



REPUBLIC OF INDONESIA

NATIONAL ACTION PROGRAMME (NAP)

for **COMBATING LAND DEGRADATION IN INDONESIA (CLD)**

In relation to
UNITED NATIONS CONVENTION TO COMBAT DESERTIFICATION (UNCCD)



Jakarta
2002

PREFACE

The Convention to Combat Desertification/Land Degradation (CCD/CLD) is implemented through a set of action programmes. These programmes are the core of the Convention at the national level. National Action Programmes (NAP) addresses the underlying causes of land degradation and drought and identifies measures to prevent and rehabilitate it.

This NAP is considered as the focus of the actions, consolidation of projects and activities identified for an integrated solution in combating land degradation in Indonesia. In line with the scope of the convention focus of the programmes is directed to solve degradation of lands in the driest provinces in Indonesia namely East Nusa Tenggara (NTT), West Nusa Tenggara (NTB) and Central Sulawesi (Sulteng).

National Action Programme elaborates joint plan of relevant stakeholders at all levels of government organization (district, provincial, national, and regional), professional organization, community-based organizations, non government organizations as well as private business groups to combat land degradation and desertification through the development and implementation of sustainable land management measures.

The National Action Programme (NAP) for combating land degradation is a part of the National Development Programme (PROPENAS), and compatible with provincial and district development plans and strategies.

All stakeholders, from both the public and private sectors, should be committed to implement the measures mutually agreed upon listed in the NAP. Stakeholders should be willing to dedicate their efforts and resources, according to their respective capacities, for the successful implementation of the programme.

Jakarta, December 2002

Ministry of Forestry

The Minister

Muhammad Prakosa, PhD.

I. INTRODUCTION

The United Nations Convention to Combat Desertification (UN-CCD) entered into force on 26 December 1996. The Convention emphasizes the need to coordinate research efforts and action programs for combating desertification and promotes a new approach to managing dry-land ecosystems and to managing development aid flows.

The Government of the Republic of Indonesia has ratified the Convention by Presidential Decree No: 135/1998, dated 28 August 1998. By ratifying the Convention Indonesia will do her best to fulfill obligations as party of the convention including national reporting, preparation of National Action Plans or Programme and participate actively in convention activities at national, regional and international level.

Three programme areas of Chapter 12 of the Agenda 21 relevant to Indonesia are:

1. (B). Combating land degradation through, inter alia, intensified soil conservation, afforestation and reforestation activities.
2. (E). Developing drought preparedness and drought relief schemes
3. (F). Encouraging and promoting local community participation and environmental education, focusing on management effects of drought.

The convention to Combat Desertification (CCD), in regard with Indonesia as well as other South East Asian Nations (ASEAN) preferably termed as to Combat Land Degradation (CLD), is implemented through a set of (focus) action programmes. These programmes are the cores of the Convention at national level. National Action Program (NAP) addresses the underlying causes of land degradation and drought and identifies measures to prevent and rehabilitate it.

This NAP is considered as the focus of the actions, consolidation of projects and activities identified for an integrated solution in combating land degradation in Indonesia. In line with the scope of the convention, the focus of the programmes is directed to solve land degradation, developing strategies for drought mitigation and relief, and encouraging partnership with local community to combat land degradation in the driest provinces in Indonesia, namely East Nusa Tenggara (NTT), West Nusa Tenggara (NTB) and Central Sulawesi (Sulteng).

Action programme strive to bring together stakeholders, both GO's and NGO's at all levels (district, provincial, national and regional) in a joint effort to achieve sustainable land management. Implementation of the NAP will involve all partners including politicians, government institutions, community-based organization, local communities, NGO's, professional organization, academic communities, private groups and associations.

The NAP for programme for combating land degradation is part of the National Development Plan, and compatible with provincial and district development plans and strategies.

II. DEFINITIONS

Desertification is formally defined as land degradation in Arid, semi-arid, and dry sub humid areas resulting from various factors, including climatic variations and human activities (Chapter 12, Agenda 21 Rio de Janeiro). In carrying out its national implementation affected country party should prepare a national action programme as the central element of the strategy to combat desertification, which will be developed with the full participation of local communities. Governments will commit themselves to providing an 'enabling environment'.

The National Action Programme (NAP) to combat land degradation (CLD) in Indonesian context in particular, is therefore defined as measures to prevent land degradation and to rehabilitate degraded land on dry land with full participation of local communities. The purpose of NAP is to identify the factors contributing to land degradation and practical measures necessary to combat land degradation and mitigate the effects of drought.

III. GENERAL PROFILE OF EASTERN PART OF INDONESIA

A. Characteristic of Climate and Dry Lands in Indonesia

Indonesia is located between two continents (Asia and Australia) and between two oceans (Hindia and the Pacific). This situation caused the land areas to be affected by air mass characteristic of the maritime continent. As the maritime continent region, the air mostly humid, especially in areas far from the influence of the air mass of Australian Continent. East Java and the chains of Nusa Tenggara have a more pronounced dry season than Western part of Indonesia because of its direct exposure to the Australian continent. The islands of Sumbawa (NTB), Flores, Sumba, and Timor (NTT) are characterized by very short rainy season. The Palu Valley in Central Sulawesi is also the most dry area in Sulawesi Island.

Indonesia is also facing a higher frequency of long dry seasons since 1982/1983, although a large part of the country enjoys humid tropical climate. Studies made by the Meteorological and Geophysical Agency and other institutions revealed that the frequent droughts caused by the El-Nino

Southern Oscillation (ENSO) maybe an indicator of global warming. The most severe droughts occurred in 1982/1983, 1987, 1991 and 1993/1994, leading to economic losses in term of rice production and stimulation of forest fire.

Based on this condition and referring to the clear climatic pattern, in Indonesian area, there are three typical climate patterns derived from the rainfall parameter. They are the monsoonal rainfall type, equatorial type and the local type of the typical climate. The monsoon rainfall type is defined by the abundant rainfall during the winter monsoon of Asia (October - March) and less rainfall during the summer monsoon of Asia (April - September); this typical rainfall are found mostly in the south of the equator line except central Maluku (Moluccas) and mostly West Papua. The equatorial rainfall type is defined by monthly rainfall up to 100 mm/month with the two peaks occurred when the sun declination crosses the equator (in March/April and September/October), they are found along the equator line and in the Northern Hemisphere. The local rainfall type in the northern hemisphere, is reversibly defined by the rainy season during April – September and extends in Central Maluku and Eastern Central Sulawesi (Celebes). Despite the continental pattern, local conditions disturb the seasonal pattern described above. Oceanic lifting has the most pronounced effect on the rainfall distribution. The cooling of humid air blown inland from the sea as it is pushed up mountains causes afternoon rains of heavy intensity even during the dry season. Coastal areas are influenced by diurnal temperature gradients between the land mass and the sea, resulting in afternoon *sea wind* which brings humid air inland with rain showers in the evening. The reverse occurs in early morning resulting in clear skies. These areas then have a weak distinction between the dry and rainy seasons. The Palu Valley (in Central Sulawesi) is a rain shadow area in which no month has an average rainfall greater than 100 mm.

Dry climate areas are defined as those areas with an annual rainfall less than 1000 mm. Based on this criteria, most areas in North and South - East Coast Bali, most of Nusa Tenggara (East and West), Central Sulawesi have this pattern and they comprise the dry lands of Indonesia as seen in Figure 1.



Figure 1. Distribution of Dry Areas in Indonesia (in red boundaries).

B. The Problems of Land Degradation

Manifestation of desertification includes accelerated soil erosion by wind, water, increasing salination of soils and near surface ground water supplies, a reduction in the productivity of drylands ecosystems, with an attendant impoverishment of the human communities dependent on these ecosystem. A combination of climatic stress and dry land degradation may lead in turn to extreme social disruption, poverty, migrations, and famine. Those conditions are commencing over several areas of Indonesia especially in the central and eastern parts of Indonesia.

Indonesia considers the great importance of the problem of desertification or land degradation, which affected many parts of the world. The serious problems were caused by many factors such as climate variations and human activities, as desertification is not merely a matter of physical land degradation, but also about the people living in the degraded dry land. The most obvious impact of the degradation of resources is low agricultural productivity that can lead to widespread poverty.

In Indonesia, a country with 17,508 islands extending through the equator, high population growth rate and uneven distribution have severe pressure on land resources. From a population of 120 million in 1968, it has grown to 179 million in 1990, with an annual growth rate of 1.98 percent. By the year 2000, the figure has already reached more than 200 million. Without any positive intervention through appropriate environmental management programme, this trend may lead to land degradation and in turn desertification.

A consequence of the population growth is an increasing demands to satisfy basic needs of a large number of people. Population pressures on land are mostly felt in densely populated areas of Java, which is inhabited by 950 people/km². To meet the demands of population, more forests have been converted to agricultural lands while on the other hand agricultural lands are converted uncontrollably to urban and industrial uses.

The extent of degraded land in Indonesia is increasing rapidly especially in the dry areas due to shifting cultivation, misuse of land resources, and over wild grazing. These practices resulted in shrub land, wasteland, and unproductive land, and in turn increasing poverty. The latest record of deforestation in Indonesia points out at a rate of 1.8 million hectares per year until 2002. Recent data from the Ministry of Forestry (Indonesia Forestry Statistic, 2001) show that degraded land has reached 34.8 million hectares consists of the following classification: 4 million hectares in Protection Forest, 1.9 million hectares in Conservation Forest, 13.8 in Production Forest, and 15.1 in non-forest lands.

In the eastern parts of Indonesia, which is considerably drier, climatic factors contribute to the dryness and arid conditions in some parts of the islands. Some areas are in recurrent dry condition, for instance the islands of Lombok, Sumbawa, Sumba and West Timor. Some areas even bear the characteristics of desert, as can be seen in some parts of Lombok, Sumbawa and Central Sulawesi.

In West Nusa Tenggara (NTB) Province the total degraded land reach 360,675 hectares consisting of 98,210 hectares in forest lands and 262,465 hectares in non-forest lands. While in East Nusa Tenggara (NTT) Province, has reached 1,356,757 hectares, consisting of 299,291 hectares in forests land and 1,057,466 hectares in non-forest lands.

Land degradation in East Nusa Tenggara (NTT) and West Nusa Tenggara (NTB) is mainly characterised by the following features:

- Land and Savannah as caused by over grassing and land fire.
- Low rate of topsoil development caused by serious fire
- Thin layer of topsoil and rocky soil affected naturally by soil age, landslides and rill and inter-rill erosion
- High sedimentation rate in the downstream as caused by severe erosion and floods

The biophysical condition of NTT and NTB, which is closely related to land degradation problems, is characterised as follows:

- Geographically NTT and NTB are islands with hilly topography, 26-46% slope, and have young sedimentary rocks and volcanic parent materials and high erosion sensitivity.
- Low vegetative cover, low infiltration rate, high run-off and risk of floods.
- Length of dry season (9 months) and rainy season (3 months) with high erosivity rainfall.
- Land productivity is very low, thus requiring a lot of inputs to restore this main farmer asset of production.
- High sediment load during floods which has led to mangrove forest degradation, downstream pollution and other negative environment impacts.

Other most relevancy area of desertification is Central Sulawesi Province which has degraded land reached 518,262 hectares, consisting of 231,360 hectares in forest lands and 286,902 hectares in non-forest land.

Naturally the environmental condition of Palu valley is very sloppy with one third of the areas have more than 40% slope level distributed along alluvium and fan deposit materials. This valley is also known for its lowest level of rainfall in Indonesia (519,6 mm/year) with the average temperature between 23 to 33 degree Celcius. This causes so many places in Palu valley are

categorized as degraded land. Moreover, at present, there are about 13.000 ha out of 60,000 ha area of Palu valley is said to be critical/bare land.

On the other hand, most of the Palu inhabitant (400,000) who depend on the surrounding fields live in those degraded lands. In the past, there were many local community-learning models used in managing the marginal areas. Unfortunately this local learning has been degraded by the new system and method that are not so environmental friendly. This causes many areas in Palu valley experiencing the degradation very fast. It is not surprising that up to now more than 50% of Palu Valley becomes unproductive areas.

To retain the worsening condition of the land, there had been some efforts done to improve the land condition such as reforestation and greening program in 1980s. However, this program was unsuccessful because of the wrong approach and lack of community support. Because of that, to suppress the land degradation process, a community model approach is needed to be developed. One of the pre-requirements for that is involving many stakeholders (community, government, academic, NGOs, youth groups, religious groups, etc.) in the planning, implementing and up to the evaluating and monitoring the program.

Details of distribution of Degraded Land in NTT, NTB, and Central Sulawesi are presented in the Appendices 1.

Besides the need to strengthen its capability to control forest and land fire, Indonesia is expecting to explore effective efforts to mitigate the impact of drought, and to promote water management strategies aided by seasonal forecasting methods and other associated land degradation rectifying measures.

C. Socio-Economic and Cultural Settings

In dry areas of NTT, NTB, Central Sulawesi, and Eastern Part of Indonesia, typical socio-economic and cultural factor affecting land degradation and deforestation are:

- limited available knowledge and low innovative ability
- low participation of local communities
- low income and capital
- food shortage due to water shortage, low soil fertility management, insects attacks
- local community empowerment is still not sufficient.
- lack of conservation practices

Those biophysical, social, economical and cultural constraints have affected the implementation of land rehabilitation, particularly in dry areas.

IV. BASIC PRINCIPLES

A. Framework Principles

1. Sustainability

The essence and main purpose of the National Action Programme (NAP) for Combating Land Degradation (CLD) are to undertake consistently sustainable management of land resources which involve not only natural resource management, but also institutional and infrastructure development with full consideration of community (socio-economic conditions).

2. National Commitment

The National Action Programme-CLD must be backed up by the long-term commitment of all parties concerned, particularly at political and decision-making levels, as well as bottom-up planning and local community based undertaking in the process of NAP-CLD. Program planning and implementation will be undertaken by local community.

3. Integrated Approach and Consistent with National Development Objectives and Priorities

This NAP approaches land degradation control comprising several inter-dependent elements in a dynamic equilibrium within the context of sustainable land resource management, social and economic development particularly poverty alleviation and environmental stability. Mitigation of drought impact is also part of the programmes.

B. Action Principles

1. Partnership

The NAP-CLD strive to bring together all stakeholders and interested parties, in a partnership approach through a process for which they will fully concerned and committed to combat land degradation.

2. Participation

Issues, options and the resulting policies, strategies and actions are agreed upon through a participatory decision-making and consensus process building among all interested partners.

3. Decentralisation and Institutional Reforms

One of the priorities of the NAP-CLD is to ensure that decentralization and institutional reform is conducive to sustainable land resource management.

V. POLICY, LEGAL, AND INSTITUTIONAL FRAMEWORK

A. Policies

1. The establishment a National Forest Fire Management Centre or *PUSDALKARHUTNAS* at the national Level and *Pusdalkarhutla* at the provincial level.
2. The Decree of DG of Forest Protection and Nature Conservation No. 47/Kpts/DJ-VII 1997 on Controlled Burning, *juncto* the Decree No. 125/Kpts/DJ-VI/1997 to prevent fires 1997.
3. The Ministry of Agriculture has introduced the zero burning land clearance policy since 1995 through the decree No. 28/KB-110/DJ.BUND/05.95.
4. The climate monitoring is taken using real time capability by the Meteorological and Geophysical Agency.
5. Action based on economic efficiency in order to maintain ecosystem diversity and complexity.
6. National Water Resources Policy, through decree of Co-ordinating Minister for Economic Affairs No. KEP-14/M.EKON/12/2001

B. Legal Framework

Related existing Laws and Regulations

1. ***People's Consultative Assembly (MPR) of the Republic of Indonesia Decree No. XVLW.R/1998 on Politics and Economy in an Economy Democracy***
Article 7 regulates the following policies:
 - a. to apply land management through land redistribution and provide compensation from available government budget and with the people's resources to improve the farmers' welfare

- b. to carry out management for land control and land-use through consolidation of urban and farm land using available government budget and the people's resources.
- 2. ***People's Consultative Assembly (MPR) of the Republic of Indonesia Decree No. IX/2001 on Agrarian Reform and Natural Resource Management***
- 3. ***Forestry Law no. 41, year 1999:***
Land degradation control is guided as follows:
 - a. implementation of land rehabilitation is based on biophysical specific condition
 - b. land degradation control is mainly implemented through participatory approach in the framework of promoting local potencies and empowerment of local communities.
- 4. ***Agrarian Law No. 5 year 1960***
It stipulates the obligations for land user and landowner to protect and conserve their respective land in productively managed manner and to make best efforts and necessary measures to avoid physical and productivity degradation process on their land.
- 5. ***Autonomy Law No. 22, year 1999***
Article 7, Sub-article 2: Conservation is under the authority of Central Government
- 6. ***Environmental Management Law No. 23, year 1997***
- 7. ***Government Regulation No. 22, year 1982 regarding Water Regulation***
- 8. ***Government Regulation No. 25, year 2000 regarding the authority of Central and Province Government***
 - Article 2, Sub-article 2 : Conservation is under the authority of Central Government
 - Article 2, Sub-article 4, point (f) : General plan for land rehabilitation and soil conservation is under the authority of Central Government (Ministry of Forestry)
 - Article 2, Sub-article 4, point (l) : Determination of criteria and standard of forest land rehabilitation is under the authority of Central Government.
- 9. ***Government Regulation No. 34, year 2000 regarding Forest Landuse, Planning, and Utilisation.***
- 10. ***Government Regulation No. 77, year 2001 regarding Irrigation***

11. ***Government Regulation No. 35, year 2002 regarding Reforestation Funds***

12. ***Decree of Minister of Forestry:***
 - No. 146/1999 regarding Guidelines of Reclamation on ex-Mining
 - No. 284/1999 regarding Guidelines of Selected Watershed Priority
 - No. 677/1998 regarding Community Participation in Community Forestry Development Management.
 - No. 464/1995 on Protection Forest by the Regional Government.
 - No. 677/1993 regarding Centre of Forest Extension
 - No. 252/1993 regarding criteria's and indicator of sustainable natural forest production forest on sustainable way
 - No. 034/2000 regarding guidelines of watershed integrated planning
 - No. 020/2001 regarding Guidelines, Standard, and Criteria of Forest and Land Rehabilitation
 - No. 052/2001 regarding Guidelines on Implementation of Watershed Management

13. ***Decree of Coordinating Minister of Economic Development No. 14, year 2001 regarding National Resource Policy***

Related Draft of Laws and Regulations

1. ***Draft of Soil and Water Conservation Act.***
2. ***Draft on Natural Resources Management Act.***
3. ***Draft of Water Resources Act***
4. ***Draft of Forest Rehabilitation and Reclamation Regulation***
5. ***Draft of Urban Forest Regulation***
6. ***Draft of NAP of UNCCD Presidential Decree***
7. ***Draft of Ministerial Decree regarding Master Plan on National and Provincial Forest and Land Rehabilitation***

Manuals and Guidelines

1. ***Manuals and guidelines have been formulated by Directorate General of RLPS, MOF***
 Guidelines on the implementation of land rehabilitation and soil conservation:
 - a. Macro plan of land rehabilitation and soil conservation
 - b. Engineering design manuals on land rehabilitation and soil conservation
 - c. Manuals on watershed management and development

2. **Indonesian Meteorological and Geophysical Agency (BMG)**
Based on the internationally recognised method "Circulation Global GCM Model", a drought monitoring guideline has been produced by Indonesian Meteorological and Geophysical Agency (BMG) for the specific purpose of mitigation of impacts of El-Nino.
3. **Director General of Forest Protection and Natural Conservation, MOF**
No. 243/Kpts/DJ-VI/1994 and No. 248/Kpts/DJ-VI/1994 concerning fire protection and control
4. **Secretariat of Aforestation and Reforestation Aid:**
 - Technical Guidelines on Soil and Water Conservation (Jakarta, 1998)
 - Technical Guidelines on Village Nursery Development (Jakarta, 1998)
5. **Forestry Extension Centre, MOF**
Information Kit on Upland Resources Management in Indonesia (Jakarta, 1997: adapted to Indonesia from *Resource Management for Upland Areas in Southeast Asia*)
6. **Forest Research and Development Centre, MOF**
How to Farm Hilly Land with Soil Conservation Principle (Bogor, 1990: adapted to Indonesia from *How to Farm Your Hilly Land Without Losing Your Soil* by: H.R.Watson)

C. Institutional Framework

1. Related Agencies and Institutions

Several institutions and boards are involved in the implementation of land rehabilitation and soil conservation and monitoring of drought in Indonesia. The related parties are as listed below.

Government Institutions:

1. Ministry of Forestry
 - a. Directorate General of Land Rehabilitation and Social Forestry
 - b. Secretariat General
 - c. Directorate General of Forest Protection and Nature Conservation
 - d. Directorate General of Forest Planology
 - e. Watershed Management Research and Development Centers
2. Directorate General of Food Crops, Ministry of Agriculture

3. Ministry of Environment
4. Ministry of Settlement and Regional Infrastructures
5. Indonesian Institute of Science
6. Ministry of Mines and Energy
7. National Coordination Agency for Survey and Mapping Coordination (BAKORSUTANAL)
8. Ministry of National Education
9. Universities (particularly which are located in dry areas)
10. Meteorological and Geophysical Agency (BMG)
11. National Aeronautical and Space Institute (LAPAN)
12. Ministry of Social Affairs
13. Directorate General of Community Empowerment, Ministry of Home Affairs
14. Ministry of Foreign Affairs
15. Local Governments

Non-Government Institutions:

1. Indonesian Soil Conservation Society (MKTI)
2. Indonesian Agriculture Meteorology Association (PERHIMPI)
3. Nature Resource Conservation Group (KPSA)
4. Pelangi Foundation
5. Wahana Lingkungan Hidup (WALHI)
6. Indonesian Tropical Nature Body (LATIN)
7. Indonesia Farmer Association (HKTI)
8. Indonesian Water Partnership (KAI)
9. AMAN
10. KATOPASA Foundation (Central Sulawesi)
11. Abdi Insani Foundation (NTB)
12. AMASUTA

International Institutions/Projects

World Bank; GTZ; JICA; Ford Foundation; UNDP; FAO; CIFOR; ICRAF; ASOCON (Asia Soil Conservation Network), AUSAID; STORMA; CIDA

2. Co-ordination Scheme

Coordination Scheme for cooperative action between related parties is conducted through several established mechanisms consists of:

- a. Coordination in Planning under National Development Planning Agency and Provincial Development Planning Agency
- b. Coordination in the implementation is under the coordination of Provincial Government and District Authorities
- c. In the forestry sector, Coordinating Group of Indonesian Forestry (CGIF) participated by international forestry donor's agencies/projects, private sectors, NGOs and Ministry of

- Forestry. In this coordinating group, a working group is specifically assigned to coordinate planning and implementation of land rehabilitation and watershed management.
- d. Another mechanism of coordination is special meetings conducted for solving particular problems arising in the implementation of land rehabilitation programs

The National Co-ordination Team for Land and Forest Fires Control was formed in 1995. The Team is headed by the State Minister for Environment and the Director General of Forest Protection and Nature Conservation. Members are senior officials from the related Ministries and several Institutes/Agencies. The National Disaster Management Co-ordination Board (BAKORNAS PB) is another body, which has the function of co-ordination, consultation and information including on resources mobilization, land degradation and the associated forest and land fires.

3. National Co-ordinating Body (NCB)

Based on the relevancy with scope and the works of UN-CCD in desertification or land degradation control and drought impacts mitigation, the most related agencies in Indonesia is Ministry of Forestry *c.q.* Directorate General of Land Rehabilitation and Social Forestry.

4. National Focal Point (NFP)

The following official was selected as Indonesia National Focal Point where communication from secretariat of UNCCD is expected to be addressed.

Indonesia National Focal Point

Director for Watershed Management and Land Rehabilitation
Directorate General Of Land Rehabilitation and Social Forestry, Ministry of Forestry (MoF)

Tel. / Fax : 62-21-5730176 / 62-21-5739092

E-mail : dirrlkt.rlps@dephut.cbn.net.id

Address : Gedung Manggala Wanabakti Block I; 13th Floor
Jl. Gatot Subroto, Senayan, Jakarta, Indonesia.

In his activities, he is closely work together and supported by:

Director for International Cooperation and Investment
Secretariat General, Ministry of Forestry (MoF)

Tel. / Fax : 62-21-5730165 / 62-21-5720210

E-mail : bambangm@dephut.cbn.net.id

Address : Gedung Manggala Wanabakti Block 7; 4th Floor
Jl. Gatot Subroto, Senayan, Jakarta, Indonesia.

5. Linkages and Synergies with other Environmental Convention

Focal Points for UN environmental conventions in Indonesia are in different institutions, UNFCCC and UNCBD in Ministry of Environment (LH), UNCCD-Ramsar in Ministry of Forest, CITES in Indonesia Institute of Science (LIPI) and Ministry of Forestry, These conventions are closely linked to each other. Therefore, to achieve a synergy among them there is a need to establish coordination forum, which is supported by secretariat of the conventions.

Forest rehabilitation and plantation as one of the current five Indonesian forest priority programmes are relevant to the scope of CCD, CBD, and CCC. Promotion and large-scale plantation of indigenous and economic value tree species (Lists and Pictures could be found in Appendices 2 and 3) are closely related to the goal and strongly linked to both UNCBD and UNFCCC.

VI. IMPLEMENTATION

A. Strategy

1. Public support and participation is critical for applying and implementing methods of prevention and rehabilitation control.
2. Developing a partnership with local institutions and community and non-government organizations for an effective implementation of land degradation control.
3. Co-ordination with implementation of CCD and CBD for synergic and effectiveness of the needed supports and resources.
4. Strengthen co-operation with related regional institutions, regional CCD Thematic Programme Networks and international organizations.
5. Developing the capacity to be better consolidated, manage and deploy existing financial resources (APBN, APBD) and strengthen the capacity to negotiate with international and national agencies for increased financial support.
6. Establishing priorities and development of action plans through active involvement in the decision-making by local communities in the implementation, monitoring and evaluation.

7. Full participation of representative community should be engaged in all level activities (planning, implementation, monitoring, and evaluation)
8. Use best practice knowledge and robust technologies including traditional knowledge and wisdom.
9. Awareness rising about good quality environment and sustainable agriculture development
10. Project should be holistically concern about the unique characteristic of the community in the respective degraded land (integrated and sites special project)
11. Project should concern on long-term security investment through a good and attractive land tenure system.

B. Planning

Mechanism of planning for implementation of the NAP is undertaken through a participatory process among stakeholders at national level in accordance with their task and responsibility. This planning process is organized and coordinated by National Coordinating Body (NCB) and National Focal Point (Ministry of Forestry). Operation plan, in the mean time, will be made by district government by means of a participatory, synchronized, and coordinated process at provincial level.

C. Thematic Programme & Project

1. Providing Enabling Conditions

- a. Strengthening existing legislation to support the programmes
- b. Enacting new laws (if necessary) is needed where the existing legislation are insufficient to accommodate and support the implementation of the programmes
- c. Developing Human resources to enhance local people knowledge and benefit in the implementation of the programmes
- d. Enhancing effective institutions to effectively execute the programmes
- e. Promoting public awareness aims all related stakeholders will be aware of the importance of the programmes and could contribute and involve in the programmes
- f. Land titling programme to ensure the security of the land where the programmes are being implemented
- g. Streamlining development programme through training, field school, and extension

- 2. Land Degradation Inventory and Monitoring**
 - a. Monitoring of soil erosion and sedimentation
 - b. Inventory and mapping of degraded land using appropriate technology including remote sensing technique
 - c. Identification and classification of degraded Land
 - d. Management of land degradation data and information system
 - e. Identification of the root causes and impact of land degradation on socio-economic and socio-culture

- 3. Promoting of Agroforestry**
 - a. Developing agroforestry demonstration areas for different soil fertility and land conservation
 - b. Promoting local knowledge and technology in agroforestry practices
 - c. Providing high quality seed/planting material and dry land farming inputs
 - d. Promoting indigenous species for multi purpose plantations in dry lands.

- 4. Monitoring and Mitigating the Impact of Drought**
 - a. Strengthening research activities in attaining drought-resistant crops
 - b. Development of sustainable dry land farming systems
 - c. Improvement of early warning systems
 - d. Formulation drought contingency plans
 - e. Monitoring of water availability
 - f. Monitoring of climate change impacts

- 5. Prevention of Land Degradation**
 - a. Extension and strengthening of local people participation
 - b. Promoting soil conservation technology option
 - c. Campaigning the danger of land degradation and the benefit of soil conservation.
 - d. Providing credit scheme for conservation farming systems
 - e. Providing guidelines and standards for soil conservation techniques

- 6. Rehabilitation of Degraded Lands**
 - a. Review of completed and ongoing projects of land rehabilitation carried out by the government, private, NGOs, and CBOs
 - b. Rehabilitation of degraded forests and lands
 - c. Development of intercropping of food, herbal, medicinal, and or horticultural crops under tree stand on degraded lands.

- 7. Improvement of irrigation facilities and Water Conservation**
 - a. Conservation and rehabilitation of watershed by reforestation, afforestation, and agroforestry systems
 - b. Construction of small pond, especially harvested rain water based reservoir ("embung")
 - c. Establishment of efficient watering systems (small irrigation) based on "embung" for development of food, horticulture and fodder crops during dry season
 - d. Maintenance of "embung" catchment by reforestation, afforestation, and agroforestry systems using cash crops.
 - e. Improving the use of natural water resources (spring, reservoir, and stream) efficiently especially during dry season.
 - f. Improvement and maintenance of small scale irrigation systems.
 - g. Empowerment of local institution in dry land water management

- 8. Sylvo and Agro-pastoral Development**
 - a. Improvement of existing pasture management and animal raising (husbandry) techniques
 - b. Renovation of existing pasture
 - c. Developing non grass fodder
 - d. Research on carrying capacity of pasture land

- 9. Monitoring and Evaluating of Climatic Variation**
 - a. Establishment of complete weather station and data base system
 - b. Trend of the temporal climate variability
 - c. Impact of climate variability and change to land degradation
 - d. Impact of global phenomena of El-Nino

- 10. Empowerment of Local Communities and Local Institutions**
 - a. Facilitating the establishment of local communities and institution
 - b. Empowering existing local communities and institution
 - c. Recognising traditional knowledge and wisdom

- 11. Establishment of Sustainable Land Management**
 - a. Establishing demonstration plots of sustainable agriculture
 - b. Transfer of knowledge and technology through regular field training

- 12. Providing Guidelines and Manuals**
 - a. Selecting appropriate guidelines and manuals
 - b. Distribution of guidelines and manuals of appropriate technologies

13. Creating and improving market systems

- a. Improving infrastructure and facilities to the dry land production, animal husbandry and forestry (especially non-timber product) areas
- b. Establishing partnership and market networking
- c. Establishing market accessibility
- d. Establishing farmer's cooperative

D. Benchmark and Indicators

Benchmarks and indicators are Scientific data used for monitoring the status of desertification and assisting the Conference of the Parties in evaluating or assessing the effectiveness of national efforts to implement the Convention.

1. Participatory process

Indicators: number of government and society institution involved and active participation in planning, executing, monitoring, and evaluation

2. Legislative and institutional framework and arrangement

Indicators: number of regulations, law, decree, and customary law

3. Resource mobilization

Indicators: mobilization of variety manpower, budget, and equipment (number and amount)

4. Linkages and synergies with other convention

Indicator : teamwork with other convention team in the area (number of meeting, workshop, and joint project)

5. Measures for rehabilitation of degraded land

Indicators: extend of degraded land, number of rehabilitation techniques implemented, and income

6. Drought and desertification monitoring assessment

Indicators: number of operating weather and hydrology stations for monitoring of drought and desertification and frequency of measurement

7. Access by affected country parties (developing countries) to appropriate technology, knowledge, and know how.

Indicators: network established to centre of technology development and information (i.e. Dry Land and Land Rehabilitation Assessment Centre; University of Mataram; National Overview on Conservation Approach and Technology project in cooperation

with Bogor Agricultural University (IPB) and ASOCON (Asia Soil Conservation Network for the Humid Tropics).

E. Resources Mobilization

Financial resources to implement the convention in Indonesia are obtained from international organization, reforestation fund, and partnership initiatives. Technical Assistant extended by ICRAF, CIFOR, ASOCON, ITTO and others have contributed for the success of the rehabilitation.

However, considering to the magnitudes of land degradation problem in the country more national and international assistant and support are urgently needed. The institution involved:

1. Local governments
2. Ministry of Forestry
3. Ministry of Settlement and Regional Infrastructures
4. Ministry of Environment
5. Ministry of Agriculture
6. BMG (Meteorological and Geophysical Agency)
7. BAKOSURTANAL (National Coordination Agency for Survey and Mapping)
8. Ministry of Home Affairs
9. Ministry of Foreign Affairs
10. Ministry of National Education
11. Indonesian Institute of Sciences
12. Ministry of Social Affairs
13. LAPAN (National Aeronautical and Space Institute)
14. Active partners
 - a. UNCCD Secretariat
 - b. ICRAF
 - c. CIFOR
 - d. UNDP
 - e. FAO
 - f. GM
 - g. ITTO
 - h. GEF

F. Related Projects

1. **Land Rehabilitation through improving environment (reforestation) and community strengthening in Palu Valley, Central Sulawesi Province.**

At present there are about 13,000 ha out of 60,000 ha acre of Palu Valley is said to be critical/bareland. This area is known for its lowest

level of rainfall in Indonesia (519.6 mm/year) and very sloppy with about 36% area have more than 40% slope level. Most people who depend on the surrounding field live in that critical land. To retain the worsening condition of the land there had been a reforestation programme, however this programme was unsuccessful because of wrong approach and lack of community support to suppress the degradation process. A community modal approach is needed to be developed.

This project will be located in poor community areas in marginal land with low soil fertility. Activities of the project consist of constructing check dam, small water pond, drip irrigation, promoting agroforestry and establishing sylvopastoral management.

This project will be run for 5 years and the first 6 months will be allocated for establishing the multi task force stakeholders coordinated by the governor of Central Sulawesi. Four years will be spent for executing the pilot project in several villages in Palu valley, monitoring and evaluating the result and the last 6 months will be allocated for socialization and promoting these demonstration plot as the sample of sustainable land management practice.

2. Social forestry project in Benain Noelmina and Kambanero watersheds in Timor Island.

This project will be located in very critical and steep dry land areas where forest fire occurred and uncontrolled grazing with high animal population density. Activities of the project include agroforestry, silvo pasture management, social forestry, and water pond construction.

3. Embung (harvested rain water reservoir) as center of integrated water, agriculture and husbandry management through developing agro-biology complex to combat land degradation in dry land, Timor, East Nusa Tenggara, and Sumbawa, West Nusa Tenggara Indonesia.

This project will be located in some selected embung in some villages in Timor and Sumbawa Island. Integrated programs on water, agriculture and animal husbandry management where embung is the center is the core purpose of this project. In the end, reducing land degradation is the main goal.

4. Prabu Hill Forest Rehabilitation in Lombok, West Nusa Tenggara (NTB)

Forest area (463 acres) of Prabu Hill, stipulated as a protection forest in 1996, located in the southern part of central district is in degraded

condition. As a Water regulator, sanctuary area, bio-diversity protection, non-timber forest product and tourist attraction Prabu Hill forest, need to be rehabilitated to recover its function. This forest rehabilitation program should be carried out in integrated and comprehensive way.

5. Management of land degradation to increase the income of community around the buffer forest areas through agroforestry in Lombok, West Nusa Tenggara (NTB)

Rinjani mountain (12,500,000 acres) in Lombok West Nusa Tenggara Province has been stated as National Park since 1990 to protect its flora, fauna and water resources. Forest destruction has happened at the forest edge due to irresponsible activities. Regulation and information programme held by governmental officer to solve the root of the problem at buffer area is not sufficient. In order to persist the damage in one hand and to increase the people's economic standard and their participation in environmental preservation in another hand a wise way should be arranged effectively. Based on the importance increasing community's income in the buffer areas and decreasing the pressure in the forest area, this project is proposed.

6. Integrated Participation Project of Dry Land culture development to increase food production and prevent land degradation in West Nusa Tenggara (NTB).

Dry land in West Nusa Tenggara province is approximately 2 million acres or about 84% of total land. Lack of attention in utilizing dry land causes low productivity of land besides increasing dry land degradation and spreading critical land. Based on enormous dry land potency in West Nusa Tenggara, developing conservation farming practices is one of solution, not only to fulfill the needs of food in the future but also to solve the problem that tend to increase each year.

7. Combating Land degradation by using social forestry approachment and based on community empowerment in Kupang District, East Nusa Tenggara.

Land degradation is the major environmental problem in East Nusa Tenggara. Land degradation occurs when the environment is intrinsically vulnerable and the people lose control of their own resources. Land degradation tends to increase every year indicated by increasing in grassland and shrubs cover on forest area. This is mainly due to shifting cultivation, expanding population, wild burning practices and overgrazing of Savannah land.

Some problems can be minimized, but other problems persist and will, constantly challenge the success of land degradation in the future. Among those problems socio-culture and socio-economy take a key role in combating land degradation in East Nusa Tenggara and District of Kupang particularly. Therefore, social forestry approachment based on community empowerment could be a promising implementation in combating land degradation.

8. Application on strata unit system in the development of sustainable slope land agroforestry in Sumbawa, West Nusa Tenggara (NTB).

Recently, new dry land area of Sumbawa, West Nusa Tenggara, tends to increase continuously and leads to the creation of critical land as a result of land degradation which is strongly related to the local people behavior in practicing agriculture and forestry activities.

Land that originally allocated for grazing has been changed for agriculture crop. This change causes the livestock tend to move towards hilly and forest area and conflict between livestock owner and the farmers. The conflict emerge due to soil and crops damages by livestock that substantially lead to the lost of crops yield or production in the agriculture lands.

In order to solve the problem it is proposed to apply Strata Unit System (SUS) consist of three-development zone: modern grazing zone, buffer zone, and core (nucleus) zone. By applying this system, land degradation and environmental, economic infrastructure, culture and institution damage will be minimized.

G. Monitoring and Evaluation

Achievement of thematic programmes will be monitored and evaluated periodically and continually. Monitoring and evaluation will be carried out through the following Mechanism: National Focal Point will monitor the progress set of activities based on sector involvement and their support at national level. While at local level, local government (district level) will monitor and evaluate the implementation of programmes. Since in the planning stage use participatory approach, local NGOs as well as CBOs will be involved to help local government in the monitoring and evaluation. The local government, then report the implementation progress to the National Focal Point.

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APPENDICES 1. DISTRIBUTION OF DEGRADED LANDS IN DRY AREA

No.	Province/District	Degraded Land (hectares)	
		Forest Land	Non Forest Land
1.	East Nusa Tenggara (NTT)		
	- Alor	110,702.94	159,037.20
	- Belu	35,704.82	129,789.50
	- Ende	90,153.27	168,551.75
	- East Flores	50,127.06	59,701.41
	- Kupang Municipal	6,262.62	10,614.24
	- Kupang	273,920.19	387,904.51
	- Lembata	87,874.63	175,808.99
	- Manggarai	176,861.55	438,497.60
	- Sikka	59,954.87	85,822.58
	- West Sumba	107,912.53	281,807.86
	- East Sumba	191,454.89	411,495.44
	- Southern Central Timor	73,075.91	193,074.93
	- Northern Central Timor	79,914.78	80,385.19
	T o t a l	1,343,920.06	2,582,491.20
2.	West Nusa Tenggara (NTB)		
	- West Lombok	8,315	23,160
	- Central Lombok	9,960	19,390
	- East Lombok	4,620	26,440
	- Sumbawa	28,775	106,570
	- Dompu	17,815	33,115
	- Kota Bima	3,015	6,050
	- Bima	25,710	47,740
	- Kota Mataram		
	Total	98,210	262,465
3.	Central Sulawesi		
	- Palu	11,318	3,506
	- Donggala	44,371	52,462
	- Parigi Moutong	12,669	29,163
	- Poso	49,396	59,756
	- Morowali	52,971	14,023
	- Banggai	30,340	19,427
	- Banggai Kepulauan	20,552	53,002
	- Toli-Toli	3,718	23,111
	- Buol	6,026	32,453
	T o t a l	231,360	286,902

4.	Bali (Unda Anyar Watershed)		
	- Bangli	9,340	30,818
	- Badung	1,281	10,670
	- Buleleng	45,537	54,930
	- Karang Asem	14,048	33,906
	- Jembrana	25,901	10,645
	- Tabanan	10,157	13,780
	Total	106,264	154,749
5.	East Java (Sampean Watershed)		
	- Probolinggo	23,949	7,986
	- Situbondo	16,448	50,513
	- Bondowoso	41,119	37,162
	- Jember	72,176	73,536
	- Lumajang	33,323	86,590
	- Banyuwangi	56,089	114,684
	Total	243,104	370,471

APPENDICES 2. List of Various Plant and Tree Species Suite to Dry Land Areas

A. Fodder Plant Species for dryland environment

Local name	Botanical name	English name	Notes
Gala-gala/turi	<i>Sesbania grandiflora</i>	West Indian pea	high nutritious leaves for cattle, flower for vegetable
Petai cina, lamtoro	<i>Leucaena leucocephala</i>	leucaena	high nutritious leaves for cattle, stem for firewood
Kabesak	<i>Acacia leucophloea</i>	-	high nutritious leaves for cattle, stem for buildings
Daun kupu-kupu	<i>Bauhinia accuminata</i>	bauhinia	leaves as a second class fodder

B. Industrial Plant Species for dryland environment

Local name	Botanical name	English name	Notes
Kemiri	<i>Aleurites moluccana</i>	candle wood	cosmetics, medicine stem for buildings
Sisal	<i>Agave sisallana</i>	Agave	fiber
Delinggem	<i>Bixa orellana</i>	Annato	coloring agent
Kapuk, kapok	<i>Ceiba pentandra</i>	Kapok tree	interior
Kayu putih	<i>Melaleuca leucadendra</i>	Cajeput tree	oil for medicine
Pinus	<i>Pinus merkusii</i>	Pine	interior; oil for household purposes
Asam	<i>Tamarindus indica</i>	Tamarind	cooking, drink, medicine
Cendana	<i>Santalum album</i>	Sandalwood	cosmetics, medicine; santalol is a high economic value oil extracted from cendana

C. Fruit Plant Species for dryland environment

Local name	Botanical name	English name	Notes
Nangka	<i>Artocarpus heterophyllus</i>	Jackfruit	stem for buildings
Mangga	<i>Mangifera indica</i>	Mango	many varieties

D. Fire wood Plant Species for dryland environment

Local name	Botanical name	English name	Notes
Kesambi	<i>Schleichera oleosa</i>	Gum-lac tree	produce a good quality carcoal; also, home for lac-producing insect

E. Building materials Plant Species for dryland environment

Local name	Botanical name	English name	Notes
Cemara, kasuari,	<i>Casuarina junghuhniana</i>	-	good quality wood
Tengguli	<i>Cassia fistula</i>	-	second class wood
Angsana, kayu mera	<i>Pterocarpus indicus</i>	nara, amboina wood	good quality wood
Hu'e, kayu puti, eukaliptus	<i>Eucalyptus alba</i>	Eucalypt	good quality wood

F. Medicinal Plant Species for dryland environment

Local name	Botanical name	English name	Notes
Mengkudu	<i>Morinda citrifolia</i>	Noni	Medicine

Appendices 3. Pictures of economic value plant species developed in dry area in Indonesia



Mimba (*Azadirachta indica*)

NEEM

Characteristic :

- Local name : Mimba
- Thick canopy with diameter reach 20 m
- High : up to 30 m ; Diameter : up to 2.5 m in girth.
- Deep root & able to grow in extremely dry condition
- The flower is attractive for the bee to produce honey
- Annual rainfall : 400 - 1,200 mm
- Altitude : up to 1,000 m asl
- Sandy and silty soil
- Regeneration : seed, seedling, sapling or tissue culture

Purpose: e.g. dental treatments, fuel-wood, anti-bacterial, antiseptic soap, pesticide, insecticide, fungicide, dermatological insects, malaria, pain relief, fever reduction, veterinary medicine, birth control, antiviral agents.

AGARWOOD

Characteristic :

- Local name: Gaharu
- High : up to 40 m ; diameter : 60 cm
- Soft hard wood with white feature
- Usually grow at hilly with sandy soil, high lime content, stony or fallow land
- Altitude : 300 - 700 m asl
- Annual rainfall : > 1,500 mm
- Regeneration : seed or seedling



Gaharu (*Aquilaria filaria*)



Kesambi (*Schleichera oleosa*)

GUM-LUC TREE

Characteristic :

- Local name: Kesambi
- High : 15 - 40 m ; Diameter : 60 - 175 cm
- Altitude : up to 1,000 m asl, generally < 600 m asl
- Wood : very hard, dense, heavy
- Able to grow in dry condition and where teak could grow naturally

SANDAL WOOD

Characteristic :

- Local name: cendana, kayu ata, ainitu
- High : up to 15 m ; Diameter : up to 35 cm
- Performance : short, not attractive, thin canopy
- Altitude : up to 1,200 m asl, optimum grow at 400 - 800 m asl
- Annual rainfall : 1,000 - 2,000 mm
- Need high intensity of solar
- Soil with high lime content



Cendana (*Santalum album*)



SUKUN (*Artocarpus altilis*)

SUKUN

Characteristic :

- Able to grow on fertile or degraded land
- Altitude : 100 m asl
- High economic values
- Big tree, canopy and leaves, and deep roots
- Ultisol soil classification
- Tidal, swamp, beach, low land, mountainous