United Nations Development Programme
Country: Zambia

PROJECT DOCUMENT[1]

Project Title: Promoting climate-resilient, community-based regeneration of indigenous forests in Zambia's Central Province

UNDAF Outcome(s): 4 – Climate change, Environment and Disaster Risk Reduction and Response

UNDP Strategic Plan <u>Primary</u> Outcome: Outcome 5: Countries are able to reduce the likelihood of conflict and lower the risk of natural disasters, including from climate change

UNDP Strategic Plan <u>Secondary</u> Outcome: Outcome 1: Growth and development are inclusive and sustainable, incorporating productive capacities that create employment and livelihoods for the poor and excluded

Expected CPAP Outputs:

CPAP Focus Area 2 (Sustainable Environment and Climate Change), Output 2: Vulnerable communities better equipped when faced with climate change.
CPAP Focus Area 2, Output 3: More effective preservation interventions for the environment and ecosystem

Executing partners/Responsible Parties: Forestry Department – Ministry of Land, Natural Resources & Environmental Protection

Implementing Entity: Ministry of Lands, Natural Resources & Environmental Protection, Forestry Department

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[1] For UNDP-supported, GEF-funded projects as this includes GEF-specific requirements.

Brief Description

Climate change – including rising temperatures and an increased frequency of droughts and extreme rain events – is negatively affecting local communities living in rural parts of Zambia. Miombo woodlands provide a range of benefits that increase the resilience of these communities to climate change. Such benefits include regulating and provisioning services. However, miombo woodlands are being degraded as a result of unsustainable land management and exploitation of natural resources. This degradation is exacerbated by the aforementioned effects of climate change. Such effects reduce the capacity of these woodlands to protect vulnerable communities from the increasingly negative impacts of climate change that are threatening their livelihoods.

Currently, restoration and livelihood development initiatives in Zambia do not adequately take into account climate change-related risks and adaptation needs. Furthermore, the capacity of Zambia's Forestry Department (FD) to plan and implement appropriate adaptation interventions is hindered by limited institutional and technical capacity.

The preferred solution to the climate change problem in Zambia is to reduce the vulnerability of local communities by: i) enhancing the capacity of the FD and local communities to plan for adaptation to climate change; and ii) implementing adaptation interventions that increase the resilience of miombo woodlands using a community-based approach. However, there are multiple barriers to achieving this preferred solution, including *inter alia*: i) limited technology for adaptation and sustainable management of miombo woodlands; ii) limited finances for adaptation; and iii) a weak policy environment and institutional capacity for mainstreaming adaptation that is community-based.

The UNDP-implemented, LDCF-financed project will contribute to overcoming these barriers using an integrated approach. In particular, the project will: i) strengthen technical and institutional capacity of foresters and communities in Central Province to plan and implement climate-resilient agro-forestry and assisted natural regeneration in miombo woodlands; ii) establish robust fire monitoring and management protection plans in all districts in Central Province to maintain regeneration in these woodlands and reduce fire frequency; and iii) replace inefficient charcoal production and wood-saving technologies with efficient systems. Local communities at project intervention sites will be included in the selection and implementation of the activities, with a particular focus on enabling the most vulnerable members of these communities, including women.

Programme Period:	2015-2019
Atlas Award ID:	00086025
Project ID:	00093441
PIMS #	4712
Start date:	June 2015
End Date	June 2020
Management Arrangements	NIM
PAC Meeting Date	_____

Total resources required		US$ 32,915,090
Total allocated resources:		US$ 32,915,090
• Regular		US$ 100,000
• GEFLDCF		US$ 3,885,000
• Other:		
	CERED	$147,661
	COMACO	$11,000,000
	ZCCN	$980,000
	ZIEM	$746,057
	Pioneer	$3,190,000
	Environment Africa	$386,372
	MLNREP	$11,420,000
	Kasanka Trust	$1,060,000

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Agreed by (Government):   Date/Month/Year

_____

Agreed by (Executing Entity/Implementing Partner):   Date/Month/Year

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Agreed by (UNDP):   Date/Month/Year

Table of Contents

List of Acronyms

ADC	Area Development Committee
AER	Agro-Ecological Region
AF	Agro-forestry
AFIS	Advanced Fire Information System
ANR	Assisted Natural Regeneration
APR	Annual Project Review
BAU	Business As Usual
C	Carbon
CAMPFIRE	Communal Areas Management Programme for Indigenous Resources
CBD	Convention on Biodiversity
CBNRM	Community-Based Natural Resource Management
CBO	Community-Based Organisation
CBU	Copperbelt University
CCA	Community Conservation Area
CCB	Climate, Community and Biodiversity standard
CDM	Clean Development Mechanism
CE	Conversion Efficiency
CERED	Centre for Environmental Research, Education and Development
CFU	Conservation Farming Unit
CH_4	Methane
CIFOR	Centre for International Forestry Research
CO	Country Office
CO_2	Carbon dioxide
COMACO	Community Market for Conservation
COMESA	Common Market for Eastern and Southern Africa
CPAP	Country Programme Action Plan
CPPP	Community Public-Private Partnership
CR	Climate Resilience
CRB	Community Resource Board
CSO	Civil Society Organisation
DACO	District Agricultural Coordinator
DAPP	Development Aid from People to People
DDCC	District Development Coordinating Committee
DNREP	Department of Natural Resources and Environmental Protection
DNRMP	Decentralised Natural Resource Management Programme
DRB	Demonstrably Renewable Biomass
DRC	Democratic Republic of Congo
EPNRMP	Environmental Protection and Natural Resource Management Programme
ERBMP	Enhanced Results-Based Management Platform
ERC	Evaluation Resource Centre
FAO	Food and Agriculture Organisation of the United Nations
FD	Forestry Department
FDI	Foreign Direct Investment
FLES	Forestry and Livelihoods Economic Survey
FNDP	Fifth National Development Plan
GART	Golden Valley Agricultural Research Trust
GEF	Global Environment Facility
GHG	Greenhouse gas
GIS	Geographical Information Systems
GMA	Game Management Area
GRZ	Government of the Republic of Zambia
GWP	Global Warming Potential
HH	Household

ICRAF	World Agroforestry Centre
ILUA	Integrated Land Use Assessment
IP	Implementing Partner
IPCC	Inter-Governmental Panel on Climate Change
IUCN	World Conservation Union
KNP	Kafue National Park
LDCF	Least Developed Countries Fund
LE	Law Enforcement
LIMS	Land Information Management System
LULUCF	Land Use, Land Use Change and Forestry
MAL	Ministry of Agriculture and Livestock
MCDMCH	Ministry of Community Development, Mother and Child Health
MDG	Millennium Development Goal
MEA	Multilateral Environmental Agreement
MESA	Monitoring for Environment and Security in Africa
MLNREP	Ministry of Lands, Natural Resources & Environmental Protection
MMEWD	Ministry of Mines, Energy and Water Development
MRV	Measuring, Reporting and Verification
MTENR	Ministry of Tourism, Environment and Natural Resources
MTR	Mid-Term Review
NAP	National Adaptation Plan or National Agricultural Policy
NAPA	National Adaptation Programme of Action
NBSAP	National Biodiversity Strategy and Action Plan
NCCDC	National Climate Change Development Council
NCCP	National Climate Change Policy
NCCRS	National Climate Change Response Strategy
NCSP	National Communications Support Programme
NDP	National Decentralisation Policy
NEP	National Energy Policy
NGO	Non-Governmental Organisation
NIM	National Implementation Modality
NMOC	Non-Methane Organic Compound
NP	National Park
NPE	National Policy on the Environment
NPP	Net Primary Production
NSREDD	National Strategy for Reducing Emissions from Deforestation and Forest Degradation
NTFP	Non-Timber Forest Product
PA	Protected Area
PES	Payment for Ecosystem Services
PFAP	Provincial Forestry Action Plan
PFM	Private Forest Management
PIF	Project Identification Form
PIM	Programme Identification Mission
PIR	Project Implementation Report
PIU	Project Implementation Unit
PM	Project Manager
PMC	Project Management Cost
PPR	Project Progress Report
PPCR	Pilot Programme on Climate Resilience
PPP	Public-Private Partnership
PTR	Project Terminal Report
RE	Renewable Energy
REDD	Reducing Emissions from Deforestation and Forest Degradation
RET	Renewable Energy Technology
SADC	Southern Africa Development Community

SASSCAL	Southern Africa Science Service Centre for Climate Change and Adaptive Land Management
SE4ALL	Sustainable Energy for All
SFM	Sustainable Forest Management
SLM	Sustainable Land Management
SNDP	Sixth National Development Plan
SOC	Soil Organic Carbon
TACC	Territorial Approach to Climate Change
TFAP	Tropical Forest Action Plan
TRAC	Target Resource Assignment from the Core
TNA	Technology Needs Assessment
TNC	The Nature Conservancy
UNCCD	United Nations Convention to Combat Desertification
UNDAF	United Nations Development Assistance Framework
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
USAID	United States Agency for International Aid
VAG	Village Action Group
VCS	Verified Carbon Standard
VER	Verified Emission Reduction
VNRMC	Village Natural Resource Management Committee
WCS	Wildlife Conservation Society
WLNP	West Lunga National Park
WWF	World Wide Fund for Nature
WWF-SARPO	World Wide Fund for Nature-Southern Africa Regional Programme Office
ZAMSIF	Zambia Social Investment Fund
ZAWA	Zambia Wildlife Authority
ZEMA	Zambian Environmental Management Agency
ZESCO	Zambia Electricity Supply Corporation
ZFAP	Zambia Forestry Action Plan
ZMK	Zambian Kwacha
ZNFU	Zambia National Farmers' Union

List of Annexes

Annex 1:   Climate change analysis
Annex 2:   Miombo woodlands
Annex 3:   Project Preparation Stakeholder Report
Annex 4:   Letter of Agreement
Annex 5:   Stakeholder involvement table
Annex 6:   Terms of Reference for project personnel
Annex 7:   Co-financing letters
Annex 8:   Adaptation Monitoring and Assessment Tool
Annex 9:   Social and Environmental Screening Tool
Annex 10:   Risk Log

1. SITUATION ANALYSIS

1.   Zambia is a Least Developed Country (LDC) in southern Africa. This country is landlocked and has an area of 752,618 km[2]. Zambia's terrain is mostly high plateau, with some hills and mountains dissected by river valleys (Figure 1). The country is divided into three agro-ecological zones (Figure 2), with rainfall being the main climatic factor for this division[2]. In 2013, the population of the country was estimated to be ~14 million people, with an average growth rate of ~2.8%[3]. A large portion of the population is in Lusaka in the south and the Copperbelt to the northwest. Despite progress that has been made in the country's economic and financial performance over recent years[4], Zambia still faces widespread poverty: approximately 60% of the population live below the international poverty line of US$1.25 per day. Moreover, there are notable disparities in incomes between rural and urban areas[5].
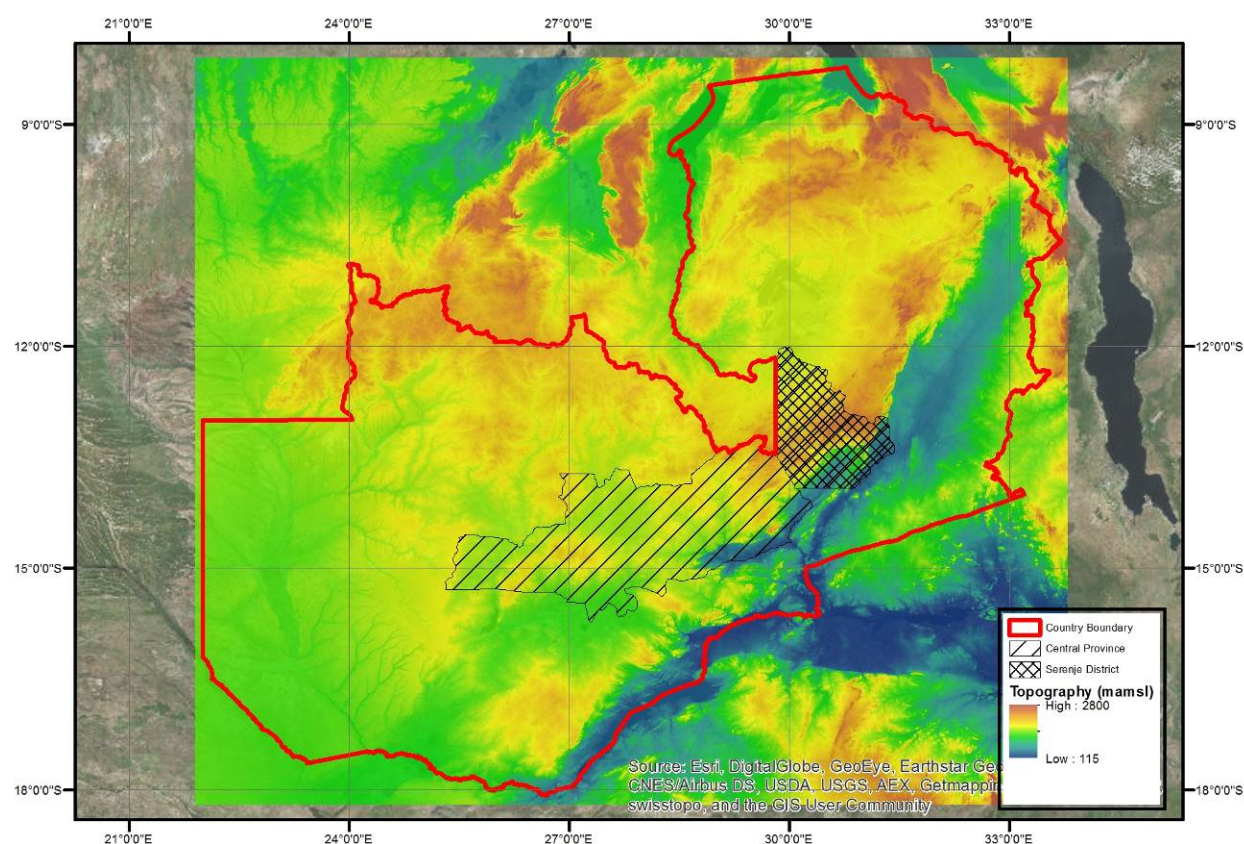

Figure 1. Topography of Zambia.

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[2] Jain, S (2006), *An Empirical Economic Assessment of Impacts of Climate Change on Agriculture in Zambia*. CEEPA Discussion Paper No. 27. CEEPA, University of Pretoria.

[3] KPMG (2014), *Zambia Country Profile 2014*; and World Health Organisation (2014), *Zambia: Country Cooperation Strategy*.

[4] GDP growth in 2005–11 was more than 6% per year.

[5] World Health Organisation (2014), *Zambia: Country Cooperation Strategy*.
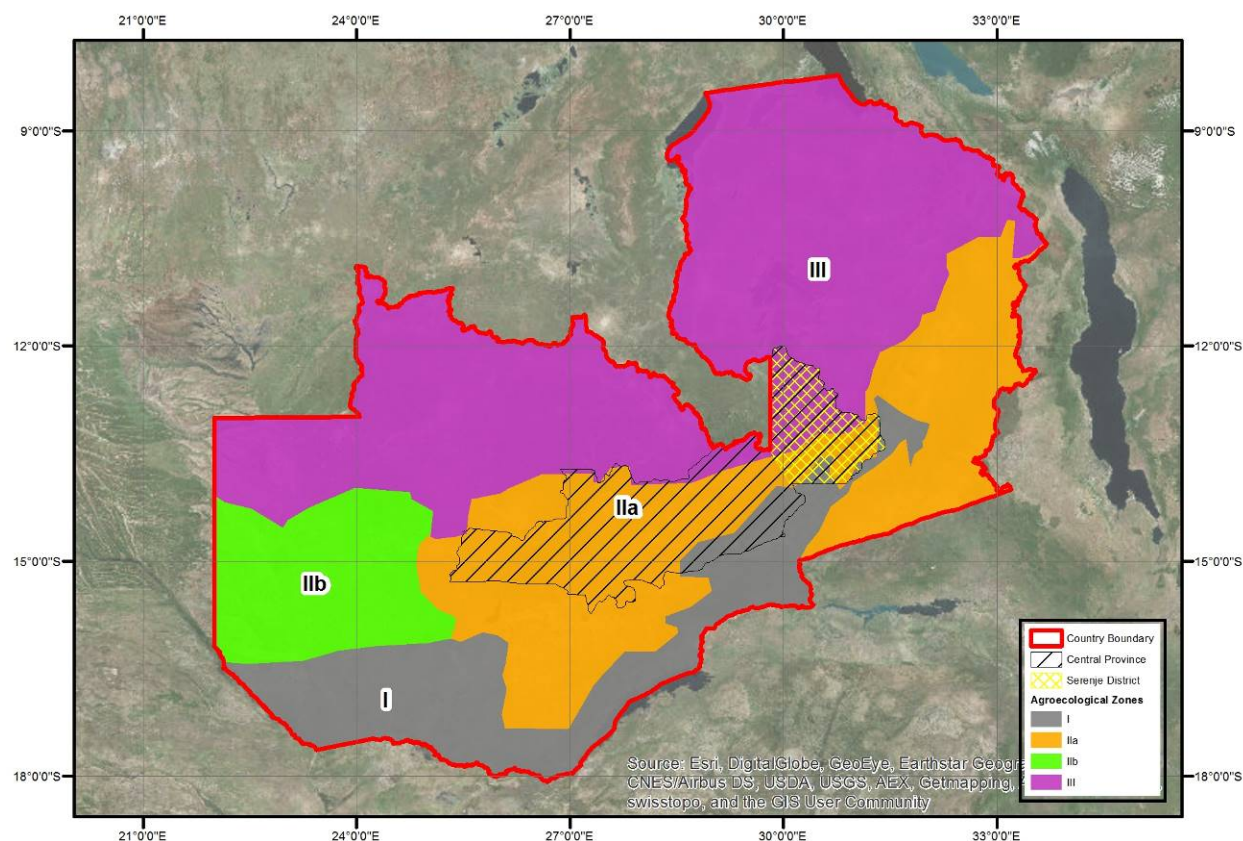
Figure 2. Agro-ecological zones of Zambia.

2. The Zambian economy relies greatly on manufacturing and industry, while commercial agriculture contributes ~20% to GDP[6]. In 2009, the contribution of the forestry sector to GDP was estimated to be 6.3%[7]. This contribution stems principally from wood products such as timber and poles. Importantly, the majority of rural communities rely on ecosystem goods and services from forests – including goods for subsistence agriculture – for their livelihoods[8]. In particular, households living adjacent to forests derive a large portion of their income from forest resources. These sources are mainly from Non-Timber Forest Products (NFTPs) such as herbal medicinal products, wild vegetables and fruits.[9]

3. Zambia's forests are located within the miombo eco-region, which has a notably high species richness[10] (Figure 3). Also referred to as the Zambezian Regional Centre of Endemism, this eco-region covers ~3,770 million km², extending from the Katanga (Democratic Republic of Congo, DRC) to the Vaal River (South Africa). The miombo eco-region consists of Central Zambezian and Southern

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[6] World Bank (2014), *Zambia at a Glance.*

[7] Mwitwa, J. and Makano, A. (2012), *Charcoal Demand, Production and Supply in the Eastern and Lusaka Provinces.* Mission Press, Ndola.

[8] Mulenga, B., Richardson, R., Mapemba, L. & Tembo, G. (2011), *The Contribution of Non-timber Forest Products to Rural Household Income in Zambia.* Food Security Research Project Working Paper No 54, June 2001. Available at www.http//ageconsearch.umn.edu/bitstream/109887/2/wp54.pdf. Accessed on 17 February 2015.

[9] Ibid.

[10] Timberlake, J. and Chidumayo, E. (2001). *Miombo Ecoregion Vision Report.* WWF-SARPO. Occasional Publications in Biodiversity No. 20.

miombo woodlands. These woodlands have a relatively high rate of mean biomass increase[11],[12]. However, in most areas of Zambia, miombo woodlands are being degraded as a result of unsustainable management practices[13] such as agricultural expansion, urbanisation and infrastructure development, wood extraction and increasing frequency and intensity of fires. In particular, the increasing demand for charcoal in both rural and urban areas is resulting in higher rates of extraction of wood from forests for this product[14]. The total forest area under charcoal production by communities is increasing[15]. Moreover, these communities burn vegetation more frequently compared with traditional practices, thereby destroying seed banks. In addition, communities have shifted the times of the year during which they burn from early (March–June) to late (October) in the dry season. Such repeated burning of miombo in the late dry season leads to a reduction in woody plant cover[16] and consequent loss of ~8% of wood resources[17]. Consequently, the regeneration potential of miombo woodlands is being reduced. This shift is underpinned by increasing demand for thatching grasses rather than timber products. See Annex 2 for a full description of miombo woodlands ecology.
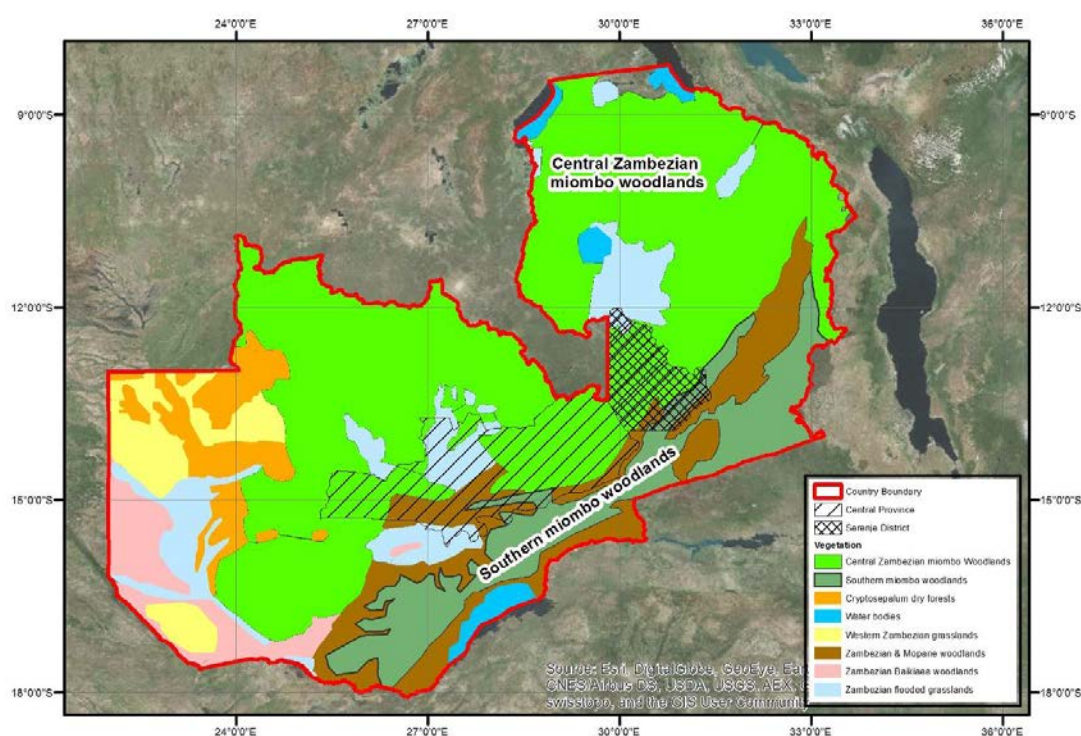

Figure 3. Vegetation zones in Zambia.

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[11] Biomass increase is affected by species composition and site conditions. The mean annual volume increment in mature woodland ranges from 0.58–30 $m^3.ha^{-1}.yr^{-1}$. In coppice woodland, the mean annual increment of biomass ranges from 1.2–3.4 tonnes $ha^-.yr^{-1}$, which is about 47% of the above-ground biomass.

[12] Chidumayo. E.N. (1993), *Responses of Miombo to Harvesting: Ecology and Management*, Stockholm Environment Institute, Stockholm.

[13] Modern agricultural practices are being used instead of traditional chitemene practices.

[14] Davison J. Gumbo, Kaala B. Moombe, Mercy M. Kandulu, Gillian Kabwe, Marja Ojanen, Elizabeth Ndhlovu Terry C.H. Sunderland (2013), *Dynamics of the Charcoal and Timber Trade in Zambia: A Scoping Study in Northern, Eastern and North-Western Provinces.* CIFOR Occasional Papers 86.

[15] Ibid.

[16] Furley, P. A., R. M. Rees, C. M. Ryan and G. Saiz (2008) Savanna burning and the assessment of long-term fire experiments with particular reference to Zimbabwe. *Progress in Physical Geography* 32(6): 611-634.

[17] Pernetta, J. C., Leemans, R., Elder, D. & Humphrey, S. (eds). (1995). *Impacts of Climate Change on Ecosystems and Species: Terrestrial Ecosystems.* IUCN, Gland, Switzerland.

4.   The Government of Zambia (GoZ) has responded to the challenges of ecosystem degradation and rural poverty by implementing restoration initiatives in participation with local communities. For example, the Ministry of Lands, Natural Resources and Environmental Protection (hereafter MLNREP) is coordinating 12 initiatives to increase jobs and related revenue in the forestry sector[18]. Importantly, poverty is recognised as a root cause of ecosystem degradation. Consequently, the GoZ's restoration activities promote livelihood diversification and provide employment opportunities for local communities.

5.   Despite the positive achievements through programmes such as these, the sustainability of GoZ's investments in restoration of ecosystems is threatened by the effects of climate change across Zambia (Annex 1). In particular, increases in the intensity and frequency of droughts, floods and extreme temperatures are adversely affecting food and water security, energy production and sustainable livelihoods of local communities[19]. Moreover, the frequency and intensity of such climate-related hazards is increasing[20]. As a result, GoZ's response to the challenge of ecosystem degradation and rural poverty will be undermined by the negative effects of climate change.

1.1 Climate change-induced problem

1.1.1 Climate change scenarios and climate variability

6.   In general, climate change projections outlined in Zambia's National Adaptation Programme of Action (NAPA, 2007), and the First and Second National Communications (INC, 2002 and SNC, 2000–2004) to the United Nations Framework Convention on Climate Change (UNFCCC) show an increase in: i) temperature; and ii) rainfall variability with regards to seasonality and raindrop impact. In general, a reduction in rainfall is envisaged for the hot, dry season – from September to October – and an increase in rainfall is expected for the rainy season especially – from December to February[21]. The main effects of these climate projections are prolonged droughts, localised floods and a shortened growing season in Zambia[22] (Annex 1). Currently, this climate variability has adverse effects on food and water security, water quality, energy and sustainable livelihoods of rural communities (Table 1). These effects are predicted to worsen under conditions of climate change in the future.[23]

1.1.2 Effects of climate variability and vulnerabilities

7.   Climate change and variability are predicted to have notable negative effects on Zambia's principal sectors, namely agriculture and food security, forestry, water and energy, and human health[24]. These effects are discussed in detail below.

i) Reduced agricultural productivity and food security

8.   Agriculture contributes ~20% to GDP[25]. Moreover, ~67% of the labour force is employed within this sector and the majority of local communities in rural areas rely strongly on subsistence agriculture for their livelihoods[26]. The effects of climate change – such as a predicted shortening of the growing

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[18] MLNREP – *Proposal for Special Funding to Improve Service Delivery and Exploitation of the Potential in the Lands, Forestry and Environment Sectors to Enhance Revenue Collection and Create Jobs* (internal document) – July 2012.
[19] Ministry of Tourism, Environment and Natural Resources (2007), *Zambia National Adaptation Programme of Action.*
[20] Ibid.
[21] McSweeney, C., New, M. & Lizacana, G., *UNDP Climate Change Profiles, Zambia.* Available at http://country-profiles.geog.ox.ac.uk.
[22] Zambia Project Preparation Grant, 2008.
[23] Ministry of Tourism, Environment and Natural Resources (2007), *Zambia National Adaptation Programme of Action.*
[24] Ministry of Tourism, Environment and Natural Resources. (2007*), Zambia National Adaptation Programme of Action.*
[25] Ministry of Finance and National Planning (2006), *Fifth National Development Plan, 2006-2010.*
[26] Ministry of Agriculture and Livestock and Co-Operatives (2004), *National Agricultural Policy, 2004-2015.*

season – will prevent important crop varieties[27] from reaching maturation[28], thereby negatively affecting the agricultural sector. Moreover, the area suitable for growing staple crops in Zambia – such as maize – under rain-fed conditions is likely to decline by 80% by 2100[29]. Consequently, food security will be undermined. Indeed, within the last 20 years, prolonged dry spells and shorter rainfall seasons have reduced maize yields to only 40% of the long-term average[30]. Vulnerability assessments have also indicated that agricultural production in the main agro-ecological region (AER) – including AER I and II – will experience severe yield deficits at critical periods of the cropping calendar as a result of climate change[31]. These regions are also notable livestock-producing regions. Consequently, the livestock sector is particularly vulnerable to the impacts of climate change because livestock numbers are strongly correlated with rainfall and temperature[32]. In summary, the anticipated variability in rainfall and increase in temperatures in Zambia will have negative effects on food security.

ii) Reduced forest productivity and climate-related hazards

9. In Zambia, climate change poses a threat to the forestry sector. Importantly, the regeneration of the miombo woodland[33] – which usually occurs relatively rapidly – has already been hampered by drought and excessive temperatures[34]. Over 80% of Zambian communities rely on these woodlands for charcoal and fuelwood. Importantly, these communities are not adapting their harvesting techniques to consider lower precipitation levels, thereby avoiding unsustainable harvesting of the woodlands (e.g. clearing of forest for agriculture and charcoal production). Therefore, the negative effects of climate change within Zambia will exacerbate the current unsustainable land-use practices. Moreover, predicted warming temperatures and longer drought periods will result in an increased frequency and intensity of climate-related hazards[35].

10. Of particular relevance for miombo woodlands is the expected increase in the frequency and severity of fires in future climate scenarios. Climate change is predicted to result in[36]: i) increased ignition of fires by lightning during more frequent storms; ii) greater biomass production resulting in greater fuel loads; iii) hotter and drier conditions that will result in easier ignition of fuel loads; and iv) windier conditions that will fan fires and cause them to burn more intensely and spread faster. More frequent and severe fires will lead to reductions in woody plant cover and conversion of miombo woodlands to grasslands[37]. This will create enormous opportunity costs for communities that currently rely on wood and NTFPs for their livelihoods[38,39].

iii) Reduced water availability

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[27] Examples of such crops include sunflowers, coffee, tea and irrigated wheat.

[28] Maize is the major staple food in Zambia and accounts for over 87% of the calorific intake.

[29] Ministry of Tourism, Environment and Natural Resources (2007), *Zambia National Adaptation Programme of Action.*

[30] Jain, S. (2007), *An Empirical Economic Assessment of Impacts of Climate Change on Agriculture in Zambia.* The World Bank Development Research Group. Sustainable Rural and Urban Development Team.

[31] Results of an assessment of the economic costs of climate change on agriculture in Zambia undertaken by the World Bank, with support from FAO, IWMI, Yale University and the University of Pretoria.

[32] As temperatures rise, population size is reduced and vice versa. Livestock population size improves during periods of high rainfall as a result of the effect rainfall has on pasture. The opposite is true during periods of low rainfall.

[33] Miombo woodland covers approximately 60% of Zambia's total surface area and thus is the most important vegetation type.

[34] Ministry of Tourism, Environment and Natural Resources (2007), *Zambia National Adaptation Programme of Action.*

[35] MTENR (2000), *Initial National Communication under the United Nations Framework Convention on Climate Change.*

[36] Cochrane, M. (2009), *Tropical Fire Ecology: Climate Change, Land Use and Ecosystem Dynamics.* Springer.

[37] Furley, P. A., R. M. Rees, C. M. Ryan and G. Saiz (2008), Savanna burning and the assessment of long-term fire experiments with particular reference to Zimbabwe. *Progress in Physical Geography* 32(6): 611-634.

[38] Chirwa, P. W. (2014), *Restoration Practices in Degraded Landscapes of Southern Africa.* African Forest Forum, Working Paper Series, Vol. (2)12.

[39] Cochrane, M. (2009), *Tropical Fire Ecology: Climate Change, Land Use and Ecosystem Dynamics.* Springer.

11.   Floods and droughts will have a negative effect on the availability of clean drinking water for local communities in Zambia. For example, floods will contribute to spreading disease, thereby reducing the availability of drinking water[40]. Moreover, droughts will directly reduce: i) the amount of drinking water available; and ii) surface water reserves in Zambia by lowering water tables and causing boreholes and streams to dry up. In rural communities, women and children frequently travel long distances to collect water. Therefore, the effects of diminishing surface water reserves will be notable in these areas, as the distances to be walked to collect this resource will lengthen. Moreover, the opportunity cost associated with collecting water will have a negative effect on these stakeholders.[41]

iv) Effects on human welfare

12.   Increased frequency and intensity of droughts results in crop failures and limited water availability. Consequently, malnutrition and diarrhoeal diseases become more prevalent. In particular, increases in flooding contribute to epidemics of water-borne diseases such as malaria. Floods and droughts have additional socio-economic consequences, such as migration. For example, the increased frequency of floods and droughts in the Gwembe Valley has resulted in migration to the nearby cities[42]. The current rate of rural–urban migration (4.15%) exceeds the rate of general population growth (2.88%)[43]. This trend is likely to continue under future climate change scenarios, resulting in increased stress on urban centres to provide basic services and amenities for migrants.

1.1.3 Root causes of vulnerability

13.   The vulnerability of local communities in Zambia is a result of multiple environmental, institutional and socio-economic factors. These factors reduce the capacity of communities to adapt to climate. The underlying causes of vulnerability of local communities in Zambia are described below.

- **Poverty and inequality**: Poverty and inequality exacerbate economic vulnerability to climate change and hinder adaptation of local communities. While the socio-economic characteristics of Zambia have improved over the past 20 years[44], the country has a Gini coefficient of 0.65 and is among the world's most unequal countries in terms of incomes[45]. In particular, unequal land distribution has an effect on the capacity of poorer people to adapt to climate change by limiting their livelihood diversification options.

- **Inefficient regulations and governance of natural resources, including exploitation of woodfuel**: Before the 1990s, charcoal production in Zambia was effectively regulated by the Forestry Department (FD). Consequently, production areas were adequately managed to promote natural regeneration. However, regulations related to charcoal production – including collection of wood – weakened during the 1990s. As a result of these weakened regulations, forest ecosystems have since been over-exploited[46]. Historically, local governance also contributed to regulating charcoal production. However, these traditional rules for accessing and utilising natural resources have also weakened over recent decades[47]. These ineffective regulations result in exploitation of woodfuel. Importantly, woodfuel supplies energy for ~90% of Zambian households and provides income for a large portion of the rural community. In particular, charcoal provides ~70% of Zambia's energy requirements because it is relatively cheap when compared with electricity and petroleum-based fuels[48]. Because Zambia is urbanising at a rate of

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[40] Including malaria, cholera, dysentry and other water-borne diseases.
[41] Ministry of Tourism, Environment and Natural Resources (2007), *Zambia National Adaptation Programme of Action.*
[42] Zambia Vulnerability Assessment Committee (2004), *Zambia Livelihood Map Re-zoning and Baseline Profiling.*
[43] Central Intelligence Agency. (2014) *The World Factbook: Zambia.*
[44] Extreme poverty declined from 58% in 1991 to 42% in 2010 and the depth of poverty in urban areas has diminished.
[45] Millennium Development Goals (2014), *Progress Report Zambia 2013*
[46] Field consultations, 2014
[47] Nelson, F. (2010) Conservation and citizenship: democratising natural resource governance in Africa. *Policy Matters* 17:233–241.
[48] Davison J. Gumbo, Kaala B. Moombe, Mercy M. Kandulu, Gillian Kabwe, Marja Ojanen, Elizabeth Ndhlovu

3.2% per annum, it is likely that the demand for – and consumption of – charcoal will increase unless cost-effective alternatives are promoted. Historically, the production of charcoal was restricted to the dry season (August–November). However, production of charcoal during the rainy season (December–February) is becoming more frequent[49]. Approximately 62% of the charcoal that is transported into Lusaka is sourced from Central Province[50]. It is estimated that, by 2030, the national deforestation rate attributable to charcoal production alone will be 51,866 ha per year[51].

- **Loss of local ecological knowledge**: Historically, ecological knowledge of forest management has not been adequately documented. This limited documentation is mostly because technical research has focused on a few timber species of high value for external markets rather than on multitude of species that are used by local communities. However, timber species represent a small proportion of the total value of the livelihoods of Zambian communities. As a result of such limitations, knowledge on managing forest ecosystems to adapt to climate variability has not been effectively collated and disseminated. Where this knowledge has been collated, it is often not ready to be immediately used[52].

- **HIV/AIDS prevalence**: Zambia's economic sectors have been significantly affected by the HIV/AIDS pandemic. Approximately 14% of Zambians are estimated to be infected with HIV, with more females being infected than males[53]. The higher infection rate in females adversely affects food security and income streams because women – who are more involved in food provision at the household level – cannot participate as frequently or intensely in agricultural activities[54]. In general, labour is constrained by the incidence of disease and sickness. For example, malaria is endemic during the rainy season and prevents many people from taking part in farm activities. Moreover, sickness increases medical costs incurred by Zambians[55].

Problem statement

Historically, miombo woodlands have been resilient and productive ecosystems on which local communities have relied strongly for their livelihoods. However, the effects of climate change are reducing the regeneration potential of these ecosystems. Moreover, non-climate-related drivers – such as poverty and inequality and unsustainable management of land – have further degraded miombo woodlands. Consequently, these degraded ecosystems are unable to produce the goods and services that contribute to livelihoods of local communities and the development of national sectors. As a result, communities that rely strongly on miombo woodlands for their livelihoods are particularly vulnerable to the negative effects of climate change.

1.2 Long-term solution and barriers to achieving this solution

1.2.1 Preferred solution

14. The preferred solution would see strengthened adaptive capacity of local communities in Zambia that rely on miombo woodlands for their livelihoods to climate change. This solution would be achieved

Terry C.H. Sunderland (2013), *Dynamics of the Charcoal and Timber Trade in Zambia: A Scoping Study in Northern, Eastern and North-Western Provinces.* CIFOR Occasional Papers 86.
[49] Ibid.
[50] Mtwita, J. and Makano, A. (2012), *Charcoal Demand, Production and Supply in the Eastern and Lusaka Provinces.* Mission Press, Ndola. Zambia.
[51] Ibid.
[52] Shackleton, C.M. and Clarke, J.M. (2007), *Paper 1: Research and Management of Miombo Woodlands for Products in Support of Local Livelihoods.* GENISES paper for the World Bank.
[53] *United Nations Development Assistance Framework for the Republic of Zambia,* 2011 – 2015.
[54] World Food Programme (2006), *Country Programme - Zambia (2007-2010).*
[55] Ministry of Tourism, Environment and Natural Resources (2007), *Zambia National Adaptation Programme of Action.*

by strengthening the institutional capacity of national (e.g. Government ministries) and sub-national (e.g. local communities) stakeholders to coordinate and implement climate-resilient restoration of forests that benefit local communities. In addition, the occurrence of climate-related (e.g. fire) and non-climate related (e.g. unsustainable management) threats to these ecosystems would be reduced, thereby promoting conservation. To achieve this solution, multiple complementary interventions would be implemented, as described below.

i) *Strengthened institutional capacity to coordinate climate-resilient Community-Based Natural Resource Management (CBNRM)*

15.   The preferred solution would see the Community-Based Natural Resource Management (hereafter CBNRM) approach adopted in Zambia to manage forest ecosystems in the face of climate change. This approach would promote conservation and local development by: i) transferring rights for access and use of forests back to local communities; ii) empowering such communities to manage these ecosystems; and iii) strengthening the capacity of local stakeholders to build partnerships with the public and private sectors, thereby promoting livelihood diversification[56]. In so doing, social and economic inequalities – such as those described in Section 1.1.3 – would be addressed[57]. Moreover, the adaptive capacity of local communities would be strengthened through diversified livelihood options. Importantly, this approach would be integrated into national policy and planning processes to promote devolution of power and benefit-sharing to local communities. Moreover, coordination for this approach among national and sub-national authorities would be enhanced, involving stakeholders from local, regional and national levels.

ii) *Restoration of climate-resilient miombo woodlands throughout Zambia*

16.   The preferred solution would include the restoration of miombo woodlands in Zambia through the introduction of a climate-smart, ecosystem-based approach to adaptation. This solution would improve ecosystem functioning and increase the benefits derived from these ecosystems. These benefits include: i) improved water quality; ii) increased groundwater recharge; iii) reduced surface water runoff during intense rainfall events; and iv) mitigating the impact of climate-related hazards such as fires. As a result, the adaptive capacity of Zambian communities to climate change would be increased. In addition, restoration of degraded miombo woodlands would increase the potential of local communities to diversify livelihoods generated by ecosystem goods and services. The development of such sustainable livelihoods would: i) reduce the pressure placed on ecosystems by traditional livelihood practices such as agriculture; and ii) contribute to social and economic development at a local level.

iii) *Integrated and innovative technologies to promote sustainable management of miombo woodlands*

17.   The preferred solution would see innovative technologies used to plan and implement climate-resilient forestry, and to conserve these ecosystems. For example, the FD would use Geographical Information Systems (GIS) to prioritise degraded areas for restoration activities. Moreover, this technology – and relevant spatial data-sets – would be used to inform CBNRM at a local level, thereby promoting synergy of national and sub-national governance systems. In particular, such technology would be used to implement techniques for management of climate-related hazards – including fire – that threaten miombo woodlands.

18.   To maintain and conserve miombo woodlands, the preferred solution would see a reduction in deforestation rates in these ecosystems. To reduce rates of deforestation, suitable technology would be implemented by local communities to enhance woodfuel efficiency. Moreover, knowledge on these technologies would be collated and disseminated to the public.

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[56] WWF (2014), *Community Based Natural Resource Management (CBNRM) for Capacity Building in Southern Africa*.

1.2.2 Barriers to achieving the long-term solution

19.   There are multiple institutional, technical and financial barriers to the implementation of the preferred solution in Zambia. The project will contribute to the long-term preferred solution by implementing a suite of complementary measures to address the barriers described below.

i) Limited technology for adaptation and sustainable management of miombo woodlands

20.   A notable barrier to achieving the preferred solution is the limited productivity of the miombo woodland ecosystem, which is exacerbated by the increasing demand for woodfuel. This limited productivity is a result of the nutrient-poor soils on which this ecosystem is located[58]. Importantly, this limited rate of productivity provides few incentives for active management of miombo woodlands. To reduce the national demand for woodfuel, practices and technology should be implemented to increase the energy conversion rate of charcoal. In so doing, the volume of wood required to satisfy market demand for charcoal will decrease, thereby reducing the pressure on miombo woodlands[59]. Currently, communities have limited access to such technologies.

ii) Limited coordination between stakeholders involved in tenure and management of forest resources

21.   Under the framework of the Forest Act (1999), individuals may acquire rights from the Forestry Department (FD) to collect forest resources from National Forests (NFs) and Local Forests (LFs), with various contractual terms and licences. NFs are established to conserve water catchment areas and biodiversity. Harvesting in these areas is restricted, unless special licences are authorised by FD. LFs are managed under a similar framework but with the objective of providing forest products for local communities. Moreover, local communities may apply for a licence to harvest natural resources from these areas. Without licences or contractual agreements for NFs and LFs, access to products from these areas is prohibited. For both NFs and LFs, management tools include management plans and licensing of harvesting[60].

22.   Outside of these reserves and other Protected Areas[61], forests are governed by traditional rights[62]. Under this framework, traditional leaders allocate land and resources to community members. If the landholder believes that his/her rights are secure, he/she may clear the land for an alternative use. As a result of this complex tenure system, conflicts between local communities and the Forest Department occur when there is limited communication and coordination between the stakeholders.

iii) Limited – or unequal distribution of – finances for conservation of forests as a means of adaptation

23.   For local communities in Zambia, revenue generation in the forestry sector has declined notably during recent decades[63]. This decline is primarily attributable to timber revenues not typically being shared with communities. Moreover, income generated through NTFPs from miombo woodlands is

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[58] Campbell, B.M., Angelsen, A., Cunnigham, A., Katerere, Y., Sitoe, A. and Wunder, S., *Miombo Woodlands – Opportunities and Barriers to Sustainable Forest Management*. Document developed for CIFOR. Available online at: http://www.cifor.org/miombo/docs/Campbell_BarriersandOpportunities.pdf.

[59] Approximately 76% of Zambia's population depend on wood fuel energy. Consequently, miombo resources are central to the livelihoods of urban and rural dwellers for charcoal production, slash and burn agriculture, timber production and non-wood products in Zambia. Malambo, F. and Syampungani, S. (2008), *Opportunities and Challenges for Sustainable Management of Miombo Woodlands: the Zambian Perspective.* Working Papers of the Finnish Forest Research Institute 98.

[60] Kokwe, M. (2012), *Forest Management Practices with Potential for REDD+ in Zambia*. Available online at: http://www.fao.org/docrep/016/i2826e/i2826e00.pdf.

[61] Protected Areas include: i) Botanical Reserves; ii) Heritage Sites; iii) Protected Fisheries; iv) National Parks; and v) Game Management Areas.

[62] USAID(2010), *Land Tenure Zambia Profile*. Available online at: http://usaidlandtenure.net/zambia.

[63] Gumbo, D.J., Moombe, K. B., Kandulu, M. M., Kabwe, G., Ojanen, M., Ndhlovu, E. & Sunderland, T. C. H. (2013), *Dynamics of the Charcoal and Indigenous Timber Trade in Zambia: A Scoping Study in Eastern, Northern and Northwestern Provinces.* Center for International Forestry Research. Occasional Paper 86. Bogor, Indonesia.

limited because most of these products are traded in the informal market. In addition, weak enforcement of regulations results in frequent illegal felling and export of timber from miombo woodlands. Generally, the direct revenues associated with converting land to produce charcoal or agricultural products is favourable when compared with services and goods from miombo woodlands, thereby limiting the motivation of local communities to conserve these ecosystems.

24.   A notable barrier to achieving CBNRM in Zambia is the difference in profit received by the stakeholders involved in income-generating activities from miombo woodlands. For example, within the charcoal production chain, local communities receive very little revenue compared with the Government and cartels involved in the industry[64]. This limited revenue received by local communities drives these stakeholders to increase the rate at which they fell trees to obtain a subsistence level of income from charcoal.

25.   The high incidence of poverty in Zambia limits the development of alternative livelihoods for vulnerable groups. Consequently, options for adapting to climate change are limited.

iv) Limited institutional capacity to implement participatory natural resource management including CBNRM

26.   In 2002, the National Action Plan (NAP) that was prepared for the implementation of the United Nations Convention to Combat Desertification (UNDD) defined the context of a number of important policies, namely: i) the national policy on environment; ii) the energy policy; iii) the population policy; iv) the gender policy; and v) the decentralisation policy. The objective of this last policy was to strengthen the capacity of local government to plan and implement development activities. In addition, the objective of the Zambia Forestry Action Programme (ZFAP 2000-2020) is to promote deforestation and enhance the contribution of the forestry sector to national social economic development (see Section 2.2.1).

27.   Despite the objectives of the frameworks described above, evidence of successful participatory resource management in Zambia is limited. Under the ZFAP, the Provincial Forestry Action Programme (PFAP) was implemented from 2002 to 2005. The focus of this programme was community participation for sustainable planning and management of resources. Although the programme was successful with regards to the development of commercial enterprises such as honey, effective implementation was hindered by limited institutional support[65].

28.   Forest management activities are also hindered by limited coordination between local and national governance systems, resulting in unclear mandates of ministries and departments involved in this sector[66]. For example, there is no legal framework that mandates particular ministries or departments with responsibility for fire control[67]. Moreover, district-level offices in the Forestry Department have limited access to the data necessary to monitor or manage forests resources effectively[68]. In general, officers who are currently involved in this sector have limited: i) knowledge on the topic of fire control; ii) technical capacity to implement relevant techniques; and iii) access to equipment such as computers and survey vehicles to monitor and enforce fire management interventions[69].

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[64] Gumbo *et al.*, 2013: *ibid.*

[65] Axberg, G., Makano, A., Matakala P. and Kokwe, M. (2012), *Decentralism NRM Programme (DNRMP): A Decentralised Innovative Programme on Integrated Forest and Other Natural Resources Management in Zambia.* Draft identification report.

[66] Gumbo, D.J., Moombe, K. B., Kandulu, M. M., Kabwe, G., Ojanen, M., Ndhlovu, E. & Sunderland, T. C. H. (2013), *Dynamics of the Charcoal and Indigenous Timber Trade in Zambia: A Scoping Study in Eastern, Northern and Northwestern Provinces.* Centre for International Forestry Research. Occasional Paper 86. Bogor, Indonesia.

[67] http://www.fao.org/docrep/005/ac798e/ac798e09.htm

[68] Day, M., Gumbo, D., Moombe, K., Wijaya, A. & Sunderland, T. (2015), *Zambia Country Profile: Monitoring, Reporting and Verification for REDD+.* Occasional Paper for USAID and CIFOR.

[69] Gumbo *et al.* (2013), *ibid.*

29. In summary, despite a comprehensive framework for participatory management of forest resources, implementation of relevant policies is not coordinated or effective. Moreover, local capacity for woodland management is weak and the legal framework does not promote partnerships to build this capacity.

v) Limited data to support monitoring and management of forests

30. Existing data and information on Zambian forests and woodlands is outdated and incomplete[70]: the last nationwide forest inventory was undertaken between 1952 and 1967. The majority of the data is over 10 years old. Consequently, there are notable gaps in data and information on livelihoods, economics and land degradation which results in inefficient planning and adaptive management processes. The knowledge gaps and data deficiencies include:

- Verification of deforestation and forest degradation rates, in particular carbon stock losses from charcoal production and the ability to map changes associated with forest degradation using remote sensing; and
- The impact of fire on woodland loss and carbon stocks, including the impact of fire on soil carbon.[71]

31. No single initiative can completely remove all of the aforementioned barriers. However, the LDCF project will work in coordination with other adaptation and forest-related initiatives to build on their advances in overcoming these barriers.

2. STRATEGY

2.1. Country ownership: country eligibility and country drivenness

32. As a Least Developed Country (LDC), Zambia has limited resources to effectively lower the risks that climate change poses to hard-won development gains. However, the Government is making efforts to address climate change. Zambia is committed to ensuring that the poorest and most vulnerable communities are supported by programmes that enhance their long-term adaptive capacity. Zambia ratified the United Nations Framework Convention on Climate Change (UNFCCC)[72], thereby committing to the adoption of policies and implementation of measures to adapt to climate change. Consequently, a number of activities have been undertaken (detailed below), which the LDCF project will build upon and complement.

33. Zambia submitted its **Initial (INC) and Second National Communication (SNC)** to the UNFCCC in 2002 and 2004 respectively. These reports guide the development of Zambia's policy, legal and institutional framework for adaptation to climate change. In addition, the SNC details Zambia's greenhouse gas inventory and establishes a long-term institutional framework that promotes a coordinated response to climate change. The proposed LDCF project is aligned with the following adaptation measures recommended in the SNC:

- Promotion of natural regeneration of indigenous forests. The LDCF project will support this measure through the regeneration of miombo woodlands.
- Improvement of fire management systems. The LDCF project will develop a geospatial fire occurrence data-set that will inform fire monitoring and management. Furthermore, training and awareness campaigns will increase the capacity to develop and implement fire management plans.

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[70] An assessment that was undertaken in 2013 identified the limited field data of forests as a barrier to conducting a National Forest Assesssment. See: http://www.fao.org/forestry/16165-074854f4cf58cb8a6fe2c2ed3af2aef0c.pdf
[71] Day *et al*. (2015), *ibid*.
[72] On 28 May 1993.

- Promotion of soil conservation methods. The LDCF project will support soil conservation through the implementation of natural regeneration and agro-forestry techniques as well as improved fire management.[73]

34. In 2007, a **National Capacity Self-Assessment (NCSA)** was completed to assist in the implementation of the Rio Conventions. The assessment identifies the national capacity and development gaps hindering the effective implementation of Multilateral Environmental Agreements, such as the UNFCCC, the United Nations Convention on Biodiversity (UNCBD) and the United Nations Convention to Combat Desertification (UNCCD). The NCSA also proposes a strategy and an action plan to address such gaps in the short- and long-term. The LDCF project is aligned with Goal 6 of the NCSA – to strengthen the institutional framework to promote strategies for conservation of biodiversity, combating desertification and drought, and to minimise climate change.

35. Zambia has undertaken a **Technology Needs Assessment** (TNA) for climate change adaptation. Priority sectors and technologies were identified through stakeholder consultations. In addition, barriers to the diffusion of selected technologies were identified and measures selected to overcome such barriers. The two sectors for special focus were the water sector and the agriculture and food security sector. The LDCF project is aligned with the selected technologies for the agriculture and food security sector, which include:

- Conservation farming with agro-forestry;
- Integrated crop-small livestock-fish-poultry-vegetable production system; and
- Promotion of crop diversification and new crop varieties.

36. The design of the LDCF project is based on information received from a range of stakeholder consultations conducted in Zambia (see Stakeholder Baseline Analysis below). The participatory approach affirms that the project reflects the needs of national stakeholders and there is country ownership of the project. In addition, the proposed LDCF project is linked to priorities reflected in the **UN Development Assistance Framework (UNDAF, 2011-2015)**. In particular, the project relates to UNDAF Outcome 4, which will develop institutional capacities to effectively sustain, manage and protect livelihoods from the risks of climate change, disasters and environmental degradation. The LDCF project also relates to Outcome 2 – achieving more sustained levels of development, employment and food security.

37. The LDCF project is aligned with the **UNDP Zambia Country Programme Action Plan (CPAP, 2011-2015)**. The LDCF project will address the following Country Programme Outcomes:

- Outcome 2.1: Government and partners enable vulnerable populations to be food-secure. The LDCF project will support small-scale farmers to implement agro-forestry technologies.
- Outcome 2.2: Government and partners provide targeted groups with opportunities for gainful and decent employment. The project will provide targeted vulnerable groups with training and support the diversification of income-generating opportunities to strengthen livelihoods.
- Outcome 4.2: Government promotes adaptation and provides mitigation measures to protect livelihoods from climate change. The LDCF project will support the adoption of sustainable land management and agricultural practices, which are climate-resilient.
- Outcome 4.3: Government implements policies and legal frameworks for sustainable community-based natural resources management. The LDCF project will support the implementation of community natural resource management through the establishment of village action groups (VAGs[74]) and the recognition of resource and use rights.

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[73] Page 40 of the SNC.
[74] Wherever the term "VAG", i.e. Village Action Group, appears in the project design, the term is intended to also encompass Village Natural Resource Management Committees (VNRMCs). VAGs are a legislated community-level institution under the Wildlife Act and Wildlife Policy, both of 1998. VAGs are subsidiary institutions to the Community Resource Board (CRB) under the Wildlife Act. VNRMCs were first legislated in the 1999 Forest Act and Forest Policy of 1998 as institutional structures at local level to engage in forest management. The 2014 Forest Policy still

38. Zambia has generally made good progress towards achieving its **Millennium Development Goal (MDG)** targets. However, there remain some targets that have yet to be attained. The LDCF project will contribute towards four of these, as detailed below:

- Target 1A: Halve the proportion of people living in extreme poverty. The project will support the diversification of livelihoods and promote alternative income-generating opportunities.
- Target 1B: Achieve full and productive employment and decent work for all, including women and young people. The project will strengthen the role of women through knowledge transfer on adaptation interventions and training. In addition, the project will collaborate with and integrate women's groups into project implementation.
- Target 1C: Halve the proportion of people who suffer from hunger. The project will increase food security and nutrition of vulnerable communities.
- Target 7A: Integrate the principles of sustainable development into country policies and programmes and reverse the loss of environmental resources. The project will increase the capacity to integrate risk reduction strategies for climate change into development policies and programmes.

Stakeholder baseline analysis

39. Multi-stakeholder consultations were conducted to inform the design of the LDCF project. These included: i) an initial consultation mission during August 2014, including an inception workshop on 7 August 2014; ii) an extensive series of stakeholder consultations; and iii) a validation mission and series of consultations (August–December 2014), including a validation workshop (10 October 2014).

40. Workshops were attended by national operational focal points and Government departments responsible for agriculture, forestry, environment and local government and housing, as well as a range of development partners, NGOs and civil society organisations. Bilateral stakeholder consultations included a range of additional meetings that were held from August–December 2014 with bilateral and multilateral organisations, Government departments and NGOs, as well as private sector partners. The Implementing Partner (IP) played a prominent role in determining the activities for the LDCF project and were involved in most of the consultations. Furthermore, the national operational focal points were involved in the project design.

41. The Project Preparation Stakeholders Report from the initial mission is included as Annex 3. Details of stakeholder involvement during the project implementation phase are provided in Section 2.9.

2.2 Project rationale and policy conformity

2.2.1 Consistency with national priorities

42. The **National Adaptation Programme of Action (NAPA)** was prepared by the Ministry of Tourism, Environment and Natural Resources (MTENR). It was submitted in October 2007. The NAPA identifies and highlights urgent adaptation interventions in Zambia and includes a list of ten priority projects. These projects target vulnerable groups such as small-scale farmers, the poor, women and children. However, many of these projects have not been fully implemented. The LDCF project will implement priority interventions identified in the NAPA and is consistent with the decisions of the ninth Conference of Parties (COP-9)[75]. In particular, the project responds to NAPA priorities 2, 4, 5 and 6 as described below:

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promulgates the same. However, VNRMCs are only found where Joint Forest Management has been piloted in the country. Where a VNRMC does not exist but a CRB does, there is a VAG.

[75] And satisfies criteria outlined in UNFCCC Decision 7/CP.7 and GEF/C.28/18.

- Promotion of alternative sources of livelihoods to reduce vulnerability to climate change/variability to communities living around Game Management Areas (GMAs): the project will support the diversification of livelihoods through the implementation of agro-forestry and other climate-resilient practices.
- Management of critical habitats: the project will support the management of indigenous miombo woodlands through climate-resilient restoration methods.
- Promote natural regeneration of indigenous forests: the project will support the assisted natural regeneration of miombo woodlands in Central Province.
- Adaptation of land-use practices (crops, fish and livestock) in light of climate change: the project will support the implementation of agro-forestry practices in Central Province to increase the adaptive capacity of the vulnerable communities.

43. Zambia's **National Long-term Vision 2030 (Vision 2030)** is a planning tool setting out goals and targets to be achieved in social and economic life. The LDCF project will contribute towards: i) economic growth and wealth creation; ii) improved food security and climate-resilient livelihoods; iii) the creation of an enabling environment for sustainable socio-economic development and the promotion of integrated environmental management; and iv) the sustainable use of natural resources.

44. The LDCF project is aligned with Zambia's **Sixth National Development Plan (SNDP)**, which is the implementation strategy for the National Vision 2030. The SNDP outlines national development policies and priority development areas towards achieving sustained economic growth and poverty reduction. Moreover, this strategy focuses on the development of climate change adaptation programmes. Within Central Province, the SNDP is focused on poverty reduction through economic diversification and increased investment in agriculture. The LDCF project will support the SNDP through the promotion of agro-forestry practices and diversification of livelihoods. In addition, the project will support two of the SNDP objectives for Central Province as follows:

- Reforestation of depleted indigenous forests; and
- Environmentally-friendly technologies for income generation.

45. The LDCF project is aligned with the recommendations of the (draft) **National Climate Change Response Strategy (NCCRS)**. This strategy has been developed to support and facilitate a coordinated response to climate change in Zambia. The objective of the NCCRS is to climate-proof vulnerable economic sectors, including the forestry sector. The LDCF project is aligned with the objectives for the forestry sector and will support the development of sustainable land use systems, consequently enhancing agricultural production and improving food security.

46. The **Zambian Forestry Action Programme** (ZFAP 2000-2020) was adopted under the National Environmental Action Plan (NEAP 1994). The objective of this programme is to address problems of deforestation and enhance the contribution of the forestry sector to national social and economic development. Importantly, this programme provided the framework for CBNRM in the forestry sector. In particular, the **National Forest Policy** (1998) – which aims to promote socio-economic development, poverty alleviation and food security – was developed under the framework of ZFAP. This policy recognises the importance of integrating traditional leaders and local communities in the sustainable management and use of forest resources.

47. Other policies of relevance include the **National Environmental Policy (NEP, 2004)**, the **National Biodiversity Strategy Action Plan (NBSAP)** and the **National Forestry Policy (NFP, 2014)**. The NEP identifies Government ministries involved in environmental affairs, a number of which have policies that include environmental matters. Furthermore, the NEP highlights current shortfalls in these policies, including: i) ineffectual mechanisms for community-based natural resource management; ii) weak informal inter-sectoral links; iii) limited up-to-date baseline data; and iv) inadequate national guidelines for effective integration of international environmental conventions.

48. The Zambian NBSAP aims to promote the conservation, management and sustainable use of Zambia's biological resources and the equitable sharing of benefits from these resources. The LDCF project will contribute to the following goals of the NBSAP:

- Goal 3: Improve the legal and institutional framework and human resource to implement the strategies for conservation of biodiversity, sustainable use and equitable sharing of benefits from biodiversity. The LDCF project is aligned with this goal and will support co-operation among stakeholders and institutions. In addition, it will improve research and knowledge on the sustainable use of biological resources.
- Goal 4: Sustainable use and management of biological resources. The LDCF project will support this goal through: i) implementing community-based natural resource management (CBNRM); ii) building on the existing land information management system; and iii) establishing monitoring and evaluation systems.

49. The NFP provides a framework for sustainable forest management that will: i) enhance economic development; ii) contribute to mitigation and adaptation to climate change; and iii) improve the livelihoods of communities through participatory forest management. The LDCF project will contribute towards the reduction of poverty through its forestry activities.

50. The LDCF project is aligned with the **National Decentralisation Policy (NDP, 2010)** and is informed by several core objectives of this policy. These include: i) empowering local communities by decentralising decision-making functions and resources; ii) implementing a system of "bottom up" planning and budgeting from the district level; and iii) promoting accountability and transparency in the management and use of resources.

51. Zambia's **National Agricultural Policy (NAP, 2004)** supports the development of a sustainable and competitive agricultural sector. The LDCF project is in alignment with the objectives of the NAP listed below:

- Objective 9: To improve food and nutrition security. The LDCF project will support this objective through agro-forestry and the diversification of agricultural production and utilisation.
- Objective 10: To promote the sustainable management and use of natural resources. The LDCF project will support the implementation of community-based natural resource management. In addition, climate-resilient land management and energy practices will be implemented.
- Objective 11: To mainstream environment and climate change in the agriculture sector. The LDCF project will promote and strengthen agricultural practices that are climate-resilient. In addition, awareness-raising activities will be undertaken to promote climate-resilient agro-forestry and farming practices.

52. Zambia's **Sustainable Energy for All** (SE4ALL) goal is to provide reliable, affordable and environmentally sound energy for sustained social and economic development. The SE4ALL Rapid Assessment and Gap Analysis identifies thermal energy for households (including woodfuel and charcoal) as being a priority area for support.

53. Zambia is a participant of the UN Reducing Emissions from Deforestation and Forest Degradation (REDD) Programme. The **National Strategy to Reduce Emissions from Deforestation and Forest Degradation** (NSREDD) identifies the proximate drivers of deforestation and forest degradation in Zambia. The proposed LDCF project is aligned with the following strategic objectives of the NSREDD:

- Objective 1: By 2030, threatened and unsustainably managed national and local forests are effectively managed and protected to reduce emissions from deforestation and forest degradation and contribute with ecosystem services across selected landscapes;
- Objective 2: By 2030, selected high value forests in open areas are effectively managed and monitored; and

- Objective 4: By 2030, good agricultural practices that mitigate carbon emissions adopted.

54. Zambia has a **Gender Policy** that was adopted in 2000. This policy recognises the disparity that exists between men and women, where women remain a disadvantaged and more vulnerable group. The policy advocates gender concerns, which are regarded as a sectoral as well as a cross-cutting issue. Women will be incorporated into the decision-making process and implementation of the LDCF project. In addition, the LDCF project will include gender-disaggregated indicators.

2.2.2 Consistency with objectives and priorities of the LDCF

55. The LDCF project is consistent with LDCF objectives CCA-1, "Reduce the vulnerability of people, livelihoods, physical assets and natural systems to the adverse effects of climate change", and CCA-2, "Strengthen institutional and technical capacities for effective climate change adaptation". Specific contributions to these objectives are described below:

- Component 1 will reduce sensitivities to climate change through the implementation of agro-forestry practices and assisted natural regeneration of forests. This is aligned with LDCF Objective CCA-1, Outcome 1.1 ("Vulnerability of physical assets and natural systems reduced"). In addition, Component 1 will strengthen adaptive capacity through the establishment of VAGs. These will enable community ownership of the project interventions. Furthermore, these VAGs will be responsible for overseeing the implementation of community-based natural resource management. This is aligned with LDCF Objective CCA-2, Outcome 2.4 ("Institutional and technical capacities and human skills strengthened to identify, prioritise, implement, monitor and evaluate adaptation strategies and measures").
- Component 2 will strengthen adaptive capacity of communities through implementing training and awareness campaigns focused on fire management and monitoring. This is aligned with LDCF Objective CCA-2, Outcome 2.4 ("Strengthened adaptive capacity to reduce risks to climate-induced economic losses").
- Component 3 will support the development of energy efficient charcoal production and wood saving technologies. This is aligned with LDCF Objective CCA-1, Outcome 1.3 ("Climate-resilient technologies and practices adopted and scaled-up"). Component 3 will also support various learning and training activities, which will strengthen the capabilities of foresters and local communities. This is aligned with LDCF Objective CCA-1, Outcome 2.4 ("Institutional and technical capacities and human skills strengthened to identify, prioritise, implement, monitor and evaluate adaptation strategies and measures").

56. In line with the LDCF eligibility criteria and priorities, the LDCF project will use LDCF resources to finance the additional costs needed for increasing the climate change resilience of the baseline situation concerning forestry regeneration in Zambia. It will build on Zambia's existing initiatives to safeguard lives and livelihoods from the impacts of an increase in frequency and intensity of climate-related extreme events, in particular floods, droughts and fires. In line with LDCF guidelines, the UNDP-implemented, LDCF-financed project has been developed and will be implemented using the following approaches: i) sustainability; ii) replicability; iii) participatory; iv) multi-disciplinary; v) complementary; and v) gender-sensitive:

- **Sustainabilit**y: The project has been designed to strengthen coordination of climate change adaptation between key ministries. In addition, the results of the LDCF-financed interventions will strengthen Zambia's institutional and technical capacities, which, in turn, will enable the Government to secure additional climate finance from a variety of sources. These interventions will strengthen the capacity of national institutions and communities to sustain climate change adaptation-related interventions in the medium- to long-term.
- **Replicability**: The project has been designed to ensure that: i) lessons are replicable; ii) training and capacity building are sufficient to allow the transfer of expertise to other initiatives; and iii) replication mechanisms are in place.

- **Participatory**: The project design has been informed by extensive stakeholder consultation. Relevant stakeholders include representatives of various ministries as well as private sector organisations, NGOs and community-based organisations. The stakeholders' involvement in the project is clearly defined and these stakeholders will be actively engaged during project implementation.
- **Multi-disciplinary approach**: The project will integrate climate change adaptation into sectoral planning in an economy-wide approach. The proposed LDCF project will involve many planning activities that will build the climate resilience of vulnerable sectors and communities. Furthermore, institutional capacity will be built in a targeted manner, particularly for forestry and fire monitoring, as well as control and enforcement of legislative frameworks. This will facilitate a harmonised approach to climate change adaptation across all sectors and by stakeholders.
- **Complementary**: The project will build on various ongoing initiatives and programmes in Zambia. These initiatives include ongoing revisions of policy and plans, and ongoing climate change adaptation projects and initiatives by donor agencies and development partners. The project will strengthen coordination of climate change activities that will facilitate collaborative partnerships between all stakeholders involved in climate change adaptation.
- **Gender-sensitive**: The project will target vulnerable groups, including women. The role of women will be strengthened through knowledge transfer on resilience-building activities and adaptation responses. Women will be included as both actors and managers, as well as beneficiaries. Furthermore, the role of women will be strengthened through the collaboration and integration of women's groups.

57. The LDCF project has been prepared in line with guidance provided by GEF and the LDCF Trust Fund. The project follows guidance from the "Strategy on Adaptation to Climate Change for the Least Developed Countries Funds and Special Climate Change Fund" and the guidance paper "Accessing resources under the Least Developed Countries Fund". The project design is also aligned with the expected interventions articulated in the LDCF programming paper and decision 5/CP.9. As the effects of climate change fall disproportionately upon the poor, the links between climate change adaptation and poverty reduction are explicitly addressed within the project design (GEF/C.28/18,1(b),29).

2.3 Design principles and strategic considerations

2.3.1 Baseline projects

58. The UNDP-implemented, LDCF-financed project is focused on increasing the adaptive capacity of communities in Zambia's Central Province to climate change. To ensure that LDCF resources are used in a strategic manner, the LDCF project will build upon existing adaptation activities implemented by Government, multi- and bilateral donors as well as NGOs. This includes coordinating efforts in Zambia and strengthening the national framework for climate change adaptation. Specifically, the LDCF project will finance the additional adaptation costs of priority actions not currently funded by the baseline projects, described below.

59. The **Ministry of Lands, Natural Resources and Environmental Protection** (MLNREP), through the Forestry Department's National Tree Planting Programme (NTPP), will provide co-financing to the proposed LDCF project. The following activities are supported under the NTPP: i) procurement of nursery equipment and materials; ii) nursery establishment; iii) tree planting; iv) weeding; and v) fire management. The Forestry Department's contribution will focus on indigenous forest conservation. In addition, climate-adaptive agro-forestry, assisted natural regeneration techniques and fire management will be promoted. This co-financing in support of Components 1 and 2 will be in the form of: i) annual budgetary allocations for the planned activities (grant); and ii) in-kind contributions to support the activities. The total contribution for the period 2015–2019 is US$11.42 million.

60. The **Centre for Environmental Research Education and Development** (CERED): CERED's main areas of work include climate change mainstreaming, forestry, freshwater and wetlands, species and protected areas, community-based natural resources management, capacity building and curriculum design and development, as well as policy analysis and development. In the western part of Central Province, CERED has been working with local communities and traditional authorities in the Mopane sub-ecoregion within the miombo woodlands to conduct participatory forest resource assessment, promote agroforestry and alternative income-generation activities to address forest degradation arising from unsustainable charcoal production and enhance climate change adaption and resilience. CERED's co-financing contribution in support of Component 1 of the LDCF project focuses on piloting of community-based, climate-adaptive agro-forestry and assisted natural regeneration techniques within the Mopane sub-ecoregion. The co-financing amount of US$147,661 is in-kind and includes: i) capacity-building activities implemented by the project; ii) staff time; and iii) technology transfer.

61. **Community Markets for Conservation** (COMACO) provides services to small-scale farmers. Currently, COMACO is undertaking a project, which commenced in 2014 and is scheduled to end in 2019. The support services provided by COMACO address issues of resilience by recommending crops and production technologies that promote soil improvement as well as viable income opportunities, reforestation and forest regeneration activities. Preferred technologies are those that can be started after brief training with low, if any, input costs, while benefiting from ongoing training updates to advance continued understanding of soils and diversification of income opportunities both on and off the farm. In addition, COMACO provides training on improved ways to promote food security, diversify income and mitigate against the effects of extreme events, pest problems and various social and health challenges arising from climate change. COMACO's operations extend throughout much of Eastern, Muchinga and Central Provinces. Through COMACO's activities, over 650,000 hectares have been set aside as community conservation areas (CCAs). COMACO will provide US$11 million in-kind towards the implementation of Components 1 and 2 of the UNDP-implemented, LDCF-financed project.

62. **Environment Africa** has partnered with WFD, a German NGO, in working towards the enhancement of food security, afforestation and reforestation for subsistence. A project is currently being implemented in the Chisamba and Chibomobo districts – among the largest districts in Central Province – and is scheduled for completion in December 2017. The interventions focus on; i) climate-adaptive agro-forestry for rural farming communities; ii) support to farmers in practising conservation farming; iii) capacity building for the District Agricultural Coordinators (DACOs) and Forestry Department in climate-resilient agro-forestry and natural regeneration practices; iv) increased knowledge about, and uptake of, appropriate supply-side, biomass energy production technologies; v) reforestation projects; vi) climate change awareness programmes for schools and traditional leaders; and vii) building capacity amongst rural farmers in community participation in natural resources management. Environment Africa will provide co-financing in the amount of US$386,372 in support of Components 1 and 3. This co-financing will be in-kind.

63. **Pioneer** is an NGO that works with a diverse array of civil society organisations, community-based organisations and communities within Central Province to provide energy efficient technologies. The objective of Pioneer is to reduce deforestation by developing and promoting alternatives to the current practice of making charcoal by cutting down trees. Pioneer has successfully established that organic matter – including maize combs, groundnut shells, charcoal fines and brown cardboard boxes – and animal droppings can be used to produce charcoal briquettes. Pioneer will provide in-kind financing in support of Component 3 to increase the knowledge and uptake of appropriate supply-side biomass energy production technologies. This in-kind contribution is in the amount of US$3.19 million.

64. The **Zambia Climate Change Network** (ZCCN) works with a diverse range of CSOs, CBOs and communities across Zambia, including in Central Province. The purpose of ZCCN's work is to deliver interventions that empower communities to actualise participatory climate change adaptation and mitigation actions. Within Central Province, ZCCN, in close collaboration with member organisations, is catalysing activities that have fostered: i) awareness; ii) resilient agriculture production; and iii)

forest regeneration activities, by using approaches that integrate scientific and indigenous knowledge. ZCCN's co-financing contribution is in support of Component 1 of the LDCF project, which focuses on piloting community-based, climate-adaptive, agro-forestry and assisted natural regeneration techniques. The co-financing is in-kind in the amount of US$980,000.

65.   **Zambia Institute of Environmental Management** (ZIEM) works with a diverse array of CSOs, CBOs and communities within Central Province. ZIEM is currently implementing the following programmes in natural resource management: i) sustainable management of forestry in Central Province; ii) REDD+ tracking, social and environmental safeguards; and iii) REDD+ finance tracking mechanisms. ZIEM is also engaging various stakeholders on energy efficiency and financing of energy through pro-poor public-private partnership. The project commenced in 2014 and is scheduled for completion in 2020. The area of focus is Central Province. The in-kind co-financing is in the amount of US$746,057 and is in support of the following LDCF project activities: i) piloting of community-based, climate-adaptive agro-forestry and assisted natural regeneration techniques; ii) enhanced capacity of foresters and communities in Central Province to implement appropriate climate-resilient agroforestry and natural regeneration practices in designated zones; iii) increased knowledge about, and uptake of, appropriate supply-side biomass energy production technologies.

66.   **Kasanka Trust** (KT) is an implementing organisation that has been active in the Kasanka National Park and surrounding areas for over 25 years with a focus on conservation and associated community development. KT has a long tradition of collaboration with local communities and other local stakeholders, including the local Community Resource Boards, ZAWA and the FD. KT follows a dual approach regarding local communities: i) seeking advice and support for conservation activities; and ii) supporting capacity building and income generating activities for the same communities. Activities carried out and envisaged to continue under climate change and related initiatives include, *inter alia*: i) mitigating land degradation; ii) reduced deforestation; iii) erosion and sedimentation; iv) sustainable forest management; v) conservation farming/agriculture vi) sustainable wood fuel and charcoal production; and vii) implementing management plans for the National Park and Kafinda Game Management Areas, as well as nearby gazetted forests. The co-funding contribution from KT is in support of the activities under Components 1 and 3 to reduce deforestation and promote sustainable community-based joint forest management of indigenous forests in the wider Kasanka area within Zambia's central province. The in-kind co-financing is in the amount of US$1,060,000.

67.   **UNDP** is committed to providing co-financing for the UNDP-implemented, LDCF-financed project. Over a five-year period, Target Resource Assignment from the Core (TRAC) funds of US$100,000 will be made available. This cash co-financing is in support of Project Management Costs (PMCs).

2.3.2 Ongoing national and regional initiatives

68.   The project implementation will benefit from the following ongoing national and regional initiatives related to decentralised forest management, climate adaptation and forest management.

69.   The UNDP-implemented, LDCF-financed project **Adaptation to the Effects of Drought and Climate Change in Agro-Ecological Zone 1 and 2 in Zambia** is developing the adaptive capacity of subsistence farmers and rural communities to withstand climate change in agro-ecological regions I and II in Zambia, in accordance with the NAPA process. This project is of particular relevance to the current LDCF project because of the synergies between the two in terms of developing climate-resilient agricultural and water management practices. Links between the two project management teams will be strengthened so as to maximise these synergies, and learning opportunities will be maximised at local levels. The Agro-Ecological LDCF project is working with COMACO (Community Markets for Conservation), which links NTFPs to local and overseas markets. Since COMACO is also one of the co-financers of the regeneration project, the regeneration project will use the market linkages that have already been put in place to ensure efficiency and sustainability. The **AfDB-LDCF**

project on 'Promoting Climate Resilient Livestock Management'[76] plans to train artisans in manufacturing livestock-related material as a source of income diversification. This will be a good starting point for the regeneration project, and the UNDP-LDCF project will coordinate with the AfDB-LDCF project to ensure that alternative livelihood options explored by the AfDB-LDCF project are consistent with the agro-forestry and natural forest regeneration options being promoted by the UNDP-LDCF project.

70. Zambia is a pilot country for the Pilot Programme for Climate Resilience (PPCR) which is funded by the World Bank. Phase II of the Zambian project, entitled **Strengthening Climate Resilience Project**, is currently being implemented – 2014–2018 – and will strengthen Zambia's institutional framework for climate resilience and improving the adaptive capacity of vulnerable communities in the Barotse sub-basin in the Western Province. The PPCR Phase II is of particular relevance to the LDCF project because of the synergies between the two projects in terms of developing innovative techniques for reducing climate change vulnerability of communities using appropriate ecosystem management practices. Links between the two project management teams will be strengthened to maximise these synergies and learning opportunities will be maximised at local levels.

71. **Strengthening Climate Resilience in the Kafue Basin** is currently being implemented by the Ministry of Finance and National Planning and funded by the African Development Bank (2014–2018). The project will foster sustained economic growth, reduce poverty and enhance food security through strengthening the adaptive capacity of 800,000 farmers to better respond to climate variability and long-term consequences of climate change in the Kafue sub-basin. The LDCF project will consult closely with this project to collate and share information on community-based climate change adaptation measures.

72. The **Climate Smart Agriculture: Capturing the Synergies Between Mitigation, Adaptation and Food Security project** (2013–2017) is implemented by FAO's Economics and Policy Innovations for Climate-Smart Agriculture Programme and supported by the European Union and the Swedish International Development Agency (SIDA). The project is currently being implemented in Malawi, Vietnam and Zambia and is aimed at strengthening the capacity of the countries to address constraints and promote climate-smart agriculture that will deliver both food security and improved livelihoods. By building resilience and the capacity of agricultural and food systems to adapt to climate change, the project will also avoid greenhouse gas emissions. The LDCF project will benefit from this project by building on the awareness raised for climate-smart agriculture. In addition, the LDCF project will consult with this project to collate information on the climate-smart agro-forestry techniques that are being successfully implemented in Zambia.

73. **Strengthening Management Effectiveness and Generating Multiple Environmental Benefits within and around Protected Areas in Zambia** is a UNDP-implemented, GEF-financed project executed by the Ministry of Lands, Natural Resources and Environmental Protection. This project is aimed at strengthening the capacity for environmental protection and natural resource management for communities around National Parks through increased knowledge of resource management and promotion of sustainable alternative livelihoods using the GEF Small Grants model. The interventions will contribute to effective natural resource management in National Parks that are experiencing high rates of degradation and deforestation. In addition, these interventions will contribute to poverty reduction through the introduction of alternative sustainable livelihoods. This project is of particular relevance to the LDCF project because of the synergies between the two in terms of developing innovative techniques for reducing climate change vulnerability of communities using appropriate ecosystem management and the development of sustainable livelihoods. The LDCF project will therefore consult with the project management team to collate information on the natural resource management challenges and introduction of sustainable livelihoods, and will benefit from UNDP's implementation of both projects.

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[76] PMIS 5394.

2.3.3 National and local benefits

74. The LDCF project will address the problems of deforestation, poverty and vulnerability of communities to climate change in Central Province. The adaptation interventions will directly contribute to MDG 7 – ensuring environmental sustainability. Because local communities depend on natural resources for their livelihoods, improved environmental management will reduce poverty and increase food security, thereby contributing to attaining MDG 1 – eradication of extreme poverty and hunger – as well as other MDGs that are closely linked to the natural resource base. Additionally, training communities in assisted natural regeneration techniques and the sustainable use of resources will increase their resilience to climate shocks. Such activities will also improve their livelihoods by diversifying their income-generating opportunities. The project will therefore contribute to reducing poverty in Central Province.

75. Without the UNDP-implemented, LDCF-financed project, local communities and the ecosystems upon which they depend will be increasingly at risk from the impacts of climate change. As a result, progress towards the sustainable management of forest resources and socio-economic development are likely to be hampered. The LDCF project will provide practical tools, technologies and capacities for an adaptation programme that promotes natural resource management by communities. Foresters and communities will be trained to implement: i) assisted natural regeneration techniques; ii) agro-forestry practices that are climate-resilient; and iii) appropriate fire management regimes. This will be achieved through practical demonstrations over 15,000 ha to improve the maintenance and enhancement of ecosystem functioning, integrity and resilience.

76. Assisted natural regeneration (ANR) comprises a range of activities designed to accelerate regeneration of forests by encouraging and enhancing natural tree establishment. Typically, this process involves reducing mortality of naturally-recruited seedlings – e.g. protecting them from fire, grazing and agricultural encroachment – as well as enrichment planting of valuable/desirable species. This approach has proven successful in restoring degraded miombo woodlands by increasing abundance and volume of trees[77]. This in turn increases the economic value of forests through more sustainable provision of ecosystem goods and services – including wood as well as NTFPs – upon which rural livelihoods depend.

77. Improved agro-forestry systems comprise a range of technologies that support cost-effective permanent agriculture and microclimate management. A higher degree of permanence in cultivation compared with shifting cultivation results in reduced demand for conversion of natural forests into agricultural land compared with shifting agriculture practices. In addition, agro-forestry has a positive effect on the socio-economic context in terms of financial profitability, satisfaction of multiple user needs and carbon sequestration. Furthermore, agro-forestry systems provide various products which otherwise would be taken from forests. A reduced number of fires and early burning will have a beneficial effect on woody biomass accumulation in miombo woodlands.[78]

78. At a local level, the UNDP-implemented, LDCF-financed project will directly contribute to reducing the socio-economic vulnerability of local communities to the adverse effects of climate change and variability at the sub-national level. A variety of site-specific activities and adaptation technologies will be implemented to reduce the vulnerability of forest ecosystems and simultaneously restore forest resources within the project area, which is particularly prone to degradation.

79. The immediate benefits of the project will be that Government institutions, NGOs and vulnerable communities have increased adaptive capacity as they: i) are more aware of the linkages between climate resilience and ecosystem management; and ii) acquire the necessary skills to apply adaptive

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[77] Blay, D., Bonkoungou, E., Chamshama, S.A.O. and Chikamai, B. (2004), *Rehabilitation of Degraded Lands in Sub-Saharan Africa: Lessons Learned from Selected Case Studies*. Forestry Research Network for Sub-Saharan Africa.
[78] Timberlake J, Chidumayo E and Sawadago L. (2010), "Distribution and characteristics of African dry forests and woodlands", in: Chidumayo E and Davison G, eds. *The Dry Forests and Woodlands of Africa: Managing for Products and Services*. London: Earthscan, 11 – 42.

approaches. This increased capacity will also support long-term benefits by promoting adaptation planning beyond the life-span of the project.

2.3.4 Site selection

80.   The site selection process for the LDCF project was designed to be transparent and inclusive. Central Province has been chosen as the focus of the landscape-based interventions for this project because deforestation and degradation are particularly problematic in the region. This is a result of increased conversion of forest for agricultural expansion and the production of charcoal[79]. In addition, late forest fires affect the regeneration of forests and often result in tree mortality.[80] In Central Province, there are: i) 371,000 ha of National Forests; and ii) 594,000 ha of Local Forests[81].

Figure 4: Administrative boundaries of Zambia

81.   Following stakeholder design consultations during the project preparation phase, a multi-criteria assessment was undertaken to identify the district within which the on-the ground activities under Components 1, 2 & 3 will be implemented[82]. The following selection criteria were then applied to select the district:

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[79] Approximately 90% of households in Central Province rely on forest products for domestic consumption.
[80] Matakala, P. (2014). *Addressing Barriers to Adoption of Improved Charcoal Production Technologies and Sustainable Land Management Practices through an Integrated Approach: Field Report – Methodological and Partnership Appraoch and Identification of Potential District Site for the Pilot.*
[81] Republic of Zambia (2012), *Report of the Auditor General on Forest Monitoring in Zambia.* Available online at: https://afrosai-e.org.za/sites/afrosai-e.org.za/files/report-files/Forest%20Monitoring%20(2012).pdf.
[82]Zambia is divided into ten provinces, which are further divided into 89 districts. Central Province, within which the LDCF project is located, has six districts: Chibombo, Kabwe, Kapiri Mposhi, Mkushi, Mumbwa, and Serenje. In addition, there are four newly-created districts – Chisamba, Luano, Ngabwe and Chitambo – that do not yet have fully-

- Assisted Natural Regeneration experience: the district's degree of experience with ANR (the greater the experience, the higher the score).
- Agro-forestry/conservation agriculture experience and potential: the district's degree of experience with agro-forestry/conservation agriculture and potential (the greater the experience and potential for agro-forestry/conservation agriculture, the higher the score).
- Experience with forest fire management: the district's degree of experience with forest fire management (the greater the experience with forest fire management, the higher the score).
- Sustainable charcoal/energy experience and potential: the district's degree of experience with sustainable charcoal production/utilisation (e.g. improved kilns and stoves, briquetting, pelleting, etc.) and sustainable energy utilisation (e.g. solar, biogas, wind, geothermal, mini-hydro, liquefied petroleum gas, etc.). (The greater the experience and potential, the higher the score).
- Existing institutional capacities: existing capacities within the Forest Department and local institutions such as VAGs, CRBs and CBOs to effectively execute the required interventions under the UNDP-implemented, LDCF-financed project (the greater the institutional capacity at district level, the higher the score).
- Existence of partners: the existence of partners at the district level to assist in the various interventions of the project (the more numerous and diverse the partners, the higher the score).
- Environmental awareness and education: the degree to which environmental awareness and education have been promoted at district level (the greater the knowledge of previous or existing programmes on environmental awareness and education programmes, the higher the score).
- Degree of forest degradation: the degree to which the district's forest estate has already been degraded (the higher the degradation, the lower the score).

82. The results of the matrix (Table 1) indicate Serenje District as the preferred location for the implementation of the LDCF project because it will provide quick, cost-effective, relatively low-risk and replicable results. Serenje District receives high scores for ANR experience, forest fire management, environmental awareness and education, as well as effective management of its forest estate compared with the forest estates of other districts.

83. Approximately 86% of Serenje District's protected areas (including National Forest Reserves and Local Forest Reserves) are encroached and there are no forest management plans at the district level. In addition, the district forest office is constrained by inadequate: i) staff to effectively manage the forest estate; and ii) operational budget to execute its functions effectively. Furthermore, there have been no previous interventions within Serenje District aimed at promoting sustainable charcoal production and utilisation techniques or alternative energy sources.[83]

84. During project inception, particular target communities and intervention sites within Serenje District will be selected in collaboration with the FD. The lessons learned from Serenje District will inform policy- and decision-makers, implementing and cooperating partners in other districts and provinces.

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established administrative structures. These districts depend upon the older districts adjacent to them. Kabwe serves as the Provincial headquarters. This government structure (the contemporary state) is superimposed on the traditional administrative structure (chiefdoms) that is under the jurisdiction of Traditional Leaders (Chiefs), who are the original owners of the land. Chiefs still yield enormous power and control over the land.

[83] Matakala, P. (2014), *Addressing Barriers to Adoption of Improved Charcoal Production Technologies and Sustainable Land Management Practices through an Integrated Approach: Field Report – Methodological and Partnership Appraoch and Identification of Potential District Site for the Pilot.*

Table 1: Multi-criteria assessment matrix for district selection.

Criteria ➡ / District ⬇	ANR experience	Agroforestry/ Conservation agriculture experience & potential	Experience with forest fire Management	Sustainable charcoal/energy experience and potential	Existing institutional capacities	Existence of partners at district level	Environmental awareness and education at district level	Degree of forest degradation	Total Score
Chibombo	0	4	2	0	1	3	4	3	**17**
Kabwe	1	1	2	2	1	2	1	2	**12**
Kapiri-Mposhi	3	2	2	1	3	3	3	2	**19**
Mkushi	3	3	1	0	3	3	3	2	**18**
Mumbwa	2	2	3	1	3	2	3	2	**16**
Serenje	4	2	4	2	3	3	4	4	**26**
Itezhi-tezhi	0	1	2	1	3	2	3	3	**15**

2.3.5 UNDP Comparative advantage

85.   The UNDP-implemented, LDCF-financed project is aligned with UNDP's comparative advantage in capacity building and providing technical support, as well as providing expertise in project design and implementation. Specifically, the LDCF project will build upon UNDP's comparative advantage stemming from experience in working with Government and communities in Zambia as well as globally on: i) establishing and strengthening institutional, policy and legislative mechanisms; ii) building capacity; iii) undertaking risk assessments; iv) mainstreaming climate change adaptation, disaster risk reduction and early warning systems into development planning; and v) harnessing best practices and community-based approaches across different thematic areas for climate change adaptation and disaster risk reduction.

86.   UNDP is particularly well positioned to provide support for the design and implementation of demonstration activities at the community level. This is largely owing to the UNDP Country Office's: i) on-the-ground presence, established networks and working relationships in the country; and ii) extensive experience in implementing projects in constrained institutional and organisational environments at the local level, while still maintaining quality and responsiveness to local needs. UNDP has supported Zambia to reduce poverty and increase food security through sustainable livelihoods from appropriate land management and biodiversity conservation[84].

87.   The project will benefit from UNDP's considerable experience in implementing a wide range of climate change adaptation projects – including those focusing on ecosystems and the forestry sector – in LDCs. For example, UNDP has already assisted the GoZ to design and implement several adaptation programmes, including the "Adaptation to the effects of drought and climate change in Agro-ecological Regions I and II" project.

88.   The UNDP Country Office is also supported by Regional Technical Advisors at the UNDP Regional Service Centre in Addis Ababa, as well as by policy, adaptation, economics and climate modelling experts in New York, Cape Town and Bangkok. A network of global Senior Technical Advisors provide additional technical oversight and leadership, helping to ensure that programmes on the ground achieve maximum policy impact. There are also other LDCF, SCCF and Adaptation Fund-financed projects within the region with similar objectives currently supported by UNDP. Consequently, there is substantial in-house technical expertise that can support the GoZ with project implementation. Furthermore, UNDP's use of the National Implementation Modality (NIM) serves to build capacity for project management and reporting in GoZ. This will prove beneficial for supporting ongoing partnerships between UNDP and GoZ for project implementation.

89.   UNDP is also uniquely positioned to exercise Results-Based Management and leverage its extensive knowledge of the similarities and differences between countries at different stages of development, and to translate that into evidence-based recommendations for effective, adaptable development solutions. UNDP's emphasis on application of the Human Rights Based Approach and its emphasis on gender equality in development programming will ground the implementation of the LDCF project in these important development principles.

2.4 Project objective, Outcomes and Outputs/activities

90.   The project objective is to promote climate-resilient, community-based regeneration of indigenous forests in Zambia's Central Province. This will enhance the adaptive capacity of local communities by securing ecosystem goods and services that underpin rural livelihoods. Community-based natural resource management (CBNRM) will be supported through the establishment of Village Action Groups (VAGs) that will manage forests and be responsible for equitable benefit distribution according to community priorities. In this way, local communities will be empowered to plan and implement effective measures for building climate resilience.

91.   Interventions will be implemented in Local and National Forest Reserves in Serenje District[85]. Under this framework, VAGs and DFs will be responsible for developing and implementing community-based management plans. These plans will detail: i) guidelines for managing miombo woodlands in zoned areas; ii)

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[84] Government of the Republic of Zambia and the United Nations Development Programme. (2011) *Zambia Country Action Plan 2011–2015.*

[85] There is no systematic institutional or planning framework that enables sustainable use of forests under customary lands. Therefore, implementation of project interventions in these areas would be at a risk of failing.

limits for resource extraction; and iii) benefit sharing. In addition, lessons learned from similar projects that have been implemented in Zambia – for CBNRM and sustainable charcoal production – will be considered during implementation.

92. The project objective will be achieved through the delivery of three integrated and complementary components. Component 1 will focus on the strengthening of capacities for planning and implementation of climate-resilient forestry practices. Component 2 will focus on protection of forest resources through implementation of fire management practices. Component 3 will reduce pressure on forest resources through the introduction of efficient charcoal kilns and the creation of alternative energy sources.

COMPONENT 1: PILOTING OF COMMUNITY-BASED, CLIMATE ADAPTIVE AGRO-FORESTRY AND ASSISTED NATURAL REGENERATION TECHNIQUES

OUTCOME 1: Enhanced capacity of foresters and communities in Central Province to implement appropriate climate-resilient agro-forestry and natural regeneration practices in designated zones

Co-financing amounts for Outcome 1: US$20,683,939
LDCF: US$2,200,000

Without LDCF Intervention (baseline)

93. At present, national and local capacities for the conservation of forests remain constrained. While national forests are protected by law[86], the Forestry Department is not able to implement measures for adequate protection and management of these areas. According to the Forestry Department's Annual Reports, forests in Central Province are experiencing ongoing deforestation and forest degradation. Twenty of the 25 Forest Protection Areas and 12 of the 15 National Forests in this province have been encroached to varying degrees.

94. Through the NTPP, the Forestry Department is implementing various activities focused on improving the state of Zambia's forests. The NTPP is establishing nurseries to support tree-planting activities in indigenous forests. The Programme elements on *management of forest reserves and* enhancement *of natural regeneration of forests* aim to enhance biodiversity conservation as well as provision of ecosystem goods and services – including wood and non-timber forest products (NTFPs) – through the protection and management of intact forests and natural regeneration in disturbed areas. However, the ongoing pressures on Zambia's natural forests are threatening the success of these initiatives. Currently, miombo woodlands in Central Province are being degraded as a result of unsustainable land/forest management practices[87]. For example, historical rates of deforestation have increased from ~20,730 ha per annum in 1969 up to ~35,670 ha per annum in 2000[88]. Urbanisation, infrastructure development and wood extraction also increase rate of deforestation and forest degradation in miombo woodlands. The expected effects of climate change will further exacerbate these pressures. The regeneration capacity of miombo woodlands is expected to reduce as mean annual temperatures and drought conditions increase. At the same time, communities are likely to increase their reliance on forests for livelihood activities to offset climate-induced losses resulting from prolonged droughts, localised floods and a shortened growing season in Zambia[89].

95. CERED supports capacity-building on management of natural resources such as forests, water and biodiversity. This is achieved through *inter alia* promotion of CBNRM. In Central Province, CERED is working with local communities and traditional authorities to conduct participatory forest resource assessments. These assessments inform community-based decision-making on diversification of livelihoods to reduce rates of

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[86] Forest Act (1973).
[87] Modern agricultural practices are being used instead of traditional *chitemene* practices.
[88] Misana, S., Mung'ong'o, C. & Mukamuri, B. (1996). *Miombo woodlands in the wider context: macro-economic and inter-sectoral influences*, in: Campbell, B. (Ed.), The miombo in transition: woodlands and welfare in Africa. Center for International Forestry Research, Malaysia.
[89] FAO. *Economics and Policy Innovations for Climate-Smart Agriculture: Zambia*. Available online at: http://www.fao.org/climatechange/epic/projects/countries/zambia/en/?20=.

forest degradation resulting from charcoal production. However, climate change is expected to result in increased forest degradation as communities increase rates of resource extraction to compensate for reduced agricultural production. Consequently, communities are unlikely to be able to practice effective and sustainable CBNRM under future climate conditions.

96. COMACO provides support to small-scale farmers on sustainable and productive agricultural practices. These support services focus on soil improvement and livelihood diversification. COMACO provides training on low-input practices, as well as improved crops and technology. This will promote food and income security for small-scale holders through enhanced agricultural productivity. However, the expected effects of climate change undermine this work through the increased frequency and severity of extreme climate events as well as an expected increase in pest problems[90]. There is consequently a need for promotion of climate-resilient agricultural practices such as agro-forestry to ensure that small-scale farmers will be able to maintain productivity under future climate conditions.

97. ZIEM supports a number of communities in Central Province on sustainable natural resource management. ZIEM's main focus is on sustainable management of forest resources and the implementation of REDD+ activities. In particular, ZIEM supports the tracking of environmental and social safeguards as well as the equitable distribution of REDD+ financing. However, climate change is expected to result in increased pressure on forest resources to sustain community livelihoods (See Annex 1). Consequently, ongoing deforestation and forest degradation are likely to undermine ZIEM's activities as communities seek to offset the effects of climate change through greater extraction of forest resources.

98. The predicted effects of climate change will result in increased degradation of natural resources (see Annexes 1 and 2). Agricultural productivity is predicted to decline by 0.6% by the year 2050[91] owing to climate-induced extreme events such as prolonged droughts, localised floods and a shortened growing season[92]. This is expected to result in increased rates of deforestation and forest degradation as local communities seek to compensate for reduced income from agriculture. As a consequence, the Forestry Department's and other stakeholders' efforts to ensure sustainable management of forest resources will be undermined by extraction of wood and NTFPs to support community livelihoods. Under business-as-usual conditions, local communities are likely to suffer from increased levels of poverty and food insecurity as current agricultural and livelihood practices become increasingly unviable owing to the effects of climate change. With over 70% of the population living below the poverty line, the NAPA recognises that vulnerable communities do not have sufficient capacity to adapt to climate change[93].

With LDCF Intervention (adaptation alternative)

99. The project will use LDCF resources to support the implementation of community-based and climate-resilient approaches to natural resource management. Outcome 1 will result in enhanced adaptive capacity of district forest officers and local communities through: i) improved planning and decision-making concerning natural resource use; ii) strengthening of the management frameworks at the local level; iii) training on climate-resilient techniques such as agro-forestry and assisted natural regeneration of miombo woodlands; and iv) the implementation of these climate-resilient approaches. This community-based approach to natural resource management will promote ownership of project interventions amongst local stakeholders in Serenje: approaches that local communities are positively willing to adopt will be integrated into planning for management of forest resources. Moreover, this approach is aligned with national policies and regulatory frameworks.

100. The LDCF project will build on the NTPP by supporting enrichment planting of miombo woodlands using climate-resilient species – such as *Faidherbia albida* and *Moringa oleifera* – that provide a range of environmental and socio-economic benefits. Furthermore, the project will support improved management of

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[90] USAID (2012), *Climate Change Impact on Agricultural Production and Adaptation Strategies: Farmers' Perception and Experiences.*

[91] Dyszynski, J. (2010), *UNEP AdaptCost Briefing Note: Economics of Climate Impacts and Adaptation in Africa's Agricultural Sector.* UNEP/Stockholm Environment Institute, Oxford.

[92] USAID (2012), *Climate Change Impact on Agricultural Production and Adaptation Strategies: Farmers' Perception and Experiences.*

[93] Ministry of Tourism, Environment and Natural Resources (2007), *Zambia National Adaptation Programme of Action.*

forest areas through resource- and land-use planning that is informed by climate change projections. These interventions will result in a greater provision of ecosystem goods and services to local communities that will remain sustainable in spite of the predicted effects of climate change.

101. The project will also build on the work of COMACO related to support for small-scale farmers. Climate-resilient agricultural practices – in particular, agro-forestry – will be promoted to ensure sustainability of agricultural production under future climate conditions. These practices are low-input and low-technology – in line with COMACO's current approaches – for a cost-effective approach that is easily implemented by local communities. Furthermore, the interventions are complementary to COMACO's work as the tree species to be included in the agro-forestry – e.g. *Sesbania sesban*, *Cajanus cajan* and *Gliricidia sepium* – will support improvements to soil conditions as well as providing alternative livelihood opportunities through the generation of NTFPs.

102. ZIEM's work on sustainable forest management through the implementation of REDD+ activities will be complemented through the improvement of planning and decision-making on CBNRM as well as the implementation of ANR practices. Project interventions will thus enhance the sustainability of wood and NTFP supplies that are expected to experience increased pressure under future climate conditions. This will enhance the climate-resilience of ZIEM's activities by reducing rates of deforestation and forest degradation that would otherwise result from increased extraction of forest resources to offset the effects of climate change.

103. Local communities will be supported in developing and strengthening frameworks for participatory decision-making and planning for resource- and land-use management in Local and National Forest Reserves. This will be based on comprehensive participatory resource mapping exercises to identify a range of climate-resilient practices for strengthening of community livelihoods under future climate conditions. The formation of VAGs will enhance the institutional capacity for CBNRM through establishment and enforcement of resource- and land-use plans – based on the priorities of community members – through a fully participatory approach. District forest officers and VAG members will be trained on climate-resilient approaches to management of forest resources – through, *inter alia,* ANR – and enhancement of agricultural productivity through agro-forestry. Finally, communities will be supported in the implementation of the identified interventions through a learning-by-doing approach.

104. By enhancing the capacities of district forest officers and community members to implement on-the-ground interventions for climate-resilient CBNRM, pressures on natural resources will be reduced. Consequently, communities will benefit from sustainable production of ecosystem goods and services under future climate conditions. This will contribute towards increased food and livelihood security in spite of the predicted negative effects of climate change.

Output 1.1: Participatory resource mapping and zoning (identification of suitable areas for agro-forestry and assisted natural regeneration measures) taking alternative climate change scenarios into account completed in all six districts of Central Province

Under this output, a comprehensive resource-mapping process will be undertaken to inform planning and decision-making on forest management. Bio-physical data – such as geology, soil types, hydrology, vegetation types, land use, past climate trends and future climate scenarios – will be collected for all six districts of Central Province. In addition, participatory resource mapping exercises will be conducted in local communities. These exercises will characterise resource use – including agriculture, extraction of wood and NTFPs, and charcoal production – and land tenure, with particular focus on the effects of past climate hazards and current climate trends. The results of the participatory resource mapping will be combined with the bio-physical data to produce integrated land-use maps. These maps will identify zones for various resource uses such as agriculture/agro-forestry, forest conservation, assisted natural regeneration (ANR), wood extraction, charcoal production and harvesting of NTFPs. This will strengthen planning for sustainable use of natural resources by enabling decision-makers at all levels to relate current land-use practices to future climate conditions.

105. The participatory resource-mapping process will actively engage with vulnerable groups such as women, the youth and the elderly. This will ensure that the results of the mapping exercises include the priorities of these

groups in the zoning of areas for various types of resource- and land-use. This will also take various land-tenure arrangements into account to ensure equitable resource access to all groups in the resource zoning.

106. Activities will include:

    1.1.1 Undertake a comprehensive study of bio-physical data – including geology, soil, vegetation, climate change projections and hydrology – for Central Province of Zambia.
    1.1.2 Conduct participatory resource mapping exercises to characterise resource use, land tenure and climate hazards, with particular focus on agricultural and forest areas.
    1.1.3 Develop integrated resource- and land-use maps – based on the bio-physical study and the participatory mapping exercise – with zones for agro-forestry and assisted natural regeneration activities.

Output 1.2: Between 30-40 VAGs formally recognised and constituted in Serenje district by Year 2, with clear resource rights and delineation of legally-recognised VAG boundaries and use zones

107. Under this output, the project will facilitate the formation of VAGs in Serenje district through a fully participatory decision-making process. Community consultations will be conducted to obtain community support and buy-in for VAGs. In particular, the consultations will sensitise community members on: i) what VAGs entail; ii) the benefits associated with VAG formation; iii) the process of registering a VAG; and iv) the operation of VAGs for managing natural resource use. Following these consultations, the establishment of 30–40 VAGs will be facilitated in communities that indicate a willingness to do so. These VAGs will have clear leadership structures elected in a democratic and participatory fashion following international best practices for CBNRM[94,95]. Governance guidelines will be developed for VAGs. These will entrench the rights of members to participate in decision-making, have access to information, control the agenda and vote. In addition, the VAGs will formulate and ratify their respective constitutions. These constitutions will be socio-culturally appropriate and will detail procedures for *inter alia*: i) managing natural resources; ii) enforcing regulations; iii) resolving conflicts; and iv) sharing benefits. Following ratification of their constitutions, VAGs will be formally registered as Trusts[96], Village Companies[97] or Conservancies[98]. Finally, VAG boundaries will be agreed and marked, thereby entrenching VAG members' rights to use, manage, benefit from, sell and protect forest resources (see Output 1.3).

108. Registering VAGs as Trusts, Companies or Conservancies will ensure accountability and formal governance structures. This will address criticisms of inadequate governance structures in previous community-based natural resource management projects[99]. Registered VAGs will allow funds to be allocated in a transparent and regulated manner. For example, in Zambia in 1995 registered VAGs obtained ~80% of revenues earned from community resources under the Luangwa Integrated Resource Development Project[100]. Once revenue is received by registered VAGs, participatory management will prevent elite capture – whereby benefit earned from community assets accrues disproportionately to a minority of community members. For example, game management areas in Zambia have been recorded as benefitting only the wealthiest 40% of households[101]. Instead, all households will have access to resources and benefit-sharing opportunities.

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[94] Senyk, J. (2005), *Lessons from the Equator Initiative: Community-Based Management by Pred Nai Community Forestry Group in the Mangroves of Southeastern Thailand*. Centre for Community-Based Resource Management, Natural Resources Institute, Winniepeg, Canada.

[95] Wood, L. (2008), *Community-Based Natural Resource Management: Case Studies from Community Forest Management Projects in Ghana, Mexico and the United States of America*. NRES 523: International Resource Management.

[96] A fund acquired from bequests, the income from which is to be used for the general betterment of the inhabitants of a community.

[97] An organisation with primarily social objectives whose surpluses are principally reinvested for that purpose in the organisation in the community, rather than being driven by the need to maximise profit for shareholders and owners.

[98] A body concerned with the preservation of nature, specific species or natural resources.

[99] Logan, B.I. & Moseley, W.G. (2002), "The political ecology of poverty alleviation in Zimbabwe's Communal Areas Management Programme for Indigenous Resources (CAMPFIRE)", *Geoforum* 33, 1–14.

[100] Kapungwe, E. (2000), 'Empowering communities to manage natural resources: where does the new power lie? Case studies from Mumbwa game management area and Lupande game management area, Zambia',in *Empowering Communities to Manage Natural Resources: Case Studies from Southern Africa* (eds. Shackleton, S. & Campbell, B.) CSIR, Pretoria., South Africa.

[101] Fernandez, A., Richardson, R.B., Tschirley, D. & Tembo, G. (2009), *Wildlife Conservation in Zambia: Impacts on Rural Household Welfare*. FSRP Working Paper 41, Lusaka, Zambia.

109. The process of formation and registration of VAGs will be fully inclusive to reflect the priorities of all community members in decision-making concerning resource- and land-use management. In particular, the priorities of vulnerable groups such as women, the youth and the elderly will be determined through the participatory processes for explicit inclusion in the formation of VAGs.

110. Activities will include:

1.2.1 Conduct community consultations to sensitise community members on the procedures for – and benefits of – constituting VAGs.
1.2.2 Facilitate the establishment of 30–40 VAGs, including the selection of leadership structures and formulation of their constitutions.
1.2.3 Register the VAGs as Trusts, Conservancies or Village Companies following the preference of each Village Action Group.
1.2.4 Validate the integrated resource- and land-use maps concerning the boundaries and land-/resource-use zones described under Output 1.1.

Output 1.3: All VAG boundaries and use zones registered under the Zambia Integrated Land Management and Information System

111. After validation of integrated resource- and land-use maps (Output 1.2), VAG boundaries and resource-use zones will be registered under the Zambia Integrated Land Management and Information System – administered by the MLNREP. The maps will be digitised as Geographical Information System (GIS) layers to support monitoring of – and planning for – land/resource use in accordance with the agreed-upon zones. The VAG boundaries will also be included in the GIS layers to clearly delineate areas falling under their respective jurisdictions. This boundary delineation will allow VAGs to quantify and monitor the availability of forest resource – e.g. number of species, number of trees, volume of wood – within their boundaries. Once forest resources have been quantified, the rate and extent to which they are harvested, protected and restored can be planned and monitored through a participatory process. The outcomes of this planning can be used to inform by-laws that stipulate how – and when – various actions relating to resource use and management are undertaken. These by-laws can be enforced as required to entrench VAG members' rights to use, manage, benefit from, sell and protect forest resources. This regulation will ensure that rates of deforestation are reduced and that forest resources are used sustainably. It will also reduce the likelihood of conflicts between resource users within and between VAGs, as the strengthened governance system will delineate users' rights to access and use forest resources.

112. Activities will include:

1.3.1 Develop GIS layers for the integrated resource- and land-use maps produced under Output 1.1.
1.3.2 Register the VAGs and their associated maps under the Zambia Integrated Land Management and Information System.

Output 1.4: Training delivered for at least 20 district forestry officers and 2,000 VAG community members on site-specific appropriate climate-resilient agro-forestry and natural regeneration practices

113. Following the identification of land-use zones under Outputs 1.1 and 1.2, district forestry officers and VAG members will be trained in the implementation of climate-resilient practices in accordance with the integrated resource- and land-use maps. This will be in preparation for the implementation of such climate-resilient practices under Output 1.6. A training needs assessment will be conducted to identify where gaps exist in the currently available training opportunities relating to agro-forestry and ANR practices. These training gaps will then be addressed through the development of a portfolio of training modules for district forestry officers and VAG members on the implementation of agro-forestry and ANR in accordance with community priorities as identified in Outputs 1.1 and 1.2. A "training-of-trainers" programme will be conducted with district forestry officers to equip them with knowledge and practical instruction on climate-resilient practices. These district forestry officers will then be capacitated to facilitate training of community members on implementation of site-specific priority activities as encapsulated in the VAG land-/resource-use zones developed under Outputs 1.1 and 1.2.

114. Training activities will ensure at least 40% representation of women for training on ANR and agro-forestry techniques (see Output 1.6).

115. Activities will include:

1.4.1 Conduct a needs assessment for training of district forestry officers and VAG members on site-specific appropriate climate-resilient agro-forestry and natural regeneration practices.
1.4.2 Develop portfolios of training modules targeting district forestry officers and VAG members, based on the needs assessment.
1.4.3 Provide training to district forestry officers on climate-resilient agro-forestry and natural regeneration practices following a "training-of-trainers" approach.
1.4.4 Train VAGs on site-specific appropriate climate-resilient agro-forestry and natural regeneration practices (to be facilitated by district forestry officers).

Output 1.5: Wood fuel collection zones established in all VAGs and coppicing practices promoted

116. Under this output, sustainable collection of wood fuel for domestic consumption and charcoal production will be promoted. Based on the land-/resource-use zones – as established under Outputs 1.1 and 1.2 – special areas will be designated for the collection of wood fuel. These wood collection zones will be identified in accordance with the VAGs' participatory decision-making processes as well as the integrated resource- and land-use maps validated by the VAGs. Furthermore, coppicing guidelines will be developed based on best practices and scientific information concerning natural regeneration of miombo woodland species. These guidelines will detail sustainable rates of coppicing and wood extraction that will reduce rates of deforestation and forest degradation by ensuring that rates of extraction do not exceed rates of regeneration. Local communities will therefore have more sustainable access to natural resources for household use as well as income generation. Guidelines for improved coppicing practices will promote sustainable CBNRM by VAGs.

117. Activities will include:

1.5.1 Establish zones for collection of wood fuel through a participatory decision-making process within each VAG.
1.5.2 Establish zones for practising coppicing to generate wood fuel.
1.5.3 Develop and disseminate coppicing guidelines for each VAG.

Output 1.6: Climate-resilient agro-forestry and ANR practices are piloted over 15,000 hectares under management in Serenje district

118. This output will support the demonstration of climate-resilient agro-forestry and ANR practices over 15,000 hectares of miombo woodlands in Serenje district. The integrated resource-/land-use maps – developed under Output 1.1 – will guide the development of agro-forestry and ANR plans for participating VAGs. Inter-cropping of conventional crops with suitable tree species such as *Faidherbia albida, Sesbania sesban, Tephrosia vogelii, Cajanus cajan, Gliricidia sepium, Senna siamea* and *Moringa oleifera* will be encouraged by providing community members with seedlings and agricultural inputs for agro-forestry. In addition, community members will be engaged through a "cash-for-work" programme to implement ANR for restoring degraded miombo woodlands in accordance with the priorities of the respective VAGs and in line with the ANR zones identified under Outputs 1.1 and 1.2.

119. The ANR practices will include enrichment planting of species that will contribute to the functional diversity of miombo woodlands. This will improve the provision of climate-resilient ecosystem goods and services that underpin the livelihoods of VAG members. For example, ANR activities will result in improved water regulation, soil conservation and production of wood and NTFPs. Indeed, rehabilitated miombo forests have been shown to supply fuel wood and building poles as well as NTFPs such as thatching grass, honey and edible fruits[102]. Species will also be selected based on their resilience to climate shocks, especially drought. Local ecological knowledge will form the basis of species selection. Other ANR practices include protection of sensitive areas – particularly where trees are being planted – against fire, grazing, cutting of wood and

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[102] Dallu, A.I.M (2002), *Tropical Secondary Forest Management in Africa: Reality and Perspectives*, Tanzania Country Paper: Workshop on Tropical Secondary Forest Management in Africa. Nairobi, Kenya.

other forms of encroachment. This will be undertaken in conjunction with the fire management plans developed under Component 2.

120.   Women, youth, the elderly and other vulnerable groups will be included in planning and implementation of ANR activities. This will be done in a culturally-sensitive manner, taking the traditional roles of women into account while at the same time providing opportunities for their equitable inclusion in project activities. For example, it is anticipated that women will participate extensively in enrichment planting through the "cash-for-work" programme[103].

121.   Activities will include:

    1.6.1   Develop agro-forestry and ANR plans for each VAG based on the integrated resource- and land-use maps produced under Output 1.1.
    1.6.2   Develop agro-forestry and ANR guidelines/manuals based on local ecological knowledge as well as international best practices.
    1.6.3   Support the implementation of ANR practices by community members through a "cash-for-work" programme.
    1.6.4   Provide community members with seedlings and other inputs for implementation of agro-forestry practices.

COMPONENT 2: INTEGRATED CLIMATE-RESILIENT FIRE MANAGEMENT

OUTCOME 2: Robust fire monitoring and management protection plans and measures in place in all districts in Central Province to maintain desired regeneration targets and reduce fire frequency by 25-30% annually across the province, within a four year burning cycle

Co-financing amounts for Outcome 2: US$2,482,073
LDCF: US$1,200,000

Without LDCF Intervention (baseline)

122.   The predicted increase in temperatures as well reduction in precipitation – with associated droughts – is expected to result in an increase in the severity and frequency of forest fires under climate change conditions (See Annex 1). This will impact the availability of wood and NTFPs, while also endangering agricultural productivity, economic assets and lives. Fire is a natural ecosystem process in miombo woodlands. However, the change in fire regime – and in particular the proliferation of fires under expected climate change scenarios – is likely to result in conversion of miombo woodlands into grasslands[104]. This will have considerable negative impacts on community livelihoods as communities are largely dependent on wood and NTFPs to supplement income from agricultural production. Increased frequency of fires in miombo reduces[105]: i) the sprout stocking rate (decrease of 48%); and ii) the stem basal area (decrease of 35%). This will impact on the availability of wood for charcoal production – an important source of income that generates ~US$30 million per annum and provides livelihoods for ~60,000 Zambians[106]. Frequent fires also result in domination of grazing areas by unpalatable species that have lower grazing potential for livestock[107]. An increase in frequency and severity

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[103] The cash-for-work grants will provide for 2.5 man days per ha per annum – a total of 37,500 man days per annum – at a rate of US$5 per day. This could provide up to 500 community members (25 per VAG) with up to 75 days' work each.
[104] Timberlake, J. and Chidumayo, E. (2001), *Miombo Ecoregion Vision Report*. WWF-SARPO. Occasional Publications in Biodiversity No. 20.
[105] Zolho, R. (2005), *Effect of Fire Frequency on the Regeneration of Miombo Woodland in Nhambita, Mozambique*. Unpublished MSc dissertation. University of Edinburgh.
[106] Chirwa, P. W. (2014), *Restoration Practices in Degraded Landscapes of Southern Africa*. African Forest Forum, Working Paper Series, Vol. (2)12.
[107] Cauldwell, A.E., Zieger, U., Bredenkamp, G.J. & Bothma, J. du P. (1999, "The response of grass species to grazing intensity in the miombo woodlands of Chibombo district of the Central Province, Zambia", *South African Journal of Botany*, 65: 311-314.

of fires is therefore expected to result in widespread losses of community livelihoods. This is, in turn, likely to result in increased poverty, food insecurity, rural-urban migration and other negative effects[108].

123.   The NTPP is supporting the sustainability of forest resources through, *inter alia,* the implementation of fire management practices. However, current planning for fire management remains inadequate to address current trends in fire occurrence. This is partly a result of inadequate availability of knowledge on historical fire occurrence concerning both frequency and severity of past fires. Furthermore, there is a general absence of local fire management plans to guide autonomous implementation of fire management practices by local communities. Where such planning does exist, it usually fails to take considerations of future fire occurrences – as expected under climate change conditions – into account.

124.   Environment Africa – in partnership with WFD – is supporting an array of initiatives related to food security and sustainable forest management. These interventions focus largely on capacity building and awareness-raising amongst local communities. However, there has to date been limited awareness-raising concerning the importance of proper management of fire regimes to safeguard community livelihoods and productive assets. In particular, there is a need for increased awareness of the role that climate change will play in increasing the frequency and severity of forest fires. Moreover, there is a need for greater understanding of practical measures that can be implemented to manage forest fires through a combination of prescribed burning regimes and fire prevention/suppression according for sustainable ecological functioning.

125.   In summary, the predicted effects of climate change will result in increased frequency and severity of forest fires[109]. This will result in ecosystem degradation and loss of ecosystem functions, particularly relating to the provision of ecosystem goods and services upon which rural livelihoods depend. In a business-as-usual scenario. climate change conditions are thus expected to result in reduced availability of resources and thus increases in levels of poverty and hardship.

With LDCF Intervention (adaptation alternative)

126.   The UNDP-implemented, LDCF-financed project will build on the baseline projects by enhancing the capacity of local communities for climate-resilient fire management as well as increasing public awareness on the impacts of fire – particularly under future climate conditions. Availability of information on fire frequency and severity will be enhanced through the establishment of a geo-spatial fire occurrence dataset for Central Province. This dataset will allow for analysis of past fire occurrences in conjunction with climate change predictions to provide a rigorous, scientific basis for fire management planning.

127.   Fire risk maps produced from the fire occurrence dataset will be ground-truthed through participatory mapping exercises in Serenje district. This will allow for the development of community-specific fire management plans detailing local priorities for prevention and suppression of fires, as well as prescribed fire treatments to ensure proper ecological functioning. District forest officers, local authorities and VAGs will be trained on the implementation of measures outlined in the fire management plans to safeguard community lives and livelihoods. This will result in the operationalisation of fire management plans through the implementation of ongoing fire management interventions, including the establishment and maintenance of firebreaks around agricultural fields, existing forests and areas where ANR is taking place. Finally, an awareness-raising programme will be conducted across Central Province to inform local communities on appropriate measures for fire management as well as the benefits of such measures. This suite of interventions will result in a reduction in the frequency and severity of forest fires relative to what is expected under future climate scenarios.

Output 2.1: Geospatial fire occurrence dataset developed for Central Province based on satellite data and GIS mapping to ascertain burn severity classifications and climate change vulnerability of miombo woodlands

128.   Under this output, a database of historical fire occurrences will be developed. This will build on ZEMA's ongoing work on mapping of natural resources under the Monitoring for Environment and Security in Africa (MESA) initiative. MESA currently provides current/recent information on fire, but has yet to describe: i)

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[108] Cochrane, M. (2009). *Tropical Fire Ecology: Climate Change, Land Use and Ecosystem Dynamics.* Springer.

[109] Zambia. (2007) *National Adaption Programme of Action.*

historical fire trends; or ii) future fire risks resulting from climate change. Through this project, remote sensing and other data will be combined to develop maps and GIS layers detailing the frequency and severity of past forest fires. The past fire occurrences will be overlaid with the bio-physical data, climate change predictions and resource-/land-use maps from Output 1.1 to identify areas that are at risk from increased incidence of fires under future climate conditions.

129. Activities will include:

2.1.1 Collate existing data from the Zambia Integrated Land Management and Information System, the National Remote Sensing Centre and other sources to develop a geospatial fire occurrence database for Central Province.
2.1.2 Map historical trends of fire incidence and burn severity.
2.1.3 Overlay historical trends with bio-physical data and future climate projections from Output 1.1 to identify areas at risk of increased incidence of fires.

Output 2.2: Fire management plans developed and operational (based on independent verification) for Serenje district based on fire occurrence dataset and local inputs

130. Under this output, fire management plans will be developed for Serenje district. The fire occurrence maps produced under Output 2.1 will be ground-truthed through participatory mapping exercises with local communities. This process will identify areas that are at risk from increased frequency of fires under future climate scenarios. Based on the participatory mapping exercises, fire management plans will be developed for participating VAGs. These management plans will include programmes for prescribed fire treatments to ensure that the natural role of fire in miombo ecosystems – which contributes to proper ecosystem functioning and thus the production of ecosystem goods and services – are maintained. The fire management plans will also detail measures – such as firebreaks, reduction of fuel loads and fire suppression activities – for reducing the risk of fires that are not part of natural ecosystem functioning.

131. The fire management plans will then be operationalised through the measures identified within them. These will include the establishment of firebreaks around areas where ANR is being practised under Output 1.1, as well as around community assets such as villages and agricultural fields. Furthermore, prescribed fire treatments will be carried out according to the approved programmes. A maintenance schedule will be developed to ensure the upkeep of firebreaks and other measures in the fire management plans. Regular inspections will be conducted by local to identify where/when maintenance is required in accordance with the maintenance schedule. This maintenance will then be carried out by local communities through a cash-for-work programme. The communities will be supported by contractors – under the oversight of a national fire management specialist – to ensure that proper health and safety procedures are followed at all times while at the same time adhering to best practices for fire management.

132. Activities will include:

2.2.1 Conduct participatory mapping exercises to ground-truth risk maps developed under Output 2.1.
2.2.2 Identify programmes for prescribed fire treatments based on the natural role of fire in miombo ecosystems.
2.2.3 Develop fire management plans that clearly identify risk zones and practical measures for reducing the risk of fires – such as firebreaks – as well as schedules for prescribed fire treatment.
2.2.4 Establish firebreaks around the sites where ANR is being practised and in other areas as defined in the fire management plans.
2.2.5 Develop a schedule for ongoing maintenance of firebreaks, including inspections and follow-up activities.
2.2.6 Conduct regular inspections and follow-up clearing of the firebreaks according to the maintenance schedule.

Output 2.3: District forestry staff, relevant VAG members and local authorities trained on appropriate climate-resilient fire protection practices (boundary and firebreak management, early burning, etc.)

133. After the development of fire management plans, training will be provided to district forestry staff, local authorities and VAG members on the implementation of relevant measures encapsulated in the plans. A

training needs assessment will identify where there are knowledge gaps related to the measures proposed under the fire management plans. The assessments will inform the development of a portfolio of training modules that will be tailored to the needs of the recipients. For example, training of local authorities will focus on planning for fire risk reduction and contingencies during fire events, while training for local communities will emphasise practical interventions for reducing fire frequency and severity. District forestry officers will then be provided training on fire management planning and implementation through a "training-of-trainers" approach. They will thus be facilitated to provide further training and support to local authorities and VAG members on the development and operationalisation of fire management plans.

134. Activities will include:

2.3.1 Conduct a needs assessment for training of district forestry officers, VAG members and local authorities on appropriate climate-resilient fire protection practices.
2.3.2 Develop portfolios of training modules targeting district forestry officers, VAG members and local authorities, based on the needs assessment.
2.3.3 Provide training to district forestry officers on climate-resilient fire protection practices following a "training-of-trainers" approach.
2.3.4 Train VAGs and local authorities on site-specific climate-resilient fire protection practices (to be facilitated by district forestry officers).

Output 2.4: Awareness-raising campaigns undertaken across all districts about the benefits of adopting fire management measures to strengthen the adaptive capacity of miombo forests to climate change

135. Under this output, awareness-raising activities will be conducted across Central Province to increase the availability of knowledge on fire management amongst local communities. Awareness-raising materials will be developed to include media that are appropriate to the recipient audiences. These are likely to include printed media as well as audio-visual media to cater for various levels of literacy[110]. Dissemination of the materials will result in increased awareness of community members on appropriate practices for managing fires as well as the benefits of reducing the occurrence of fires in accordance with fire management plans.

136. Activities will include:

2.4.1 Develop awareness-raising materials – such as flyers, posters, brochures, short video documentaries, community theatre and radio programmes – on fire management measures in miombo ecosystems.
2.4.2 Disseminate awareness-raising materials through appropriate media such as radio, television and community visits.

COMPONENT 3: INCREASED KNOWLEDGE ABOUT, AND UPTAKE OF, APPROPRIATE SUPPLY-SIDE BIOMASS ENERGY PRODUCTION TECHNOLOGIES

OUTCOME 3: Energy efficient charcoal production and wood-saving technologies have successfully replaced inefficient systems in targeted areas of Central Province, helping offset pressure on the forests as the climate changes

Co-financing amounts for Outcome 3: US$4,412,574
LDCF: US$300,000

Without LDCF Intervention (baseline)

137. At present, charcoal production is resulting in deforestation and forest degradation across Central Province. This is reducing the availability of critical ecosystem goods and services upon which local communities

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[110] Zambia's overall literacy rate is currently ~61%, but this figure is considerably lower (~50%) in rural areas (Zambia Ministry of Education, 2009).

depend for their livelihoods. This situation is expected to be exacerbated by the effects of climate change. Agricultural productivity is expected to decline as climate change causes an increase in the frequency and severity of droughts, localised flooding and other extreme weather events. Local communities are likely to seek to offset these losses by increasing their reliance on charcoal production to supplement reduced income from agriculture. This will result in a negative feedback cycle whereby forest resources will experience increased pressure, further reducing their capacity for providing ecosystem goods and services.

138.   Current charcoal production in earth kilns has a low efficiency, with a wood-to-coal conversion rate of 16–25%[111]. Under these inefficient conditions, it is estimated that 8 tonnes of wood are required for every 1.3 tonnes of charcoal produced, which is the annual urban demand per household. It is estimated that 0.01 ha of undisturbed forest in Eastern and Lusaka Provinces is cleared annually for every tonne of charcoal consumed[112]. Under a business-as-usual scenario, deforestation for charcoal production is expected to be 51,866 ha per year by 2030. The annual charcoal consumption for the Copperbelt, Eastern and Lusaka Provinces is estimated as being 1,423,400 tonnes, leading to the loss of 14,234 ha of forests annually.

139.   Pioneer has considerable experience related to energy-efficient technologies to reduce rates of deforestation and forest degradation. Alternative sources of fuel are being promoted to reduce wood extraction and thus remove pressure on forests. In particular, Pioneer has identified alternative organic waste products that can serve as feedstocks for charcoal production. However, there is still limited knowledge on the appropriate techniques for conversion of these feedstocks into charcoal briquettes. Furthermore, communities do not have access to the technologies required to make this conversion. Consequently, forests continue to be degraded by ongoing extraction of wood for charcoal production to supplement rural livelihoods. This trend is expected to become more pronounced under future climate change conditions as pressure on forest resources increase.

With LDCF Intervention (adaptation alternative)

140.   The project will demonstrate the use of improved technologies to: i) improve the livelihoods of local communities at intervention sites; and ii) reduce rates of deforestation and forest degradation in these areas. This will be achieved through: i) more efficient production of charcoal; and ii) use of alternatives to wood for the production of charcoal. Improved livelihoods of local communities at intervention sites will promote economic development, thereby strengthening the capacity of these stakeholders to adapt to the negative effects of climate change. The project will support the formation of charcoal producer groups to improve coordination of wood extraction. In particular, these groups will receive training on sustainable use of forest resources as well as the operation of improved charcoal kilns. These kilns will then be distributed to members of the charcoal producer groups. The more efficient production of charcoal through the operation of improved charcoal kilns will result in reduced pressure on forest resources. This will be complemented by a monitoring, tracking and licensing system to ensure that sustainable use of wood for charcoal production is maintained.

141.   Introduction of efficient charcoal kilns has been demonstrated to be extremely effective in reducing rates of deforestation and forest degradation when compared to a business-as-usual scenario[113]. These kilns have up to double the efficiency of traditional kilns – 40% compared with ~20% – and have a shorter production cycle of 24–30 hours (compared to 3–15 days for traditional kilns)[114]. The annual urban demand per household of 1.3 tonnes per annum would therefore only require 3.25 tonnes of wood (*cf.* 8 tonnes for traditional kilns). This equates to ~5,780 ha of forest per year to produce the annual charcoal consumption for the Copperbelt, Eastern and Lusaka Provinces (1,423,400 tonnes) – a considerable reduction from the business-as-usual scenario of 14,234 ha of forest annually.

142.   To further reduce pressure on forest resources, alternative sources of charcoal will be promoted. Feedstocks such as agricultural residues, animal manure and other waste materials will be identified based

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[111] Hibajene, S.H. & Kalumiana, O.S. (2003), *Manual for Charcoal Production in Earth Kilns in Zambia.* Department of Energy, Ministry of Energy and Water Development, Lusaka, Zambia.

[112] Mwitwa, J. and Makano, A. (2012), *Charcoal Demand, Production and Supply in the Eastern and Lusaka Provinces.* Mission Press, Ndola. Zambia.

[113] World Bank (2009), *Environmental Crisis or Sustainable Development Opportunity? Transforming the Charcoal Sector in Tanzania - A Policy Note.*

[114] GIZ (undated), *HERA Cooking Energy Compendium.*

on their suitability for use in briquetting machines. Charcoal producers will be trained on the use of these materials and the operation of briquetting machines. The project will also introduce these machines to the charcoal producers. This will result in reduced pressure on forests as charcoal production will be less reliant on wood through the substitution of alternative materials. The introduction of additional sources of income – i.e. through briquetting as an alternative to traditional charcoal – will reduce the risk of leakages resulting from destructive use of forest resources.

Output 3.1: Deployment of technologies and development of sustainable charcoal schemes in 20 VAGs with (i) charcoal producer groups formed and trained to operate kilns; (ii) charcoal retort kiln pilots introduced (120 improved kilns to replace earth kilns); (iii) monitoring, tracking and licensing system established for all improved kilns piloted

143.   Under this output, community members in 20 VAGs will be capacitated to practice sustainable and efficient charcoal production to reduce pressure on forest resources. Charcoal producer groups will be formed to improve coordination of wood extraction for the purposes of charcoal production. This will result in more sustainable use collection and production of charcoal with concomitant reductions in the rate of deforestation and forest degradation.

144.   Training will be provided to the members of charcoal producer groups on how to coordinate extraction of wood as well as the operation of improved charcoal kilns. These kilns will be introduced to the producer groups to enable them to improve the efficiency of charcoal production. Charcoal producers will register under a monitoring, tracking and licensing system to be implemented by the project as a condition to receiving the improved kilns. This system will regulate the production of charcoal in accordance with resource-/land-use plans – developed under Output 1.1 – to ensure that production does not exceed the regeneration rates of the forest resources. District forestry officers will thus be able better monitor the extraction of wood to ensure that it remains at sustainable levels. These integrated approaches – enforced by the licencing system – will limit the amount of charcoal produced per year within a rotational cycle of 18 years to 830,000 sacks of charcoal per year (assuming a rotational cycle of 18 years for 1 ha charcoal production on an area of 15,000 ha and the need for 0.01 ha forest for one sack of charcoal).

145.   The project will ensure that training of charcoal producers and deployment of improved charcoal kilns will target a minimum of 20% of women.

146.   Activities will include:

> 3.1.1 Form charcoal producer groups in 20 VAGs.
> 3.1.2 Provide training to members of charcoal producer groups on sustainable extraction of wood and operation of improved kilns.
> 3.1.3 Introduce 120 improved charcoal kilns to charcoal producer groups.
> 3.1.4 Develop and implement a monitoring, tracking and licensing system for all improved kilns introduced.

Output 3.2: 50 charcoal or sawdust briquetting machines or presses piloted across 20 VAGs

147.   Under this output, briquetting machines will be introduced in VAGs. These machines will reduce the pressure on forest resources by allowing the production of charcoal using alternative feedstocks. For example, agricultural residues and industrial wastes can be used in the place of wood harvested from forest areas. In areas where ANR is being conducted, charcoal production will be able to continue without risking the viability of ANR activities. Suitable sources of feedstock – e.g. sawdust, chaff, straw, waste paper – and binding agents will be identified, based on local availability. Producers of identified feedstocks and binding agents will be linked with charcoal producer groups to strengthen the supply chains for these materials. Appropriate briquetting machines will then be selected, taking into account the: i) feedstocks; ii) binding agents; and iii) operational requirements. Members of charcoal producer groups will then be supplied with such briquetting machines and trained in their operation.

148.   The project will ensure that training on briquetting and the distribution of briquetting machines will target a minimum of 20% of women in charcoal producer groups.

149.   Activities will include:

3.3.1 Identify sources of biodegradable waste and binding agents that are suitable as feedstocks for production of briquettes in the targeted VAGs.

3.3.2 Facilitate the strengthening of value chains through linking of producers/suppliers of biodegradable waste and binding agents to charcoal producer groups.

3.3.3 Identify briquetting machines – e.g. presses, extruders – that are suitable for the production of briquettes from the identified feedstocks.

3.3.4 Provide training to members of charcoal producer groups on operation of briquetting machines.

3.3.5 Introduce 50 briquetting machines to charcoal producer groups.

2.5 Key indicators, risks and assumptions

Indicators

150. Indicators for the UNDP-implemented, LDCF-financed project are based on UNDP's Monitoring and Evaluation Framework for Climate Change Adaptation and will be gender-disaggregated. In addition, project indicators are aligned with the GEF/LDCF Adaptation Monitoring and Assessment Tool (AMAT). The Project Results Framework in Section 3 details indicators, baseline information, targets and sources of verification at the Objective and Outcome level.

151. The Project objectives are aligned with the following Climate Change Adaptation focal areas:
- CCA-1: Reducing Vulnerability: Reduce vulnerability to the adverse impacts of climate change, including variability, at local, national, regional and global level.
- CCA-2: Strengthen institutional and technical capacities for effective climate change adaptation.

152. The project's Outcomes and Objectives will be monitored according to the following indicators:

Objective: To increase the rate of forest regeneration and promote climate-resilience adaptation practices among forest-dependent communities in Zambia's Central Province.

Indicators:
- Number of foresters and members of local groups in Central Province participating in climate-resilient, community-based regeneration of indigenous forests.
- Number of households benefiting from climate-resilient, community-based regeneration of indigenous forests.

Outcome 1: Strengthened technical and institutional capacity of foresters and communities in Central Province to implement appropriate climate-resilient agro-forestry and natural regeneration practices in designated zones.

Indicators:
- Change in capacity score[115] of district forestry officers and VAG members for planning and implementing Assisted Natural Regeneration (ANR) and agro-forestry interventions (CCA Indicator 10).
- Climate-resilient agro-forestry and ANR practices implemented across 15,000 hectares (CCA Indicator 2).

Outcome 2: Robust fire monitoring and management protection plans and measures in place in all districts in Central Province to maintain desired regeneration targets and reduce fire frequency by 25–30% annually across the province, within a four-year burning cycle.

Indicators:

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[115] The UNDP Capacity Development Monitoring Scorecard provides a standardised framework for monitoring improvements in capacity that is flexible enough to accommodate projects operating on various themes and at both national and sub-national levels. It is easily tailored to measure project-specific capacities on a scale of 0–3 (0: low capacity; 3: high capacity).

- Change in capacity score of district forestry officers, VAG members and local authorities for planning and implementing fire management interventions (CCA Indicator 10).
- Change in frequency of fire across all districts in Central Province.

Outcome 3: Energy efficient charcoal production and wood-saving technologies have successfully replaced inefficient systems in targeted areas of Central Province, helping offset pressure on the forests as climate changes.

Indicators:
- Change in number of users of improved charcoal kilns and briquetting machines (CCA Indicator 4).
- Tonnes of non-traditional (i.e. alternative feedstock and energy-efficient) charcoal produced per year in the targeted areas of Central Province.

Risks

153. Table 2 below summarises the risks to the UNDP-implemented, LDCF-financed project.

Table 2: Key risks and assumptions underlying project development.

Risk	Rating	Risk Mitigation Measure	Assumption
1. In Zambia, the decentralisation process is a relatively new concept. Moreover, customary land tenure law sometimes conflicts with forest regulations. For example, outside of state-controlled forest areas, traditional leaders may allocate forested land to community members for agricultural use. This is particularly true in areas where local communities have limited knowledge of forestry legislation. Such problems might affect the formation of the VAGs and decentralised approach.	P: 1 I: 4 Rating Medium	• The National Decentralisation Policy (2010) supports the project's decentralised approach. The FD is supportive of such approaches. • The project will work closely with the relevant District Councils and District Forestry Officers to ensure that the VAGS are in conformity with local structures and customary law, and supported by local authorities (see Outputs 1.2–1.4). • The project will benefit from implementation of a similar approach via the GEF MFA project[116]. Moreover, the SFM projects of Finland and USAID, which are adopting similar approaches in other provinces, will be consulted. • Lessons learned from the 20 years of CBNRM will be reviewed. • The project will also build on institutional structures that have been established through similar projects and initiatives undertaken in Zambia.	• VAGs are established successfully. • All Government stakeholders that are involved in the LDCF project support the decentralisation policy.
2. Local communities have limited capacity to implement and monitor project interventions, particularly assisted regeneration. Success of regeneration interventions will be limited.	P: 1 I: 5 Rating Medium	• Best practices from similar initiatives will be applied for the LDCF project. • Local communities will be trained on relevant topics (see Outputs 1.4, 2.3, 2.4 and 3.1). Moreover, these communities will be made aware of the benefits of miombo woodlands – including NTFPs.	• Local communities will apply trainings.
3. The approach adopted by the project is ineffective because of limited coordination between stakeholders at the local, provincial and local level.	P: 3 I: 4 Rating High	• The LDCF project will initiate and sustain dialogue between stakeholders at all levels (see Outputs 1.1 and 2.2). • The benefits of a community-based and integrated approach to CBNRM – particularly through ANR and fire management – will be demonstrated by the LDCF project (see Outputs 1.1, 1.2, 1.5, 1.6 and 2.2).	• Stakeholders that are involved in the project are willing to communicate and coordinate. • Dialogue will be sustained during and beyond project implementation.

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[116] Sustainable Land Management in the Zambian Miombo Woodland Ecosystem

		• Best practices from similar initiatives will be applied to the LDCF project.	
4. Extreme climatic events and climate variability affect success of regeneration and agro-forestry interventions.	P: 1 I: 5 Rating Medium	• Ensure that current climatic variability is taken into account in restoration processes (see Output 1.6). • Focus on resilient species (e.g. *Faidherbia albida, Moringa oleifera, Sesbania sesban, Cajanus cajan* and *Gliricidia sepium*) and promote techniques to assist plant growth, particularly in the seedling and sapling stages (see Output 1.6).	• Project activities are unlikely to be undermined by extreme climate events.
5. Limited acceptance of interventions by local communities in Central Province. [117]	P: 2 I: 5 Rating Medium	• Local communities will be included in participatory activities, thereby promoting buy-in (see Outputs 1.1–1.3 and 2.2). • Activities will be undertaken to enhance awareness of the benefits of interventions (see Outputs 1.1, 1.2, 1.4, 2.3 and 2.4).	• Local communities will take ownership of the project.
6. Local communities will continue to transform miombo forest to agricultural or grass lands.	P: 4 I: 5 Rating High	• Benefits of ANR will be demonstrated by the LDCF project (see Output 1.6). • Activities will be undertaken to enhance awareness of the benefits of interventions (see Outputs 1.1, 1.2, 1.4, 2.3 and 2.4). • Intervention sites will be monitored by local authorities and VAGs (see Outputs 1.2, 1.3 and 2.2).	• Local communities will experience initial benefits from ANR during the project lifespan. • Local communities will take ownership of the project. • Market fluctuations for natural resources from miombo woodlands will not result in exploitation in intervention sites.
7. Tangible results will only be visible after the project finishes. Therefore, local communities might not support interventions[118].	P: 3 I: 4 Rating High	• The LDCF project will adopt a participatory planning approach (see Outputs 1.1–1.3 and 2.2). • Communities will be made aware of the benefits of ANR and have access to these benefits once they are generated. • Activities will be undertaken to enhance awareness of the benefits of ANR.	• Local communities will experience initial benefits from ANR during the project lifespan. • Market fluctuations for natural resources from miombo woodlands will not result in exploitation in intervention sites.
8. GIS tools for fire management do not match with the needs of communities on the ground.	P: 1 I: 3 Rating Medium	• Activities that are undertaken during the inception phase will include meetings between the Zambian Environmental Management Agency (ZEMA) and local stakeholders. During these meetings, GIS for practical fire management will be explained to local communities (see Outputs 2.1 and 2.2).	• Local communities support the integration of scientific information into community management frameworks. • There is sufficient capacity to apply GIS tools and translate products from the tools to local communities.
9. There is a conflict of interest between current suppliers of energy technologies in the country and the introduction of briquetting machines.	P: 1 I: 3 Rating Medium	• Local briquette producers will benefit from training and improved equipment (see Output 3.2). • Best practices from similar initiatives will be applied to the LDCF project.	• Current suppliers of energy technology will be willing to participate in project activities.
10. Particular members of local communities will be selected to receive kilns, thereby potentially marginalising	P: 1 I: 4 Rating Medium	• Beneficiaries of the sustainable charcoal programme should be selected based on vulnerability and needs, to avoid the exclusion of the poorest of the poor from the programme (see Output 3.1).	• Benefits from kilns will accrue at the community level.

[117] Leventon, J. *et al.* (2014), Delivering community benefits through REDD+: lessons from Joint Forest Management in Zambia. *Forest Policy and Economics* Available at http://dx.doi.org/10.1016/j.forpol.2014.03.2005
[118] Field consultations during project preparation, 2014.

other (more vulnerable) members. In this case, the most vulnerable members of local communities will not be targeted for project interventions.		• These improved kilns will benefit a greater number of local community members than traditional kilns (see Output 3.1).	
11. Implemented interventions are not cost-effective.	P: 1 I: 4 Medium	• Assisted regeneration provides numerous income-generating opportunities for local communities, and is a cost-effective approach to restoration of miombo woodlands. The benefits of this approach will accrue over time as ecosystems that are restored become more productive. However, miombo woodlands regenerate relatively rapidly[119]. Therefore, benefits will be realised during the project. In addition, training for VAGs on site-specific appropriate climate-resilient agro-forestry and natural regeneration will include information on the benefits of these approaches. • Agro-forestry interventions have been developed based on best-practice and through extensive consultation with stakeholders in the country and in Central Province.	• Sufficient national financial resources will be available to maintain the project's interventions in the long-term.

2.6 Cost effectiveness

154. The activities of the UNDP-implemented, LDCF-financed project have been designed to be cost-effective. Should the LDCF project not be implemented, the business-as-usual activities will increase future costs of forest degradation and lead to further marginalisation of local communities.

155. In order to reduce costs and to avoid duplication, the LDCF project will pursue an active partnership strategy with other ongoing initiatives and collaborative synergy with NGOs on the ground. Through this collaboration, the LDCF project will build on the lessons learned and best practices from past and current projects and ensure that cost-effectiveness is included as a selection criteria for identification of appropriate adaptation practices and implementation protocols.

156. Interventions under Component 1 form a package of forest and land-use management techniques that restore degraded and deforested lands to more productive forests. These ANR activities are more cost-effective than plantations and result in higher biodiversity, which enhances the value of the ecosystems[120]. Consequently, a higher diversity of timber and non-timber forest products is generated, which satisfies the multiple needs of communities.

157. Interventions under Component 2 will build upon existing GIS-based fire monitoring. In doing so, the LDCF project will create synergies with existing fire management strategies in Central Province by improving the capacity of forestry officers to plan for and manage fires. Theses synergies will be further enhanced through capacity building. The enhancement of synergies is proven to be a cost-effective measure.

158. Component 3 acknowledges worldwide experiences that economic sustainability cannot be achieved as an output from environmental benefits. Rather, economic welfare has to be created at the outset. This will provide for ecological sustainability and resilience. Project financing therefore provides substantial economic and other benefits for communities from the start through CBNRM and other support to grant the highest

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[119] In coppice woodland, the mean annual increment of biomass ranges from 1.2–3.4 tonnes per hectare per year, which is about 4-7% of the above-ground biomass.

[120] Food and Agriculture Organisation - Regional Office for Asia and the Pacific (2011), *Forests Beneath the Grass: Proceedings of the Regional Workshop on Advancing the Application of Assisted Natural Regeneration for Effective Low-Cost Restoration.* Available online at: http://www.fao.org/docrep/014/i1734e/i1743e00.pdf.

cost-effectiveness for all components. Therefore, this approach will avoid project failures caused by leakages or higher initial economic returns from more destructive forest use systems.

Table 3: Demonstration of cost-effectiveness for each proposed Output, indicating the project barrier addressed by each Output.

Output	Barriers Addressed	Alternatives Considered
1.1. Participatory resource mapping and zoning (identification of suitable areas for agro-forestry and assisted natural regeneration measures) taking alternative climate change scenarios into account completed in all six districts of Central Province. 1.2. Between 30-40 Village Action Groups (VAGs) formally recognised and constituted in Serenje District by Year 2, with clear resource rights and delineation of legally recognised VAG boundaries and use zones. 1.3. All VAG boundaries and use zones registered under the national Land Information Management System (LIMS). 1.4. Training delivered for at least 20 district forestry officers and 2,000 VAG community members on site-specific appropriate climate-resilient agro-forestry and natural regeneration practices and value chain development for alternative livelihoods. 1.5. Wood fuel collection zones established in all VAGs and coppicing practices promoted. 1.6. Climate-resilient agro-forestry and ANR practices are piloted over 15,000 hectares under management in selected districts across the Province.	Low productivity of the ecosystem, low motivation of communities to conserve forests, unclear forest use rights and collection zones	Alternative 1: BAU: Forests will not be regenerated and therefore not add value to communities' livelihoods or to GDP. Vulnerability to climate change of the socio-ecological system will be enhanced, leading to further climate resilience loss with increasing costs in a positive feedback loop. The absence of VAGs will lead to continued conflicts among forest stakeholders. Alternative 2: ANR: ANR is a low-cost, community-based regeneration alternative that is tailored to a forest regeneration system which addresses the multiple needs of communities and re-establishes climate resilience of the socio-ecological system. Alternative 3: Plantations generate slightly higher biomass than ANR but, however, incur higher costs, planting materials are more difficult to access and – as they are mainly monocultures[121] – are also vulnerable and are more difficult to implement through CBNRM. Alternative 4: Creation of VAGs: will be most effective, as costs of user conflicts will be avoided. Alternative 5: Agro-foresty: Most cost-effective alternative to high-input sedentary agriculture, as per discussion in Chapter 2.3.3.
2.1. Geospatial fire occurrence dataset developed for Central Province based on satellite data and GIS mapping to ascertain burn severity classifications and climate change vulnerability of Miombo woodlands. 2.2. Fire management plans developed and operational (based on independent verification) for all targeted districts based on fire occurrence dataset and local inputs.	Lack of awareness and sensitivities to the increasingly negative impacts of late burning under climate change, lack of equipment by local communities and Forestry Department to control proliferating fires, previous lack of GIS technologies to monitor forest fires.	Alternative 1 BAU: Continued late burning will further enhance the vulnerability of forest ecosystems to climate-induced fires and, in the long-run, double the frequency of fires, leading to a climax vegetation of crippled trees with corked leaves, which are unable to maintain important ecosystem services necessary to sustain livelihoods for forest communities or to contribute substantially toGDP. Alternative 2: Integrated fire management by making use of GIS-based services of ZEMA, in combination with piloting local fire management will allow use of fires in an optimum way to maximise forest regeneration according to specific management targets even under conditions of climate change.

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[121] The productivity of plantations in Zambia is threatened by several factors, including fungal pathogens that reduce timber quality and cause tree mortality. Chungu, D., Muimba-Kankolongo, A., Wingfield, M., & Roux, J. (2010), "Plantation forestry diseases in Zambia: contributing factors and management options". *Annals of Forest Science* 67: 802.

2.3. District forestry staff, relevant VAG members and local authorities trained on appropriate climate-resilient fire protection practices (boundary and firebreak management, early burning, etc.).		
2.4. Awareness-raising campaigns undertaken across all districts about the benefits of adopting fire management.		
3.1. Deployment of technologies and development of sustainable charcoal schemes in 20 VAGs with: (i) charcoal producer groups formed and trained to operate kilns; (ii) charcoal retort kiln pilots introduced (120 improved kilns to replace earth kilns); (iii) monitoring, tracking and licensing system established for all improved kilns. 3.2. 50 charcoal or sawdust briquetting machines or presses piloted across 20 VAGs.	Relatively low biomass productivity, non-defined use rights, lack of access to sustainable charcoal technologies, absence of monitoring and tracking system, low motivation of communities to conserve forests.	Alternative 1: BAU: Charcoal producers with relatively low incomes from charcoal production will continue with deforestation activities and enhance losses of GDP from deforestation. Alternative 2: Sustainable rotational coppicing and improved kilns will halt deforestation on 15,000 ha project area. The system will limit the amount of charcoal produced per year within a rotational cycle of 18 years to 830,000 sacks of charcoal per year (assuming a rotational cycle of 18 years for 1 ha charcoal production on an area of 15,000 ha and the need for 0.01 ha forest for one sack of charcoal). As the number of charcoal producers will be limited under the sustainable charcoal production system, some charcoal producers will have to look for alternative incomes. On the other hand, through the new kiln technology, incomes per wood unit produced and per labour input will double under *ceteris paribus* conditions, which can be shared accordingly. Alternative incomes will be provided through transfer of briquetting technologies to communities and various types of benefit-sharing.

159. Costs were determined for small-scale, on-the-ground adaptation measures identified through consultations undertaken with community members as well as other national and sub-national stakeholders. Using a community-based approach to adaptation – while ensuring that development plans are informed by science and local knowledge – empowers vulnerable communities to plan for, and adapt to, the impacts of climate change. Interventions proposed in the project have been selected based on available knowledge of proven or promising adaptation technologies. Furthermore, project activities will be informed by the expertise of relevant GoZ institutions – such as MLNREP – to ensure their suitability to the local context.

160. In addition, the effectiveness of these activities in reducing vulnerability to climate change will be tested and measured – through socio-economic and cost-benefit analyses – during the course of the project. The most successful activities will be prioritised for up-scaling to neighbouring communities. Furthermore, details regarding their implementation will be widely disseminated at workshops and training events undertaken by the project.

2.7 Sustainability

161. The LDCF project has been designed to support the sustainability of the project interventions beyond the implementation period. Sustainability will be supported by multiple measures, which are detailed below.

162. A consultative approach supports the sustainability of interventions beyond the duration of the project by ensuring that the long-term needs of climate-vulnerable local communities are prioritised. Local stakeholders were consulted during the project preparation phase and similar consultations will be ongoing as part of the cash-for-work programme. The project design team engaged with relevant national stakeholders and experts to align activities with national priorities and development goals. This will support long-term political and financial commitment of policy- and decision-makers to the project interventions. Additionally, a decentralised approach will foster and support community ownership of project interventions, resulting in greater buy-in by the project beneficiaries. Empowerment of communities through effective CBNRM implementation will also increase the adaptive capacity of communities to address climate risks in future. On-the-ground interventions

will be implemented at a community and village level. The maintenance of such interventions is relatively low-cost and does not require technical skill, enabling maintenance by local communities beyond the duration of the project. Furthermore, these interventions will continuously generate economic revenues for communities in the long-term.

163. To support the mainstreaming of climate change into planning and policies across multiple sectors, the project will strengthen the capacity of relevant Government stakeholders and departments to plan and implement climate-smart land use. This capacity building will be complemented by a strategy for maintaining technical capacity in MLNREP and relevant departments. These interventions will strengthen the institutional environment for adaptation planning, both during and after the project period. Close involvement of numerous GoZ institutions and departments in the project's development and implementation promises potential for future incorporation of the project's approaches into ongoing planning and strategies.

164. Improved generation and collation of information on climate-smart land-use planning will support technical staff within MLNREP to apply the project approach on an ongoing basis. Specifically, the LDCF project will establish a geospatial fire occurrence data set for Central Province (Output 2.1), which can be used for monitoring historical fire assessment and early warning. Lessons learned and best practices from the project regarding environmental sustainability and climate resilience will be shared and up-scaled across the country to increase the project's impact.

2.8 Replicability

165. The interventions implemented by the project are designed as pilot demonstrations that can be replicated in other districts in Zambia. The design of the project's activities includes several measures that will support replicability of successful activities beyond the project implementation period.

166. Pilot projects will inform related initiatives. All components and their technical elements are scalable and can therefore be replicated in all geographical areas of the country and beyond, where ecological conditions are similar. The benefits of the interventions piloted in Central Province will be assessed. Lessons learned from this process will be collated and disseminated to support replication of assisted natural regeneration, agro-forestry and fire management regimes in other sites around Zambia. In particular, pilot projects will generate evidence on the cost-effectiveness of ecosystem rehabilitation interventions. Best practices and lessons from the project will be disseminated nationally.

167. The project's interventions will increase the availability of information and planning tools to support future climate change adaptation initiatives in Zambia. For example, the geospatial fire data set developed under Output 2.1 will generate data that can be used by local communities. Additionally, methodologies, results and lessons learned will be compiled and disseminated to other provinces.

168. Generating evidence on the cost-effectiveness of climate change adaptation interventions will facilitate policy and budgetary adjustments, while the direct involvement of Government institutions will demonstrate the potential for integration of approaches and strategies proposed under this project into on-going planning processes. As a result, the capacity built and information generated by the LDCF project will be sustainable to provide a foundation to support ongoing and future climate change-related initiatives in Zambia.

2.9 Stakeholder involvement plan

169. The management of forests and other natural resources requires the concerted effort of a range of stakeholders. Therefore, stakeholders at both national and local levels will be engaged during implementation of the UNDP-implemented, LDCF-financed project. This process commenced during the PIF and project preparation phases. Based on the regional CBNRM experience and the lessons learned from Zambian CBNRM, the project allows for the adoption of a local-level institutional arrangement framework that has recently been developed for REDD+ in Zambia[122] and is based on the following principles:

- Development of business enterprises focusing on the sustainable utilisation of forest resources;

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[122] Zambian Forestry Department and UN REDD (2012), *Forest Management Practices With Potential For Redd+ In Zambia, Final Report.*

- Capacity building through experiential learning and a participatory forest management approach within the Forestry Department;
- Development of robust institutional linkages for collaborative management; and
- Adoption of sustainability strategy elements.

170. The LDCF project will assist communities in the development of appropriate and sustainable forest resource and land-use management practices to alleviate human-induced pressure on resources. Furthermore, the project will address on-site planning and the development of appropriate management regimes. Thereby, knowledge will be generated together with the intended users, facilitating accessibility to knowledge and technology and ensuring it is more effective than when technologies are imposed on users. Furthermore, the project will help create a community-based cadre of people in technology development, who will alleviate the formal shortage of extension personnel.

171. The institutional structure of the project will reinforce the linkages between Government ministries and relevant departments regarding decentralised planning and facilitation of development activities at district level. This should further ensure the district-level ownership of the project. At the community level, the project should equally be facilitated by and through legally-constituted VAG structures to support the activities post-project.

172. An overview of the role of the different stakeholders in the project is outlined below in Table 4 followed by a communications and consultations process to be executed in three phases.

Table 4: Key stakeholders and proposed roles.

Key Stakeholder	Role in Project
Forestry Department (FD) – Ministry of Lands, Natural Resources and Environmental Protection (MLNREP)	Overall lead agency, chair of the Project Steering Committee and key implementing partner. The FD and MLNREP will be responsible for the mapping and zoning under Output 1 and training of district forestry officers under Output 1.4. In addition, the FD and MLNREP will assist with the development of fire monitoring and management plans under Outcome 2.
Ministry of Agriculture and Livestock (MAL)	Key Implementation Partner for Component 1. MAL will assist with the identification and implementation of agro-forestry techniques.
Ministry of Community Development, Mother and Child Health (Community Development Department)	Community Development Department District Officers will play a key role in assisting with training and awareness-raising campaigns at the District level under Outcomes 1.4 and 2.4, as well as for Component 3.
Ministry of Local Government and Housing (MLGH) – District Councils (DCs)	The mandate of DCs includes district governance and administration, including establishment of by-laws, maintenance of law and order, imposition of levies, planning, infrastructure development, protection of local forests and woodlands, road maintenance, establishment of social and recreational amenities, maintaining postal services, sanitation and drainage, and community development. The DCs will play a key role in regards to activities to be undertaken by VAGs.
Ministry of Mines, Energy and Water Development (MMEWD)	Key Implementing Partner for Component 3. The MMEWD will provide technical support for the development of renewable energy technologies.
Ministry of Chiefs and Traditional Affairs (MCTA) – House of Chiefs	The MCTA will play a key role in community involvement and participation, assisting with the establishment of VAGs and delineation of boundaries (Outputs 1.2 and 1.3), allocation of lands for wood fuel collection zones (Output 1.5) and the establishment of charcoal producer groups (Output 3.1).
Village Action Groups (VAGs) /	Key units of BENEFIT, ACTION and ACCOUNTABILITY for all site-specific activities under both components. VAGs will establish, monitor and manage land use plans and protected forests, and act as the main entry-point for all site-level activities. VAGs will be established to implement members' directives with annual elections, maintain membership records, and conduct quarterly general meetings for submission of reports and finances. VAGs will be responsible for undertaking activities under Outcomes 1, 2 and 3.
UN-REDD Programme, Zambia	In-depth cooperation on implementation, particularly with regard to project design, institutional arrangements and monitoring under Outcome 1. The activities will be in alignment with the Sustainable Forest Management analytical framework, which prioritises practices perceived as having the highest potential for REDD+ implementation in Zambia.

Zambia Climate Change Network (ZCCN)	Cooperation on design and implementation; ZCCN may also be sub-contracted by MLNREP to implement specific activities. ZNNC will sit on the PSC as a representative of civil society.
Local NGOs	Cooperation on design and implementation and possible sub-contracting for various activities. Several NGOs – including Pioneer and COMACO – will be key stakeholders in the design of the ANR and agro-forestry schemes.
Copperbelt University / Zambia Forestry College	Key monitoring and capacity building partner for: provision of support services (research, monitoring and training), development of training manuals and support services to resource monitoring, and dissemination of scientific information.
Centre for Environmental Research, Education and Development (CERED)	Cooperation on agro-forestry research, technology dissemination, education (curriculum design and development), agroforestry scaling up including provision of agroforestry germplasm, SFM and Climate Smart Agricultural practices (adaptation and mitigation)
Zambia Women's Alliance	Will be involved in all gender-related activities.
Zambia Land Alliance	Will be involved in all land-rights related activities.

2.10 How have UNDP safeguards been taken into account?

173. The UNDP environmental and social safeguard requirements have been followed in the development of this LDCF project. As outlined below, the project will have minor social and environmental effects. However, various measures have been put in place to reduce these potentially adverse effects.

174. The implementation of community- and ecosystem-based approaches to climate change adaptation – proposed under Outcomes 1, 2 and 3 – will protect ecosystems, assets and livelihoods form the effects of climate-induced hazards. These proposed interventions will not negatively affect natural resources. For example, ecosystem-based approaches will stabilise soil, improve water infiltration, increase the diversity of crops and restore natural vegetation. In addition, the increase in biomass as the result of re-vegetation, regeneration and improved agricultural and land-use practices will increase carbon sequestration.

175. Although the project will benefit local communities, it is not expected that this will lead to localised population increases. Rather, it is expected that the approaches used will diffuse to surrounding communities. The use of a community-based approach that is cost-effective and does not required advanced infrastructure makes it easily replicable. It is therefore possible for the benefits in the project sites to be realised in adjacent districts. The benefits of the project interventions will also reduce the vulnerability of communities to natural disasters. Furthermore, communities will have greater access to natural resources and are expected to have improved income through improved and diversified livelihoods. Consequently, the project is expected to have positive socio-economic effects.

176. Gender equality and the use of a community-based approach are focus areas of the LDCF project. Consequently, project interventions will promote social equity and equality. Through consultation with women's groups, the interventions that are focused on women will be culturally appropriate. In addition, the agro-forestry techniques that will be introduced are not expected to negatively affect local traditions. Approval of the local community on the interventions will first be sought – prior to implementation. Furthermore the VAGs will receive training on a community-based approach to forest management. These activities will empower local communities to claim their rights to forest resources.

177. Current climatic variability will be taken into account in restoration processes. Moreover, resilient species will be selected for agro-forestry and techniques to assist plant growth will be adopted. Local communities will also be involved in all stages of project design, thereby enabling them to plan effectively.

3. PROJECT RESULTS FRAMEWORK

This project will contribute to achieving the following Country Programme Outcome as defined in CPAP or CPD:
CPAP Focus Area 2: Sustainable Environment and Climate Change

Country Programme Outcome Indicators:
Output 2: Vulnerable communities better equipped when faced with climate change.
Output 3: More effective reservation interventions for the environment and ecosystem.

Primary applicable Key Environment and Sustainable Development Key Result Area:
Promote climate change adaptation.

Applicable SOF (e..g GEF) Strategic Objective and Programme:
CCA-1: Reduce the vulnerability of people, livelihoods, physical assets and natural systems to the adverse effects of climate change.
CCA-2: Strengthen institutional and technical capacities for effective climate change adaptation.

Applicable SOF (e.g. GEF) Expected Outcomes:
Outcomes 1.1, 1.3 and 2.4

Applicable SOF (e.g. GEF) Outcome Indicators:
Indicators 1, 2, 4 and 10

	Indicators	Baseline	Targets End of Project	Source of verification	Assumptions
Project Objective[123] To promote climate-resilient, community-based regeneration of indigenous forests in Zambia's Central Province, thereby securing ecosystems goods and services and enhancing the adaptive capacity of local communities.	Number of foresters and members of local groups in Central Province participating in climate-resilient, community-based regeneration of indigenous forests.	0	At least 20 foresters and 1,200 members of local groups.	Training reports, capacity scorecards (see source of verification for Outcomes 1 and 2), consultations with forest officers and local communities at project intervention sites in Serenje District.	*Assumption* District forestry officers and VAGs will apply information disseminated, maps and trainings. Regeneration activities occur in timely fashion; and intervention sites are effectively managed and conserved.
	Number of households benefiting from climate-resilient, community-based regeneration of indigenous forests.	0	At least 3,000 households.	Household surveys at intervention sites at project inception and termination.	*Risk* Encroachment threatens miombo woodlands, thereby undermining project interventions.
Outcome 1[124] Strengthened technical and institutional capacity of foresters and communities in Central Province to implement	1.1 Change in capacity score of district forestry officers and Village Action Group (VAG) members for planning and implementing	0	1.1 VAGs and district forestry officers score at least 2.	Verified through scoring scorecard methodologies adapted from AMAT (2014). The indicator is based on five criteria of the capacity assessment framework: • Are the stakeholders able to identify climate change risks and appropriate ANR interventions?	*Assumptions* District forestry officers and VAGs will apply information disseminated, maps and trainings.

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[123] *Objective (Atlas output) monitored quarterly ERBM and annually in APR/PIR*
[124] *All outcomes monitored annually in the APR/PIR. It is highly recommended not to have more than 4 outcomes.*

appropriate climate-resilient agro-forestry and natural regeneration practices in designated zones.	Assisted Natural Regeneration (ANR) and agro-forestry interventions (CCA Indicator 10).			• Are the stakeholders specifying targets for these interventions? • Have the institutions clearly defined roles and responsibilities for the coordination and implementation of these interventions? • Is there evidence of effective implementation of these interventions by these stakeholders? • Is there evidence of institutional capacities for the continuous assessment, learning and review of ANR?	*Risk* Trainings are not prepared/delivered effectively.
	1.2 Climate-resilient agro-forestry and ANR practices implemented across 15,000 hectares (CCA Indicator 2).	0	1.2 At least 15,000 hectares of climate-resilient agro-forestry established.	Ongoing monitoring at project intervention sites to record: • Area of climate-resilient agro-forestry practices (using GPS and mapping software); and • Survivorship of agro-forestry species.	*Assumption* Regeneration activities occur in timely fashion; and intervention sites are effectively managed and conserved. *Risk* Encroachment threatens miombo woodlands, thereby undermining project interventions.
Outcome 2 Robust fire monitoring and management protection plans and measures in place in all districts in Central Province to maintain desired regeneration targets and reduce fire frequency by 25-30% annually across the province, within a four-year burning cycle.	2.1 Change in capacity score of district forestry officers, VAG members and local authorities for planning and implementing fire management interventions (CCA Indicator 10).	0	2.1 VAG members and local authorities score at least 2.	Verified through scoring scorecard methodologies adapted from AMAT (2014). The indicator is based on five criteria of the capacity assessment framework: • Are the stakeholders able to identify climate change risks and appropriate fire management interventions? • Are the stakeholders specifying targets for these interventions? • Have the institutions clearly defined roles and responsibilities for the coordination and implementation of these interventions? • Is there evidence of effective implementation of fire management interventions by these stakeholders? • Is there evidence of institutional capacities for the continuous assessment, learning and review of adaptation strategies?	*Assumption* District forestry officers and VAGs will apply information disseminated, maps and trainings. *Risk* Trainings are not prepared/delivered effectively.
	2.2 Change in frequency of fire across all districts in Central Province.	0	2.2 Frequency of fires reduced by 25%.	Records of fires across Central Province.	*Assumption* GIS software is applied effectively; information from GIS software is effectively packaged and disseminated to local communities; and updated fire management plans will be applied.

					Risks Non-climate related threats undermine project activities.
Outcome 3 Energy efficient charcoal production and wood-saving technologies have successfully replaced inefficient systems in targeted areas of Central Province, helping offset pressure on the forests as the climate changes.	3.1 Change in number of users of improved charcoal kilns and briquetting machines (CCA Indicator 4).	0	3.1 At least: 120 community members using charcoal retort kilns; and 50 community members using charcoal or sawdust briquetting machines. (20% of who should be women) To be validated during project inception.	Household surveys at intervention sites at project inception and termination; and records of charcoal producer groups established and kilns/briquetting machines distributed.	*Assumptions* Local communities at intervention sites will accept and take ownership of improved kilns and briquetting machines. *Risks* Local communities will not adopt new technologies.

4. TOTAL BUDGET AND WORK PLAN

Award ID:	00086025		Project ID(s):		00093441						
Award Title:	Promoting Community-Based Climate Resilient Forest Regeneration										
Business Unit:	ZMB10										
Project Title:	Promoting climate-resilient community-based regeneration of indigenous forests in Zambia's Central Province										
PIMS no.	4712										
Executing partners/Responsible Parties	Ministry of Lands, Natural Resources and Environmental Protection (MLNREP) – Forestry Department (FD)										

SOF (e.g. GEF) Outcome/Atlas Activity	Responsible Party/ Implementing Agent	Fund ID	Donor Name	Atlas Budgetary Account Code	ATLAS Budget Description	Amount Year 1 (USD)	Amount Year 2 (USD)	Amount Year 3 (USD)	Amount Year 4 (USD)	Amount Year 5 (USD)	Total (USD)	See Budget Note:
OUTCOME 1:	Ministry of Lands, Natural Resources & Environmental Protection, Forestry Department	62160	LDCF	71400	Contractual Services – Individual	50,400	50,400	50,400	50,400	50,400	252,000	a
				71300	Local Consultants	60,000	56,000	18,000	18,000	8,000	160,000	b
				71200	International Consultants	75,500	51,000	0	0	0	126,500	c
				74200	Audio Visual and Print Prod Costs	13,500	19,500	16,500	10,000	0	59,500	d
				72300	Materials and Goods	402,500	57,500	57,500	7,500	7,500	532,500	e
				75700	Training, Workshops and Conferences	8,000	81,000	25,000	18,000	0	132,000	f
				72600	Grants	187,500	187,500	187,500	187,500	187,500	937,500	g
				Total Outcome 1		797,400	502,900	354,900	291,400	253,400	2,200,000	
OUTCOME 2 :	Ministry of Lands, Natural Resources & Environmental Protection, Forestry Department	62160	LDCF	71400	Contractual Services – Individual	80,400	35,400	35,400	35,400	35,400	222,000	h
				71300	Local Consultants	18,000	16,000	4,000	4,000	4,000	46,000	i
				71200	International Consultants	30,000	15,500	0	0	0	45,500	j
				74200	Audio Visual and Print Prod Costs	15,000	30,000	30,000	30,000	15,000	120,000	k
				72300	Materials and Goods	324,500	10,000	10,000	10,000	10,000	364,500	l
				75700	Training, Workshops and Conferences	25,000	50,000	50,000	50,000	25,000	200,000	m
				72600	Grants	64,400	34,400	34,400	34,400	34,400	202,000	n
				Total Outcome 2		557,300	191,300	163,800	163,800	123,800	1,200,000	

OUTCOME 3 :	Ministry of Lands, Natural Resources & Environmental Protection, Forestry Department	62160	LDCF	71300	Local Consultants	29,100	14,600	3,100	3,100	3,100	53,000	o
				74200	Audio Visual and Print Prod Costs	3,000	4,500	4500	2,500	0	14,500	p
				71400	Contractual Services Individual	12,000	12,000	12,000	12,000	12,000	60,000	q
				72300	Materials and Goods	137,500	0	0	0	0	137,500	r
				75700	Training, Workshops and Conferences	15,000	20,000	0	0	0	35,000	s
				Total Outcome 3		**196,600**	**51,100**	**19,600**	**17,600**	**15,100**	**300,000**	
PROJECT MANAGEMENT COSTS/UNIT	Ministry of Lands, Natural Resources & Environmental Protection, Forestry Department	62160	LDCF	71400	Contractual Services – Individual	7,200	7,200	7,200	7,200	7,200	36,000	t
				77200	Furniture	15,000	-	-	-		15,000	u
				71600	Travel	10,000	10,000	10,000	10,000	10,000	50,000	v
				74100	Professional services	3,000	3,000	3,000	3,000	3,000	15,000	w
				74500	Miscellaneous Expense	5,847	4,317	4,627	3,171	1,480	19,442	x
				75700	Training, Workshops and Conferences	10,000		7,500		7,500	25,000	y
				72500	Supplies	4,915	4,915	4,915	4,915	4,898	24,558	z
				Total PMC		**55,962**	**29,432**	**37,242**	**28,286**	**34,078**	**185,000**	
	UNDP	04000	UNDP	71200	International Consultants	0	0	30,000	0	45,000	75,000	aa
				74500	Miscellaneous	5,000	5,000	5,000	5,000	5,000	25,000	bb
				Total PMC		**5,000**	**5,000**	**35,000**	**5,000**	**50,000**	**100,000**	
GEF PROJECT TOTAL						**1,607,262**	**774,732**	**575,542**	**501,086**	**426,378**	**3,885,000**	
UNDP PROJECT TOTAL						**5,000**	**5,000**	**35,000**	**5,000**	**50,000**	**100,000**	
PROJECT TOTAL UNDP						**1,612,262**	**779,732**	**610,542**	**506,086**	**476,378**	**3,985,000**	

Summary of Funds: [125]

	Amount Year 1	Amount Year 2	Amount Year 3	Amount Year 4	Amount Year 5	Total
GEF	$ 1,607,262	$ 774,732	$ 575,542	$ 501,086	$ 426,378	$ 3,885,000
UNDP–TRAC	$ 5,000	$ 5,000	$ 35,000	$5,000	$ 50,000	$ 100,000
Ministry of Lands, Natural Resources and Environment Protection (MLNREP)	$ 4,724,564	$ 2,277,333	$ 1,691,812	$ 1,472,948	$ 1,253,343	$ 11,420,000
Centre for Environmental Research Education and Development (CERED)	$ 61,089	$ 29,446	$ 21,875	$ 19,045	$ 16,206	$147,661
Community Markets for Conservation	$ 4,550,806	$ 2,193,578	$ 1,629,591	$ 1,418,776	$ 1,207,249	$11,000,000
Environment Africa	$ 209,972	$ 101,211	$ 75,189			$386,372
Pioneer	$ 1,319,734	$ 636,138	$ 472,581	$ 411,445	$ 350,102	$ 3,190,000
Zambia Climate Change Network	$ 405,435	$ 195,428	$ 145,182	$ 126,400	$ 107,555	$ 980,000
Zambia Institute of Environmental Management	$ 308,651	$ 148,776	$ 110,524	$ 96,226	$ 81,880	$ 746,057
Kasanka Trust	$ 438,532	$ 211,381	$ 157,033	$ 136,718	$ 116,336	$ 1,060,000
TOTAL	**$ 13,667,416**	**$ 6,587,965**	**$ 4,894,143**	**$ 4,195,542**	**$ 3,570,024**	**$ 32,915,090**

Budget Note	Description of Cost Item
	Outcome 1
a	• Project manager @ $2,000 per month for 5 years (pro-rated across Outcomes) • Project administrative officer @ $700 per month for 5 years (pro-rated across Outcomes) • Driver @ $1,500 per month for 5 years
b	• National ANR and AF specialist: 140 days @ $200/day + 80 days DSA @ $100/day

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[125] *Summary table should include all financing of all kinds: GEF financing, cofinancing, cash, in-kind, etc...*

	• National CBNRM specialist: 140 days @ $200/day + 80 days DSA @ $100/day • National Community Mobiliser/Facilitator: 140 days @ $200/day + 100 days DSA @ $100/day • National GIS/Remote sensing specialist: 50 days @ $200/day + 10 days DSA @ $100/day • National M&E specialist: 150 days @ $200/day + 90 days DSA @ $100/day
c	• International ANR and agro-forestry specialist: 60 days @ $500/day +2 flights @ $1000 + 20 days DSA @ $100/day • International CBNRM, forest and land tenure specialist: 60 days @ $500/day +2 flights @ $1000 + 20 days DSA @ $100/day • International alternative livelihoods specialist: 60 days @ $500/day +2 flights @ $1000 + 20 days DSA @ $100/day • International agricultural/environmental economics specialist: 45 days @ $500/day +1 flights @ $1000 + 10 days DSA @ $100/day
d	• Edit, print and publish documents on local ecological knowledge, training manual on ANR and agro-forestry, planting guides @ $40,000 total • Costs for establishing and printing forest management plans/maps for 20 VAGs @ $19,500 total
e	• 1 x Project vehicle @ $50,000 each • 4 x motorcycles @ $15,000 each • Running costs for vehicle & motorcycles @ $7,500 per annum • Beams, roofing, shade-clothe and other materials for establishing 20 community nurseries @ $5,000 each • Equipment for ANR/agro-forestry activities, e.g. mattocks, shovels, spades, etc. @ $35,000 total • Seeds, seedlings and trees for nurseries, ANR and agro-forestry @ $200,000 total • Computers, data servers, software licences etc. for GIS mapping of VAGs @ $20,000 total • Radios & telecommunications equipment @ $10,000 total
f	• Training of 20 district officers and 2000 VAG community members on site-specific appropriate climate-resilient agro-forestry and natural regeneration practices including workshops on ANR and AF @ $132,000 total
g	• Cash-for-work grants to communities for ANR activities @ $5 per day x 2.5 days per ha x 15,000 ha x 5 years
Outcome 2	
h	• Project manager @ $1,000 per month for 5 years (prorated across Outcomes) • Project administrative officer @ $700 per month for 5 years (prorated across Outcomes) • Contractor to provide support for firebreak establishment & management in accordance with community-based fire management plans @ $60,000 for Y1 (establishment) & $15,000 per annum for Y2–Y5 (maintenance)
i	• National fire management specialist (for development of fire management plans): 100 days@ $200/day + 40 days DSA @ $100/day • National fire management specialist (for overseeing implementation and maintenance activities): 25 days@ $200/day + 10 days DSA @ $100/day for Y1, 15 days@ $200/day + 10 days DSA @ $100/day per year for Y2–Y5
j	• International fire management specialist: 54 days @ $500/day +2 flights @ $1,000 + 20 days DSA @ $100/day • International GIS/remote sensing specialist: 25 days @ $500/day + 1 flight @ $1,000 + 10 days DSA @ $100/day
k	• Edit, print and publish protocols, handbooks and manuals for Integrated Fire Management • Costs of editing, printing and publishing fire management plans • Costs of awareness raising materials on fire risks under climate change
l	• Procurement of 4 tractors for the establishment of firebreaks @ $75,000 each • Operating costs and annual service of tractors @ $10,000 per annum • Cost of providing fire-fighting equipment for communities (e.g. flails) @ $14,500 total
m	• Training of district forestry staff, relevant VAG members and local authorities on appropriate climate-resilient fire protection practices (boundary and firebreak management, early burning, etc)
n	• Cash-for-work grants to communities to patrol for fires: 12 months per annum @ $60 per month x 20 VAGs x 5 years • Cash-for-work grants to communities to establish and maintain firebreaks: 500 man days @ $5 per day x 20 VAGs for establishment of fire breaks in Y1, 200 man days @ $5 per day x 20 VAGs for maintenance of fire breaks per annum for Y2–Y5
Outcome 3	
o	• National briquetting expert: 100 days @ $200/day +30 days DSA @ $100/day

	• National efficient kiln expert: 50 days @ $200/day +30 days DSA @ $100/day • National monitoring, licensing and tracking expert: 20 days @ $200/day + 6 days DSA @ $100/day for Y1 to establish system, 15 days @ $200/day + 5 days DSA @ $100/day for Y2–Y5 to track license and production
p	• Edit, print and publish protocols, handbooks and manuals for sustainable kiln use and briquetting technology
q	• Project manager @ $1,000 per month for 5 years (prorated across Outcomes)
r	• Costs for the provision of 120 retort kilns @ $1,000 each • Costs for 50 briquetting machines @ $350 each • Equipment and tools for setting sustainable rotation system into place $40 000
s	• Training of 20 charcoal user groups in briquetting and sustainable kiln use
	Project Management
t	• Project administrative officer @ $700 per month for 5 years (prorated across Outcomes)
u	• Office furniture
v	• Project Manager travel and other internal flights. • Project team travel and local transport around regions and district
w	• Annual audit @ $3,000 per annum
x	• Direct project costs UNDP cost recovery charges for support services provided (see LoA)
y	• Inception Workshop @ $10,000. • 2 x Lessons Learned Workshops @ $7,500 per workshop.
z	• Office supplies, stationery, etc/
aa	• International Consultant – Mid-term review @ $40,000. • International Consultant – Terminal Evaluation @ $40,000.
bb	• Miscellaneous costs including insurance and bank charges

5. MANAGEMENT ARRANGEMENTS

178. The execution modality for this project will follow UNDP's National Implementation Modality (NIM). The Implementing Partner (IP) for this project will be the Ministry of Lands, Natural Resources and Environmental Protection (MLNREP). This Ministry will have project ownership and will recruit a Project Manager (PM) – paid by the project – to coordinate operations. Stakeholders that will be involved in the project will benefit through technical support and training on relevant topics. Such ministries will include: i) MLNREP; ii) MAL; ii) the Ministry of Chiefs and Traditional Affairs (MCTA); iii) the Ministry of Mines, Energy and Water Development (MMEWD) iv) regional government stakeholders; and v) Community-Based Organisations (CBOs). However, the main beneficiaries of the LDCF project will be local communities in Central Province, Zambia.

179. The Project Steering Committee (PSC) will be chaired by MLNREP and will be responsible for approving project activities. Based on the activities approved by the PSC, the Project Management Unit (PMU) will ensure the provision of funds to all institutions/organisations to undertake relevant activities. All Executing partners/Responsible Parties will be responsible for managing tasks allocated to their institution/organisation. To clearly define the responsibility of each Executing partners/Responsible Parties during project implementation, Memorandums of Understanding (MoUs) and Terms of Reference (TORs) will be developed under the guidance of the PMU. Moreover, a Letter of Agreement (LoA) (included as Annex 4) has been developed to detail all additional services required of UNDP beyond its role of overseeing the IP. For example, the IP has requested UNDP to provide services such as recruitment, procurement, assistance for training and payments services. The direct project costs requested of UNDP are also detailed in the Total Budget Work Plan (Section 4).

180. The Stakeholder Involvement Table, indicating the key inputs of all project partners during project implementation, is provided in Annex 5. Figure 5 below illustrates the project management structure.

181. The **Project Steering Committee** (PSC) will be established by MLNREP and will be responsible for approving reports and activities. This Committee will also provide guidance for proper implementation of the project. Members of the Project Steering Committee will include UNDP, representatives of District Councils, MAL, MMEWD, Ministry of Chiefs and Traditional Affairs (MOCTA), ZEMA, Zambia Climate Network and others. The PSC will play a critical role in project monitoring and evaluation by quality-assuring processes and products and using evaluations for performance improvement, accountability and learning. Moreover, the Committee will: i) ensure that required resources are committed, ii) arbitrate on any conflicts within the project and iii) negotiate a solution to any problems with external bodies. In addition, the PSC will approve the recruitment and responsibilities of the Project Implementation Unit (PIU) and any delegation of its project assurance responsibilities. The Committee will also be responsible for approving any deviations from the original project document in the approved Annual Work Plan (AWP). The Committee will convene twice annually. Members of the PSC will be validated during the Project Appraisal Committee (PAC) meeting. In addition, representatives from other institutions/organisations can be included in PSC meetings as appropriate.

182. The PSC will include four distinct divisions/roles, which are described below:

- An **Executive** (from MLNREP) will be an individual who will chair the PSC.
- The **Senior Supplier** (SS) (from UNDP) will be a group representing the interests of the parties concerned. This group will provide funding for specific cost-sharing projects and/or technical expertise to the project. The primary function of this supplier will be to guide the technical feasibility of the project and align the outcomes/outputs with LDCF policies.
- The **Senior Beneficiary** (SB) (from FD) will be a group representing the interests of those who will ultimately benefit from the project. The primary function of the SB will be to ensure the realisation of project results from the perspective of project beneficiaries.

- The **Project Assurance** (PA) (from UNDP Zambia Programme Officer and UNDP-GEF) will support the PSC Executive by undertaking: i) objective and independent project oversight; and ii) monitoring functions in line with UNDP and GEF/LDCF policies and procedures.

183. The **Project Manager** (PM) will be an international/regional expert recruited to manage the project (see TOR, Annex 6). The PM will also conduct the financial management. In addition, another individual will be the CBNRM Manager. Moreover, a CBNRM team will be recruited locally by the project. This decentralised organisation structure builds on the success of decentralised approaches in Kafue and South Luangwa, and is workable in the current fluidity of the institutional situation in Zambia Wildlife Authority (ZAWA), Forestry, and related Ministries. The PM will have the authority to run the project on a day-to-day basis on behalf of the IP, within the constraints laid down by the PSC. Work and financial disbursements will be guided by the AWP. This plan will be developed through a process of performance review and work planning, and will be approved by the Project Steering Committee and UNDP. The PM's main responsibility will be to ensure that the LDCF project achieves the targets described in this document, to the required standard of quality and within the specified constraints of time and cost. The PM is accountable to UNDP, the IP and the PSC. The activities undertaken by the PM will be monitored for quality, timeliness and cost-effectiveness. He/she will also be responsible for coordinating budgets and work plans at the regional level with the Regional Committees (RCs). The PM will be assisted by a Technical Committee (TC), a Project Coordinator (PC) and a Financial and Administrative Officer (FAO).

184. A representative from MLNREP will be assigned as the **Project Coordinator** (PC) to support the PM with: i) overall administration; and ii) maintaining liaison with UNDP. This coordinator will be recruited by MLNREP and act as a permanent staff of MLNREP (i.e. he/she will not supported by the LDCF-financed project). Travel indemnities will be paid for the PC and have been accounted for in the TBWP (Section 4).

185. The **Technical Committee** (TC) will include the following permanent members: Forest Department (2 representatives), the UNDP Programme Officer, the PM, a representative from the MAL, a representative of the Zambian Climate Network (ZCN), a representative of Zambian Land Alliance (ZLA), a representative of Zambian Alliance of Women (ZAW), a representative of the MOCTA and a representative of the MEMWD. The role of the TC is to provide technical advice and guidance to the PIU, namely financial and technical support as required by the needs of this unit. The Technical Committee is required to meet once per month to ensure timely project implementation.

186. The **Project Implementation Unit's** (PIU) overall role will be to ensure that comprehensive technical and management support is provided to project implementers and local beneficiaries, such as overseeing knowledge management and Monitoring and Evaluation (M&E). Importantly, the PIU should have adequate capacity to provide support for technical and financial activities. Moreover, the team of PM, PC and the TC must be able to work collaboratively in the fields of natural resource management, economics, political science and organisational issues. Moreover, this unit must be able to ensure that activities are designed and implemented in line with national and international best practices.

187. **Regional Committees** (RCs) will provide a supporting role to the PIU to avoid duplication and promote complementarity of similar initiatives. The RC in Serenje District will include: i) the head of Central Province; ii) two members of Serenje Regional Council (RC); and iii) heads of locally-based NGOs/CSOs. The District head will be responsible for two-way communication with all communities in the RC's jurisdiction. The responsibility of the RCs will be to ensure close cooperation with the national and local governments/organisations for the purposes of implementing local activities, discussing technical issues, setting priorities, resolving conflicts and supervising site-level activities. The RCs will be accountable to the PIU.
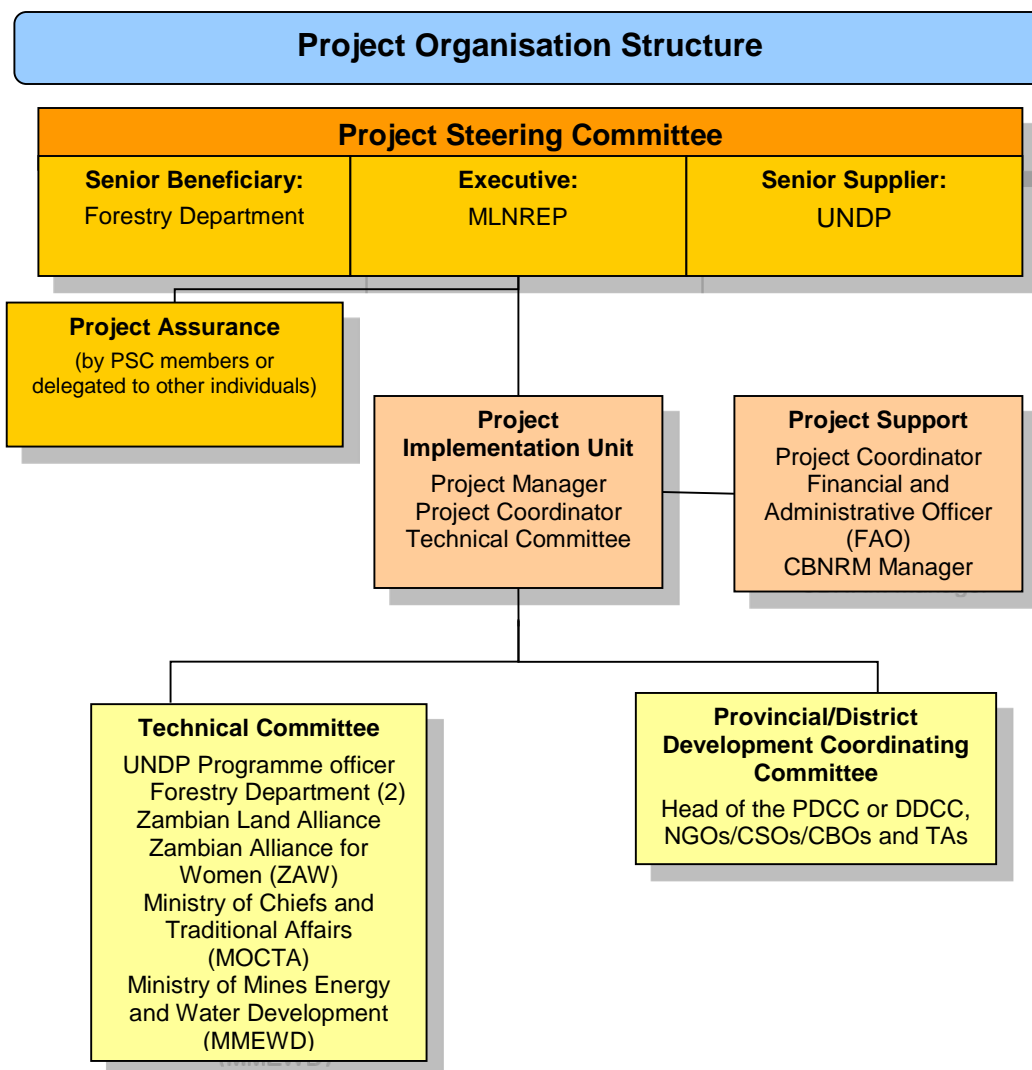
Project Organisation Structure

Project Steering Committee		
Senior Beneficiary: Forestry Department	**Executive:** MLNREP	**Senior Supplier:** UNDP

Project Assurance
(by PSC members or delegated to other individuals)

Project Implementation Unit
Project Manager
Project Coordinator
Technical Committee

Project Support
Project Coordinator
Financial and Administrative Officer (FAO)
CBNRM Manager

Technical Committee
UNDP Programme officer
Forestry Department (2)
Zambian Land Alliance
Zambian Alliance for Women (ZAW)
Ministry of Chiefs and Traditional Affairs (MOCTA)
Ministry of Mines Energy and Water Development (MMEWD)

Provincial/District Development Coordinating Committee
Head of the PDCC or DDCC, NGOs/CSOs/CBOs and TAs

Figure 5: Project Management Structure.

188. To ensure UNDP's ultimate accountability for the project results, decisions made by the Project Steering Committee will be in accordance with standards that promote: i) management for development results; ii) best value for money; iii) fairness; iv) integrity; v) transparency; and vi) effective international competition. If consensus cannot be reached by the PSC on a particular topic, the PM will make the final decision. Potential members of the PSC will be reviewed and recommended for approval during the PAC meeting. In addition, representatives of other groups can be included in the PSC as appropriate. At the national level, the PSC will collaborate closely with MNLREP, ZEMA, MMEWD, MCTA and key actors in civil society.

6. MONITORING FRAMEWORK AND EVALUATION

189. The project will be monitored through the following M& E activities. The M&E budget is provided in the table below.

Project inception

190. Within the first 2 months of the proposed LDCF project, a project inception workshop will be conducted. Attendees of this workshop will include, *inter alia*: i) stakeholders that have assigned roles in the project organisation structure; ii) UNDP Country Office; and iii) where appropriate/feasible, UNDP regional technical, policy and programme representatives. The inception workshop will: i) promote country ownership of the project; and ii) enable planning for the first year (AWP). In addition, this workshop will:

- Promote understanding and ownership among all stakeholders involved in the project;
- Detail the roles, support services and complementary responsibilities of UNDP CO and RCU staff vis-à-vis the project team;
- Discuss the roles, functions, and responsibilities within the project's decision-making structures, including reporting and communication lines, and conflict resolution mechanisms;
- Validate the TORs for project staff;
- Discuss the AMAT Tracking Tool;
- Finalise the first annual work plan;
- Review and agree on the indicators, targets and their Means of Verification (MoV), and recheck assumptions and risks;
- Provide a detailed overview of reporting and M&E requirements; the M&E work plan and budget should be agreed and scheduled;
- Discuss financial reporting procedures and obligations, and arrangements for annual audit; and
- Plan and schedule PSC meetings.

191. An inception workshop report will be prepared within the first 3 months and shared with participants to formalise agreements and plans decided during the meeting.

Daily monitoring

192. Day-to-day monitoring of general project implementation progress will be the responsibility of the PM, based on the project's AWP and its indicators, with overall guidance from the Project Director. The project team will inform the UNDP CO of any delays or difficulties faced during implementation of the LDCF project. In so doing, appropriate support will be provided by UNDP, or corrective measures implemented in a timely and remedial fashion.

193. Day-to-day monitoring of ANR will be the responsibility of field officers. These officers will coordinate implementation of activities at the selected sites.

Quarterly monitoring

194. Project Progress Reports (PPRs) will be produced and submitted on a quarterly basis based on M&E data in the UNDP Enhanced Results-Based Management Platform (ERBMP). Risk analyses will be logged and regularly updated in ATLAS. In addition, impacts and probabilities of high technical risks that are identified during the project preparation phase will be meticulously followed up. Based on the information recorded in ATLAS, Project Progress Reports (PPRs) will be generated in the Executive Snapshot. Other ATLAS logs will be used to monitor issues and record lessons learned, etc. The use of these functions is a key indicator in the UNDP Executive Balanced Scorecard.

Annual monitoring

195. The Annual Project Review/Project Implementation Report (APR/PIR) will be prepared to monitor progress. This report combines both UNDP and GEF reporting requirements. Moreover, it includes – but is not limited to – reporting on the following: i) progress made toward objective and outcome indicators; ii) baseline data and end-of-project targets (cumulative); iii) project outputs delivered per

project outcome (annual); iv) lessons learned/good practice; v) AWP and other expenditure reports; vi) risk and adaptive management; and vii) ATLAS QPR. Portfolio-level indicators (i.e. the LDCF AMAT tracking tool) are used on an annual basis as well.

Periodic Monitoring through Site Visits

196.   Representatives from Forestry Department, the UNDP CO and the UNDP RCU will conduct visits to project sites based on the agreed schedule in the project's Inception Report/Annual Work Plan. These visits will be undertaken to assess project progress, with particular focus on: i) ANR implementation at the field sites; ii) fire management implementation at the community level; iii) designation of fuel wood collection sites; and iv) rotation cycles. Members of the PSC may join these visits. No less than one month after each visit, a Field Visit Report/BTOR will be prepared by the Forestry Department and UNDP RCU and circulated to the project team and PSC members.

Mid-Term of Project Cycle

197.   The Mid-Term Review (MTR) will measure progress made towards outcome targets, and identify a course of correction if required. This review will: i) focus on the effectiveness, efficiency and timeliness of project implementation; ii) identify problems requiring decisions and actions; and iii) present initial lessons learned on project design, implementation and management. Findings of this review will be incorporated as recommendations for improved implementation during the final half of the project's term. The organisation, ToR and timing of the mid-term review will be decided after consultation between the organisations involved in implementing the LDCF project. The TOR for the MTR will be prepared by the UNDP CO based on guidance from the Regional Coordinating Unit and UNDP-GEF. The management response and the evaluation will be uploaded to UNDP corporate systems, in particular the UNDP Evaluation Office Evaluation Resource Centre (ERC). The AMAT Tracking Tool will also be completed during the mid-term review cycle.

End of Project

198.   Terminal Evaluation (TE) will take place three months prior to the final PSC meeting in accordance with UNDP and GEF guidance. This evaluation will focus on the delivery of the projects results as initially planned, and after the mid-term review. In addition, the TE will measure impact and sustainability of results, including the contribution to capacity development and the achievement of global environmental benefits/goals. Moreover, the TE should provide recommendations for follow-up activities.

199.   The Project Terminal Report (PTR) will summarise the results achieved (objectives, outcomes, outputs), lessons learned and problems encountered during implementation of the LDCF project. In addition, the report will include recommendations for further steps that may need to be taken to ensure sustainability and replicability of the project's results.

Audit Clause

200.   Audit will be conducted according to UNDP Financial Regulations and Rules and applicable Audit policies.

Learning and knowledge sharing

201.   Results from the project will be disseminated within and beyond the project intervention zone through existing information sharing networks and forums.

202.   The project will identify and participate, as relevant and appropriate, in scientific, policy-based and/or any other networks, which may be of benefit to project implementation though lessons learned. The project will identify, analyse, and share lessons learned that might be beneficial in the design and implementation of similar future projects.

203. Finally, there will be a two-way flow of information between this project and other projects of a similar focus.

Communications and visibility requirements

204. Full compliance is required with UNDP's Branding Guidelines. These can be accessed at http://intra.undp.org/coa/branding.shtml, and specific guidelines on UNDP logo use can be accessed at: http://intra.undp.org/branding/useOfLogo.html. Amongst other things, these guidelines describe when and how the UNDP logo needs to be used, as well as how the logos of donors to UNDP projects needs to be used. For the avoidance of any doubt, when logo use is required, the GEF logo needs to be used alongside the UNDP logo. The GEF logo can be accessed at: http://www.thegef.org/gef/GEF_logo. The UNDP logo can be accessed at http://intra.undp.org/coa/branding.shtml.

205. Full compliance is also required with the GEF's Communication and Visibility Guidelines (the "GEF Guidelines"). The GEF Guidelines can be accessed at: http://www.thegef.org/gef/sites/thegef.org/files/documents/C.40.08_Branding_the_GEF%20final_0.pdf. Amongst other things, the GEF Guidelines describe when and how the GEF logo needs to be used in project publications, vehicles, supplies and other project equipment. The GEF Guidelines also describe other GEF promotional requirements regarding press releases, press conferences, press visits, visits by Government officials, productions and other promotional items.

206. Where other agencies and project partners have provided support through co-financing, their branding policies and requirements should be similarly applied.

Table 6. Monitoring and Evaluation Budget.

Type of M&E activity	Responsible Parties	Budget US$ *Excluding project team staff time*	Time frame
Inception Workshop and Report	FD UNDP	Indicative cost: 10,000	Within first two months of project start-up
Measurement of Means of Verification of project results.	Project Manager will oversee the hiring of specific studies and institutions, and delegate responsibilities to relevant team members.	To be finalised in Inception Phase and Workshop.	Start, mid and end of project (during evaluation cycle) and annually when required.
Measurement of Means of Verification for Project Progress on output and implementation	Oversight by Project Manager and project team	To be determined as part of the Annual Work Plan's preparation.	Annually prior to ARR/PIR and to the definition of annual work plans
APR/PIR	Project manager and team UNDP CO	None	Annually
Periodic status/ progress reports	Project manager and team	None	Quarterly
Mid-term Report	Project manager and team UNDP CO External consultants (i.e. evaluation team)	Indicative cost: 40,000	At the mid-point of project implementation.
Terminal Evaluation	Project manager and team UNDP CO External consultants (i.e. evaluation team)	Indicative cost : 40,000	At least three months before the end of project implementation

Type of M&E activity	Responsible Parties	Budget US$ *Excluding project team staff time*	Time frame
Project Terminal Report	Project manager and team PC FD UNDP CO National consultant	0	At least three months before the end of the project
Audit	UNDP CO Project manager and team	Indicative cost per year: 3,000	Annually
Visits to field sites	UNDP CO PC FD Government representatives	For GEF supported projects, paid from IA fees and operational budget	Annually
TOTAL indicative COST Excluding project team staff time and UNDP staff and travel expenses		US$ 93,000 (+/- 5% of total budget)	

7.   LEGAL CONTEXT

207. This document, together with the CPAP signed by the Government and UNDP which is incorporated by reference, constitute together a Project Document as referred to in the SBAA and all CPAP provisions apply to this document. Consistent with the Article III of the Standard Basic Assistance Agreement, the responsibility for the safety and security of the implementing partner and its personnel and property, and of UNDP's property in the implementing partner's custody, rests with the implementing partner. The implementing partner shall:

- Put in place an appropriate security plan and maintain the security plan, taking into account the security situation in the country where the project is being carried out; and
- Assume all risks and liabilities related to the implementing partner's security, and the full implementation of the security plan.

208. UNDP reserves the right to verify whether such a plan is in place, and to suggest modifications to the plan when necessary. Failure to maintain and implement an appropriate security plan as required hereunder shall be deemed a breach of this agreement.

209. The implementing partner agrees to undertake all reasonable efforts to ensure that none of the UNDP funds received pursuant to the Project Document are used to provide support to individuals or entities associated with terrorism and that the recipients of any amounts provided by UNDP hereunder do not appear on the list maintained by the Security Council Committee established pursuant to resolution 1267 (1999). The list can be accessed via http://www.un.org/Docs/sc/committees/1267/1267ListEng.htm. This provision must be included in all sub-contracts or sub-agreements entered into under this Project Document.

8. ANNEXES