Determination of Eligible Lands
for A/R CDM Project Activities
and of Priority Districts
for Project Development Support in Indonesia

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Preface

The Government of Indonesia has ratified the Kyoto Protocol and is preparing to engage projects under the Clean Development Mechanism (CDM). Since Indonesia has no experience in this the technical assistance offered by the Asian Development Bank (ADB) was welcomed (Project code: *TA 4137-INO*). The overall goal of the ADB-Technical Assistance project is to help the Government of Indonesia work with local stakeholders to prepare projects that (i) promote sustainable forest development, and (ii) can earn Certified Emission Reduction (CER) units for the reduction of greenhouse gas (GHG) emissions under the CDM of the Kyoto Protocol.

The Center for International Forestry Research (CIFOR), in collaboration with the World Agroforestry Centre (ICRAF), was asked to support selection, evaluation and development of CDM projects according to the Kyoto Protocol's modalities and procedures. CIFOR and ICRAF also took the lead in modeling at least two pilot districts to support baseline and scenario evaluation to be included in the Project Design Document (PDD).

This document reports on the selection criteria and results for further consideration by the Government of Indonesia in consultation with other stakeholders, including local governments and civil societies. This is in line with the immediate purpose of the technical assistance, which is to develop the capacity of the Government and Indonesian stakeholders for pilot testing carbon sequestration projects under the CDM that will strengthen understanding of the processes, implications, and potential applications of the CDM. It is expected that this document will help both local hosts and investors prepare the necessary data, documents, and human resources to fully implement the projects.

We would like to take this opportunity to gratefully acknowledge Winrock International and the Land Management Grant College of Bogor Agricultural University for their collaboration as consultants to the Government of Indonesia, especially in the process of stakeholder consultations and the provision of necessary data and information. Critical inputs were also given by the National Project Director and the Steering Committee.

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CIFOR-ICRAF Team

Abstract

Based on the best available remote sensing data from before 1990, the total area of formally eligible lands in Indonesia for the afforestation and reforestation (A/R) Clean Development Mechanism (CDM) activities under the Kyoto protocol is about 46 M ha. Priorities for assistance in the development of A/R CDM project activities may use criteria based on (i) the Human Development Index (HDI), which is focused on districts with below-average HDI; (ii) population density, which is in the range where the land/labour ratio is conducive to profitable tree-based farming systems; and (iii) Fire Risk Index (FRI).

Overall the lists for Java, Sumatra, Kalimantan, Nusa Tenggara, Sulawesi, Molluca, and Papua that meet these criteria involve 302 Districts, 195 M ha of total area in the districts with 48 M ha of 'eligible Kyoto lands' and 158 M people and a mean HDI of 64.7. The mean of district-level population density is 293 persons/km^2 and the mean FRI is 0.086.

When a 'default' setting of the criteria (minimum 15% of eligible lands in the district, population density between 10 and 100 persons/km^2, HDI below 65), we obtain a priority list of 60 districts (20% of the total). This priority lists involves 46 M ha in the districts (24% of the total) with 19 M ha of 'Kyoto lands' (40% of the total) and 19.5 M people (12% of the total) and a mean HDI of 62.9 (reflecting the 'pro-poor' prioritisation), mean of district-level population density of 53 persons/km^2 (the larger districts tend to have lower densities) and mean FRI of 0.135 (60% higher than for the set as a whole).

1. Introduction

Clean Development Mechanism (CDM) project activities have to meet a number of requirements to ensure that they truly support 'development' for the people living in the area, that they are 'clean' and that they follow proper procedures. Technically, eligibility of lands for the implementation of CDM project activities requires compliance with the international rules and national regulations and priorities. In the first commitment period of the Kyoto Protocol, Land-use, Land-use Change and Forestry (LULUCF) activities under the CDM are limited to afforestation and reforestation. In this connection, the Conference of Parties of the United Nations Framework Convention on Climate Change (UNFCCC) provided the definition of afforestation and reforestation under the provision of Decision 17/CP.7, where:

> *'Afforestation' is the direct human-induced conversion of land that has not been forested for a period of at least 50 years to forested land through planting, seeding and/or the human-induced promotion of natural seed sources.* While

> *'Reforestation' is the direct human-induced conversion of non-forested land to forested land through planting, seeding and/or the human-induced promotion of natural seed sources, on land that was forested but that has been converted to non-forested land. For the first commitment period, reforestation activities will be limited to reforestation occurring on those lands that did not contain forest on 31 December 1989.*

The definitions of 'forest' and 'tree' in this regard are left to the national authorities, but require consistency. A strict definition of forest that only includes natural old-growth forest will ensure that a large area of land is 'eligible', but disqualifies most 'reforestation' activities as not restoring land to the 'forest' condition. A looser definition substantially increases the scope for 'reforestation' but reduces

'eligibility'. In practice, Indonesia has chosen a definition of forest that is based on at least 30% of crown cover by trees at least 5 m high. This definition means that cassava fields (a perennial at least 2 m high) and monoculture coffee or tree gardens are excluded, but coffee gardens with 30% crown cover of emergent trees are 'in'. Rubber, oil palm and industrial timber plantations are effectively included, as are most agroforestry systems where timber or fruit trees are grown in combination with annual food crops or grass as fodder. Once lands are classified as 'eligible', the next steps in the CDM process require estimates of actual C sequestration, and will thus differentiate among these various reforestation options.

Back-dated quality-controlled datasets are crucial to determine eligible lands to carry out CDM project activities under the Kyoto Protocol. They should use the same 'forest'/'non-forest' delineation as will be used for judging acceptability of reforestation activities. This report provides a spatially explicit identification of 'eligible lands' for Indonesia, acknowledging the limitations of maps that used a 'natural forest' definition that excludes much of the plantations, agroforest and trees in agroforestry landscapes. Higher-resolution data within selected candidate project areas will have to add these land cover types to the consideration.

Further biophysical and socio-economic data and information within administrative boundaries of districts (Kabupaten) and province were analysed to help in the assessment of the suitability of reforestation for the local economy and in the setting of priorities for support in CDM project development. These data are only a first step in a process where project developers will have to consult local government and other stakeholders as part of a process that is meant to ensure 'clean development' and guard against the imposition of land use restrictions on rural poor households.

2. Materials and Methods

2.1 Indonesian forest cover

Two kinds of spatial datasets were used as materials to determine eligible lands for A/R CDM project activities. The World Conservation Monitoring Centre (WCMC 1996) originated the first dataset, which represents information on the tropical moist forest in Indonesia before 1990 using very broad vegetation type categories. The information was gathered from various sources including:

- Three thematic maps (1:250,000) of land systems and land suitability, land use, and land status produced by the Regional Physical Planning Programme for Transmigration (RePPProT) project. The project was started in 1984 in association with the National Centre for Co-ordination of Surveys and Mapping (BAKOSURTANAL). The dates of the maps are: Sumatra, 1988; Java and Nusa Tenggara, 1989; central Kalimantan, 1985; south, west and east Kalimantan, 1987; Sulawesi, 1988; Moluccas, 1989; and Irian Jaya, 1986.
- Remote sensing imagery for Indonesia used in

preparing the maps included air photography, Landsats 2, 3, 4 and 5, SPOT, and radar, including SAR and SLAR. Areas covered, dates and scales varied greatly and full details are available from BAKOSURTANAL and RePPProT's regional reviews (RePPProT 1990).

The legend includes eleven forest categories:
- Upper montane forest
- Lower montane forest
- Needleleaf forest
- Deciduous/semi-deciduous forest
- Lowland evergreen broadleaf rain forest
- Semi-evergreen broadleaf forest
- Disturbed natural forest
- Freshwater swamp forest
- Mangrove

Forest logged but left to regenerate either with or without silvicultural treatment was not distinguished from pristine forest in this dataset. Thus, this dataset does not distinguish the areas of recently logged
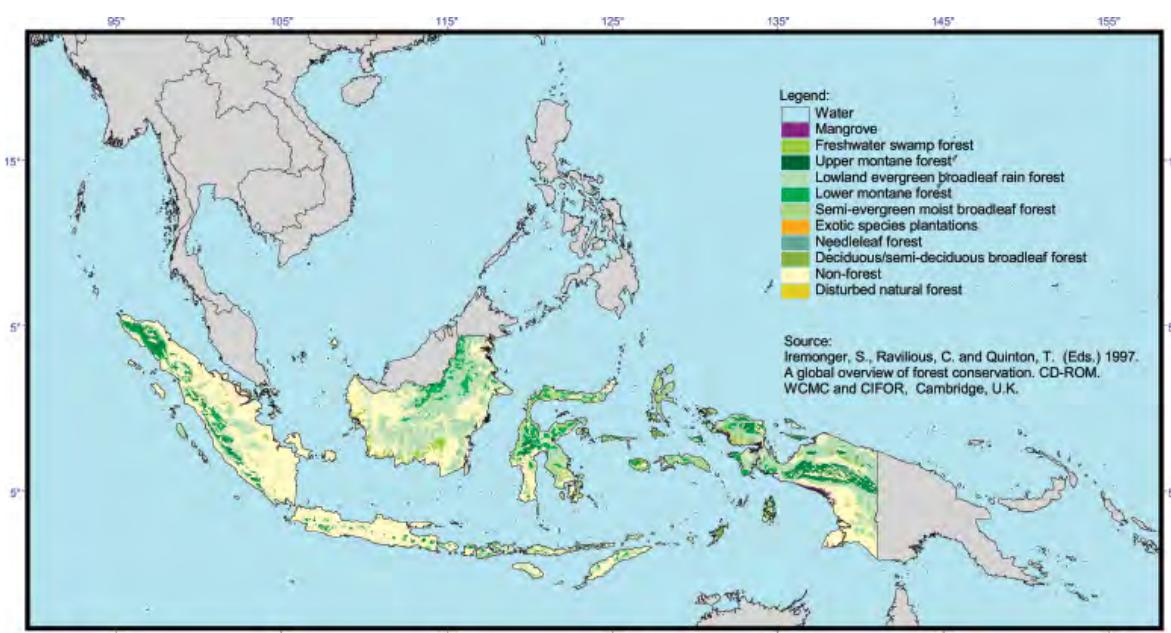
Figure 1.   The Indonesian forest cover before 1990 (Iremonger *et al*. 1997)

forest, which were identified by RePPProT. Areas that RePPProT showed as converted from forestry to other land uses are clearly identified.

In addition, there are two non-forest categories, which are water bodies and non-forest lands. The summary of forest cover before 1990 is shown in Figure 1.

The second dataset represents the forest cover after 1990. These data were obtained from the Forest Cover Map of Insular Southeast Asia produced by the Tropical Ecosystem Environment observation by Satellite (TREES) project of the EU-Joint Research Center (Stibig *et al.* 2002). The map was based on the SPOT4 VEGETATION satellite imageries with a spatial resolution of 1 km.

The high spectral resolution of SPOT imageries could identify land-cover type with greater accuracy. However, the coarse spatial resolution has to be traded off by validating them with LANDSAT-TM products, which have a resolution of 30×30 m^2.

The TREES legend includes nine categories of land-cover, including non-forest:
• Evergreen montane forest
• Closed evergreen forest
• Dense evergreen forest
• Swamp forest
• Mangrove forest
• Mixed bush and shrubs
• Cropland
• Burnt area
• Non-forest

Based on the map produced by TREES project the Indonesian forest cover after 1990 is summarised in Figure 2.

2.2 'Hard' selection criteria of Kyoto eligible lands

The term 'hard' does not connote the difficulty in accessing the data but simply expresses the non-negotiable nature of the agreed rules and modalities. The following criteria are considered 'hard' because of the following reasons:
• The land should comply with the definitions of forest, afforestation, and reforestation
• The data are spatially explicit and compatible with GIS processes
• Non-spatial data may be used as long as they represent an identifiable domain that may be deducted from or added to the values derived from spatial data

It is necessary, therefore, to compare land-cover maps dated before and after 1990 as well as to overlay other working maps and data concerning land-uses
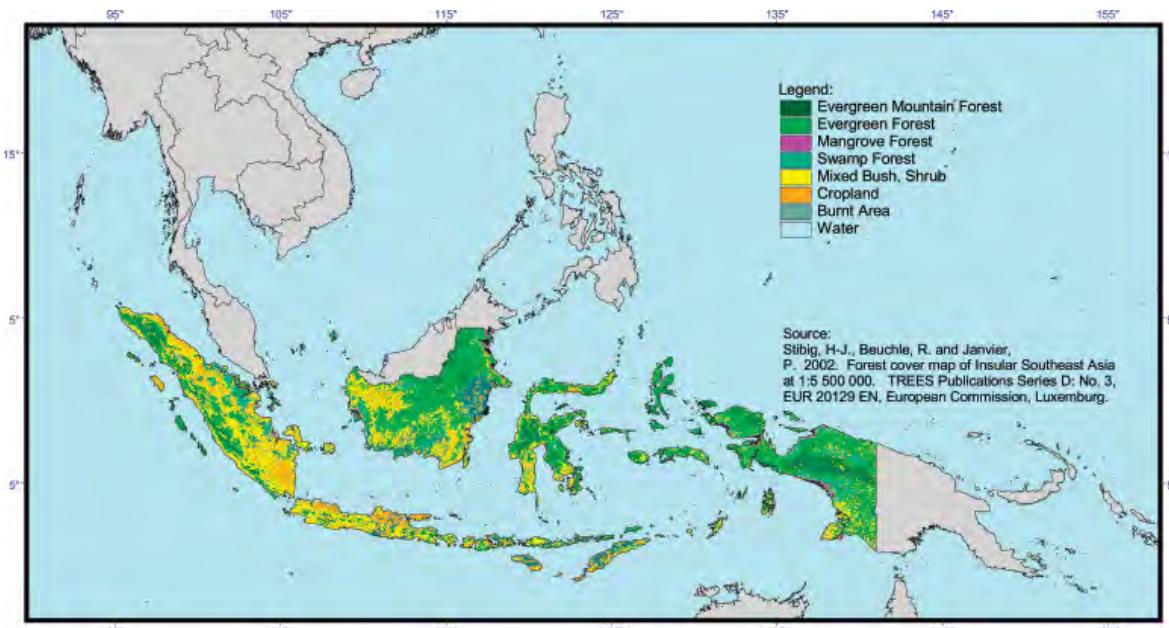
Figure 2. The Indonesian forest cover after 1990 (Stibig *et al.* 2002)

and administrative jurisdictions. The Kyoto eligible lands could then be presented, for example, by district. The procedure of determining eligible lands using 'hard' criteria is summarised in Figure 3. The process is then followed by 'soft' selection criteria, which will be described below.

2.2.1 Land cover changes before and after 1990

After excluding water bodies and overlaying the WCMC and TREES maps and based on the definitions of afforestation and reforestation, the CDM project activities may be carried out in areas which are non-forest and remain unchanged after 1990, and areas which are under the following categories of change:

- From non-forest to mixed bush and shrubs
- From non-forest to cropland

The mixed bush and shrubs class contains all non-forest vegetation cover with a more or less evergreen appearance. This class may include natural vegetation cover but also mature plantation coconut, oil-palm and rubber. Under the forest definition chosen by Indonesia in fact at least part of the lands in this category are considered to be 'forest'. Further studies with higher-resolution data will be needed to clarify the status of these lands.
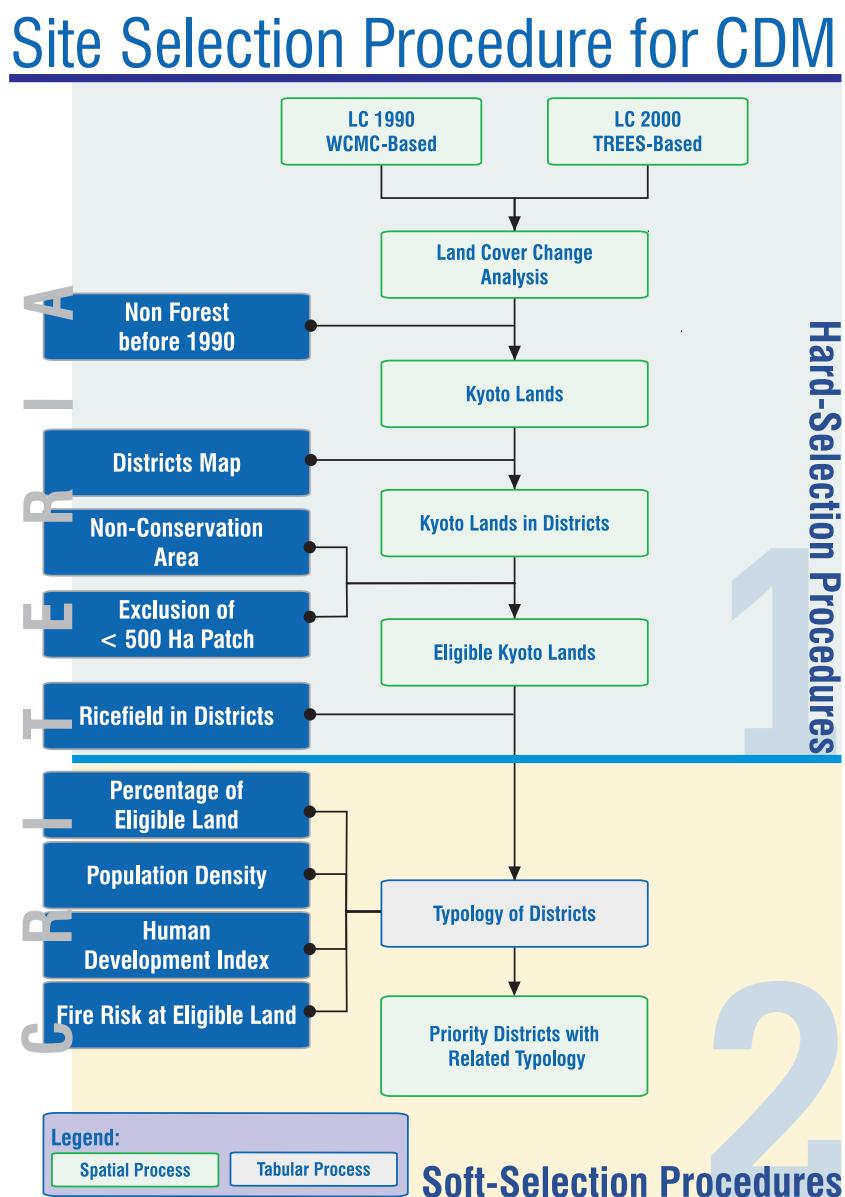
Figure 3. Stepwise procedures to select eligible land using 'hard' and 'soft' criteria

The cropland class includes more intensively cultivated areas, such as rice fields. These will be treated separately using agricultural statistics data available at district level. Parts of this class displays stages of bare soil. Early stages of tree crop plantations will be included in this category as well.

2.2.2 Conservation and production areas

The Agency of Forest Planning of the Ministry of Forestry produced a map of forest land-use by consensus, known as TGHK (Ministry of Forestry 1999), which indicates the following categories:
- Protection forest
- Nature Reserve
- Production forest
- Limited production forest
- Convertible production forest

By definition the first two categories do not comply with the Kyoto rules and technically speaking will not produce significant additionality. Therefore, they are excluded from the map of land cover change before and after 1990.

2.2.3 Small patches

Numerous small patches of eligible land are usually found after such overlaying. All patches smaller than 500 ha of eligible land will be excluded, because even with a relatively high mean annual increment of biomass (say, 10 m^3/year), such patches would not significantly contribute meaningful additionality or carbon sequestration. One may argue that they could be combined to form a substantially 'large' aggregate of eligible lands. This may be true in terms of physical sum, but it is highly likely that one would face rather complicated institutional and regulatory arrangements. Such an aggregate also probably would not be cost-effective as it usually entails high transaction costs.

2.2.4 Area of rice fields

Large areas under non-forest or cropland categories may be dominated by irrigated or rainfed rice fields, especially on Java, Bali, southern Sumatra and Sulawesi. They will definitely not be converted into carbon sequestering land, although they are eligible by definition. As the data of rice field area are available at district level, the area will be deducted from the spatial data of eligible land after incorporating district boundary.

It would then be possible to show the fractions of eligible land and rice fields by district. Such information may be useful in order to provide information for general land-use planning at the district level.

2.3 'Soft' selection criteria of Kyoto eligible lands

'Soft' criteria (not legally constrained, negotiable indications of priority) consider the possibility of including or excluding particular criteria or findings, which may or may not be spatially explicit but relevant to the national and local initiatives. Among these criteria population density, human development index and fire risk were selected. They are well documented and highly deserved from the perspective of sustainable development objectives.

2.3.1 Population density

District level data collated by the National Statistical Agency are used to calculate population density. The distribution of population density is highly skewed towards districts on Java. It is argued that A/R CDM project activities will likely have to support high population densities in terms of their labor requirement. A density of 60 persons/km^2 was found by ICRAF to be the highest where people can find a paid job in caring for the trees in community rubber plantation. It is also considered that C-stock increasing land use is not an 'urban' type of employment. Based on these arguments the categories of population density are proposed to consist of four classes:

Low: < 10 persons/km^2
Lower-medium: 10–100 persons/km^2
Upper-medium: 101–300 persons/km^2
High: > 300 persons/km^2

Further it is worth to consider a population density of 100 persons/km^2 as the threshold to determining the appropriateness of implementing CDM project activities. Thus, districts with population density of more than 100 persons/km^2 should not be prioritised and vise versa.

Figure 4 shows the distribution of population based on the density class category by district. It is obvious that Java is the most densely populated island. In some districts it has well above 1000 people/km^2.
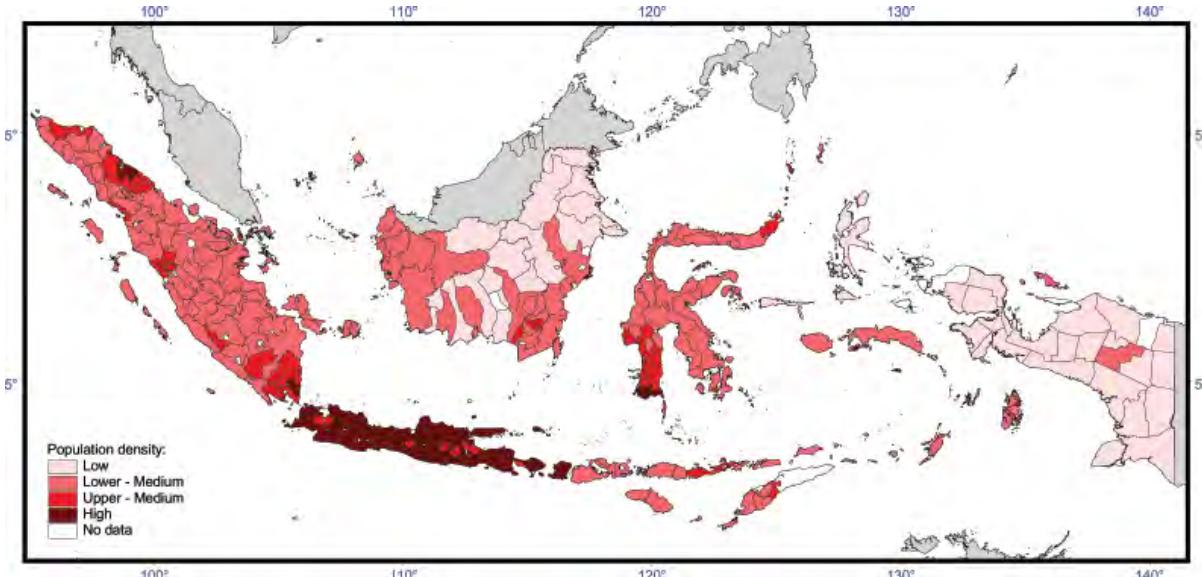
Figure 4. Population density data for Indonesia, classified as low (< 10 persons/km²), lower-medium (10–100 persons/km²), upper-medium (100–300 persons/km²) and high (> 300 persons/km²)

It should be noted that the missing data in some islands is due to statistical discrepancies after the recent split of some districts.

2.3.2 Human Development Index

The Human Development Index (HDI) is considered a better indicator of development equity and people's welfare than per capita income as it measures not merely economic growth. The HDI is based on three components: longevity, as measured by life expectancy at birth; educational attainment, as measured by the combination of adult literacy rate and mean years of schooling; and standard of living, as measured by adjusted per capita expenditure. The index is defined as the simple average of the indices of those three components:

$$HDI = 1/3 \ (Index \ X_1 + Index \ X_2 + Index \ X_3)$$

where X_1, X_2 and X_3 are longevity, educational attainment and standard of living, respectively.

Longevity is measured by using the indicator of life expectancy at birth (e_0). The e_0 is related to the infant mortality rate (IMR). The estimation of IMR at provincial level is calculated based on data series from the 1971, 1980 and 1990 censuses, and pooled data of the 1995 survey between censuses (*SUPAS*) and the 1996 national socio-economic survey (*SUSENAS*).

The component of educational attainment is measured by using two indicators—literacy rate and mean years of schooling. The literacy rate is defined as the proportion of population aged 15 years or older who are able to read and write, in Latin or other script, as a percentage of this age group. Mean years of schooling is defined as the average years of formal schooling attended among the population aged 15 years or older.

As a proxy of standard of living the adjusted real per capita expenditure is used after taking into account the Consumer Price Index (CPI) and the Purchasing Power Parity (PPP) for each region as the relative price of a certain bundle of commodities.

A report by BAPPENAS and UNDP (2004) grouped the HDI into four categories:

Very poor:	< 50
Poor:	50–66
Medium:	66–80
Not poor:	> 80

The gap between the current index and 100 represents the human development 'shortfall'—the distance that each district needs to travel. The 'very poor' and 'poor' districts have a below-average HDI, whereas the HDI of 'medium' districts is above average. There was no district that fell under 'not poor'.
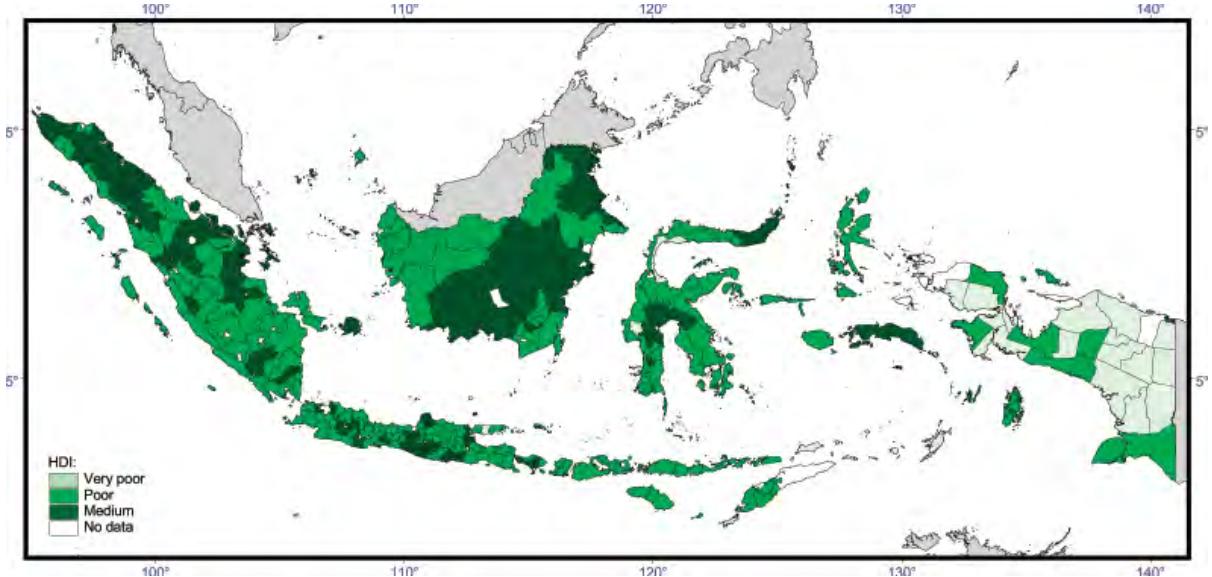
Figure 5. Human Development Index by district for Indonesia (low < 50; lower-medium 50–66; upper-medium 66–79; and high > 80)

Figure 5 shows that HDI categories by district are distributed quite evenly across the archipelago. It also demonstrates that Papua has only poor and very poor categories.

2.3.3   Fire Risk Index

Fire risk is associated with fire frequency between El Nino events. It is estimated from the frequency of hot spot occurrence observed by the NOAA-AVHRR satellite between 1998 and 2004. Hot spot frequency is grouped into three categories:

Low: < 6
Medium: 7–12
High: 13–19

Since the NOAA satellite resolution is 1 km^2, each hot spot was buffered for this pixel, meaning that one hot spot represents an area of 1 km^2. In order to produce a more spatially meaningful representation, the fraction of affected area can be calculated as ratio of the buffered area for each category and the area of the district.

LFraction = *area affected by low hot spot frequency/district area*
MFraction = *area affected by medium hot spot frequency/district area*
LFraction = *area affected by low hot spot frequency/district area*

Fire Risk Index (FRI) can be defined as the sum of fractions of areas affected by each fire frequency category multiplied by weighting factors for each category. The factors were arbitrarily chosen as 1, 3 and 10 for the low, medium and high frequencies, respectively.

FRI = (1*LFraction) + (3*MFraction) + (10*HFraction)

The weighting factors may be adjusted depending on the level of risk management capability of the respective implementing units. Based on the range of the indices, they may be grouped into the following categories:

Low: < 0.05
Medium: 0.05–0.20
High: > 0.20

A low FRI means few fire incidents, a medium FRI corresponds with an intermediate number of fire incident and a high FRI describes a situation of having elevated risk of fires.

Figure 6 shows the distribution of FRI, which is highest in the provinces of Riau, South Sumatra and Lampung, West Kalimantan, Central Kalimantan and South Kalimantan.
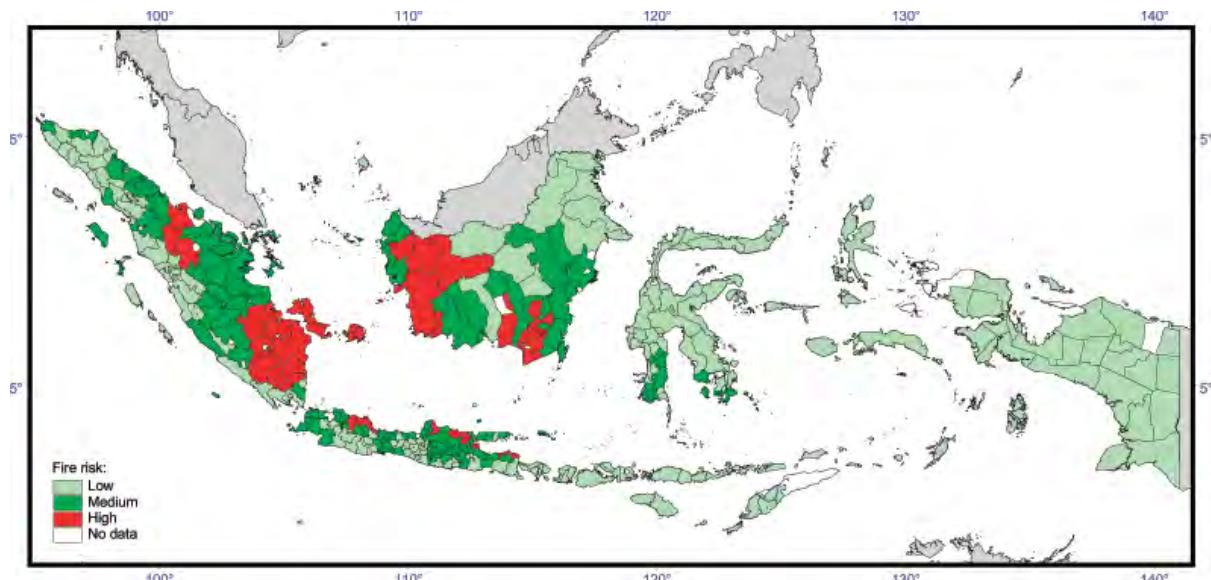
Figure 6.   Indication of frequency of fire (hot spots) on lands that were deforested before 1990

3. Relationships among the quantitative indicators

In order to indicate the distribution of eligible land across the districts the forest fraction is defined as the ratio of 'forested' area to district area. Similarly, the rice paddy fraction is the ratio of rice field area to district area. The first task is to explore the (statistical) relationships among these data (Figure 7).

Population density clearly differentiates the islands. Java has the highest population density and Kalimantan the lowest, while those of Sumatra and Nusa Tenggara are intermediate. In an Indonesia-wide (at least for the islands included in the analysis) comparison population density has clear relationships (negative and positive, respectively) with forest cover and paddy rice fields. The data for Java and Kalimantan are confined to the upper and lower range, respectively, with Sumatra and Nusa Tenggara in intermediate position. Within each of these islands (island groups) the overall relationship is still maintained, but generally more weakly.

The data on HDI suggests that the poorest districts (lowest HDI) are found on Java and Nusa Tenggara, while most of the districts in Sumatra and Kalimantan
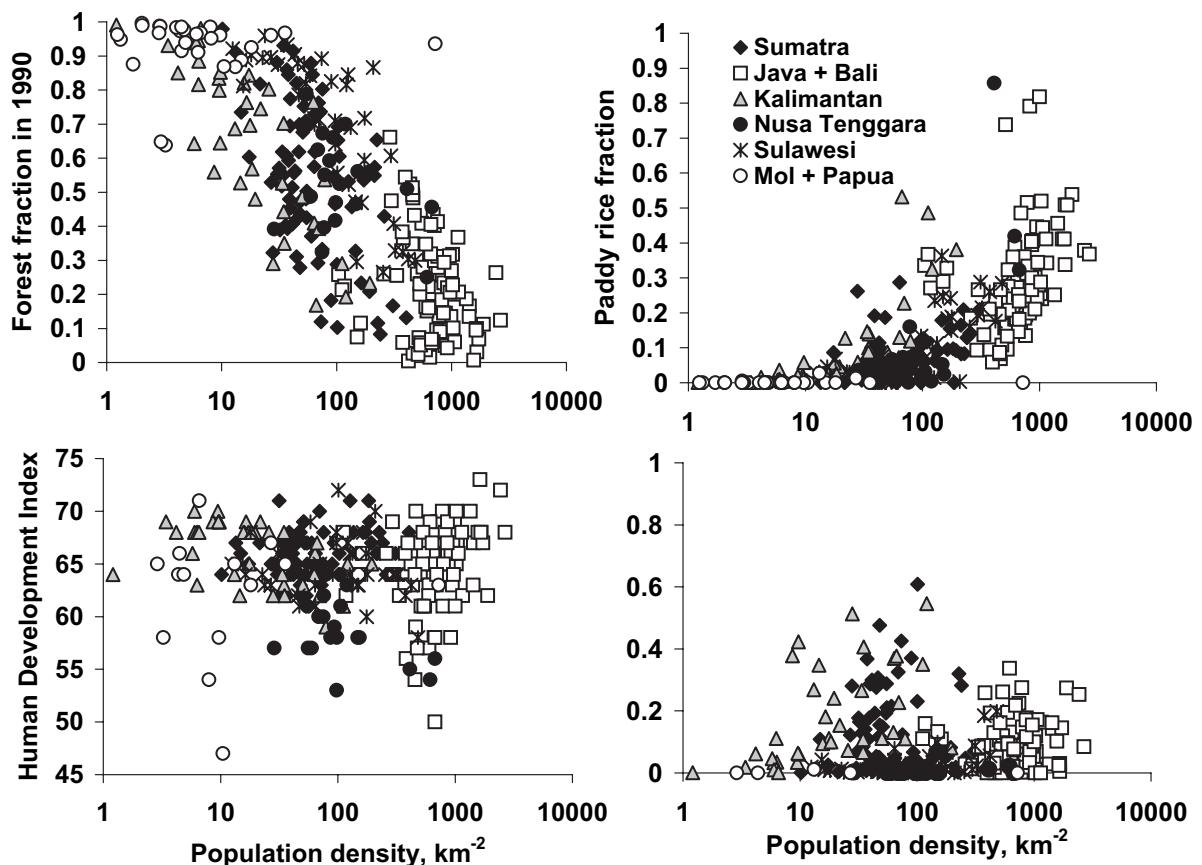
Figure 7. Relationship between district-level population density (number of persons per square kilometer; a logarithmic scale is used) and the fraction of the district (Kabupaten) with (natural) forest cover at the start of 1990 (to the best of our knowledge), the fraction in paddy rice fields, the Human Development Index and an indicator of fire frequency (hot spots) over recent years

are close to the overall mean value of 65. The hot spot frequency is highest in parts of Sumatra and Kalimantan as well as in areas on Java. Statistically, the strongest correlation is that between population density and the forest fraction:

$$\text{ForestFraction} = -0.1239 \, \text{Ln(PopDens)} + 1.0678$$
$$(R^2 = 0.607, \, n = 224)$$

Analysis of the residues (difference between the actual forest fraction of a district and the value expected on the basis of this equation) shows no relationship with the rice field fraction and the Human Development Index, but fire frequency explains part of the negative residues (Figure 8).

The relationship between forest fraction and HDI is weak when we consider the data set as a whole (Figure 9; Table 1). But when the data are analysed per island (group) an interesting pattern emerges: for the 'outer islands' of Kalimantan, Nusa Tenggara and Sumatra the slope is positive (more forest is associated with a higher HDI), while for Java the relationship is negative (higher HDI is associated with less forest). In both cases a forest fraction of about 30% is associated with the lowest HDI. It will be interesting to explore this further for components of the HDI, as the aggregated relationships are weakly defined. It suggests, however, that Sumatra is intermediate between the other outer islands and Java—as it is in many other respects.
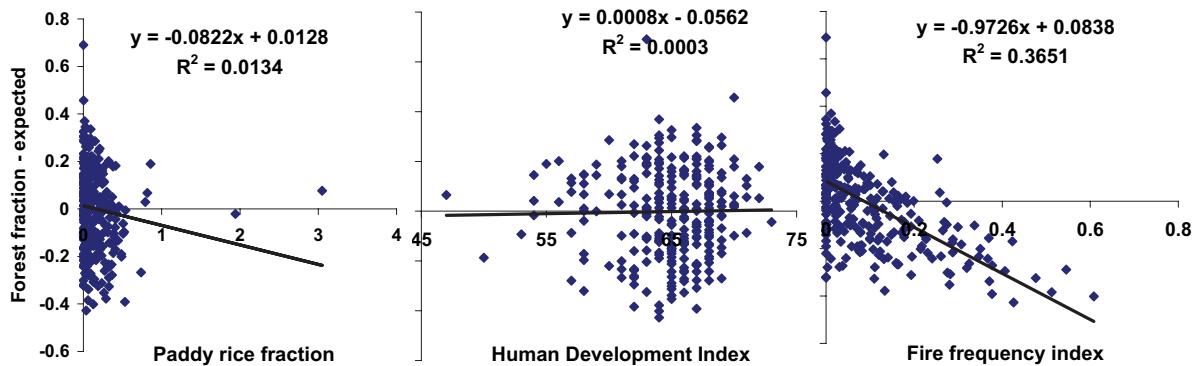
Figure 8. Exploration of relationships among the 'residues' (differences between 1990 forest cover and that expected on the basis of the 2002 population density and a logarithmic relationship derived from Fig. 7) and the paddy rice fraction, Human Development Index and fire frequency indicator
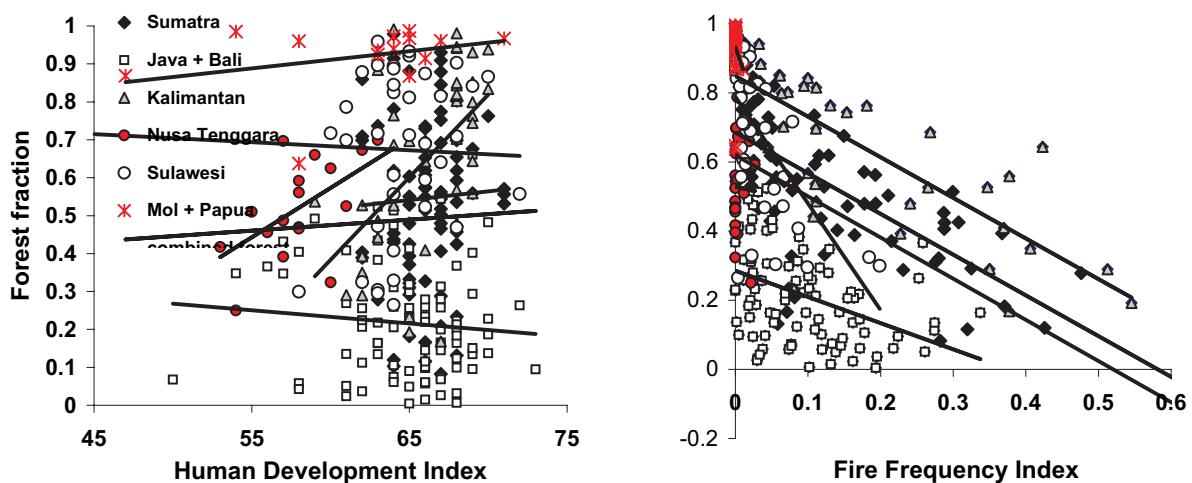
Figure 9. Relationships among Human Development Index, Fire Frequency Index and the forest fraction of districts in Java, Sumatra, Kalimantan and Nusa Tenggara

Table 1. Coefficients of simple linear regression equations among forest fraction (y) of districts in Java, Sumatra, Kalimantan and (Bali +) Nusa Tenggara, the Human Development Index (HDI) and the Fire Frequency Index, shown in Figure 3

	Human Development Index (HDI)	R²	Fire Frequency Index (FFI)	R²
Combined 'Outer islands'	y = 0.0112 HDI − 0.2695	0.0262	y = −0.4456 FFI + 0.5075	0.042
Sumatra	*y = 0.0066 HDI + 0.1363*	*0.004*	*y = −1.0467 FFI + 0.7261*	*0.4549*
Kalimantan	*y = 0.0406 HDI − 1.9986*	*0.2911*	*y = −1.2302 FFI + 0.8704*	*0.5397*
Nusa Tenggara	*y = 0.0205 HDI − 0.7682*	*0.1499*	*y = −0.0178 FFI + 0.4366*	*1E-06*
Java	y = −0.0103 HDI + 0.905	0.089	y = −0.0703 FFI + 0.2438	0.0016

4. District Typologies

The 'hard' and 'soft' selection processes produce eligible land for A/R CDM project activities with the embedded opportunity to meet the objective of sustainable development. At the same time local governments and hosts could anticipate potential project risks for the carbon assets to leak. The terms 'eligible' and 'ineligible' to label each district should be interpreted in association with the potential threatening factors.

The further discussion is based on a data set of 'potentially eligible' areas, which were identified as meeting the requirement of having been deforested before 1990, called 'Kyoto lands', and where at least 500 ha of such lands are available to make a project possible.

District typologies that indicate groupings based on a certain attribute may further be clustered. This way site selection to host A/R CDM may begin. The typology should be further refined or fine-tuned and guided by local considerations. Stakeholder consultation, which was not undertaken for this reporting, should be prioritised.

4.1 A/R CDM eligible land area by district
In the next step, the Kyoto lands are split between paddy rice fields (where tree-based production is unlikely to be relevant) and 'eligible Kyoto lands' with other upland uses, where CDM can be explored.

The CDM eligible lands derived from 'hard' selection criteria are shown in Appendix 1. The area in each district may be further adjusted depending on local priorities. For example, some district may well in advance plan to increase its cultivated area as irrigation scheme and market for the commodities had been previously studied. In contrary, some of the districts may reclaim the lost conservation area that may not fall under the rules and modalities of the A/R CDM project activities. In so doing, the

fraction of CDM eligible lands, as expressed by the ratio of CDM eligible land area to district area, may be determined as part of local land use planning.

4.2 Meeting sustainable development objectives
In addition to the deduction of rice field areas, the argument of excluding areas with high population densities and the more-prosperous communities has direct implications on eligibility for most districts in Java and for a few districts in the outer islands.

The HDI range indicated in the BAPPENAS and UNDP studies was unequally distributed. Based on the most recent SUSENAS data, no indices below 50 or above 80 were found, which suggests that the value of 66 may be used as threshold between low and high HDI. Districts with HDI below 66 are considered as 'not' wealthy, while those with indices above 66 are counted among the wealthy districts. Districts' population densities and HDI are shown in Appendix 2.

Fire risk as a factor to be anticipated is used as a flag for each of the districts to prepare in managing the risks and optimising the opportunity. The list of districts' fire risks is shown in Appendix 3.

The areas in Java, Sumatra, Kalimantan, Nusa Tenggara, Sulawesi, Molluca and Papua that meet these criteria involve 195 M ha in 302 districts with 48 M ha of 'eligible Kyoto lands', 158 M people and a mean HDI of 64.7. The mean of district-level population density is 293 persons/km^2 and the mean FRI is 0.086.

4.3 Applying criteria for prioritising districts
Although all these districts may be able to develop 'valid' project proposals for CDM (and there is no formal reason why they cannot), a priority-setting

process may include the following criteria:

1) low HDI, reflecting the focus on 'development' in CDM; the mean (64.9) was chosen as threshold;

2) medium population density of between 10 and 100 persons/km^2; at very low densities 'reforestation' is likely to depend on external supply of labour (defying the positive development aspect), while at high densities tree-based land use systems are unlikely to provide sufficient returns to labour, leading to competition for land between tree-based and intensive land use types. We tentatively used a value of 100 persons/km^2, as the most intensive tree-based system we know (rubber agroforest) absorbs 60–70 persons/km^2, and we can allow for a non-rural component of the population at district level (more precise data on 'rural population' are not available at this stage);

3) minimum fraction of district that is Kyoto land and not rice fields; we suggest 15% as cutoff point, as below this value CDM is unlikely to warrant attention at district scale.

With these three criteria we obtain a priority list of 60 districts, or 20% of total. This priority list involves 46 M ha (24% of total) with 19 M ha of 'Kyoto lands' (40% of total) and 19.5 M people (12% of total). The areas have a mean HDI of 62.9 (reflecting the 'pro-poor' prioritisation). The mean of district-level population density is 53 person/km^2

(the larger districts tend to have a lower density) and the mean fire frequency index is 0.135 (60% higher than for the set as a whole). It seems reasonable to use this 'priority list' (Figure 10; Table 2) as the potential domain for CDM application and to look for districts that 'represent' the three categories of fire frequency index, as well as other characteristics that we found to be associated with the priority list.

4.4 Clustering of districts based on similarity

Assessing the degree of similarity of these priority districts becomes the next step of analysis. Grouping of districts based on the degree of similarity is considered useful to ensure that the districts to be selected represent similar characteristics. This procedure will also allow for the estimation of success across those districts in the same group by extrapolation.

First, cluster analysis was applied to all districts in the data set using nine input indicators representing district area, land use, population density, HDI and fire risk (Appendix 5). A subset to the priority districts was then compiled to see the clustering within priority districts.

From the analysis, 15 clusters were obtained, three of which were extracted and suggested as the basis for further selection.
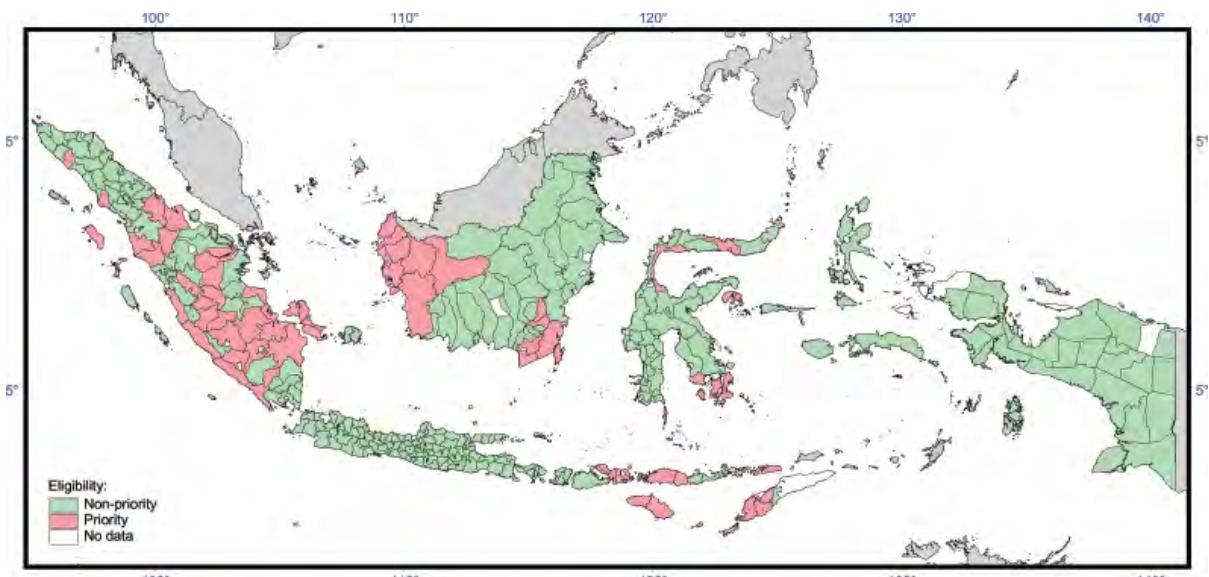
Figure 10. Districts prioritised for CDM based on the criteria: minimum 15% of eligible lands in the district, population density between 10 and 100 persons/km^2, HDI below 65

Table 2. Districts that meet the 'priority' criteria of HDI below data set mean, population density between 10 and 100 persons/km² and at least 15% of district eligible

Code	District	Province	HDI 2002	Population Density (persons/km²)	Potential CDM Fraction
Priority districts with low fire frequency					
1115	Nagan Raya	Nanggroe Aceh Darussalam	66	39	0.305
1202	Mandailing Natal	North Sumatra	64	53	0.160
1302	Pesisir Selatan	West Sumatra	66	64	0.207
1304	Sawahlunto/Sijunjung	West Sumatra	62	54	0.244
1309	Pasaman	West Sumatra	64	65	0.324
1701	Bengkulu Selatan	Bengkulu	65	17	0.310
1801	Lampung Barat	Lampung	63	72	0.202
5205	Dompu	West Nusa Tenggara	58	87	0.327
5206	Bima	West Nusa Tenggara	59	93	0.265
5301	Sumba Barat	East Nusa Tenggara	53	98	0.516
5302	Sumba Timur	East Nusa Tenggara	57	29	0.573
5303	Kupang	East Nusa Tenggara	57	60	0.477
5304	Timor Tengah Selatan	East Nusa Tenggara	58	99	0.512
5305	Timor Tengah Utara	East Nusa Tenggara	60	75	0.626
5307	Alor	East Nusa Tenggara	57	56	0.291
5308	Lembata	East Nusa Tenggara	62	76	0.326
5312	Ngada	East Nusa Tenggara	64	79	0.411
5313	Manggarai	East Nusa Tenggara	60	69	0.303
7201	Banggai Kepulauan	Central Sulawesi	61	47	0.199
7301	Selayar	South Sulawesi	64	90	0.155
7402	Muna	Southeast Sulawesi	61	64	0.293
7502	Gorontalo	Gorontalo	65	70	0.251
Priority districts with medium fire frequency					
1102	Aceh Singkil	Nanggroe Aceh Darussalam	62	47	0.215
1201	Labuhan Batu	North Sumatra	62	32	0.571
1402	Indragiri Hulu	Riau	66	34	0.337
1404	Pelalawan	Riau	66	15	0.237
1502	Merangin	Jambi	66	37	0.378
1503	Sarolangun	Jambi	65	27	0.454
1506	Tanjung Jabung Timur	Jambi	65	39	0.329
1508	Tebo	Jambi	65	34	0.425
1509	Bungo	Jambi	64	48	0.522
1604	Lahat	South Sumatra	65	75	0.605
1605	Musi Rawas	South Sumatra	62	36	0.550
1703	Bengkulu Utara	Bengkulu	64	31	0.393
6101	Sambas	West Kalimantan	59	79	0.344
6102	Bengkayang	West Kalimantan	63	35	0.458
6104	Pontianak	West Kalimantan	64	63	0.164
6302	Kota Baru	South Kalimantan	65	18	0.247
6309	Tabalong	South Kalimantan	63	50	0.427
7401	Buton	Southeast Sulawesi	63	64	0.259
Priority districts with high fire frequency					
1407	Rokan Hulu	Riau	64	40	0.522
1409	Rokan Hilir	Riau	66	41	0.444
1602	Ogan Komering Ilir	South Sumatra	63	48	0.534
1603	Muara Enim	South Sumatra	64	73	0.845
1606	Musi Banyu Asin	South Sumatra	65	28	0.416
1607	Banyu Asin	South Sumatra	65	55	0.569
1807	Way Kanan	Lampung	65	90	0.754
1901	Bangka	Kepulauan Bangka Belitung	65	69	0.667

Code	District	Province	HDI 2002	Population Density (persons/km²)	Potential CDM Fraction
1903	Bangka Barat	Kepulauan Bangka Belitung	65	45	0.689
1904	Bangka Tengah	Kepulauan Bangka Belitung	65	60	0.629
1905	Bangka Selatan	Kepulauan Bangka Belitung	65	37	0.607
6103	Landak	West Kalimantan	62	35	0.511
6105	Sanggau	West Kalimantan	62	28	0.651
6106	Ketapang	West Kalimantan	64	13	0.283
6107	Sintang	West Kalimantan	62	15	0.462
6301	Tanah Laut	South Kalimantan	66	64	0.461
6303	Banjar	South Kalimantan	64	34	0.328
6308	Hulu Sungai Utara	South Kalimantan	62	70	0.380
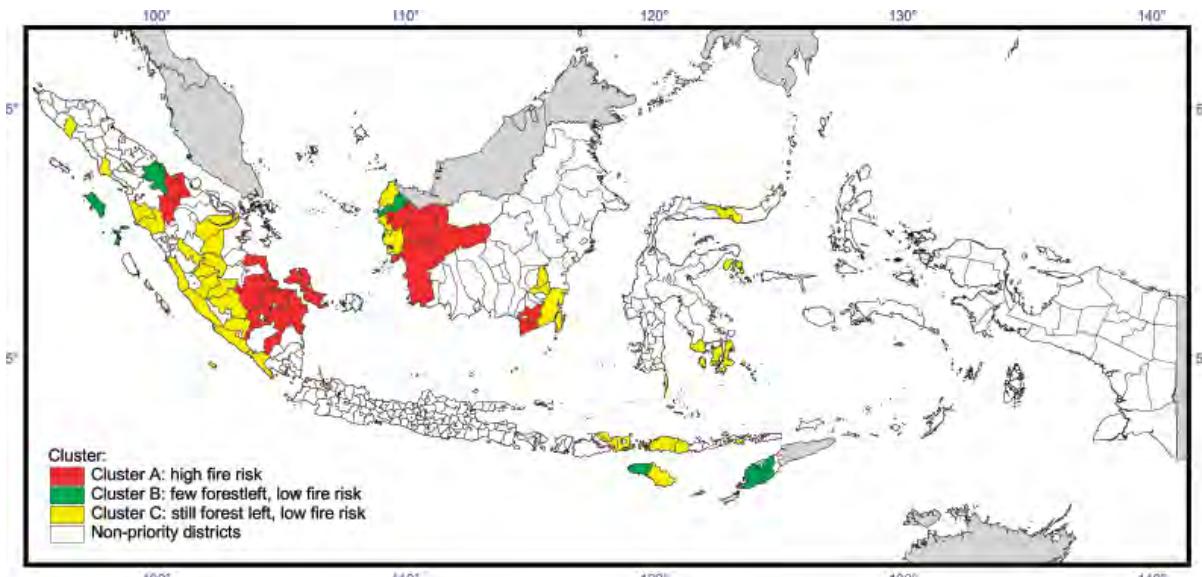
Figure 11. Three clusters suggested representing districts with degrees of similarity

- Cluster A: Characterised by high fire risk, the districts are located mostly in the low peneplain areas of eastern Sumatra and in West Kalimantan. Nineteen of 32 districts are on the priority list. For CDM projects proposed in these districts, fire risk should be taken into consideration.
- Cluster B: Characterised by low to medium fire risk, the districts are located mostly in Nusa Tenggara. All nine districts are on the priority list.
- Cluster C: Characterised by low to medium fire risk, the districts are located mostly at the western mountain range of Bukit Barisan in Sumatra. Fourteen of the 67 districts are on the priority list.

The three clusters based on the similarity in terms of fire risk and terrain can be seen in Figure 11.

Papua is not included in the clusters with fire risk as an attribute, but clusters based on the area or coverage of, for example, conservation area may serve the purpose for this particular region. Likewise, Java is not included, but if the clustering were based on population density, it might be included. As far as A/R CDM project activities are concerned clusters should be based on practical aspect rather than conceptual.

5. Further Considerations

Obviously, other criteria will have to be added to reflect the level of preparedness and interest of local community and district government, as well as the actual land uses on 'Kyoto eligible' lands.

The current analysis at district *(kabupaten)* level was based on coarse data useful for getting the idea in the broad context (national level). More-detailed analyses with finer data sets, for example on the subdistrict (*kecamatan*) level, are needed, however, for better identification of land parcels eligible for CDM projects, biophysical as well as socio-economic conditions to be considered and the various risks to be anticipated.

Once detailed analyses are done and eligible land parcels are identified, economic values of various land use options are needed. Some Kyoto eligible lands with higher existing economic value may need to be excluded from prospective CDM lands.

Like other tree-planting activities, CDM projects should benefit local farmers. Thorough socio-economic studies on the local populations should therefore be done to evaluate whether the project meets the umbrella vision of poverty alleviation.

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Appendices

Appendix 1. CDM eligible land by district

District Code	Province	District	District area (ha)	"Kyotoland" (ha)	Ricefield (ha)	Eligible land (ha)*
1101	Nanggroe Aceh Darussalam	Simeulue	207136.80	29069.76	20942	8127.76
1102	Nanggroe Aceh Darussalam	Aceh Singkil	364225.11	109715.86	31556	78159.86
1103	Nanggroe Aceh Darussalam	Aceh Selatan	398194.90	34025.36	28696	5329.36
1104	Nanggroe Aceh Darussalam	Aceh Tenggara	483685.58	33762.60	27927	5835.60
1105	Nanggroe Aceh Darussalam	Aceh Timur	592734.81	262790.91	67714	195076.91
1106	Nanggroe Aceh Darussalam	Aceh Tengah	728881.53	112606.78	12828	99778.78
1107	Nanggroe Aceh Darussalam	Aceh Barat	353416.14	150350.02	101356	48994.02
1108	Nanggroe Aceh Darussalam	Aceh Besar	322745.27	147099.57	37336	109763.57
1109	Nanggroe Aceh Darussalam	Pidie	471800.71	142087.38	54968	87119.38
1110	Nanggroe Aceh Darussalam	Bireuen	190778.76	84648.60	18450	66198.60
1111	Nanggroe Aceh Darussalam	Aceh Utara	269572.63	181450.34	48179	133271.34
1112	Nanggroe Aceh Darussalam	Aceh Barat Daya	255660.67	30960.12	n.a.	30960.12
1113	Nanggroe Aceh Darussalam	Gayo Lues	619822.88	56431.23	n.a.	56431.23
1114	Nanggroe Aceh Darussalam	Aceh Tamiang	245743.08	131339.32	n.a.	131339.32
1115	Nanggroe Aceh Darussalam	Nagan Raya	386546.21	117984.18	n.a.	117984.18
1116	Nanggroe Aceh Darussalam	Aceh Jaya	431549.51	78604.90	n.a.	78604.90
1201	North Sumatra	Labuhan Batu	1640953.25	1003023.15	65395	937628.15
1202	North Sumatra	Mandailing Natal	696569.90	152302.31	40601	111701.31
1203	North Sumatra	Tapanuli Selatan	1307446.14	498704.93	67654	431050.93
1204	North Sumatra	Tapanuli Tengah	264323.81	91729.16	33162	58567.16
1205	North Sumatra	Tapanuli Utara	643672.70	145599.37	64740	80859.37
1206	North Sumatra	Toba Samosir	408939.22	97265.30	24974	72291.30
1208	North Sumatra	Asahan	510575.08	404103.92	47225	356878.92
1209	North Sumatra	Simalungun	491690.76	376770.86	47031	329739.86
1210	North Sumatra	Dairi	490829.72	121605.02	13675	107930.02
1211	North Sumatra	Karo	241020.74	113010.74	15096	97914.74
1212	North Sumatra	Deli Serdang	505664.32	439294.77	99866	339428.77
1213	North Sumatra	Langkat	690264.40	374762.14	61868	312894.14
1301	West Sumatra	Kepulauan Mentawai	653894.71	13723.73	4088	9635.73

District Code	Province	District	District area (ha)	"Kyotoland" (ha)	Ricefield (ha)	Eligible land (ha)*
1302	West Sumatra	Pesisir Selatan	646016.65	174888.63	40884	134004.63
1303	West Sumatra	Solok	737173.41	114213.60	39725	74488.60
1304	West Sumatra	Sawahlunto/Sijunjung	628094.15	182853.42	29530	153323.42
1305	West Sumatra	Tanah Datar	148490.41	51382.58	30968	20414.58
1306	West Sumatra	Padang Pariaman	172836.37	77980.49	28455	49525.49
1307	West Sumatra	Agam	246481.10	114489.72	38129	76360.72
1308	West Sumatra	Lima Puluh Koto	311903.76	96237.57	38709	57528.57
1309	West Sumatra	Pasaman	848442.67	324049.79	48776	275273.79
1401	Riau	Kuantan Singingi	551732.96	241426.18	25524	215902.18
1402	Riau	Indragiri Hulu	838907.40	319783.40	37075	282708.40
1403	Riau	Indragiri Hilir	1307633.56	690502.41	93269	597233.41
1404	Riau	Pelalawan	1401268.48	371215.63	39750	331465.63
1405	Riau	Siak	863634.29	370751.45	16127	354624.45
1406	Riau	Kampar	1137858.96	654151.21	49750	604401.21
1407	Riau	Rokan Hulu	822439.39	449723.53	20287	429436.53
1408	Riau	Bengkalis	1246465.03	403984.33	66703	337281.33
1409	Riau	Rokan Hilir	1023553.67	497485.83	42980	454505.83
1410	Riau	Kepulauan Riau	429534.55	77117.37	2897	74220.37
1411	Riau	Karimun	97662.68	43075.74	0	43075.74
1412	Riau	Natuna	283578.64	33779.53	2188	31591.53
1501	Jambi	Kerinci	400131.71	78969.52	28596	50373.52
1502	Jambi	Merangin	738899.17	290693.94	11727	278966.94
1503	Jambi	Sarolangun	710660.03	334914.00	12185	322729.00
1504	Jambi	Batanghari	615202.00	296661.28	32090	264571.28
1505	Jambi	Muara Jambi	499349.49	259651.87	29124	230527.87
1506	Jambi	Tanjung Jabung Timur	513253.38	267312.07	98486	168826.07
1507	Jambi	Tanjung Jabung Barat	576664.70	234502.92	30636	203866.92
1508	Jambi	Tebo	665371.30	299244.68	16407	282837.68
1509	Jambi	Bungo	494431.13	278512.21	20534	257978.21
1601	South Sumatra	Ogan Komering Ulu	1086604.10	774061.74	119613	654448.74
1602	South Sumatra	Ogan Komering Ilir	2048356.30	1477744.47	383227	1094517.47
1603	South Sumatra	Muara Enim	829422.74	730001.08	29463	700538.08
1604	South Sumatra	Lahat	705651.78	471291.76	44244	427047.76
1605	South Sumatra	Musi Rawas	1277002.45	762491.62	60229	702262.62
1606	South Sumatra	Musi Banyu Asin	1585607.76	1075199.71	415588	659611.71
1607	South Sumatra	Banyu Asin	1251936.69	719974.07	7077	712897.07
1701	Bengkulu	Bengkulu Selatan	768084.06	304672.95	66549	238123.95
1702	Bengkulu	Rejang Lebong	408527.18	161289.83	25078	136211.83
1703	Bengkulu	Bengkulu Utara	1041263.40	464970.45	55726	409244.45
1801	Lampung	Lampung Barat	517041.45	136177.70	31603	104574.70
1802	Lampung	Tanggamus	382668.92	163250.95	31659	131591.95
1803	Lampung	Lampung Selatan	455843.85	260180.71	64393	195787.71
1804	Lampung	Lampung Timur	291058.26	242640.74	60930	181710.74
1805	Lampung	Lampung Tengah	456640.39	418957.42	58753	360204.42
1806	Lampung	Lampung Utara	243742.53	215509.71	20376	195133.71
1807	Lampung	Way Kanan	410099.67	335305.03	26134	309171.03
1808	Lampung	Tulang Bawang	703463.38	631084.28	88247	542837.28
1901	Kepulauan Bangka - Belitung	Bangka	325113.57	230213.41	13244	216969.41
1902	Kepulauan Bangka - Belitung	Belitung	237577.60	118065.90	625	117440.90
1903	Kepulauan Bangka - Belitung	Bangka Barat	301859.58	208087.65	n.a.	208087.65
1904	Kepulauan Bangka - Belitung	Bangka Tengah	206605.34	129944.56	n.a.	129944.56

District Code	Province	District	District area (ha)	"Kyotoland" (ha)	Ricefield (ha)	Eligible land (ha)*
1905	Kepulauan Bangka - Belitung	Bangka Selatan	380391.77	230759.40	n.a.	230759.40
1906	Kepulauan Bangka - Belitung	Belitung Timur	206839.20	122746.83	n.a.	122746.83
3201	West Java	Bogor	306501.21	226956.89	56385	170571.89
3202	West Java	Sukabumi	428466.81	317192.60	66997	250195.60
3203	West Java	Cianjur	374097.10	259704.90	77291	182413.90
3204	West Java	Bandung	314423.57	188133.48	62152	125981.48
3205	West Java	Garut	315697.79	178637.86	54145	124492.86
3206	West Java	Tasikmalaya	281499.30	202808.32	56619	146189.32
3207	West Java	Ciamis	277999.65	213459.01	66461	146998.01
3208	West Java	Kuningan	124603.30	92661.12	98548	-5886.88
3209	West Java	Cirebon	107320.96	95264.11	57752	37512.11
3210	West Java	Majalengka	134191.84	120008.39	52937	67071.39
3211	West Java	Sumedang	161175.81	125293.72	35403	89890.72
3212	West Java	Indramayu	209791.81	181428.92	108175	73253.92
3213	West Java	Subang	221540.39	185266.45	86058	99208.45
3214	West Java	Purwakarta	97552.26	70347.68	18931	51416.68
3215	West Java	Karawang	198463.08	155281.71	88526	66755.71
3216	West Java	Bekasi	129682.83	108216.26	59101	49115.26
3301	Central Java	Cilacap	230901.89	161978.94	64486	97492.94
3302	Central Java	Banyumas	142813.07	114294.10	34220	80074.10
3303	Central Java	Purbalingga	82654.08	56430.91	21038	35392.91
3304	Central Java	Banjarnegara	116285.67	80111.14	15682	64429.14
3305	Central Java	Kebumen	134370.93	114862.44	42362	72500.44
3306	Central Java	Purworejo	109490.47	91536.67	30306	61230.67
3307	Central Java	Wonosobo	100524.85	58981.17	18565	40416.17
3308	Central Java	Magelang	114516.40	84988.45	38376	46612.45
3309	Central Java	Boyolali	110684.38	99863.85	23263	76600.85
3310	Central Java	Klaten	67329.36	65218.62	34244	30974.62
3311	Central Java	Sukoharjo	51552.72	51223.71	21176	30047.71
3312	Central Java	Wonogiri	192492.99	178436.12	31434	147002.12
3313	Central Java	Karanganyar	81928.14	70878.84	22856	48022.84
3314	Central Java	Sragen	98172.85	93337.30	39966	53371.30
3315	Central Java	Grobogan/Purwodadi	199907.44	196897.13	61843	135054.13
3316	Central Java	Blora	196019.25	195147.10	45727	149420.10
3317	Central Java	Rembang	106793.03	100662.95	29464	71198.95
3318	Central Java	Pati	159835.08	144567.00	57677	86890.00
3319	Central Java	Kudus	42716.52	39796.63	21720	18076.63
3320	Central Java	Jepara	107735.78	74013.35	26135	47878.35
3321	Central Java	Demak	98940.80	88937.79	51373	37564.79
3322	Central Java	Semarang	102834.72	83663.02	25795	57868.02
3323	Central Java	Temanggung	89169.68	76920.97	27847	49073.97
3324	Central Java	Kendal	102536.39	78556.38	27268	51288.38
3325	Central Java	Batang	75002.98	58548.62	22709	35839.62
3326	Central Java	Pekalongan	98479.18	51720.51	26147	25573.51
3327	Central Java	Pemalang	113752.32	90251.70	38939	51312.70
3328	Central Java	Tegal	100231.03	86735.23	194619	-107883.77
3329	Central Java	Brebes	175972.27	128602.25	143905	-15302.75
3401	DI Yogyakarta	Kulon Progo	61078.55	51884.76	11097	40787.76
3402	DI Yogyakarta	Bantul	49215.51	44320.14	16613	27707.14
3403	DI Yogyakarta	Gunung Kidul	147688.46	143789.05	10131	133658.05
3404	DI Yogyakarta	Sleman	57489.25	52063.17	23648	28415.17
3501	East Java	Pacitan	142654.39	134248.30	13337	120911.30

District Code	Province	District	District area (ha)	"Kyotoland" (ha)	Ricefield (ha)	Eligible land (ha)*
3502	East Java	Ponorogo	145047.39	121254.17	34837	86417.17
3503	East Java	Trenggalek	125737.32	100594.25	11985	88609.25
3504	East Java	Tulungagung	116385.54	95001.24	23183	71818.24
3505	East Java	Blitar	174708.65	146812.51	31662	115150.51
3506	East Java	Kediri	155319.75	137385.78	50992	86393.78
3507	East Java	Malang	352940.15	240555.21	51438	189117.21
3508	East Java	Lumajang	180980.53	107094.42	37457	69637.42
3509	East Java	Jember	335953.15	200018.87	84611	115407.87
3510	East Java	Banyuwangi	354447.18	168858.90	69387	99471.90
3511	East Java	Bondowoso	155520.77	101432.54	30448	70984.54
3512	East Java	Situbondo	162309.65	102945.61	31832	71113.61
3513	East Java	Probolinggo	172799.82	112808.23	526760	-413951.77
3514	East Java	Pasuruan	149398.52	115919.53	40416	75503.53
3515	East Java	Sidoarjo	68652.83	50569.87	25955	24614.87
3516	East Java	Mojokerto	100126.04	78795.34	36741	42054.34
3517	East Java	Jombang	109693.59	103039.03	48636	54403.03
3518	East Java	Nganjuk	128918.68	117318.02	42993	74325.02
3519	East Java	Madiun	111557.63	103259.97	32291	70968.97
3520	East Java	Magetan	72495.64	61996.88	29273	32723.88
3521	East Java	Ngawi	140951.81	135764.79	50666	85098.79
3522	East Java	Bojonegoro	236190.62	230630.02	174270	56360.02
3523	East Java	Tuban	199037.73	188925.78	64247	124678.78
3524	East Java	Lamongan	177649.76	166822.93	86239	80583.93
3525	East Java	Gresik	122664.93	86631.45	36806	49825.45
3526	East Java	Bangkalan	131131.14	123522.29	30552	92970.29
3527	East Java	Sampang	123754.20	115389.77	22383	93006.77
3528	East Java	Pamekasan	80533.92	77109.73	16918	60191.73
3529	East Java	Sumenep	215965.81	122766.19	23274	99492.19
3601	Banten	Pandeglang	289958.52	178936.66	61020	117916.66
3602	Banten	Lebak	334960.96	249337.44	45834	203503.44
3603	Banten	Tangerang	119173.30	104462.74	43853	60609.74
3604	Banten	Serang	183015.16	145380.11	63006	82374.11
5101	Bali	Jembrana	85823.87	29101.92	7953	21148.92
5102	Bali	Tabanan	86909.80	44974.10	23112	21862.10
5103	Bali	Badung	39293.99	30346.52	11301	19045.52
5104	Bali	Gianyar	36477.31	23075.86	14990	8085.86
5105	Bali	Klungkung	30972.19	23843.82	4108	19735.82
5106	Bali	Bangli	52583.45	23960.80	3078	20882.80
5107	Bali	Karangasem	86134.73	43740.85	7126	36614.85
5108	Bali	Buleleng	133563.10	65006.30	11601	53405.30
5201	West Nusa Tenggara	Lombok Barat	172380.29	84514.10	147794	-63279.91
5202	West Nusa Tenggara	Lombok Tengah	126292.85	94727.08	52917	41810.08
5203	West Nusa Tenggara	Lombok Timur	150385.62	81817.21	48508	33309.21
5204	West Nusa Tenggara	Sumbawa	837565.77	178293.35	55685	122608.35
5205	West Nusa Tenggara	Dompu	218591.72	89171.11	17655	71516.11
5206	West Nusa Tenggara	Bima	431425.32	146682.15	32296	114386.15
5301	East Nusa Tenggara	Sumba Barat	392908.24	229069.42	26400	202669.42
5302	East Nusa Tenggara	Sumba Timur	680117.12	413891.05	24179	389712.05
5303	East Nusa Tenggara	Kupang	551793.53	283038.77	19775	263263.77
5304	East Nusa Tenggara	Timor Tengah Selatan	401686.90	213095.22	7276	205819.22
5305	East Nusa Tenggara	Timor Tengah Utara	268107.32	181299.53	13554	167745.53
5306	East Nusa Tenggara	Belu	226307.06	121012.64	11834	109178.64
5307	East Nusa Tenggara	Alor	296432.37	89877.46	3559	86318.46
5308	East Nusa Tenggara	Lembata	127451.08	41669.44	65	41604.44

District Code	Province	District	District area (ha)	"Kyotoland" (ha)	Ricefield (ha)	Eligible land (ha)*
5309	East Nusa Tenggara	Flores Timur	178248.57	53615.53	716	52899.53
5310	East Nusa Tenggara	Sikka	179408.99	78798.66	4248	74550.66
5311	East Nusa Tenggara	Ende	223173.15	106112.75	6973	99139.75
5312	East Nusa Tenggara	Ngada	300446.53	134999.01	11604	123395.01
5313	East Nusa Tenggara	Manggarai	690517.74	259288.96	50286	209002.96
5314	East Nusa Tenggara	Rote Ndao	129459.90	78164.79	20689	57475.79
6101	West Kalimantan	Sambas	597606.92	276856.01	71060	205796.01
6102	West Kalimantan	Bengkayang	556461.70	310182.27	55275	254907.27
6103	West Kalimantan	Landak	863235.80	561528.12	120105	441423.12
6104	West Kalimantan	Pontianak	1086192.77	256058.65	78291	177767.65
6105	West Kalimantan	Sanggau	1871739.99	1328911.37	110187	1218724.37
6106	West Kalimantan	Ketapang	3486219.35	1092728.97	107051	985677.97
6107	West Kalimantan	Sintang	3266001.17	1543802.10	35673	1508129.10
6108	West Kalimantan	Kapuas Hulu	3096121.20	358823.10	38713	320110.10
6201	Central Kalimantan	Kotawaringin Barat	1133284.48	268256.57	22554	245702.57
6202	Central Kalimantan	Kotawaringin Timur	1620839.93	254065.26	57834	196231.26
6203	Central Kalimantan	Kapuas	1487330.68	380057.75	189381	190676.75
6204	Central Kalimantan	Barito Selatan	440520.79	87010.82	14660	72350.82
6205	Central Kalimantan	Barito Utara	1131246.74	187878.03	23970	163908.03
6206	Central Kalimantan	Sukamara	379524.15	167402.40	7371	160031.40
6207	Central Kalimantan	Lamandau	491652.36	72944.89	3189	69755.89
6208	Central Kalimantan	Seruyan	1442729.86	265923.74	11359	254564.74
6209	Central Kalimantan	Katingan	2079164.94	121055.00	75328	45727.00
6210	Central Kalimantan	Pulang Pisau	1168506.44	415823.47	67623	348200.47
6211	Central Kalimantan	Gunung Mas	859684.13	172469.07	10210	162259.07
6212	Central Kalimantan	Barito Timur	386628.67	201199.93	17741	183458.93
6213	Central Kalimantan	Murung Raya	2417461.28	167844.35	1509	166335.35
6301	South Kalimantan	Tanah Laut	385743.46	227923.30	49943	177980.30
6302	South Kalimantan	Kota Baru	1427631.57	433231.43	80242	352989.43
6303	South Kalimantan	Banjar	482190.86	228293.98	70210	158083.98
6304	South Kalimantan	Barito Kuala	233661.47	165765.45	113512	52253.45
6305	South Kalimantan	Tapin	216893.93	180386.46	115310	65076.46
6306	South Kalimantan	Hulu Sungai Selatan	165397.75	133584.35	53670	79914.35
6307	South Kalimantan	Hulu Sungai Tengah	118848.64	91166.06	45235	45931.06
6308	South Kalimantan	Hulu Sungai Utara	293569.96	178220.61	66707	111513.61
6309	South Kalimantan	Tabalong	361561.78	185832.42	31550	154282.42
6401	East Kalimantan	Pasir	1085759.13	194900.83	29389	165511.83
6402	East Kalimantan	Kutai Barat	3431876.14	514343.16	52606	461737.16
6403	East Kalimantan	Kutai Kertanegara	2617197.75	1130204.85	69644	1060560.85
6404	East Kalimantan	Kutai Timur	2835565.79	1013653.92	21633	992020.92
6405	East Kalimantan	Berau	2113705.09	116512.18	8577	107935.18
6406	East Kalimantan	Malinau	3854502.72	35666.49	4001	31665.49
6407	East Kalimantan	Bulongan	1581043.95	98180.67	15894	82286.67
6408	East Kalimantan	Nunukan	1583268.28	31029.67	7827	23202.67
6409	East Kalimantan	Penajam Paser Utara	336955.44	100261.62	29760	70501.62
7101	North Sulawesi	Bolaang Mengondow	782361.51	124042.95	44071	79971.95
7102	North Sulawesi	Minahasa	451686.25	200169.44	21994	178175.44
7103	North Sulawesi	Kepulauan Sangihe Talaud	92188.71	12318.56	302	12016.56
7104	North Sulawesi	Kepulauan Talaud	105007.05	11325.40	2787	8538.40
7201	Central Sulawesi	Banggai Kepulauan	316194.64	67697.12	4850	62847.12
7202	Central Sulawesi	Banggai	909612.95	114428.56	24672	89756.56
7203	Central Sulawesi	Morowali	1306925.84	102924.58	34662	68262.58
7204	Central Sulawesi	Poso	1192920.97	125928.58	37918	88010.58

District Code	Province	District	District area (ha)	"Kyotoland" (ha)	Ricefield (ha)	Eligible land (ha)*
7205	Central Sulawesi	Donggala	936916.68	113760.18	72253	41507.18
7206	Central Sulawesi	Toli-Toli	361970.94	45347.61	19148	26199.61
7207	Central Sulawesi	Buol	401081.13	41613.63	9233	32380.63
7208	Central Sulawesi	Parigi Moutong	628871.45	113778.63	350	113428.63
7301	South Sulawesi	Selayar	121445.57	21236.39	2420	18816.39
7302	South Sulawesi	Bulukumba	114787.00	76993.03	24595	52398.03
7303	South Sulawesi	Bantaeng	39130.42	27228.15	6888	20340.15
7304	South Sulawesi	Jeneponto	67073.50	46993.52	19082	27911.52
7305	South Sulawesi	Takalar	63882.50	43147.08	16610	26537.08
7306	South Sulawesi	Gowa	175826.86	104139.23	50605	53534.23
7307	South Sulawesi	Sinjai	85161.17	62604.13	13622	48982.13
7308	South Sulawesi	Maros	160650.80	71310.04	30257	41053.04
7309	South Sulawesi	Pangkajene Kepulauan	96301.76	37848.89	18591	19257.89
7310	South Sulawesi	Barru	118038.53	36650.92	13302	23348.92
7311	South Sulawesi	Bone	454959.76	320425.22	111992	208433.22
7312	South Sulawesi	Soppeng	136237.24	72378.22	25035	47343.22
7313	South Sulawesi	Wajo	247660.72	130736.35	89830	40906.35
7314	South Sulawesi	Sidenreng Rappang	193180.38	92225.61	45425	46800.61
7315	South Sulawesi	Pinrang	190039.08	77143.22	45898	31245.22
7316	South Sulawesi	Enrekang	180852.48	64975.08	8407	56568.08
7317	South Sulawesi	Luwu	312644.37	90908.84	41787	49121.84
7318	South Sulawesi	Tana Toraja	341646.47	63084.00	31610	31474.00
7319	South Sulawesi	Polewali Mamasa	199879.16	56487.72	29893	26594.72
7320	South Sulawesi	Majene	102020.79	15835.01	1501	14334.01
7321	South Sulawesi	Mamuju	1049566.31	43264.50	31541	11723.50
7322	South Sulawesi	Luwu Utara	1490796.59	145271.39	101036	44235.39
7323	South Sulawesi	Mamasa	273979.94	26092.02		26092.02
7401	Southeast Sulawesi	Buton	693722.57	196655.42	17276	179379.42
7402	Southeast Sulawesi	Muna	444887.83	134049.92	3529	130520.92
7403	Southeast Sulawesi	Kendari	1609999.56	303242.81	73841	229401.81
7404	Southeast Sulawesi	Kolaka	927909.94	62128.04	31582	30546.04
7501	Gorontalo	Boalemo	638481.28	71754.36	13215	58539.36
7502	Gorontalo	Gorontalo	579720.74	166919.23	21560	145359.23
8101	Maluku	Maluku Tenggara Barat	944052.12	106567.80	0	106567.80
8102	Maluku	Maluku Tenggara	1027840.28	77710.63	0	77710.63
8103	Maluku	Maluku Tengah	2033066.75	80094.63	27011	53083.63
8104	Maluku	Buru	891900.93	117775.97	23915	93860.97
8171	Maluku	Ambon	30833.39	1983.91	0	1983.91
8201	North Maluku	Maluku Utara	2152622.03	57580.94	2100	55480.94
8202	North Maluku	Halmahera Tengah	1096252.73	13870.83	5523	8347.83
9101	Papua	Merauke	5174572.66	1876219.09	n.a.	1876219.09
9102	Papua	Jayawijaya	1775305.39	232955.92	n.a.	232955.92
9104	Papua	Nabire	1902478.81	28591.16	n.a.	28591.16
9106	Papua	Puncak Jaya	1456299.76	124858.62	n.a.	124858.62
9107	Papua	Fak-Fak	1187456.74	72189.21	n.a.	72189.21
9108	Papua	Mimika	2449449.30	57445.98	n.a.	57445.98
9110	Papua	Manokwari	1537108.74	61038.34	n.a.	61038.34
9112	Papua	Biak Numfor	346336.46	11160.27	n.a.	11160.27
9171	Papua	Jayapura	1430215.90	47002.37	n.a.	47002.37
9405	Papua	Paniai	1244760.99	59951.99	n.a.	59951.99
9413	Papua	Boven Digoel	2876588.58	148443.44	n.a.	148443.44
9414	Papua	Mappi	2270697.97	800647.02	n.a.	800647.02
9415	Papua	Asmat	3681256.78	458835.84	n.a.	458835.84
9416	Papua	Yahukimo	1821982.02	65244.05	n.a.	65244.05

District Code	Province	District	District area (ha)	"Kyotoland" (ha)	Ricefield (ha)	Eligible land (ha)*
9417	Papua	Pegunungan Bintang	1911412.45	26168.14	n.a.	26168.14
9418	Papua	Tolikara	643303.26	57767.53	n.a.	57767.53
9419	Papua	Sarmi	2923724.29	109305.99	n.a.	109305.99
9420	Papua	Keerom	1212944.47	39490.24	n.a.	39490.24
9421	Papua	Kaimana	1767661.90	7007.16	n.a.	7007.16
9422	Papua	Sorong	1412621.57	23326.80	n.a.	23326.80
9424	Papua	Teluk Bintuni	2254368.37	24387.57	n.a.	24387.57
9425	Papua	Teluk Wondama	443712.49	6640.21	n.a.	6640.21
9426	Papua	Waropen	3137820.95	84543.87	n.a.	84543.87

*) Note: Negative figures indicate data discrepancies in the rice field areas (taken from the District Statistics Office).
They may have used harvest area which can be doubled or triplet depending on the number of harvest per year

Appendix 2. Population density and Human Development index by district

District Code	Province	District	Population density (persons/km²)	Population density class	HDI 2002	HDI class
1101	Nanggroe Aceh Darussalam	Simeulue	36.87	2	62	2
1102	Nanggroe Aceh Darussalam	Aceh Singkil	47.44	2	62	2
1103	Nanggroe Aceh Darussalam	Aceh Selatan	41.84	2	64	2
1104	Nanggroe Aceh Darussalam	Aceh Tenggara	34.64	2	67	3
1105	Nanggroe Aceh Darussalam	Aceh Timur	42.67	2	67	3
1106	Nanggroe Aceh Darussalam	Aceh Tengah	38.03	2	67	3
1107	Nanggroe Aceh Darussalam	Aceh Barat	64.02	2	66	2
1108	Nanggroe Aceh Darussalam	Aceh Besar	93.18	2	67	3
1109	Nanggroe Aceh Darussalam	Pidie	109.33	3	68	3
1110	Nanggroe Aceh Darussalam	Bireuen	183.28	3	71	3
1111	Nanggroe Aceh Darussalam	Aceh Utara	146.50	3	66	2
1112	Nanggroe Aceh Darussalam	Aceh Barat Daya	59.86	2	67	3
1113	Nanggroe Aceh Darussalam	Gayo Lues	13.47	2	67	3
1114	Nanggroe Aceh Darussalam	Aceh Tamiang	97.04	2	67	3
1115	Nanggroe Aceh Darussalam	Nagan Raya	39.33	2	66	2
1116	Nanggroe Aceh Darussalam	Aceh Jaya	21.61	2	67	3
1201	North Sumatra	Labuhan Batu	32.21	2	62	2
1202	North Sumatra	Mandailing Natal	52.87	2	64	2
1203	North Sumatra	Tapanuli Selatan	46.95	2	68	3
1204	North Sumatra	Tapanuli Tengah	102.69	3	66	2
1205	North Sumatra	Tapanuli Utara	39.64	2	67	3
1206	North Sumatra	Toba Samosir	69.72	2	70	3
1208	North Sumatra	Asahan	193.31	3	67	3
1209	North Sumatra	Simalungun	164.07	3	68	3
1210	North Sumatra	Dairi	52.02	2	67	3
1211	North Sumatra	Karo	126.96	3	71	3
1212	North Sumatra	Deli Serdang	404.81	4	68	3
1213	North Sumatra	Langkat	135.99	3	68	3
1301	West Sumatra	Kepulauan Mentawai	10.17	2	64	2
1302	West Sumatra	Pesisir Selatan	64.23	2	66	2
1303	West Sumatra	Solok	61.72	2	64	2
1304	West Sumatra	Sawahlunto/Sijunjung	53.71	2	62	2
1305	West Sumatra	Tanah Datar	224.77	3	68	3
1306	West Sumatra	Padang Pariaman	213.50	3	66	2
1307	West Sumatra	Agam	172.60	3	68	3
1308	West Sumatra	Lima Puluh Koto	103.34	3	67	3
1309	West Sumatra	Pasaman	64.54	2	64	2
1401	Riau	Kuantan Singingi	43.61	2	67	3
1402	Riau	Indragiri Hulu	33.71	2	66	2

District Code	Province	District	Population density (persons/km²)	Population density class	HDI 2002	HDI class
1403	Riau	Indragiri Hilir	47.89	2	68	3
1404	Riau	Pelalawan	14.83	2	66	2
1405	Riau	Siak	31.65	2	71	3
1406	Riau	Kampar	46.40	2	68	3
1407	Riau	Rokan Hulu	39.66	2	64	2
1408	Riau	Bengkalis	50.74	2	69	3
1409	Riau	Rokan Hilir	41.14	2	66	2
1410	Riau	Kepulauan Riau	44.82	2	67	3
1411	Riau	Karimun	186.31	3	69	3
1412	Riau	Natuna	30.28	2	65	2
1501	Jambi	Kerinci	75.41	2	68	3
1502	Jambi	Merangin	36.61	2	66	2
1503	Jambi	Sarolangun	26.94	2	65	2
1504	Jambi	Batanghari	33.35	2	67	3
1505	Jambi	Muara Jambi	54.18	2	67	3
1506	Jambi	Tanjung Jabung Timur	38.93	2	65	2
1507	Jambi	Tanjung Jabung Barat	38.31	2	68	3
1508	Jambi	Tebo	34.43	2	65	2
1509	Jambi	Bungo	47.96	2	64	2
1601	South Sumatra	Ogan Komering Ulu	100.67	3	67	3
1602	South Sumatra	Ogan Komering Ilir	47.88	2	63	2
1603	South Sumatra	Muara Enim	73.30	2	64	2
1604	South Sumatra	Lahat	74.96	2	65	2
1605	South Sumatra	Musi Rawas	36.06	2	62	2
1606	South Sumatra	Musi Banyu Asin	27.87	2	65	2
1607	South Sumatra	Banyu Asin	54.79	2	65	2
1701	Bengkulu	Bengkulu Selatan	17.39	2	65	2
1702	Bengkulu	Rejang Lebong	105.66	3	64	2
1703	Bengkulu	Bengkulu Utara	30.59	2	64	2
1801	Lampung	Lampung Barat	72.46	2	63	2
1802	Lampung	Tanggamus	214.67	3	66	2
1803	Lampung	Lampung Selatan	259.53	3	64	2
1804	Lampung	Lampung Timur	309.40	4	66	2
1805	Lampung	Lampung Tengah	240.48	3	67	3
1806	Lampung	Lampung Utara	227.66	3	66	2
1807	Lampung	Way Kanan	89.64	2	65	2
1808	Lampung	Tulang Bawang	101.33	3	64	2
1901	Kepulauan Bangka - Belitung	Bangka	68.87	2	65	2
1902	Kepulauan Bangka - Belitung	Belitung	55.03	2	67	3
1903	Kepulauan Bangka - Belitung	Bangka Barat	44.88	2	65	2
1904	Kepulauan Bangka - Belitung	Bangka Tengah	60.44	2	65	2
1905	Kepulauan Bangka - Belitung	Bangka Selatan	37.43	2	65	2
1906	Kepulauan Bangka - Belitung	Belitung Timur	41.36	2	67	3
3201	West Java	Bogor	258.47	3	66	2
3202	West Java	Sukabumi	506.11	4	64	2
3203	West Java	Cianjur	646.71	4	65	2
3204	West Java	Bandung	709.36	4	69	3
3205	West Java	Garut	693.06	4	63	2
3206	West Java	Tasikmalaya	564.16	4	67	3

District Code	Province	District	Population density (persons/km²)	Population density class	HDI 2002	HDI class
3207	West Java	Ciamis	540.52	4	65	2
3208	West Java	Kuningan	830.12	4	65	2
3209	West Java	Cirebon	1899.14	4	62	2
3210	West Java	Majalengka	859.56	4	64	2
3211	West Java	Sumedang	629.64	4	68	3
3212	West Java	Indramayu	787.89	4	61	2
3213	West Java	Subang	619.07	4	63	2
3214	West Java	Purwakarta	764.32	4	66	2
3215	West Java	Karawang	948.47	4	63	2
3216	West Java	Bekasi	1433.19	4	67	3
3301	Central Java	Cilacap	710.96	4	65	2
3302	Central Java	Banyumas	1051.30	4	67	3
3303	Central Java	Purbalingga	1024.53	4	65	2
3304	Central Java	Banjarnegara	760.46	4	64	2
3305	Central Java	Kebumen	888.49	4	66	2
3306	Central Java	Purworejo	648.06	4	68	3
3307	Central Java	Wonosobo	755.14	4	65	2
3308	Central Java	Magelang	104.43	3	67	3
3309	Central Java	Boyolali	836.49	4	66	2
3310	Central Java	Klaten	1664.04	4	68	3
3311	Central Java	Sukoharjo	1566.39	4	68	3
3312	Central Java	Wonogiri	521.87	4	67	3
3313	Central Java	Karanganyar	991.15	4	69	3
3314	Central Java	Sragen	876.06	4	65	2
3315	Central Java	Grobogan/Purwodadi	649.84	4	66	2
3316	Central Java	Blora	421.78	4	65	2
3317	Central Java	Rembang	539.75	4	66	2
3318	Central Java	Pati	743.14	4	69	3
3319	Central Java	Kudus	1728.25	4	67	3
3320	Central Java	Jepara	960.33	4	67	3
3321	Central Java	Demak	1035.94	4	66	2
3322	Central Java	Semarang	1350.52	4	70	3
3323	Central Java	Temanggung	779.09	4	70	3
3324	Central Java	Kendal	859.97	4	66	2
3325	Central Java	Batang	923.24	4	66	2
3326	Central Java	Pekalongan	300.28	4	64	2
3327	Central Java	Pemalang	1157.62	4	62	2
3328	Central Java	Tegal	1426.21	4	63	2
3329	Central Java	Brebes	1002.22	4	61	2
3401	DI Yogyakarta	Kulon Progo	614.55	4	69	3
3402	DI Yogyakarta	Bantul	1657.00	4	68	3
3403	DI Yogyakarta	Gunung Kidul	464.40	4	67	3
3404	DI Yogyakarta	Sleman	1635.68	4	73	3
3501	East Java	Pacitan	377.16	4	66	2
3502	East Java	Ponorogo	599.37	4	63	2
3503	East Java	Trenggalek	532.18	4	68	3
3504	East Java	Tulungagung	824.74	4	68	3
3505	East Java	Blitar	635.65	4	67	3
3506	East Java	Kediri	162.18	3	66	2
3507	East Java	Malang	661.89	4	65	2
3508	East Java	Lumajang	552.27	4	61	2
3509	East Java	Jember	663.86	4	58	2
3510	East Java	Banyuwangi	434.50	4	63	2
3511	East Java	Bondowoso	455.64	4	54	2

District Code	Province	District	Population density (persons/km²)	Population density class	HDI 2002	HDI class
3512	East Java	Situbondo	382.48	4	56	2
3513	East Java	Probolinggo	598.84	4	57	2
3514	East Java	Pasuruan	117.86	3	62	2
3515	East Java	Sidoarjo	2438.50	4	72	3
3516	East Java	Mojokerto	111.91	3	68	3
3517	East Java	Jombang	1068.21	4	66	2
3518	East Java	Nganjuk	797.44	4	65	2
3519	East Java	Madiun	150.87	3	64	2
3520	East Java	Magetan	855.87	4	67	3
3521	East Java	Ngawi	595.87	4	62	2
3522	East Java	Bojonegoro	513.27	4	61	2
3523	East Java	Tuban	540.57	4	61	2
3524	East Java	Lamongan	695.48	4	64	2
3525	East Java	Gresik	861.96	4	69	3
3526	East Java	Bangkalan	675.14	4	58	2
3527	East Java	Sampang	673.14	4	50	1
3528	East Java	Pamekasan	917.84	4	58	2
3529	East Java	Sumenep	477.65	4	57	2
3601	Banten	Pandeglang	373.09	4	63	2
3602	Banten	Lebak	334.94	4	62	2
3603	Banten	Tangerang	2674.18	4	68	3
3604	Banten	Serang	970.67	4	64	2
5101	Bali	Jembrana	292.52	3	69	3
5102	Bali	Tabanan	464.15	4	70	3
5103	Bali	Badung	1025.64	4	70	3
5104	Bali	Gianyar	1141.66	4	68	3
5105	Bali	Klungkung	530.80	4	65	2
5106	Bali	Bangli	397.22	4	67	3
5107	Bali	Karangasem	460.23	4	59	2
5108	Bali	Buleleng	456.73	4	64	2
5201	West Nusa Tenggara	Lombok Barat	411.13	4	55	2
5202	West Nusa Tenggara	Lombok Tengah	614.46	4	54	2
5203	West Nusa Tenggara	Lombok Timur	673.67	4	56	2
5204	West Nusa Tenggara	Sumbawa	54.82	2	61	2
5205	West Nusa Tenggara	Dompu	87.15	2	58	2
5206	West Nusa Tenggara	Bima	93.28	2	59	2
5301	East Nusa Tenggara	Sumba Barat	97.55	2	53	2
5302	East Nusa Tenggara	Sumba Timur	28.73	2	57	2
5303	East Nusa Tenggara	Kupang	59.66	2	57	2
5304	East Nusa Tenggara	Timor Tengah Selatan	98.50	2	58	2
5305	East Nusa Tenggara	Timor Tengah Utara	75.05	2	60	2
5306	East Nusa Tenggara	Belu	147.79	3	58	2
5307	East Nusa Tenggara	Alor	55.83	2	57	2
5308	East Nusa Tenggara	Lembata	75.87	2	62	2
5309	East Nusa Tenggara	Flores Timur	119.94	3	63	2
5310	East Nusa Tenggara	Sikka	153.06	3	58	2
5311	East Nusa Tenggara	Ende	105.94	3	61	2
5312	East Nusa Tenggara	Ngada	78.96	2	64	2
5313	East Nusa Tenggara	Manggarai	68.70	2	60	2
5314	East Nusa Tenggara	Rote Ndao	78.09	2		1
6101	West Kalimantan	Sambas	79.07	2	59	2
6102	West Kalimantan	Bengkayang	34.66	2	63	2
6103	West Kalimantan	Landak	35.11	2	62	2
6104	West Kalimantan	Pontianak	62.77	2	64	2

District Code	Province	District	Population density (persons/km²)	Population density class	HDI 2002	HDI class
6105	West Kalimantan	Sanggau	28.02	2	62	2
6106	West Kalimantan	Ketapang	13.09	2	64	2
6107	West Kalimantan	Sintang	14.56	2	62	2
6108	West Kalimantan	Kapuas Hulu	6.31	1	63	2
6201	Central Kalimantan	Kotawaringin Barat	16.48	2	69	3
6202	Central Kalimantan	Kotawaringin Timur	17.29	2	68	3
6203	Central Kalimantan	Kapuas	21.83	2	69	3
6204	Central Kalimantan	Barito Selatan	25.80	2	68	3
6205	Central Kalimantan	Barito Utara	9.50	1	70	3
6206	Central Kalimantan	Sukamara	8.63	1	69	3
6207	Central Kalimantan	Lamandau	9.76	1	69	3
6208	Central Kalimantan	Seruyan	6.28	1	68	3
6209	Central Kalimantan	Katingan	6.00	1	68	3
6210	Central Kalimantan	Pulang Pisau	9.71	1	69	3
6211	Central Kalimantan	Gunung Mas	9.56	1	69	3
6212	Central Kalimantan	Barito Timur	19.59	2	68	3
6213	Central Kalimantan	Murung Raya	3.42	1	69	3
6301	South Kalimantan	Tanah Laut	63.88	2	66	2
6302	South Kalimantan	Kota Baru	17.67	2	65	2
6303	South Kalimantan	Banjar	33.63	2	64	2
6304	South Kalimantan	Barito Kuala	111.81	3	61	2
6305	South Kalimantan	Tapin	66.62	2	67	3
6306	South Kalimantan	Hulu Sungai Selatan	120.70	3	65	2
6307	South Kalimantan	Hulu Sungai Tengah	194.65	3	65	2
6308	South Kalimantan	Hulu Sungai Utara	70.03	2	62	2
6309	South Kalimantan	Tabalong	50.16	2	63	2
6401	East Kalimantan	Pasir	15.65	2	68	3
6402	East Kalimantan	Kutai Barat	4.18	1	68	3
6403	East Kalimantan	Kutai Kertanegara	18.36	2	68	3
6404	East Kalimantan	Kutai Timur	5.78	1	66	2
6405	East Kalimantan	Berau	6.30	1	68	3
6406	East Kalimantan	Malinau	1.21	1	64	2
6407	East Kalimantan	Bulongan	5.99	1	70	3
6408	East Kalimantan	Nunukan	6.57	1	68	3
6409	East Kalimantan	Penajam Paser Utara	34.73	2	68	3
7101	North Sulawesi	Bolaang Mengondow	58.51	2	69	3
7102	North Sulawesi	Minahasa	101.39	3	72	3
7103	North Sulawesi	Kepulauan Sangihe Talaud	208.29	3	70	3
7104	North Sulawesi	Kepulauan Talaud	73.97	2		1
7201	Central Sulawesi	Banggai Kepulauan	47.04	2	61	2
7202	Central Sulawesi	Banggai	30.94	2	66	2
7203	Central Sulawesi	Morowali	12.45	2	65	2
7204	Central Sulawesi	Poso	22.66	2	64	2
7205	Central Sulawesi	Donggala	45.91	2	62	2
7206	Central Sulawesi	Toli-Toli	52.30	2	64	2
7207	Central Sulawesi	Buol	26.79	2	63	2
7208	Central Sulawesi	Parigi Moutong	54.25	2		1
7301	South Sulawesi	Selayar	90.17	2	64	2
7302	South Sulawesi	Bulukumba	323.38	4	64	2
7303	South Sulawesi	Bantaeng	421.30	4	63	2
7304	South Sulawesi	Jeneponto	481.76	4	58	2
7305	South Sulawesi	Takalar	376.56	4	62	2
7306	South Sulawesi	Gowa	313.91	4	64	2

District Code	Province	District	Population density (persons/km²)	Population density class	HDI 2002	HDI class
7307	South Sulawesi	Sinjai	254.10	3	64	2
7308	South Sulawesi	Maros	178.05	3	64	2
7309	South Sulawesi	Pangkajene Kepulauan	297.03	3	64	2
7310	South Sulawesi	Barru	132.87	3	66	2
7311	South Sulawesi	Bone	149.45	3	63	2
7312	South Sulawesi	Soppeng	164.64	3	68	3
7313	South Sulawesi	Wajo	146.45	3	63	2
7314	South Sulawesi	Sidenreng Rappang	127.40	3	66	2
7315	South Sulawesi	Pinrang	174.46	3	66	2
7316	South Sulawesi	Enrekang	97.21	2	67	3
7317	South Sulawesi	Luwu	96.98	2	68	3
7318	South Sulawesi	Tana Toraja	121.95	3	67	3
7319	South Sulawesi	Polewali Mamasa	175.78	3	60	2
7320	South Sulawesi	Majene	126.21	3	64	2
7321	South Sulawesi	Mamuju	23.76	2	63	2
7322	South Sulawesi	Luwu Utara	18.08	2	68	3
7323	South Sulawesi	Mamasa	43.21	2		1
7401	Southeast Sulawesi	Buton	64.09	2	63	2
7402	Southeast Sulawesi	Muna	64.35	2	61	2
7403	Southeast Sulawesi	Kendari	15.39	2	65	2
7404	Southeast Sulawesi	Kolaka	37.34	2	65	2
7501	Gorontalo	Boalemo	16.27	2	64	2
7502	Gorontalo	Gorontalo	70.23	2	65	2
8101	Maluku	Maluku Tenggara Barat	14.89	2		1
8102	Maluku	Maluku Tenggara	18.17	2	63	2
8103	Maluku	Maluku Tengah	27.05	2	67	3
8104	Maluku	Buru	13.18	2	65	2
8171	Maluku	Ambon	723.46	4	63	2
8201	North Maluku	Maluku Utara	4.37	1	64	2
8202	North Maluku	Halmahera Tengah	2.89	1	65	2
9101	Papua	Merauke	3.26	1	58	2
9102	Papua	Jayawijaya	10.49	2	47	1
9104	Papua	Nabire	7.99	1	54	2
9106	Papua	Puncak Jaya	4.48	1	66	2
9107	Papua	Fak-Fak	4.86	1	64	2
9108	Papua	Mimika	4.74	1	65	2
9110	Papua	Manokwari	9.72	1	58	2
9112	Papua	Biak Numfor	35.72	2	65	2
9171	Papua	Jayapura	6.59	1	71	3
9405	Papua	Paniai	8.11	1		1
9413	Papua	Boven Digoel	1.32	1		1
9414	Papua	Mappi	2.98	1		1
9415	Papua	Asmat	1.70	1		1
9416	Papua	Yahukimo	6.06	1		1
9417	Papua	Pegunungan Bintang	2.92	1		1
9418	Papua	Tolikara	6.25	1		1
9419	Papua	Sarmi	1.24	1		1
9420	Papua	Keerom	2.86	1		1
9421	Papua	Kaimana	2.04	1		1
9422	Papua	Sorong	4.05	1		1
9424	Papua	Teluk Bintuni	2.05	1		1
9425	Papua	Teluk Wondama	4.49	1		1
9426	Papua	Waropen	0.68	1		1

Appendix 3. Fire risk in CDM eligible land by district

District Code	Province	District	District area (ha)	Fire Risk Index	Fire risk class
1101	Nanggroe Aceh Darussalam	Simeulue	207136.80	0.00740	Few Fires
1102	Nanggroe Aceh Darussalam	Aceh Singkil	364225.11	0.05084	Intermediate
1103	Nanggroe Aceh Darussalam	Aceh Selatan	398194.90	0.00494	Few Fires
1104	Nanggroe Aceh Darussalam	Aceh Tenggara	483685.58	0.01165	Few Fires
1105	Nanggroe Aceh Darussalam	Aceh Timur	592734.81	0.02260	Few Fires
1106	Nanggroe Aceh Darussalam	Aceh Tengah	728881.53	0.02427	Few Fires
1107	Nanggroe Aceh Darussalam	Aceh Barat	353416.14	0.01950	Few Fires
1108	Nanggroe Aceh Darussalam	Aceh Besar	322745.27	0.06730	Intermediate
1109	Nanggroe Aceh Darussalam	Pidie	471800.71	0.02013	Few Fires
1110	Nanggroe Aceh Darussalam	Bireuen	190778.76	0.05647	Intermediate
1111	Nanggroe Aceh Darussalam	Aceh Utara	269572.63	0.07750	Intermediate
1112	Nanggroe Aceh Darussalam	Aceh Barat Daya	255660.67	0.00297	Few Fires
1113	Nanggroe Aceh Darussalam	Gayo Lues	619822.88	0.01279	Few Fires
1114	Nanggroe Aceh Darussalam	Aceh Tamiang	245743.08	0.03189	Few Fires
1115	Nanggroe Aceh Darussalam	Nagan Raya	386546.21	0.03100	Few Fires
1116	Nanggroe Aceh Darussalam	Aceh Jaya	431549.51	0.00581	Few Fires
1201	North Sumatra	Labuhan Batu	1640953.25	0.16417	Intermediate
1202	North Sumatra	Mandailing Natal	696569.90	0.03119	Few Fires
1203	North Sumatra	Tapanuli Selatan	1307446.14	0.11537	Intermediate
1204	North Sumatra	Tapanuli Tengah	264323.81	0.03609	Few Fires
1205	North Sumatra	Tapanuli Utara	643672.70	0.02557	Few Fires
1206	North Sumatra	Toba Samosir	408939.22	0.02069	Few Fires
1208	North Sumatra	Asahan	510575.08	0.08149	Intermediate
1209	North Sumatra	Simalungun	491690.76	0.07369	Intermediate
1210	North Sumatra	Dairi	490829.72	0.00927	Few Fires
1211	North Sumatra	Karo	241020.74	0.02173	Few Fires
1212	North Sumatra	Deli Serdang	505664.32	0.05809	Intermediate
1213	North Sumatra	Langkat	690264.40	0.05420	Intermediate
1301	West Sumatra	Kepulauan Mentawai	653894.71	0.00059	Few Fires
1302	West Sumatra	Pesisir Selatan	646016.65	0.04552	Few Fires
1303	West Sumatra	Solok	737173.41	0.01038	Few Fires
1304	West Sumatra	Sawahlunto/Sijunjung	628094.15	0.02546	Few Fires
1305	West Sumatra	Tanah Datar	148490.41	0.00317	Few Fires
1306	West Sumatra	Padang Pariaman	172836.37	0.00539	Few Fires
1307	West Sumatra	Agam	246481.10	0.04982	Few Fires
1308	West Sumatra	Lima Puluh Koto	311903.76	0.02063	Few Fires
1309	West Sumatra	Pasaman	848442.67	0.04854	Few Fires
1401	Riau	Kuantan Singingi	551732.96	0.19257	Intermediate

District Code	Province	District	District area (ha)	Fire Risk Index	Fire risk class
1402	Riau	Indragiri Hulu	838907.40	0.12862	Intermediate
1403	Riau	Indragiri Hilir	1307633.56	0.15438	Intermediate
1404	Riau	Pelalawan	1401268.48	0.10855	Intermediate
1405	Riau	Siak	863634.29	0.17732	Intermediate
1406	Riau	Kampar	1137858.96	0.30733	Risk of Fire
1407	Riau	Rokan Hulu	822439.39	0.28686	Risk of Fire
1408	Riau	Bengkalis	1246465.03	0.14916	Intermediate
1409	Riau	Rokan Hilir	1023553.67	0.29930	Risk of Fire
1410	Riau	Kepulauan Riau	429534.55	0.05318	Intermediate
1411	Riau	Karimun	97662.68	0.07112	Intermediate
1412	Riau	Natuna	283578.64	0.01532	Few Fires
1501	Jambi	Kerinci	400131.71	0.01068	Few Fires
1502	Jambi	Merangin	738899.17	0.05698	Intermediate
1503	Jambi	Sarolangun	710660.03	0.12222	Intermediate
1504	Jambi	Batanghari	615202.00	0.07827	Intermediate
1505	Jambi	Muara Jambi	499349.49	0.19296	Intermediate
1506	Jambi	Tanjung Jabung Timur	513253.38	0.17741	Intermediate
1507	Jambi	Tanjung Jabung Barat	576664.70	0.10978	Intermediate
1508	Jambi	Tebo	665371.30	0.08469	Intermediate
1509	Jambi	Bungo	494431.13	0.11765	Intermediate
1601	South Sumatra	Ogan Komering Ulu	1086604.10	0.23090	Risk of Fire
1602	South Sumatra	Ogan Komering Ilir	2048356.30	0.47624	Risk of Fire
1603	South Sumatra	Muara Enim	829422.74	0.42587	Risk of Fire
1604	South Sumatra	Lahat	705651.78	0.12292	Intermediate
1605	South Sumatra	Musi Rawas	1277002.45	0.14038	Intermediate
1606	South Sumatra	Musi Banyu Asin	1585607.76	0.28009	Risk of Fire
1607	South Sumatra	Banyu Asin	1251936.69	0.28789	Risk of Fire
1701	Bengkulu	Bengkulu Selatan	768084.06	0.02533	Few Fires
1702	Bengkulu	Rejang Lebong	408527.18	0.01491	Few Fires
1703	Bengkulu	Bengkulu Utara	1041263.40	0.06685	Intermediate
1801	Lampung	Lampung Barat	517041.45	0.01410	Few Fires
1802	Lampung	Tanggamus	382668.92	0.01873	Few Fires
1803	Lampung	Lampung Selatan	455843.85	0.04795	Few Fires
1804	Lampung	Lampung Timur	291058.26	0.07094	Intermediate
1805	Lampung	Lampung Tengah	456640.39	0.28230	Risk of Fire
1806	Lampung	Lampung Utara	243742.53	0.31963	Risk of Fire
1807	Lampung	Way Kanan	410099.67	0.37076	Risk of Fire
1808	Lampung	Tulang Bawang	703463.38	0.60810	Risk of Fire
1901	Kepulauan Bangka - Belitung	Bangka	325113.57	0.32501	Risk of Fire
1902	Kepulauan Bangka - Belitung	Belitung	237577.60	0.21070	Risk of Fire
1903	Kepulauan Bangka - Belitung	Bangka Barat	301859.58	0.27565	Risk of Fire
1904	Kepulauan Bangka - Belitung	Bangka Tengah	206605.34	0.21481	Risk of Fire
1905	Kepulauan Bangka - Belitung	Bangka Selatan	380391.77	0.36723	Risk of Fire
1906	Kepulauan Bangka - Belitung	Belitung Timur	206839.20	0.28765	Risk of Fire
3201	West Java	Bogor	306501.21	0.02854	Few Fires
3202	West Java	Sukabumi	428466.81	0.10534	Intermediate
3203	West Java	Cianjur	374097.10	0.04368	Few Fires
3204	West Java	Bandung	314423.57	0.04306	Few Fires
3205	West Java	Garut	315697.79	0.02315	Few Fires

District Code	Province	District	District area (ha)	Fire Risk Index	Fire risk class
3206	West Java	Tasikmalaya	281499.30	0.02431	Few Fires
3207	West Java	Ciamis	277999.65	0.02700	Few Fires
3208	West Java	Kuningan	124603.30	0.03616	Few Fires
3209	West Java	Cirebon	107320.96	0.27399	Risk of Fire
3210	West Java	Majalengka	134191.84	0.17779	Intermediate
3211	West Java	Sumedang	161175.81	0.09369	Intermediate
3212	West Java	Indramayu	209791.81	0.27442	Risk of Fire
3213	West Java	Subang	221540.39	0.33725	Risk of Fire
3214	West Java	Purwakarta	97552.26	0.12823	Intermediate
3215	West Java	Karawang	198463.08	0.17011	Intermediate
3216	West Java	Bekasi	129682.83	0.14331	Intermediate
3301	Central Java	Cilacap	230901.89	0.07359	Intermediate
3302	Central Java	Banyumas	142813.07	0.06857	Intermediate
3303	Central Java	Purbalingga	82654.08	0.01172	Few Fires
3304	Central Java	Banjarnegara	116285.67	0.02169	Few Fires
3305	Central Java	Kebumen	134370.93	0.11462	Intermediate
3306	Central Java	Purworejo	109490.47	0.04775	Few Fires
3307	Central Java	Wonosobo	100524.85	0.00461	Few Fires
3308	Central Java	Magelang	114516.40	0.01112	Few Fires
3309	Central Java	Boyolali	110684.38	0.04099	Few Fires
3310	Central Java	Klaten	67329.36	0.03068	Few Fires
3311	Central Java	Sukoharjo	51552.72	0.10181	Intermediate
3312	Central Java	Wonogiri	192492.99	0.07688	Intermediate
3313	Central Java	Karanganyar	81928.14	0.05310	Intermediate
3314	Central Java	Sragen	98172.85	0.13837	Intermediate
3315	Central Java	Grobogan/Purwodadi	199907.44	0.13153	Intermediate
3316	Central Java	Blora	196019.25	0.19347	Intermediate
3317	Central Java	Rembang	106793.03	0.11953	Intermediate
3318	Central Java	Pati	159835.08	0.22397	Risk of Fire
3319	Central Java	Kudus	42716.52	0.14534	Intermediate
3320	Central Java	Jepara	107735.78	0.08578	Intermediate
3321	Central Java	Demak	98940.80	0.11888	Intermediate
3322	Central Java	Semarang	102834.72	0.02858	Few Fires
3323	Central Java	Temanggung	89169.68	0.00154	Few Fires
3324	Central Java	Kendal	102536.39	0.10171	Intermediate
3325	Central Java	Batang	75002.98	0.06859	Intermediate
3326	Central Java	Pekalongan	98479.18	0.02466	Few Fires
3327	Central Java	Pemalang	113752.32	0.16355	Intermediate
3328	Central Java	Tegal	100231.03	0.16183	Intermediate
3329	Central Java	Brebes	175972.27	0.10049	Intermediate
3401	DI Yogyakarta	Kulon Progo	61078.55	0.01995	Few Fires
3402	DI Yogyakarta	Bantul	49215.51	0.00462	Few Fires
3403	DI Yogyakarta	Gunung Kidul	147688.46	0.03006	Few Fires
3404	DI Yogyakarta	Sleman	57489.25	0.02424	Few Fires
3501	East Java	Pacitan	142654.39	0.03761	Few Fires
3502	East Java	Ponorogo	145047.39	0.09711	Intermediate
3503	East Java	Trenggalek	125737.32	0.02080	Few Fires
3504	East Java	Tulungagung	116385.54	0.01817	Few Fires
3505	East Java	Blitar	174708.65	0.05547	Intermediate
3506	East Java	Kediri	155319.75	0.10961	Intermediate
3507	East Java	Malang	352940.15	0.02137	Few Fires
3508	East Java	Lumajang	180980.53	0.05123	Intermediate
3509	East Java	Jember	335953.15	0.02073	Few Fires
3510	East Java	Banyuwangi	354447.18	0.04311	Few Fires

District Code	Province	District	District area (ha)	Fire Risk Index	Fire risk class
3511	East Java	Bondowoso	155520.77	0.12939	Intermediate
3512	East Java	Situbondo	162309.65	0.25825	Risk of Fire
3513	East Java	Probolinggo	172799.82	0.09344	Intermediate
3514	East Java	Pasuruan	149398.52	0.15943	Intermediate
3515	East Java	Sidoarjo	68652.83	0.25266	Risk of Fire
3516	East Java	Mojokerto	100126.04	0.11069	Intermediate
3517	East Java	Jombang	109693.59	0.17156	Intermediate
3518	East Java	Nganjuk	128918.68	0.14777	Intermediate
3519	East Java	Madiun	111557.63	0.13322	Intermediate
3520	East Java	Magetan	72495.64	0.17128	Intermediate
3521	East Java	Ngawi	140951.81	0.19512	Intermediate
3522	East Java	Bojonegoro	236190.62	0.16171	Intermediate
3523	East Java	Tuban	199037.73	0.26089	Risk of Fire
3524	East Java	Lamongan	177649.76	0.21756	Risk of Fire
3525	East Java	Gresik	122664.93	0.11644	Intermediate
3526	East Java	Bangkalan	131131.14	0.07354	Intermediate
3527	East Java	Sampang	123754.20	0.07737	Intermediate
3528	East Java	Pamekasan	80533.92	0.03348	Few Fires
3529	East Java	Sumenep	215965.81	0.05083	Intermediate
3601	Banten	Pandeglang	289958.52	0.08778	Intermediate
3602	Banten	Lebak	334960.96	0.08344	Intermediate
3603	Banten	Tangerang	119173.30	0.08469	Intermediate
3604	Banten	Serang	183015.16	0.15455	Intermediate
5101	Bali	Jembrana	85823.87	0.01307	Few Fires
5102	Bali	Tabanan	86909.80	0.00000	Few Fires
5103	Bali	Badung	39293.99	0.00000	Few Fires
5104	Bali	Gianyar	36477.31	0.00000	Few Fires
5105	Bali	Klungkung	30972.19	0.00000	Few Fires
5106	Bali	Bangli	52583.45	0.00000	Few Fires
5107	Bali	Karangasem	86134.73	0.01756	Few Fires
5108	Bali	Buleleng	133563.10	0.03132	Few Fires
5201	West Nusa Tenggara	Lombok Barat	172380.29	0.01184	Few Fires
5202	West Nusa Tenggara	Lombok Tengah	126292.85	0.02158	Few Fires
5203	West Nusa Tenggara	Lombok Timur	150385.62	0.00000	Few Fires
5204	West Nusa Tenggara	Sumbawa	837565.77	0.00277	Few Fires
5205	West Nusa Tenggara	Dompu	218591.72	0.02646	Few Fires
5206	West Nusa Tenggara	Bima	431425.32	0.01904	Few Fires
5301	East Nusa Tenggara	Sumba Barat	392908.24	0.00000	Few Fires
5302	East Nusa Tenggara	Sumba Timur	680117.12	0.00300	Few Fires
5303	East Nusa Tenggara	Kupang	551793.53	0.00000	Few Fires
5304	East Nusa Tenggara	Timor Tengah Selatan	401686.90	0.00000	Few Fires
5305	East Nusa Tenggara	Timor Tengah Utara	268107.32	0.00000	Few Fires
5306	East Nusa Tenggara	Belu	226307.06	0.00000	Few Fires
5307	East Nusa Tenggara	Alor	296432.37	0.00090	Few Fires
5308	East Nusa Tenggara	Lembata	127451.08	0.00361	Few Fires
5309	East Nusa Tenggara	Flores Timur	178248.57	0.00123	Few Fires
5310	East Nusa Tenggara	Sikka	179408.99	0.00000	Few Fires
5311	East Nusa Tenggara	Ende	223173.15	0.00000	Few Fires
5312	East Nusa Tenggara	Ngada	300446.53	0.00258	Few Fires
5313	East Nusa Tenggara	Manggarai	690517.74	0.00053	Few Fires
5314	East Nusa Tenggara	Rote Ndao	129459.90	0.00000	Few Fires
6101	West Kalimantan	Sambas	597606.92	0.11005	Intermediate
6102	West Kalimantan	Bengkayang	556461.70	0.10724	Intermediate
6103	West Kalimantan	Landak	863235.80	0.40621	Risk of Fire

District Code	Province	District	District area (ha)	Fire Risk Index	Fire risk class
6104	West Kalimantan	Pontianak	1086192.77	0.13096	Intermediate
6105	West Kalimantan	Sanggau	1871739.99	0.51242	Risk of Fire
6106	West Kalimantan	Ketapang	3486219.35	0.26827	Risk of Fire
6107	West Kalimantan	Sintang	3266001.17	0.34711	Risk of Fire
6108	West Kalimantan	Kapuas Hulu	3096121.20	0.03509	Few Fires
6201	Central Kalimantan	Kotawaringin Barat	1133284.48	0.18094	Intermediate
6202	Central Kalimantan	Kotawaringin Timur	1620839.93	0.09985	Intermediate
6203	Central Kalimantan	Kapuas	1487330.68	0.15345	Intermediate
6204	Central Kalimantan	Barito Selatan	440520.79	0.07244	Intermediate
6205	Central Kalimantan	Barito Utara	1131246.74	0.03383	Few Fires
6206	Central Kalimantan	Sukamara	379524.15	0.37748	Risk of Fire
6207	Central Kalimantan	Lamandau	491652.36	0.06033	Intermediate
6208	Central Kalimantan	Seruyan	1442729.86	0.11137	Intermediate
6209	Central Kalimantan	Katingan	2079164.94	0.03271	Few Fires
6210	Central Kalimantan	Pulang Pisau	1168506.44	0.42309	Risk of Fire
6211	Central Kalimantan	Gunung Mas	859684.13	0.06356	Intermediate
6212	Central Kalimantan	Barito Timur	386628.67	0.24086	Risk of Fire
6213	Central Kalimantan	Murung Raya	2417461.28	0.01809	Few Fires
6301	South Kalimantan	Tanah Laut	385743.46	0.36956	Risk of Fire
6302	South Kalimantan	Kota Baru	1427631.57	0.11113	Intermediate
6303	South Kalimantan	Banjar	482190.86	0.26536	Risk of Fire
6304	South Kalimantan	Barito Kuala	233661.47	0.35020	Risk of Fire
6305	South Kalimantan	Tapin	216893.93	0.37698	Risk of Fire
6306	South Kalimantan	Hulu Sungai Selatan	165397.75	0.54555	Risk of Fire
6307	South Kalimantan	Hulu Sungai Tengah	118848.64	0.08083	Intermediate
6308	South Kalimantan	Hulu Sungai Utara	293569.96	0.22719	Risk of Fire
6309	South Kalimantan	Tabalong	361561.78	0.11134	Intermediate
6401	East Kalimantan	Pasir	1085759.13	0.09435	Intermediate
6402	East Kalimantan	Kutai Barat	3431876.14	0.06168	Intermediate
6403	East Kalimantan	Kutai Kertanegara	2617197.75	0.09978	Intermediate
6404	East Kalimantan	Kutai Timur	2835565.79	0.04551	Few Fires
6405	East Kalimantan	Berau	2113705.09	0.01281	Few Fires
6406	East Kalimantan	Malinau	3854502.72	0.00059	Few Fires
6407	East Kalimantan	Bulongan	1581043.95	0.00983	Few Fires
6408	East Kalimantan	Nunukan	1583268.28	0.00082	Few Fires
6409	East Kalimantan	Penajam Paser Utara	336955.44	0.06636	Intermediate
7101	North Sulawesi	Bolaang Mengondow	782361.51	0.00177	Few Fires
7102	North Sulawesi	Minahasa	451686.25	0.00816	Few Fires
7103	North Sulawesi	Kepulauan Sangihe Talaud	92188.71	0.00002	Few Fires
7104	North Sulawesi	Kepulauan Talaud	105007.05	0.00000	Few Fires
7201	Central Sulawesi	Banggai Kepulauan	316194.64	0.00774	Few Fires
7202	Central Sulawesi	Banggai	909612.95	0.00301	Few Fires
7203	Central Sulawesi	Morowali	1306925.84	0.01889	Few Fires
7204	Central Sulawesi	Poso	1192920.97	0.01318	Few Fires
7205	Central Sulawesi	Donggala	936916.68	0.00394	Few Fires
7206	Central Sulawesi	Toli-Toli	361970.94	0.00000	Few Fires
7207	Central Sulawesi	Buol	401081.13	0.00266	Few Fires
7208	Central Sulawesi	Parigi Moutong	628871.45	0.00622	Few Fires
7301	South Sulawesi	Selayar	121445.57	0.03052	Few Fires
7302	South Sulawesi	Bulukumba	114787.00	0.02266	Few Fires
7303	South Sulawesi	Bantaeng	39130.42	0.05534	Intermediate
7304	South Sulawesi	Jeneponto	67073.50	0.19883	Intermediate
7305	South Sulawesi	Takalar	63882.50	0.18438	Intermediate

| District Code	Province	District	District area (ha)	Fire Risk Index	Fire risk class
7306	South Sulawesi	Gowa	175826.86	0.08686	Intermediate
7307	South Sulawesi	Sinjai	85161.17	0.00365	Few Fires
7308	South Sulawesi	Maros	160650.80	0.06646	Intermediate
7309	South Sulawesi	Pangkajene Kepulauan	96301.76	0.01064	Few Fires
7310	South Sulawesi	Barru	118038.53	0.02074	Few Fires
7311	South Sulawesi	Bone	454959.76	0.09922	Intermediate
7312	South Sulawesi	Soppeng	136237.24	0.04042	Few Fires
7313	South Sulawesi	Wajo	247660.72	0.06559	Intermediate
7314	South Sulawesi	Sidenreng Rappang	193180.38	0.05336	Intermediate
7315	South Sulawesi	Pinrang	190039.08	0.01414	Few Fires
7316	South Sulawesi	Enrekang	180852.48	0.00800	Few Fires
7317	South Sulawesi	Luwu	312644.37	0.01208	Few Fires
7318	South Sulawesi	Tana Toraja	341646.47	0.02011	Few Fires
7319	South Sulawesi	Polewali Mamasa	199879.16	0.01140	Few Fires
7320	South Sulawesi	Majene	102020.79	0.01157	Few Fires
7321	South Sulawesi	Mamuju	1049566.31	0.00318	Few Fires
7322	South Sulawesi	Luwu Utara	1490796.59	0.00710	Few Fires
7323	South Sulawesi	Mamasa	273979.94	0.02029	Few Fires
7401	Southeast Sulawesi	Buton	693722.57	0.07860	Intermediate
7402	Southeast Sulawesi	Muna	444887.83	0.04136	Few Fires
7403	Southeast Sulawesi	Kendari	1609999.56	0.04192	Few Fires
7404	Southeast Sulawesi	Kolaka	927909.94	0.01145	Few Fires
7501	Gorontalo	Boalemo	638481.28	0.01025	Few Fires
7502	Gorontalo	Gorontalo	579720.74	0.01001	Few Fires
8101	Maluku	Maluku Tenggara Barat	944052.12	0.00000	Few Fires
8102	Maluku	Maluku Tenggara	1027840.28	0.00000	Few Fires
8103	Maluku	Maluku Tengah	2033066.75	0.00003	Few Fires
8104	Maluku	Buru	891900.93	0.01068	Few Fires
8171	Maluku	Ambon	30833.39	0.00000	Few Fires
8201	North Maluku	Maluku Utara	2152622.03	0.00008	Few Fires
8202	North Maluku	Halmahera Tengah	1096252.73	0.00007	Few Fires
9101	Papua	Merauke	5174572.66	0.00000	Few Fires
9102	Papua	Jayawijaya	1775305.39	0.00000	Few Fires
9104	Papua	Nabire	1902478.81	0.00000	Few Fires
9106	Papua	Puncak Jaya	1456299.76	0.00000	Few Fires
9107	Papua	Fak-Fak	1187456.74	0.00000	Few Fires
9108	Papua	Mimika	2449449.30	0.00000	Few Fires
9110	Papua	Manokwari	1537108.74	0.00000	Few Fires
9112	Papua	Biak Numfor	346336.46	0.00000	Few Fires
9171	Papua	Jayapura	1430215.90	0.00000	Few Fires
9405	Papua	Paniai	1244760.99	0.00000	Few Fires
9413	Papua	Boven Digoel	2876588.58	0.00000	Few Fires
9414	Papua	Mappi	2270697.97	0.00000	Few Fires
9415	Papua	Asmat	3681256.78	0.00000	Few Fires
9416	Papua	Yahukimo	1821982.02	0.00000	Few Fires
9417	Papua	Pegunungan Bintang	1911412.45	0.00000	Few Fires
9418	Papua	Tolikara	643303.26	0.00000	Few Fires
9419	Papua	Sarmi	2923724.29	0.00000	Few Fires
9420	Papua	Keerom	1212944.47	0.00000	Few Fires
9421	Papua	Kaimana	1767661.90	0.00000	Few Fires
9422	Papua	Sorong	1412621.57	0.00000	Few Fires
9424	Papua	Teluk Bintuni	2254368.37	0.00000	Few Fires
9425	Papua	Teluk Wondama	443712.49	0.00000	Few Fires
9426	Papua	Waropen	3137820.95	0.00000	Few Fires

Appendix 4. Land cover classification at 1 km nominal spatial resolution for Indonesia according to the IGBP legend based on imagery of the 1992–1993 period (Hadi and van Noordwijk 2005).
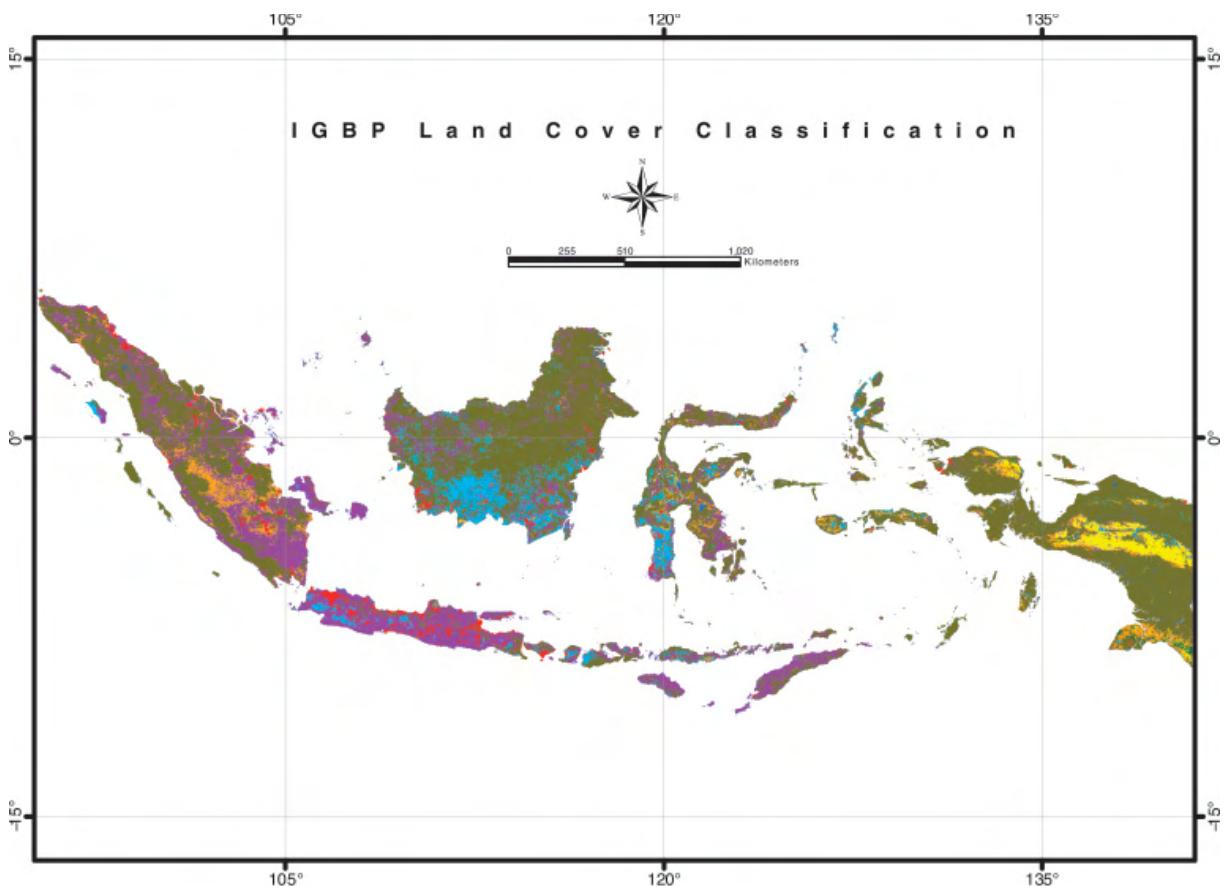
Appendix 5. Land cover classification for Indonesia's islands (excluding the seas) according to the IGBP legend (Source: Loveland *et al*. 1998)
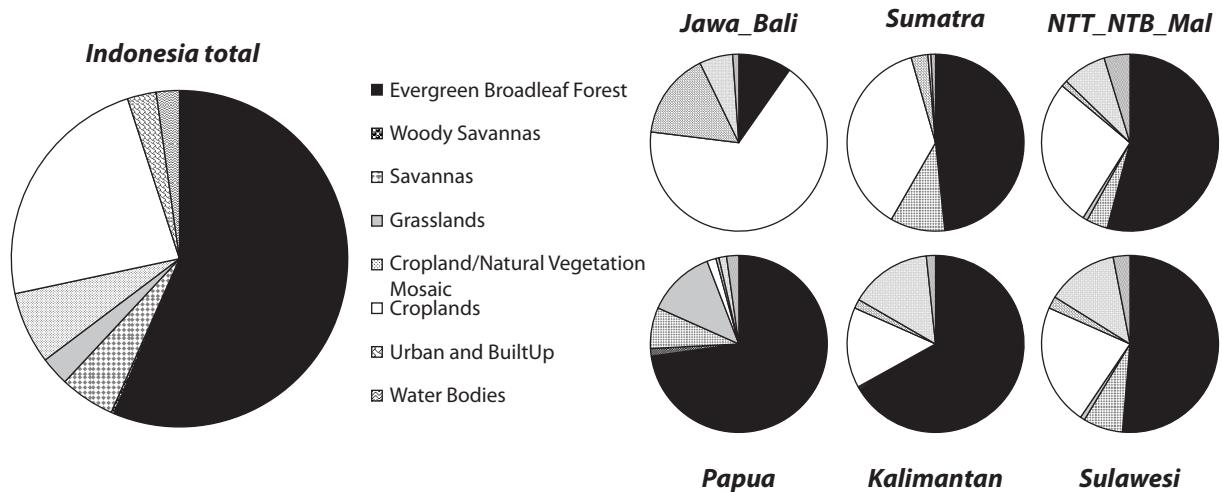
Appendix 6. Workbook for applying specified prioritisation criteria to a list of district level statistics of land cover, fire frequency, population density and Human Development Index

Before a Project Design Document (PDD) can be developed, the eligibility of lands on which the afforestation and reforestation (A/R) Clean Development Mechanism (CDM) project activities are to be established has to be secured. This report describes the development of the 'hard criteria', which were used to determine the area and location of such lands with respect to administration at District or *Kabupaten* level in Indonesia. The criteria follow the decision on modalities and procedures of the Conference of Parties (COP) to the United Nations Framework Convention on Climate Change (UNFCCC) in their ninth sessions (Decision 19/CP.9).

Further screening is suggested to prioritize project implementation on eligible lands by considering the socio-economic and biophysical constraints. The 'soft criteria', which consist of population density, human development index (HDI) and fire risk were introduced. This means districts with low population density, low HDI and low fire risk may be prioritized.

From the host countries' perspectives it is imperative that projects meet the sustainable development objectives stipulated in the dual objectives of the CDM. The site selection criteria is 'pro-poor' as expressed by the low HDI prioritization. It is recommended, however, that the preparedness of stakeholders in the prioritized districts be assessed. Likewise, the legal instruments and institutional arrangement should be able to support the implementation of the projects.

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