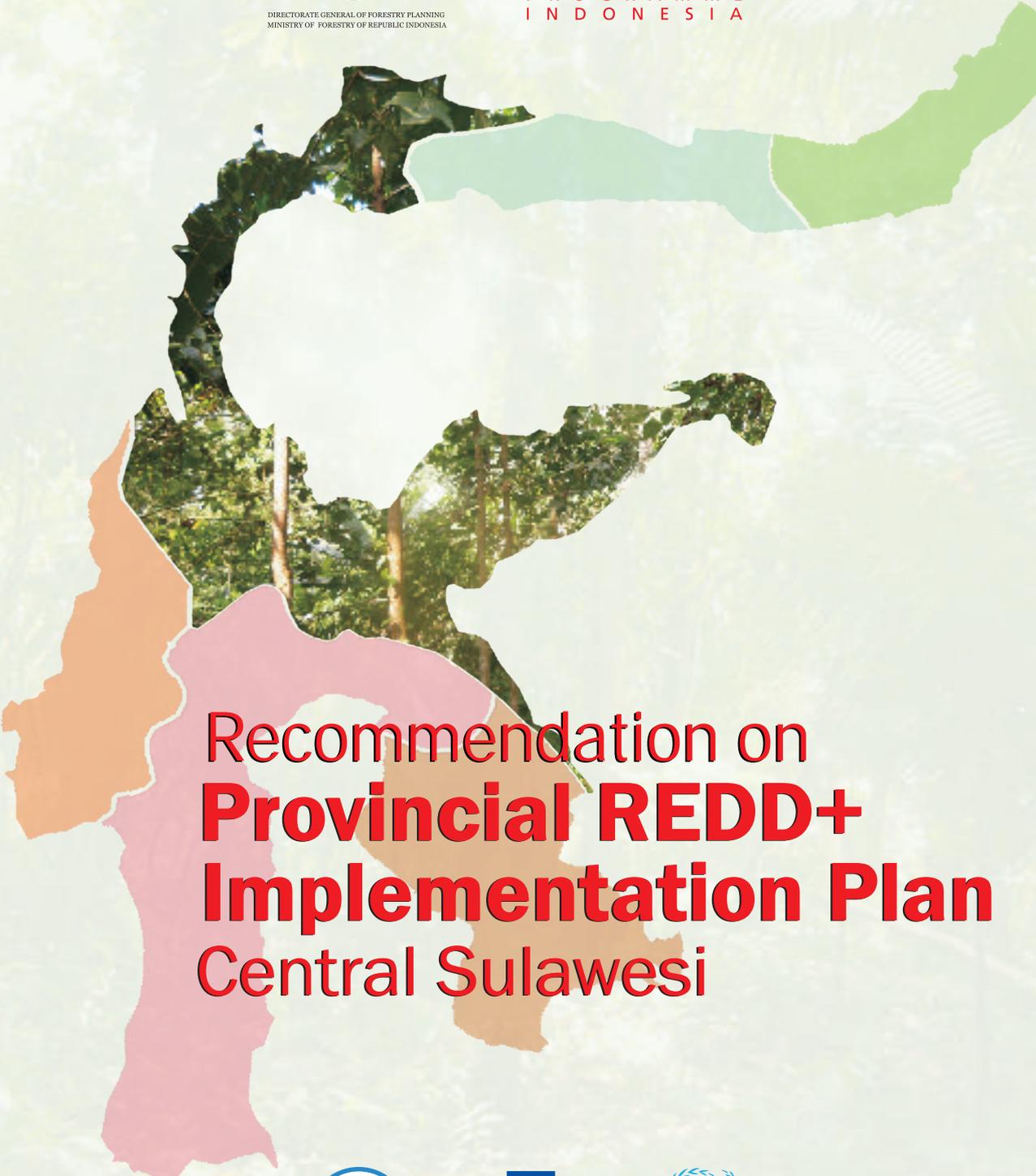




DIRECTORATE GENERAL OF FORESTRY PLANNING  
MINISTRY OF FORESTRY OF REPUBLIC INDONESIA

UN-REDD  
PROGRAMME  
INDONESIA



# Recommendation on **Provincial REDD+** **Implementation Plan** Central Sulawesi



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DIRECTORATE GENERAL OF FORESTRY PLANNING  
MINISTRY OF FORESTRY OF REPUBLIC INDONESIA



# Recommendation on Provincial REDD+ Implementation Plan Central Sulawesi



RECOMMENDATION ON  
PROVINCIAL REDD+ IMPLEMENTATION PLAN  
CENTRAL SULAWESI

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# Table of Contents

Abbreviations	5
Executive Summary	7
Introduction	13
Forest Profile and Greenhouse Gas Emissions from Land Use Change	17
Options for REDD+ Priority Actions and Locations	23
Ensuring Consistency of REDD+ Action Plan with Other Planning Documents	31
Priority REDD+ Action Plans	37
Implementation Strategic Action Plan	45
Monitoring and Evaluation	53



# Abbreviations

APBD	<i>Anggaran PendapatanBelanja Daerah</i> (Regional Budget Allocation)
APBN	<i>Anggaran Pendapatan Belanja Negara</i> (National Budget Allocation)
APL	<i>Areal Penggunaan Lain</i> (Areas for Other Purposes)
BAU	Business as Usual
GDRP	Gross DomesticRegional Bruto (GDRP)
HPH	<i>Hak Pengusahaan Hutan</i> (Right to Extract Timbers from Natural Forest)
HTI	<i>Hutan Tanaman Industri</i> (Industrial Timber Estate)
HTR	<i>HutanTanaman Rakyat</i> (Community Plantation Forest)
KPH	<i>Kesatuan Pengelolaan Hutan</i> (Forest Management Unit - FMU)
MRV	Measurement, Reporting and Verification
REL	Reference Emissions Levels
RAD-GRK	<i>Rencana Aksi Daerah – Gas Rumah Kaca</i> (Regional Action Plan to Reduce Greenhouse Gas)
RAN-GRK	<i>Rencana Aksi Nasional – Gas RumahKaca</i> (National Action Plan to Reduce Greenhouse Gas)
RPJMD	<i>Rencana Pembangunan Jangka Menengah Daerah</i> (Socio-economic development plan)
Renstra	<i>Rencana Strategis</i> (Strategic Plan)
RTRWP	<i>Rencana Tata Ruang Wilayah Propinsi</i> (Provincial Spatial Plan)



# Executive Summary

This report identifies REDD+ priority actions for Central Sulawesi taking into consideration local specific situations and socio-economic considerations.

REDD+ provides opportunities to achieve multiple benefits by contributing to the conservation of biodiversity and ecosystem services that are important to local communities, such as watershed protection and supply of non-timber forest products. Due to data limitations these opportunities were not used as a basis for the selection of priority actions. However, some recommendations for achieving multiple benefits in the implementation of priority actions are made.

The historical rates of deforestation and forest degradation in Sulawesi have been generally low compared to Sumatera and Kalimantan islands. Emissions generated from deforestation and forest degradation, between 2000 and 2011, were 14.35 million tCO<sub>2</sub>e annually. Based on the historical emissions, the projected annual emissions between 2000 until 2020 are 17.2 million tCO<sub>2</sub>e annually. However, using the adjusted approach,<sup>1</sup> emissions that will be generated are estimated at 15.2 million tCO<sub>2</sub>e /year.

According to the national commitment to reduce greenhouse gas, Central Sulawesi is expected to reduce emissions by 26 per cent from the business as usual level in 2020. To achieve this commitment, the target for Central Sulawesi is to reduce emission as much as 4.8 million tCO<sub>2</sub>e/year from the BAU level in 2020.

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<sup>1</sup> Taking into account the ratio of forests and the total land in the province as well as population.

Considering both social and economic considerations, six potential actions for REDD+ have been identified for Central Sulawesi. In this report, the economic consideration was assessed based on the opportunity costs of REDD+, while the social factor considers local communities' settlement and agricultural lands within state forests when identifying REDD+ actions (as they provides an indicator of overlapping claims). The identified actions are:

1. **The development of FMUs.** The Provincial Forestry Office aims to develop additional two new FMUs between 2011 and 2016, besides one established FMU in DampelasTinombo. The establishment of FMU as previously discussed aims to ensure a proper institutional setting to manage forests for their intended purposes. The FMU is expected to result in reducing deforestation and forest degradation, which in Central Sulawesi is 0.4 per cent and 1.14 per cent annually.
2. **Community plantation forests to rehabilitate areas without forest cover in production forests.** Around 53,965 hectare of community forest plantations will be developed, where communities are provided with rights to plant timber species and benefit from timbers. The priority districts include Banggai, Poso, Morowali, Donggala, ParigiMountong, and Buol. This program can help rehabilitate lands currently with no forest cover, which are around 14,690 hectares (resulting in carbon gain of around 5.4 million tCO<sub>2</sub>e within 5-6 years). Positive effects for biodiversity and ecosystem services can be enhanced by using planting methods that are appropriate to the site and aiming for a diverse composition of native species. Priority for rehabilitation should be given to sites that are sensitive to loss of soil cover or water regulation functions.
3. **Community forestry (or Village Forest) to rehabilitate areas without forest cover in protected and conservation forests.** The rehabilitation of protection and conservation forests can enhance carbon stocks, particularly in locations currently without forest cover. The total areas that can be rehabilitated in protected and conservation forests are around 70,985 hectare, with the potential of carbon enhancement as much as 44.2 million tCO<sub>2</sub>e within 10 to 12 years. In protected and con-

ervation forests, using rehabilitation methods that generate benefit for biodiversity and ecosystem services is particularly important. Priority should be given to sites that can have a buffering function for high biodiversity areas, as well as sites that are sensitive to loss of soil cover or water regulation functions. On sites that are capable of regenerating naturally, the only measures that should be taken are to prevent further degradation through illegal activities.

4. **Law enforcement in production forests under logging concessions (HPH).** In Central Sulawesi, only one company can sustain its operation, while other companies had to stop their operations for the time being due to low financial returns from logging. This situation is caused by many factors including low timber prices and also competing timber supply from illegal logging. The inactivity of operations in those locations opens up opportunity for illegal encroachment particularly in areas with easy and open access. REDD+ needs to strengthen law enforcement to ensure commercial logging concessionaires implement sustainable forest management in areas designated to them. Law enforcement can help reduce deforestation particularly in secondary forests (382,031 hectare), which are usually accessible by surrounding communities. Potential of emission reduction is 76 million tCO<sub>2</sub>e between 2012 and 2020.
5. **Reallocation of industrial timber plantations from primary and secondary forests to non-forest areas.** The reallocation of timber plantations that have obtained licenses to operate in areas with forest cover to areas without forest cover can prevent deforestation and the associated emissions. Carbon emissions that will be generated due to the clearance of forest for timber plantations will be 350.1 and 255.8 tCO<sub>2</sub>e per hectare in primary and secondary forests respectively. Land swap can take place in production forests, currently without forest cover, with areas allocated for timber plantations currently with forest covers (primary or secondary forests). REDD+ can therefore help compensate the returns from timbers, which can be extracted prior to the opening of the lands for plantations. The potential of emission reductions from this measure are 15 million tCO<sub>2</sub>e. Priority should be given to high biodiversity sites and endangered forest types that are within areas allocated for plantations,

as well as to sites that provide important ecosystem services for local populations.

- 6. Reallocation of crop plantations from primary and secondary forests to non forest areas.** In conversion forests and APL, REDD+ can provide incentives to relocate plantation companies that have already obtained licenses to convert primary and secondary forests for estate crops. Assuming that plantation companies will plant oil palm, carbon emissions that will be generated due to land use change will be 570.3 and 476 tCO<sub>2</sub>e/ha in primary and secondary forests respectively. Land swap, for instance, can take place in production forests currently without forest cover with APL areas currently still have forest cover. Priority should be given to high biodiversity sites and endangered forest types that are within areas allocated for plantations, as well as to sites that provide important ecosystem services for local populations.

To ensure successful implementation of the proposed REDD+ actions, several immediate steps are required to be pursued to ensure readiness before REDD+ implementation. They include:

- 1. Building the readiness (2012-2015).** It is also imperative to continue strengthening readiness of Central Sulawesi in the implementation of REDD+. On-going activities can be carried out further including in building an MRV system, safeguards, developing institutions on REDD+, strengthening law enforcement, issuing necessary regulations and developing the knowledge base on the multiple values of forests in the province and their spatial distribution. Ongoing dialogues on REDD+ at the provincial level have been useful in developing REDD+ provincial strategy (Strategi Daerah REDD+) and building necessary institutions on REDD+ at the provincial and district levels.
- 2. Stakeholder consultations on the proposed action plans.** Proposed actions presented in this report need to be consulted with relevant stakeholders particularly with those who will be directly affected, including businesses, local communities and government agencies.

**3. Project inception note development.** Following discussions with stakeholders, a project inception note can be developed. The development of PIN will require verifying information presented in this report on the ground (through ground-truthing) to ensure the accuracy of data. After any donor is interested in providing funding, a full scale project proposal can be developed. Given the high potential for biodiversity conservation in Central Sulawesi and the strong interest of many donors to promote equity considerations in REDD+, one option could be to develop a targeted project proposal for 'high biodiversity and socially equitable REDD+', taking into account the recommendations for optimizing multiple benefits made above. This could be presented to donors with a declared interest in multiple benefits, including biodiversity, ecosystem services and poverty reduction.

Two options to finance REDD+ actions in Central Sulawesi are: government budget and international support from both bilateral and multilateral cooperation. The government of Indonesia has committed to reduce greenhouse gas emissions by 26 per cent from business as usual in 2020 using domestic resources, including from (national and local) government budget and the contribution of the private sector. International support can be allocated to achieve additional targets to reduce emissions from deforestation and forest degradation.

In order to achieve the 26 percent target of emissions reduction using domestic resources, Central Sulawesi can focus on the first three proposed actions: 1) developing FMUs; 2) community forest plantations to rehabilitate production forests without forest cover; and 3) community forestry to rehabilitate areas without forest cover in protection and conservation forests. These actions can contribute to reduce emissions as much as 58.8 million tCO<sub>2</sub>e or around 7.35 million tCO<sub>2</sub>e/year.

External resources can be used to implement three other proposed actions, including law enforcement in production forests under logging concessions (HPH) and relocation of timber and crop plantations from forests to areas without forest covers. Additional 91.17 million tCO<sub>2</sub>e or 11.4 million tCO<sub>2</sub>e/year can be achieved from the implementation of these three additional activities.



# Introduction

Central Sulawesi is the largest province in the island of Sulawesi in terms of the total land area and the proportion of forest covers. Administratively, Central Sulawesi Province consists of ten districts and one city: Banggai, Banggai Islands, Buol, Donggala, Morowali, Mautong Parigi, Poso, Tojo Una-Una, Toli-Toli, Sigi, and Palu City. To sustain its economic growth, Central Sulawesi depends mainly on the agricultural sector, which contributes to almost 40 percent of the total regional economy in 2010.<sup>2</sup> The sector is important to provide employment for over 600 thousand people (or almost 60 percent of the total working-age population), and particularly for the poor populations who reside in rural areas. The percentage of populations under the poverty line in Central Sulawesi is higher than the national average. In 2011, around 15.83 per cent of the total populations in Central Sulawesi were poor, while at the national level, the average percentage of populations under the poverty line was 12.49 per cent.

The forestry sector contributes around 4.19 per cent annually to the Central Sulawesi Gross Domestic Regional Bruto (GDRP). In the first trimester of 2012, the contribution of the forestry sector to GDRP increased by 8.94 per cent. The importance of forest resources has both social and economic implications. Around 70 per cent of the total land in Central Sulawesi is classified as the forest zone (or around 4.3 million hectare), where 800,000 people are currently living within and surrounding forests (or around 33 per cent of the total population).<sup>3</sup>

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<sup>2</sup> Agricultural Sector as defined in BPS includes food crops, plantation, livestock, forestry, and fisheries.

<sup>3</sup> [www.forestpeoples.org/sites/.../sulawesi-tengah-briefing-4-edited.pdf](http://www.forestpeoples.org/sites/.../sulawesi-tengah-briefing-4-edited.pdf)

The forests of Sulawesi are internationally recognized for their high biodiversity, with a large proportion of endemic species that exist nowhere else in the world. Due to the rugged topography, many forest areas are also essential for maintaining the quality of soils and regulating water flows.

Social economic development has put pressures on Central Sulawesi's forests. The situation is also worsened by illegal activities in forests including encroachment, illegal logging and forest disturbance. Between 2000 and 2011, the decline of forest cover has reached 184,141 hectare, with the annual deforestation rate of 16,740 hectare per year (Suryadi et al, 2012). Forest degradation during the same period reached 563,473 hectare with the annual forest degradation rate of 51,225 hectare per year.

Realizing the importance of sustainable use of forest resources, the provincial government has attempted to address deforestation in Central Sulawesi. The Governor's vision is reflected in the Regional Development Agenda (2011-2016), which refers to "the sustainable management and use of natural and forest resources." As an attempt to reduce deforestation, the Governor has established in 2011 the REDD+ Working Group in Central Sulawesi, which was formalized by the issuance of the Governor Decree Number 522/84/DISHUTDA-GST/2011. The Working Group consists of 77 members, including 10 representatives from indigenous people and local communities; while the Provincial Forestry Office serves as a secretariat to provide an administrative support for the REDD+ Working Group.

The Central Sulawesi government, together with the REDD+ Working Group, has pursued several activities to build REDD+ readiness in Central Sulawesi. Supports have also been provided by UNREDD to facilitate the process with technical assistance. A number of achievements include: developing the draft of the REDD+ Provincial Strategy, developing the Reference Emissions Levels (REL), and the Measurement, Reporting and Verification (MRV) procedures for Central Sulawesi Province. The REDD+ working group is currently finalizing the Strategy (Strategi Daerah REDD+), where a consultation process with all districts in Central Sulawesi will be conducted.

Central Sulawesi is also required to produce the Provincial Action Plan to reduce greenhouse gas (RAD-GRK) as instructed by the President in the Presidential Decree 61/2011. In October 2009, President Susilo Bambang Yudhoyono committed to reducing Indonesia's CO<sub>2</sub> emissions by 26 per cent against the business-as-usual (BAU) level in 2020 using domestic resources. With international supports, Indonesia aims to achieve additional 15 per cent, which leads to a total of 41 per cent emission reductions from the BAU level in 2020. Following this commitment, the Presidential Decree 61/2011 was issued to lay down further the action plans to achieve such targets in relevant sectors including: forest and peatland, waste, agriculture, industry, and energy and transportation. The forestry and peatland sector should reduce emissions as much as 0.67 Giga tCO<sub>2</sub> and 1.039 Giga tCO<sub>2</sub> to achieve the 26 and 41 per cent targets respectively by 2020.

To provide inputs to the REDD+ Provincial Strategy and the RAD-GRK, UN-REDD is assisting the Provincial Government in conducting technical analysis to prepare REDD+ provincial action plans. The expected outputs of this exercise are *to identify priority actions and locations for REDD+ at the provincial level taking into consideration local specific situations and socio-economic considerations*. The Provincial Action Plan is developed based on spatial data collected and government documents and commitments in socio-economic development (Rencana Pembangunan Jangka Menengah Daerah or RPJMD) and forest management (Rencana Strategis – RENSTRA) at both national and local levels. The analysis on this report is also benefited from reports that have been produced by UNREDD, including on Reference Emissions Levels, Opportunity Cost Analysis, and others. Focused-group discussions will also be conducted to verify the results of the analysis with relevant stakeholders. Following the completion of the report, it is expected that the consultation process and political discussions will be carried out between stakeholders on developing detailed project proposals and other necessary actions.

Due to data limitations, the method of analysis did not consider the potential for REDD+ to achieve multiple benefits by contributing to the conservation of biodiversity and ecosystem services that are

important to local communities. However, some recommendations for achieving multiple benefits in the implementation of priority actions are made. Spatial information related to some elements of biodiversity (e.g. location of Important Bird Areas) and proxies for ecosystem services (e.g. slope steepness and location of sites in relation to watershed boundaries) is available. A series of maps using this information is being produced by UNREDD and should be referred to when planning and implementing priority actions.

This report summarizes the results of analysis conducted in identifying the priorities and proposes priority activities and locations for consideration of REDD+ implementation in Central Sulawesi. The report first discusses Central Sulawesi forest profile and greenhouse gas emissions from land use change, before presenting a number of options available for REDD+ actions. It then details the government regulations and policy documents to ensure the consistency with the proposed REDD+ actions, which are then presented towards the end of this report.

# Forest Profile and Greenhouse Gas Emissions from Land Use Change

## Central Sulawesi Forest Profile

More than half of the total land area in Central Sulawesi is classified as forest zones. Based on the data obtained from the Ministry of Forestry (2011), the total land area in Central Sulawesi is 6.1 million hectare, wherearound 70 per cent of the Province is categorized as forest zones. Forest zones are divided into the following categories:

1. Conservation area Natural Protection Areas (Kawasan Suaka Alam) and Natural Conservation Area (Kawasan Pelestarian Alam) including land and marine. The total area of conservation forest is 676,248 hectare or 9.94 percent.
2. Protection forest (Hutan Lindung) as much as 1,489,923 hectare or 21.9 percent
3. Cultivated Areas:
  - a) Limited Production Forest, totaling 1,476,316 hectare or 21.7 percent.
  - b) Permanent Production Forest, totaling 500,589 hectare or 7.36 percent.
  - c) Conversion Production Forest, totaling 251,856 hectare or 3.7 percent. These forests can be legally converted to other land use activities.

The quality of forest cover in areas classified as forest zones varies. The Land Cover Map 2011 shows that the total primary forests (dry forest and mangrove) are 2.28 million hectare, while the secondary forests are 1.17 million hectare. Primary and secondary forest scatter in every forest classifications as well as in non forest zone. Around 483,000 hectare is currently without forest

cover (or around 10 per cent), while the remaining 10 per cent of the area classified as forest zones has no data about its land cover.

Table 1 shows the actual land cover in each forest classification. Non forest zones are also known as areas for other purposes (Areal Penggunaan Lain – APL). Forests within APL can also be legally converted to other land use activities. In Central Sulawesi, around 215,790 and 499,390 hectare of primary and secondary forests can be found in APL (Table 1).

TABLE 1. ACTUAL FOREST COVER IN FOREST ZONES

Forest Classification	Land Cover	Total Area (Hectare)
Production forest (limited and permanent)	Primary forest	906,944
	Secondary forest	646,004
	Mangrove (primary and secondary)	395
	Plantation	7,325
	Bushes, grassland and empty land	109,097
	Housing, agricultural land, transmigration	174,415
	Mining	391
	Others (water, pond, etc)	497
Protection forest	Primary forest	872,432
	Secondary forest	330,432
	Mangrove (primary and secondary)	4,121
	Swamp forest (primary and secondary)	1,009
	Plantation	601
	Bushes, grassland and empty land	39,972
	Housing, agricultural land, transmigration	42,919
	Mining	248
Others (water, pond, etc)	171	
Conservation forest	Primary forest	419,809
	Secondary forest	86,225
	Mangrove (primary and secondary)	4,338
	Plantation	3,710
	Bushes, grassland and empty land	31,013
	Housing, agricultural land, transmigration	27,437
	Mining	2,271
	Others (water, pond, etc)	1,008
Conversion forest	Primary forest	74,389
	Secondary forest	103,737
Areas for other uses (APL)	Primary forest	215,790
	Secondary forest	499,390

Source: Author's recalculation from Forest Zone Map and Land Cover Map, data as of 2011.

Between 2000 and 2011, the major land cover change causing deforestation was the conversion from Dry land Secondary Forest to Shrub, Dry land Agriculture, and Shrub Mixed Dry land Agriculture. Identified factors driving forest conversion were transmigration, mining estate crop, and infrastructure development. The total deforestation between 2000 and 2011 was around 184,141 hectare or around 16,740 hectare annually. Furthermore, forest degradation was marked by the conversion from Dry land Primary Forest became Dry land Secondary Forest. The total areas of forest degradation well exceeded the total areas of deforestation within the same period, which was 563,473 hectare or around 51,225 hectare annually (Table 2).

TABLE 2. DEFORESTATION AND FOREST DEGRADATION  
IN CENTRAL SULAWESI

	Deforestation		Forest Deforestation	
	Hectare	Hectare/Year	Hectare	Hectare/Year
2000-2003	46,704	15,568	320,826	106,942
2003-2006	80,031	26,677	187,242	62,414
2006-2009	22,487	7,496	23,884	7,961
2009-2011	34,919	17,460	31,521	10,507
<b>Total</b>	<b>184,141</b>	<b>16,740</b>	<b>563,473</b>	<b>51,225</b>

Source: Suryadi et al (2012)

### Greenhouse Gas Emissions from Forests

Deforestation and forest degradation produce greenhouse gas emissions. Between 2000-2011, the emissions from deforestation and forest degradation in Central Sulawesi were estimated at 14.4 million tCO<sub>2</sub>e/year, while the total sequestration was 45,382 tCO<sub>2</sub>e/year. The sequestration was marked by the change of shrubs and agricultural lands to secondary forests. The net emissions between 2000 and 2011 in Central Sulawesi were therefore 14.35 million tCO<sub>2</sub>e annually. Based on the historical emissions, the projected annual emissions between 2000 until 2020 are 17 million tCO<sub>2</sub>e annually. Detailed methodology of REL development is provided in

the UN-REDD report on "Provisional Reference Emission Level of Central Sulawesi" (Suryadi et al, 2012). In the development of the REL, the report refers to the emission factors listed in Table 3.

TABLE 3. EMISSION FACTOR FOR BAPLAN LAND COVERCLASS

Landcover	Stock_tCha	Source
Dryland Primary Forest	195.4	NFI
Dryland Secondary Forest	169.7	NFI
Primary Mangrove	170	NFI
Primary swamp forest	196	NFI
Secondary Mangrove Forest	120	NFI
Secondary Swamp Forest	155	NFI
Forest Plantation	100	NFI
Shrub	15	Wasrin, 2000
Shrub Swamp	15	
Estate Crop	63	
Settlement	1	
Grassland	4.5	
Dryland Agriculture	8	
Mixed Dryland Agriculture	10	
Paddy field	5	
Transmigration	10	
Cacao plantation	8,4 Mg C/ha	Gravenhos et al

Table source: Baplan MoF (2011) and Tadulako University (2010)

The report also estimated the future emissions based on the Adjusted Historical Based (AHB) method, which applies some adjustment factors related on their national or sub-national circumstances, such as population, forest cover proportion, and others. Under this scenario, the forest cover in 2020 will decrease by 66.15 per cent. Projected annual emissions after adjusted using above value are 15.2 million tCO<sub>2</sub>e/year.

Drivers of deforestation and forest degradation and their economic significance

Similar to any other provinces in Indonesia, deforestation and forest degradation in Central Sulawesi are caused by planned and

unplanned activities. Planned deforestation, which occurs legally in production and conversion forests as well as APL, has its socio-economic importance for the Province and local communities. Legal forest conversion for productive activities, such as for timber extraction, plantation, mining and agriculture, generate incomes for local governments and also for local communities. A number of unplanned activities also cause deforestation and forest degradation, including forest encroachment, illegal logging and forest fires. The underlying causes of deforestation are mainly due to low law enforcement, ineffective spatial planning, ineffective forest management unit and problematic tenurial system (UNREDD, 2012).

The significance of productive activities causing deforestation and forest degradation is reported in a study conducted by UN-REDD on "Opportunity Cost Study of the Major Land Uses in Central Sulawesi" (Wulan, 2012). The findings of the report can be summarized below (Table 4):

1. Commercial logging generates a return to the land as much as IDR 15.2 million per hectare. The system has the lowest establishment cost since it can provide positive cash flow at the first year of its operation.
2. Oil palm plantation, which is one of the main drivers of deforestation, has the highest profitability as well as return to land. This land use system is mostly operated by large scale companies and relatively new in region. The NPV reach IDR 72 million per hectare. However, the wage rate for plantation workers is almost four times below return to labor. Oil palm plantation is currently viewed as the most profitable land use systems in Indonesia, although the productivity in Central Sulawesi is lower than the productivity of oil palm plantation in Sumatera and Kalimantan.
3. Cocoa and clove plantations are also profitable (IDR 13 million and IDR 17 million respectively); however, both systems involve high establishment cost. In the past both systems were established as part of a government program. The government provides planting materials, fertilizers and tools for the first one to three years. Some programs also provide cost to cover labor

for land preparation. Some plantations are also established through low interest rate credit which could be considered, if government is planning to improve land productivity with rejuvenate old plantations or utilizing fallow/idle land

TABLE 4. PROFITS FROM LAND USE ALTERNATIVES

Land Use	Return to Land NPV (IDR'000/ha/year)	Years to Positive Sash flow	Establishment Cost (IDR'000/ha/year)	Return to Labour (IDR/ps-day)
1. Timber concession (HPH)	15,200	1	170	66,159
2. Large scale oil palm plantation	72,309	6	14,231	190,236
3. Smallholder cacao plantation	13,764	8	35,549	72,697
4. Smallholder coconut plantation	2,378	19	25,968	56,045
5. Smallholder clove	17,195	11	40,232	92,339
6. Paddy field	30,655	n.a	n.a	63,079

Source: The Opportunity Cost Study of the Major Land Uses in Central Sulawesi (Wulan, 2012)

# Options for REDD+

## Priority Actions and Locations

### The Baseline

Since there is uncertainty related to the method that will be adopted in the development of REL at the international REDD+ negotiation, this report refers to both historical and forward-looking rates of deforestation and forest degradation in establishing the baseline. The historical trend of deforestation is important to develop the REL as they can inform the total emission reductions over a period of time and it can also assist in identifying the future trend of deforestation. In the case of Indonesia, future land use change may not necessarily be correlated to historical deforestation. Opening forests for infrastructure, plantations and mining can occur in any primary and secondary forests, depending on forest classifications and the Spatial Land Use Plan (RTRW). In Central Sulawesi, the Draft of the Provincial Spatial Land Use Plan (RTRWP) 2010-2030 is expected to be finalized in December 2012. The Plan can then provide information about future deforestation and forest degradation and the associated emissions from land use change.

Future land use change proposed by the RTRW is shown in Table 5. The latest satellite images data (2012) shows that the total land area in Central Sulawesi is 6.5 million hectare. This figure is different with the one reported by the Ministry of Forestry in 2011, which is 6.1 million hectare, and also with the one included in the Regional Decree 2/2004, which is 6.8 million hectare.<sup>4</sup> Data presented in this

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<sup>4</sup> This number is different to the previous figure reported by the Ministry of Forestry because they use different satellite images, which result in different data & information.

report henceforth refer to the RTRW Map to ensure consistency, unless otherwise specified. The proposed reduction of forest zones is totaling 756,524 hectare, if compared to the latest GIS data. The change will take place in protection, production and conversion forests. The total conservation forests are proposed to increase as much as 190,355 hectare, if compared with the Regional Decree 2/2004. However, when compared with the latest GIS data, there will be a reduction (change of forest status) of as much as 144,566 hectare in conservation forests. The total areas classified as protection forests will also be reduced to 1.1 million hectare.

TABLE 5. PROPOSED LAND COVER CHANGE BASED ON THE PROVINCIAL SPATIAL PLAN (RTRW)

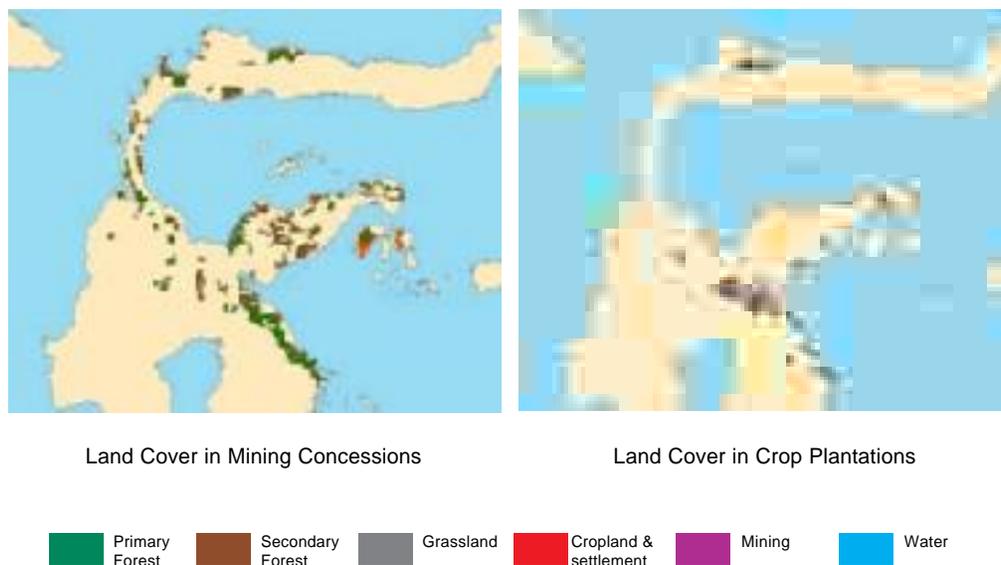
Forest classification	Total Area		Total Based on the Updated Data			
	Based on PERDA No. 2/2004		Based on the Updated Data		Proposed RTRWP Sulteng	
	Total	%	Total%	Total	%	
<b>Protection Forest</b>	676,248	9.94	1,011,169	15.43	866,603	13.23
• Conservation	1,489,923	21.90	1,353,464	20.66	1,107,930	16.91
• Protection	2,166,171	31.84	2,363,772	36.07	1,968,418	30.04
<b>Total A</b>						
<b>Cultivation Forest</b>	1,476,316	21.70	1,432,290	21.86	1,199,819	18.31
• Limited production forest	500,589	7.36	453,838	6.93	220,107	3.36
• Permanent forest	251,856	3.70	242,494	3.70	97,697	1.49
• Conversion forest	2,228,761	32.76	2,113,826	32.26	1,515,832	23.13
<b>Total B</b>						
<b>None Forests</b>						
• Areas for other purposes	2,408,368	35.40	2,000,695	30.53	3,001,794	45.81
• Water body			58,722		58,722	0.90
<b>Total C</b>	2,408,368	35.40	2,075,075	31.67	3,068,422	46.83
<b>TOTAL</b>	<b>6,803,300</b>	<b>100.00</b>	<b>6,552,672</b>	<b>100.00</b>	<b>6,552,672</b>	<b>100.00</b>

Source: Draft Provincial Spatial Land Use Plan (2012)

Assuming that the RTRWP will be approved, the emissions that will be generated from the proposed changes can be estimated. In the proposed RTRWP, a number of activities that are expected to generate emissions are:

1. **Mining** — The total areas allocated for mining, including the existing ones, are 1.31 million. The 2011 Land Cover Map shows that the areas consist of 550,646 hectare of primary forests and 409,646 of secondary forests. Assuming only 20 per cent of the areas with forest cover that can be cleared, the total emissions from mining alone can reach 130 million tCO<sub>2</sub>e.
2. **Crop Plantations** — The total areas allocated for plantations, including the existing ones, are 490,644 hectare. The 2011 Land Cover Map shows that the areas consist of 127,144 hectare of primary forests and 115,614 hectare of secondary forests. The total emissions from crop plantation can reach 117.8 million tCO<sub>2</sub>e.
3. **Timber Plantation** — The total areas allocated for timber plantation (HTI), including the existing ones, are 19,627 hectare. The 2011 Land Cover Map shows that the areas consist of 19,627 hectare of primary forests and 31,853 hectare of secondary forests. The total emissions from timber plantations can reach 15 million tCO<sub>2</sub>e.
4. **Commercial logging** — The total areas (existing and planned) allocated under commercial logging are over 1 million hectare. Assuming that commercial logging extraction can only be pursued in lands with primary forest covers (due to high timber potential), which are around 473,045 hectare, the emissions that would be generated from commercial logging are 43.9 million tCO<sub>2</sub>e.

FIGURE 1. LAND COVER IN AREAS ALLOCATED FOR MINING AND PLANTATIONS



### Options for Mitigation Actions in Central Sulawesi

Considering the baseline situation in Central Sulawesi, priority actions and areas to reduce deforestation and forest degradation under REDD+ can be determined. Several options that can potentially reduce emissions from deforestation and forest degradation, as well as enhancing carbon stocks are discussed below.

Most areas allocated as permanent and limited production forests are currently under commercial logging concessions (HPH). Around 44.6 per cent of the production forests are covered by primary forests, while around 36 per cent of the total areas are secondary forests and the remaining 20 per cent are empty land, bushes, settlements and community plantations and agricultural lands. Most of the commercial logging concessionaires have however stopped their operations due to low financial returns from timber extraction. The companies preferred to stop the operation for the time being rather than bearing financial loss. Law enforcement is crucial in forests under logging concessions because the inactivity

of operations in those locations opens up opportunity for illegal encroachment particularly in areas with easy and open access. REDD+ needs to strengthen law enforcement to ensure commercial logging concessionaires implement sustainable forest management in areas designated to them.

TABLE 6 POTENTIAL REDD+ ACTIONS IN PRODUCTION FORESTS

Status	Land Cover	Existing Land Use Activity	Opportunity Costs (IDR'000/ha/yr)	Change of Carbon Stock (tCO <sub>2</sub> e/ha)
Production Forests (under logging concessions)	Primary Forest	Commercial logging (HPH)	15,200,000	(-) 94.3
	Secondary Forest	No activity (prone to encroachment)	0	(-) 606.3

Production forests with no-forest cover, which are currently under logging concessions, can also be rehabilitated to enhance the carbon stocks. Priority for rehabilitation should be given to sites that are no longer capable of natural regeneration, as well as to sites that are sensitive to loss of soil cover or water regulation functions. Over 70,000 hectares of empty and grasslands are found in production forests. In these locations, activities that can be conducted include converting the land no longer covered by forest to a timber plantation (HTI), allocating forestland for community plantation (HTR), or for ecosystem restoration (RE). All these activities will increase/enhance the total carbon stock, depending on the quality of forests that will be achieved. For monoculture timber plantation, carbon gain will be 367 tCO<sub>2</sub>e/hectare (around approximately 5-7 years), while community plantation forests and restoration ecosystem can rehabilitate lands to be secondary forests, containing around 622.9 tCO<sub>2</sub>e/hectare (around approximately 10-12 years). However, it is important to be mindful that many forest areas without forest cover are usually very critical and the lands are no longer fertile to be planted. Positive effects for biodiversity and ecosystem services can be enhanced by using planting methods that

are appropriate to the site and aiming for a diverse composition of native species.

Around 65,683 hectare of production forests are allocated for commercial timber plantations (HTI). In these locations, both primary and secondary forests can also be found. Timber plantation was considered as one of the so-called rehabilitation policies, which however involves converting severely degraded forest to commercial timber plantations. In Central Sulawesi, converting primary and secondary forests to HTI generates 350 and 255.8 tCO<sub>2</sub>e per hectare respectively.

Several possible mitigation actions to reduce emissions from timber plantations are land swap and increasing productivity in existing plantations. Land swap involves reallocation of plantations from areas with forest cover to those without forest cover, which can avoid emissions from clearing forests prior to the operation of timber plantations. For instance, a swap between areas allocated for HTI with forest cover and areas allocated for existing HPH without forest cover could take place to avoid emissions from deforestation. Preventing the opening of primary and secondary forests for HTI can avoid emissions as much as 348.65 and 255.8 tCO<sub>2</sub>e/hectare. REDD+ benefits can be used to compensate the opportunity costs, which are the returns from logging extracted prior to the operation of HTI. The benefits of logging in primary forests prior to HTI operations could be assumed to be similar to the returns of extracting timbers in natural forests (HPH). Hence, the opportunity cost of this action will be around 15.2 million/ha/year. Another possible action is to increase the productivity of existing plantations to achieve the production targets and at the same time reduce the need to convert forests in the future. Research to assess the direct relation between the increase productivity and reducing deforestation from HTI should however be conducted to understand its potential emission reductions.

In order to enhance multiple benefits from such land swaps, priority should be given to high biodiversity sites and endangered forest types that are within areas allocated for plantations, as well as to sites that provide important ecosystem services for local populations.

In protection and conservation forests, carbon stock enhancement can also be pursued. Rehabilitation of areas currently without forest cover may absorb as much as 622.9 tCO<sub>2</sub>e/hectare, assuming that the quality of forests would be similar to primary forests (within approximately 10-12 years). In protected and conservation forests, using rehabilitation methods that benefit biodiversity and ecosystem services is particularly important. Priority should be given to sites that can have a buffering function for high biodiversity areas, as well as sites that are sensitive to loss of soil cover or water regulation functions. On sites that are capable of regenerating naturally, the only measures that should be taken are to prevent further degradation through illegal activities.

In areas classified as conversion forest and APL that can be legally converted for other land use activities, primary and secondary forest covers can also be found. Assuming that the alternative land use is for oil palm plantations, carbon emissions that will be generated are 570.3 and 476 tCO<sub>2</sub>e/ha if oil palm plantations convert primary and secondary forests respectively. In Central Sulawesi, oil palm plantations will generate as much as IDR 72 million/hectare annually (Table 7).

The possible REDD measures for this location is land swap. Oil palm plantations that will operate in lands with primary and secondary forests can be reallocated to other locations without forest cover. This will therefore avoid carbon emissions, while at the same time will not compromise economic benefits that will be generated from oil palm plantations. REDD+ benefits can therefore focus on incentivizing companies holding the licenses to move their operations from areas with forest cover to non-forestland.<sup>5</sup> The land swap should be compensated as much as logging extracted in primary and secondary forests during the opening of the land. The benefits can be assumed to be similar to the profit from commercial logging (HPH), which is 15.2 million/hectare/year. Priority should be given to high biodiversity sites and endangered forest types that are within areas allocated for plantations, as well as to sites that provide important ecosystem services for local populations.

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<sup>5</sup> In addition, some kind of provision needs to be made to prevent the allocation of a new license on the same plot of land

TABLE 7. FOREST COVER IN CONVERSION FORESTS AND APL

Land Cover	Alternative Land Use Activities	Profit (IDR'000/ha/year)	Change of Carbon Stock (tCO <sub>2</sub> e/ha)
Primary Forest	Oil palm plantation	72,309	(-) 570.3
	Cacao plantation (smallholder) - agroforestry	13,764	(-) 609.6
Secondary Forest	Oil palm plantation	72,309	(-) 476
	Cacao plantation (smallholder) - agroforestry	13,764	(-) 515

# Ensuring Consistency of REDD+ Action Plan with Other Planning Documents

**W**hen choosing between options for REDD+ action, it is also important to pay attention to the existing national and local socio-economic planning documents and other national and local commitments that are relevant to reducing greenhouse gas emissions. The following sub-sections highlight relevant planning documents that are relevant to REDD+ in Central Sulawesi.

## **Regional Socio-economic Development Plan (RPJMD)**

The Provincial Social Economic Development Plan Phase 2 (2011-2016) aims at strengthening every development aspect by providing emphasis on economic development, human resources capacity development and increased competitiveness of regional economy. The Socio-Economic Development Plan (Rencana Pembangunan Jangka Menengah Daerah or RPJMD) also aims to reduce deforestation by 10 percent, while at the same time strengthen agricultural development and ensure sustainable utilization of natural resources. The Provincial Government is also intended to strengthen institutions and people awareness to support the process of rehabilitation and conservation of natural resources and biodiversity.

Two main priorities included in the RPJMD, which are highly relevant with the forestry sector and land use change, are below:

1. Increase economic growth through pro-poor economy
  - a) **Policy direction:** Revitalization of forests and forest industries as well as increase of economic growth based on natural resources utilization.

Program: Increase of forest business

- b) Policy direction: Increased welfare of people living surrounding and inside forests.

Program: Increased people empowerment

2. Sustainable management and utilization of natural resources

- a) Policy direction: Rehabilitation and conservation of forests and natural resources.

Program: Increased function of DAS (watersheds) as the support system with an emphasis on community empowerment and biodiversity conservation as well as forest protection.

- b) Policy direction: Establishment of forest zones.

Program: Macro planning of the forestry sector and strengthening the boundaries of forest zones.

**Forest priority**

The Provincial Forestry Strategic Plan (Rencana Strategis - RENSTRA - Kehutanan) further details the RPJMD for the forestry sector. The medium term objectives and targets of the Provincial Forestry Office (2011-2016) are summarized in Table 8 below.

TABLE 8 THE FORESTRY STRATEGIC PLAN (2011-2016)

Objectives	Targets	Performance Indicators
Optimize the management of production forests by increasing the administrative system related to the collection of forest levies and also revitalizing the primary industry of wood products	Increased incomes of communities surrounding forests	The development of Hutan Tanaman Rakyat (HTR) 1000 hectare.
	Increase the contribution of forestry sector to Central Sulawesi GDRP	Increase of revenue from forest levies by 10 per cent
		Increase of forest products with certification by 5 per cent
Strengthen the pre-conditions of sustainable natural resources management in production and protection forests	Optimize the management and utilization of forest zones	Establishment of 2 Forest Management Units (Kesatuan Pengelolaan Hutan)
	Maintain forest boundaries	Better control of forest zones utilization in 30 locations
		Maintenance of 750 km forest boundaries
	Manage properly the Dampelas Tinombo FMU	The development of 6 planning documents
		Rehabilitation of 500 hectare areas
		The establishment of 3 FMU resorts
Increase the function of production and protection forests as the support system to reduce the risks of natural disasters through engaging communities surrounding forests	Increase the total areas of plantation forest to decrease degradation forests with a strong emphasis on increasing people welfare	Rehabilitation of critical land through Community Forestry and Forest Plantation as much as 3,500 ha
		500,000 seeds (for forests and multipurpose tree species) are provided for communities
		Enhanced participation of 1,750 people in forest rehabilitation and social forestry
Reduce forest disturbance, ensure security of forests and their products as well as optimize the management of Tahura (grand forest parks) Poboya-Paneki	Reduce disturbance of forest security and forest destruction	Lowered destruction of forest zones by 20 per cent per year
	Increase the involvement and awareness to protect environment and conserve natural resources	Lowered conflict, encroachment, illegal logging in production forests without concession, protection forests and Tahura zones by 20 per cent per year
		The management of protection forests in 5 locations
		Community development in 50 villages
	Manage Tahura properly	The management of 2,500 hectare of Tahura
		The enrichment of 500 hectare of Tahura
Increase administrative system, accountability, transparency in the planning, financial management and asset management of The Provincial Forestry Office	Increase planning, monitoring and accountability	The management of five protection forests

The establishment of Forestry Management Unit (or Kesatuan Pengelolaan Hutan - KPH) is to ensure that all forests are managed properly by a formal institution. All forest zones in Indonesia will be divided into FMUs. This is a positive step considering many of forest areas do not have a formal tenure system and a proper institution to manage. The establishment of FMUs can therefore be expected to result in reducing deforestation and forest degradation.

The Forestry Office also aims to develop around 53,965 hectare of community forest plantations, where communities are provided with rights to plant forests and benefits from timbers. This program can help rehabilitate lands, particularly those without forest cover, which are around 14,690 hectares. Enhancement of carbon stocks in these locations can therefore be achieved.

#### **National Action Plans to Reduce Greenhouse Gas (RAN-GRK)**

As mentioned previously, Indonesia is committed to reducing Indonesia's CO<sub>2</sub> emissions by 26 per cent against the business-as-usual (BAU) level in 2020 using domestic resources, while the additional 15 per cent will be achieved with international assistance. The Presidential Decree 61/2011 was issued to lay down further the action plans to achieve such targets, where the forestry and peatland sector should reduce emissions as much as 0.67 Giga tCO<sub>2</sub> and 1.039 Giga tCO<sub>2</sub> to achieve the 26 and 41 per cent targets respectively by 2020. Selected action plans that are highly relevant for Central Sulawesi are listed in Table 9 below.

TABLE 9. SELECTED ACTION PLANS FROM RAN GRK

Action Plan	Activities/Targets	Location	Expected Emissions Reduction (million tCO <sub>2</sub> e)
The establishment of FMUs	Establishing 120 FMUs	All provinces	31.15
Planning of the utilization of forests and the increase of forest business	Providing licenses for Commercial Timber Utilization or Ecosystem Restoration (IUPHHK-HA/RE) in 2.5 million logged over areas	12 provinces including Central Sulawesi	22.94
	Increase the production of non-forest product or ecosystem services	All provinces	1.38
Formalized forest zone boundaries	Formalize 25,000 km forest zones boundaries	All provinces	123.4
Rehabilitation of forests and lands as well as reclamation of forests in priority watersheds	Rehabilitate forests in priority watersheds as much as 500,000 hectare	All provinces	18.35
	Rehabilitate critical lands in priority watersheds as much as 1,954,000 ha	All provinces	71.71
The development of social forestry	Facilitate the establishment of Community Forestry (HutanKemasyarakatan or HKm and HutanDesa or HD) as much as 2.5 million hectare	25 provinces including Central Sulawesi	91.75
The development of conservation area, essential ecosystem and protected forests.	Increase the management of essential ecosystem as the life support system as much as 10 per cent	17 provinces including Central Sulawesi	41.50
	Reduce illegal encroachment in 12 priority provinces	12 provinces including Central Sulawesi	49.77
The increase of forest plantation business	Allocate 3 million hectare for commercial timber plantation or community timber plantation	26 provinces including Central Sulawesi	110.10



## Priority REDD+ Action Plans

Options of REDD+ actions aforementioned can be assessed based on three main criteria to decide the priority mitigation actions for Central Sulawesi. The method applied to identify the priority actions and areas for REDD+ is detailed in Annex 1, where economic and social factors are taken into consideration. The economic consideration will be assessed based on the opportunity costs of REDD+, while the social consideration requires decision-makers to map local communities' settlement and agricultural lands indicating the overlap of claims. Local communities' participation in forest management can then be prioritized, including through a number of schemes including community forestry, village forest and customary forestry. These schemes will allow local communities to benefit directly from forests.

The success of proposed action plans is subject to the readiness of Central Sulawesi to implement REDD+. A number of activities have been pursued to build the readiness, including strengthening coordination and institution, capacity development and issuance of necessary regulations. Proposed activities that are still required to build the readiness in Central Sulawesi are discussed in the next section.

The priority REDD+ actions for Central Sulawesi can include:

1. **The development of FMUs.** The Provincial Forestry Office aims to develop two new FMUs between 2011 and 2016, additional to one established FMU in Dampelas Tinombo. The establishment of FMU as previously discussed aims to ensure a proper institutional setting to manage forests for their intended purposes. The FMU is expected to result in reducing deforestation

and forest degradation, which is 0.4 per cent and 1.14 per cent annually in Central Sulawesi. The potential of emission reductions from the development of FMUs is presented in Table 10 below.

Establishing FMUs is a priority task of the Ministry of Forestry, together with the Provincial Forestry Office, which will be financed by the government budget. The process of establishment of FMUs will take XX years and can be expected to be effective immediately.

TABLE 10 POTENTIAL OF EMISSION REDUCTIONS IN THREE PRIORITY FMU

FMU	Forest Cover	Total Area (Hectare)	Reduced Deforestation* & Degradation** (Hectare)	Emissions Reduction (tCO <sub>2</sub> e)
Dampelas Tinombo	Primary Forest	77,642	2,485*	1,781,718
			8,696**	817,418
	Secondary Forest	17,463	559*	348,022
Buntasabo	Primary Forest	123,497	3,952*	2,833,981
			13,832**	1,300,176
	Secondary Forest		1,781*	1,108,930
Banggai	Primary Forest	55,642	711*	510,088
		22,228	2,490**	234,019
	Secondary Forest	15,291	489*	234,019
<b>Total Emission Reductions</b>				<b>9,168,371</b>

\* The annual rate of deforestation in Central Sulawesi is 0.04 per cent. These figures are obtained assuming deforestation in FMUs can be reduced entirely in the next 8 years.

\*\* The annual rate of forest degradation in Central Sulawesi is 1.14 per cent. Forest degradation occurs mainly in primary forests. These figures are obtained assuming forest degradation in FMUs can be reduced entirely in the next 8 years.

- Community plantation forests to rehabilitate areas without forest cover in production forests.** Around 53,965 hectare of community forest plantations will be developed, where communities are provided with rights to plant forests and benefits from timbers. The targeted districts include Banggai, Poso, Morowali, Donggala, ParigiMoutong, and Buol. This program can help rehabilitate areas with no forest cover, which are around 14,690

hectares (resulting in carbon gain of around 5.4 million tCO<sub>2</sub>e). Positive effects for biodiversity and ecosystem services can be enhanced by using planting/rehabilitation methods (please select as needed) that are appropriate to the site and aiming for a diverse composition of native species. Priority for rehabilitation should be given to sites that are sensitive to loss of soil cover or water regulation functions.

- 3. Community forestry to rehabilitate secondary forests and non-forest in protected and conservation forests.** The rehabilitation of protection and conservation forests can enhance carbon stocks, particularly in the locations currently without forest cover. The total areas that can be rehabilitated in protected and conservation forests are around 70,985 hectare, with the potential of carbon enhancement as much as 44.2 million tCO<sub>2</sub>e within 10 to 12 years. In protected and conservation forests, using rehabilitation methods that generate benefits for biodiversity and ecosystem services is particularly important. Priority should be given to sites that can have a buffering function for high biodiversity areas, as well as sites that are sensitive to loss of soil cover or water regulation functions. On sites that are capable of regenerating naturally, the only measures that should be taken are to prevent further degradation through illegal activities.

TABLE 11. POTENTIAL OF CARBON STOCK ENHANCEMENT IN PROTECTION AND CONSERVATION FORESTS

Status/ Land Cover	Total land available (Hectare)	Change in (tCO <sub>2</sub> e/ha)	Indicative districts	Total change (tCO <sub>2</sub> e)
Protection forest: no forest cover	39,972	(+) 622.9	All districts in Central Sulawesi	24,898,558
Conservation forest: no forest cover	31,013	(+) 622.9	Banggai, Morowali, Poso, Donggala, Toli-Toli and ParigiMoutong	19,317,997
<b>Total carbon gain</b>				44,216,555

Rehabilitation within protection and conservation forests can be conducted together with local communities. One scheme that can be implemented in both protection and conservation forests is rehabilitation of degraded land through the Village Forest scheme, where villagers can play a main role in managing and utilizing the benefits from state forest. A village forest is not only utilizing forests resources but it is also responsible for the sustainability of its functions, for instance, for buffer zones. The involvement of communities currently living within forest protection, as shown in Figure 2, can also be promoted in the rehabilitation program. As a return, they can obtain compensation for providing labor to rehabilitate forests and protect forests from REDD+ benefits.

FIGURE 2. LAND COVER OF PROTECTION FORESTS IN CENTRAL SULAWESI AND MOROWALI DISTRICT



a. Land cover of protection forests in Central Sulawesi

b. Land cover of protection forests in Morowali District



**4. Law enforcement in forests under logging concessions (HPH).** In Central Sulawesi, only one company can sustain its operation, while other companies had to stop their operations for the time being due to low financial returns from logging. This situation is caused by many factors including low timber prices and also competing timber supply from illegal logging. The inactivity of operations in those locations opens up opportunity for illegal encroachment particularly in areas with easy and open access. REDD+ can strengthen law enforcement to ensure commercial logging concessionaires implement sustainable forest management in areas designated to them. Law enforcement can help reduce deforestation particularly in secondary forests which are usually accessible by surrounding communities (Table 12). When making agreements with concessionaires to preserve forests, priority should be given to high biodiversity sites and endangered forest types that are currently outside of conservation areas, as well as to sites that provide important ecosystem services for local populations.

TABLE 12. POTENTIAL OF EMISSION REDUCTIONS FROM LAW ENFORCEMENT IN PRODUCTION FORESTS UNDER COMMERCIAL LOGGING CONCESSIONS (HPH)

Forest Cover	Total Area (Hectare)	Reduced carbon emissions (tCO <sub>2</sub> e/ha)	Indicative Districts	Assumptions
Secondary forest	382,031	76,149,475*	Banggai, Morowali, Poso, Donggala, Buol, Toli-Toli	The annual rate of deforestation 0.04 per cent. Assuming deforestation is reduced entirely in the next 8 years.

\* The annual rate of deforestation in Central Sulawesi is 0.04 per cent. It is assumed that deforestation is avoided in these locations between 2012 and 2020. The total emission reductions however may also overlap with the total emissions mentioned above in Action 1 above as the priority FMUs are production forests.

FIGURE 2. LAND COVER OF PROTECTION FORESTS  
IN CENTRAL SULAWESI AND MOROWALI DISTRICT



a. Land cover of protection forests in Central Sulawesi



5. **Reallocation of timber plantations from primary and secondary forests to non forest areas.** The reallocation of timber plantations that have obtained licenses to operate in areas with forest cover to areas without forest cover can prevent deforestation and the associated emissions. Carbon emissions that will be generated due to the clearance of forest for timber plantations will be 350.1 and 255.8 tCO<sub>2</sub>e per hectare in primary and secondary forests respectively. Land swap can take place in production forests, currently without forest cover, with areas allocated for timber plantations currently with forest covers (primary or secondary forests). REDD+ can therefore help compensate the returns from timbers, which can be extracted

prior to the opening of the lands for plantations. The potential of emission reductions from this measure are 15 million tCO<sub>2</sub>e (Table 13). Priority should be given to high biodiversity sites and endangered forest types that are within areas allocated for plantations, as well as to sites that provide important ecosystem services for local populations.

TABLE 13 POTENTIAL OF EMISSION REDUCTIONS IN TIMBER PLANTATION (HTI)

Forest Cover	Total Area (Hectare)	Proposed Activities	Reduced Carbon Emissions (tCO <sub>2</sub> e/ha)	Indicative Districts	Assumptions
Primary forest	19,627	Land swap	6,871,766	Banggai, Poso, Donggala, Parigi Moutong	Bare lands are available to be swapped with timber plantation companies
Secondary forest	31,853	Land swap	8,147,966		

At the same time, efforts should also be invested in increasing productivity of timber plantations in Central Sulawesi to reduce the driver of deforestation from timber plantations in the future. This is particularly important considering the demand of timbers cannot be expected to decline overtime. As previously mention, a thorough research should be conducted to understand the direct impact of increasing productivity and its associated emission reductions. Measures to increase productivity should be environmentally sustainable.

- 6. Reallocation of crop plantations from primary and secondary forests to non forest areas.** In conversion forests and APL, REDD+ can provide incentives to relocate plantation companies that have obtained licenses to convert primary and secondary forests for estate crops. Assuming that plantation companies will plant oil palm, carbon emissions that will be generated due to land use change will be 570.3 and 476 tCO<sub>2</sub>e/ha in primary and secondary forests respectively. Land swap, for instance, can take place in production forests currently without forest cover with

APL areas currently still have forest cover. The potential of emission reduction in these locations can be seen in Table 14 below.

TABLE 14 POTENTIAL OF EMISSION REDUCTIONS IN CROP ESTATE

Forest Cover	Total Area (Hectare)	Profit (IDR'000/ Ha/Year)	Reduced Carbon Emissions (tCO <sub>2</sub> e/ha)	Indicative Districts
Primary forest	127,144	72,309	570.3	Buol, Morowali, Banggai, Poso, Donggala
Secondary forest	115,614	72,309	476	Buol, Morowali, Banggai, Poso, Donggala

The potential total area for a land swap between production forests and APL is 109,097 hectare. The suitability of these lands for timber and oil palm plantations is however unclear. A thorough analysis is required particularly many empty lands are considered already infertile for plantations. Assuming the relocation of HIT from areas with forest cover to non forests within production forests (Action 5) will take place first, the remaining available land without forest cover for land swap is only 57,617 hectare.<sup>6</sup> The potential for emission reductions are 32,858,975 tCO<sub>2</sub>e, if the opening of primary forests for plantation can be avoided through a land swap as much as 57,617 hectare.<sup>6</sup> Priority should be given to high biodiversity sites and endangered forest types that are within areas allocated for plantations, as well as to sites that provide important ecosystem services for local populations.

<sup>6</sup> Within production forests, only 109,907 hectare that are currently without forest covers according to the land cover data (2011).

# Implementation Strategic Action Plan

## Stages

In order to ensure an effective and result-based mechanism, a REDD+ mechanism should be implemented in successive phases. The parties to UNFCCC have proposed three phases of the implementation of REDD+. Phase one would focus on strategy development and core capacity building. Phase two would provide support for the implementation of national policies and measures together with compensation for proxy-based results for emission reductions. Phase three would be a fully result-based compensation mechanism for emission reductions and removals from the forestry and land-use sectors.

The Provincial Government has prepared Central Sulawesi's readiness to implement REDD+. The Province is currently completing Phase 1 where Central Sulawesi has developed the draft of the REDD+ Provincial Strategy, the Reference Emissions Levels (REL), and the Monitoring, Reporting and Verification (MRV) procedures for Central Sulawesi Province. Moving towards Phase 2, Central Sulawesi will be ready to implement REDD+ policies and measures and receive compensation for proxy-based results. This report provides a number of options for the Provincial Government to identify the priority actions and locations to implement REDD+ in Central Sulawesi.

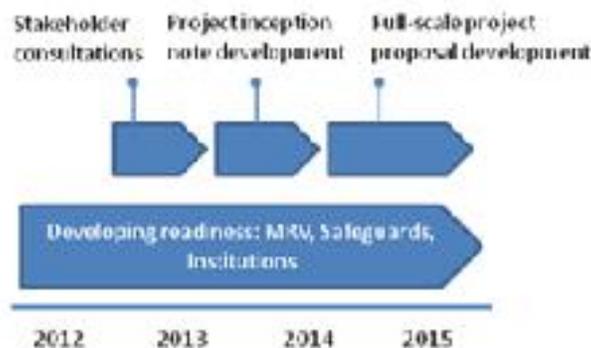
Several immediate steps that are still required to be pursued to ensure readiness before REDD+ implementation include (Figure 4):

1. Building the readiness (2012-2015). It is also imperative to continue strengthening readiness of Central Sulawesi in the implementation of REDD+. On-going activities can be carried out further including in building an MRV system, safeguards,

developing institutions on REDD+, issuing necessary regulations and developing the knowledge base on the multiple values of forests in the province and their spatial distribution. Ongoing dialogues on REDD+ at the provincial level have been useful in developing REDD+ provincial strategy (Strategi Daerah REDD+) and building necessary institutions on REDD+ at the provincial and district levels.

2. Stakeholder consultations on the proposed action plans. Proposed actions presented in this report need to be consulted with relevant stakeholders particularly with those who will be directly affected, including businesses, local communities and government agencies.
3. Project inception note development. Following discussions with stakeholders, a project inception note can be developed. The development of PIN will require verifying information presented in this report on the ground (through ground truthing) to ensure the accuracy of data. After any donor is interested in providing funding, a full scale project proposal can be developed. Given the high potential for biodiversity conservation in Central Sulawesi and the strong interest of many donors to promote equity considerations in REDD+, one option could be to develop a targeted project proposal for 'high biodiversity and socially equitable REDD+', taking into account the recommendations for optimizing multiple benefits made above. This could be presented to donors with a declared interest in multiple benefits, including biodiversity, ecosystem services and poverty reduction.

FIGURE 4 STAGES OF PROVINCIAL ACTION PLAN IMPLEMENTATION



## **Institution Mapping and Their Role**

Different institutions have different responsibilities in forest management and land-use change in Indonesia. According to the Law 41/1999, the Ministry of Forestry is responsible to manage areas classified as state forests. A number of production activities are currently allowed by law to exploit Indonesia's forests. Productive activities that can take place in the production forests include: commercial timber utilization (HPH), commercial non-timber forest product utilization, environmental services utilization, commercial forest estates utilization, timber exploitation, and non-timber forest product exploitation. Following decentralization, the subnational levels are authorized to issue: Environmental Service Utilization Permits, Timber and Non-Timber Exploitation Permits to collect a limited amount of timber and non-timber products, Commercial Forest Estate Utilization Permits and Commercial Non-timber Forest Product Utilization Permits. The authority to issue utilization permit for commercial timber in production forests is maintained by the national government. The financial importance of the activities that are currently under the authority of local governments is less significant compared to commercial logging. Local governments are also authorized to implement a number of forest related activities. The Provincial Forest Agency carries out functions related to the utilization of forests in natural forests and plantation forests at the local level. They are also responsible in the implementation, monitoring and evaluation of Forestry Strategy aforementioned

Municipal and district governments are authorized by Law 26/2007 on Spatial Planning to develop local spatial plans according to guidelines and norms established by the national government. Based on local spatial plans, local governments can submit proposals for land-use change to the Ministry of Forestry within lands classified as conversion forests. An application for forest conversion must be submitted to the Minister of Forestry, which will then approve the change in forest status with a ministerial decree. In the case of forest clearance for oil palm plantations, for instance, local governments have the authority to issue a business permit, which is required before the final decision on forest clearance can be made

by the Minister of Forestry. Local governments are also responsible for the issuance of permits for plantations. Plantations should occur only on areas classified as conversion forests or APL.

In the forest zone, community-based institutional arrangements to manage forest resources can be established, including village forest, community forest and customary forest. A village forest is a forest zone that is managed by a village government and is aimed at improving the prosperity of the villagers. A community forest is a forest zone that has the empowerment of the local community as its main utilization purpose. A customary forest is a forest zone located in a customary area.

The implementation of the Forestry Law was detailed by Government Regulation 06/2007, which stipulates that the management of forests in Indonesia would be divided into a Forest Management Unit (FMU). The Minister of Forestry has the authority to designate a forest zone as an FMU with a specific function including protection, conservation or production forest. The authority to establish an organization to manage the FMU is the responsibility of different governmental levels. If the forest boundaries fall under one district only, the district government will have the responsibility to establish the FMU's organization. When the forest unit stretches across districts, the provincial government will be responsible for establishing the organization to manage the FMU, while, if the forest area crosses the boundaries of one province, it will be under the authority of the Ministry of Forestry. The organization to manage the FMU has the following tasks and responsibilities: (1) to manage the forest area, including developing a forest management plan, forest utilization, forest zones utilization, forest rehabilitation and reclamation, forest protection and conservation; (2) to detail the national, provincial and district policies to be implemented by local forest plans; (3) to implement the management of forests in their location, including planning, organizing, implementing and monitoring and evaluation; and (4) to promote investment to support the achievement of forest management objectives.

To implement proposed REDD+ actions, a number of stakeholders should be involved. Table 5 shows the institutions that need to be involved in each proposed action aforementioned.

FIGURE 5 INSTITUTION MAPPING FOR THE PROPOSED ACTION PLANS

No.	Core Activities	Stakeholders Involved
1	The development of FMU*	Forest Management Unit (KPH), the Ministry of Forestry, Provincial Forest Agency (Dinas Kehutanan Provinsi), District Forest Agency (Dinas Kehutanan Kabupaten), local community groups
2	Community plantation forests for forest rehabilitation within production forests	The Ministry of Forestry, Forest Agency (provincial and district), local community groups
3	Community forestry to rehabilitate areas without forest cover in protected and conservation forests	The Ministry of Forestry, Forest Agency (provincial and district), local community groups
4	Law enforcement in forests under logging concessions (HPH)	Logging concessionaires, the Ministry of Forestry, Forest Agency (provincial and district),
5	Reallocation of timber plantations from primary and secondary forests to non forest areas	Timber industry concessionaires, the Ministry of Forestry, Forest Agency (provincial and district), head of districts, Governor
6	Reallocation of crop plantations from primary and secondary forests to non forest areas	Crop plantation concessionaires, the Ministry of Forestry, Forest Agency (provincial and district), Crop Estate Agency (provincial and district), Planning agency (provincial and district), head of districts, Governor

### Fund Potential Source Identification

In Central Sulawesi, two options to finance REDD+ actions are government budget and international support from both bilateral and multilateral cooperation.

**Government budget** — The government of Indonesia has committed to reduce greenhouse gas emissions by 26 per cent from business as usual in 2020 using domestic resources, including from government budget and the contribution of the private sector. The action plans to reduce emissions, including those to be implemented in the forestry sector as shown in Table 9, will be financed by the government budget.

Central Sulawesi is expected to reduce emissions around 40 million tCO<sub>2</sub>e. According to analysis conducted by UNREDD, the expected emissions until 11.4 million annually. In 2020, the

expected emissions will therefore be 103 million tCO<sub>2</sub>e. Reducing 26 per cent of the emissions require Central Sulawesi to reduce 27 million tCO<sub>2</sub>e in 2020. However, using the future land use change as the baseline, the expected emissions generated are around 305 million tCO<sub>2</sub>e in 2020. The reduction of 26 per cent will be around 79 million tCO<sub>2</sub>e in 2020. Irrespective of the adopted baselines, the first 26 per cent reduction should be pursued using the government budget.

Three programs, which will be implemented under the Forestry Strategic Plan, will lead to emission reductions around 34 million tCO<sub>2</sub>e as shown in the Proposed Action Plan Table below. To achieve additional targets, the national government should allocate additional resources to finance the actions to reduce emissions from deforestation and forest degradation.

**International support** — Additional emission reductions can be made possible with international support. One of the received supports is the committed US\$ 1 billion pledged by Norway to assist Indonesia to reduce deforestation and degradation. International assistance from bilateral and multilateral corporations can also assist Central Sulawesi to reduce emissions from deforestation and forest degradation. The proposed actions that may be supported by international REDD+ finance are listed in the Proposed Action Plan Table below.

## PROPOSED ACTION PLAN

Core Activities	Emissions reduction (tonCO <sub>2</sub> eq)	Source	Completion (Year)	Starting Year	Implementers
The development of FMU*	9.1 million	APBN/ APBD	2016	2012	Dinas Kehutanan Provinsi
Community plantation forests for rehabilitation within production forests	5.4 million	APBN/ APBD	2016	2012	Dinas Kehutanan Provinsi
Community forestry to rehabilitate areas without forest cover in protected and conservation forests	44.2 million	APBN/ APBD	2022-2024	2012	Dinas Kehutanan Provinsi
Law enforcement in primary forests under logging concessions (HPH)	76.15 million	International support	2022-2024	2013	The Ministry of Forestry, Governor, Head of districts, logging concessionaires
Reallocation of timber plantations from primary and secondary forests to non forest areas	6.87 million	International support	2016	2013	The Ministry of Forestry, Governor, Head of districts, logging concessionaires, and timber plantation companies
Reallocation of crop plantations from primary and secondary forests to non forest areas	15 million	International support	2016	2013	The Ministry of Forestry, Governor, Head of districts, logging concessionaires, oil palm plantations, the Ministry of Agriculture

\* With additional support from international REDD+ finance, the Government can establish more KPH sooner and reduce emissions quicker.



## Monitoring and Evaluation

**M**onitoring and evaluation of the Provincial Action Plan for REDD+ should be conducted based on the key performance indicators that will be developed and agreed in each proposed action. Periodic monitoring including on a variety of policies and measures such as forest law enforcement and tenure reforms, is necessary.

Deforestation and forest degradation should be monitored periodically through remote sensing and ground checking which can be conducted together with local communities. There is a need for a high level of precision requires the use of fine-resolution imagery, imagery repeated over time or imagery that requires significant expertise to process. Similarly, ground measurements, crucial to verify and measure carbon stocks, are time consuming and relatively expensive at a large scale, such as a national inventory.

Indonesia has already had some capacity to measure, monitor and report the emission reductions and carbon stock enhancement. The existing agencies or units currently involved in MRV in Indonesia are:

1. The Ministry of Forestry - The Directorate of Forest Resources Inventory and Monitoring has a mandate to measure and monitor forest cover change and emission factors. Four Sub-directorates under the Directorate are: Inventory, Monitoring, Mapping and Spatial Data Network. The Sub-directorate of Inventory deals with the national forest inventory (emission factors), while the Sub-directorate of Monitoring deals with remote sensing and forest cover data. The Sub-directorate of Mapping and Spatial Data Network are responsible respectively

for spatial data analysis and data sharing and exchange.

2. Indonesian National Institute of Aeronautics and Space (LAPAN) has also involved in conducting wall-to-wall land cover change analysis and provide high resolution remote sensing data for validation.
3. The Ministry of Environment has regularly reported Indonesia's emissions reductions through National Communications to the UNFCCC every four years.

Data collected by these agencies can then be used to monitor periodically deforestation and forest degradation in Central Sulawesi. Ground measurements can be conducted by the Provincial and District Forest Office together with local communities.

According to the National REDD+ Strategy and in line with international commitments, monitoring should also address the implementation of safeguards. This will require monitoring the impacts of REDD+ implementation on natural forests, biodiversity and other social and environmental benefits. If designed well, a monitoring system for safeguards can have strong synergies with the monitoring of carbon stocks.

## **Annex 1. The Method**

To identify the priority actions and locations for REDD+, this study made use of spatial data, reviewed policy documents and conducted focused-group discussions with relevant stakeholders to verify the results of analysis. Spatial data are required to understand the existing land use activities, using Forest Zone Map (Peta Kawasan Hutan) and Land Cover Map (Peta Tutupan Lahan). Information about the need for space in the future can be obtained through the proposed Provincial Spatial Plan (Rencana Tata Ruang Wilayah Provinsi).

The following steps will be conducted to identify the priority actions and locations for REDD+:

1. Overlay between the Provincial Spatial Plan (Rencana Tata Ruang Wilayah Provinsi - RTRWP) and the Forest Classification Map to see future need for space and the land use change expected to take place (**Map 1**).

2. Overlay between **Map 1** and the Land Cover Map to obtain the total area for land use change and the total change of carbon stock. The total change of carbon stock is obtained by multiplying the total area of land use change with the emission factors of each land use change as shown in Table 3 above.
3. Apply the socio-economic criteria to areas where land use change may occur or carbon stock enhancement can be pursued. The priority actions and locations are identified based on the following criteria:
  - a) Economic consideration based on the opportunity costs. Opportunity costs are: the forgone profits from alternative land uses such as logging plantations, or food crops, that is related to the minimum price to be paid for REDD+ services. Opportunity costs can provide information on economic incentives that drive decision-making to pursue legal land use change in a location. They can also provide indication on the compensation required to reduce emissions from preventing an alternative land use activity in a location.
  - b) Social consideration based on the map of community agricultural lands and settlements as the indication of any overlap claims. This report excludes the agricultural lands and community settlements from any proposed activities. It also identifies potential involvement of communities in REDD+ actions within their surrounding forests.

