Papua New Guinea

National Action Plan for the UNCCD

Combating land degradation through integrated management

Capacity Building for
Sustainable Land Management Project Office
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Port Moresby, Papua New Guinea

And

United Nations Development Programme
Country Office, Papua New Guinea

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Preface – by the Prime Minister of PNG

Papua New Guinea is a signatory to the United Nations Convention on Combating Desertification and is committed to meet our obligations. For PNG, this means preventing and mitigating general land degradation. I would like to express my strong

Land degradation and a bad environment generally, is of great concern to PNG, because land degradation directly and indirectly can cause death, poor health, and otherwise in many ways negatively affect people's livelihoods, including pollution of rivers, reduced fish stocks in rivers, surface runoff and mud slides, degradation of ecosystems and biodiversity, reduced economic productivity, and consequently leading to human poverty.

Of course, we are proud of our high levels of unique biodiversity and want to protect this biodiversity for now and future generations, because we shall depend on this biodiversity for food, medicines, etc.

The economic development of PNG is very necessary, because PNG and our people need to prosper. PNG possesses vast natural resources, which can help sustain the development of our country. And as such, the demand for developing the land and its resources is rapidly growing.

I and the government will insist that the economic development must not have unnecessary adverse effects on the very same people, who the development is supposed to benefit, neither in the short term nor in the long term. Therefore, development must be sustainable. Furthermore, there is an increasing perception and understanding that a good environment contributes to economic growth by reducing risks to people and to the business potential and investment environment.

Everyone acknowledges that coordinating and managing the sometimes conflicting demands on the land is very challenging. We must ensure that land and resources are developed, managed and governed sustainably. Therefore, the government of PNG engages in collaborative management with stakeholders (government agencies, CSOs, business, and with donors) as a sign of the shared responsibility. All levels of society shall have to be adaptive.

This will require review and adjustment of existing policies and regulations, as well as the design of new ones, including effective safe guarding mechanisms, mitigative measures and promotion of more sustainable land use practices. It also requires improved integrated monitoring systems, and strengthening the role of research to underpin land use practices and policies.

Further, PNG is affected by climate change and natural disasters, which tend to exacerbate existing challenges, which on the other hand exacerbate the risks and consequences of climate change and natural disasters. Land management techniques and plans must incorporate appropriate measures.

The Department of the Environment and Conservation – on behalf of the Government of PNG - has conducted wide consultations with stakeholders to ensure that the National Action Plan is based on and benefits from the opinions and technical insights of stakeholders.

The purpose of the National Action Plan is three-fold: First, to mainstream sustainable land management. Second, to develop and enhance capacities for sustainable land management. Third,

to enhance and develop capacities for knowledge management in sustainable land management efforts. This will require greater integration of, and linkages among, relevant sectoral agencies and organizations as well as infrastructure, transport, education, and health.

On behalf of the peoples and government of PNG, I would like to re-iterate PNG's commitment to the UNCCD. As the Prime Minister, I am honored to endorse this important document whereby we shall pursue sustainable land management as the underlying principle for the National Action Plan for the UNCCD for PNG.

This NAP provides a unified framework for the next 5-10 years for all stakeholders.

The GoPNG envisages that funding shall be appropriated by donors, private sector and government. Strategic partnership, including private-public partnerships shall be important.

I wish to express my sincere gratitude for the commitment of everyone involved. I would like to acknowledge and thank the various agencies, departments, organizations and individuals, whose collective efforts have made this NAP possible.

Finally, I am indebted to the Secretary of the Department of Environment and Conservation, Dr. Wari Lea Iamo, and his team, under whose guidance and responsibility the NAP was developed, and to the United Nations Country Office for Papua New Guinea for their collaboration and support.

I look forward to the journey to a more sustainable and prosperous future and development trajectory of our country. It is vital that all members of the PNG society benefit from the rapidly increasing exploitation of our immense natural resources. Rapid development poses the very real danger of overexploitation with land degradation as a consequence.

Executive Summary

The major challenge for PNG is to get the balance right - between, on the one side, development and the urgent need for improved welfare (including food security and poverty alleviation) of our people, and, on the other, the longterm sustainable management of our vast resources.

PNG cannot afford to slow development and growth, because PNG must be able to feed its people. PNG relies far too much on importing foods with exhorbitant prices as a consequence. Of course, the already poor are disproportionately affected. Therefore, development and enhancement of agricultural production is necessary.

This will depend on sufficient revenues to fund these investments.

Necessarily, this will have to be funded through production, trade and income from the vast potential of our forests and mining areas as well as marine resources. The global demands for resources are ever increasing and will only accelerate over the years to come. PNG needs to be prepared. If the full potential shall be harnessed to the benefit of all and without destroying opportunities for the future, a coordinated and balanced approach is needed.

Common for all sectors – agriculture, forestry and mining – effective and timely transport and distribution of the products will require a very significant improvement in infrastructure, especially to improve access to markets, education and health.

Therefore, it is paramount that we maintain and manage our resources in a way which ensures that we can continue to benefit from these resources for generations to come.

PNG is in global demand! Not just for the exploitation and extraction of our natural resources. First, the natural forests of PNG play a very important role for the future of the global climate. It is therefore only reasonable that the vested interest of the global community in sustainably managing and conserving our forests, contribute substantially thereto. Second, our absolutely unique biodiversity must be conserved for the benefit of future generations.

The National Action Plan sets out the priorities for combating land degradation, in terms of overarching principles, outcomes, outputs and activities.

Papua New Guinea's status as a home to 5% of the world's biological diversity is threatened by the rapidly growing demand for land and its resources for socio-economic development of the country. These threats particularly result from land degradation and have been addressed from various sectors of natural resource development. Despite these efforts and investments, land degradation will continue to be addressed as an isolated impact on biological diversity unless integrated into the overall institutional arrangements on land use management in the country. Hence, this project aims to contribute to achieving preventive measures on land degradation through promoting sustainable land management practices.

The NAP was developed through a series of stakeholder consultations and workshops.

The main underlying focus of the NAP is on the wise application and development of integrated and sustainable land management approaches and practices.

This NAP outlines an approach and roadmap towards an improved and enhanced way of managing land in PNG. The NAP focuses on the three main primary sectors – agriculture, forestry and mining - on which PNG has depended and will depend on. The potential of these sectors is very big and hitherto untapped and will likely undergo rapid development.

The purpose of this NAP is to help put a system into place whereby we ensure that this development is achieved applying sustainable management practices and approaches.

Acknowledgements

The Government of Papua New Guinea is deeply indebted to all stakeholders who have invested their time and effort to help ensure that this NAP has become as integral and comprehensive as possible. Everyone deserves special and personal thanks. LIST ALL ORGANISATIONS/AGENCIES.

The following deserve special thanks:

Professor Chalapan Kaluwin from the University of PNG provided invaluable suggestions and guidance and helped keep us on a strategic track and direction.

Mr. Martin Barl from OCCD contributed substantially to discussions, particularly on REDD and with experiences and approaches to decentralize and establish OCCD capacity at the local level. He also provided strategic input to the investment plan process.

The Government of Papua New Guinea (GoPNG) in partnership with the United Nations Development Programme and the Global Environmental Facility (GEF) formulated the UNDP-GEF Medium Size Targeted Portfolio Capacity Building for Sustainable Land Management (SLM) Project in 2007. At the SLM Inception Workshop in November 2010, the development of the National Action Plan was approved to begin.

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Acronyms

CI	Conservation International
CILM	Commission of Inquiry into Land Matters
CO	Country Office
CSIRO	Commonwealth Scientific and Industrial Research Organisation
CSOs	Civil Society Organisations
DAL	Department of Agriculture and Livestock
DEC	Department of Environment and Conservation
DLPP	Department of Lands and Physical Planning
DPE	Department of Petroleum and Energy
EU	European Union
FIMS	Forest Information Management System
GCU	Global Coordination Unit
GEF	Global Environment Facility
GIS	Geographical Information Systems
GOPNG	Government of PNG
GPS	Global Positioning Systems
IFAD	International Fund for Agricultural Development
KM	Knowledge Management
LIS	Land Information System
LMIS	Land Management Information System
M&E	Monitoring and Evaluation
MDG	Millennium Development Goals
MEAs	Multilateral Environment Agreements
MRA	Mineral Resources Authority
MTDS	Medium Term Development Strategy
NADP	National Agriculture Development Plan
NAP	National Action Plan/Programme
NAPs	National Action Plans/Programmes
NARI	National Agriculture Research Institute
NCSA	National Capacity Self Assessment
NDC	National Disaster Centre
NDS	National Development Strategy
NEC	National Executive Council
NFA	National Fisheries Authority
NRSC	National Remote Sensing Centre
NSDS	National Sustainable Development Strategy
NSO	National Statistical Office
OCCD	Office of Climate Change Department
PIP	Project Implementation Plan
PMU	Project Management Unit
PNG	Papua New Guinea
PNGFA	Papua New Guinea Forest Authority
PNGLIS	PNG Land Information Systems
PNGRIS	PNG Resource Information System
PNGSD	Papua New Guinea Sustainable Development Ltd

SC	Steering Committee
SGP	Small Grants Program (UNDP/GEF)
SLM	Sustainable Land Management
TOR	Terms of Reference
UNCBD	United Nations Convention on Biodiversity
UNCCD	United Nations Convention to Combat Desertification
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
UOT	University of Technology
UPNG	University of Papua New Guinea

Glossary and Definitions

Introduction

The Government of Papua New Guinea (GOPNG) ratified the United Nations Convention on Combating Desertification (UNCCD. This National Action Plan (NAP) for the UNCCD is the plan of the GOPNG to ensure that Papua New Guinea works towards meeting its international obligations of the UNCCD.

The definition of land degradation in the context of the UNCCD is:

A reduction or loss, in the biological or economic productivity and complexity of rain-fed cropland, irrigated cropland, or range, pasture, forest and woodlands resulting from land uses or from a process or combination of processes, including processes arising from human activities and habitation patterns, such as:

- *Soil erosion caused by wind and/or water*
- *Deterioration of the physical, chemical and biological or economic properties of soil*
- *Long-term loss of natural vegetation*

Two underlying challenges to sustainability in PNG are:

- Tradeoffs between Local and National needs/drivers?
  - Local: subsistence, improvement of livelihood
  - National: Food production, Infrastructure, Economic growth
- Short-term versus Long-term returns/incentives:
  - Locally: driven by short-term issues
  - Nationally: driven by medium-longer term issues

In the context of PNG, this implies preventing and mitigating general land degradation through Sustainable Land Management (SLM). Many areas under current exploitation are often unsustainably managed, with consequent environmental and related socioeconomic effects as a consequence.

The key objectives of the NAP are:

- Mainstream SLM into policies, regulations, strategies, plans, educational systems, networks
- Develop and enhance capacities for SLM
- Enhance and develop capacities for SLM knowledge management

The NAP is seeking ways in which SLM approaches can contribute to win-win solutions. This will involve integrated approaches, based on appropriate research questions.

The strategic planning documents of the PNG are hierarchical in nature. The Development Strategic Plan 2030 consists of Vision 2010-2050 (40 year Economic Strategy), Development Strategic Plans 2010-2030, Development Strategic Plan 2030-2050, and 1st Medium Term Strategic Plan 2010-2015.

The Vision 2050 describes a day in the future where the welfare of every Papua New Guinean will be well looked after. The challenge is to achieve this vision within 40 years from 2010.

The PNG Development Plan 2010-2030 sets out the strategy to achieve the Vision 2050 in the first 20 years (2010-2030) of the Vision 2050. the PNG DSP has specific targets that PNG would like to achieve by 2030. the PNG DSP is also new and different in the sense that it has moved away from the past traditional planning (business as usual) approaches and sets forth new direction and parameters for development planning. For example, this current PNGDSP (2010-2030) includes the cross-cutting sector. The cross-cutting sector contains strategies for: population, youth, gender, HIV/AIDS, Vulnerable and disadvantaged, Environment, Climate change, National Disaster Management, Public Sector Management, National Statistics Systems, and, International Relations and Security.

The Medium Term Development Plan 2011-2015 (MTDP 2011-2015) is the action plan to implement the PNG DSP in the first 5 years (2011-2015) in order to also work towards achieving our Vision 2015.

"The MTDP 2011-2015 now becomes the touchstone for all sectoral, provincial, district and local level plans. It describes the resource envelope within which the National Government will operate for the next 5 years. It sets out clearly what is to be achieved by National Government Expenditure. It provides both direction and accountability for all sector activities."
[Hon. Paul Tiensten, LLM, MP. Minister for National Planning and District Development.]

The MTDP has integrated the MDGs in the sense that it has incorporated the PNG tailored MDG targets and indicators in each respective sector logframes. It also includes a list of deliverables/activities that each sector will carry out with its costings / funding allocation (input) for the next five years.

Climate change and environmental sustainability is one of the seven strategic focus areas of Vision 2050. This calls for the promotion of sustainable development through the 'wise use' principle and emphasizes maintenance of biodiversity and sustainable use in economic planning.

The Development Strategic Plan 2010-2030 (DSP) sets out the strategy for transforming PNG from a low-income to middle income country by 2030, by quadrupling its GDP through sustained growth of 8% per annum and including the creation of two million jobs as well as opening up 20% of customary land to commercial uses.

The DSP is a broad framework and roadmap to put PNG on track to meet the Vision 2050 targets. The DSP is implemented through a series of Medium Term Development Strategies (covering consecutive five-year periods).

The GDP of PNG is dominated by the extractive sectors – in 2008, agriculture, forestry and fisheries made up around 60 percent; and mining, petroleum and quarrying made up approximately 25 percent.

The National Action Plan

The NAP for PNG is aligned with MDG-7, Vision 2050, the PNG Development Plan 2010-2030 and the Medium Term Development Plan 2011-2015.

The overarching framework consists of the following principles which shall govern the national action plan for PNG:

1. Sustainable development achieved

2. Land management governance and policy
3. Education, training and awareness
4. Knowledge information and research
5. Evaluation and monitoring
6. Partnership and financing

The NAP shall contribute towards:

The agricultural, pasture, mining, forest and other terrestrial land uses of PNG are sustainable, productive systems that maintain ecosystem productivity and ecological functions while contributing directly to the environmental protection, economic growth and social livelihood of the people of the country.

This shall be achieved through a comprehensive effort to build capacity for sustainable land management in PNG:

Capacities for sustainable land management are built in appropriate government and civil society institutions/user groups and mainstreamed into government planning and strategy development.

Stakeholder Involvement Plan

The NAP has been developed under the overall leadership of and coordination by the DEC in collaboration with the UNDP and with financial support by the GEF.

The process for developing the NAP involved wide consultations with stakeholder organizations and government agencies.

In addition, the content of the NAP was discussed in workshops with stakeholders.
The Stakeholder Matrix is shown in Annex 1.

The NAP sets out a framework that will enable organizations and agencies to enhance their contribution to and impact on society through enhanced integrated approaches. This will happen through enhancing capacities and improving access to funding. Further, the NAP sets the foundation for collaborative efforts among agencies and organisations. The emphasis of the NAP is on integrated approaches to land management, leading to sustainable management.

The ambitions set out in the NAP are only possible if everyone contributes collectively based on their mandates, strengths and comparative advantages.

Time frame and Boundary

The NAP has a ten-year horizon. Annual work plans will be developed by agencies and organizations based on the outputs and activities.

The NAP encompasses a comprehensive range of interventions designed to build capacity for developing sustainable land management systems that address the root causes of land degradation, thereby overcoming barriers to SLM. The NAP focuses on sustainability of the key land uses: agriculture, mining, forestry.

Institutional setup of the NAP

The coordination of the execution of the NAP is under the responsibility of the DEC through a committee chaired by the DEC and with a broad membership from government agencies, CSOs, private sector and donors:

- Government: Agriculture, Forestry, Mining, Climate Change, National Planning, DEC, infrastructure (Land and Physical Planning, Works)
- Research and academic
- Civil society: An NGO
- Private Sector - PNGSDP

The responsibilities of the DEC will be similar to the government's management of other multilateral agreements, and will include:

- Report to UNCCD
- Establish and formalize the committee for the NAP
- Coordinate the NAP and the development of specific workplans by individual stakeholders
- Communicate information related to UNCCD and the NAP, to stakeholders
- Facilitate cooperation among stakeholders and partners on efforts related to the NAP
- Institutionalize the UNCCD into the DEC operations
- Develop framework for implementation including all levels of government - responsibility of implementation lies at all levels of government
- Construct website for the NAP

Coordination

Inter-sectoral coordination and cooperation will be enhanced through technical working groups where experts from different sectors meet to discuss specific cross-cutting issues and to ensure mainstreaming of sustainable practices and approaches into and among sectors.

General profile of PNG, land use classification, and land use patterns

Papua New Guinea is the largest of the South Pacific island nations apart from Australia in terms of natural wealth, landmass and population base and occupies the eastern half of the island of New Guinea. Its geographical grid reference are 141^0 W and 156^0 W longitudes and the latitudes of 5^0 S and 10^0 S. Papua New Guinea gained its political independence and was declared a democratic state on the 16^{th} of September 1975. It has twenty provinces that are administrated by 20 provincial governments, and 86 districts cutting across the 20 provinces. Under the new legislation, the "Organic Law on Provincial Governments and Local-Level Governments, 1995", it created about 289 local-governments which spreads across the country. These local governments consist of Ward Councilors who represent about 6000 wards in the country.

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The people of Papua New Guinea are mainly Melanesians with minority Polynesians and Micronesians. They have lived in a communal society for over 40,000 years. Although the first expatriates were sighted as early as the 15^{th} century, the formal contact with the Europeans was made in 1884 with the establishment of the British protectorate in the south (Papua) and the German colony of in the north (New Guinea) of the country. Generally, the society in PNG has developed, over centuries, very strong traditional social structures. It is divided into different levels with the highest level being a tribe. A tribe consists of a number of clan groups and a clan is made up of several family units. Such social structure existed to maintain the welfare of the people as well as protect the land. The vast cultural diversity is reflected by the over 800 different languages in the country and that there are over ten thousand autonomous tribes with their unique social, cultural and political features.

The total land area of PNG is 464,000 km^2 (46.28 million hectares). Geologically, PNG is situated between two active tectonic plates namely the Australian plate and Indo-Pacific plate. The northern part of the country is located in a volcanic active zone and is frequently hammered by various geophysical hazards while its southern part is relatively stable. The geomorphological attributes of the country vary significantly. Geologically, PNG is a very young nation, which is constantly going through massive uplift processes.

A series of mountain chains run through the centre of the mainland and the Islands to the southeast. The landscape of PNG undergoes gradual and continuous changes due to volcanism, landslides induced by seismic activity and various denudation processes. PNG is subdivided into five major landscape regions and their fourteen associated landforms.

The climate of Papua New Guinea is tropical with relatively high temperature, high precipitation and high humidity. The major factors affecting PNG's climate are its topography and the seasonal latitudinal movement of two air masses under the influence of intertropical convergence zone (ITCZ). The variability of the climate and particularly El Nino are the most influential phenomena in the country and the wider region. The consequences include drought and frost on land and soils. In addition, several parts of the country have a savanna (Aw) climate type that has distinct annual dry and wet seasons.

Papua New Guinea has a unique flora and fauna, largely reflecting its special biogeographical location and geological conditions. Vegetation types in PNG are at the interchange of the Indo-Melanesian and Australian flora zones. Lowland vegetation of PNG is dominated by rainforest (70 percent of total landmass), whereas Montane forests dominate at higher altitudes.

Land Tenure & Land Use Trend

In Papua New Guinea, 97 percent of the land is customary land. The remaining three percent is alienated land. The customary land tenure system has existed as a form of '*social contract'* and sets the terms and conditions for land use between the members and the land group within the given society. The specific land tenure arrangements differ among different ethnic groups and associated cultures in PNG.

Almost 60 percent of alienated land is owned by government and the remaining percent is shared between Faith-Based Organizations and privately owned business entrepreneurs. State land, freehold land, and customary land can be leased provided that the applications are registered by the appropriate legislations which include "Land Group Incorporation Act, 1974" and the "Land Dispute Settlement Act, 1975". Under these legislations, the customary-oriented 'social contract' still remains intact, thus ownership also remains intact, only the land becomes registered and therefore available to the modern open market.

Annex 2 shows the major land use potential and limitations in provinces of PNG.

Agricultural lands

Agricultural land use can be divided into three broad categories: subsistence cultivation, cash cropping (indigenous), and plantation. Most indigenous people are engaged in subsistence cultivation. Many people in lowland and highland areas have moved into cash cropping, particularly tree crops such as coffee, cacao, oilpalm.

Forest resources

Forests in Papua New Guinea are the largest renewable natural resource. About 36 million hectares (75% of total land area) is forested, of which 15 million hectares is classified as productive forest containing high quality tropical hardwoods. Of these 15 million hectares, 32 percent of it is designated for forest production. However, only about 7 million hectares of the natural forest is suitable for logging. Out of that, about 3.5 million hectares have already been logged. About 4 million hectares is reserved for future development. Between 150,000 and 180,000 hectares of forest is selectively logged with a 40-year cutting cycle, while 25,000 hectares is cleared for agriculture, clear cutting and infrastructure annually. The most common species of logs and also the processed woods exported include *Burckella, calophylum, erima, kwila, malas, pencil cedar, PNG mersawa, PNG walnut, taun* and other unknown species. PNG's forest industry is under greater pressure to ensure sustainable management of forest resources, given the seriousness of the allegations raised about the legality and sustainability of large scale logging operations in PNG.

Ecosystems and Biodiversity resources

The nation is comprised of 0.5 percent beaches and ridges, 11 percent swamps, 15 percent lowlands, 43 percent foothills and mountains up to 1000m above sea level, 25 percent mountains 1000-3000m and 4 percent above 3000m. About 5-7 percent of the world's total terrestrial biodiversity exist in PNG. PNG's forest ecosystems and its genetic biodiversity is one of the richest in the world. Over 9,000 species of higher plants, including 1,500 species of forest trees

are found in PNG, as well as over 700 species of birds, two hundred species of mammals, 15,000-20,000 species of vascular plants, and so on.

PNG is recognized as one of four mega-diversity areas of the world. Some flagship species of socio-cultural, economic and spiritual significance to the country. The future "food basket" and sources of future medicines and cures. Much of the country's unique flora and fauna species are under threat of being depleted and some close to extinction, due to overexploitation and unsustainable development practices. Yet, much of it is less visible and less charismatic biodiversity remains undocumented, such as viruses, bacteria, algae, and fungi are needed. Databases are needed.

Soil & Water

Soil types in PNG vary considerably. Most is volcanic in origin and ash soil (or *andisols)* are common in the higher altitudinal areas as well as the islands regions towards the southeast, and have higher water-holding capacity and higher ability to fix large quantities of phosphorus, compared to other soils.

PNG is a water-rich nation, with approximately 9 hydrological drainage basins and some 5,383 freshwater lakes. Water consumption is derived from precipitation, water supply schemes, irrigation, dams, wells, stream and rivers. An estimate of the internal renewable water resources is about 801.0 km^3/year. The average precipitation varies across the nation. Access to good quality water in sufficient quantity for domestic, agricultural and industrial purposes is costly in areas where average rainfall is below normal. Thus, good water supplies are often very limited in some of the most remote areas and in some urban centres.

Socio-Economic Context

From the mid 1980s, PNG has maintained a steady economic growth and an increasing GDP, except a decline during the 1990s. During the first decade of the 21st century, favorable external market conditions, political stability, efforts to curbe corruption and prudent monetary and trade policies, as well as firm fiscal management, contributed to 3,5 percent increase in growth.

Population

The current population of PNG is 6,732,000 people (estimate in 2009) with an annual growth rate of nearly 3 percent. The life expectancy in PNG is about 54??? years, with an infant mortality rate of 64 deaths per 1000 live births, and the maternal mortality rate is 300 deaths per 100,000 births. The adult literacy rate and the completion rate of primary school is about 52 percent and 59 percent respectively.

Civil society in PNG has also been affected by an escalating law and order situation, as well as poverty, security, governance issues, land tenure arrangement, limited infrastructure, lack of basic services, increasing environmental disasters and HIV/AIDS. Generally, the quality of life has significantly deteriorated and level of unemployment has reached an unprecedented level over the years.

Causes of Land Degradation

The broad causes of land degradation are:

- Inappropriate management practices – Improvement of management practices
- Lack of policy implementation – Strengthen policy implementation and enforcement
  - Human/financial resources – Enhance resource allocations to human/financial resources
  - Lack of awareness and understanding of sustainability (local, provincial, national)
- Inappropriate policies
- Natural disasters
- Lack of incentives, and, Disincentives
- Governance, ownership, tenure, corruption
- Institutional setup

A detailed Root Cause Matrix is presented in Annex 3.

Land tenure in PNG is complicated and is dominated by the traditional customary land ownership. This tradition and system has existed for millennia and have worked particularly well for the local communities where collective and shared responsibilities among families and households. However, pressures for resources and large-scale production have intensified considerably.

Agriculture

Only one percent of the total land area of PNG is currently arable and used for agricultural production. This coupled with less than optimal food distribution. Marginal lands amount to about 30 percent of the total land area and may be suitable for sustainable agricultural production, although this may not be readily available for agriculture due to geographical, ownership, financial and infrastructure limitations and may restrict its productive usage.

Agriculture is undergoing gradual and significant change towards a more commercialized sector in response to global market demands and opportunities. In villages and communities, cash cropping increasingly replace subsistence food crops - coconut, coffee, tea, sugarcane, oil palm and peanuts – which are typically grown on flat and fertile land. Subsistence food production is retained on sloping hillsides. Commercial vegetable farming is on moderate to steep slopes and often with inappropriate soil conservation measures. High quality arable lands are gradually becoming scarce due to population increase and increasing production. Further, increasing production pressures have caused shortened fallow periods which gradually has led to reduced crop yields.

In addition, soil erosion problems associated with unsustainable agricultural practices at the commercial or subsistence level are increasing in many parts of PNG on steep sloping fertile lands, due to overexploitation and mismanagement causing soil erosion. Soils under intense farming pressure are subject to fertility depletion due to decline in soil organic matter, leaching and acidification. Thus, nutrient demanding (e.g., corn for home consumption) receive very little fertilizers with consequent soil depletion. Soils in many provinces such as Western Highlands and Morobe are severely depleted in nitrates and phosphates. Phosphate and nitrates replacement through commercial fertilizers is expensive due to long transport distances and import from overseas. Lack of effective management and soil fertility maintenance techniques particularly on customary land has transformed fertile marginal lands into degraded and/or potentially degradable land.

Overgrazing

Overgrazing by domestic livestock husbandry causes severe land degradation in PNG. In savannah areas/provinces the dry season limits growth of grasses, and therefore these areas are also typically overgrazed. Overgrazing causes gradual depletion of soil and nutrients and further loss due to sheet erosion. Over time, good quality forage species are gradually replaced by low quality forage plant species with relatively shorter reproductive cycles. Poor pasture management has led to significant weed problems such as in the lower Markham area of Morobe Province. Introduction of more appropriate pasture species is necessary but rather expensive.

The tribal ownership structure also poses challenges in terms of addressing overgrazing. Pastures are generally state-owned whereas livestock are privately owned. Most of the smallholders' grazing areas are tribal pastures and can only sustain low pasture and livestock productivity. There is no lease system for pasturelands, no viable models for sustainable management for these pastures, no policies, and a need to promote sustainable management.

New approaches should be more participatory, involving livestock owners, as well as combining top-down and bottom-up approaches to jointly enhance design, management, monitoring and evaluations.

Further, there is a need for enhancing capacity on expertise in common pasture management (conceiving, testing and adaptively modifying sustainable grazing systems) and participatory pasture/natural resource management approaches.

Some grassland areas have been 'enhanced' through establishment of plantations, but it is acknowledged that these have not sufficiently been integrated with the agricultural and forestry sectors. The plantations may again become open access grazing lands if they are not properly managed. Or alternatively being converted to oil palm ventures due to the short-term financial benefits to owners.

Towards sustainable agriculture

There are, though, positive changes towards more sustainable agricultural practices. For example, minimum tillage best practices are used by large and small sugarcane farmers in Markham in Morobe Province, a key agricultural production area of PNG This practice minimizes erosion and maintains soil organic matter thereby ensuring that soil fertility is maintained. There are still planters who burn residues from sugar, coconut trees, tea, banana and grasslands which exposes the soil to erosion.

Mechanization is happening in the management of many crops. However, there is little solid knowledge of the possible consequences of this mechanization, such as soil compaction. Also, new weeds from plantation forestry areas are increasingly causing problems.

Some crops have been profitable thanks due to international subsidies, e.g., support from the European Union for sugar cane for more than 20 years. Major uncertainties still remain on the sustainability of the likely alternatives to sugarcane, when the sugar cane subsidy ends. Oil palm has proven a likely alternative.

Agricultural production in the 19 provinces is performed by a few large companies and the many small community farmers. Virtually all land is tribal/clan owned with some subsistence farming. The lease system for agricultural lands is no longer functional as lands have been returned to landowners or clans. Investing in sustainable practices requires certainty about the future, and the uncertainties of land tenure may discourage major investments in the agricultural sector.

Further, there is a widespread need for public awareness and training on improved land management strategies. This should increasingly apply bottom-up approaches focusing on smallholder or clan agricultural extension. Specifically, there is a need for enhancing appropriate policies, incentives and monitoring systems.

Deforestation

Large-scale destruction of tropical forest resources is a major impediment to ecological and economic sustainability, including the loss of goods and services provided by forest and forest ecosystems for local communities as well as watershed services. Deforestation contributes to climate change through the greenhouse effect and the sustainable management of PNG's vast forests are thus of global significance. At the local level, deforestation reduces and changes local rainfall patterns and exposes topsoil and thus susceptible to severe erosion and preventing natural forest regeneration.

Deforestation is a very big problem along the mainland coast and island provinces of PNG that have a number of large forestry programmes. These areas have increasingly been deforested over the past 50 years. There is certainly a need to enhance forest protection and enforcement of existing regulations. Most deforestation in PNG is on privately/clan owned forestlands. Enhanced monitoring and quantification of these trends are needed.

The GoPNG introduced a ban on clearing forests in river reserves and mountain reserves but stronger enforcement is needed.

Other reasons for clearing of forest are cattle pastures on both private and tribal/community lands. On customary lands, deforestation is for subsistence agriculture. The GoPNG acknowledges the need for more effective regulations.

Reforestation

Reforestation as a means to reduce land degradation has progressed substantially over the past three decades, particularly in East New Britain, Madang, and Morobe provinces, through exotic and recently native species. To ensure financial sustainability of these initiatives, the full economic potential of these plantations need to be fully developed and realized.

Conversely, oil palm and vanilla plantations have high financial returns and have thus been attractive to communities and overseas companies.

Enhanced monitoring and enforcement are needed to ensure that clearing of virgin forest land is kept to a minimum to avoid soil degradation and pollution to the coastal communities in provinces of West New Britain, Milne Bay, Oro, Madang, Morobe and Western provinces.

Mining and petroleum development

Mining and petroleum operations are important for PNG, both for domestic consumption but in particular for export to create critical revenues. The challenge is to balance benefits to society (at both local and national levels, i.e., jobs and revenues) with negative adverse impacts. Some impacts of mining operations on the landscapes in which the operations are located, are unavoidable. Thus, several mines have operated for decades and have had substantial adverse impacts on surrounding communities and environment, including clearance of existing vegetation and changing habitats, e.g., through pollution and sedimentation loads into terrestrial and aquatic ecosystems.

Therefore, the GoPNG initiated a review of policies related to both design and rehabilitation during closure of such sites. This helps move the mining industry towards more responsible standards. Land rehabilitation programmes shall ensure that adverse impacts are temporary. GoPNG has developed a sustainable mining policy, which recognizes the rights of people on community lands. Past mistakes at mining sites will be avoided in the future.

Fire

The western rain shadow side of mountains and the Eastern sides of mountains, as well as Central, Milne Bay and Gulf Provinces are now dominated by fire-adapted exotics species and grasses, due to gradual conversion of the natural forests from fires. Local communities have contributed to these fires as part of converting forest lands to areas for grazing, subsistence agriculture and collection of firewood. The slopes used to be used for grazing lands and firewood. Although grazing is no longer economically viable, fires are frequent during the dry season (June to late November) thereby preventing natural regeneration of woody species. Fires are often set to catch wild games and preparing land for subsistence gardening.

Fire prevention programs and the capacity at the provincial level should be enhanced. Further, improved reforestation techniques are required.

Use of chemicals and plant residues

Chemicals used in the agriculture and mining sectors have caused harm to the land and water resources and to human health. There is also evidence that some pests and diseases have developed resistance to specific pesticides.

Natural Disasters

PNG is increasingly challenged by recurring natural disasters such as droughts, mass land slides, volcano eruptions, and floods. These cause considerable environmental damage, destruction of agriculture activities, loss of life, and with significant consequences for the national and local economy.

Enhanced efforts to mitigate the impacts and reduce associated risks remain important.

Institutional Framework

Institutional and Governance Barriers to Sustainable Land Management

The GoPNG is committed to sustainable development and is working to improve alignment of resources and state agencies towards the sustainability agenda. The GoPNG aims to ensure continuity and a critical mass of people within key departments. This is necessary to ensure policy coherence and securing resources for implementing the obligations of the GoPNG to the MEAs including the UNCCD.

Enhancing the institutional capacity is important to enable development and implementation of land development programs. Institutional capacity (manpower, skills, and attitudes) and institutional systems (planning, implementation, monitoring, training and management) will be enhanced

Annex 4 provides an overview of related government agencies and institutions at central and local levels, respectively, including research and development.

Legal and Policy Framework

Annex 5 provides an overview of national laws, acts, regulations and policies relevant to natural resources and the environment.

PNG is also bound by several other global and regional mandates for sustainable development, including signatory to most UN conventions, with which there are obvious potential linkages to the NAP (Annex 6).

UNFCCC

There are substantial possible synergies and linkages between SLM and REDD, because many of the initiatives and efforts under the proposed REDD scheme are very similar to and in support of those needed for SLM.

The REDD PNG National Development Programme is in the process of developing the legal and administrative practice for REDD+.

In the context of SLM, the relevant REDD+ abatements include:

- Reduced Impact Logging
- Sustainable Forest Management
- Reforestation
- Shift oilpalm to degraded grasslands
- Driving subsistence agriculture away from primary forest
- Moratorium on new timber and agricultural leases

REDD+ will apply a participatory approach through stakeholder engagement at all levels - central, provincial, district and local levels. Consultations and mechanisms for coordination and dialogues are being established at local levels.

Pilot sites on REDD are sought to be established.

    - UNCBD
    - Other Multilateral Environmental Agreements, international and regional
- Linkages and synergies with other national and regional issues
    - Disaster risk reduction and management
    - …
- National land use policy and planning
- Land degradation monitoring and assessment
- Programmes and schemes for addressing land degradation
- Governance and land tenure systems and policies
- Integration and incorporation of sectoral policies

Infrastructure

The importance of infrastructure as a key driver of change is wellknown from all over the world.

Planning

- Thematic programmes and projects
    - Providing enabling conditions
    - Land degradation and soil inventory and monitoring
        - Surveys
        - Scale and level of mapping
        - Use of remote sensing tools
        - Forest cover assessments
        - Type and extent of land degradation)
    - Measures to combat and mitigate effects of land degradation
        - Rehabilitation of degraded lands
        - Improvement of irrigation facilities and water conservation
        - Silvo and agro-pastoral development, agroforestry
    - Monitoring and evaluating climatic variation (relationship between climate and desertification / degradation of land; rainfall distribution, climate and weather forecasting)
    - Empowerment of local communities and local institutions
    - Providing guidelines and manuals
    - Creating and improving market systems

- Management of Natural Resources
    - Land management and planning processes
    - Water resources
        - meeting water requirements of the country: drinking, irrigation, …
    - Environmental issues
    - Consideration of scale of operations:
        - Larger scale and medium scale – farming and plantations
        - Small scale – traditional shifting cultivation
    - Exploitation of mineral resources
    - Unsustainable agricultural practices
    - Unsustainable forestry practices

- Management for food, fuel, fodder and energy requirements
    - Food security
    - Fuel-fodder security
    - Meeting rural energy needs

Research and development: integrated approach

The Role of science and research must be strengthened. Policies should be based on thorough and sound research and science. The government of PNG shall seek to improve the linkages and synergies between policy and extension agencies on the one hand, and research agencies on the other hand. The strong capacity of the existing research agencies will be further improved and the role of applied research on sustainable land management shall be enhanced and mainstreamed into policy-setting government agencies. We shall continue to collaborate with CSOs which often possess a strong research capacity. There are already good examples and experiences of collaborative efforts between government agencies and CSOs, where the latter complement the government in terms of specific research questions.

- Monitoring mechanism on land degradation

- Capacity building and Human Resources

The Action Plan

The overarching framework of the NAP was presented earlier. For each principle under the NAP, a set of outcomes, outputs and activities have been identified. Outcomes and outputs are presented here, and the associated activities presented in Annex 7.

Principle

1. Sustainable Development

Outcome

1.1 SLM incorporated into existing development policies will encourage and generate economic growth, alleviate poverty and improve livelihoods while maintaining sustainable/stable ecosystems

Output

1.1.1 Environmental governance of the natural resource base and maintenance of ecosystems improved – through a strengthened regulatory process

1.1.2 Income earning opportunities through SLM practices increased, through the application of best practices

1.1.3 Access to basic goods and services for the rural/local communities improved – relevant social and physical infrastructure developed

2. Land Management Governance and Policy

2.1 Capacity building strengthened

2.1.1 Human resources at all levels strengthened

2.1.2 Database / IT facilities developed and enhanced

2.1.3 GIS and mapping/surveying facilities enhanced

2.1.4 Valuation techniques and models of SLM (including environmental services) developed and tested

2.1.5 Physical planning improved

2.1.6 Educational tools for SLM developed and enhanced

2.2 Granting of titles strengthened

2.2.1 Existing procedures to be supplemented by a checklist for endorsement and approval at all levels of government authorities

2.3 Policies developed and strengthened

2.3.1 Land use policy (SLM)

2.3.2 Land mobilization policy

2.3.3 Relevant existing policies reviewed

2.4 Legislation developed

2.4.1 New legislation developed, based upon review and amendment of ILG Act 2009 and Customary Land Registration Act 2009, Land Use Act (SLM), Lands Act 1996.

3. Education, Training and Awareness

3.1 To enhance and achieve sustainable development and sustainable land management issues through development of capacity building and human resources of the country, communities and stakeholders

3.1.1 M&E Taskforce established

3.1.2 SLM training program developed

3.1.3 Education program on SLM developed

3.1.4 Awareness programs on SLM prepared

4. Knowledge Information and Research

4.1 Knowledge information and research system on SLM, enhanced

- 4.1.1 SLM research objectives to be identified
- 4.1.2 Database of and access to global knowledge on SLM established
- *4.1.3 SLM tools and technologies developed, enhanced and synergized.*
- 4.1.4 SLM piloted in provinces and communities
- 4.1.5 Exchange of national experiences on SLM

5. Evaluation and Monitoring

5.1 Progress of the NAP monitored and evaluated

- 5.1.1 Monitoring and evaluation plan for SLM developed
- 5.1.2 Monitoring and evaluation of SLM programme performed
- 5.1.3 Reporting to UNCCD on progress and performance of NAP

6. **Partnership and Financing**

6.1 Partnerships developed and strengthened, and sustainable financing mechanisms instituted, to address all aspects of SLM

- 6.1.1 Public-private partnerships to promote SLM, strengthened
- 6.1.2 Financing agreements, MOUs between National Government and Development Partners, developed
- 6.1.3 All relevant government agencies at national and provincial levels, as well as CSOs and industries, engaged to access financing to manage and implement SLM initiatives

Cross-cutting Issues

- Gender
- Use of traditional knowledge

Short-term, medium-term, and Long-term interventions for combating land degradation in PNG:

A priorisation of outcomes and outputs, respectively, is outlined in Annex 8.

Strategy for Communication, Information and Dissemination

The need for an integrated communication and dissemination strategy is important. The strategy shall include all aspects of the SLM approach. The mechanisms by which these issues should be addressed include: awareness, training, compilation, information on approaches, conceptual frameworks, pilot demonstration sites.

Financing and Resources Mobilization, including investment policies

Funding is a pre-requisite to implement the NAP. Total costing of the NAP has not been attempted. This section focuses on identifying strategic funding opportunities in relation to prioritized outcomes and outputs. All possible funding sources will be solicited for the NAP (Annex 9).

A funding and costing plan for the National Action Plan for PNG for the next 5 to 10 years shall be prepared for individual outputs and activities of the NAP and will be the responsibility of relevant agencies and organizations. A matrix of outputs and possible / likely investors is presented for the agricultural, forestry and mining sectors, respectively (Annexes 10, 11, 12). Synergies among sectors with respect to common funding schemes shall be sought and explored.

This will be used as the basis for bilateral and multilateral negotiations with international partners as well as Private Sector Partners.

Four main categories of investors and investment relationships are considered relevant: Government, Multi-laterals, Bilaterals, and, Public-Private-Partnerships (PPP).

Counterpart Government funding for SLM

If the Department of Environment and Conservation (DEC) needs to seek funding for a specific component of the SLM programme from the National Government, the executing agency (i.e., DEC) will have to submit a project proposal for funding under the Public Investment Program (PIP) in order for the project to be included in the development budget. There is a project document format in which the project proposal will adhere to and this must be submitted before June 30th in a year to be appraised and considered for funding in the next coming year.

PPP

A policy framework for PPP with government is pending. PPP offers potentially immense opportunities both in terms of funding and real impacts on the ground. But collaboration with the private sector is often considered as risky and with concern, both by government and by CSOs. PPP arrangements could serve to ensure proper integration with other sectors.

Levies from from specific sectors

In the case of forestry, levies (approximately Kina 50 million) from logging companies are allocated to reforestation efforts. This is managed by PNGFA. The LNG project will have

potentially big impacts on the environment and on development, both at the national level on general budget allocations, and at the local level on areas surrounding the LNG project.

Multilaterals

The WB is generally involved in land issues, including mining as well as agriculture (cf. coffee, oilpalm, cocoa).

The GEF has allocated USD 20 million for biodiversity, climate change and land degradation.

The EU tends to focus on agriculture and livelihoods issues.

IFAD has expressed interest to support mainstreaming of SLM into national plans and strategies, for human resource development in key sectors and for developing knowledge management capacities for integrated SLM and for completing the NAP.

The International Tropical Timber Organisation (ITTO). PNGFA is an affiliated member of ITTO, through an annual membership fee of USD 250,000.00. ITTO provides technical support in terms of capacity building and provides funds in several projects related to sustainability, such as afforestation of grassland areas and also Forest Law Enforcement and Governance workshops.

Bilaterals

JICA (Japan) has been supportive of PNGFA in terms of capacity building and has also provided technical support. JICA is currently involved in the establishment of a Remote Sensing Unit in PNGFA and capacity building in the form of training to forestry officers in Information Technology and Remote Sensing.

Strategic Priority Areas

Attention and fund raising should focus on the following strategic key gaps for each of the three main sectors, agriculture, forestry and mining:

Agriculture

- There is no one specific policy on SLM in place (cf. Output 1.1)
- Lack of specialist human resource to support research and development in SLM (cf. Output 2.1)
- Standardise check-list for issuance of land titles (cf. Output 2.2)
- Need for review of the Lands Act with reference to SLM benefits (cf. Output 2.4)
- Facilitators and educators trained (cf. Output 3.1)
- Lack of nationwide awareness about SLM (Output 3.1)
- Strengthen existing agricultural research and training providers in PNG (cf. Output 4.1)
- Lack of application of research findings (cf. Output 4.1)
- Develop specific indicators for M&E purpose (cf. Output 5.1)
- Lack of partnership with farming communities and farmers organisations and access to credit facilities – e.g., womens groups, youths (cf. Output 6.1)

Forestry

- Forestry investment interventions
    - RIL, Sec. Forest Mgmt, Forest Conservation, Reforest./Afforest., Forest extension services, Forest Research (MPTS), agroforestry, fire mgmt.

  - REDD+
- Govt. shall invest into ensuring that the forest sector resource is developed under the principles of SFM
- Economic oportunities for forest conservation shall be encouraged
- Govt. through PNGFA shall invest into the tree plantation development and afforestation of grassland areas
- Govt. through PNGFA shall revive and strengthen forest extension services to the rural areas
- Govt. through PNGFA shall encourage and strengthen forest research and training on multi-purpose tree species
- Govt. through PNGFA and DAL relevant stakeholders shall facilitate investment opportunities under PPP etc for agroforestry development
- Govt. through PNGFA and PNG Fire Services encouraged to strengethen Fire management in rural communities
- Govt. shall enable the REDD+ programme by relevant funding streams through all of government approach and PPP

Mining

- Provisions of the mining closure policy and the mine rehabilitation plan (MRA) included in the current review process, by DNPM????
- More incentives to ILGs within mining sectors to enhance the knowledge on SLM best practices – MID-LONG TERM
  - PPP
  - Tax credit scheme
- How SLM practices can be captured under PPP arrangements

Conclusions

The NAP presented here will naturally function as a working document, which continuously will need further revision and attention, as development progresses.

Three cross-cutting areas will deserve additional attention and consideration beyond what has been possible in this document, viz. land rights and access, disasters and gender.

Land rights and access is one of the fundamental challenges towards improving sustainable land management in PNG. Making general solutions are difficult, because of the many different local rules in relation to issuance of land titles. It is noteworthy that the primary focus and priority of the NADP is on small-holders. The local SABL is a contentious issue and the government has recently issues a temporary moratorium on new SABLs. In addition, the OCCD is working towards establishing complete audits on already-existing SABLs.

The need for baselines in virtually all sectors under the NAP was highlighted as being crucial. It was argued that without baselines on land use and practices, it is very difficult or even impossible to measure progress in performance (against targets, through indicators). Baselines are necessary for proper identification of areas for intervention and initiatives.

The lack of a national land use plan was highlighted as very crucial. Again, however, development of a national land use will depend on good baseline data.

Innovative ways for funding the establishment of, and jointly managing, protected areas will be pursued. Experiences from elsewhere in the world might be useful and relevant in PNG. For example, perhaps private sector companies could become involved in protected area conservation and management, as a means to offset some of the adverse impacts which the company might have, and/or as part of efforts to improve the corporate responsibility profile of the company.

Mining investments in PNG are booming and can potentially have substantial positive impact on the development path of PNG. The mining law is under revision and will be updated to suit the current circumstances… this will include enhancing attention to social and environmental responsibility and sustainability. This shall help ensure that benefits from the mining boom are shared more equitably across the society including the local communities.

Changes in market requirement can potentially be a driver of changes in land use and practices. Thus, certification requirements are examples where the markets can demand and impose improved management regimes and practices on production and land use.

Policies should be based on thorough and sound research and science. The government of PNG shall seek to improve the linkages and synergies between policy and extension agencies on the one hand, and research agencies on the other hand. The strong capacity of the existing research agencies will be further improved and the role of applied research on sustainable land management shall be enhanced and mainstreamed into policy-setting government agencies. We shall continue to collaborate with CSOs which often possess a strong research capacity. There are already good examples and experiences of collaborative efforts between government agencies and CSOs, where the latter complement the government in terms of specific research questions.

The need for awareness and knowledge management is broad and multifaceted and is key element of this National Action Plan. This is a combination of education and training. An effective communication strategy has been developed to ensure that the key target audiences are reached.

Sustainability is both conceptually and technically very complex. Developing common understanding of what SLM entails at both the strategic level and at terms of on-the-ground efforts will need continuous efforts. Thus, the NAP sets out a plan for further systematic efforts to build stronger understanding of the importance of SLM and its role in the national context, particularly at the sub-national level and at local level. This also includes a formal review of practical tools and methods in the local context.

References

Annexes