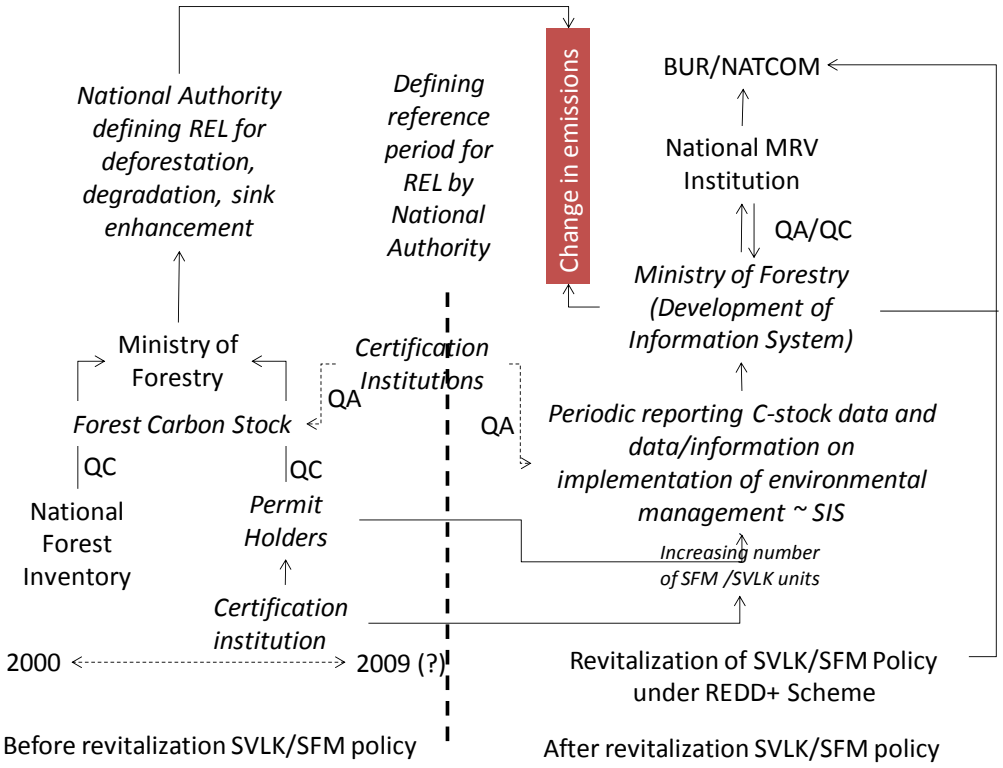

Figure 5.2. Possible integration of current certification process with MRV system. Note the italic indicates institutional mechanism/system that needs to be developed

6 Development of Safeguard Information System

Following the Decision 1/CP.16, developing country in the implementation of actions for reducing emission from deforestation, forest degradation and role of forest conservation, sustainable forest management and sink enhancement (REDD+) should develop safeguard information system (SIS). The term "safeguard" often used in reference to measures, such as policies or procedures, designed to prevent undesirable outcomes of actions or programmes (Moss and Nussbaum, 2011). Safeguards are primarily designed to prevent harm in program implementation but can also support delivery of positive benefits and sustainable development goals.

Based on Decision 1/CP.16, there are seven components of safeguard that should be promoted and supported in the implementation of REDD. The first component is that REDD+ programs and activities should be consistent with the objectives of national forest programmes and relevant international conventions and agreements. The second is that, REDD+ should promote transparent and effective national forest governance structures. The third is that implementation of REDD+ should respect for the knowledge and rights of indigenous peoples and members of local communities. The fourth is that implementation of REDD+ should involve relevant stakeholders, in particular indigenous peoples and local communities. Fifth is that REDD+ actions are consistent with the conservation of natural forests and biological diversity, ensuring that the actions are not used for the conversion of natural forests, but are instead used to incentivize the protection and conservation of natural forests and their ecosystem services, and to enhance other social and environmental benefits. The sixth and the seventh components are that actions to address the risks of reversals and to reduce displacement of emissions are properly implemented.

In Indonesian forestry sector, there are a number of policy instruments that are directly related to REDD safeguard. Some of the instruments used by the Government of Indonesia to safeguard development activities include (Pustanlinghut, 2012):

(1) Environmental impact assessment (AMDAL) which include environmental management and monitoring plan (RKL/RPL),

(2) Certification on SFM Performance Evaluation and Validity of Wood Legality (PK-PHL and SVLK; see section 2.2).

(3) PGI (Partnership Governance Index), a comprehensive measure to evaluate democratic governance performance of province in Indonesia which includes transparency, fairness, efficiency and effectiveness.

Other instruments applied outside government include (i) HCVF (High conservation value forest), FPIC (Free Prior Informed consent, the principle that a community has the right to give or withhold its consent to proposed projects that may affect the lands they customarily own, occupy or otherwise use), SESA (Strategic Environmental and Social Safeguards Assessment), etc.

Considering the above fact, development of Information System for Safeguard REDD+ should be integrated and synergy with the existing system. This will make REDD+ safeguard can be implemented effectively at various level and avoid cost that might be higher than the benefit gains

from the REDD+. Centre for Standardization and Environment of Ministry of Forestry (Pustanlinghut, 2012) has initiated multistakeholder process in developing safeguard institutional system (SIS) for REDD+ (Figure 6.1). The institutional structure proposed for SIS for REDD consists of two elements. First is institution responsible to consolidating, validating and verifying data and information on the implementation of safeguard, and second is institution that will tackle complaint from public to data and information of SIS and facilitate conflict resolution. This structure is quite similar to that of SFM/SVLK where there are certification institution that will do verification and KAN mechanism for handling complaint (see Figure 2.2). Information of the results of verification for SFM/SVLK will be uploaded and stored in the web-site at the Ministry of Forestry as well as the certification institutions.

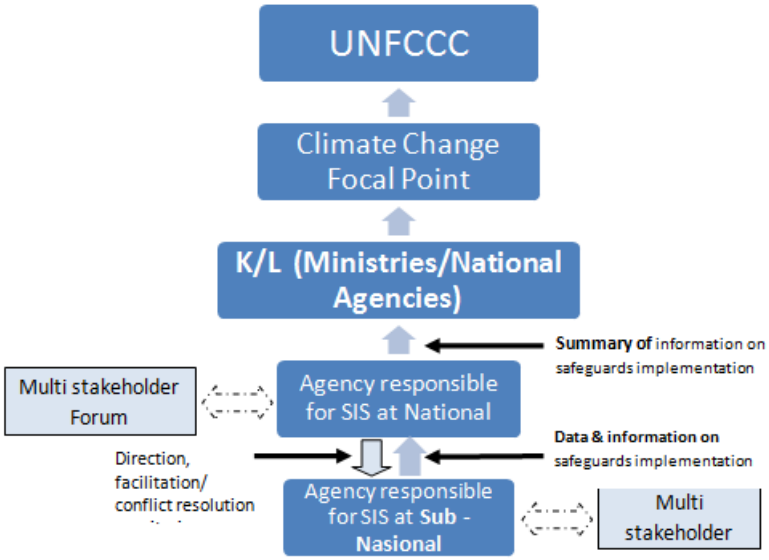

Figure 6.1. Proposed Institutional structure for REDD+ safeguard (Pustanlinghut, 2012)

Based on assessment to indicators used in SFM/SVLK certification, it is also found that there are compatibility between SFM/SVLK indicator and REDD+ MRV/safeguard components (Table 6.1). However, there are some adjustments that need to be done in the current certification system to be fully compatible with RED MRV and safeguard. By having the SFM/SVLK indicators fully compatible with the RED MRV and safeguard, direct impact on the implementation of SFM/SVLK on emission reduction can be quantified and implementation of the SFM/SVLK can be considered as REDD+ actions. Figure 6.2 shows the proposed process for integrating SFM/SVLK process with REDD+ MRV and safeguard information system (SIS).

Table 6.1. Compatibility of indicators used in SFM/SVLK certification with REDD+ MRV and Safeguard components

Aspect in REDD+	Indicators in REDD+	Compatibility of indicators of SFM/SVLK with REDD+ MRV ad Safeguard	
		SFM	SVLK
MRV	Carbon stock change	+	0
SAFEGUARD Components	NFP/ Conventions		
	- Large scale	+	+
	- Small scale	–	–
	Good governance, sovereignty	+/–	+/–
	Respect indigenous peoples	–	0
	Stakeholder engagement	+	+
	BioD, natural forest, ecosystem services	+	–
	Permanence of C (RPL/PPL)	+	–
	Leakage of C (RPL/PPL)	+	0

Note: + = compatible; – = need adjustment; 0 = not connection

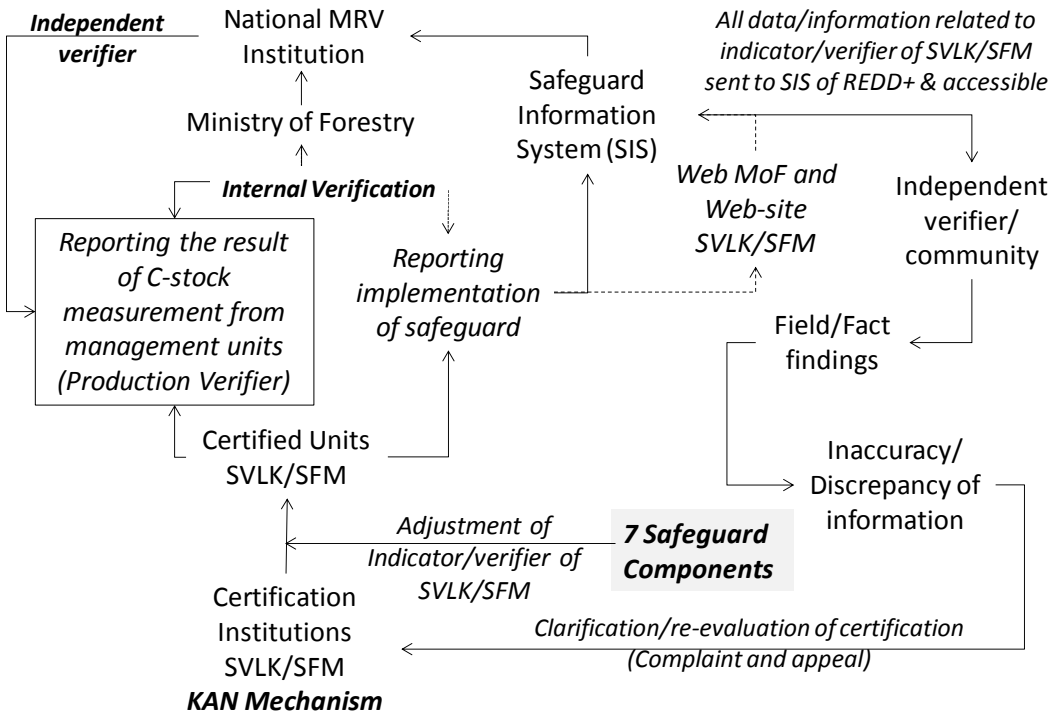

Figure 6.2. Integration of SVLK/SFM with REDD MRV and Safeguard

7 Conclusion & Recommendation

Policies, strategies and actions for achieving sustainable forest management system in Indonesia are all in line with the REDD+ activities. The implementation of the policies and action plans will result in greenhouse gas emission reduction. To gain international recognition on the resulted emission reduction, Indonesia needs to define its reference emission levels, to have robust and transparent national forest monitoring system including system for providing information on how the safeguards are being addressed and respected throughout the implementation of the strategy and action plans.

For increasing the effectiveness of the policies and actions in achieving SFM and reducing emission GHG emission from deforestation, government needs to create some incentive and financing policies. These include (i) financing policies for the acceleration of FMU establishment, (ii) incentive policies for the certification system, (iii) financing and incentive policy for accelerating the establishment of timber plantation on degraded land and CFM for sink enhancement, and (iv) incentive and financing policies for conserving forest carbon and land swap (change of forest function to save forested land). Debt Nature Swap scheme is considered as potential financing source to support the implementation of the incentive policies.

Reference Emission Level (REL) for deforestation has been developed by the Ministry of Forestry using historical information including proposal on the allocation of emission reduction for each province. Application of historical approach in defining REL at sub-national level (province and district) is not appropriate. It is recommended that different approaches can be used by sub-nationals considering their specific circumstances. Platform for negotiation process in defining REL between national and sub-national should be developed.

REL for forest degradation and reference level (RL) for sink enhancement are also need to be developed. Data from forest certification systems involving on-the-ground auditing in combination with data from the national forest inventory is potential to be used for developing REL for forest degradation. Reference for sink-enhancement can also be developed using historical data on realization of land rehabilitation (GERHAN or RHL), CFM, and timber plantation establishment on degraded land. Efforts to improve the management of these data including system for quality assurance and quality control (QA/QC) should be prioritized as part of process for developing robust and transparent National Forest Information System.

Official document describing transparently the approach and methodology used in developing REL, source of data including uncertainty assessment accessible by public is not available yet. This will reduce the credibility of the REL and not meet international requirements. The national REL may need to be reported to the UNFCCC secretariat in biennial update reports (BUR) as part of obligation under the climate change convention.

Potential emission reduction resulted from the implementation of the policies and action plans of the SFM under the framework of REDD+ in the period of 2012-2025 may reach 6.75 Gt CO2 cumulatively equivalent to 30 billion USD of income. The benefit from carbon is much smaller than

the those of non-carbon. The economic benefit from non-carbon from the implementation of SFM could reach 5 times of the benefit from carbon.

Plan for the establishment of a transparent and credible system to measure, report and verify (MRV) results of emission reduction from the implementation SFM under the framework of REDD+ has been designed by the REDD+ Task Force. Institutional system for implementing the MRV will not require the establishment of new institutions. However, Ministry of Forestry with REDD+ Task Force and other related government agencies may need to set up strategies and actions for addressing the problem of inconsistency in methodology used for measuring and monitoring land/forest cover change, standardization for land/forest cover classification, development of sampling plots in national forest inventory, data accessibility, coordination in land and forest resource database management across institutions, and systematic system for QA/QC.

Policy instruments from government and non-government organization that are directly related to REDD safeguard are available Indonesia. For example, indicators used in SFM/SVLK certification are generally compatible with REDD+ MRV system and safeguard components. Therefore, it is strongly recommended that the development of Information System for Safeguard should be integrated and synergized with the existing certification systems as this will make REDD+ safeguard can be implemented effectively at various level and avoid high cost.

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SUSTAINABLE FOREST MANAGEMENT, FOREST BASED CARBON, CARBON STOCK, CO2 SEQUESTRATION AND GREEN PRODUCTS IN ORDER TO REDUCE EMISSIONS FROM DEFORESTATION AND FOREST DEGRADATION

Dr. Rizaldi Boer

MINISTRY of FORESTRY ITTO I T T O

RED-PD 007/09 Rev. 2 (F)

Enhancing Forest Carbon Stock to Reduce Emission from Deforestation and Degradation through Sustainable Forest Management (SFM) Initiatives in Indonesia

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