



**FAO/GLOBAL ENVIRONMENT FACILITY
PROJECT DOCUMENT**



PROJECT TITLE: Reversing Desertification Process in Susceptible Areas of Brazil: Sustainable Agroforestry Practices and Biodiversity Conservation (REDESER)	
PROJECT SYMBOL: GCP/BRA/085/GFF	
Recipient Country: Brazil	
Resource Partner: Global Environment Facility (GEF)	
FAO project ID: 616970 GEF Project ID: PIMS 5324	
Executing Partner(s): Federative Republic of Brazil, Ministry of Environment (MMA), Secretariat of Extractivism and Sustainable Rural Development (SEDR), Department to Combat Desertification and Land Degradation (DCD)	
Expected EOD (starting date): April 1, 2016	
Expected NTE (end date): March 30, 2020	
Contribution to FAO's Strategic Framework	<p>a. Strategic Objective/Organizational Result: <i>Strategic Objective 2: Increase and improve provision of goods and services from forestry and fisheries in a sustainable manner:</i> a) producers and natural resource managers adopt practices that increase and improve the provision of goods and services in agricultural sector production systems in a sustainable manner; <i>Strategic Objective 5: Increase the resilience of livelihoods to threats and crises:</i> c) countries apply prevention and impact mitigation measures that reduce risks for agriculture, food and nutrition. b. Regional Result/Priority Area: 2. Climate change and environmental sustainability c. Country Programming Framework Outcome: Outcome 4: Public policies and programs for the Sustainable Management of forest resources, fisheries and aquaculture within the context of climate change and desertification strengthened.</p>
GEF Focal Area/LDCF/SCCF: LD, BD, SFM/REDD+ (Multiple Focal Areas)	
GEF/LDCF/SCCF Strategic Objectives: LD-2; LD-3; BD-2; SFM/REDD+-1	
Environmental Impact Assessment Category (insert √): A <input checked="" type="checkbox"/> B C	
Financing Plan: GEF allocation:	USD 3,930,155
<u>Co-financing:*</u>	
1. AGENDHA – socio-environmental NGO	160,000
2. APNE - Northeast Plants Association	160,000
3. CEPIS - Technological Park Foundation of Paraíba	533,333
4. FA - Araripe Foundation	160,000
5. FAO – Food and Agriculture Organization of the United Nations	200,000
6. FUNETEC - Technological and Cultural Education Foundation	800,000
7. IABS - Brazilian Institute of Development and Sustainability	266,666
8. ICRAF – World Agroforestry Centre	100,000
9. INSA - National Semi-Arid Institute	1,333,333
10. MDA - Ministry of Agrarian Development	3,360,000
11. MMA - Ministry of Environment	1,866,667
12. SEAFDS - Paraíba state agriculture secretariat	1,066,667
13. SEAPAC - Rio Grande do Norte social organization	160,000
14. SEIHRMACT – Paraíba state environment secretariat	800,000
15. SEMA - Crato municipal environment secretariat	533,334
16. SEMARH – Alagoas state environment secretariat	533,333
17. SEPLAN - Rio Grande do Norte state planning secretariat	1,066,666
18. SFB - Brazilian Forest Service	2,666,667
Subtotal Co-financing:	15,766,666

Total Budget: *Exchange rate = BRL 3.75 per USD	USD 19,696,822
<p style="text-align: center;">EXECUTIVE SUMMARY</p> <p>The objective of the REDESER project is to halt and reverse the process of desertification through actions to address increasingly strong causes of land degradation and biodiversity loss in Caatinga ecosystems located in Areas Susceptible to Desertification (ASD), which cover 1.34 million km² (16% of Brazil) and are home to 34.8 million people (17%) in 1,490 municipalities (27%).</p> <p>Project activities will contribute to national efforts to identify and disseminate best production practices for sustainable use in ASD. The Caatinga biome provides wood-based energy and environmental services of great importance to local livelihoods and the regional and national economies. Land degradation in the Caatinga is due mainly to overharvesting of wood and clear-cutting of native vegetation for unsustainable crop and livestock production. Biodiversity is lost because of land-use change and habitat fragmentation. There are 60 threatened species in the Caatinga, including some of the most threatened bird species in the world.</p> <p>The main barriers to be overcome by the Project are: 1) Limited knowledge and capacity in promoting integrated natural resource management (INRM) across market value chains (from production landscapes to market products); 2) Limited institutional capacity to promote sustainable land management (SLM) and sustainable forest management (SFM); 3) Lack of sustained technical support for the restoration of degraded forests and landscapes; 4) Lack of identification and effective dissemination of best practices.</p> <p>The project will carry out concrete field activities involving federal, state and municipal governments, civil society organizations and family farmers in 14 municipalities, within a total of 89 adjacent municipalities to be indirectly influenced by project actions in the following clusters of municipalities: 1) Araripe, in southern Ceará; 2) Seridó, in southern Rio Grande do Norte and northern Paraíba; 3) Uauá, in northeastern Bahia; 4) Xingó, in western Alagoas. Other project activities including capacity development will reach beyond sites in these clusters and involve the entire ASD.</p> <p>The Project will be implemented through five components: 1) Promoting Integrated Natural Resource Management (INRM) in ASD Production Landscapes; 2) Promoting Multiple-Use Forest Management - through adoption and expansion of multiple-use sustainable forest management (SFM) practices among family farmers in the ASD; 3) Forest and Landscape Restoration (FLR) - so as to contribute to community-based economies, maintain and restore biodiversity; 4) Knowledge Management, Capacity Development and Awareness-Raising - aimed at communities and institutions involved in environmental licensing processes; 5) Coordination with other initiatives, monitoring and evaluation.</p> <p>The project impacts will exert direct influence over 904,142 ha., with 618,062 ha. of forest, the rest being mainly cropland and rangeland. 152,475 ha. of the land area of intervention is degraded (see Appendix 1). Project activities over four years will avoid 5,709 ha. of deforestation in the areas of direct project intervention and absorb</p>	

439,200tCO_{2eq} through restoration activities and additional 696,219 tCO_{2eq} through avoided deforestation. Furthermore, the project will reduce the deforestation rate in the area of indirect impact by 30%, enabling therefore an estimated 2,472,347 tCO_{2eq} sequestration through avoided deforestation and forest degradation. Due to new practices, increased capacity and awareness as well as institutional changes, the positive impacts at the local level will be maintained in the future and multiplied over a much larger area.

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GLOSSARY OF ACRONYMS

Note: The acronyms for Brazilian organizations and programs are in Portuguese so that their identity is clear for the reader.

ABC	Brazilian Cooperation Agency
ABC	Low Carbon Emission Agriculture

ADESE	Seridó Development Agency
AFS	Agroforestry System
AGENDHA	Advice and Management on Nature Studies, Human Development and Agro-ecology
ANA	National Water Agency
ANATER	National Agency of Technical Assistance and Rural Extension
AOP	Annual Operational Plan
APA	Environmental Protection Area
APNE	Northeast Plant Association
APP	Area of Permanent Preservation
APR	Annual Project Report
ASA	Semi-Arid Network
ASCOM	Communications Office
ASD	Areas Susceptible to Desertification
ATER	Technical Assistance and Rural Extension
AWP/B	Annual Work Plan and Budget
BANCOOB	Brazilian Cooperative Bank
BANSICREDI	Sicredi Cooperative Bank
BASA	Amazon Development Bank
BB	Bank of Brazil
BD	Biodiversity
BH	Budget Holder
BNB	Northeast Development Bank
BNDES	National Economic and Social Development Bank
BRL	Brazilian Real
CAA-NM	Alternative Agriculture Center of Northern Minas Gerais
CAR	Rural Environmental Registry
CBD	Convention on Biological Diversity
CE	Ceará (State)
CEF	Federal Savings Bank
CEMAFAUNA	Caatinga Fauna Management Center
CENARGEN	EMBRAPA Genetic Resources and Biotechnology
CEPIS	Center for Sustainable Industrial Production
CHESF	São Francisco Hydro-Electric Company
CIFOR	Center for International Forestry Research
CIMA	Agrobiodiversity Management Irradiation Centers
CNAPO	National Commission of Agroecology and Organic Production
CODEVASF	São Francisco and Parnaíba Valleys Development Company
CONAB	National Food Supply Company
CONAMA	National Environment Council
COOPERCUC	Family Agribusiness Cooperative of Canudos, Uauá and Curaçá
CRAD	Reference Center in Recovery of Degraded Areas
CSO	Civil Society Organization
DCD	Department to Combat Desertification and Land Degradation (SEDR-MMA)
DLDD	Desertification, Land Degradation and Drought
DNOCS	National Department of Civil Works against Droughts
EMBRAPA	Brazilian Agricultural Research Corporation

EPA	Environmental Protection Area
FA	Araripe Foundation
ES	Espírito Santo (State)
FAO	Food and Agriculture Organization of the United Nations
FE	Final Evaluation
FLONA	National Forest
FLR	Forest and Landscape Restoration
FNDE	National Educational Development Fund
FNDF	National Forest Development Fund
FNMA	National Fund for Environment
FPMIS	Field Project Management Information System
FUNAI	Brazilian Foundation for Indigenous Peoples
FUNBIO	Brazilian Fund for Biodiversity
FUNETEC	Technological and Cultural Education Foundation
GDP	Gross Domestic Product
GEB	Global Environmental Benefit
GGWSSI	Great Green Wall for the Sahara and the Sahel Initiative
GHG	Greenhouse Gases
GIZ	German International Cooperation Agency
GLCN	Global Land Cover Network
GoB	Government of Brazil
IABS	Brazilian Institute of Development and Sustainability
IBAMA	Brazilian Institute of Environment and Renewable Natural Resources
IBGE	Brazilian Institute of Geography and Statistics
ICMBio	Chico Mendes Institute of Biodiversity Conservation
ICRAF	World Agroforestry Center
IDH	Human Development Index
IICA	Inter-American Institute for Cooperation on Agriculture
INCRA	National Institute of Colonization and Agrarian Reform
INRM	Integrated Natural Resource Management
INSA	National Institute of the Semi-arid
ISPN	Institute for Society, Population and Nature
IUCN	International Union for the Conservation of Nature
LADA	Land Degradation Assessment in Drylands
LD	Land Degradation
LDCF	Least Developed Countries Fund
LoA	Letter of Agreement
LTO	Lead Technical Officer
LTU	Lead Technical Unit
M&E	Monitoring and Evaluation
MAPA	Ministry of Agriculture, Livestock and Supply
MCTI	Ministry of Science, Technology and Innovation
MDA	Ministry of Agrarian Development
MDS	Ministry of Social Development and Fight Against Hunger
MEC	Ministry of Education
MI	Ministry of National Integration
MIQCB	Interstate Movement of Women Babassu Nut Breakers
MMA	Ministry of Environment

MONAT	Natural Monument
NAMA	Nationally Appropriate Mitigation Action
NAP	National Action Plan
NAPA	National Adaptation Programme
NCCD	National Commission to Combat Desertification
NFCFM	National Program of Community and Family Forest Management
NFF	National Forest Facility
NFP	National Forest Program
NIP	National Implementation Plan
NPTD	National Project Technical Director
NTC	National Technical Coordinator
NTFP	Non-timber forest products
OED	Office of Evaluation (FAO)
OFP	GEF Operational Focal Point
OEMA	State Environment Agency
OSCI	Civil Society Public Interest Organization
PAB	Project Advisory Board
PAC	Growth Acceleration Programme
PAN	National Action Plan
PBMC	Brazilian Panel on Climate Change
PEU	Project Execution Unit
PIB	Gross Internal Product
PIF	Project Identification Form (GEF)
PIP	Project Inception Phase
PIR	Project Implementation Review
PIW	Project Inception Workshop
PLANAPO	National Plan for Organic Production and Agroecology
PLANAVEG	National Plan for Recovery of Native Vegetation
PMFS	Sustainable Forest Management Plan
PMU	Project Management Unit
PNAE	National School Lunch Programme
PNAPO	National Policy for Organic Production and Agroecology
PNATER	National Technical Assistance and Rural Extension Policy
PNPPS	National Plan for the Promotion of Socio-Biodiversity Production Chains
PNUMA	United Nations Environment Program
PPCerrado	Action Plan for Prevention and Control of Deforestation in the Cerrado
PPCDAm	Action Plan for Prevention and Control of Deforestation in the Amazon Region
PPG	Project Preparation Grant (GEF)
PPP-ECOS	Eco-Social Small Grants Program
PPR	Project Progress Report
PRA	Environmental Regularization Program
PROBIO	Project for Conservation and Sustainable Use of Brazilian Biological Diversity
PRODHAM	Program of Hydro-environmental Technologies and Practices
PRONAF	National Family Farming Program
PSC	Project Steering Committee

PTC	Project Technical Coordinator
PTF	Project Task Force
PTM	Portfolio Task Manager
PY	Project Year
RCC	Regional Consultative Commission
RDS	Sustainable Development Reserve
REDD+	Reduction of Emissions from Deforestation and Forest Degradation, including the role of conservation, sustainable management of forests and enhancement of forest carbon stocks
REDESER	Reversing Desertification Process in Susceptible Areas of Brazil: Sustainable Agroforestry Practices and Biodiversity Conservation
RENASEM	National Registry of Seeds and Seedlings
RTA	Regional Technical Advisor
RTC	Regional Technical Commission
SAP	State Action Plan
SBF	Forest and Biodiversity Secretariat (MMA)
SC	Steering Committee
SCCF	Special Climate Change Fund
SDG	Sustainable Development Goal
SEAFDS	Secretariat of Family Agriculture and Development of the Semi-Arid (Paraíba)
SEAPAC	Service for Support of Alternative Community Projects (Rio Grande do Norte)
SEBRAE	Brazilian Service of Support for Micro and Small Enterprises
SEDR	MMA's Secretariat of Extractivism and Sustainable Rural Development
SEIHRMACT	State Secretariat of Infra-Structure, Water Resources, Environment and Science and Technology (Paraíba)
SEMA	Secretariat of Environment
SEMARH	Secretariat of Environment and Water Resources
SEPLAN	Secretariat of Planning
SFB	Brazilian Forestry Service
SFM	Sustainable Forest Management
SGP	Small Grants Program
SLM	Sustainable Land Management
SNUC	National System of Nature Conservation Units
SNSM	National System of Seeds and Seedlings
SO	Strategic Objective
STAP	Scientific and Technical Advisory Panel
SUDENE	Northeast Development Agency
TCI	Investment Centre Division (FAO)
TCID	Investment Centre, Technical Cooperation Department (FAO)
TCP	Technical Cooperation Project
TOR	Terms of Reference
TPC	Tripartite Committee
TT	Tracking Tool
UC	Conservation Unit
UCG	University of Campina Grande
UFRI	University of Rio de Janeiro

UNCCD	United Nations Convention to Combat Desertification in Those Countries Experiencing Serious Drought and/or Desertification
UNFCCC	United nations Framework Convention on Climate Change
UNDP	United Nations Development Program
UNFF	United Nations Forum on Forests
UNILAB	University for International Integration of Afro-Brazilian Lusophone Countries
UNIVASF	University of the São Francisco Valley
USD	United States Dollar
WOCAT	World Overview of Conservation Approaches and Technologies
WRI	World Resources Institute
ZEE	Ecological-Economic Zoning

SECTION 1 – RELEVANCE

1.1 GENERAL CONTEXT

a) General development context related to the project

With an area of 8.5 million km², Brazil is the world's fifth largest country, the largest in South America and the third largest of the Americas, after Canada and the United States. The country has a variety of landscapes, including coastal mountain ranges, central highlands, a large semi-arid region, the Amazon rain forest, wetlands and grasslands, which are divided into the country's six official biomes: Atlantic Forest, Cerrado, Caatinga, Amazon, Pantanal and Southern Grasslands (Pampas). The Caatinga and Cerrado, both of which are sub-humid, are ecologically similar in that they have long dry seasons, few dense forests and much herbaceous plant cover, but the Caatinga, which covers 734,478 km², is the only biome entirely within Brazil and is an Area Susceptible to Desertification (ASD) subject to periodic droughts lasting several years.

Brazil is a developing country that is emerging as one of the world's largest economies, with GDP of USD 2.33 trillion, at the top of the Middle Income Countries (MIC) and a key role in international affairs. It is one of the BRICS, the five major emerging economics (Brazil, Russia, India, China and South Africa), as well as participating in the BASIC bloc (Brazil, South Africa, India and China) and the IBSA Dialog Forum (India, Brazil and South Africa). It participates in both the G20 group of developed countries and the G77 plus China group of developing countries. Growth was relatively strong during the recent economic crisis, but slowed to 1% per year in 2013 and is now near negative. The industry and service sectors have grown, but agriculture and livestock remain a mainstay of the economy, producing food and income, providing tax revenues and helping the balance of trade. They are now largely integrated with agro-industry, which provides inputs and processes outputs.

In 2015, the population of Brazil was 203.6 million, which is approximately half the total for South America. Currently, more than 85% live in officially urban places, which include many small towns in the interior. Brazil's rural population is concentrated in the Northeast, one of Brazil's five macro-regions, where most of the Caatinga is located. The Total Fertility Rate (TFR) has dropped to 1.64, well below the replacement level, and consequently families are smaller and the age structure is older.

Brazil's economic, social and environmental achievements have put the country in a position of international leadership, although serious problems remain. Its anti-poverty conditional cash transfers serve as a model for the world. It has some of the largest emissions of greenhouse gases, but has also reduced them more than the rest of the world and is a key player in international climate negotiations, defending a pledge and check approach and promising an end to illegal deforestation by 2030 and 12 million ha. of restoration.

In contrast to its economic and demographic importance and in spite of progress, Brazil still stands out worldwide for its regional and income inequality, between the extremes of the poor Northeast and the wealthier Southeast. The IDH for 2013 was 0.744, with

average annual income of USD 14,275, life expectancy of 73.9 years and average schooling of 7.4 years. The Gini index of income inequality fell from 0.594 in 2001 to 0.495 in 2014. There has been universal public health care since 1988. Since 2003, the statutory minimum wage has undergone significant real increases. Government policies have combated extreme poverty with family stipends (conditional cash transfers) and the “Brazil without Misery” initiative, which now includes socio-productive inclusion, meaning job training, opportunities for self-employment and promotion of productive activities for the poor. Focused social programs include rural worker retirement, “Light for All” for electricity, “Water for All” for water supply, “My Life, My House” for housing and “My House Better” for furniture and appliances. The government also purchases food from small farmers and provides school lunches. During droughts in semi-arid areas, there are drought stipends, water tank trucks and harvest insurance and cisterns have been installed in a million rural households. Such social programs save lives (millions of people died in past droughts, but none died due to the recent drought), reduce out-migration and alleviate pressure on land, although they do not avoid death of livestock and wildlife during droughts. The social programs also increase local consumer demand for smallholder products and services.

Brazil has made rapid progress in addressing gender disparities. Illiteracy among both men and women is becoming residual and there are now more women than men in universities. Women participate actively in the labor force and in social movements. They receive special treatment in rural development and land reform settlements since 2007. Schools include teaching on gender issues. There is a special ministry for women’s policies. On the other hand, Brazilian women are paid 58% of what their male colleagues earn, while devoting over 15 hours more each week to housework than men. The level of participation in the executive and legislative branches is low. There are also problems with domestic violence. The Northeast is a stronghold of gender discrimination as compared to the rest of Brazil, although change is under way.

The ASDs have some of the worst human development indices of the Northeast region based on indicators such as poverty and mortality rates (Table 1.1). Illiteracy rates in the semi-arid areas are high but falling (Table 1.2), with 36% of children age 7-14 unable to read and write, 43% of youth 12-17 years old and 60% of those 18 and over. Few people have secondary schooling, much less higher education. The average Family Development Index (IDF), used to measure levels of family development based on factors such as resource availability and living conditions, is 0.54 in ASD, compared to 0.70 for Brazil as a whole.

Table 1.1. Infant mortality rates, ASD, Northeast and Brazil, 2005 and 2012.

Region	Infant Mortality	
	2005	2012
ASD	26.13	15.49
Northeast	26.38	15.57
Brazil	21.16	13.88

Source: DATASUS (Ministry of Health), 2014.

Table 1.2. Illiteracy rates, ASD, Northeast and Brazil, 1991, 2000 and 2010.

Region	Illiteracy (%)		
	1991	2000	2010
ASD	40.49	27.99	21.05
Northeast	36.55	24.79	18.54
Brazil	19.33	12.84	9.37

Source: Brazilian Institute of Geography and Statistics (IBGE), 2014.

In addition to various indigenous peoples and Afro-descendant communities called *quilombolas*, the ASD in Brazil are home to traditional communities of family farmers of mixed descent that are generally referred to as *sertanejos*, i.e. inhabitants of the semi-arid hinterland known as *sertão* who have their own culture in terms of dress, speech, music, *cordel* literature and diet.

b) Global Environmental Benefits (GEB) status, threats and causes the project will address

The Caatinga is the largest dry forest region in South America and one of the richest dry forests in the world. The biome includes pockets of Cerrado (savanna woodland) and has transitions to the Amazon, Cerrado and Atlantic Forest biomes. It is particularly rich in avifauna, with high levels of endemism of plants (Table 1.3), but it has been subject to intense deforestation, having lost more than 40% of the forest cover so far. Deforestation and fragmentation of forests as well as pollution by pesticides result in significant biodiversity loss, some of which is hardly noticed. For example, disappearance of bees due to clearing, fire and pollution seriously affects pollination, the production of honey and food and income security for smallholders.

There are 82 species threatened by extinction in the Caatinga, including two of the ten most threatened birds in the world, the indigo macaw (*Anodorhynchus leari*) and the little blue macaw (*Cyanopsitta spixii*). The other most noteworthy threatened terrestrial vertebrate species are maracajá wildcats (*Leopardus wiedii*), suçuarana wildcats (*Leopardus pardalis*), three-banded armadillos (*Tolypeutes tricinctus*) and red bats (*Myotis ruber*). Distinctive endemic plant species include *Godmania dardanoi*, *Cordia globosa*, *Billbergia fosteriana*, *Cereus jamaru*, *Melocactus oreas*, *Pilosocereus gounellei*, *Copernicia prunifera* and *Ziziphus joazeir*. The threatened species are listed in Appendix 8. There are invasive alien species such as palo verde (*Parkinsonia aculeata*) and algaroba (*Prosopis juliflora*), although this particular leguminous drought-resistant tree species is also considered to be useful as a source of food and feed. Conservation International has mapped Key Biodiversity Areas (KBAs) for plants and aquatic species.

Table 1.3. Distribution of species by type and endemism, Caatinga.

Type	Total	Endemic (%)
Plants	932	34
Mammals	148	8
Birds	510	3
Fish	240	8
Reptiles and amphibians	154	15

Source: EMBRAPA, 2014.

Only 7.4% of the Caatinga, 63,631 km², is in protected areas, with 1.1% in the category of Integral Protection (without human presence) and 6.3% in the category of Sustainable Use (Table 1.4). More information on status, threats, causes and problems the project will address can be found in the sub-section on barriers (1.1.1.b).

Table 1.4. Protected areas (Conservation Units), Caatinga.

Category	Area km ²	% of the Caatinga
Integral Protection	9,600	1.1
Sustainable Use	52,031	6.3
Total	63,631	7.4

Source: Brazilian Forest Service, 2014.

Drought patterns in Northeast Brazil are changing and seriously affect the living conditions of its population, while rains are erratic and sometimes cause disastrous consequences. Floods can occur, but droughts are recurrent. From 2011 to 2013, the ASD experienced periods of the most intense drought in decades. Farmland, livestock and infrastructure were destroyed along with the investment capacity of family farmers. The cattle herd was reduced by 1.3 million head between 2011 and 2012, directly affecting the dairy industry and livelihoods of 10 million people. The negative impacts on the regional and national economies were far-reaching.

Climate projections in Brazil vary widely according to the models used. The Brazilian Panel on Climate Change (PBMC), which can be considered the Brazilian IPCC, carried out detailed analyses that are being published by the Federal University of Rio de Janeiro (UFRJ). The Brazilian Agricultural and Livestock Research Company (EMBRAPA) has also studied patterns of climate change that indicate a need for many crops to migrate to latitudes that are less affected by rising temperatures and reductions in rainfall. In 2015, the Secretariat of Strategic Affairs (SAE) released a series of studies about regional climate change for 2040 showing higher temperatures and lower precipitation for Northeast Brazil, affecting agriculture, energy and infrastructure of various kinds.

Deforestation of 2,700 km² per year continues to be the major cause of land degradation and desertification, creating unfavorable conditions for natural regeneration, soil conservation, moisture content and fertility. The various economic drivers of threats are described below.

Production of firewood, which is often unsustainable, accounts for over 30% of the energy consumed by industries in the Northeast, in addition to domestic consumption by poor farmers. Deforestation is also due to clear-cutting to open fields for smallholder subsistence agriculture, rain-fed commercial agriculture for Brazilian markets, rain-fed agriculture for export, irrigated crops and extensive livestock raising. Such clearing causes fragmentation of natural areas, land degradation and desertification, while cattle-raising causes emissions of methane and fertilizers used on crops cause emissions of nitrous oxide.

Small-scale agriculture, in the ASD, mostly, for subsistence and domestic markets, is subject to adverse weather conditions and is characterized by low productivity, limited use of technological inputs and insufficient technical assistance. However, thousands of small farmers generate a vital flow of raw materials for food, clothing, medical supplies and construction, meeting the growing needs of the region's population. Family farming also provides livelihoods for millions of people who would otherwise have no alternative but to migrate to cities.

Agricultural production in the ASD has traditionally been dependent on long fallow systems that contribute to the replenishment of nutrients in production cycles ranging from 3 to 7 years. Practices have changed under pressure of commercial agriculture and are increasingly dependent on external inputs and technology. Production of grain and upland cotton stand out in the states of Bahia, Maranhão and Piauí. The expansion of these crops results in the rapid disappearance of large forest areas.

The national agricultural censuses in 1996 and 2006 indicate a trend in the reduction of areas of natural pastures. In 10 years, the decrease in the area of natural pastures in the Northeast was 3.9 million ha. concentrated in Bahia. Expansion of pastures, excess stocking rates and indiscriminate grazing have negative impacts on the natural vegetation, changing the floristic composition, the productive potential of biomass and the capacity for natural regeneration. In addition, intense trampling of grazing areas alters the water cycle, causing hardening of the soil, thus reducing water infiltration and accelerating surface runoff and erosion. Trampling of the edges of streams and rivers also causes siltation.

Brazil has 4.45 million ha. of irrigated land, of which 980,000 ha. are located in semi-arid and sub-humid areas in the Northeast. The activity benefits the agro-industrial complex, especially in the municipalities of Juazeiro, in Bahia, and Petrolina, in Pernambuco, which produce fruit for export. Inadequate drainage causes soil salinization, which limits crop yields.

Mining, mainly for clay and gypsum, contributes to land degradation and desertification in relatively small areas, but the negative impacts can reach larger areas because of the demand for firewood are far more extensive.

Growth in production of textiles, shoes, food, steel, ceramics and plaster has direct impacts by increasing the consumption of firewood, which comes increasingly from forests distant from industrial centers such as Araripina plaster hub in Pernambuco and the bricks and tiles hub in the Seridó regions of Paraíba and Rio Grande do Norte.

Population growth is no longer a serious threat, since fertility rates have declined and there continues to be strong out-migration from rural areas to towns and cities. The main problems with demographic changes are that there is less family labor available and that youth often leave the countryside, while the proportion of elderly grows and separation and divorce are common. Such changes in age and sex composition and family structure must be taken into account in planning for technology for family farming.

c) Institutional and policy framework

The complex institutional and policy framework for the REDESER project is described in detail in sub-sections below on baseline projects and investments (1.1.1) and participants and stakeholders (1.1.3). There are many federal and state government agencies as well as civil society organizations and scientific and academic institutions, in addition to various commissions and networks in which they participate. There are also numerous government policies, plans and programs that are directly related to project execution and to replication and sustainability of its results.

1.1.1 Rationale

a) Baseline projects and investments for the next 3-5 years addressing the identified GEB threats and causes and development

Opportunities for involvement with co-financing partners in order to promote the implementation of best production practices to reach project objectives are identified below. In addition to government projects and investments to be conducted by ministries and state and municipal agencies, there are also various associations and cooperatives involved, as described in Table 1.6 in Section 1.1.3.

Ministry of Environment (MMA). The implementation of the UNCCD National Action Plan (NAP), led by the DCD of the MMA's Secretariat of Extractivism and Sustainable Rural Development (SEDR), is part of Brazil's commitment to the United Nations Convention to Combat Desertification and Mitigate the Effects of Drought (UNCCD). The NAP and the various State Action Programs (SAPs) provide a basis for reversing unsustainable production practices throughout ASD. Other relevant policies and programs in which the MMA is involved are described below.

Chico Mendes Institute for Biodiversity Conservation (ICMBio). In addition to parks, this agency of the MMA manages sustainable use protected areas such as Extractive Reserves (RESEX), Sustainable Development Reserves (RDS) and National Forests (FLONA). The Araripe-Apodi FLONA covers 38,919 ha. in the Araripe field site, where there is also an Environmental Protection Area (APA). Production in these protected areas must comply with low-impact forest management for production of wood and NTFPs. ICMBio stresses multiple uses of natural resources and the protection and promotion of local traditions and cultures in territories that extend beyond protected areas.

National Biodiversity Policy. In order to implement the three components of the Convention on Biological Diversity (conservation, sustainable use and benefit sharing), Brazil created the National Program of Biological Diversity in 1994 and a National Biodiversity Policy in 2002, for which the MMA is responsible. Workshops were organized between 1998 and 2000 to establish priority areas and actions and these were revised in 2006 and 2011. The Caatinga has 82 priority areas, of which 27 are considered extremely important, covering 24.7% of the total area.

National System of Nature Conservation Units (SNUC). The national system includes 12 types of federal, state and municipal protected areas in two broad categories: **Integral Protection** and Sustainable Use. The SNUC covers 17.4% of the country, of which 13.8% is in sustainable use protected areas, which are home to traditional communities that depend on biodiversity for their livelihoods. The Sobradinho Lake, formed by the hydropower dam in Bahia, is surrounded by an environmental protection area of 1,018,000 ha.

Sustainable Use and Integral Protection categories of the SNUC in the Caatinga include:

- i. **Environmental Protection Area (EPA)¹**, which is an extensive natural area for protection and conservation of biotic attributes (fauna and flora), therein aesthetic or cultural, important for the quality of life of local people and for the protection of regional ecosystems. The main goal of EPAs is the conservation of natural processes and biodiversity, including guidance, the development and adaptation of diverse human activities to the environmental characteristics of the area. As protected areas with sustainable use category, the EPAs allow human occupation. These units are established to reconcile the human occupation of the area and the sustainable use of its natural resources. EPAs can be established in areas of public or private land by federal, state or municipalities, without the need for expropriation of private land. However, activities and practices developed in these are subject to specific rules. The conditions for conducting scientific research and public viewing areas in the public domain will be established by the unit's management agency, while in private property, it is up to the owner to establish the conditions for research and visits by the public, subject to the legal requirements and restrictions.
- ii. **Natural Monument (MONAT²)**. In Brazil, MONAT is a category of strictly protected conservation area defined by the National Nature Conservation Units (SNUC). These units are created in order to preserve rare natural sites, natural or of great scenic beauty. The units of category MONAT may consist of particular areas, provided it is possible to match the unit's goals with the use of land and natural resources of the site by the owners. If there is incompatibility between the field goals and the private activities or not there is consent from the owner to the conditions proposed by the responsible unit of administration for the coexistence of Natural Monument with the use of the property, the area should be expropriated, according to what provided by law. The open house is subject to conditions and restrictions set out in Unit Management Plan, the standards set by the agency responsible for its administration and those specified by regulation.

¹ In Portuguese they are called APA (*Área de Proteção Ambiental*)

² As per its acronym in Portuguese

According to the National Register of Protected Areas, there were 23 units of this category in Brazil in 2012. Sao Francisco MONAT is one of them.

Araripe has a large National Forest (Araripe-Apodi) with 38,919 ha. as well as an Environmental Protection Area-EPA (Chapada de Araripe), with 972,590 ha., both in the category of Sustainable Use. Xingó canyons have the São Francisco National Monument (MONAT) in the category of Integral Protection, with 26,736 ha. The Seridó Ecological Station is an Area of Integral Protection (IP) in Rio Grande do Norte, with 1,163 ha. The other targeted project areas have practically no official protected areas. There are no UNESCO World Heritage Sites. Thus, there is practically no prospect for establishing continuous biological corridors among protected areas in the Caatinga. The alternative that is feasible for these sites is sustainable productive landscapes not covered by SNUC.

Forest Law. A key instrument for reducing clearing and recovering degraded areas in Brazil is the Rural Environmental Registry (CAR), which is the responsibility of the Brazilian Forest Service (SFB) and State Environment Secretariats. It maps the Legal Reserves (20% in the Caatinga) and Areas of Permanent Preservation (set-asides along edges of rivers and streams, on hilltops and on steep slopes, averaging about 5%) required by the new Forest Law (2012) in each rural property. Enforcement of the law, which requires compliance in order to have access to credit after 2017, will improve connectivity among forest fragments and provide detailed geographically-referenced information on land use, protection and recovery. CAR will be followed by an Environmental Regularization Program (PRA)..

Green Grant Program. Through the program established in 2011, the MMA makes direct financial transfers to extremely poor families in priority areas for conservation in the Amazon, Cerrado and Caatinga biomes. The families receive USD 100 every three months for two years, renewable, to promote conservation and sustainable use of natural resources. The Green Grant Program finances sustainable forest management, among other priorities.

National Policy for Agro-ecology and Organic Production (PNAPO). The policy is implemented through the National Plan for Organic Production and Agro-ecology (PLANAPO). The policy is coordinated by the National Agro-ecology and Organic Production Commission (CNAPO), with 14 civil society representatives, and the Inter-ministerial Chamber of Agro-ecology and Organic Production (CIAPO), both of which include the MMA, among other ministries. The first public call for proposals was launched in 2014, with a budget of USD 11.4 million to finance 30 projects for 20,000 family farmers, rural settlers and indigenous and traditional peoples and communities. Support will be provided for native seed banks, an activity that is of fundamental importance for restoration required by the Forest Law and can provide income for small farmers.

National Plan for Recovery of Native Vegetation (PLANAVEG). The goal of the plan designed by the MMA in 2015 is to broaden public policies, financial incentives, markets, best agricultural and livestock practices and other measures needed to recover natural vegetation in at least 12.5 million ha. in the next 20 years. Priority is for Legal Reserves, Areas of Permanent Preservation and degraded areas with low productivity. This will contribute greatly to recovery of habitat for native terrestrial and freshwater fauna or at least connectivity among habitats. It creates enormous new demand for native planting

material including seeds, seedlings and shoots, which smallholders could provide, improving their cash income.

Ministry of Agrarian Development (MDA). The MDA, which works with family farming, has one of the largest federal budgets and is the main co-financier of the REDESER project. It has long been a key partner of the MMA in promoting sustainable development with emphasis on the rural poor and gender equity through various agencies and programs.

National Institute of Colonization and Agrarian Reform (INCRA). In the extensive agrarian reform settlements in the Northeast established by this agency of the MDA, the strong demand for firewood and charcoal provides opportunities for work and income for family farmers, but sustainability requires appropriate practices, licensing and inspection. SFM in native or recovered areas also contributes to ecosystem conservation. INCRA collaborates with the MMA in establishing five Agrobiodiversity Management Irradiation Centers (CIMAs) in the Caatinga.

Rural credit. The National Program to Strengthen Family Farming (PRONAF), managed by MDA, provides a wide range of sources of credit for family farmers with low interest rates. For official purposes, *family farmers* in Brazil are rural producers who: a) use the land as owners, squatters, tenants or land reform settlers; b) reside on or near the property; c) have no more than four fiscal modules (varying in size according to location) for farming or six fiscal modules for livestock; d) primarily use family labor. Loans are channeled through the National Rural Credit System of the Bank of Brazil, the Bank of the Northeast and the Bank of the Amazon, among others. Of the 12 types of credit available, the most suitable for NTFPs and agroforestry are in the environmental credit lines. Specific credit instruments have been developed to provide working capital for micro, small and medium enterprises, although these modalities require adjustments so that they can be accessed by family farmers.

Rural extension. Brazil's technical assistance and rural extension system was dismantled in the 1990s, but a new law in 2010 established the National Technical Assistance and Rural Extension Policy (PNATER). The National Program of Technical Assistance and Rural Extension in Family Farming and Agrarian Reform (PRONATER) and a new agency, coordinated by the MDA, promote sustainable development among the diverse categories of family farming, considering gender, generation and ethnicity. It can promote SLM, SFM, NTFP and agroforestry systems. There are now more flexible procedures for contracting rural extension services. There is now more emphasis on sustainability. Possible synergies include: a) partnerships among government, businesses and civil society; b) partnerships with formal and non-formal educational organizations; c) preparation and publication of basic and advanced training materials; d) design, testing and deployment of innovative technologies. Interpersonal rural extension is difficult in remote areas.

National Community and Family Forest Management Program (PNMFC). The joint initiative between the MMA, through the Brazilian Forest Service (SFB), and the MDA was created to coordinate promotion of sustainable forest management with a focus on traditional communities and peoples and family farmers who make their living from use of forests. The steering committee includes representatives of various government agencies and civil society organizations.

Program for Food Acquisition (PAA). The program for government purchase of food products is conducted in partnership with states and municipalities and the National Food Supply Company (CONAB) of the Ministry of Agriculture, Livestock and Food Supply (MAPA). It is of vital importance for strengthening local supply chains of family farming. Payments are made directly to family farmers. The main objectives are to promote access to food, encourage family farming and contribute to the formation of public food stocks. Food is distributed to people in situations of food insecurity and beneficiaries of social assistance. The program strengthens local and regional marketing networks, values biodiversity and organic and agro-ecological food production and stimulates farmer associations. It benefits both farmers who are suppliers of products and consumers who are beneficiaries of social assistance programs.

National Semi-Arid Institute. The fourth largest co-financier of the REDESER project is the National Semi-Arid Institute (INSA), a unit of the Ministry of Science, Technology and Innovation (MCTI) for the region, located in Campina Grande, in the interior of Paraíba. It carries out research on the Caatinga and has advanced information and communication technology for dissemination of results. FAO is currently collaborating with INSA for the production of the first ever baseline assessment of the Global drylands using FAO-developed Collect Earth Tool and involving data collection of the drylands of the sub-region of Brazil-Venezuela-Colombia, including the Caatinga. The reference data will be used and be completed during the project inception phase (by month 6, Project Year 1) for monitoring in the framework of this project.

Citizenship Territories. The program involving many different ministries promotes economic development and democratic access to basic services in rural areas through sustainable territorial development based on social participation involving federal, state and municipal governments. The 120 territories comprise groups of municipalities with similar economic and environmental characteristics, cultural identity and geographic and social cohesion. The five Citizenship Territories in the REDESER project sites are: 1) Cariri, for Araripe; 2) Seridó and Médio Sertão da Paraíba, for Seridó; 3) Sertão do São Francisco, for Uauá; 4) Alto Sertão de Alagoas, for Xingó. For each territory, the program provides hundreds of millions of Brazilian Reais in assistance regarding sustainable production, education, health, infrastructure, water supply, social development and rights. It is important for the project to catalyze top-down and bottom-up influence on how the funds are used so that they contemplate land degradation, desertification and biodiversity in the five Citizenship Territories and the rest of the ASD.

National Plan for the Promotion of Socio-biodiversity Production Chains (PNPPS). The PNPPS, conducted in coordination with the MDA, MDS, CONAB and MMA, promotes value chains of sustainable use of biodiversity in territories of traditional peoples and communities. It provides alternative income for rural communities through access to credit, technical assistance, rural extension, local markets and minimum price guarantees.

State and municipal environment and agriculture secretariats. Five sub-national environment, agricultural and planning secretariats, which sometimes include water resources and science and technology, signed co-financing letters to support the project in their respective areas: 1) Paraíba state agriculture secretariat (SEAFDS); 2) Paraíba state environment secretariat (SEIHRMACT); 3) Rio Grande do Norte state planning

secretariat (SEPLAN); 4) Alagoas state environment secretariat (SEMARH); 5) Crato (Ceará) municipal environment secretariat (SEMA).

World Agroforestry Center (ICRAF). The vision of this research center of the Consortium of International Agricultural Research Centers (CGIAR) is “a rural transformation in the developing world as smallholder households strategically increase their use of trees in agricultural landscapes to improve their food security, nutrition, income, health, shelter, social cohesion, energy resources and environmental sustainability.” Its mission is “to generate science-based knowledge about the diverse roles that trees play in agricultural landscapes, and to use its research to advance policies and practices, and their implementation, that benefit the poor and the environment.” Its new office in Brazil focuses on agroforestry systems for recovery of degraded areas protected by the Forest Law.

b) Remaining barriers to address threats on Global Environmental Benefits (GEBs)

During full project preparation, the barriers that the project will address to deliver global environmental benefits were further analyzed. Duplication with other projects has been carefully avoided. Despite government efforts, there are still some main barriers that need to be addressed:

Barrier # 1: Limited identification and lack of effective dissemination and uptake of best practices

Through the past projects/initiatives in the Northeast region of Brazil, a variety of SFM, biodiversity management and SLM techniques and practices were implemented in a pilot fashion. Some of these were highly successful and were shown to be very effective. But there have not been enough efforts to evaluate these practices, identify them as best practices, and effectively disseminate and promote them further.

Dryland forests and agrosilvopastoral systems of the Caatinga have received limited recognition and attention so far in Brazil, despite their crucial ecological, social and economic roles. If compared with other unique ecosystems in Brazil (e.g. the Amazon region), the Caatinga has not attracted the amount of technical and financial investment that is needed neither for assessment, monitoring, conservation, sustainable management nor for restoration in the wider landscape.

Policy initiatives, funding schemes and field projects to supporting SLM and combating desertification, management and restoration of dryland forests and agroforestry systems in Brazil drylands have remained scattered and un-known by many of the producers and farmers. Most of these initiatives would need a careful assessment to draw lessons on success and failure factors, and to compile best practices for dissemination and scaling-up. As result, land degradation, habitat and biodiversity loss, CO₂ leakage and GHG emissions are global environmental problems still widespread in the Caatinga.

Barrier #2: Complex and restrictive legislations and regulatory frameworks for SFM and SLM

Forest management legislations, both at federal and state level, are complex and restrictive, and there are no clear directives to enable their implementation, especially at

the local and farm level. The processes associated with uptake and approvals of SFM plans at local level are bureaucratic and tedious. The existing licensing and inspection guidelines and practices generally favor unsustainable land use such as clearing for crops and pasture, which contribute to degradation and desertification rather than innovative SLM and SFM. Procedures and regulations (i.e. sanitary standards) are designed for the large-scale production of conventional agricultural products, without addressing the particularities of the small-scale production. All this discourages the adoption of SFM and SLM by smallholders and rural farmers.

Barrier # 3: Lack of appropriate policy and guidelines for INRM, SFM and FLR

This is remarkable, as it is vital to qualify and formally recognize INRM/SFM practices, especially taking in to consideration the new Forest Law and the national Environmental Regularization Program (PRA). These practices are important and necessary to support sustainable management and restoration of dryland forests and landscapes with their associated natural resources at local level. A coordinated effort at federal and state level will be necessary to achieve this. New alternatives and guidelines have to be prepared in order to integrate and recognize good SFM and INRM practices, taking into consideration traditional integrated production systems, sustainable harvesting, processing and marketing of non-wood forest products, forest and landscape restoration and ecosystems services.

Barrier #4: Limited institutional capacities to promote SLM, SFM and FLR at regional and state level

There are significant gaps in capacities of regional and state level institutions to promote SLM, SFM and FLR practices. The lack of capacities can be categorized as: a) capacities to provide technical assistance and guidance; and b) capacities to engage civil society and local communities in identifying and promoting best practices.

Civil society and local communities are poorly engaged in identifying and promoting NRM best practices. When there is demand of NWFPs, the supply is generally insufficient in terms of quantity, quality and regularity. Small-scale rural producers and forest-dependent communities in the Caatinga lack knowledge on how to apply for credit and soft loans. National banks (state-owned and private) lack knowledge about unconventional rural products and processes that are different from uniform national standards. Existing processes are very bureaucratic, time-consuming and costly, which discourages the adoption of new practices

Institutional knowledge is limited about effectiveness, sustainable production, sustainable forest management and restoration planning and standards, analysis of productivity, costs, impacts, benefits and market volatility. Norms and curricula are defined at the federal level, without due consideration of regional specificities, traditional practices, low income or informal organization of production. Credit agents and rural extension officers are not familiar with these products and services, many of which have

not been sufficiently tested in the field under normal conditions. There is little inter-sectoral cooperation or coordination, which also results in inability to generate confidence and support among civil society and local communities to adopt new practices.

Barrier #5: Limited value chain incentives for implementing INRM practices at small-scale level in the Caatinga

On the value chain side, market incentives that support the identification and scaling-up of best NRM practices in the Caatinga are limited. Farmers, institutions and academia are accustomed to working with conventional livestock and crops. As mentioned above, sanitary standards are designed for the large-scale production of conventional agricultural products. Few non-wood forest products (NWFP) are marketed or incorporated into government-funded programs or in local value chains, mainly because the NWFPs are not known and often dealt with in informal markets. Supply chains for multiple-use SFM products and services are fragile or inexistent.

More efforts are needed to stimulate and drive enhanced and targeted INRM across landscapes and to link sectoral production systems. This includes both producers and end-users. Caatinga ecosystems, if well managed, would offer a great and yet untapped economic potential for producers, due to the wide range of goods and services that the Caatinga farmers provide (including the biological diversity of non-wood forest products and other traditional agroforestry products). However, few economic and financial viability analyses have been conducted to assess small-scale rural production systems and their related value chains. Viability and sustainability are necessary conditions to incentivize local stakeholders to investing and allocating sufficient resources for INRM in their drylands. According to FAO, the improvement of income opportunities arising from forest and agroforestry systems is one essential way of providing such incentives.

Barrier #6: Weak capacity in knowledge management and transfer and extension services in ASD. Similarly to the above barriers, the dissemination of best practices of land use and management are related to poor coverage and inappropriate content of extension services in rural areas, in particular in more remote parts of the ASD. Having technical information is not sufficient, if not well transmitted and disseminated to the state and local institutions and the practitioners/producers who are supposed to implement them on the ground. Indeed, some valuable experiences exist, but are isolated in a few research centers and local projects rather than being taken up in new initiatives involving agrarian reform settlers, other family farmers, wild harvesters, indigenous peoples and various kinds of traditional communities. More attention needs to be given to appropriate multicultural approaches integrating gender and ethnicity and traditional knowledge.

Barrier #7: Lack of sustained technical support for forest and landscape restoration. Though in the past there have been efforts to enable forest restoration in the Northeast region, with some good successes, the efforts have hit a snag once the initiatives/projects ended. It is important to identify and execute activities that would ensure sustainable forest and landscape restoration creating biodiversity connectivity areas between PAs.

Furthermore, in spite of State Action Plan(s), the restoration of degraded forests and ecosystems lacks sufficient and sustained technical and financial support in existing government initiatives. Restoration is limited by: a) insufficient systematization and assessment of existing experiences; b) lack of criteria for defining priority areas for restoration; c) lack of guidelines /standards for restoration of degraded forests and landscapes in the context of drylands; d) high costs of restoration using seedlings; e) inappropriate methods and silvicultural systems for ASD conditions; f) isolated local organizations; g) inability of farmers to invest; h) Gaps in the supply of seeds of native species (trees, shrubs and grasses); i) lack of the use of cost-effective restoration strategies (such as natural regeneration).

c) Incremental reasoning (added value of the project)

In order to remove the above mentioned barriers and achieve global environmental benefits, GEF funds will be invested incrementally to the aforementioned baseline initiatives, as described below and further detailed in sub-sections 2.3 and 2.4:

Component 1: Promoting Integrated Natural Resources (INRM) in Production Landscapes.

In order to overcome barriers # 1, 3, 4 and 5, and indirectly barrier 2³ (see subsection 1.1.1.b), Component 1 through GEF financing of USD 937,747 will support the promotion of INRM in production landscapes in project targeted areas. Federal government co-financing of USD 700,000 through MMA will support technical assistance, staff time, field activities, use of facilities. State government in-kind co-financing of USD 1,333,333 from Paraíba and Alagoas will support similar activities, as will municipal in-kind funding of USD 266,667 from Crato. Non-governmental in-kind financing of USD 160,000 from the Araripe Foundation and the same amount from APNE⁴ will support field activities. ICRAF⁵ will contribute with research and knowledge management-related activities for this Component with co-financing by USD 40,000.

Component 2: Promoting Multiple-use Forest Management

In order to overcome barriers # 1, 4, 5, and indirectly barrier 2⁶ (see subsection 1.1.1.b), Component 2 through GEF financing of USD 1,199,309 will support multiple-use forest management in project areas. Federal government co-financing of USD 1,333,333 through the Ministry of Agrarian Development (MDA), USD 566,667 through MMA and USD 2,556,667 through the Brazilian Forestry Service (SFB) will support technical assistance, staff time, field activities, use of facilities, travel. State in-kind financing of USD 266,667

³ Barrier 2 is directly being addressed by the UNDP/GEF project *Sustainable Land Use Management in the Semiarid Region of Northeast Brazil (Sergipe)*, as anticipated in the FAO/GEF PIF submitted in 2013. This FAO/GEF project is coordinating actions with the UNDP/GEF project through the Directorate of Desertification (MMA) which is the main counterpart for both projects.

⁴ For its acronym in Portuguese, *Associação Plantas do Nordeste*, Plant Association of Northeast

⁵ World Agroforestry Centre

⁶ Barrier 2 is directly being addressed by the UNDP/GEF project *Sustainable Land Use Management in the Semiarid Region of Northeast Brazil (Sergipe)*, as anticipated in the FAO/GEF PIF submitted in 2013. This FAO/GEF project is coordinating actions with the UNDP/GEF project through the Directorate of Desertification (MMA) which is the main counterpart for both projects.

from Paraíba will support field activities in Seridó, as will municipal in-kind funding of USD 266,667 from Crato. ICRAF⁷ will contribute with research and knowledge management-related activities for this Component with co-financing by USD 20,000.

Component 3: Forest and Landscape Restoration (FLR)

In order to overcome barriers # 1, 4, 6 and 7 (see subsection 1.1.1.b), Component 3 through GEF financing of USD 992,294 will support sustainable forest and landscape restoration. Government co-financing of USD 2,026,667 through MDA, USD 400,000 from MMA and USD 1,333,333 from INSA will support technical assistance, staff time, field activities, use of facilities, travel. State government in-kind co-financing of USD 1,066,666 from SEPLAN-RN and USD 533,333 from Paraíba will support field activities in Seridó. Non-governmental in-kind financing of USD 160,000 from AGENDHA will support field activities in Bahia.

Component 4: Knowledge Management, Capacity Development and Awareness-Raising

In order to overcome barriers # 1, 4, 6 and 7 (see subsection 1.1.1.b), Component 4 through GEF financing of USD 462,448 will support coordination, capacity development, communication and awareness-raising. Paraíba state government in-kind co-financing of USD 266,667 will support technical assistance, staff time, field activities, use of facilities, travel. Non-governmental in-kind co-financing of USD 800,000 from FUNETEC, USD 266,666 from IABS and USD 160,000 from SEAPAC will support training and dissemination. ICRAF⁸ will contribute with research and knowledge management-related activities for this Component with co-financing by USD 40,000.

Component 5: Coordination with other activities, Monitoring and Evaluation

GEF financing of USD 151,207 will support project Monitoring and Evaluation and project coordination with complementary initiatives aiming at landscape-level benefits on land degradation and desertification. Government co-financing of USD 200,000 through the MMA and USD 110,000 through the Brazilian Forest Service will support technical assistance, staff time, field activities, use of facilities and travel for data collection, processing and dissemination and for coordination with other initiatives.

FAO will provide USD 200,000 (in-kind) to support the Project Management structure. See details in the Financial Plans, Section 4.3 of this Project Document.

In general terms, the added value of the REDESER project with GEF financing is the ability to mobilize significant co-financing resources, more than USD 15 million, from 17 different federal, state and municipal government institutions and non-governmental organizations and to involve numerous additional stakeholders to work across sectors, in a mainstreaming initiative that until now has not received the interest and support it deserves, in spite of the severe environmental, economic and social impacts of land degradation and desertification, climate change and biodiversity loss.

⁷ World Agroforestry Centre

⁸ World Agroforestry Centre

The scenario without GEF resources would be timid and isolated initiatives, without integration and mainstreaming. To the contrary, the allocation of GEF resources will make it possible to implement concrete benefits, produce and disseminate new knowledge, capacity and awareness, reactivate implementation of policies such as SAPs and construct multi-sectoral dialog with all partners regarding ASD development issues. In Brazil, limited international cooperation can be used to leverage substantial additional resources and influence far-reaching policies and practices.

1.1.2 FAO's comparative advantages

As a world leader in designing and implementing technical programs to bolster natural resource management and combating desertification, FAO has wide experience in partnerships with government, donors, research organizations and networks and civil society and community organizations around the world. Building on its experience over the past 60 years, FAO catalyses regional and international cooperation, including North-South, South-South and triangular cooperation, serving as a neutral forum.

Sustainable natural resource management and sustainable forest management and restoration are FAO's greatest technical strengths. From working with farmers and producers in their fields to scientists in their laboratories to policy-makers and technical forestry officers in their ministries, FAO has a high level of awareness and understanding of the causes and drivers of deforestation and forest degradation and of the various options for the development of sustainable forest and ecosystem management strategies that reduce poverty through the generation of income and employment, that integrate biodiversity conservation into productive forest landscapes and that both mitigate climate change and provide key tools for rural communities to adapt to climate change.

FAO has strong international programs for knowledge management in support of SFM and restoration in drylands, disseminated through capacity development projects and events, on-line platforms such as the SFM Tool Box, technical guidelines and forestry papers. All of these will provide critical support to the REDESER project and benefit from its contributions.

Moreover, FAO leads or participates in the most active global and regional networks and platforms on Desertification, Land Degradation and Drought (DLDD) issues, including TerrAfrica, the World Overview of Conservation Approaches and Technologies (WOCAT), the GEF-funded Land Degradation Assessment in Drylands (LADA) and the Global Land Cover Network (GLCN), and the Great Green Wall for the Sahara and Sahel Initiative (GGWSSI).

FAO's Forestry Department is combating desertification and land degradation through a comprehensive program focused on drylands forestry, agroforestry, climate change adaptation and mitigation, resource assessments, sustainable forest management and forest and landscape restoration. This has included the formulation of National Forest Programs (NFP) in countries that are heavily affected by desertification in Africa, Asia, Latin America, the Caribbean and the Pacific.

FAO's Forest Policy and Resources Division (FOA) has backstopped field projects in diverse habitats (drylands, islands and mountains) and assisted in improving the

production and marketing of a wide range of ecosystem services and commodities, such as gums, resins and other NWFPs using a Market Analysis and Development approach across forest products value chains. It has provided technical oversight on interregional studies, guidelines and publications based on field experience and lessons learned through country-driven processes.

Reducing rural poverty is central to FAO's mission and it has long experience in promoting sustainable rural livelihood solutions, particularly among smallholder and subsistence farmers. FAO understands how to make agriculture profitable for rural women and young people, specifically with respect to informal employment in agriculture.

FAO has been selected as the implementing agency for this project because of the broad and global nature of the project objectives and FAO's proven experience and expertise in SFM, sustainable management of natural resources and combating desertification, as well as its knowledge of the subject matter and its many regional and country offices. FAO is able to work closely with rural communities, countries, United Nations agencies, donors and research and capacity-development organizations.

FAO's projects in this sector in Brazil during the last two decades are listed below. A wide range of delivery modalities for national, regional and inter-regional projects has been employed, ranging from fully FAO-funded Technical Cooperation Projects (TCP), projects granted by external donors (GEF, European Community and the National Forest Facility) and projects fully funded by the Brazilian Government. The portfolio of national projects reached a total value above USD 22 million. The portfolio includes the NFP Facility funds, totaling USD 300,000 between 2007 and 2010 to support the National Forestry Program.

A sequence of two TCP projects, TCP/BRA/3103 and -3202, set the basis for a GEF initiative prepared with a Project Preparation Grant (GCP/BRA-073/GFF) completed in 2008 that prepared the ground for the full project GCP/BRA/079/GFF "Strengthening National Policy and Knowledge Frameworks in Support of Sustainable Management of Brazil's Forest Resources", GEF n.3767, begun in 2010 and still ongoing. The large GEF-funded project aims at supporting national forest policy, with FAO acting as implementing and executing agency, at the urging of the MMA, which has expressed the need for FAO experience and expertise in managing GEF projects.

1.1.3 Participants and other stakeholders

The REDESER project will promote capacity development based on alliances among state agencies, ministries, the Federal Public Ministry and civil society organizations at various levels. In addition to using co-financing promised to far, it will also seek new and additional sources of funding. The project is led by the Department to Combat Desertification (DCD) of the Secretariat of Extractivism and Sustainable Rural Development (SEDR) of the MMA. Its implementation is linked to the main government agencies responsible for forestry, rural development, NTFPs, biodiversity, land regularization and extension programs. A summary of key project participants and stakeholders, whether or not they have signed co-financing letters, and their roles and responsibilities, directly or through inter-ministerial programs, is presented in Table 1.5.

Table 1.5. Participants and stakeholders and relevant roles

Participants and stakeholders	Relevant Roles
Ministry of Environment (MMA), Secretariat of Extractivism and Sustainable Rural Development (SEDR), Department to Combat Desertification and Land Degradation (DCD)	MMA is one of the main project co-financiers. Its DCD is responsible for the implementation of Brazil's National Action Plan (NAP) to Combat Desertification. The department is in charge of implementation of Brazilian commitments with UNCCD and is responsible for the design and implementation of public policies to combat desertification and land degradation and conserve biodiversity in ASD. It will play a central role in the implementation of relevant policies and programs.
Chico Mendes Institute of Biodiversity Conservation (ICMBio)	ICMBio, part of MMA, manages the federal protected areas (Conservation Units) and promotes community development in those that allow for sustainable use, in addition to research and knowledge, environmental education and ecosystem management. It will support development of information materials and training and assist in training farmers on best NTFP and agroforestry production practices, as well as identifying the best alternatives for the recovery of degraded areas providing biological connectivity among forest remnants. It seeks greater integration between protected areas and local communities and society in general.
Brazilian Institute of Environment and Renewable Natural Resources (IBAMA)	IBAMA, also part of MMA, will participate in defining technical and regulatory frameworks and coordinate with state environmental agencies to internalize technical standards and develop appropriate guidelines for environmental monitoring, law enforcement and administrative sanctions, particularly with regard to the prevention and control of deforestation and forest fires. The institution will benefit from the best practices and standards of sustainable production to be generated by the project and use them in monitoring and orientation.
Brazilian Forest Service (SFB)	The Brazilian Forest Service (SFB), also part of MMA, supports forest management activities in the Caatinga and other biomes and manages the National Fund for Forest Development (FNDF). It is responsible for managing national forests (FLONA) such as Araripe, where it can test the results of the project. The SFB will work with the project to strengthen the collection of seeds, production of seedlings and recovery of degraded areas through seed and seedling planting,

	<p>supporting the Caatinga Forest Management Network and implementation of the management plan of the Araripe FLONA. In addition, the SFB is a key partner in the design of training and information materials. It is also responsible for the Rural Environmental Registry (CAR) to enforce the Forest Code and for developing and coordinating detailed federal and state norms about its application.</p>
Ministry of Agrarian Development (MDA)	<p>The mission of MDA is to promote sustainable development in agrarian reform settlements and among family farmers in general. It will be the main co-financier of the project. MDA policies are fundamental for strengthening and diversifying family farming in areas that are socially and environmentally vulnerable. The project will involve it directly in the introduction of SLM and SFM among family farmers, benefiting from its leadership involving many stakeholders in long-term initiatives. MDA and its agencies strengthen family farming by facilitating access to credit through the National Program to Strengthen Family Agriculture (PRONAF), which includes organic and agro-ecological production, agroforestry and NTFP.</p>
Ministry of Social Development and the Fight against Hunger (MDS)	<p>The role of MDS, which works closely with MMA and MDA, is to channel public investments for organized for social inclusion, food and nutrition security, social assistance, minimum income and water security for poor families. It can provide additional co-financing for training programs and dissemination of information. The MDS will use the information produced by the project to train its personnel and producers involved in agroforestry, guide investments in target landscapes, provide more effective support for productive activities and improve the Food Acquisition Program (PAA). Together with MDA and BNDES, it will support 24 member organizations of ASA to establish 600 community agro-biodiversity seed banks in the Caatinga.</p>
Ministry of Agriculture, Livestock and Food Supply (MAPA)	<p>The mission of MAPA, which works with large-scale agriculture and livestock, is to promote sustainable development and the competitiveness of agribusiness. Although it is not a project co-financier, one of its most relevant initiatives is the Sector Plan for Mitigation and Adaptation to Climate Change for the Low Carbon Agriculture (ABC Plan), which offers very substantial incentives and resources (on the order of USD 1 billion per year for Brazil as a whole) to farmers who adopt practices that increase the resilience of production</p>

	<p>systems and reduce greenhouse gas emissions, thus being important for uptake of sustainable technologies that contribute to carbon storage and sequestration and generate co-benefits in terms of biodiversity conservation and land degradation. Another role is implementation of the National Plan of Agro-ecology and Organic Production (PLANAPO).</p>
National Food Supply Company (CONAB)	<p>CONAB, part of MAPA, implements two important policies that include NTFPs: minimum prices for biodiversity products (PGPMBio) and food acquisition (PAA). It ensures fair prices for government procurement of NTFPs, setting minimum prices for agricultural and social biodiversity products. It will incorporate project information in its activities.</p>
Brazilian Agricultural Research Enterprise (EMBRAPA)	<p>EMBRAPA is also part of MAPA. The project will establish a cooperation agreement with EMBRAPA Goats and Sheep in Sobral, Ceará, to disseminate agroforestry in the Caatinga based on best practices of SFM for rearing this kind of livestock common in the region. The center will be involved in providing technical expertise, implementation of project activities, promoting partnerships and coordination with stakeholders (government agencies, cooperatives, producer associations, NGOs) participating in the project to improve NTFPs, agroforestry, SLM and SFM in ASD.</p>
Ministry of National Integration (MI)	<p>The MI will be involved because of its mega-projects in the Northeast, especially the São Francisco River transposition project, involving 477 km. of canals to carry water to parts of Ceará, Rio Grande do Norte, Paraíba and Pernambuco, and the Trans-Northeastern Railway. Both projects require environmental compensation that can be synergetic with the project. The MI also supports “Routes of Integration” linking local productive clusters (APLs) of biodiversity products such as honey and cashew.</p>
Ministry of Education (MEC)	<p>MEC is responsible for the National School Lunch Program (PNAE). In 2014 the budget for this institutional market program was USD 1.2 billion to benefit 43 million pupils. At least 30% of the funds transferred to municipalities must be used to purchase family farm products, stimulating local and regional economic development and reducing extreme poverty. In addition to conventional products, the program also promotes sustainable use of biodiversity such as native fruits, but supply is far from sufficient for this scale.</p>

Ministry of Science, Technology and Innovation (MCTI)	The Northeast Regional Center of the National Space Research Institute (INPE) in Natal, Rio Grande do Norte, is doing detailed satellite monitoring in the Caatinga that will provide valuable data for project monitoring and evaluation.
National Savings Bank (CEF), Bank of the Northeast (BNB), Bank of Brazil (BB)	These three federal banks provide loans under the National Program to Strengthen Family Farming (PRONAF). Financing supports agroforestry systems, agro-ecology, restoration of Legal Reserves (RL) and Areas of Permanent Preservation (APP), family farming in general and processing and marketing of agricultural products. The project will seek to promote and adjust credit lines for sustainable forest activities and operationalize special financing systems for promoting SFM and dissemination of best production practices among farmers and wild harvesters and their associations.
State Environment Agencies (OEMAs)	Because of decentralization to sub-national governments, state environment agencies are increasingly responsible for planning and implementation of environmental licensing and regulation. For this project, they will play a key role in implementing state action programs to combat desertification in all the states of ASD (Alagoas, Bahia, Ceará, Paraíba, Pernambuco, Piauí, Rio Grande do Norte, Sergipe, Maranhão, Minas Gerais and Espírito Santo). They will also assist in engaging the private sector. State environment agencies in Paraíba and Alagoas are co-financiers.
Sustainable RN	Through the Department of Planning and Finance of the Planning Secretariat (SEPLAN) of Rio Grande do Norte, one of the co-financiers, the project will establish a partnership with the Rio Grande do Norte Regional and Governance Project ("Sustainable RN"), to be funded by a USD 360 million loan from the World Bank. The partnership focuses on the Seridó Region in conjunction with INSA and MMA through the implementation of a pilot project aimed at integrating soil remediation, landscape management, natural resource management, recovery of natural areas and exchange of experiences of living in harmony (<i>convivência</i>) with drought, thus contributing to increased food security, improved productive infrastructure and access to markets for family farmers.

Research and Education (INSA)	<p>Collaboration with partners in research and education institutions will provide support for the implementation of technical assistance in the field, training of personnel and improved awareness of local conditions. INSA will play an important role in achieving the knowledge management objectives of the REDESER project using its advanced information and communication technology, in particular through studies, application of new research methods and systematization and dissemination of sustainable use techniques to combat desertification, conserve biodiversity and reduce emissions. INSA will house the implementation unit of the project in Campina Grande, in the state of Paraíba. As one of the main co-financiers, it will host many of the project activities related to dissemination of best practices and capacity development, facilitating training and the production of extension materials. It will also support in collaboration with FAO and partners the monitoring of project performance and impacts on the ground.</p>
University for International Integration of Afro-Brazilian Lusophone Countries (UNILAB)	<p>The project will establish agreements with UNILAB to offer opportunities for trainees and personnel on issues related to living in harmony with semi-aridity. UNILAB will benefit from the project actions to identify, carry out research about and develop best production practices with potential application in drylands in Africa.</p>
Center for Sustainable Industrial Production (CEPIS)	<p>CEPIS, one of the co-financiers, is part of the Technology Park Foundation of Paraíba. It is a reference center recognized for its work on industrial energy efficiency and cleaner production. The project will benefit from the joint work with CEPIS by expanding its presence among producers of bricks and tiles throughout the Seridó region that are now heavily dependent on the use of firewood provided by family farmers and ranchers.</p>
Semi-Arid Network (ASA)	<p>ASA includes over 1,000 civil society organizations that defend the goal of living in harmony with semi-aridity. It implements the program “One Million Cisterns,” which promotes household storage of rain water for human and productive uses. ASA will support the project through: a) dissemination of best production practices in the field; b) capacity development and mobilization of rural communities; c) exchanges with African and Latin American countries.</p>

Advice and Management on Nature Studies, Human Development and Agro-ecology (AGENDHA)	The NGO, one of the co-financiers, promotes technological innovation, implements technical assistance and rural extension and participates in policy dialog about ways to live in harmony with semi-aridity. It supports 30 cooperatives and associations mainly led by women involving more than 3,000 people. It will cooperate with expansion of the coverage of food procurement and distribution programs in the northeastern part of the state of Bahia, where the Uauá site is located.
Northeast Plants Association (APNE)	One of the co-financiers, this association promotes sustainable development through the promotion of SFM and greater knowledge about Caatinga flora through the implementation of training courses, field evaluations and studies of ASD environments. The project will work with APNE by establishing agreements to support training on seed collection, forest nursery practices, SFM, degraded areas and biological connectivity.
Araripe Foundation (FA)	The foundation, one of the co-financiers, plays a key role in raising awareness and dissemination of information about improvement of living conditions in semi-arid conditions. It already implements NTFP production chains in the Crato region of Ceará. The foundation will support project activities to promote better production practices in ASD, staff training and production of information materials.
Seridó Development Association (ADESE)	The association, which is qualified by the Ministry of Justice as a Civil Society Organization of Public Interest (OSCIP), works in 25 municipalities in Rio Grande do Norte's Seridó region and is a key player in the "Sustainable RN" project. The organization's goals are the consolidation of local processes of participation, promotion of sustainable socio-economic development and public policy dialog.
Brazilian Institute of Development and Sustainability (IABS)	One of the co-financiers, also an OSCIP, IABS seeks to promote social welfare, sustainable development and the reduction of international, national, regional and local inequalities. It has an important field center in the Xingó region of Alagoas. The Mandacaru and Drylands Champions prizes are valuable forms of dissemination of innovations. Cooperation with the project will involve management processes and training.
Social Action Agency of the Natal Ecclesiastical Province, the Caicó	One of the co-financiers, this agency is located in Rio Grande do Norte. Its mission is to support rural and urban population groups that are socially vulnerable,

Diocese and the Mossoró Diocese (SEAPAC)	leading the proposition and achievement of rights and public access policies. It invests in the organization and coordination of civil society in dialog with the government and building broad partnerships, implementing educational, social and environmental processes from the perspective of a united, democratic, just and sustainable society. It is a key player in the Seridó project site.
Alternative Agriculture Center - Northern Minas Gerais (CAA-NM)	The project will establish exchanges with this non-governmental center, which has vast experience in generation and dissemination of knowledge about ways in which local community associations can support land reform, family farming, agro-ecology, agroforestry and NTFPs in the Caatinga and the Cerrado.
Family Farmer Cooperative of Canudos, Uauá and Curaçá (COOPERCUC)	In the Uauá field site, this cooperative will play a key role in providing information and knowledge to help other associations engage in sustainable use of biodiversity. Its more than 200 members, mostly women, process native Caatinga fruits (mainly <i>umbu</i> and passion fruit) for domestic and international markets. The cooperative serves as a model for establishing partnerships with governmental and inter-governmental agencies and non-governmental organizations.

1.1.4 Lessons learned from past and related work, including evaluations

The REDESER project will build upon pioneering experiences of diversified and sustainable use of resources of the Caatinga. Various options for SLM and SFM have been studied in the ASD since the 1980s, especially through projects on sustainable use of biomass supported by FAO and UNDP. The BRA/02/G31 project on Integrated Ecosystem Management for the Caatinga Biome (2002-2006) provided crucial information. These projects have spread the concept of SFM, taking into account livelihoods and increasing the understanding of society about the value of Caatinga vegetation, although wider dissemination is needed.

The main lesson learned from this experience is with regard to the need to promote cooperation among government institutions across sectors and civil society. Other lessons learned are: a) the importance of connectivity among fragments of the Caatinga biome; b) the need to improve environmental licensing of production of fuelwood; c) recognition of the role of industrial demand for biomass and the potential for industry to influence the supply chain to make it more sustainable; d) the importance of SFM for food and energy security among family farmers.

SFM plans constitute a valuable experience in nearly 400,000 ha that are already licensed in ASD, providing an opportunity for successful sustainable management, restoration and socioeconomic sustainability. The total number of approved plans is constantly growing, despite the obstacles to their wider acceptance, which require evaluation and strategy development. In the project area only 1,712 hectares are under management plans.

Experience shows that SFM can be included in state plans such as the Pernambuco Environment Plan (PLANOAMBIENTAL) and Piauí's Action Plan for Integrated Development of the Parnaíba Basin (PLANAP). SFM and community forest management plans are also supported by INCRA/MDA and SFB/MMA in agrarian reform settlements in southwestern Bahia and Pernambuco, respectively. The Program of Hydro-environmental Technologies and Practices (PRODHAM) of the Water Resources Secretariat of Ceará includes best soil and water conservation practices that can be replicated throughout the ASD.

Partnerships with industry associations and research organizations have proven effective in promoting adherence to the principles of sustainable use. Greater efficiency in production of gypsum in Pernambuco and bricks and tiles in various states is vital for sustainable use of fuelwood. Previous technical assistance projects of regional partners such as CEPIS and SEBRAE were able to influence environmental monitoring, increase use of wood from known sources and promote adoption of improved industrial burning methods.

Lessons learned served as the basis for a project proposal to promote sustainable use of natural resources through the strengthening of grassroots organizations so as to improve their organizational skills, communication, public visibility and extension capabilities. Previous experiences also show the possibilities of local projects for native fruit production chains, in line with the National Policy for Sustainable Development of Traditional Peoples and Communities and the National Plan for Promotion of Socio-biodiversity Production Chains. Other experiences have provided national and international visibility for local handicrafts. These initiatives improve both human nutrition and biodiversity conservation.

At global level, the following lessons have been learned from SLM⁹-related work done by FAO and its partners in recent years:

Use guidelines and build on successful projects, programmes and partnerships

The project will make use of FAO's global guidelines for the restoration of degraded forests and landscapes in drylands¹⁰, and will build on the following lessons learned from initiatives and projects implemented in different dryland regions including Africa, the Near East, Central Asia and Latin America:

⁹ SLM is defined as the adoption of land use systems that, through appropriate management practices, enables land users to maximize the economic and social benefits from the land while maintaining or enhancing the ecological support functions of the land resources. This can include carbon accumulation in biomass, biodiversity protection, water filtering and soil health among others

¹⁰<http://www.fao.org/3/a-i5036e.pdf>

- Adopting landscape restoration approaches and principles¹¹ is critical to the success of efforts to combat DLDD and achieve climate change mitigation and adaptation. Maintaining the functionality and sustainability of fragile ecosystems, such as islands and drylands, both in ecological and socio-economic terms, requires taking a landscape perspective. The interlinked challenges related to climate change, food security, poverty, deforestation, ecosystem degradation, desertification and biodiversity loss call for solutions that go beyond single-track approaches that aim to solve one problem, but often exacerbate another. Integrated approaches to landscape management can increase synergies among multiple land use objectives and may require new policies, investments, market incentives, institutions and capacities. The role of forests and trees, and the goods and services they provide, should be viewed from a broader perspective that encompasses agricultural productivity, soil protection, water supply and distribution, biodiversity conservation and pasture provision as well as forests and trees. An integrated approach that takes into account the perspectives, needs and interests of all stakeholders, including local communities and individual land users, is an indispensable element in developing sustainable land use and livelihood strategies for rural areas. This is especially needed in drylands, where forests and agroforestry systems provide a safety net for the livelihoods of people that are affected by land degradation, drought and desertification.
- Applied research, which combines modern science and traditional and indigenous knowledge, is needed for planning, managing and monitoring sustainable land management and landscape restoration interventions
- Local knowledge and innovation can be protected and applied through the establishment of local knowledge building systems, such as farmers' field schools.
- Coordination, complementarities and synergies should be promoted among stakeholders and ongoing projects and programmes (sectors, fields, including Civil Society Organizations [CSOs]) at local, national and regional levels. Participatory and inclusive approaches ensure the active involvement of all stakeholders.
- Integrated natural resource management and restoration require a combination of preventive and curative measures.
- The participation of youth and women is critical for enabling the sustainability of project achievements through the development of champions and new leaders of change.

¹¹ A landscape approach looks across large, connected geographic areas to more fully recognize natural resource conditions and trends, natural and human influences and opportunities for resource conservation, restoration and development. It seeks to identify important ecological values and patterns of environmental change that may not be evident when managing smaller land areas. A landscape approach provides a framework for integrating science with management; for coordinating management efforts and directing resources where they are most needed; and for adapting management strategies and actions to changing conditions and new information. It also provides an important foundation for developing coordinated management strategies with partner agencies, stakeholders and indigenous people. For further information, see also link to FAO Unasylva issue on FLR: <http://www.fao.org/3/a-i5212e.pdf>

- It is important to integrate objectives of rural employment creation in the project, including for women and youth, acknowledging that jobs can contribute to conserving, protecting and enhancing natural resources, while also helping to mitigate and adapt to climate change.
- It is necessary to develop income-generating activities based on the sustainable use of forest goods and ecosystems services (wood and non-wood forest products, ecotourism) while ensuring the effective management of ecosystem goods and services using FAO's market analysis and development approach and tools, which have shown success in many countries

Use new approaches to capacity development

- In the past, development assistance focused mainly on the transfer of knowledge and blueprint solutions from one region to another. This sometimes contributed to the successful application of ready-made solutions, but did not necessarily strengthen the abilities of the national system to analyze their own situations and develop suitable solutions to their problems. Capacity development, key for sustaining results, is at the heart of the project and will take place throughout the project inception, implementation, monitoring and evaluation stages. The project will take a three-dimensional approach to capacity development that focuses on the enabling environment, organizational and individual capacity to sustain change. The approach will not only address technical capacities, for example in SLM and SFM but also the functions needed to sustain change. These include the capacity to share knowledge, to create partnerships, to lead advocacy activities, to have inclusive policy processes, to share information on SLM/SFM and FLR, to ensure that all stakeholders participate in meetings and to mobilize resources.
- Capacity development through south-south learning and cooperation is a strategy to ensure sustainability. This will be accomplished by using regionally and nationally adapted web-based tools, case studies, learning aids, policy briefs, maps, sharing lessons learned from smallholders and providing joint training courses. Such courses will be an efficient means of sharing experiences, and new knowledge and building trust and cross-border relations. Training will be provided on a demand-driven basis. It is well known that the exchange of experiences between producers can scale up good practices in sustainable land management.

1.1.5 Links to national development goals, strategies, plans, policy and legislation, GEF and FAO's Strategic Objectives

a) Alignment with national development goals and policies

The REDESER project is in line with the Constitution of Brazil, which establishes universal rights to an ecologically balanced environment, considered to be a good for the common use of the people and essential for healthy quality of life. For the social objective, it aligns with the Brazil Without Misery (BSM) part of the "More Brazil" Pluriannual Plan (PPA) for 2012-2015, the overarching reference for federal government policy, together with the Growth Acceleration Plan (PAC). The Pluriannual Plan for 2016-2019, which is now being prepared, fits with national policies to conserve biodiversity and reduce emissions from

deforestation. It is also in line with the various long-standing national policies to promote regional development and reduce inequality, especially in the Northeast.

The implementation of the anti-desertification approach undertaken by SEDR/DCD/MMA includes partnerships for international cooperation through UNDP, FAO, the Inter-American Institute for Cooperation on Agriculture (IICA) and the German International Cooperation Agency (GIZ). The Climate Fund has a budget of USD 10 million and supports 40 projects to combat desertification, while the National Environment Fund (FNMA) provides additional support.

At the inter-institutional level, the project relates to the São Francisco and Parnaíba River Valleys Development Company (CODEVASF) initiatives covering 263 communities and 12,000 families. It is also related to the work of the National Water Agency (ANA) of the MMA in partnership with the Semi-Arid Network (ASA) regarding integrated management for river basins and ecosystems and energy efficiency.

The project is linked the Biodiversity Law, the National Biodiversity Plan, the 2015 National Report to the CBD and the CBD's goals for 2020, including Aichi targets. The action plan prioritizes strategic studies, a national biodiversity policy and a biodiversity information network. The project will collaborate with the Secretariat of Biodiversity and Forests (SBF) and the National Biodiversity Project (PROBIO) by providing supplementary data, information gap analysis and knowledge management.

Many of the project's activities are related to mitigation and adaptation to climate change. The ASD face loss of native vegetation and biodiversity, increased frequency of droughts and floods, reduced generation of hydropower, decreased food production and increased out-migration to other regions or even other countries. Project activities conform with the general guidelines of the National Policy on Climate Change, which stresses reduction of deforestation and forest degradation.

The advance of deforestation in the Caatinga is estimated at an annual rate of 2,700 km², equivalent to release of more than 25 million tons of CO₂. SFM and INRM are opportunities to promote carbon storage and sequestration. At least 20% of the area should be in Legal Reserves (RL) and another estimated 5% in Areas of Permanent Preservation (APP), the set-asides on each rural property required by the Forest Law. The project will contribute to overcoming the deficit of nearly 2 million ha. that need to be recovered in the Caatinga according to the National Plan to Recover Native Vegetation (PLANAVEG).

The Forest Law, replaced the former Forest Code and approved in 2012, makes concessions to landowners regarding consolidated use of land and provides for various kinds of flexibility, but the intention is to enforce the law. The Rural Environmental Registry (CAR) requires geo-referenced declaration of RL and APP areas. Enforcement of the law will be a powerful incentive to recover degraded areas, especially since it is condition for access to bank credit..

Likewise, the project will focus on the diffusion of agro-ecological production in vulnerable areas of ASD. Preventive action includes collaboration with local projects, farmers' organizations and networks and agricultural research institutions such as

EMBRAPA Semi-Arid, INSA and the National Space Research Institute (INPE), which works with disaster alerts.

The Forest Law provides for establishment of the National Fund for Forest Development (FNDF) to promote sustainable forest management. The fund supports NTFPs and agroforestry through technical assistance and extension and sustainable forest management research and development.

The national policy on food and nutrition security foresees: a) sustainable supply structures and decentralized systems and agro-ecological production, extraction, processing and distribution of food; b) food and nutrition security for traditional and indigenous peoples and communities and agrarian reform settlers; c) sufficient quantity and quality of water for consumption and production of food.

The project focuses on Brazil's poorest region, which has advanced signs of land degradation and desertification. The activities already under way involving numerous ministries seek productive and social inclusion, food and nutrition security, water security, diversification of production and access to markets, but they could involve fuller consideration of forests, biodiversity, climate change and ecosystem functions.

b) Alignment with NAPA, NAPs, NBSAP, NIPs and NAMA

Overall, the project is in line with international commitments of Brazil to the UNCCD and with its Ten-Year Strategy 2008-2018, seeking to link the implementation of national initiatives with strategic and operational objectives of the strategy and the construction of indicators to analyze the impacts of ongoing activities of living in harmony (convivência) with semi-aridity. The project's activities will be aimed at strengthening the implementation of Brazil's National Action Plan (NAP) to Combat Desertification and its national report to UNCCD, increasing the visibility of the program through cross-cutting initiatives.

The following paragraphs explain how the REDESER project addresses the priority geographical and thematic areas identified in Brazil's recent national reports to UNCCD, CBD and UNFCCC:

- UNCCD: 4th Report of Brazil to UNCCD: <http://www.unccd-prais.com/Data/Reports> (see Brazil 2012)
- CBD: 5th report to CBD: <https://www.cbd.int/doc/world/br/br-nr-05-en.pdf>
- UNFCCC: 2nd National Communication of Brazil to UNFCCC: http://unfccc.int/national_reports/non-annex_i_natcom/submitted_natcom/items/653.php (see Brazil 2010) and Biennial Update Report to UNFCCC: http://unfccc.int/national_reports/non-annex_i_natcom/reporting_on_climate_change/items/8722.php (see Brazil 2014).

UNCCD

In Brazil's report on the fourth UNCCD reporting cycle, 2010-2011, there are priority commitments regarding family farming, agricultural food supply, the National Forestry Program, conservation and sustainable use of biodiversity and genetic resources,

integrated sustainable development of the Semi-Arid and the fight against desertification, among other commitments less directly relevant to the REDESER project. The priorities mentioned are addressed by all the project components (integrated natural resource management in production landscapes, multiple-use forest management, forest and landscape restoration and coordination, communication and awareness-raising). It should be noted that the institution which submitted the report in 2012 is the Directorate of the Department to Combat Desertification of the Secretariat of Extractivism and Sustainable Rural Development at the Ministry of Environment, the same that will be responsible for the REDESER project in the Government of Brazil.

CBD

The relevant geographical and thematic priorities in Brazil's Fifth National Report to the Convention on Biological Diversity submitted by the Secretariat of Biodiversity and Forests of the Ministry of Environment in January of 2015 are: 1) Revised legislation, focusing on effectiveness of public policies; 2) Protected areas, including global designation and wetlands; 3) Restoration of vegetation cover, including restoration initiatives and action plans for deforestation reduction; 4) Sustainable forest management; 5) Integrated landscape management; 6) Conservation Action Plans; 7) Sustainability of agricultural production and use of native biodiversity, including native biodiversity and the National Agroecology and Organic Production Plan (PLANAPO). The REDESER project will include activities that contribute directly to points 1, 3, 4, 5 and 7. Specifically: 1) Outcome 1.1 includes improved licensing processes making use of technical guidance, while components 2, 3 and 4 also contribute to policy effectiveness ; 3) Restoration of vegetation cover is the objective of Component 3; 4) Sustainable forest management (SFM) is the objective of component 2; 5) Integrated landscape management is the objective of Component 1, on Integrated Natural Resource Management (IRNM); 7) Sustainability of agricultural production and use of native biodiversity is the objective of all components.

UNFCCC

In the Second National Report to UNFCCC in 2010, desertification is given specific attention as one of Brazil's five special circumstances. The priorities for mitigation are: 1) Sustainable development; 2) Mitigation as such; 3) Medium- and long-term planning; 4) Clean Development Mechanism. With regard to sustainable development, the REDESER project will help mitigation efforts through the reduction of deforestation. The priorities for adaptation foreseen in the report include specific activities in the semi-arid region, energy, water resources, forests and agriculture and livestock, all of which are related to REDESER components 1, 2, 3 and 4. The first Biennial Update Report of Brazil, in 2014, deals with Monitoring, Reporting and Verification (MRV), REDD+ and measurement of emissions. The new inter-institutional arrangements at the federal level are indirectly relevant to the REDESER project. It should be noted that the National Semi-Arid Institute (INSA), which will be the decentralized base for the project, is part of the Ministry of Science, Technology and Innovation (MCTI), which is responsible for climate reporting in Brazil.

The commitments of Brazil regarding desertification are: 1) the fight against poverty and inequality, strengthening land reform, basic education and family farming and reducing food and nutrition insecurity; 2) capacity development to increase production in the ASD; 3) preservation, conservation and sustainable management of natural resources, including environmental management, protected areas, water resources management, sustainable use and revitalization the São Francisco River; 4) democratic management, institutional strengthening, civil society participation and reporting and monitoring.

The main activities regarding desertification include: a) monitoring of implementation, quality and impact of the program; b) knowledge management, including Ecological-Economic Zoning (ZEE), early warning systems, research and development and basic studies; c) training and capacity development for government programs; d) enhancement of international cooperation, e) social mobilization, f) training of civil society leaders. The project also fits perfectly with the demands of society as defined in state action plans.

At the Conference of the Parties of the UNFCCC (COP 15) in Copenhagen in 2009, Brazil presented its voluntary mitigation plan to reduce greenhouse gas emissions between 36.1% and 38.9% of projections for 2020. Federal Decree 7,390 of 2010 establishes official mitigation goals. Currently the main means of implementation are the Action Plan for Prevention and Control of Deforestation in the Amazon Region (PPCDAm), the Action Plan for Prevention and Control of Deforestation in the Cerrado (PPCerrado) and the Plan for Low Carbon Emission in Agriculture (ABC). Other mitigation tools include Clean Development Mechanism (CDM) and the Climate Fund. Scenarios for greenhouse gas emissions are being developed by the ministries of Environment, Strategic Affairs, Treasury and Science, Technology and Innovation, as well as the Climate Observatory, the Brazilian Forum on Climate Change and the Avina Foundation.

The project proposal and strategies contribute to reaching Aichi Biodiversity Targets 5, 7, 14 and 18.

- By focusing on seed and nursery production and the recovery of degraded forests in ASD, also called “regreening,” Component 3 contributes to safeguarding threatened biodiversity as foreseen in Target 5: “By 2020, the rate of loss of all natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation are significantly reduced.”
- Through Components 1 to 4, the project contributes to sustainable management on agricultural and forest land, as foreseen in Target 7: “By 2020, areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity.”
- Likewise, the project contributes to provision of ecosystem services for vulnerable segments of the population as foreseen in Target 14: “By 2020, ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and well-being, are restored and safeguarded, taking into account the needs of women, indigenous and local communities, and the poor and vulnerable.”
- By supporting active involvement and empowerment of local communities and indigenous and traditional peoples, the project promotes traditional knowledge regarding sustainable use of NTFP, landraces and dissemination of agroforestry in line with Target 18: “By 2020, the traditional knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable

use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention, with the full and effective participation of indigenous and local communities at all relevant levels.”

c) Alignment with GEF focal areas

As explained in more detail below, the REDESER project is consistent with the following GEF strategic objectives:

- Biodiversity Focal Area – Objective 2 (BD-2): Mainstream Biodiversity Conservation and Sustainable Use into Production Landscapes, Seascapes and Sectors;
- Land Degradation Focal Area - Objective 2 (LD-2): Forest Landscapes: Generate sustainable flows of forest ecosystem services in drylands, including sustaining livelihoods of forest dependent people;
- Land Degradation Focal Area - Objective 3 (LD-3): Integrated Landscapes: Reduce pressures on natural resources from competing land uses in the wider landscape;
- Sustainable Forest Management Focal Area/REDD+ Focal Area – Objective 1: (SFM/REDD+-1) Forest Ecosystem Services: Reduce pressures on forest resources and generate sustainable flows of forest ecosystem services

Component 1 is aligned with the LD-3 objective, Outcome 3.2: Integrated landscape management practices adopted by local communities, Output 3.2 INRM tools and methodologies developed and tested. Component 1 will support the increase and diversification of smallholders’ incomes through the application and dissemination of INRM in the territory of Caatinga. 1,567 rural people will be the direct beneficiaries. Component 1 will support the adoption and mainstreaming of INRM into productive systems in 904,142 hectares, increasing the spatial coverage of INRM practices in wider landscapes. INRM tools and methodologies will be introduced in the project intervention areas (i.e. 3 practices¹²).

Component 1 will also contribute to the BD-2 objective, Outcome 2.1: Increase in sustainably managed landscapes and seascapes that integrate biodiversity conservation, Output 2.2. National and sub-national land-use plans (number) that incorporate biodiversity and ecosystem services valuation by incorporating BD conservation or sustainable use of its components in 904,142 ha of project direct intervention under INRM practices.

Component 2 is aligned with the LD-2 objective, Outcome 2.2: Improved forest management in drylands, Output 2.2 Types of innovative SFM practices introduced at field level. Component 2 will support the increase in the number of hectares providing sustained flow of services in forest ecosystems in drylands (Baseline: 0; Target: 618,062ha. of forest areas. 85% of forest cover in project area), and will increase the total spatial coverage of SFM practices and technologies (Baseline: 1,712 ha; Target: 15,000 ha).

¹²¹² List of practices, according to the LD Tracking Tool: Sustainable production of non-wood forests and agriculture products; Forest and Landscape restoration; and Sustainable management of natural resources

Component 2 will also contribute to SFM/REDD+-1 Objective, Outcome 1.2: Good management practices applied in existing forests, Output 1.2: Forest area (hectares) under sustainable management, separated by forest type, by promoting the increase of areas covered by forest management plans (Baseline: 1712 ha; Target: +15.000 ha – see LD-2).

In addition, Component 2 will contribute to the BD-2 Objective, Outcome 2.1, Output 2.2. by integrating biodiversity conservation criteria in specific management practices (Baseline: 1,712 ha managed under SFM practices with management plans. Target: 15,000 ha under SFM plans).

Component 3 will address the BD-2 Objective, Outcome 2.1, Output 2.2, by increasing the areas where specific management practices that integrate BD are implemented through restoration with native species (Baseline: 0 restoration. Target: 30,000 ha. under restoration with native species).

Component 3 will also contribute to the SFM/REDD+-1 Objective, Outcome 1.2, Output 1.2 by increasing the carbon stored in forest ecosystems and emissions avoided from deforestation and forest degradation from this project (Direct lifetime): a) Conservation & enhancement of carbon in forests (Target: +30,000 has of forest restored, +439,200 ton CO₂eq sequestered); and b) Avoided deforestation and forest degradation (Target: avoided emissions of 696,219ton CO₂eq in 5,709 ha). As well, Component 3 will support the restoration/rehabilitation of degraded forests (Baseline: 0; Target: 30.000 ha).

Component 4 is cross-cutting and aligned with the BD, SFM/REDD+ and LD focal areas. It will support awareness-raising among federal and local institutions, private sector, and local producers in ASD on the importance of habitat preservation, sustainable forest management, and the management of natural resources from an integrated perspective. As well, Component 4 will promote the development of capacities of local government staff (in 14 municipalities of ASD), policy-makers, farmers, and education stakeholders on FLR, reducing, reversing and preventing desertification, SFM and BD conservation.

Component 5 is also cross-cutting and aligned with the BD, SFM/REDD+ and LD focal areas. It will promote synergy with complementary initiatives (such as the UNDP/GEF Project in Sergipe¹³) to foster sustainable management and restoration benefits. In addition, Component 5 will support the Project M&E system that will generate lessons and valuable data that will be published and disseminated with the support of FAO in other dryland ecosystems in Brazil, in Latin America and the Caribbean, and in other ASD in the world.

d) Alignment with FAO Strategic Framework and Objectives

The implementation of the REDESER project is an opportunity to leverage national efforts that are compatible with the overall strategy of FAO. Its Strategic Framework for 2010-2019 is based on a vision of the world without hunger and goals regarding eradication of hunger and poverty and the sustainable use of natural resources. All of FAO's five Strategic Objectives are contemplated, but the most relevant are: a) SO2: Increase and improve

¹³ *Sustainable Land Use Management in the Semiarid Region of North-East Brazil (Sergipe)*, GEF ID 3066

provision of goods and services from agriculture, forestry and fisheries in a sustainable manner; b) SO5: Increase the resilience of livelihoods to threats and crises.

Moreover, the project is coherent with FAO's regional priorities for Latin America and the Caribbean and is aligned with the priority area of Climate Change and Environmental Sustainability: "[provide assistance to governments for] strengthening national programmes for the sustainable management of natural resources, agro-climatic risk reduction, mitigation of emissions and adaptation of the agriculture sector to climate change, in the new context of low-carbon development."

The project is in line with the FAO Country Priority Framework in Brazil, agreed with the Brazilian Government in May, 2013, for its priority result 4, "Sustainable Management of Natural Resources, Climate Change and Desertification", output 4.2: "Demonstrative experiences of sustainable use of forests [...] implemented".

The project strategy is consistent with the zero draft of the Ministerial Declaration of the High-Level Segment for the Eleventh Session of the United Nations Forum on Forests (UNFF11), which stresses the multiple roles of forests to life and well-being and their vital role in poverty eradication, economy, health, food and water security, gender equality, climate change, biodiversity and disaster risk reduction, in the context of implementation of the Sustainable Development Goals (SDGs) for 2015 and beyond. It also aligns perfectly with the goal of Land Degradation Neutrality (LDN) established at the 12th Conference of the Parties (COP 12) in Ankara, Turkey, in 2015.

SECTION 2 – PROJECT FRAMEWORK AND EXPECTED RESULTS

2.1 PROJECT STRATEGY

The project strategy is to promote a shift in the current context of limited knowledge about and capacity for promoting integrated natural resource management (INRM) across market value chains (from production landscapes to market products), insufficient institutional capacity to promote SLM and SFM, lack of sustained technical support at the local level for the restoration of degraded forests and landscapes and shortages in identification and dissemination of best practices. This strategy aims at addressing the threats to global environmental benefits that are described in Section 1. The project will support the mobilization of a wide range of federal, state and municipal authorities, research institutions, non-governmental organizations, farmers, industries and other stakeholders to identify, test and disseminate appropriate ways to halt and reverse desertification, with potential for replication in Brazil and other dryland countries.

To achieve broad impact in a biome twice as large as France, the project will link concrete technical interventions at specific sites with capacity development and knowledge management activities involving civil society and government stakeholders over a broader area. The project will disseminate a wide range of sustainable land management and forestry practices in the ASD and other regions.

The approach involves a mixture of traditional and innovative improved practices capable of addressing unsustainable land use at large scale. In the ASD of Brazil, these include sustainable harvesting of wood for fuel and fence posts, common pastures, livestock foraging in managed woodlands, long fallow systems, pruning, intensive mulching, biological control, sustainable use of native fruits and nuts, managed regeneration, enrichment, agroforestry, seed and seedling collection and planting, beekeeping, handicrafts, backyard home gardens, efficient cook stoves, drip irrigation, small underground dams (zero base) and rainwater capture and storage, among others.

The project will promote SLM, SFM and FLR to reduce deforestation and increase vegetation cover through regeneration, supporting and enriching the biodiversity of the Caatinga biome. The restoration of degraded areas in ASD requires a variety of social and technical approaches to conservation and restoration at a landscape scale with full involvement of local communities and governments.

The project will follow a market analysis and development approach to identify opportunities for integration of biodiversity-based products (non-wood forest products, NWFP) into the markets and sustain their production through INRM.

To help support economic and financial viability of sustainable production practices (INRM, SFM, FLR) in production systems, the project will promote a value chain approach. Improving the income opportunities derived from forest and agriculture products sourced from sustainably managed and restored lands is one way of providing incentives for local stakeholders to participate in sustainable management practices. Therefore, the project will support the development and strengthening of small-scale tree and forest product enterprises to support livelihoods and helping broadening local income

opportunities. Capacity for owners and managers of such enterprises will be built to integrate environmental sustainability, economic viability and social sustainability and provide equitable, gender-balanced benefits. A tool designed to assist in such integration is Market Analysis and Development (MA&D)¹⁴, which has been developed by FAO as a participatory training approach to assist local people in developing income-generating enterprises while conserving tree and forest resources. The development of small and medium-sized enterprises can be facilitated by microloans and/or credits and existing Government policies and private supporting schemes, Supportive structures such as networks of producers and buyers and certification schemes will be explored and developed further.

The project will address the lack of capacities in terms of: i) INRM in the wider landscape and the value chain approach; (2) SFM; 3) FLR, by supporting awareness-raising and extension activities, as well as the interface between research/policy and farmers - which at present is weak in the Caatinga.

Regarding land degradation, the project will apply the "land degradation neutrality" approach, i.e. maintaining or improving the condition of global land resources through sustainable land management and restoration, with the overall goal of conserving healthy and productive land resources over time, in line with national sustainable development priorities related to poverty reduction, gender equity, food and water security and climate change adaptation and mitigation.

Local implementing agencies will help disseminate best SLM, SFM and FLR practices throughout the ASD, beginning with the priority areas identified by state action plans. The involvement of the states in implementing the project will strengthen institutional capacity and knowledge within the ASD to promote best practices for local development and "living in harmony (*convivência*) with semi-aridity," the new philosophy for drylands in Northeast Brazil, and to promote water, food and energy security and conservation of biodiversity in an inclusive manner.

The project will strengthen environmental governance by involving governments, civil society organizations and academia. It will use existing organizational structures and instruments to strengthen the implementation of the National Action Plan (NAP) to Combat Desertification in Brazil, without establishing new and additional structures. Administration will require coordination between the NAP Director based in Brasília and corresponding anti-desertification structures in each of the states, especially the focal points of the state action plans. This will strengthen the outreach and the effectiveness of the National Commission to Combat Desertification (NCCD).

In addition, the project will adopt a strategic integrated approach together with an ongoing project of the Department to Combat Desertification (DCD) of the Secretariat of Extractivism and Sustainable Rural Development (SEDR) of the Ministry of Environment (MMA) and the Inter-American Institute for Cooperation in Agriculture (IICA), as well as three other GEF projects through the United Nations Development Program (UNDP), seeking synergy and complementarity and taking due care to avoid duplication:

The GEF-UNDP Small Grants Program (SGP), known in Brazil as the *Programa de Pequenos Projetos Ecossociais* (PPP-ECOS), in operation since 1995, is one of the possible channels

¹⁴ www.fao.org/forestry/enterprises/25492/en.

of replication within the Caatinga, the Cerrado and adjacent parts of the Amazon. With sufficient funding, it could issue specific calls for proposals regarding desertification, biodiversity conservation and reduction of carbon emissions. If possible, these calls could be supported with resources from international donors, foundations, private sector, banks and development instruments of federal and state governments.

The UNDP/GEF Project “Mainstreaming Biodiversity Conservation and Sustainable Use into NTFP and AFS production practices in Multiple-Use Forest Landscapes of High Conservation Value,” through the Genetic Resources and Biotechnology Center (CENARGEN) of the Brazilian Agricultural and Livestock Research Company (EMBRAPA), approved in 2015, will generate detailed biological and economic data in three biomes (Caatinga, Cerrado and Amazon), without spatial overlap with the REDESER project, but with valuable technical information on sustainable use of biodiversity.

The UNDP/GEF Project “*Sustainable Land Use Management in the Semiarid Region of Northeast Brazil (Sergipe)*” which is led by the Ministry of Environment, has been designed by the same project team in coordination with the present proposal. The project aims at strengthening the governance framework strengthened to avoid, reduce and revert land degradation in the State of Sergipe, and to strengthen extension services, support the availability of best practice models and financing to increasing SLM adoption in Sergipe and reduce land degradation, especially in the Alto Sertão region in the western part of the state.

Since field activities would not be feasible in all the nine states covering 734,478 km², the strategy led to selection of four target areas in accordance with the priorities previously identified in the state action plans. Additional selection criteria for purposes of the project include: institutional support, biological diversity, being representative, potential for replication, accessibility, partnerships and institutional arrangements at the local level. The selected clusters of municipalities, called here Araripe, Seridó, Uauá and Xingó, are located in the deep hinterlands of five states (Ceará, Paraíba, Rio Grande do Norte, Alagoas and Bahia). In the eight micro-regions covered by the influence of the project, there are 80 municipalities, of which 14, with 904,142 ha, have been selected for concrete activities at specific sites in the field, in four clusters (Table 2.1). Data are available for municipalities, but not for individual properties or areas within them.

Table 2.1. Clusters of municipalities selected for direct project action in the field.

Targeted area	State	Municipality area (in km ²)	Municipality area (in hectares)
MR Alagoana S.F			
Delmiro Gouveia	AL	322.26	32,226
Olho d'Água do Casado	AL	608.49	60,849
Piranhas	AL	408.11	40,811
Sub total		1,338.87	133,887
MR Araripe			
Crato	CE	1,176.50	117,650
Barbalha	CE	559.51	55,951
Jardim	CE	552.42	55,242

Sub total	CE	2,288.43	228,843.40
MR E.da Cunha			
Uauá	BA	3,025.23	302,523.0
Sub total	BA	3,025.23	302,523
MR Seridó (PB)			
Santa Luzia	PB	455.97	45,597
São Mamede	PB	530.76	53,076
Várzea	PB	190.30	19,030
Sub total	PB	1,177.02	117,702.30
MR Seridó (RN)			
C. dos Dantas	RN	245.04	24,504
Equador	RN	265.59	26,559
Parelhas	RN	512.69	51,269
Santana do Seridó	RN	188.55	18,855
Sub total	RN	1,211.87	121,187.00
Sub total (PB+RN)		2,388.89	238,889.30
Total		9,041.42	904,142.20

Araripe. The micro-region of Araripe, located in the southern extreme of the state of Ceará, covers 36 municipalities with an area of 16,250 km². The three municipalities selected for field activities are Crato, Barbalha and Jardim, with an area of 2,288 km². They are subject to deforestation pressure due to agricultural expansion, mainly for the formation of pastures, with severe signs of soil degradation. There are isolated Cerrado ecosystems and transitions. The micro-region is important to the regional economy because its main economic base is gypsum, accounting for 95% of Brazil's production of plaster. It is also subject to the impacts of ceramic industries that produce bricks and tiles and exert strong pressure on natural resources, especially biomass (fuelwood), water and clay. The population is 203,439, of which 55,507 are rural and 103,987 live in poverty. The average monthly family income is USD 282. The regional socio-economy also includes extractive activities such as wild harvesting of pequi fruit for food and babassu palmnuts for oil. The production of cassava, combined with other informal economic activities, contributes to the process of degradation of biodiversity. The Federal University of Ceará has a campus in Crato. Project initiatives will promote sustainable development combining forest production and biodiversity conservation in and around one of the Caatinga's largest protected areas, Chapada de Araripe Environmental Protection Area (EPA), covering 972,590 ha., including the Araripe-Apodi National Forest.

Seridó. The Seridó region, one of the four official nuclei of desertification in the Northeast, includes parts of the states of Rio Grande do Norte and Paraíba. In Rio Grande do Norte, it includes the Western Seridó, Eastern Seridó and Serra de Santana micro-regions, covering 13,000 km², or 25% of the state. The adjacent Seridó of Paraíba, across the state border to the south, is comprised of two micro-regions, East and West Seridó, with a total area of

4,347 km². The Patos micro-region includes the municipalities of Patos, Santa Terezinha and Cacimba de Areia. According to the Paraíba state action plan of 2011, the Seridó portions of the states of Paraíba and Rio Grande do Norte are undergoing the same degradation processes. For the REDESER project, the three municipalities selected in Paraíba are Várzea, São Mamede and Santa Luzia and the four in Rio Grande do Norte are Parelhas, Equador, Santana do Seridó and Carnaúba dos Dantas. These seven municipalities cover an area of 2,388 km² with a population is 329,536, of which 74,344 inhabitants are rural and 166,666 live in poverty. The average monthly family income is USD 289.

Uauá. In northeastern Bahia, the micro-region of Euclides da Cunha has nine municipalities and an area of 19,500 km², while the project will carry out field activities specifically in the municipality of Uauá, with an area of 3,025 km². The municipality was chosen because of strong pressure on land use, advanced levels of degradation, low levels of human development and high potential for use of native fruits. The population is 24,294, of which 13,533 inhabitants are rural and 16,397 live in poverty. The average monthly family income is USD 218. In 2010, Uauá was ranked 4,029 among the 5,565 Brazilian municipalities with regard to the Municipal Human Development Index (HDI-M). The micro-region has unique experiences with traditional landscape management based on extensive livestock production combined with NTFPs such as the emblematic Caatinga fruits called umbu and licuri.

Xingó. In the extreme west of Alagoas, where the micro-region of the São Francisco Hinterland covers 1,203 km², the project will carry out field activities in its three municipalities, which are Piranhas, [Delmiro Gouveia](#) and [Olho d'Água do Casado](#). The population is 79,632, of which 27,562 are rural and 45,742 live in poverty. The average monthly family income is USD 218. The municipality of Piranhas has a sustainability training center and Delmiro Gouveia has a campus of the Federal University of Alagoas. Field activities will be carried out primarily in Piranhas, with an area of 408 km². The degradation of the Caatinga is due in large part to harvesting of wood for production of charcoal as well as burning to open pasture for livestock (goats, cattle and sheep) and subsistence farming. The state action plan of Alagoas concluded that the shortfall in sustainable management practices of vegetation, land and reforestation is due to the lack of training of stakeholders and dissemination of best practices. Extractive activities in the Xingó area are marked by conflict since the installation of Natural Monument of the São Francisco in 2009. Natural Monuments (MONATs) are one of the categories of integral protection conservation units the National System of Nature Conservation Units (SNUC) established in 2000. They are intended to preserve natural sites that are rare or unique or have outstanding scenic beauty, as is the case of the São Francisco canyons.

2.2 PROJECT OBJECTIVE

The project objective is to halt and reverse environmental degradation in areas susceptible to desertification (ASD), ensuring the flow of ecosystem services, promoting the integrated management of natural resources, generating environmental benefits and contributing to poverty reduction.

2.3 EXPECTED PROJECT OUTCOMES

The expected project outcomes are:

Outcome 1.1: INRM has been mainstreamed and scaled up at landscape level.

The targeted project value for this outcome is 904,142 ha., No baseline exist. Assessment of the practices and experiences of the production systems and across market value chain (in the project area will be undertaken at the onset of the project using appropriate assessment tools with local experts). The project will result in 20% increase in purchase of NTFPs by institutional markets and technical guidance for state environmental agencies. Guidelines will be developed for identification and evaluation of INRM systems and 100 technical staff trained and prepared to use the guidelines and conduct the assessment.

Outcome 2.1: Forest areas under multi-purpose Sustainable Forest Management (SFM) have been increased

The targeted project value for this outcome is 15,000 ha under multiple-use forest management, starting from 1,712 ha in the project area.

Outcome 3.1: Seed/seedling production capacity improved to support restoration of degraded lands in ASD

The targeted project value for this outcome is an increase by 20% of nurseries production improved and registered (legal), as well as capacity developed on seed and seedling production good practices and registrations standards for 1600 personnel of the tree nursery network.

Outcome 3.2: Forest connectivity sites have been defined, sustainably managed and restored.

The targeted project values for this outcome are 30,000 ha of new forest connectivity through restoration of degraded land, innovative and appropriate forest regeneration, enrichment and planting techniques.

Outcome 4.1: Improvement in capacity of key state and municipal institutions about LD and desertification.

The targeted project value for this outcome is increased capacity and knowledge of the 270 personal working in the 14 Municipalities and the 9 ASD states and beyond project sites and a strong network established for information sharing and dissemination on land degradation and desertification issues and how to address them through SLM, SFM and FLR.

Outcome 4.2: Policy-makers and farmers, private sector and education stakeholders have capacity to implement SFM, FLR, INRM and biodiversity conservation

The targeted project values for this outcome are increased production and use of education, extension and dissemination materials (3 videos, 48 radio spots, 9 events with family farmers, distribution of 5,000 booklets to educational institutions, new editions of 5 books and 10 technical or exchange events).

Outcome 5.1: Synergy with complementary initiatives to promote sustainable management and restoration benefits

Outcome 5.2: Project implemented with results-based management and application of findings/lessons learnt

2.4 PROJECT COMPONENTS, OUTPUTS AND ACTIVITIES

In order to provide an initial overview, all the project components, outcomes, outputs and activities are listed in Table 2.2. The outputs and activities, as well as the respective baselines and targets, are explained in more detail in subsequent paragraphs and in Appendices 1 and 2.

Table 2.2. Project components, outcomes, outputs and activities.

Component 1 - Promoting Integrated Natural Resource Management (INRM) in Production Landscapes	
Outcome 1.1 – INRM mainstreamed and scaled up at landscape level	
Output 1.1.1 INRM best practices identified, evaluated and up-scaled at farm and landscape levels (Target: 904,142 ha)	Activity 1.1.1.1 Inventory and analysis of best traditional and improved INRM practices
	Activity 1.1.1.2 Organization and implementation of a geo-referenced database of best practices
	Activity 1.1.1.3 Seminar about INRM practices for ASD professionals dealing with credit, technical assistance and rural extension regarding natural resource management
	Activity 1.1.1.4 Publication and dissemination of organized data on-line and printed
	Activity 1.1.1.5 Replication of best practices in selected project areas within the 904,142 ha
Output 1.1.2 Non-Timber Forest Products (NTFP) from INRM incorporated in government programs and projects and local agro-industries	Activity 1.1.2.1 Identification and evaluation of main NTFP supply chains in project areas using FAO's Market Analysis and Development methodology
	Activity 1.1.2.2 Identification of the potential for creating added value for NTFP supply chains
	Activity 1.1.2.3 Strengthening local organizations for the management of agro/forestry-based industries
	Activity 1.1.2.4 Identification and execution of marketing studies and business plans for development and

	strengthening of microenterprises based on sustainable production and marketing of identified NTFPs
	Activity 1.1.2.5 Regional seminars on credit and finance, including agro-industrial /NTFPs production and markets
Output 1.1.3 Capacity for identification, evaluation and promotion of INRM systems strengthened at state-level departments, agencies and banks.	Activity 1.1.3.1 Natural resource management course for extension workers with the participation of public educational institutions
	Activity 1.1.3.2 Training seminars on federal and state environmental legislation affecting natural resource management, including the new Forest Law
Component 2 - Promoting Multiple-Use Forest Management	
Outcome 2.1 - Forest area under SFM have been increased	
Output 2.1.1 Innovative small- and large- scale SFM practices identified, evaluated and replicated in selected experimental areas (Target: +15,000 ha)	Activity 2.1.1.1 Seminars with project partners to design sustainability criteria for forest management plans
	Activity 2.1.1.2 Forum involving government and civil society stakeholders about ways to simplify rules so as to enable SFM up-take and dissemination
	Activity 2.1.1.3. Identification of 6 sites for SFM demonstration and development of management plans for the selected sites
Output 2.1.2 Support for the development of multiple-use SFM supply chains	Activity 2.1.2.1 Identification of innovative SFM practices
	Activity 2.1.2.2 Seminars on sustainability criteria and forest management plans preparation with project partners
	Activity 2.1.2.3 Permanent forums for SFM simplification processes and support for developing management plans
	Activity 2.1.2.4 Expansion of the scope of the National Family and Community Forest Management Program to cover more areas in ASD
Output 2.1.3 Guidelines developed for SFM practices and monitoring protocols at local level	Activity 2.1.3.1 Identification and systematization of existing guidelines for SFM
	Activity 2.1.3.2 Workshops to review guidelines and generate practical recommendations for SFM
	Activity 2.1.3.3 Strengthening the Caatinga Forest Management Network with data generated in the monitoring of SFM activities in project areas
Component 3 – Forest and Landscape Restoration	

Outcome 3.1 - Seed and seedling production capacity improved to support restoration of degraded forests and lands in ASD	
Output 3.1.1 Smallholders and public nurseries in ASD legalized with improved native seed and seedling production	Activity 3.1.1.1 Working group to identify and update data on forest seed collectors in ASD
	Activity 3.1.1.2. Assessment of the 165 nurseries in ASD according to tree nurseries technical and registration standards
	Activity 3.1.1.3. Based on outcomes of activity 3.1.1.3., selection of 35 tree nurseries for support for registration and improvement of production practices
	Activity 3.1.1.2 Support for marketing of forest seeds and seedlings through websites, information bulletins of seed production associations and participation in agricultural and industrial fairs
Output 3.1.2 Seed collectors and nursery personnel trained and registered in National System of Seeds and Seedlings (SNSM)	Activity 3.1.2.1 Identification of agents for processing of forest seeds and seedlings
	Activity 3.1.2.2 Training for seed collectors to improve technical capacities and comply with official standards
	Activity 3.1.2.3 Installation of equipment for seed collectors
	Activity 3.1.2.4 Support for seed collection in order to comply with federal requirements
	Activity 3.1.2.5 Training for seed collectors and nursery personnel on legal issues required for professional regularization
Output 3.1.3 Practical guidelines for FLR in ASD are developed and adopted by stakeholders	Activity 3.1.3.1 Seminar on FLR in ASD organized for the presentation of the FAO global guidelines on restoration of degraded forests and landscapes in drylands and their adaptation to the national context with local experts and stakeholders
	Activity 3.1.3.2 Compilation of good restoration practices and case studies for dissemination
	Activity 3.1.3.3 Development of adapted practical guidelines for restoration of dryland forests and landscapes in ASD
Outcome 3.2 - Forest connectivity sites have been defined, sustainably managed and restored	
Output 3.2.1 Appropriate sites identified and restoration plans under implementation for restoration and establishment of forest connectivity using cost-effective and adapted restoration techniques (assisted natural	Activity 3.2.1.1 Selection of potential sites for promoting corridors and connectivity
	Activity 3.2.1.2 Design of the restoration plan together with government and CSO for restoration of the selected degraded forest to establish connectivity among fragments

regeneration, enrichment and planting)	
Output 3.2.2 Participatory projects for restoration of degraded lands and improvement of production landscapes and land-use practices	Activity 3.2.2.1 Methodological proposal for sustainable production landscapes through local participation
	Activity 3.2.2.2 Training in agroforestry systems for large landowners and family farmers in order to provide connectivity among the islands of biodiversity
	Activity 3.2.2.3. Identification of potential areas for replicating assisted natural forest regeneration innovations in land reform settlements
	Activity 3.2.2.4. Assessment of current initiatives carried out by rural extension and development institutions
	Activity 3.2.2.5 Support to interested framers and producers in developing restoration projects for funding under Government and appropriate schemes
Component 4 – Knowledge Management, Capacity Development and Awareness-Raising	
Outcome 4.1 – Improvement in capacity of key state and municipal institutions about LD and desertification	
Output 4.1.1 Strengthened learning and action networks facilitating field exchanges in ASD	Activity 4.1.1.1 Identification of institutions, programs, projects and networks promoting actions to prevent and combat LD and desertification through SFM, INRM and FLR in ASD
	Activity 4.1.1.2 Training for multiplier agents in partner institutions in ASD
	Activity 4.1.1.3. Establishment of an on-line database network to be hosted at INSA for exchange of information , knowledge and projects relevant to ASD issues
Outcome 4.2 - Policy-makers and farmer, private sector and education stakeholders are better informed about SFM, FLR, INRM and biodiversity conservation	
Output 4.2.1 Guidelines and briefs developed based on best practices and lessons learned on SFM, FLR and INRM in ASD	Activity 4.2.2.1 Promotion of events and exchanges for discussing technical regulations for SFM, FLR and INRM
	Activity 4.2.2.2 Transformation of best practices into technical guidelines for SFM, FLR and INRM (linked to activity 3.1.3.3).
Output 4.2.2 ASD academic community engaged against LD and desertification	Activity 4.2.2.1 Inventory of relevant scientific publications on LD and desertification in ASD
	Activity 4.2.2.2 Seminar for presentation of material collected in the inventory
	Activity 4.2.2.3 Organization, reprinting and distribution of selected materials to key educational institutions with suggestions to include them in curricula

Output 4.2.3 Increased Awareness about SFM and FLR practices in ASD	Activity 4.2.3.1 Media production documenting approaches and best practices and impacts in project selected sites
	Activity 4.2.3.2 Implementation of media production in the project selected sites
	Activity 4.2.3.3 Systematization of media production and presentation of results at two events (micro-regional and ASD regional level)
Component 5 - Coordination with Other Initiatives, Monitoring and Evaluation	
Outcome 5.1. Synergy established with complementary initiatives to promote sustainable management and restoration benefits at landscape level	
Output 5.1.1. Effective collaboration with complementary initiative	Activity 5.1.1.1: Coordination meetings with other GEF-financed projects in ASD of Brazil
Outcome 5.2: Project implemented with results-based management and application of project findings and lessons learned	
Output 5.2.1 Project M&E system operational providing information on progress in meeting project outcome and output targets	Activity 5.2.1.1 Coordination among project participants and stakeholders Activity 5.2.1.2 Collection and organization of data needed for monitoring and evaluation Activity 5.2.1.3. Narrative progress and terminal reports prepared on-time
Output: 5.2.2 Mid-term and final evaluations conducted, project best practices and lessons learned published and disseminated	Activity 5.2.2.1 Mid-term evaluation after the first 24 months of project implementation Activity 5.2.2.2 Terminal evaluation completed within three month of project conclusion Activity 5.2.2.3 Publication and dissemination of best practices and lessons learned Activity 5.2.2.4 Preparation of appropriate exit strategy for continuity in the future

Component 1 - Promoting Integrated Natural Resource Management (INRM) in Production Landscapes

In this component, INRM practices based on traditional as well as innovative systems incorporating conservation and integrated management of biodiversity will be identified and evaluated according to their suitability to the environmental, social and economic conditions of the Caatinga. Viable and successful production systems will be replicated. In

the dissemination strategy, the civil society and local state agencies described in Sub-section 1.1.3 above will be involved. Agricultural and non-timber forest products from areas carrying out best practices will be channeled into government programs such as the National Program for Strengthening Family Agriculture (PRONAF), the school lunch program (PNAE), the food acquisition program (PAA) and the Minimum Price Guarantee Program for Family Agriculture (PGPM). They will also be promoted through local industries, strengthening market linkages as important drivers for further expansion. These actions will generate associated economic benefits and increase confidence of local communities and farmers to adopt sustainable practices. According to the experience gained, proposals for public policies and criteria will be developed to identify, evaluate and adjust INRM systems.

Outputs 1.1.1, 1.1.2 and 1.1.3 will help achieve Outcome 1.1. The expansion of traditional and improved INRM systems will include a wide range of SLM and SFM systems together with other improved production practices that have potential to generate and increase positive flows of ecosystem services and socio-economic benefits, contributing to sustainable production in the diverse environmental and social conditions in ASD.

An overview of the best INRM systems will be prepared in connection with each of the state action plans in the ASD. The project will strengthen government departments and agencies by training personnel in the formulation and dissemination of appropriate technical guidelines for INRM.

The process of making INRM available in ASD includes identification, analysis and evaluation of traditional and improved SFM and SLM. The project will make use of a broad range of extension practices carried out by numerous institutions and farmers' networks described in Sub-section 1.1.3 of this Project Document.

Output 1.1.1 - INRM best practices identified, evaluated and up-scaled at farm and landscape levels

In Project Year (PY) 1, this output will summarize the state of the art of existing traditional and improved INRM systems in drylands and their economic, social and environmental costs and benefits. Important sources of data will include the Mandacaru and Drylands Champions program carried out by the Brazilian Institute of Development and Sustainability (IABS) and studies by the Inter-American Institute for Agricultural Cooperation (IICA). Data will be included in INSA's System for Management of Information and Knowledge on the Brazilian Semi-Arid (SIGSAB). SLM and SFM best practices (see Section 2.1 below) will be systematized and analyzed. One key issue in the Caatinga is sustainability of harvesting of fuelwood and its impacts on net carbon emissions. Another key issue is foraging for cattle and goats in forest and reforested areas and use of pruning to reduce height. Direct sowing of seeds or transplanting of seedlings collected in the wild will be compared with planting of seedlings acquired from registered nurseries. In PY2, PY3 and PY4, the selected systems will be tested in at least in two sites to be selected in each project area in the interior of the ASD and adjusted taking into account the monitoring and evaluation of results.

Based on surveys among farmers, further replication of SLM and SFM in the Caatinga hinterlands will be conducted in PY3 and PY4 in the same or neighboring municipalities

in collaboration with local farmers and partner organizations, encouraging wide dissemination and exchanges among communities, using techniques such as farmer-to-farmer training, action research and the sustainable livelihoods approach.

Output 1.1.2 - Non-timber Forest Products (NTFP) from Integrated Natural Resource Management (INRM) incorporated in government programs/projects and local agro-industries

Promotion of NTFPs will be based on guidelines of the National Plan to Promote Socio-Biodiversity Products that emphasize: a) conservation and sustainable use; b) rights of access of traditional peoples and communities and family farmers to biodiversity resources; c) fair and equitable sharing of benefits; d) cultural diversity and traditional knowledge.

Output 1.1.2 will cover the following activities: i) in-depth assessment of specificities of NTFP supply chains and credit and financial mechanisms in ASD; ii) identification of industrialization options through partnerships with MDA, MDS, MMA and CONAB; iii) assessment of regulatory frameworks that limit access to credit and investment for family farming, women, youth and traditional peoples and communities. The target is to increase government purchases through the Food Acquisition Program (PAA) and the National School Lunch Program (PNAE) by 20% by PY4, with 35 local organizations having consolidated or initiated sales flow to these institutional markets. It may be necessary to disseminate NTFPs used for household consumption widely and to concentrate NTFPs sold to markets in a smaller number of areas in order to achieve scale and avoid market saturation. Combinations of NTFPs will be chosen considering their compatibility in terms of ecology, demands for labor, markets etc.

The study on credit and financing and regulatory frameworks of at least four NTFPs will be conducted in PY1 by a short-term consultant or expert provided by co-financiers. The assessments will be discussed and validated in regional workshops and a final seminar to formulate specific recommendations for changes in existing processes. Between PY2 and PY4, dialog with the MDA, MAPA, MDS, MMA, IBAMA, INCRA, BNDES, BNB, BB, ICMBio, SFB, cooperatives and local associations, municipalities, labor unions and private companies will be undertaken to improve NTFP and agroforestry credit lines and regulatory frameworks. The project will support the dissemination of information on regulatory frameworks and new lines of credit for cooperatives, associations and trade unions to promote awareness and increase the interest of potential beneficiaries. This will be done in close coordination with the EMBRAPA/UNDP/GEF project *“Mainstreaming Biodiversity Conservation and Sustainable Use into NTFP and AFS production practices in Multiple Use Forest Landscapes of High Conservation Value,”* which will generate detailed biological and economic data in three biomes.

Output 1.1.3 - Capacity for identification, evaluation and promotion of INRM systems strengthened at state-level departments and agencies

Output 1.1.3 will promote awareness among institutional personnel among key stakeholders by using project funds and leverage on other sources to: a) create high-level educational opportunities through provision of scholarships and stipends; b) upgrade forest management capacities by integrating training that emphasizes social, economic

and cultural aspects of ASDs; c) provide training on forest legislation and administration according to the new Forest Law; d) train government staff at environmental agencies and CSOs to disseminate knowledge on NTFPs and agroforestry and the relevant regulations.

The target is to reach 100 technical staff in nine states through INSA and the respective state environmental agencies. Additional co-financing from other sources will be sought when necessary.

Component 2: Promoting Multiple-Use Forest Management

Based on knowledge about relevant experiences of multiple-use forest management in the Caatinga, as well as the Cerrado, Amazon and Atlantic Forest, Component 2 will promote innovative SFM practices in coordination with civil society and extension agencies (see Sub-section 1.1.3 above). On-farm technical assistance will be provided to ensure successful implementation of best practices and effective changes in forest management regimes.

Through existing government programs and policies, the activities for Outcome 2.1 will support wider dissemination of productive activities that generate global environmental benefits in terms of soil structure, levels of moisture content and biodiversity conservation as well as socio-economic benefits such as increased food security.

Activities will help strengthen state environmental agencies' capacities to improve licensing, inspection and technical assistance, conditions which determine the extent to which SFM can be sustainably implemented at broader scale. This component will promote dissemination of the requirements of the new Forest Law and the need to submit declarations on land use in all rural properties to the Rural Environmental Registry (CAR), which will become a condition for accessing credit in 2017.

Output 2.1.1: Innovative small- and large-scale SFM practices identified, evaluated and replicated in selected forest management and experimental areas

In PY1, project experts, in consultation with specialists and practitioners, will assess the technical, economic and social feasibility of SFM practices in the Caatinga and analyze the various kinds of bottleneck that hinder their implementation. The most promising practices will be implemented in six demonstration areas at four sites and lessons learned will be extracted.

The selection of sites for promotion of SFM will take into account the following criteria: a) the contribution of SFM plans to reducing forest fragmentation and providing connectivity among forested areas; b) conservation of biodiversity hotspots in the Caatinga; c) potential use of SFM for sustainable energy production; d) land reform settlements; e) mitigation of and adaptation to climate change and drought.

In PY2 and PY3, the SFM practices regarding fuelwood will be replicated in six sites in the same or adjacent municipalities. The whole process of mainstreaming SFM will promote the integration of extension activities in land reform settlements, family farming and joint activities with SFB, INCRA and state environmental agencies.

Output 2.1.2: Support for the development of multiple-use SFM supply chains

Main activities include identification of SFM innovations, sharing information on sustainability criteria that are necessary to improve government regulations for SFM protocols and simplification of SFM procedures. By implementing this output, the project will expand the National Program of Community and Family Forest Management (NFCFM) in the Caatinga and Cerrado, supporting its expansion and qualifying activities according to the results of field assessments and the priorities of NAP Brazil and state action plans.

Technical support and policy cooperation will be provided for development and implementation of management plans for the Araripe-Apodi National Forest, the Chapada de Araripe Environmental Protection Area (EPA), and the São Francisco Natural Monument (MONAT) by the responsible environmental authorities so that by the end of the project the NTFPs from these protected areas and buffer zones can be licensed and marketed.

Output 2.1.3: Guidelines developed for SFM practices and monitoring protocols at local level

Guidelines regarding SFM best practice protocols for monitoring the results of their adoption will be developed in connection with Component 1 activities on SFM practices identification and assessment.

On the basis of recognized experience and validation, extension materials will be prepared to disseminate adapted SFM practices that are well-suited to the peculiarities of the region.

The project will strengthen the Forest Management Network database providing inputs of data from managed forests in accordance with sustainable production principles.

Component 3 - Forest and Landscape Restoration

This component aims at restoring degraded areas so as to provide connectivity among forest fragments as well as strengthening of a regional forest seed network to provide for the sustainable supply of native seeds to meet restoration needs. This will be accomplished through cooperation among the MMA, Degraded Land Recovery Centers (CRADs), the Semi-Arid Network (ASA) and initiatives such as the Caatinga and Cerrado Forest Seeds Network. The project will identify human resources for training of seed collectors and nursery workers so that they can be part of the National System of Seeds and Seedlings (SNSM).

This component will identify degraded areas for forest restoration, taking into account which areas can provide connectivity among forest remnants. Participatory plans will be prepared for landscape restoration. The socio-economic needs of the communities involved will be taken into account. Care will be taken to favor choice of species that best suit the needs of local communities and the conservation of biodiversity. Forest restoration techniques will include farmer-managed natural regeneration, forest enrichment, direct sowing, planting of seedlings or shoots and use of native species that facilitate soil recovery and the return of native fauna, including pollinators and seed

dispersers as well as production of NTFPs and other goods and services. Species and areas to be restored will be selected with local farmers and stakeholders as appropriate.

Output 3.1.1: Smallholders and public nurseries in ASD legalized with improved native seed and seedling production

This output seeks to ensure the provision of seeds and seedlings for Caatinga and Cerrado species for restoration of degraded lands and natural enrichment. Seeds are especially important because of lower costs for production, acquisition and transportation, lower losses from mortality, potential for decentralization and suitability for poor soils in drylands. A working group will be created with representatives of the MMA and Reference Centers for Recovery of Degraded Areas (CRADs), among others. The working group will identify forest seed collectors and processors in the Caatinga, updating existing information on species, dissemination, handling procedures, cost and integration in government programs as well as identifying staff training needs.

In PY1, PY2, PY3 and PY4, 15 seed collectors will be trained each year, one forest seed area will be implanted and one annual seed collector event will be supported through the various project partnerships.

Output 3.1.2: Seed collectors and nursery personnel trained and registered in the National System of Seeds and Seedlings (SNSM)

This output seeks to ensure the production of seedlings of Caatinga and Cerrado forest species (including trees, shrubs and grasses). For this purpose, surveys of forest nurseries and their capacities will be carried out in the ASD. With the working group, the state of the art of nursery production will be examined to identify bottlenecks and ways of improving seedling production. The surveys will provide inputs to support training plans and creation of a training program for the production of native species according to the requirements of the SNSM.

Output 3.1.3: Practical guidelines for FLR in ASD are developed and adopted by stakeholders

This output involves a seminar on FLR in ASD organized for the presentation of the FAO Global Guidelines for the Restoration of Degraded Forests and Landscapes in Drylands and their adaptation to the national context with local experts and stakeholders.

The output also includes compilation of best restoration practices and case studies for dissemination, as well as development of adapted practical guidelines for restoration of dryland forests and landscapes in ASD.

Output 3.2.1 - Appropriate sites identified and restoration plans under implementation for restoration and establishment of forest connectivity using cost-effective and adapted techniques (assisted natural regeneration, enrichment and planting)

Potential areas for establishing biological connectivity among forest remnants will be selected taking into account criteria such as biodiversity vulnerability, political and

economic feasibility and co-financing opportunities. Additional co-financing will be sought from public and private companies, including those that are required to provide environmental compensation, such as the São Francisco Project and the Trans-Northeastern Railroad, as explained in Sub-section 1.1.5 of this Project Document.

Output 3.2.2: Participatory plans for restoration of degraded land and improvement of production landscapes and land-use practices

Using various sources of support, especially those related to implementation of the new Forest Law, participatory restoration projects will be defined for each of the selected areas following the results of field surveys aimed at: a) identification of degraded lands suitable for restoration; b) identification of organized groups of local farmers interested in restoration of ecologically sensitive sites; c) guidance on identifying, planning and formulating participatory projects to reverse deforestation and restore degraded areas.

The project will promote replication of best practices by local projects related to the recovery of productive landscapes in different ecosystems in the ASD, combining successful experiences with potential local projects and available sponsorship or co-financing.

Component 4 – Knowledge Management, Capacity Development and Awareness-Raising

Knowledge management and communication are essential for all components of the project, which will promote exchange of information among the different stakeholders, taking into account both technical and local knowledge as well as lessons learned from previous projects. It will use tools such as meetings, videos, booklets, manuals, posters, radio, television, internet and digital media, according to the most efficient and effective means for reaching specific audiences. Multiplier agents will be identified in each region in institutions that already work with farmers, government officials and local environmental agencies. Capacity development activities will include training through short-term demonstration events, field trips, seminars, workshops and courses. The project will also generate inputs such as scientific papers and policy briefs, especially through INSA, to influence decision-makers. Academic institutions will be involved because of their long-term role in providing professional training and environmental education to the public at large. These initiatives will provide a basis for a permanent knowledge exchange network.

The communication strategy involves women and their organizations in all projects activities so as to create awareness and reduce gender inequality. It will support women's contributions to the management of natural resources and ensure equity in access to information, knowledge, skills, resources and decision-making. The project will also reach out to youth and students as well as older generations, both men and women.

Component 4 will also provide decision-makers and farmers, private sector and education stakeholders with better information about best SFM, FLR, INRM and biodiversity conservation practices and the policies necessary for their dissemination, filling the existing knowledge gaps. Other actions include specific training of policy makers and

production and distribution of publications, including manuals on best practices in accessible language.

Output 4.1.1: Strengthened learning and action networks facilitating field exchanges in ASD

The relevant institutions, projects and programs in the project areas will be identified in order to plan the training of professionals and communities about diffusion of best experiences. At least 350 multiplier agents will be trained on how to give talks, participate in workshops and seminars, carry out technical visits and undertake training. Their training will be planned and implemented with local governmental and non-governmental agencies and institutions and will be funded by the co-financiers and other partner institutions. After four years, the project areas will have trained people in a position to disseminate the knowledge acquired and lead the exchange of experiences through the new network.

Output 4.1.1 will generate a sustained flow of appropriate information on best practices including websites (INSA, Cerratinga at ISPN, website at the Federal Rural University of the Semi-Arid) in PY1 as well as articles, courses workshops and forums.

Output 4.2.1: Guidelines and briefs developed based on best practices and lessons learned on SFM, FLR and INRM in ASD

Manuals on best practices for ASD that are easy to read and accessible to both rural people and professionals will be published. For this purpose, partner institutions and other channels will be identified to distribute the material. Its preparation will be based on an inventory of effective practices that can be replicated through integration of current regulations with best SFM and INRM practices. The target audiences will be government institutions, rural communities and cooperatives able to make use of the manuals in their respective regions. An additional benefit will be adjustments in the application of regulations of the state environmental agencies so as to promote best practices.

Output 4.2.1 will support the production and distribution of folders, videos, one institutional video, and radio spots. See more in Appendices 1 and 2.

Output 4.2.2: ASD academic community engaged against LD and desertification

The implementation of this output requires interaction with academic and research institutions and faculty and students working in ASD in order to achieve their support for the dissemination of best practices, which are poorly documented and diffused in public and private institutions. This process involves universities, institutes and foundations that can publicize LD and desertification issues among professors, students and the general public. The project will undertake an inventory of publications in the ASD with potential for achieving this purpose through reprinting and distribution. High-profile government agencies in the ASD such as National Department of Public Works against Droughts (DNOCS), Bank of North East (BNB), Company for the Development of San Francisco and Paraíba Valleys (CODEVASF), Hydro-power Company of San Francisco (CHESF) will be involved in the recovery of the most relevant scientific material. Courses will be

undertaken with the National Program for Access to Technical Training and Employment (PRONATEC) and the National Seed Network (RENASSEM).

The target for Output 4.2.2 is 1,000 booklets in PY1, 1,500 in PY2, 1,500 in PY3 and 2,000 in PY4, as well as two new editions of books in PY2, two in PY3 and one in PY4, as well as three events per year with researchers who do research on and interact with family farmers.

Output 4.2.3: Increased awareness-raising about SFM and FLR in ASD

This output involves generating media material of high quality on forest and landscape restoration practices that have proven to be effective in the regional context. The material should continue to be produced even after the project is over. It includes folders, brochures, institutional printed materials, radio programs and videos. The development of media material will be carried out with the support of co-financers such as government institutions, academia and civil society organizations, according to the demands of beneficiaries who will use the information.

The targets for Output 4.2.3 are four micro-regional events, one seminar to update media in PY1, one workshop to prepare a video on rural women and youth in PY2, one radio program for each micro-region in PY3 and, finally, exchange among micro-regions in PY4.

Component 5: Coordination with Other Activities, Monitoring and Evaluation

Output 5.1.1: Effective collaboration with complementary activities

Kindly see description of related initiatives under Section 4.1 below.

Output 5.2.1: Project M&E system operational providing information on progress in meeting project outcome and output targets

The targets for Output 5.2.1 are effective coordination of project activities with complementary initiatives and the local, state and federal levels so as to achieve the project objectives and provide the necessary information for monitoring and evaluation.

Output: 5.2.2: Mid-term and final evaluation conducted, project best practices and lessons learned published and disseminated

Output 5.2.2 involves carrying out the mid-term and terminal evaluations as scheduled, as well as publication and dissemination of project results and preparation of the appropriate exit strategies.

2.5 GLOBAL ENVIRONMENTAL BENEFITS

The project will provide multiple interdependent global environmental benefits. During the project lifetime and in the future the areas of avoided deforestation will contain more biodiversity, provide more connectivity, regulate hydrological cycles, reduce erosion and store additional carbon. Furthermore, the process of reversing deforestation will not only continue for many years to come, but also expand in geographical scope to many other

areas of Brazil, including those that are now undergoing change in the direction of becoming subject to desertification. The subject of sub-humidity, water scarcity and desertification – becoming ASDs – is now a major concern in central, southeastern and southern Brazil as well as parts of Bolivia, Paraguay, Uruguay and Argentina. In social terms, this process provides various eco-social synergies between environment and society, improving the resilience of the rural and urban population in ASDs. If the regional population were to migrate to coastal cities, where the state capitals are located, the impacts on both rural and urban emissions would be greater and they would be subject to rising sea levels.

Land degradation. Cleared land in the Caatinga is highly subject to water erosion in the rainy season and to wind erosion in the dry season. Clearing contributes to acceleration of surface runoff and therefore flooding downstream, which is now a serious problem in various cities of the Northeast, especially coastal cities located at the mouths of rivers. Plant cover is also essential for evapotranspiration to form new clouds to carry atmospheric moisture from the Atlantic to the hinterland parts of the Caatinga, even when there is not severe drought. The project target for SLM benefits set by the MMA is 904,142 hectares.

The involved government institutions and their local staff, civil society, and small and medium-scale rural farmers (see Table 1.5) will be supported to develop their capacities on SLM, INRM, SFM, FLR and BD conservation and sustainable use; and along with the FAO technical assistance will help deliver GEBs as detailed below. Targeted protected forests and buffer zones in the Caatinga are areas of global importance, as described in Section 1. The project will incorporate 904,142 hectares under integrated natural resource management through sustainable land management with maintained or increased forest cover. This includes: 1) 30,000 hectares of degraded forest and lands restored with native species and assisted natural regeneration; 2) 15,000 hectares under sustainable forest management plans; 3) 618,062 hectares of forest areas under multi-purpose SFM; 4) improvement of the conservation status of native fauna through restoration of forest connectivity between protected areas; 5) reduction of the pressures on forest ecosystems by production sectors through reduction of the deforestation rate (by 50% in the project area direct influence and by 30% in the area of indirect influence); 6) the increase of carbon stock during project direct lifetime through: i) conservation and enhancement of carbon in forests (30,000 hectares restored, 439,200 ton CO_{2eq} sequestered), and ii) avoided deforestation and forest degradation in project direct intervention areas (avoided emissions of 696,219 ton CO_{2eq} in 5,709 hectares and of 2,472,347 ton CO_{2eq} in project indirect influence area).

Moreover, other GEBs to be accrued by the project will include: i) the integration of globally-important BD conservation and sustainable use into specific management practices (i.e. restoration with native species in 30,000 hectares in Component 3); ii) the increase of connectivity among PAs (MONAT and EPAs) with a landscape approach; iii) the reduction of degradation of forests; iv) the increase of stakeholders' awareness on how to manage globally-important BD, through capacity development of stakeholders, participation, inter-institutional and intersectoral coordination, setting the basis for sustainability after project termination; v) the inclusion of sustainably produced NWFP in government projects and programs as well as local agro-industries. This pilot experience

may allow in the long-term, the adoption of production best practices throughout the whole Caatinga regions; vi) the financial sustainability of environmental-friendly production alternatives through the strengthening and articulation of the financial (e.g. banks) and non-financial (e.g. public purchase) incentive mechanisms – expected to be up-scaled in the whole province after project termination.

Biodiversity. It is highly probable that the majority of the 82 threatened species in the Caatinga are still present in the project sites. They include the indigo macaw (*Anodorhynchus leari*), the little blue macaw (*Cyanopsitta spixii*), found near Uauá, maracajá wildcats (*Leopardus wiedii*), suçuarana wildcats (*Leopardus pardalis*), three-banded armadillos (*Tolypeutes tricinctus*) and red bats (*Myotis ruber*). The threatened species of flora are listed in Appendix 8. Restoration will spread native plant species and overcome isolation of their gene pools in fragments, in addition to providing connectivity among fragments and reducing genetic erosion. Restoration will increase habitats, connectivity, forest cover and reduce contamination by pesticides and fertilizers. Since they are adapted to heat and drought, the Caatinga's native biodiversity as well as its agro-biodiversity are globally strategic in the context of global warming because they can be planted elsewhere, in areas that are already or are now becoming subject to desertification. The project will contribute to include the INRM approach in the globally significant Caatinga, which is unique in the world.

Table 2.4 summarizes the main global benefits to be accrued by the project.

Table 2.4
Summary of global environmental benefits to be delivered by the Project¹⁵

Global environmental benefits
<i>Biodiversity and ecosystem functions</i> <ul style="list-style-type: none"> • Increase in connectivity and habitats for biodiversity • Increase in forest cover and diversity of tree species • Reduction of pressures over native forests due to expansion of the agricultural and livestock frontier, and selective logging • Conservation of forest seeds and fauna species of global importance <i>Carbon benefits</i> <ul style="list-style-type: none"> • Avoided CO_{2eq} emissions • Carbon stored

Carbon benefits

Reduced Carbon Emissions and Increased Carbon Stocks

National and local institutions, local communities, NGOs and small-scale farmers will help deliver carbon benefits through the implementation of project activities. Therefore, the Project will have direct and indirect impacts on carbon stocks and will reduce CO₂ emissions. The following estimation has been calculated by using a defensive methodology – see below.

¹⁵ Please find specific quantitative and qualitative indicators in the Project Results Framework, Appendix 1.

Baseline information

Deforestation data in the Caatinga biome from MMA/IBAMA-CSR was used to calculate the annual forest area loss in Caatinga. There is information for the periods 2002 to 2008 (annual forest losses of 0.33% of total area) and 2008 to 2009 (annual forest losses of 0.23% of total area). This implies a deforestation of 15,893 ha per year and 11,077 ha per year respectively during 2002-2008 and 2008-2009 in the area of indirect impact (66 municipalities) and 2,984 ha per year and 2,080 ha per year respectively in 2002-2008 and 2009-2010 in the area of the project direct impact (14 municipalities).

The deforestation areas were detected by the Remote Sensing Center (CSR) of IBAMA for the period 2002 to 2008, as well as 2008 and 2009. The methodology applied to assess deforestation is available as described at http://www.mma.gov.br/estruturas/sbf_chm_rbbio/arquivos/relatorio_tcnico_caatinga_72.pdf (for the period 2002-2008) and http://www.mma.gov.br/estruturas/sbf_chm_rbbio/arquivos/relatorio_tecnico_caatinga_2008_2009_72.pdf (for the period 2008-2009).

The decrease in forest area losses observed in 2008-2009 compared to 2002-2008 might not be sustainable so for the estimates beyond 2009, it was considered more appropriate to use an average annual forest area loss as estimate as follows:

$(0.33 \times 904,142 \times 6 + 0.23 \times 904,142) / 7 = 2,855$ ha/year for the area of direct impact

and

$(0.33 \times 4,816,060 \times 6 + 0.23 \times 4,816,060) / 7 = 15,205$ ha/year for the area of indirect impact

Based on this information, the deforestation BAU scenario in the project area (direct and indirect) has been estimated as follows:

Table 2.5
Deforestation scenario (business-as-usual)
(Estimation for the project implementation period: 2015 – 2019)

	2005 (2002- 2008)	2009 (2008- 2009)	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Deforestation (ha/year) in area of direct impact	2984	2080	2855	2855	2855	2855	2855	2855	2855	2855	2855	2855
Deforestation (ha/year) in area of indirect impact	15,893	11,077	15,205	15,205	15,205	15,205	15,205	15,205	15,205	15,205	15,205	15,205

Note: the estimation of the deforestation from 2010 onwards was calculated as the average of the deforestation for the periods 2002-2008 and 2008-2009 as no information is available to demonstrate the sustainability of the decrease trends observed in 2008-2009).

The forest carbon density was calculated by using estimates provided by the FAO (FRA 2015 - Country report, Brazil) for Caatinga biome, which uses various references, with a conservative value of 33.3 t C/ha, including all carbon pools but soil (aboveground

biomass, belowground biomass, litter and deadwood), and an equivalent of 122.2 t CO_{2eq}/ha applying a factor Co_{2eq}/C of 3.66 (source IPCC, 2006).

FAO FRA 2015 Country report for Brazil is available at:

<http://www.fao.org/documents/card/en/c/6261857f-c0da-4f72-98fd-a18e9ca50509>

FRA 2015- Brazil report compiles the most reliable and updated sources of information on forest area losses and biomass estimates for Caatinga biome at publication date in 2015. It is expected that the estimates can be improved using results of the ongoing national forest inventory undertaken with support from GEF (*Strengthening National Policy and Knowledge Framework in Support of Sustainable Management of Brazil's Forest Resources* project), when available.

Based on this information, the baseline carbon and carbon dioxide emissions are presented in the Table 2.6 below.

Table 2.6: Carbon emissions and Carbon dioxide emission (business-as-usual)

	2005 (2002 – 2008)	2009 (2008- 2009)	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Area of direct impact												
Deforestation (ha/year)	2,984	2,080	2855	2855	2855	2855	2855	2855	2855	2855	2855	2855
Carbon emission (t C/year)	99,416	69,290	95,112	95,112	95,112	95,112	95,112	95,112	95,112	95,112	95,112	95,112
Carbon dioxide emission (t CO _{2eq} /year)	364,524	253,600	348,109	348,109	348,109	348,109	348,109	348,109	348,109	348,109	348,109	348,109
Area of indirect impact												
Deforestation (ha/year)	15,893	11,077	15,205	15,205	15,205	15,205	15,205	15,205	15,205	15,205	15,205	15,205
Carbon emission (t C/year)	529,553	369,082	506,629	506,629	506,629	506,629	506,629	506,629	506,629	506,629	506,629	506,629
Carbon dioxide emission (t CO _{2eq} /year)	1,941,694	1,350,841	1,854,261	1,854,261	1,854,261	1,854,261	1,854,261	1,854,261	1,854,261	1,854,261	1,854,261	1,854,261

Note: Using 33 t C/ha and a conversion factor of 3.66 for estimating CO_{2eq}.

The project will help reduce the pressures over the forests by implementing a Sustainable Forest Management strategy that includes:

- Reduction in the rate of deforestation through i) sustainable forest management plans (15,000 hectares), ii) forest restoration (30,000 hectares with native species), and iii) multi-purpose SFM in forest areas (618,062 hectares).
- Avoided deforestation and forest degradation (696,219 tonCO_{2eq} in 5,709 hectares)
- Enhanced forest carbon sequestration through i) restoration of forest connectivity sites and ii) recovering the forest cover of 30,000 hectares (439,200 tonCO_{2eq}).

In the alternative project scenario, business-as-usual CO₂ emissions will be reduced due to project interventions. Calculations are as follows:

Direct impacts

Avoided Emissions from Deforestation

Through the *Outcome 2.1: Forest areas under multi-purpose SFM have been increased* and the *Outcome 3.2: Forest connectivity sites have been defined, sustainably managed and restored*: These actions should half deforestation in the project area during the implementation period, and avoid deforestation of 5,709 ha of forests conserved by producers and communities, inside or around the agricultural systems, It is expected to promote a reduction of the emissions in amount of **696,219 t CO_{2eq}** (5,709 ha x 33.3 C/ha x 3.66) as indicated in the table 2.7 below.

Table 2.7: Avoided carbon emissions and Carbon dioxide emission (scenario with SFM)

	2005 (2002 – 2008)	2009 (2008-2009)	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Business as usual												
Deforestation (ha/year)	2984	2080	2855	2855	2855	2855	2855	2855	2855	2855	2855	2855
Carbon emission (t C/year)	99,416	69,290	95,112	95,112	95,112	95,112	95,112	95,112	95,112	95,112	95,112	95,112
Carbon dioxide emission (t CO _{2eq} /year)	364,524	253,600	348,109	348,109	348,109	348,109	348,109	348,109	348,109	348,109	348,109	348,109
With SFM												
Deforestation (ha/year)	2984	2080	2955	2955	2955	2955	2955	2955	1,427	1,427	1,427	1,427
Carbon emission (t C/year)	99,416	69,290	95,112	95,112	95,112	95,112	95,112	95,112	47,556	47,556	47,556	47,556
Carbon dioxide emission (t CO _{2eq} /year)	364,524	253,600	348,109	348,109	348,109	348,109	348,109	348,109	174,055	174,055	174,055	174,055
Avoided emissions												
Avoided carbon dioxide emissions (t CO _{2eq} /year)									174,055	174,055	174,055	174,055
Total CO _{2eq}									696,219			

Total avoided emissions due to the project interventions in reducing deforestation and forest degradation are therefore: **696,219 t CO_{2eq}** (project implementation period).

Enhanced Forest Carbon Sequestration

Through the *Outcome 2.1* the project will promote SFM and SLM practices in the wider landscape (904,142 hectares) through the adoption of NRM guidelines and capacity development activities and promotion of SFM supply chains. This will contribute to an enhancement of forest carbon sequestration however at this stage it is difficult to give any estimation and the assessment will be carried out during PY1.

Through *Outcome 3.2* it is expected that 30,000 ha will be restored as a result of project implementation during four years. This restoration will be also yearly executed in phases: 33% in PY2 (10,000 ha), 33% in PY3 (10,000 ha), 33% in PY4 (10,000 has). Taking a conservative value of enhanced forest sequestration of 2 t C/ha/year, it is estimated additional sequestration of **439,200 t CO_{2eq}** $[(1/3 \times 30,000 \text{ ha} \times 3 \text{ years} + 1/3 \times 30,000 \text{ ha} \times 2 \text{ years} + 1/3 \times 30,000 \text{ ha} \times 1 \text{ year}) \times 2 \text{ t C/ha/year} \times 3.66]$

Total enhanced sequestration due to the project interventions to increase carbon stock is therefore: **439,200 CO_{2eq}** as impact of outcome 2.1 will be assessed later.

Over the 4-year lifetime of the project, this will lead to avoided emissions of **696,219 t CO_{2eq}** and additional sequestration of **439,200 t CO_{2eq}** (see Table 2.8 below).

Table 2.8: Direct avoided emissions and sequestration (4 years project implementation)

	2005 (2002 – 2008)	2009 (2008-2009)	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
	Business as usual (baseline)											
Carbon dioxide emission (t CO2eq/year)	364,524	253,600	348,109	348,109	348,109	348,109	348,109	348,109	348,109	348,109	348,109	348,109
Emissions									11,418			
Avoided carbon dioxide emissions (t CO2eq)												
5,709 ha of forests will be conserved									696,218			
Total:									696,218			
Enhanced forest carbon sequestration (t CO2eq)												
30,000 ha restored as a result of the implementation of the project during the four years									439,200			
SFM in 904,142 ha								No accounted for the time being				
Total:								878,400				

Indirect Impacts

In addition to the direct impacts, the project is expected to generate some indirect positive impacts. The major indirect impact would be the reduction of the deforestation rate. During the 4-years project, it is expected that the project will create indirect impacts by reducing at least 30% of the deforestation rate in the area of indirect impact (avoiding loss of 60,820 ha). This indirect impact is estimated in an amount of avoided emission of **2,472,347 t CO_{2eq}** as presented in the table 2.9 below. Furthermore the project will have an additional indirect impact through SFM in 618,062 ha, leading to an estimated carbon enhancement of 2,058,146 t CO_{2eq} calculated using a cautious estimated increase of carbon of 0.5 t C/ha/an through SFM $(618062/3 \times 0.5 \times 3.33 + 618062/3 \times 2 \times 0.5 \times 3.33 + 618062/3 \times 3 \times 0.5 \times 3.33)$.

Table 2.9:
Direct and indirect avoided emissions and sequestration (4-years project implementation)

	2005 (2002 – 2008)	2009 (2008-2009)	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Business as usual (Direct impact)												
	2984	2080	2855	2855	2855	2855	2855	2855	2855	2855	2855	2855
	99,416	69,290	95,112	95,112	95,112	95,112	95,112	95,112	95,112	95,112	95,112	95,112
	364,524	253,600	348,109	348,109	348,109	348,109	348,109	348,109	348,109	348,109	348,109	348,109
With SFM (direct impact)												
Deforestation (ha/year)	2984	2080	2955	2955	2955	2955	2955	2955	1,427	1,427	1,427	1,427
Carbon emission (t C/year)	99,416	69,290	95,112	95,112	95,112	95,112	95,112	95,112	47,556	47,556	47,556	47,556
Carbon dioxide emission (t CO2eq/year)	364,524	253,600	348,109	348,109	348,109	348,109	348,109	348,109	174,055	174,055	174,055	174,055
Direct avoided carbon dioxide emissions (t CO2eq/year)										174,055	174,055	174,055
TOTAL									696,218			
Business as usual (indirect impact)												
Deforestation (ha/year)	15,893											
		11,077	15,205	15,205	15,205	15,205	15,205	15,205	15,205	15,205	15,205	15,205
Carbon dioxide emission (t C/year)	529,553	369,082	506,629	506,629	506,629	506,629	506,629	506,629	506,629	506,629	506,629	506,629
Carbon dioxide emission (t CO2eq/year)	1,941,694	1,350,841	1,854,261	1,854,261	1,854,261	1,854,261	1,854,261	1,854,261	1,854,261	1,854,261	1,854,261	1,854,261
Indirect avoided carbon dioxide emissions (t CO2eq/year)									618,087	618,087	618,087	618,087
TOTAL:									2,472,347 + 2,058,146 t CO2eq			

Adaptation Benefits

Resilience. The ability of local communities and of biodiversity to adapt to desertification, higher temperatures, less rainfall and more extreme events depends to a large extent on keeping as much forest cover as possible. The Caatinga vegetation can be used for keeping livestock by pruning trees and shrubs so they can be used for forage. The *palma* cactus is a key source of water for keeping livestock alive during droughts. Forest cover is important to maintain local hydrological cycles, with water for consumption and production, although increased concentrations of CO₂ in the atmosphere could decrease streamflow. Alternative uses of the Caatinga include NTFPs such as native fruits and nuts, honey from native and *Apis mellifera* bees, handicrafts and reproductive material (seeds and seedlings) of native forest species for restoration required by the Forest Law.

2.6 COST EFFECTIVENESS

The alternative strategies and methodologies considered, namely a purely federal project or pure research and communication, were found not to be cost effective. The project as designed is cost-effective because of the leverage on government, society and knowledge management in Brazil, changing the game as it is now played. Government budgets are extremely limited, many foreign donors no longer consider Brazil to be a priority country for development assistance and most non-governmental organizations lack funding and capacity for carrying out a project with wide geographical scope. Nonetheless, there are substantial resources and capacities in Brazil that can be mobilized when states,

municipalities, civil society and researchers are involved as partners. Many of the partnerships established through the project will continue in the future. Also, the involvement of young people at this point in their lives will result in returns on the investment for decades to come.

The proposed project has the primary objective of ensuring long-term sustainability of the ecosystems and globally relevant biodiversity in Brazil's ASD. To achieve this goal, the project has identified four components, dealing with: a) upscaling of INRM and NTFP; b) improved SLM and SFM practices; c) sustainable forest recovery; d) institutional capacity regarding LD and desertification. These four components, in addition to a fifth component on coordination, monitoring and evaluation, are cost-effective ways to remove the barriers and address the threats to global environmental benefits identified during project preparation. Thus, the project is cost-effective because it complements the baseline initiatives, capacity, infrastructure and national and local policies. Project preparation has identified the following strategies and methodologies that are complementary and synergic:

- Participation of key stakeholders will ensure that decision-making and project implementation will be aligned with national and local development priorities and initiatives.
- Capacity development will improve intra- and inter-institutional and intra- and inter-sector coordination, which in turn will avoid duplication of efforts and reduce implementation costs.
- Training and awareness-raising of farmers and communities about SLM, SFM and FLR will be supported to achieve a shift to more favorable attitudes regarding sustainable management of soils, water and forests and adoption of appropriate technologies.
- The selective recovery of traditional knowledge of *sertanejo* family farmers and Afro-descendant communities regarding the management and use of natural resources will contribute to the sustainability of production practices.
- The value chain approach that links production to markets will increase cost-effectiveness.
- The feasibility analysis of monetary and non-monetary incentives and compensation schemes will contribute to long-term financial sustainability.
- The communication strategy includes tools that will allow low-cost dissemination of project results, reaching a wide audience in appropriate and cost-effective ways.
- Systematization of experiences and lessons learned will contribute to cost-effective replication of project results throughout the ASD in Brazil and other countries.

2.7 INNOVATIVENESS

The REDESER project is innovative in that, through a research-in-development approach, it identifies and disseminates best practices of SFM, FLR and SLM that are not yet widely adopted in ASD, but are practical and effective means of reversing desertification and land degradation over a vast area of Brazil, providing local, regional, national and global benefits. Some of the practices already exist in ASD or in other regions or countries, but their adaptation and wide diffusion constitute innovation in the Caatinga. At the same time, some of the techniques developed in the drylands of the Northeast, in particular with

regard to capture, storage and management of rain water, are now being transferred to other regions, where water scarcity has recently become a cause of great concern.

Innovative practices. Promising practices include rotation of pastures, redistributing cattle among different parcels according to their productivity, integrated crop-livestock systems, sustainable silvopastoral and agro-forestry management practices, use of foliage as fodder (lowering and thinning), free-range poultry, raising goats and sheep, fish farming, beekeeping for honey and byproducts, rainwater catchment and storage for consumption and for production, electric fences and ecological stoves, among others. Practices from other regions that favor maintenance of forest cover instead of clearing that leads to land degradation include sustainable use of native fruit species (like *umbu*, *licuri*, *mangaba*, *caju*, *murici* and *maracujá boi*), nuts and fibers, as well as medicinal plants, wildlife management, ecotourism and handicrafts with wood.

The project "*One land and two waters (P1+2)*" implemented by the Semiarid Association (ASA) will contribute with its experience with various types of rainwater catchment and storage, including: 1) cisterns with "sidewalks", 2) underground dams, 3) trench tanks, 4) stone tanks or caldrons, 5) popular water pumps, 6) diversion of road water. These can be used for "productive backyards.

Further detailed good practices to be used are described in the guidelines for the restoration of degraded forests and landscapes in drylands (<http://www.fao.org/3/a-i5036e.pdf>) as well as compiled by INSA (http://www.gndri.net/institution/insa_brazil_gn.php)

SECTION 3 - FEASIBILITY

3.1 ENVIRONMENTAL IMPACT ASSESSMENT

Following FAO's Environmental Impact Assessment (EIA) Guidelines for FAO Field Projects, the proposed project is classified under category B, meaning minimal or no adverse impacts. The corresponding Environmental and Social Review Form is attached in Appendix 7.

3.2 RISK MANAGEMENT

REDESER project risks have been identified and analyzed during project preparation and mitigation measures have been incorporated into the project design. The risks and mitigation measures have been considered regarding: a) climate change; b) biodiversity; c) support from public and governments; d) pressures from agribusiness; e) socio-economic conditions. The probability of climate change and pressures from agribusiness are considered high, while the probabilities of risks regarding biodiversity, support from public and governments and socio-economic conditions are considered medium. The various mitigation strategies that the project will use to deal with these risks are described in the Risk Matrix in Appendix 4.

With support from and under the supervision of FAO, the Project Management Committee (PMC) will be responsible for the day-to-day management of these risks and the effective implementation of mitigation measures. The M&E system will monitor project outcome and output indicators as well as risks and mitigation measures. The PMC will also be responsible, in dialog with other project partners, for monitoring the effectiveness of mitigation measures and adjusting mitigation strategies as needed, as well as identifying and managing any new risks not foreseen during project development.

The six-monthly Project Progress Reports (see section 4.5.3) are the main tools for project risk monitoring and management. The reports include a section on systematic follow-up of risks and mitigation actions identified in previous reporting periods. They also include a section for identification of new risks or risks that still need attention, their ratings and mitigation actions, as well as who is responsible for monitoring those actions with the respective timelines. FAO will monitor the project risk management closely and follow up if needed by providing support for the adjustment and implementation of risk mitigation strategies. Reporting on risk monitoring and rating will also be part of the annual Project Implementation Review (PIR) prepared by FAO and submitted to the GEF Secretariat (see section 4.5.3).

SECTION 4 – IMPLEMENTATION AND MANAGEMENT ARRANGEMENTS

4.1 INSTITUTIONAL ARRANGEMENTS

Besides FAO as GEF Agency, the main institutions that are directly involved in the project and have signed co-financing letters are, in alphabetical order by their Brazilian acronyms in Portuguese:

1. AGENDHA – Socio-environmental NGO
2. APNE - Northeast Plants Association
3. CEPIS - Technological Park Foundation of Paraíba
4. FA - Araripe Foundation
5. FUNETEC - Technological and Cultural Education Foundation
6. IABS - Brazilian Institute of Development and Sustainability
7. ICRAF – World Agroforestry Centre
8. INSA - National Semi-Arid Institute
9. MDA - Ministry of Agrarian Development
10. MMA - Ministry of Environment
11. SEAFDS - Paraíba state agriculture secretariat
12. SEAPAC - Rio Grande do Norte social organization
13. SEIHRMACT – Paraíba state environment secretariat
14. SEMA - Crato municipal environment secretariat
15. SEMARH – Alagoas state environment secretariat
16. SEPLAN - Rio Grande do Norte state planning secretariat
17. SFB - Brazilian Forest Service

The amounts of co-financing are on the cover page and in Table 4.2 of this Project Document. The roles of the co-financiers are described in Table 1.6 in sub-section 1.1.3. Additional institutions and organizations will be mobilized during the project inception phase and during project implementation.

As requested by the Government of Brazil, the Food and Agriculture Organization of the United Nations (FAO) will be the GEF Implementing Agency in the Direct Execution (DEX) modality (see description in Section 4.2).

The project co-executing partners will be responsible for ensuring coordination of the first four project components, as well as coordination and collaboration with other project stakeholders.

The MMA is the main executing partner, as the National Focal Point of the United Nations Convention to Combat Desertification and Drought (UNCCD), with responsibility for coordinating Brazil's National Action Program (NAP) to Combat Desertification.

FAO, MMA and the co-financiers listed above will collaborate with implementing agencies of other programs and projects to identify and facilitate synergies with other relevant GEF-financed projects, as well as with projects financed by other donors. Collaboration

will be undertaken through communication among GEF agencies and executing partners of other programs and projects as well as exchange of information and dissemination materials among projects.

In order to guarantee effective coordination and collaboration among different initiatives, specific responsibilities have been assigned to the Project Management Committee (PMC) and included in the Terms of Reference of project personnel.

Overall, the project is in line with the UNCCD Ten-Year Strategy 2008-2018 and Brazil's National Action Plan (NAP) to Combat Desertification. The integrated funding strategy for implementation of the strategy in Brazil includes the Climate Fund, the National Forestry Development Fund, the National Environment Fund, the Brazilian Biodiversity Fund and the Federal Savings Bank's Socio-environmental Fund, as well as the Bank of Brazil and the Bank of the Northeast.

In addition to federal initiatives, there are also many viable options for synergies with state governments. For example, the "Rio Grande do Norte Regional and Governance Project" ("Sustainable RN"), funded by a loan of USD 360 million from the World Bank, involves a wide range of interventions in the state of Rio Grande do Norte, including support for family farmers and their organizations and a regional platform of more than 2,500 civil society organizations, many of which are located close to the project intervention areas in the state's Seridó region. Likewise, the project will coordinate with the Secretariat for Environment and Water Resources (SEMARH) of Sergipe for implementation of the "Sustainable Land Use Management in the Semi-Arid Region of Northeast Brazil (Sergipe)" project (BRA/14/G32) regarding the Alto Sertão region, across the São Francisco River from the Xingó region of Alagoas, with total funding of USD 21,148,208 between 2014 and 2019. This project has UNDP as implementing agency and is also linked with the DCD of SEDR the Ministry of Environment. The Alagoas state government is very active in the Xingó region.

EMBRAPA, the federal agricultural research agency, with funding from UNDP and GEF, is responsible for implementing the GEF project called "Integration of Conservation and Sustainable Use of Biodiversity in Productive Practices of Non-Timber Forest Products and Agroforestry Systems in Productive Landscapes of High Conservation Value." The project, with total funding of USD 33,279,452 for 2014-2018, has selected Citizenship Territories as areas of intervention. Of the total of six areas, four are located in the Caatinga and Cerrado and two in the Amazon. The project will focus mainly on supporting extractive communities and traditional peoples located in Cerrado areas. The coordinators of both projects in Brasília are in close contact to avoid duplication.

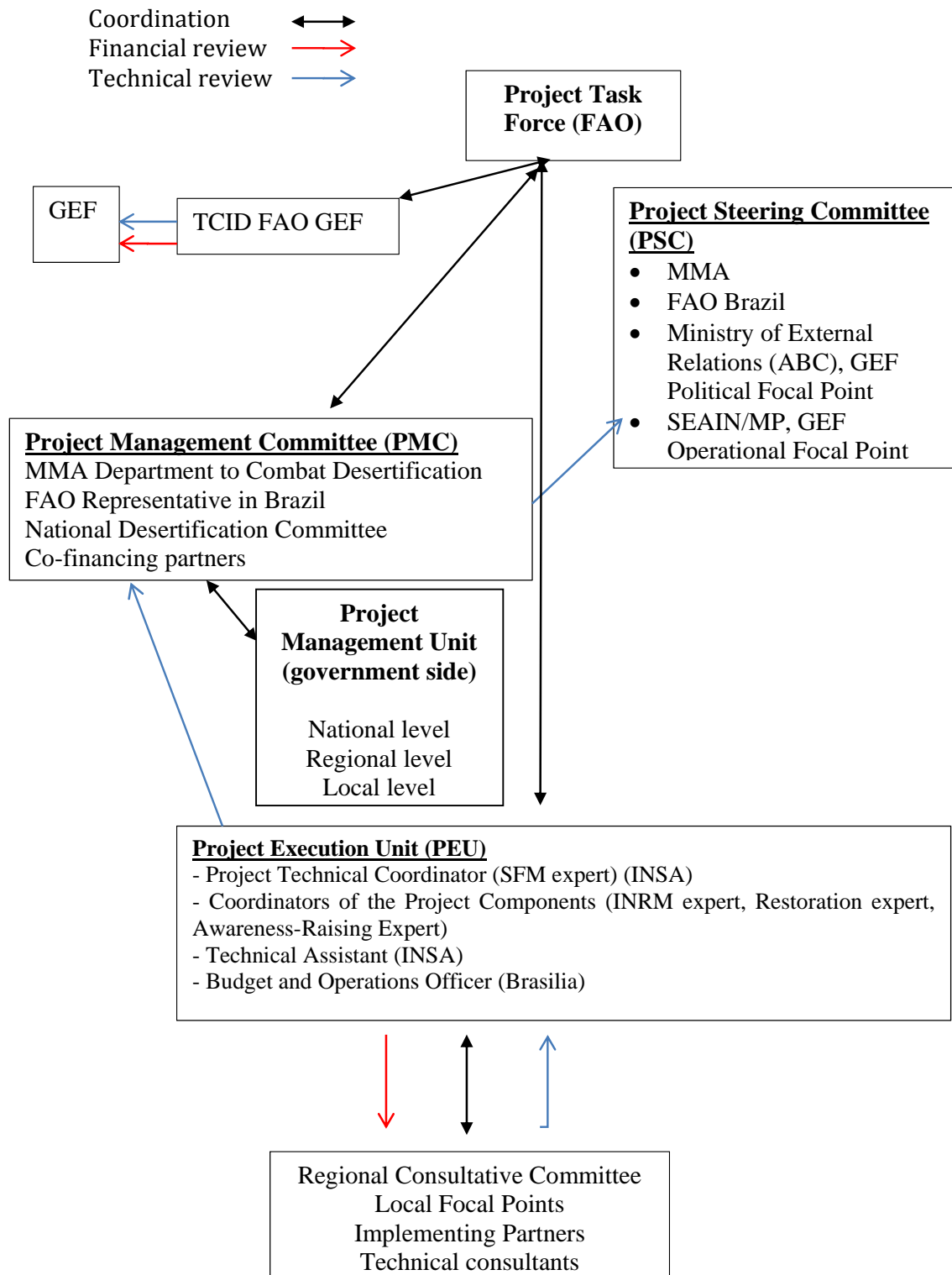
With respect to forest management, the Brazilian Forest Service is responsible for the Rural Environmental Registry (CAR), about which it is consulting society regarding the details of implementation. The agency is responsible for the Federal Program of Community and Family Forest Management. It also plans to promote best forest management practices with emphasis on the Caatinga and Cerrado biomes. These initiatives are carried out in dialog with the NAP and are supported by the National Forest Development Fund (FNDF).

4.2 IMPLEMENTATION ARRANGEMENTS

FAO will be the GEF Implementing Agency responsible for supervision and provision of technical guidance during project implementation. FAO's role and responsibilities is described in sub-section 4.2.2 below.

412 The project will be technically executed by the MMA. A Project Steering Committee (PSC) will be set up to provide oversight of and coordinate the planning of project implementation (see sub-section 4.2.3). More specifically, project activities will be carried out through a Project Management Committee (PMC) made up of the Director of the Department to Combat Desertification (DCD) of the Secretariat of Extractivism and Sustainable Rural Development (SEDR), the FAO Representation in Brazil, two representatives of the National Committee for Combating Desertification and three representatives of the most relevant governmental co-financiers. The PMC will be responsible for decision-making, providing guidance and supervising the Project Execution Unit (PEU). Other implementation arrangements are described in detail in sub-sections 4.2.1, 4.2.2 and 4.2.3 below.

Figure 4.1. Institutional Arrangements for Project Implementation.



4.2.1 Roles and responsibilities of the project co-executing partners

The **GEF Operational Focal Point (OFP)** in the Secretariat of International Affairs (SEAIN) of Brazil's Ministry of Planning, Budget and Management (MP) has endorsed the project and will monitor the annual Project Implementation Reviews (PIR). He/she will be part of the Project Steering Committee (PSC) and will be invited to the mid-term and final evaluations of the project.

The **Ministry of Environment (MMA)** is primarily responsible for coordinating the programming of GEF resources in the Land Degradation and Biodiversity focal areas, as well as some Climate Change initiatives shared with the Ministry of Science, Technology and Innovation. In the REDESER project, the MMA will be responsible for: (i) technical implementation of project activities; (ii) day-to-day monitoring of project progress and achievement of results; (iii) requesting to the FAO Representation in Brazil the procurement of goods, minor works and services, which will be undertaken by the FAO Representation in Brazil. The Minister of Environment or his/her representative will chair the PSC and the annual meetings for project planning and review. Technical execution of the project will be the responsibility of the Department to Combat Desertification (DCD)/SEDR. The MMA will supervise preparation and submission to the FAO Representation in Brazil of the six-monthly Project Progress Reports (PPRs), detailed Annual Work Plan and Budget (AWP/B) and all the documents necessary to prepare the Project Implementation Reviews (PIRs), as described in sub-section 4.5.3.

Various **federal government agencies** responsible for forestry, rural development, NTFPs, biodiversity, land regularization and extension programs will be involved in project implementation. The most relevant institutions are: Ministry of Agrarian Development (MDA), Ministry of Social Development and the Fight Against Hunger (MDS), state environment agencies, Chico Mendes Institute for Biodiversity Conservation (ICMBio), Brazilian Forest Service (SFB), National Agency for Technical Assistance and Rural Extension (ANATER), National Supply Company (CONAB) and Ministry of Agriculture, Livestock and Supply (MAPA), many of which are co-financiers. A summary of all their respective roles and responsibilities is presented in sub-section 1.1.3.

A GEF-financed **Project Execution Unit (PEU)** will be established. The main responsibility of the team, following the directives and decisions of the PSC and the Project Management Committee and under the supervision of FAO and the NPD, is to ensure coordination and execution of the project through the rigorous and effective implementation of the AWP/B. The PEU will be headed by the **Project Technical Coordinator (PTC)**, to be financed by GEF funds.

The Director of the DCD/SEDR of the MMA will act as National Project Director (NPD) and main national counterpart for the day-to-day management of the project. His/her time will be fully covered by the MMA and will be counted as MMA's co-financing for the project. He/she will work to ensure achievement of the projects outcomes. He/she will represent the MMA on the PSC, chair the Regional Consultative Committee, keep the MMA updated on project progress and challenges as needed and represent the project at high-level national and international meetings. The NPD will be responsible for requesting from FAO the timely disbursement of GEF resources that will allow the execution of

project activities, in strict accordance with the Project Results-Based Budget (see Appendix 3) and the approved AWP/B for the current project year, but can delegate to the Project Technical Coordinator (PTC) the responsibility for requesting from FAO the timely disbursement of GEF resources as foreseen in the AWP/B.

For the execution of project activities, a PTC will be hired with project resources on a full-time basis. He/she will be hosted at INSA in Campina Grande, Paraíba, and will be responsible for the day-to-day management of the project and for coordinating the activities with all project partners. Specifically, he/she will be in charge of:

- Coordinating and closely supervising the implementation of project activities;
- Ensuring collaboration among the participating national, state and local institutions and organizations;
- Implementing and managing the project M&E plan and its communication program;
- Preparing the Project Progress Reports (PPRs) containing information on the activities carried out and the progress in achieving outcomes and outputs;
- Organizing annual project workshops and meetings to monitor project progress;
- Preparing the Annual Work Plans and Budgets (AWP/B) in coordination with FAO Lead Technical Officer (LTO), the FAO Project Task Manager (PTM) at FAO Brazil, the FAO/GEF Coordination Unit (TCU) and the National Project Director (NPD);
- Submitting PPRs together with the AWP/B to the Project Management Committee (PMC) for approval and presentation to the Project Steering Committee (PSC) and FAO;
- Acting as secretary to the PMC and the PSC;
- Prepare a first draft of PIRs and support the organization of mid-term and final evaluations.

The national **Budget and Operations Officer** will be responsible for the day-to-day financial management and operation of the project including raising contracts and procure other needed inputs in accordance with the approved budget and annual work plans. The Budget and Operations Officer will work in close consultation with the PTC, Budget Holder (BH, see below), Lead Technical Officer (LTO, see below) and project executing partners, particularly with the FAO Representation in Brazil, and will take the operational responsibility for timely delivery of needed inputs to produce project outputs.

4.2.2 FAO's roles and responsibilities of the GEF agency

FAO's role in the project governance structure

FAO will be the GEF Implementing Agency of the project as well as the financial and operational executing agency. As the financial and operational executing agency, FAO will provide procurement and contracting services and financial management services of GEF resources. As the GEF Agency, FAO will supervise and provide technical guidance for the overall implementation process. Administration of the GEF grant will be in compliance with

the rules and procedures of FAO and in accordance with the agreement between FAO and the GEF Trustee. As the GEF agency for the project, FAO will:

- Administer funds from GEF in accordance with FAO rules and procedures;
- Oversee project implementation in accordance with the project document, work plans, budgets, agreements with co-financiers and the rules and procedures of FAO;
- Provide technical guidance to ensure that appropriate technical quality is applied to all activities concerned;
- Carry out at least one supervision mission per year;
- Report to the GEF Secretariat and Evaluation Office, through the annual Project Implementation Review (PIR), on project progress and provide financial reports to the GEF Trustee.

Based on a request from the Government of Brazil, FAO will also be the executing agency of the GEF resources including financial management, procurement of goods and contracting of services following FAO rules and procedures. As the financial executer, FAO will provide six-monthly financial reports including a statement of project expenditures to the Project Steering Committee (PSC) and the Project Management Committee (PMC).

In accordance with the present Project Document, progress on the financial execution of the project and the AWP/B approved by the PSC, FAO will prepare revisions to maintain the budget updated in the FAO's Field Programme Management Information System (FPMIS). The budget revisions will be provided to the PMC to facilitate project planning and execution. FAO will, in collaboration with the PTC and the PMC, participate in the planning and execution of contracting and procurement processes. FAO will also process payments corresponding to delivery of goods, services and products at the request of the NPD. All technical reports will be paid once the FAO Lead Technical Officer (LTO) has approved them.

FAO's roles in internal organization

The roles and responsibilities of FAO staff are regulated by the FAO Guide to the Project Cycle, Quality for Results, 2015, Annex 4: Roles and Responsibilities of the Project Task Force Members, and its updates.

The FAO Representation in Brazil will be the **Budget Holder (BH)** responsible for the management of the GEF resources. As a first step in project start-up, the FAO Representation in Brazil will establish an interdisciplinary Project Task Force (PTF) within FAO to guide the implementation of the project.

The PTF is a management and consultative body that integrate the necessary technical qualifications from the FAO relevant units to support the project. The PTM is composed of a Budget Holder, a Lead Technical Officer (LTO), the Funding Liaison Officer (FLO) and one or more technical officers based on FAO Headquarters (HQ Technical Officer).

In consultation with the LTO (see below), the FAO Representation in Brazil will be responsible for timely operational, administrative and financial management of the GEF project resources, including in particular: (1) contracting and procurement processes based on the request from the Government, according to FAO's rules and procedures and

in accordance with the approved AWP/B; (2) process the payments corresponding to delivery of goods, services and technical products based on the prior clearance of the same by the NPD and the FAO LTO; (3) provide six-monthly financial reports including a statement of project expenditures and the PSC; (4) at least one time per year, or more frequently if required, prepare budget revisions for submission to the TCI/GEF Coordination Unit through FPMIS.

The FAO Representation in Brazil will, in consultation with the PTF, give no-objection to AWP/Bs submitted by the PEU as well as to the Project Progress Reports (PPRs). PPRs may be commented by the PTF and should be approved by the LTO before being uploaded by the BH in FPMIS.

The **FAO GEF Project Task Manager (PTM)** will, under the direct supervision of the FAO Representation in Brazil, support the FAO Representation in the supervision of project management and progress, procurement and contracting processes, and on the provision of technical guidance to the project, in close consultation with the LTO and the interdisciplinary Project Task Force. The PTM will be paid from GEF fee resources and will have the following main tasks:

- Review and provide comments on the Project Progress Reports (PPRs) prepared by the PTC and submit them the LTO for technical clearance and to the BH for approval.
- Participate in the annual project progress review and planning workshops; review and provide comments on the AWP/B and recommend its approval to the FAO Representation, in consultation with the LTO and the FAO-GEF Coordination Unit.
- Review the contracting and procurement documentation for those contracts and procurements to be financed by GEF resources and recommend their approval to the FAO Representation, in consultation with the LTO and the FAO-GEF Coordination Unit.
- Review the co-financing reports submitted annually in June by the project partners.
- Review and provide comments to the six-monthly financial reports prepared by the Administrative Assistant FAO Representation in Brazil, previous to their submittal to the PTC for preparation of the PPR.
- Undertake periodic supervision missions, support the results-based project management and facilitate the provision of technical guidance by FAO;
- Support the PTC and LTO in preparing the annual PIR report;
- Ensure that the PTC and the PEU have provided information on co-financing provided during the course of the year for inclusion in the PIRs;
- When requested by the FAO Representation, participate in the Project Steering Committee;
- Participate in the project personnel selection committees to interview and give advice on candidate selection for key positions to be financed by GEF resources. The committees composition will be designated by the MMA, the FAO LTO and PTM, and in specific cases TCI/GEF, and other partners as requested in the PSC meetings;
- Prepare draft Terms of Reference for the mid-term and final evaluations in consultation with the FAO Evaluation Office, the LTO and the FAO-GEF Coordination Unit and project co-executing partners; support the organization of

the evaluations; contribute to the development of any agreed adjustment plan in project execution approach and supervise its implementation.

The **Lead Technical Officer (LTO)** for the Project will be the FAO Forestry Officer (drylands) of the Forest Policy and Resources FOA(FOA) Division, with experience in sustainable forest management and restoration in ASD. The role of the LTO is central to FAO's comparative advantage for projects. The LTO will oversee and carry out technical backstopping to the project implementation. The LTO will support the BH in the implementation and monitoring of the AWP/Bs, including work plan and budget revisions. The LTO is responsible and accountable for providing or obtaining technical clearance of technical inputs and services procured by the Organization.

In addition, the LTO will provide technical backstopping to the PEU to ensure the delivery of quality technical outputs. The LTO will coordinate the provision of appropriate technical support from PTF to respond to requests from the PSC. The LTO will be responsible for::

- Reviewing and giving no-objection to TORs for consultancies and contracts to be performed under the project and to CVs and technical proposals short-listed by the Project Management Committee for key project positions, goods, minor works and services to be financed by GEF resources;
- Supported by the FAO Representation in Brazil, in particular by the PTM, reviewing and clearing final technical products delivered by consultants and contract holders financed by GEF resources before the final payment can be processed;
- Assisting with review and provision of technical comments on draft technical products/reports upon request from the Project Management Committee during project execution;
- Reviewing and approving project progress reports submitted by the PTC, in coordination with the BH;
- Supporting the FAO Representation in reviewing, revising and giving no-objection to AWP/B submitted by the PTC for approval by the Project Steering Committee;
- Ensure the technical quality of the six-monthly Project Progress Reports (PPRs). The PPRs will be prepared by the PTC, with inputs from the PEU. The BH will submit the PPR to the FAO/GEF Coordination Unit for comments, and the LTO for technical clearance. The PPRs will be submitted to the PSC for approval twice a year. The BH will upload the approved PPR to FPMIS.
- Supervise the preparation and ensure the technical quality of the annual Project Implementation Review report, supported by the PTM. The PIR will be drafted by the PTC with inputs from the PEU. The PIR will be submitted to the BH and the FAO-GEF Coordination Unit for approval and finalization. The FAO/GEF Coordination Unit will submit the PIRs to the GEF Secretariat and Evaluation Office as part of the Annual Monitoring Review (AMR) report of the FAO-GEF portfolio.
- Undertaking annual (or as needed) field supervision missions;
- Provide inputs for the TORs of the mid-term and final evaluations as requested by FAO Office of Evaluation, development and follow-up to recommendations on how to insure sustainability of project outputs and results after the end of the project.

The **HQ Technical Officer** is a member of the PTF, as a mandatory requirement of the FAO Guide to the Project Cycle. The HQ Technical Officer has most relevant technical expertise - within FAO technical departments - related to the thematic of the project. The

HQ Technical Officer will provide effective functional advice to the LTO to ensure adherence to FAO corporate technical standards during project implementation, in particular:

- Supports the LTO in monitoring and reporting the identified risks and mitigation measures (Appendix 4) in close coordination with the project partners.
- Provides technical backstopping for the annual work plan and budgets.
- Clears technical reports, contributes to and oversees the quality of Project Progress Report(s) (PPRs – see Section 4.5).
- May be requested to support the LTO and PTF for implementation and monitoring.
- Supports the LTO and BH in providing inputs to the TOR of the Mid-term and Final Evaluations as requested by OED.

The **FAO-GEF Coordination Unit** will act as **Funding Liaison Officer (FLO)**. The FAO/GEF Coordination Unit will review Project Progress Reports and financial reports, and will review and approve budget revisions based on the approved Project Budget (Appendix 3) and the AWP/Bs. The FAO/GEF Coordination Unit will review and provide a rating in the annual PIR and undertake supervision missions if considered necessary. The PIRs will be included in the FAO GEF AMR submitted to GEF by the FAO GEF Coordination Unit. The FAO GEF Coordination Unit may also participate in the mid-term and final evaluations and in the development of corrective actions in the project implementation strategy if needed to mitigate risks affecting the timely and effective implementation of the project. The FAO GEF Coordination Unit will, in collaboration with the FAO Finance Division, request transfer of project funds from the GEF Trustee based on six-monthly projections of funds needed.

The **FAO Finance Division** will provide annual Financial Reports to the GEF Trustee and, in collaboration with the FAO-GEF Coordination Unit, request project funds from the GEF Trustee on a six-monthly basis.

4.2.3 Project decision-making mechanisms

The **Project Steering Committee (PSC)** will take decisions on the overall project management and will be in charge of ensuring compliance with the project strategic approach for the operational tasks. The PSC will be chaired by the Minister of Environment or his/her delegate with the participation of the FAO Representative or his/her delegate. The PSC will be composed by representatives of FAO, the MMA, the Secretariat of International Affairs (SEAIN) of the Ministry of Planning (MP), the Brazilian Cooperation Agency (ABC) of the Ministry of External Relations (MRE) and their respective alternate members. The PSC can be expanded to include other representatives upon mutual agreement among the parties. The Project Technical Coordinator will serve as PSC Secretariat, with no voting rights. The PSC will meet at least twice a year and its responsibilities will include: (i) overall oversight of project progress and achievement of planned results as per the project document; (ii) taking decisions about the practical organization, coordination and implementation of the project; (iii) facilitating cooperation among MMA, FAO and project participating partners and project support at the local level; (iv) advising the PTC on other on-going and planned activities and facilitating collaboration between the project and other programs, projects and initiatives; (v)

facilitating provision of co-financing is in a timely and effective manner; (vi) reviewing and approving the six-monthly Project Progress Reports and the AWP/B.

The **Project Management Committee (PMC)**, including some of the state governments, will be responsible for: (i) guiding project implementation as per the AWP/B; (ii) timely achievement of project outcomes and outputs; (iii) effective and efficient use of resources allocated as per the project document; iv) planning project activities, giving guidance and advice to the PSC; v) providing technical advice to the Project Steering Committee; vi) advising the PSC on other on-going and planned activities and facilitating collaboration between the project and other programs, projects and initiatives. The PMC may also be involved in technical evaluation of project progress and outputs and development of an agreed adjustment plan in project execution approach, if needed. The PMC will include the Director of DCD/SEDR/MMA or his/her delegate, the FAO PTM and the FAO LTO. Membership of the PMC will be defined at the Project Inception workshop in a participatory manner and other project partners will be invited accordingly. The PMC will meet at least every two months.

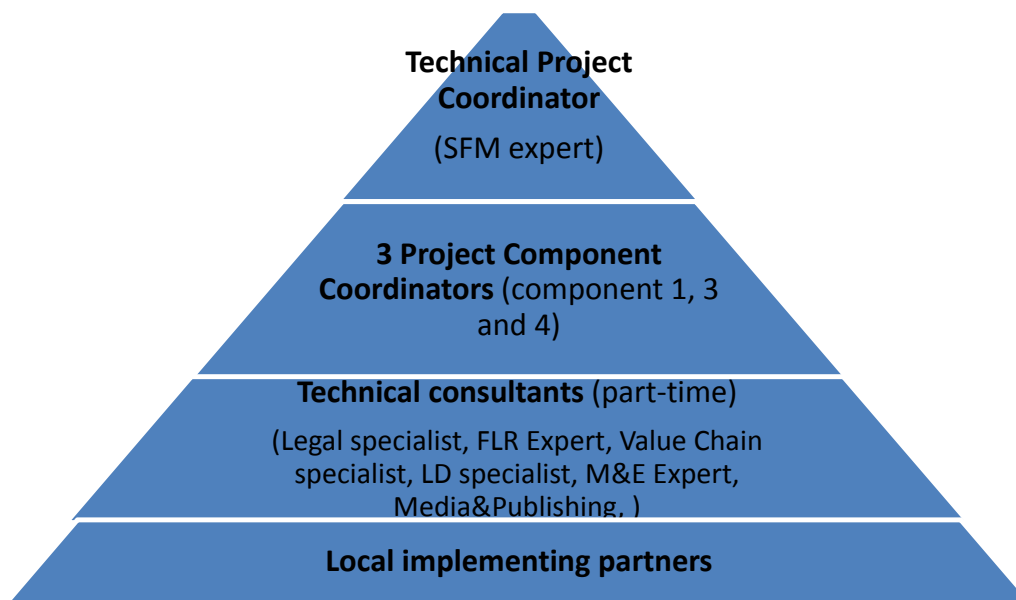
Project Advisory Board (PAB). The Project Advisory Board will serve as the political-technical body to support project planning and implementation, provide advice and facilitate inter-sector coordination. The PAB will play a critical role in project monitoring and evaluation and use of results for improvement of project performance, accountability and learning. In conformity with requirements for all international cooperation projects in Brazil, the PAB will include representatives of MMA, ABC and FAO and will meet once a year at Tripartite Meetings.

The **Project Management Unit (PMU)** will carry out the activities established in the Annual Work Plan and Budget (AWP/B). In order to provide transparency and ensure a participatory process in the management of the project, project coordination will include national, regional and local levels, as follows:

- a) **National Coordination** will be the responsibility of the Ministry of Environment (MMA), through its Department to Combat Desertification (DCD), which is responsible for implementation of NAP Brazil. MMA will be responsible for planning, national coordination and monitoring of the implementation of the project.
- b) **Regional Coordination** will consist of a specific technical core team with federal and state civil servants and professionals hired specifically to work on the project. The Regional Coordination will be responsible for overall coordination, planning, supervision and monitoring of activities to be performed in project on-site interventions, through interaction with the implementing partners responsible for these activities. This coordination will include representatives of the Ministry of Environment (MMA), the Brazilian Forest Service (SFB) and the Brazilian Institute of Environment and Renewable Natural Resources (IBAMA), among others.
- c) **Local Coordination** among the various parties involved in field operations will be carried out in the four field areas and will exchange technical and administrative information with the project's technical supervision.

Located in Brasília and Campina Grande (INSA Office), the **Project Execution Unit (PEU)** will consist of the National Project Director (NPD), the Project Technical Coordinator (PTC) and a technical assistant. Technical and administrative staff of the MMA will also participate and provide support to the PEU. To obtain specific outputs, the incremental support of GEF will be used to hire specialized consultants for specific periods of time. For delivery of relevant outputs, in particular those related to implementation of field activities, letters of agreement (LoA) will be signed by FAO and selected local, state, regional or national non-profit organizations, research and/or academic institutions or civil society organizations, according to the specific needs, complying with FAO's rules. The PEU will develop Annual Work Plans and Budgets (AWP/Bs) indicating the outputs and activities planned for the year, the implementation periods for each activity roles and responsibilities and the M&E plan. The AWP/Bs will be approved by the FAO Representation (see 4.2.2) and the Project Steering Committee. The PEU organizational chart is illustrated below:

Graphic 1: Organizational chart of the Project Execution Unit, Brazil REDESER Project



The Project Technical Coordinator (PTC) will be responsible for the day-to-day implementation of the project, and for providing technical supervision for Component 2 (SFM). Under the general oversight of the NPD, the FAO PTF and the PTC, an INRM Specialist will be responsible for coordinating the implementation of Component 1; a Forest Restoration Specialist will coordinate the implementation of Component 3; and an Awareness-raising specialist will coordinate the implementation of Component 4. The PTC and the Project Component Coordinators will be hired for 48 months by using GEF resources. Their draft TORs are detailed in Appendix 5.

In addition, GEF resources will be invested in hiring part-time technical consultants who will deliver specific project outputs: i) a Value Chain Specialist (24 months); ii) an Expert in FLR in Brazil Drylands (14 months); iii) an Expert in LD and Desertification (6 months);

iv) an Expert in Media and Publishing (12 months); v) Legal specialist (12 months); vi) an M&E Expert to design the project M&E system by month 6th of PY1 (6 months). See more details in Appendices 1 and 2.

Furthermore, FAO will sign Letter(s) of Agreement with local agencies to implement specific technical outputs in project intervention sites. These LOAs will be further defined during Project inception in PY1.

Project Governmental Liaison Officer (PGLO). The PGLO will be provided by the Government of Brazil. He/she will ensure that the project is closely aligned with the NAP strategy and with other government programs and projects and will contribute to the effective dissemination of lessons learned at the national and international level.

Regional Consultative Commission (RCC). The Regional Consultative Commission (RCC) will be constituted by technical focal points who will facilitate the coordination among the local, state and national levels in the designated areas in the states of Ceará, Bahia, Alagoas, Rio Grande do Norte and Paraíba. The RCC will be composed by representatives of the local partner institutions and technical civil servants of state governments who are specialized professionals. The RCC will be responsible for supervising and monitoring site interventions, promoting coordination and exchanging information, methodologies and field data. The RCC will support the identification and participation of grassroots and state-level organizations linked to family farming, agriculture and livestock, water resources, forestry and biodiversity conservation.

The MMA will designate **Focal Points (FPs)** who will be the primary contact points for the coordination of state and local activities and will serve as links with the national level. They will also be responsible for supervising the work of SFM implementation in situ. The FPs will ensure the identification and participation of key stakeholders from local, state, regional and national organizations, such as family farming, agriculture and livestock, water resources, forestry and science and technology, as well as local, state and regional representatives of programs and projects such as PRONAF, Citizenship Territories, Brazil Without Misery and Ecological-Economic Zoning, among others. The FPs will be responsible for the implementation of project activities within their specific areas, informing the Project Technical Coordinator of results obtained and contributing to the preparation of quarterly and annual reports. They will maintain a registry of the co-financing contributions.

With the support of FAO, the project will carry out a pre-selection of local **Implementing Partners (IPs)** to identify organizations that are in a position to participate in the initiative as institutional partners. Four local non-profit organizations will implement project field activities in the respective selected areas (Araripe, Seridó, Uauá and Xingó). Letters of Agreement (LoA) will be signed between FAO and selected entities. The criteria for selection and registration as partners will be defined during the Inception Phase of the project (first three months of implementation). The main criteria include: a) eligibility according to FAO rules (Manual Section 507, on Letters of Agreement); b) experience with projects of this kind; c) ability to innovate and add value to the project; d) accumulated knowledge about the subject of the project; e) technical and specialized capacity needed to achieve results; f) potential for partnerships with other institutions in the area. The hiring of IPs will be carried out through a competitive process. After the selection process,

the IPs will participate in a workshop in which the project goals will be explained and guidelines to standardize monitoring and evaluation will be defined for all IPs.

National Commission to Combat Desertification (NCCD). The NCCD will coordinate actions at the federal, state and local levels, including 11 ministries, 6 federal agencies, 11 state governments, the association of municipal environmental agencies, 11 civil society organizations and 2 private sector representatives.

4.3 FINANCIAL PLANNING AND MANAGEMENT

As GEF implementing agency, FAO will be responsible for the execution of the GEF resources and FAO co-financing. Financial management of and reporting on GEF resources will be carried out by FAO according to its rules and policies.

The total cost of the project is USD 19,696,822, of which USD 3,930,155 will be financed by the GEF grant and USD 15,766,666 will be co-financed by 18 co-financiers, including FAO and beneficiaries. Table 4.1 includes the cost by component and Table 4.2 includes the sources and types of confirmed co-financing.

Table 4.1. Cost by component.

Component	Cost (USD)
1	3,597,747
2	6,742,643
3	6,512,293
4	1,995,781
5	461,207
PMC	387,150
Total	19,696,822

Table 4.2. Confirmed sources of co-financing.

Sources of Co-financing	Name of Co-financier (source)	Type of Cofinancing	Cofinancing Amount (\$)
National Government	MMA – Ministry of Environment	Grant	1,866,667
National Government	SFB – Brazilian Forest Service	Grant	2,666,667
National Government	MDA – Ministry of Agrarian Development	Grant	3,360,000
National Government	INSA – National Semi-Arid Institute	Grant	1,333,333
State Government	SEMARH – Alagoas Secretariat of Environment and Water Resources	Grant	533,333
State Government	SEAFDS – Paraíba Secretariat of Family Farming and Development of the Semi-Arid	Grant	1,066,667

State Government	SEIHRMACT – Paraíba Secretariat of Environment etc.	Grant	800,000
State Government	SEPLAN - Rio Grande do Norte Secretariat of Planning	Grant	1,066,666
Municipal Government	SEMA – Crato Secretariat of Environment	Grant	533,334
Civil Society	FUNETEC – Technological and Cultural Education Foundation	In kind	800,000
Civil Society	IABS – Brazilian Institute of Development and Sustainability	In kind	266,666
Civil Society	SEAPAC – Service for Support of Alternative Community Projects	In kind	160,000
Civil Society	CEPIS – Center for Sustainable Industrial Production	In kind	533,333
Civil Society	Araripe Foundation	In kind	160,000
Civil Society	APNE – Northeast Plants Association	In kind	160,000
Civil Society	AGENDHA – Advice and Management on Nature Studies, Human Development and Agroecology	In kind	160,000
Civil Society	ICRAF – World Agroforestry Center	Grant	100,000
GEF Agency	FAO – United Nations Food and Agriculture Organization	In kind	200,000
Total Co-financing			15,766,666

4.3.1 Financial plan (by component, outputs and co-financier)

The details of the financial plan, by component, outputs and sources of co-financing, including the GEF inputs, government inputs, FAO inputs and other co-financing inputs, are presented below.



Financial Plan Brazil
Redeser.xlsx

4.3.2 GEF inputs

Table 4.3 shows the GEF inputs for each component.

Component	GEF inputs
1	937,747
2	1,199,309
3	992,294
4	462,448

5	151,207
PMC	187,150
Total	3,930,155

4.3.3 Government inputs

The federal, state and municipal inputs for each component are shown in Table 4.4 and the financial plan.

Component	Federal	State	Municipal	Total
1	700,000	1,333,333	266,667	2,300,000
2	4,456,667	266,667	266,667	4,990,001
3	3,760,000	1,599,999		5,359,999
4		266,667		266,667
5	310,000			310,000
Total	9,226,667	3,466,666	533,334	13,226,667

4.3.4 FAO inputs

Under Component 2, the Brazilian Forest Service through FAO will contribute through the Project UTF/BRA/081/BRA “Consolidation of the National Forest Program (CNFP)” (started on 01/01/2011, NTE 30/06/2016, budget USD 3,299,527) to the validation of best practices in Forest Management adapted to local conditions in the project’s target areas.

FAO will provide co-financing for an amount of USD 200,000, including an in-kind contribution of USD 172,000, originating from one ongoing project. In addition, FAO will contribute in-kind co-financing of USD 28,000 in staff time, facilities, office space and information-sharing platforms that will co-finance the Project Management Cost. These contributions will be managed by FAO and recorded each year by the project team in accordance with GEF policies and procedures.

FAO will also provide support by sharing communication and awareness-raising strategies and methodologies developed at its Headquarters and tested in similar conditions in other countries.

4.3.5 Other co-financiers inputs

The inputs from other co-financiers are shown in the financial plan (section 4.3.1).

4.3.6 Financial management of and reporting on GEF resources

Financial management and reporting on GEF resources will be carried out in accordance with FAO’s rules and procedures and the agreement between FAO and the GEF Trustee. On the basis of the activities foreseen in the budget and the project, FAO will undertake

all operations for disbursements, procurement and contracting for the total amount of GEF resources, as per the request of the NPD and the PEU.

Financial Records. FAO shall maintain a separate account in United States dollars for the project's GEF resources, showing all income and expenditures. Expenditures incurred in a currency other than United States dollars shall be converted into United States dollars at the United Nations operational rate of exchange on the date of the transaction. FAO shall administer the project in accordance with its regulations, rules and directives.

Financial Reports. The BH shall prepare six-monthly project expenditure accounts and final accounts for the project, showing the amount budgeted for the year, the amount expended since the beginning of the year, and separately, the un-liquidated obligations, as follows:

1. Details of project expenditures on an output-by-output basis, reported in line with project budget codes as set out in the project document, as of June 30 and December 31 of each year.
2. Final accounts on completion of the project on a component-by-component and output-by-output basis, reported in line with with the Project Budget (Appendix 3 of this Project document).
3. A final statement of account in line with FAO Oracle Project budget codes, reflecting actual final expenditures under the project, when all obligations have been liquidated.

Financial Statements. Within 30 working days of the end of each semester, the FAO Representation in Brazil shall submit six-monthly statements of expenditure of GEF resources to the Project Management Committee and Project Steering Committee. The purpose of the financial statement is to list the expenditures incurred on the project on a six-monthly basis compared to the budget, so as to monitor project progress and to reconcile outstanding advances during the six-month period. The financial statement shall contain information that serves as the basis for periodic revision of the budget.

The BH will submit the above-mentioned financial reports for review and monitoring by the LTO and the FAO GEF Coordination Unit. Financial reports for submission to the donor (GEF) will be prepared in accordance with the provisions in the GEF Financial Procedures Agreement and submitted by the FAO Finance Division.

Responsibility for cost overruns. The BH shall utilize the GEF project funds in strict compliance with the Project Budget (Appendix 3) and the approved AWP/Bs. The BH can make variations provided that the total allocated for each budgeted project component is not exceeded and the reallocation of funds does not impact the achievement of any project output as per the project Results Framework (Appendix 1). At least once a year, the BH will submit a budget revision for approval of the LTO and the FAO/GEF Coordination Unit through FPMIS. Cost overruns shall be the sole responsibility of the BH.

Audit. The Project shall be subject to the internal and external auditing procedures provided for in FAO financial regulations, rules and directives and in keeping with the Financial Procedures Agreement between the GEF Trustee and FAO. The audit regime at FAO consists of an external audit provided by the Auditor-General (or persons exercising an equivalent function) of a member nation appointed by the Governing Bodies of the

Organization and reporting directly to them, and an internal audit function headed by the FAO Inspector-General, who reports directly to the Director-General. This function operates as an integral part of the organization under policies established by senior management, and furthermore has a reporting line to the governing bodies. Both functions are required under the Basic Texts of FAO, which establish a framework for the terms of reference of each. Internal audits of accounts, records, bank reconciliation and asset verification take place at FAO field and liaison offices on a cyclical basis.

4.4 PROCUREMENT

As per the request of the Government, FAO will procure the equipment and services foreseen in the budget (Appendix 3) and the AWP/B, in accordance with FAO rules and procedures.

Careful procurement planning is necessary for securing goods, services and works in a timely manner, on a “Best Value for Money” basis, and in accordance with the rules and regulations of FAO. It requires analysis of needs and constraints, including forecast of the reasonable timeframe required to execute the procurement process. Procurement and delivery of inputs in technical cooperation projects follow FAO’s rules and regulations for the procurement of supplies, equipment and services, i.e. Manual Sections 502 and 507. Manual Section 502, on “Procurement of Goods, Works and Services,” establishes the principles and procedures that apply to procurement of all goods, works and services on behalf of the organization, in all offices and in all locations, with the exception of the procurement actions described in Appendix A, on Procurement Not Governed by Manual Section 502. Manual Section 507 establishes the principles and rules that govern the use of Letters of Agreement (LoA) by FAO for the timely acquisition of services from eligible entities in a transparent and impartial manner, taking into consideration economy and efficiency to achieve an optimum combination of expected whole-life costs and benefits (“Best Value for Money”).

The FAO Representative in Brazil will prepare an annual procurement plan for major items, which will be the basis of requests for procurement actions during implementation. The plan will include a description of the goods, works or services to be procured, estimated budget and source of funding, schedule of procurement activities and proposed method of procurement. In situations where exact information is not yet available, the procurement plan should at least contain reasonable projections that will be corrected as information becomes available.

Before commencing procurement, the PTC will update the project’s Procurement Plan for approval by the Project Management Committee. This plan will be reviewed during the inception workshop and will be approved by the FAO Representation in Brazil. The PTC will update the Procurement Plan every six months and submit it to the FAO Representation in Brazil for approval.

4.5 MONITORING AND REPORTING

Monitoring and evaluation of progress in achieving project results and objectives will be carried out based on the targets and indicators established in the project Results Matrix

(Appendix 1) and described in sub-sections 2.3 and 2.4. The project monitoring and evaluation activities have been budgeted at USD 121,338 (see Table 4.7 below) . Monitoring and evaluation activities will follow FAO and GEF monitoring and evaluation policies and guidelines. The monitoring and evaluation system will also facilitate learning and replication of project results and lessons in relation to integrated natural resource management.

4.5.1 Oversight and monitoring responsibilities

The monitoring and evaluation roles and responsibilities specifically described in the Monitoring and Evaluation table (see Table 4.7 below) will be undertaken through: i) day-to-day monitoring and project progress supervision missions in coordination with local organizations and other stakeholders; (ii) technical monitoring of indicators to measure the introduction of best practices and the surface covered by incentive mechanisms, as well as the number of people trained in best practices; (iii) specific monitoring plans for implementation of best practices (component 2); (iv) mid-term and final evaluations by independent consultants and the FAO Evaluation Office; (v) monitoring and supervision missions (FAO). Monitoring will also include calculations of avoided GHG emissions due to project intervention.

At the initiation of project implementation, the PTC and the PEU will set up a project progress monitoring system. Participatory mechanisms and methodologies for systematic data collection and recording will be developed to support outcome and output indicator monitoring and evaluation. During the inception workshop (see section 4.5.3), M&E related tasks to be addressed will include: (i) presentation and clarification (if needed) of the Project Results Framework with all project stakeholders; (ii) review of the M&E indicators and their baselines; (iii) drafting the required clauses to include in consultants' contracts to ensure they complete their M&E reporting functions (if relevant); (iv) clarification of the respective M&E tasks among the project stakeholders.. The M&E Expert (see TORs in Appendix 5) will prepare a draft monitoring and evaluation matrix that will be discussed and agreed upon by all stakeholders during the inception workshop. The **M&E matrix** will be a management tool for the PTC and the PEU to: i) six-monthly monitor the achievement of output indicators; ii) annually monitor the achievement of outcome indicators; iii) clearly define responsibilities and verification means; iv) select a method to process the indicators and data.

The **M&E Plan** will be prepared by the M&E Expert in the three first months of the Project Year (PY) 1 and validated with the PSC. The M&E Plan will be based on the M&E Table (see table 4.7) and the M&E Matrix and will include: i) the updated results framework, with clear indicators per year; ii) updated baseline, if needed, and selected tools for data collection (including sample definition); iii) narrative of the monitoring strategy, including roles and responsibilities for data collection and processing, reporting flows, monitoring matrix, and brief analysis of who, when and how will each indicator be measured. Responsibility of project activities may or may not coincide with data collection responsibility; iv) updated implementation arrangements, if needed; v) inclusion of the tracking tool indicators, data collection and monitoring strategy to be included in the mid-term evaluation and final evaluation; vi) calendar of evaluation workshops, including self-evaluation techniques.

The day-to-day monitoring of the Project implementation will be the responsibility of the PTC and will be driven by the preparation and implementation of an AWP/B followed up through six-monthly PPRs. The preparation of the AWP/B and six-monthly PPRs will reflect a unified planning process involving the main project stakeholders. As tools for results-based-management (RBM), the AWP/B will identify the actions proposed for the coming project year and provide the necessary details on output and outcome targets to be achieved, and the PPRs will report on the monitoring of the implementation of actions and the achievement of output and outcome targets. Specific inputs to the AWP/B and the PPRs will be prepared based on participatory planning and progress review with all stakeholders, coordinated through the PTC and facilitated through project planning and progress review workshops. These contributions will be consolidated by the PTC in the AWP/B draft and the PPRs.

An annual project progress review and planning meeting should be held with the participation of the project partners to finalize the AWP/B and the PPRs. Once finalized, the AWP/B and the PPRs will be submitted to the FAO LTO for technical clearance, and to the Project Steering Committee for revision and approval. The AWP/B will be developed in a manner consistent with the Project Results Matrix to ensure adequate fulfillment and monitoring of project outputs and outcomes.

Following the approval of the Project, the PY1 AWP/B will be adjusted (either reduced or expanded in time) to synchronize it with the annual reporting calendar. In subsequent years, the AWP/Bs will follow an annual preparation and reporting cycle as specified in section 4.5.3.

4.5.2 Indicators and information sources

To monitor project outputs and outcomes including contributions to global environmental benefits, specific indicators have been established in the Project Results Matrix (Appendix 1). The Project Results Matrix indicators and means of verification will be applied to monitor both project performance and impact. Following FAO monitoring procedures and progress reporting formats, data collected will be sufficiently detailed to track specific outputs and outcomes and provide early warning about project risks. Output target indicators will be monitored on a six-monthly basis and outcome target indicators will be monitored on an annual basis, if possible, or as part of the mid-term and final evaluations.

The project output and outcome indicators have been designed to monitor biophysical and socio-economic impacts and progress in building and consolidating capacities for INRM, SLM, SFM and NTFP at the legal and political level as well as the production level among family farmers.

The main information sources to support the M&E plan include: i) MMA and FAO monitoring systems; ii) participatory workshops with stakeholders and beneficiaries to review project progress; iii) on-the-ground monitoring of best practices of SLM and SFM; iv) progress reports prepared by the PTC with inputs from the MMA, project specialists and other stakeholders; v) consultants' reports; vi) training reports; viii) mid-term review and final evaluation; viii) financial reports and budget revisions; ix) Project

Implementation Reviews prepared by the FAO LTO supported by the FAO Representation in Brazil; x) FAO supervision mission reports.

4.5.3 Reporting schedule

Specific reports that will be prepared under the monitoring and evaluation program are: (i) Project Inception Report; (ii) Annual Work Plan and Budget (AWP/B); (iii) Project Progress Reports (PPRs); (iv) Annual Project Implementation Review (PIR); (v) technical reports; (vi) co-financing reports; (vii) Terminal Report. In addition, assessment of the GEF Tracking Tools (TTs) against the baselines will be required at mid-term review and final evaluation.

Project Inception Report. After FAO internal approval of the project, an inception workshop will be held. Immediately after the workshop, the PTC will prepare a project inception report in consultation with the PTM in the FAO Representation in Brazil and other project partners. The report will include a narrative on the institutional roles and responsibilities and coordinating action of project partners, progress to date on project establishment and start-up activities and an update on any changes in external conditions that may affect project implementation. It will also include a detailed first-year AWP/B and the M&E Matrix (see above). The draft project inception report will be circulated to FAO, the PSC and the PMC for review and comments before its finalization, no later than three months after project start-up. The report will be cleared by the FAO BH, LTO and the FAO GEF Coordination Unit. The BH will upload it into FPMIS.

Annual Work Plan and Budget(s) (AWP/Bs). The PTC will submit to the Project Management Committee a draft AWP/B no later than 10 December of each year. The AWP/B should include detailed activities to be implemented by project outcomes and outputs and divided into monthly timeframes and targets and milestone dates for outcome and output indicators to be achieved during the year. A detailed project budget for the activities to be implemented during the year should also be included together with all monitoring and supervision activities required during the year. The FAO PTM will circulate the draft AWP/B to the FAO interdisciplinary Project Task Force and will consolidate and submit the FAO comments to the PTC, who will incorporate the comments of the Project Management Committee. The final AWP/B will be sent to the Project Steering Committee for approval and to the FAO for final no-objection. The BH will upload the AWP/Bs in FPMIS.

Project Progress Reports (PPR). The PPRs are used to identify constraints, problems or bottlenecks that impede timely implementation and take appropriate remedial action. PPRs will be prepared based on the systematic monitoring of output and outcome indicators identified in the Project Results Framework (Appendix 1), AWP/B and M&E Plan. Each semester the PTM will prepare a draft PPR, and will collect and consolidate any comments from the FAO PTF. The PTC will submit the final PPRs to the FAO Representative in Brazil every six months, prior to 10 June (covering the period between January and June) and before 10 December (covering the period between July and December). The July-December report should be accompanied by the updated AWP/B for the following Project Year (PY) for review and no-objection by the FAO PTF. Once these comments have been incorporated, the LTO will give his/her technical clearance, the BH

will approve and remit the final PPR to the Project Steering Committee (PSC) for final approval. The BH will upload the PPRs in FPMIS..

Annual Project Implementation Review (PIR). The PTC, under the supervision of the LTO and BH and in coordination with the PTM and the national project partners, will prepare a draft annual PIR report¹⁶ covering the period July (the previous year) through June (current year) no later than 1 July every year. The LTO will finalize the PIR and will submit it to the FAO-GEF Coordination Unit for review by 10 July. The FAO-GEF Coordination Unit, the LTO, and the BH will discuss the PIR and the ratings¹⁷. The LTO is responsible for conducting the final review and providing the technical clearance to the PIR(s). The LTO will submit the final version of the PIR to the FAO-GEF Coordination Unit for final approval. The FAO-GEF Coordination Unit will then submit the PIR(s) to the GEF Secretariat and the GEF Independent Evaluation Office as part of the Annual Monitoring Review of the FAO-GEF portfolio. The PIR will be uploaded to FPMIS by the FAO-GEF Coordination Unit.

Technical Reports. Technical reports will be prepared as part of project outputs and to document and share project outcomes and lessons learned. The drafts of any technical reports must be submitted by the PTC to the Project Management Committee and the FAO Representation in Brazil, which will share it with the LTO for review and clearance and to the FAO-GEF Coordination Unit for information and comments, prior to finalization and publication. Copies of the technical reports will be distributed to the PSC and other project partners as appropriate. The final reports will be uploaded on the FAO FPMIS by the FAO PTM.

Co-financing Reports. The PTC will be responsible for collecting the required information and reporting on in-kind and cash co-financing provided by all the project co-financiers and any new partners that have not signed co-financing letters. Every year, the PTC will submit the report to the FAO Representation in Brazil before July 10, covering the period from July of the previous year through June of the current year. This information will be used in the PIRs.

GEF Tracking Tools. Following the GEF policies and procedures, the tracking tools for the LD, BD and SFM/REDD+ focal areas will be submitted to the GEF Secretariat at three moments: (i) with the project document at CEO endorsement; (ii) at the project's mid-term evaluation; (iii) with the project's terminal evaluation.

Terminal Report. Within two months before the end date of the project, the PTC will submit to the Project Management Committee and the FAO Representation in Brazil a draft Terminal Report. The main purpose of the final report is to give guidance to authorities (ministerial or senior government level) on the policy decisions required for follow-up of the Project and to provide the donor with information on how the funds were utilized. The terminal report is accordingly a concise account of the main products, results, conclusions and recommendations of the project, without unnecessary background,

¹⁶ Prior to the preparation of the PIR report, the FAO-GEF Coordination Unit will provide the updated format as every year some new requirements may come from the GEF.

¹⁷ The PTC, the BH, the LTO and the FAO/GEF Coordination Unit should assign ratings to the PIR every year. The ratings can or cannot coincide among the project managers.

narrative or technical details. The target readership consists of persons who are not necessarily technical specialists, but who need to understand the policy implications of technical findings and needs for ensuring sustainability of project results. Work is assessed, lessons learned are summarized and recommendations are expressed in terms of their application to the promotion of SLM, SFM, INRM and NTFP in the context of the development priorities at the national and state levels, as well as in practical execution terms on the ground. This report will specifically include the findings of the final evaluation as described in sub-section 4.6. A final project review meeting should be held to discuss the draft terminal report with the Project Steering Committee before it is finalized by the PTC and approved by the BH, LTO and the FAO-GEF Coordination Unit.

4.5.4 Monitoring and evaluation summary

Table 4.7 provides a summary of the main monitoring and evaluation reports, responsible parties and timeframes:

Table 4.7. Summary of the main monitoring and evaluation activities.

Type of M&E Activity	Responsible Parties	Time-frame	Budget
Inception Workshop	PTC, FAO (PTM supported by LTO, BH and FAO GEF Coordination Unit)	Within two months of project start up	USD 6,500
Project Inception Report	PTC, Expert M&E and FAO PTM, cleared by LTO, BH, and FAO GEF Coordination Unit	Immediately after the workshop	-
Field-based impact monitoring	PTC, institutions and organizations participating in the project	Continually	USD 14,285 (project coordination time, technical workshops for identification of indicators, M&E workshops)
Supervision visits and rating of progress in PPRs and PIRs	PTC and FAO (PTM, LTO. FAO GEF Coordination Unit may participate in the visits if needed.)	Annual or as required	FAO visits will be financed through GEF agency fee and project coordination visits will be financed by the project travel budget
Project Progress Reports (PPR)	PTC with inputs by MMA, MDA, FAO and other participating partners	Six-monthly	USD 4,945

Type of M&E Activity	Responsible Parties	Time-frame	Budget
Project Implementation Review (PIR)	Drafted by the PTM, with the supervision of the LTO and BH. Approved and submitted to GEF by the FAO-GEF Coordination Unit	Annual	Financed through GEF agency fee
Co-financing Reports	PTC with inputs from other co-financiers	Annual	USD 1,649
Technical reports	PTC, and FAO (LTO, PTM)	As appropriate	
Mid-term Evaluation	External consultants and FAO Office for Evaluation in consultation with the project team and other partners	At mid-point of project implementation	USD 40,000 for external consultants
Final evaluation	External consultants and FAO Evaluation Office in consultation with the project team including the FAO GEF Coordination Unit, and other partners	At the end of project implementation	USD 40,000 for external consultants
Terminal Report	PTC and FAO (PTM, LTO, FAO GEF Coordination Unit, TSCR report unit)	Two months before the end date of the project	USD 17,412
Total Budget			USD 124,791

4.6 PROVISION FOR EVALUATIONS

At the end of the first 24 months of project implementation, the BH will arrange an independent Mid-Term Evaluation (MTE) in consultation with the PSC, the PEU, the LTO and the FAO-GEF Coordination Unit. The MTE will be undertaken to review progress and effectiveness in terms of achieving project objective, outcomes and outputs. Findings and recommendations of this review will be instrumental for bringing improvement in the overall project design and execution strategy for the remaining period of the project's term if necessary. The FAO Evaluation Office (OED) will arrange for the MTE in consultation with project management. The evaluation will, *inter alia*:

- a) Review the effectiveness, efficiency and timeliness of project implementation;
- b) Analyse effectiveness of partnership arrangements;
- c) Identify issues requiring decisions and remedial actions;
- d) Propose any mid-course corrections and/or adjustments to the implementation strategy as necessary; and
- e) Describe the technical achievements and lessons learned derived from project design, implementation and management.

An independent Final Evaluation (FE) will be carried out three months prior to the terminal report meeting. The FE will aim to identify the project impacts, sustainability of project outcomes and the degree of achievement of long-term results. The FE will also have the purpose of indicating future actions needed to expand on the existing Project in subsequent phases, mainstream and up-scale its products and practices, and disseminate information to management authorities and institutions with responsibilities in food security, conservation and sustainable use of natural resources, small-scale farmer agricultural production and ecosystem conservation to assure continuity of the processes initiated by the Project. Both the MTR and FE will pay special attention to outcome indicators and will be aligned with the GEF Tracking tool (LD, BD and SFM focal areas).

4.7 COMMUNICATION AND VISIBILITY

Learning and Knowledge Sharing. Results from the project will be disseminated within and beyond the project areas through a number of existing networks and forums. In addition, the project will participate, as relevant and appropriate, in FAO-sponsored networks. It 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 through lessons learned. It will also identify, analyze and share lessons learned that might be beneficial in the design and implementation of similar future projects. Identification and analysis of lessons learned is an on-going process and should be delivered at least once every 12 months. FAO shall provide a format and assist the project team in categorizing, documenting and reporting on lessons learned. Specifically, the project will ensure coordination in terms of avoiding overlap, sharing best practices and generating knowledge products of best practices about sustainable land and forest management.

SECTION 5 – SUSTAINABILITY OF RESULTS

Social, environmental and financial-economic sustainability, as well as sustainability of capacities, all of which are interdependent, will be achieved through a multi-faceted exit strategy designed to ensure that positive results continue to flow after project termination.

5.1 SOCIAL SUSTAINABILITY

Social sustainability will be sought through training at the state and national level, rural extension with farmers, capacity development, information dissemination, civil society participation and policy advocacy. Broad social movements and networks such as the Semi-Arid Network (ASA) are already involved in government efforts to combat desertification. Local NGOs will provide support for regional and national alliances, outreach and continuity. These constituencies will influence elected officials, legislators and law enforcement agents as well as formulating demands regarding formulation, implementation and evaluation of relevant public policies.

Mainstreaming of gender and generation issues contributes to social sustainability and resilience of family farming. In the REDESER project, participatory mechanisms will provide for women's empowerment in productive activities, family and community relations and decision-making at all levels. Traditionally, rural women play crucial roles in food security. There is now increased participation of women as heads of households in the Northeast as well as in government and universities, although advances have not been sufficient to protect girl and women against health risks and gender violence, especially in conditions of poverty. Training on gender will be provided for project staff and institutions involved in the project. Implementation will promote technologies that provide income for women. In connection with government and non-governmental initiatives, the project will stimulate installation of more efficient cook stoves and drinking water collection systems in rural households, reducing women's work loads. Other beneficial innovations include tropical home gardens (peri-domiciliary agroforestry) and processing of socio-biodiversity products from wild collection. Another interesting possibility for women's economic participation and empowerment is production of handicrafts made with wood and non-wood material (fibers, flowers, nuts, seeds etc.) collected in forest areas, including bio-jewelry. It is also essential to provide opportunities and contributions for youth in the countryside, especially as regards use of modern technology, and for the increasing proportion of elderly, who offer their wisdom but need support of more machinery.

More sustainable and resilient production systems provide food and nutrition security directly, through providing diverse sources of protein, oils, carbohydrates and vitamins and minerals from crops, livestock and wild collection, even in dry seasons and during droughts. They also contribute to food security indirectly by providing sources of monetary income throughout the entire year, not just at harvest time, and during droughts.

The family farmer *sertanejos* of the ASD in Brazil can be considered traditional peoples. The project does not involve indigenous people or Afro-descendant *quilombola* communities directly, but the SLM, SFM and NTFP best practices can be adopted by the various groups that live elsewhere in the Caatinga and its transitions to other biomes. Sub-section 1.1.3 on stakeholder analysis provides more details on how the project will ensure social inclusion.

5.2 ENVIRONMENTAL SUSTAINABILITY

Environmental sustainability will be sought, first of all, through promotion of uptake of more sustainable land and forest management, integrated with agricultural and animal husbandry practices, especially in the areas most susceptible to desertification. They will provide benefits in terms of land degradation, biodiversity conservation and reduced emissions of greenhouse gases. They will include practices that are adapted to climate change impacts and that promote resilience, so as to minimize future losses and damages. The practices that the project will identify, test and adjust, if needed, can be replicated throughout the drylands of the Northeast as well as the other Brazilian biomes that are starting to experience scarcity of water.

In addition to practices, the project can contribute to improved environmental policies, or consideration of environment in economic and social development policies, which involve more substantial resources. It will empower constituencies that can continue to influence formulation, implementation and evaluation of policies, programs and projects in the future.

Lasting environmental benefits on a large scale depend on strengthened land use policies and planning, taking due account of land degradation. They depend on better integration of environment into the governance framework, coupled with increased capacity as well as availability and accessibility of funding. The project's combination of work at the grassroots level with initiatives at the science and policy level will contribute to this end.

5.3 FINANCIAL AND ECONOMIC SUSTAINABILITY

Financial and economic sustainability requires higher levels of agricultural productivity, lower costs of inputs, greater use of local inputs, improved access to markets, higher family farm incomes, more diversification and less vulnerability to seasonal and inter-annual variations, including more severe climate impacts in the future.

Investments in new technologies must be affordable for small farmers and provide sufficient economic return, both monetary and non-monetary, especially if they involve the use of credit. Family farmers living in or near poverty need to minimize risks of indebtedness. The SFM techniques to be promoted will take into consideration their financial viability for farmers, i.e. costs and benefits in the short, middle and long term. This includes, for example, the possibilities of using exotic species such as legumes and bananas that provide sources of food and income for small farmers while also facilitating the reintroduction and reproduction of native species.

Environmental sustainability (lower levels of degradation and desertification) depends to a large extent on economic sustainability, so that predatory practices can be avoided and investment in sustainable practices is financially feasible, even in the face of budget restrictions or national or global economic crisis. For example, income from sale of honey can substitute for income from grazing and can be used to invest in more beekeeping equipment or to pay back loans for investing in drip irrigation.

Financial sustainability will be assured through the mainstreaming and incorporation of SFM criteria into large existing baseline programs, which involve billions of dollars every year and through support for increased access to funding for such activities from a variety of traditional and non-traditional sources.

5.4 SUSTAINABILITY OF CAPACITIES DEVELOPED

Sustainability of capacities developed will be promoted through the project emphasis on mechanisms for training and creation of human capital on SFM, licensing, oversight and extension. The institutions that will become more involved are state and municipal secretariats, INSA, universities, rural technical assistance agencies, land reform agencies, social movements, other MMA secretariats and other ministries, particularly MDS, MDA, MCTI and MAPA.

The project will influence the various members of the NCCD, which is a permanent structure, to make progress in the transition from good intentions to concrete and specific forms of action. Institutional capacity development through formal and informal training, in addition to suggestions about relevant criteria for recruitment of new staff with appropriate qualifications, is an essential element of institutional sustainability.

5.5 APPROPRIATENESS OF TECHNOLOGY INTRODUCED

As mentioned in the third paragraph of section 2.1, the best practices of SLM and SFM that are most promising in the Caatinga include sustainable harvesting of wood for fuel and fence posts, common pastures, livestock foraging in managed woodlands, long fallow systems, pruning, intensive mulching, biological control, sustainable use of native fruits and nuts, managed regeneration, enrichment, agroforestry, seed and seedling collection and planting, beekeeping, handicrafts, backyard home gardens, efficient cook stoves, drip irrigation, small underground dams (zero base) and rainwater capture and storage, among others. These are appropriate technologies, known in Brazil as “social” technologies, with positive social, economic and environmental impacts.

The appropriateness of the various technologies will be analyzed regarding their effectiveness and efficiency. If they produce too little or take too long, the efforts of the project could fail and result in resistance to any innovation. This could also happen if there are no markets for new products or if inappropriate application of regulatory frameworks results in fines or penalties. There is need for legal security, especially to comply with complex and ambiguous rules and regulations about the use of areas protected by the Forest Law as well as collection and sale of seeds.

Appropriateness of technologies introduced depend on economic feasibility and affordability for small farmers. The economic return to SLM and SFM requires analysis to determine what benefits can be derived as compared to the alternatives available, especially in scenarios of desertification, climate change and market volatility. For forest restoration, the costs and benefits of natural regeneration assisted by fencing, bird perches, beekeeping and control of fire will be compared with costs and benefits of planting seedlings, which faces risks of predation, fire and mortality. Likewise, direct planting of seeds may be less costly and risky, especially in areas distant from homes or water.

The costs of administration must also be taken into account. The abilities of government agencies to hire staff and provide transportation to and lodging in remote rural areas are limited, especially in times of economic crisis and fiscal adjustment. At the same time, the ability of small farmers to go to municipal seats or state capitals in poor regions as needed to comply with rules and regulations is also limited and involves opportunity costs. These direct and indirect transaction costs must also be considered.

Biodiversity corridors in the sense of continuous stretches of native vegetation between or among protected areas are not always possible. As seen in sub-section 1.1.1, protected areas are rare in the Caatinga. Mosaics of protected areas would be desirable, but not necessarily appropriate, especially if they concentrate conservation in the areas that are already most protected and neglect others. Complete physical continuity among forest remnants is not always necessary to maintain flows among gene pools. Possible alternatives include "stepping stones" as well as translocation of seeds or seedlings, in the case of flora, or of breeding stock, in the case of fauna.

Agroforestry systems should not be limited to isolated patches, but rather can encompass the entire farm, including edges of roads, small slopes, rocky areas, swamps, green hedges, wooded patches, areas around springs, i.e. the entire family farming production system (*sistemas agrícolas familiares*), establishing interrelations at the landscape level. Agroforestry system technologies developed in the Amazon or Atlantic Forest need to be adapted to conditions of heat and dryness of the Caatinga. Work on this topic is planned in Brazil by ICRAF and IUCN.

5.6 REPLICABILITY AND SCALING UP

Replication and scaling-up to the level of all the states in ASD will be achieved through development and proposition of adjustments in inappropriate legal frameworks, especially rules and regulations regarding licensing, inspection, rural extension and credit. For example, it will be shown that well-managed wood harvesting and rotation of small cleared plots with sufficient fallow combined with extraction (wild collection) for sustainable use of biodiversity, although they may at first sight be considered detrimental to the environment, are in fact beneficial, especially as compared to monocultures and pastures, which replace small-scale family farming and are often degraded.

Replication and scaling-up within the Caatinga will commence immediately because of the proximity of field sites to neighbors in similar circumstances, especially in the 92 municipalities in and around the four selected areas. Training of human resources will

have both immediate and lasting results, as will the strategy for dissemination of project results in Component 4. In addition to large networks such as ASA, there is now improved transportation (automobiles, motorcycles, buses and airplanes) at the local, regional and national levels, in addition to widespread access to modern means of communication (cellular telephones, television, internet), even in rural areas. The improvements in social capital, infrastructure and technology facilitate replication and scaling up.

The GEF-UNDP Small Grants Program, in operation since 1995, is one of the possible channels of replication within the Caatinga, the Cerrado and adjacent parts of the Amazon. With sufficient funding, it could issue specific calls for proposals regarding desertification, biodiversity conservation and reduction of carbon emissions. If possible, these calls could be supported with resources from international donors, foundations, private sector, banks and development instruments of federal and state governments.

Through the project, the Department to Combat Desertification will be strengthened within the MMA and in its relations with other agencies and ministries, the NCCD and the National Environment Council (CONAMA). Thus, the project will grant more visibility to issues of desertification and land degradation.

Replication and scaling-up require new sources of funding, which are not as easily found now that Brazil is considered by international donors to be an emerging country that no longer deserves priority for international development assistance, while at the same time economic growth is weak and the government is undergoing fiscal adjustment. Nonetheless, there are many new possibilities that the project will help identify and disseminate. This will be facilitated by the fact that environmental problems of water and climate, which the project addresses, are now major national and international concerns.

In addition to inputs into the worldwide FAO Drylands program network, all this work within Brazil will create many opportunities for interaction with other countries with areas subject to desertification. This has already begun with African countries through the MMA working with the UNCCD. There has also been exchange between Brazil and Chile through UNDP and the GEF-UNDP Small Grants Program, which now operates in more than 130 developing countries around the world. With regard to forests, the Center for International Forestry Research (CIFOR), which is active in Brazil, is another avenue for interaction with other countries around the world, as is the World Agroforestry Centre (ICRAF). The selected sites may be used as part of South-South cooperation on drylands between Brazil and Africa and potentially Central America to be developed in partnership among FAO's programme on Action Against Desertification in support of the Great Green Wall, ICRAF, IUCN and the World Resources Institute (WRI), which now have offices in Brazil. WRI is working on the concept of up-scaling landscape restoration through "regreening" in Africa, a continent with which Brazil has many ties. FAO and WRI are also partners in the implementation of the Rome Promise on monitoring and assessment of global drylands for Sustainable management and restoration and FAO has already engaged work with INSA for starting baseline assessments in this regard.

APPENDIX 1: RESULTS MATRIX

Summary of project outcomes and impacts:

Objective/Impact	Component	Outcome indicators	Assumptions
<p><u>Project Objective:</u> To halt and reverse environmental degradation in areas susceptible to desertification (ASD), ensuring the flow of ecosystem services, promoting the integrated management of natural resources, generating environmental benefits and contributing to poverty reduction.</p> <p><u>Development Objective:</u> Increase and improve provision of goods and services from sustainable management and restoration of dryland forest and agroforestry production landscapes.</p>	Component 1: Promoting Integrated Natural Resource Management (INRM) in Production Landscapes	1,567 smallholders increase and diversify farming production by adopting and mainstreaming INRM within the 904, 142 ha under INRM	State environmental agencies (OEMAs) adopt improved licensing processes for land clearing and land use.
	Component 2: Promoting Multiple-Use Forest Management	<p>Direct effect: 15,000 ha of forest area of project-selected sites under SFM practices</p> <p>Indirect effect in 618,062 ha: 4 NTFPs commercialized with stable prices at project selected sites 3 NTFPs (babassu, <i>pequi</i> and <i>licuri</i>) from selected sites increase market value by processing</p>	<p>Efforts to simplify SFM licensing procedures are carried out on a permanent basis by environmental agencies.</p> <p>Financial resources are available for NTFP and smallholders.</p>
	Component 3: Forest and Landscape Restoration (FLR)	<p>Direct impact: 30,000 ha identified and under restoration in project selected sites</p> <p>Direct impact: Guidelines on Forest and Landscape Restoration (FLR) for Brazil Drylands are developed and adopted in support of restoration efforts by stakeholders</p>	Land restoration methods are improved to make large-scale forest and landscape restoration attractive.

		Indirect impact: 20 local participatory projects under implementation in other degraded areas with PRONAF and other financial sources	
	Component 4: Knowledge Management, Capacity Development and Awareness-Raising	<p>Improved institutional capacities of a total of 270 staff (including staff working in the offices of the 14 municipalities and 9 states) affect decision-making in favor of sustaining ecosystem services</p> <p>A knowledge management database established compiling tools and good practices supported and compiled by the project (SFM, INRM, FLR, NWFP)</p>	<p>Opportunities open by implementation of Rural Environmental Registry (CAR) according to requirements of environmental regulation under Brazil's new Forest Law.</p> <p>The Northeast Development Superintendency (SUDENE) supports capacity development efforts in collaboration with project team and experts (as expected and agreed during project formulation).</p>
	Component 5: Coordination with Other Activities, Monitoring and Evaluation		

Project outcomes and outputs:

Outcomes & Outputs	Indicators	Baseline	Target	Milestones towards achieving outcome and output targets				Data Collection and Reporting	
				Year 1	Year 2	Year 3	Year 4	Means of verification	Responsible for data collection
Component 1									
Outcome 1.1 INRM has been mainstreamed and scaled up at landscape level	# of hectares where INRM is adopted and mainstreamed ¹	0	904,142 ha.		271,243 ha.	Additional 271,243 ha (total of 542,485 ha.)	Additional 361,657 ha. (total of 904,142 ha.)	PAE ² s/NAP ³ Brazil reports	INRM Specialist and INSA
	LD-3 ii): Spatial coverage of INRM practices in wider landscape (in hectares)							Maps	
	BD-2.1: areas where the project directly contributes to							Photos	
								Field surveys of rural households	
								Biophysical assessment using Collect Earth Tool in collaboration with INSA	

¹ In the project intervention sites

² Parsimony analysis of endemism

³ National Action Plan, UNCCD

Outcomes & Outputs	Indicators	Baseline	Target	Milestones towards achieving outcome and output targets				Data Collection and Reporting	
				Year 1	Year 2	Year 3	Year 4	Means of verification	Responsible for data collection
Component 1									
	BD conservation or sustainable use of its components								
	LD-3 ii): # of INRM tools and methodologies introduced	0	3 good practices: i) sustainable production of non-wood forest and agriculture products; ii) Forest and Landscape restoration; and iii) sustainable management of natural resources.		3 good practices applied in 30% of the target areas	3 good practices applied in 60% of the target areas	3 goods practices applied in 100% of the target areas and disseminated in capacity development activities		INRM Specialist (in coordination with Awareness-Raising Specialist) Project Technical Coordinator (PTC)
<u>Outcome 1.1 (contd.)</u>	# of smallholders with increased and diversified production based on INRM	negligible	1,567 people		470 people (30% of households are female-led)	Additional 470 people (total of 940 people) (30% of households are female-led)	Additional 627 people (total of 1,567 people) (30% of households are female-led)	Household income surveys including gender-sensitive indicators	PTC INRM Specialist

Outcomes & Outputs	Indicators	Baseline	Target	Milestones towards achieving outcome and output targets				Data Collection and Reporting	
				Year 1	Year 2	Year 3	Year 4	Means of verification	Responsible for data collection
Component 1									
	% of households that are female-led								
Output 1.1.1: INRM best practices identified, evaluated and replicated at farm and landscape levels	% of areas of project intervention where the best practices have been implemented			Best practices assessed and evaluated in 904,142 ha, Sites of good practices for up-scaling are identified	Good practices are up-scaled in 30% of the target areas	Good practices are up-scaled in additional 30% of the target areas	Good practices are upscaled in additional 40% of the target areas (100%)		PTC INRM Specialist

Output 1.1.2 NTFP from INRM incorporated in government programs and projects and	Increase in products purchased by PAA21/PNAE22	Less than 10 products listed by PAA and PNAE at project sites	Purchases by PAA/PNAE increased by 20% by 2019	PAA/PNAE purchases boosted in project areas Rural households integrated to	First 5 local organizations have consolidated sales flow to PAA/PNAE	Another 10 local organizations have consolidated sales flow to PAA/PNAE	Another 20 local organizations requesting access to PAA/PNAE	PAA/ PNAE annual reports	PTC INRM Specialist Value Chain Specialist (part-time)
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²¹ National Purchase Program, for its acronym in Portuguese

²² National Program of School Feeding, for its acronym in Portuguese

local agro-industries				PAA/PNAE with 15% purchase increase			PAA/PNAE purchases increased by 20%		
Output 1.1.3 Capacity for identification, evaluation and promotion of INRM systems strengthened at state-level departments and agencies	Guidelines developed for identification and evaluation of INRM systems # of technical staff prepared to use the guidelines	None	1 set of guidelines 100 technical staff prepared to use guide-lines and evaluate INRM	Work plans initiated by 4 state environmental agencies (OEMAs)	Specific technical orientations for fallow and pasture commons by 4 OEMAs 100 technical staff trained	Work plans replicated by at least 5 OEMAs of remaining ASD states	Specific technical guidelines for land use in remaining ASD states	Licensing systems making use of technical guidance Technical notes issued by OEMAs	PTC INRM Specialist Expert in legal issues related to sustainable local development Awareness-raising specialist
Component 2									
Outcome 2.1 Forest areas under multi-purpose Sustainable Forest management (SFM) have been increased	LD-2 iii): i) # of hectares providing sustained flow of services in forest ecosystems in drylands	0	618,062 ha. of forest areas. (85% of forest cover in project area)		309,031 ha.		618,062 ha. of forest areas. (85% of forest cover in project area)		PTC (SFM Expert) Local implementing agencies

	<p>SFM/REDD+-1.2: a) <i>Area covered by forest management plans</i></p> <p>b) <i>with conservation and enhancement of carbon in forest through SFM</i></p> <p>BD-2 iii): Specific management practices that integrate BD: a) SFM plans</p> <p>LD-2 ii): Total spatial coverage of SFM</p>	<p>a) 2 management plans exist covering a total of 1,712 ha</p> <p>b) 0</p>	<p>a) +15,000 ha under SFM plans</p> <p>b) 618,062 ha corresponding to 2,058,146 t CO₂eq (indirect impact)</p>	+2,000 ha. with SFM plans	Additional 4,000 ha. with SFM plans	Additional 4,000 ha with SFM plans	<p>a) Additional 5,000 ha with SFM plans. (Total: +15,000 ha. under SFM plans)</p> <p>b) 618,062 ha corresponding to 2,058,146 t CO₂eq (indirect impact)</p>	<p>SFM plans prepared</p> <p>OEMA annual reports</p>	<p>PTC (SFM Expert)</p> <p>Local implementing agencies</p>

	practices and technologies ²³								
Output 2.1.1 Innovative small- and large-scale SFM practices identified, evaluated and replicated in selected forest management and experimental areas	Demonstration areas with selected SFM practices	None	6 SFM demonstration areas installed in 15,000 ha.	Work plan includes innovations for SFM productive chain in ASD (fuelwood, transport, industrial procedures)	First 3 SFM sites adopt production chain innovations for fuelwood 6,000 ha.	Another 3 SFM sites adopt production chain innovations for fuelwood 10,000 ha.	Available data and general information disseminated through technical staff and agencies 15,000 ha. applying SFM practices	Annual reports and publications of CEPIS Red ceramics industrial segment reports	PTC (SFM Expert) Local implementing agencies
Output 2.1.2 Support for the development of multiple-use SFM supply chains	# of SFM plans for multiple use with NTFP at Araripe EPA ²⁴ and buffer areas of São Francisco MONAT ²⁵	One known experience in silvo-pasture in Pernambuco	SFM plans for multiple use with NTFP at Araripe EPA and buffer areas of São Francisco MONAT	Best practices identified and proposed at project selected sites to be	2 CU Management Plans Demand for SFM triggered in	Sustainable use projects disseminated and licensing procedures qualified	Marketing of NTFP of Araripe EPA and São Francisco MONAT	Project Progress Reports, Field surveys and field books of extensionists	PTC (SFM Expert) Local implementing agencies

²³ Under: 1) Best management practices /reduced Impact Logging; 2) Biodiversity conservation; 4) Management planning and multiscale land-use planning; 5) Participatory forestry, and 6) Sustained timber and NTFP production, as per the LD Tracking Tool, Indicator LD-2 iii).

²⁴ APA is the acronym in Portuguese for *Área de Proteção Ambiental* (Environmental Protection Area, EPA). In Brazil, an EPA is an extensive natural area for protection and conservation of biotic attributes (fauna and flora), therein aesthetic or cultural, important for the quality of life of local people and for the protection of regional ecosystems. A long description of EPAs is detailed in Section 1 of the Project Document.

²⁵ Natural Monuments (MONAT as per its acronym in Portuguese). A description of MONATs is detailed in Section 1 of the Project Document.

				part of Conservation Unit (CU) Management Plans	project selected sites				Value chain specialist
Output 2.1.3 Guidelines developed for SFM practices and monitoring protocols at local level	# of forestry officers and agency using the guidelines	35 forestry officers using SFM directives in 5 states 10 ASD environmental agencies using SFM directives	Technical directives At least 100 forestry officers qualified	Licensing problems identified and evaluated at selected project areas Training plan (contents and strategies)	First 50 forestry officers enabled to apply guidelines for appropriate SFM at project selected areas	Another 50 forestry officers enabled to apply guidelines for appropriate SFM at project selected areas	Selected SFM for follow-up procedures at project sites 50% of OEMAs using project validated directives	Annual reports of OEMAs Project progress reports	PTC (SFM Expert) Awareness-raising Specialist

Outcomes and Outputs	Indicators	Baseline	Target	Milestones towards achieving outcome and output targets				Data Collection and Reporting	
				Year 1	Year 2	Year 3	Year 4	Means of verification	Responsible for data collection
Component 3									
Outcome 3.1 Seed/seedling production capacity improved to support	BD-2 iii): Specific management practices that integrate BD: b) restoration	0 restoration	30,000 ha under restoration with native species		10,000 ha under restoration with native species	Additional 10,000 ha	Additional 10,000 ha Making a total of 30,000 ha under	Satellite information Maps Field reports	Forest Restoration specialist FLR Expert

Outcomes and Outputs	Indicators	Baseline	Target	Milestones towards achieving outcome and output targets				Data Collection and Reporting	
				Year 1	Year 2	Year 3	Year 4	Means of verification	Responsible for data collection
restoration of degraded lands in ASD	with native species						restoration with native species		Local implementing agencies PTC
<u>Output 3.1.1</u> Smallholders and public nurseries in ASD legalized with improved native seed and seedling production	# of nurseries registered	90% of 165 forest nurseries without legal registration	Additional 20% of nurseries are registered	All 165 tree seed nurseries are assessed according to national registration standards Corrective actions/ registration plans for at least 35 nurseries developed in support of their registration during project implementation	Additional 10 tree nurseries registered	Another 10 nurseries registered	Another 15 nurseries registered	Field reports Registration documents Forest seeds sales Media clips	Forest Restoration specialist FLR Expert Local implementing agencies Legal Specialist
<u>Output 3.1.2</u> Seed collectors and nursery personnel	Level of capacities of personnel working at nurseries.	Low capacities of 1600 personnel (working in	1600 personnel with at least medium-level capacities,	Capacity assessment of the personnel of tree	300 personnel benefit from the training	Additional 500 personnel benefit from the training	Additional 600 personnel benefit from the training	National registry Surveys distributed throughout	Forest Restoration specialist

Outcomes and Outputs	Indicators	Baseline	Target	Milestones towards achieving outcome and output targets				Data Collection and Reporting	
				Year 1	Year 2	Year 3	Year 4	Means of verification	Responsible for data collection
trained and registered in National System of Seeds and Seedlings	Capacity development materials prepared and adapted to ASR and the local social context	the 165 nurseries)	Modular training courses for seed collectors and nursery workers developed	nurseries and seed collectors Training modules developed				the capacity development process to assess improvement in capacities	Local implementing agencies Legal Specialist Awareness-raising Specialist
Output 3.1.3 Practical guidelines for FLR in ASD developed and adopted by stakeholders	# of guidelines	No guidelines in Brazil FAO Global Guidelines for the restoration of degraded forests and landscapes in drylands just launched in October 2015	Guidelines developed and adopted for Brazil using as a basis the FAO global guidelines	Seminar on FAO global guidelines and adaptation to national context A group of experts established to prepare the FLR guidelines in drylands of Brazil	Best practices and case studies compiled Draft guidelines prepared and tested	Best practices and case studies disseminated Guidelines finalized and adopted and their implementation initiated	Guidelines published and case studies showing their use developed	Published guidelines Validation workshops reports	Forest Restoration specialist FLR Expert PTC FAO
Outcome 3.2 Forest connectivity sites have been	SFM/REDD+- 1. Carbon stored in forest ecosystems	Zero in the project intervention area (no restoration)	a) Conservation & enhancement of carbon in forests:	a) 0 b) direct impact 174,055 ton CO2eq;	a)146,400 ton CO2eq b) direct impact:	a)Additional 146,400 ton CO2 eq b)Additional	a)Additional 146,400 ton CO2eq b)Additional	Maps State agencies reports	Forest Restoration specialist FLR Expert

Outcomes and Outputs	Indicators	Baseline	Target	Milestones towards achieving outcome and output targets				Data Collection and Reporting	
				Year 1	Year 2	Year 3	Year 4	Means of verification	Responsible for data collection
identified, sustainably managed and restored	and emissions avoided from deforestation and forest degradation from this project (Direct lifetime): a) Conservation & enhancement of carbon in forests b) Avoided deforestation and forest degradation		+30,000 has of forest restored, +439,200 ton CO2eq sequestered and additional enhancement of carbon in forest through SFM (target: 618,062 ha, 2,058,146 t CO2eq - indirect impact) . b) Avoided deforestation and forest degradation (avoided emissions (direct impact): 696,219 ton CO2eq ha in 5,709 ha) Indirect impact: avoided emissions of	indirect impact 618,087 ton CO2eq	additional 174,055 ton CO2eq and indirect impact: additional 618,087 ton CO2eq	b) Additional 174,055 ton CO2eq, and indirect impact : additional 618,087 ton CO2eq	174,055 ton CO2eq. Additional enhancement of carbon in forest through SFM (618,062 ha, 2,058,146 t CO2eq - indirect impact).	Field surveys	PTC Local implementing agencies FAO

Outcomes and Outputs	Indicators	Baseline	Target	Milestones towards achieving outcome and output targets				Data Collection and Reporting	
				Year 1	Year 2	Year 3	Year 4	Means of verification	Responsible for data collection
			2,472,347 ton CO ₂ eq in 60,820 ha						
	SFM/REDD+-1.2: b) Restoration/rehabilitation of degraded forests	Zero	30,000 ha.		10,000 ha	Additional 10,000 ha	Additional 10,000 ha (making a total target of 30,000 ha).		
Output 3.2.1 Appropriate sites identified and restoration plans under implementation for restoration and establishment of forest connectivity using cost-effective and adapted restoration techniques (assisted natural	# of hectares with restored forest connectivity	None in the <i>degraded forests area of 104,169 ha</i>	30,000 ha selected with restoration plans under implementation	30,000 ha selected and restoration plans developed	First 10,000 ha with restoration plan under way	Another 10,000 ha with restoration plans under way	Another 10,000 ha with restoration plan under implementation	Maps Restoration plans Annual restoration monitoring reports and sites of ASD OEMAs and MMA	Forest Restoration specialist FLR Expert PTC Local implementing agencies FAO

Outcomes and Outputs	Indicators	Baseline	Target	Milestones towards achieving outcome and output targets				Data Collection and Reporting	
				Year 1	Year 2	Year 3	Year 4	Means of verification	Responsible for data collection
regeneration, enrichment and planting etc.)									
Output 3.2.2 Participatory projects for restoration of degraded lands and improvement of production landscapes and land use practices	# of local projects prepared for financing	None	8 projects in 15,000 ha. prepared and financing negotiated with the MMA and national banks	Methodology developed for participatory projects (4 selected areas)	Participatory project formulation in 4 selected areas At least 2 projects in negotiation for financing	An additional 2 of selected projects with funds raised	Another 4 projects developed with funding secured	Projects selected Resources negotiated Project documents	PTC FLR Specialist
Component 4									
Outcome 4.1 Improvement in capacity of key state and municipal institutions	# of staff with improved capacities at local level # of knowledge management	ASD states have very limited exchange on LD and desertification	Increased capacity and knowledge of at least 270 personnel from the 14 municipalities and the 9 ASD	Capacities of the 270 personnel are assessed Capacity development plan based on	At least 50 people benefit from the capacity development plan	Additional 150 personnel benefit from the capacity development plan	Additional 70 personnel benefit from the capacity development plan	Project reports Surveys On-line webpage	Awareness-raising Specialist Media and Publishing Specialist

Outcomes and Outputs	Indicators	Baseline	Target	Milestones towards achieving outcome and output targets				Data Collection and Reporting	
				Year 1	Year 2	Year 3	Year 4	Means of verification	Responsible for data collection
about SLM, SFM and FLR	networks in ASD		states on LD and desertification issues and responses A strong network established in ASD for knowledge exchange	the needs assessment prepared Projects related to LD and desertification issues identified and connected	An on-line data base designed on LD projects in ASD, experts and stakeholders		An on-line network/ database developed and hosted at INSA for exchange of information, knowledge and projects relevant to ASD issues		Expert in LD and desertification PTC
<u>Output 4.1.1</u> Strengthened learning and action networks facilitating field exchanges in ASD	# of actions	None	Sustained flow of appropriate information on best practices An on-line network/ database developed and hosted at INSA for exchange of information, knowledge and projects relevant to ASD issues	Partnerships developed Internet portal (Cerratinga, RESAB)	First 18 articles, 6 courses, 12 workshops and fora	Another 18 articles, 6 courses, 12 workshops and fora	Workshop to present results Strategy to continue portal, networks and publications	Site operations Publications	Awareness-raising Specialist Media and Publishing Specialist
<u>Outcome 4.2</u> Policy-makers and	Availability of good-quality	Poor information materials	Materials for forest officers, nursery staff	Policy makers and partners fully	Enhanced production of material on LD,	Enhanced production of material on	Forest officers, nursery staff	Media information	Awareness-raising Specialist

Outcomes and Outputs	Indicators	Baseline	Target	Milestones towards achieving outcome and output targets				Data Collection and Reporting	
				Year 1	Year 2	Year 3	Year 4	Means of verification	Responsible for data collection
farmer, private sector and education stakeholders have capacity to implement SFM, FLR, INRM and BD conservation	materials at local level.	and delivery	and seed collectors is produced and distributed in each project site	participating in planning and production of materials on SFM, BD, FLR, LD and INRM	SFM, FLR, and BD for training courses and other events	nurseries and seed collection	and seed collectors have access to technical directives in each project selected site and beyond	Survey Materials	Media and Publishing Specialist FLR Specialist PTC Expert in LD and desertification
<u>Output 4.2.1</u> Guidelines and briefs developed on best practices and lessons learned on SFM, FLR and INRM in ASD	# of information materials	Scarce information on SFM, FLR and INRM	Increased availability of local and regional information on specific SFM, FLR and INRM practices	Project event with media to explain LD threats in ASD and project purposes 1 folder on the project	1 video about SFM and FLR 1 video about INRM First 16 radio spots	1 institutional video on the learning and action network Another 16 radio spots	1 NTFP information video 1 video on project results Another 16 radio spots	Folders Videos Spots Media information Publications	Specialist INSA Awareness-raising Specialist Media and Publishing Specialist

Outcomes and Outputs	Indicators	Baseline	Target	Milestones towards achieving outcome and output targets				Data Collection and Reporting	
				Year 1	Year 2	Year 3	Year 4	Means of verification	Responsible for data collection
Output 4.2.2 ASD academic community engaged against LD and desertification	# of publication # of booklets disseminated	Scientific publications on LD, desertification and drought out of print and not available	Publication and distribution of booklets and books through partnerships (PRONATEC ²⁶ , RENASEM ²⁷)	Analysis of state of the art 5,000 booklets printed	First 3 events with family farmers First 1,500 booklets delivered to educational institutions First 2 books with new editions	Another 3 events with family farmers Another 1,500 booklets delivered to educational institutions Another 2 books with new editions	Another 3 events with family farmers Another 2,000 booklets delivered to educational institutions Another book with new edition	Project reports Publications	Expert in LD and desertification M&E
Output 4.2.3 Increased awareness about sustainable forest management and Forest and Landscape Restoration in ASD	# of events to improve communication about SFM and FLR in ASD	Various materials published by projects, government and NGOs in ASD	8 events	1 seminar to update media instruments at ASD	1 systematization workshop for video production on project information for rural women and youth	1 radio program for each selected micro-region	1 final workshop Exchange among rural communicators from 3 micro-regions Seminar of innovators Regional event		

²⁶ National Program of Access to Technical Education and Employment

²⁷ Catholic Charismatic Association of Brazil

Outcomes & Outputs	Indicators	Baseline	Target	Milestones towards achieving outcome and output targets				Data Collection and Reporting	
				Year 1	Year 2	Year 3	Year 4	Means of verification	Responsible for data collection
Component 5									
Outcome 5.1 Synergy with complementary initiatives to promote sustainable management and restoration benefits at landscape level	# of initiatives with established collaboration	Poor synergy	Majority of relevant stakeholders interacting	Identification of existing and planned initiatives	Interaction with 10 key initiatives	Interaction with 10 key initiatives	Interaction with 10 key initiatives	Project progress reports PIRs	M&E expert PTC NPD
Output 5.1.1 Effective collaboration with complementary initiatives	# of work plans jointly formulated	NA	Full collaboration with 3 GEF projects (Sergipe, EMBRAPA, Rio Grande do Norte) and other related initiative in the Caatinga	3 annual work plans	3 annual work plans	3 annual work plans	3 annual work plans	Project progress reports PIRs	M&E Expert PTC NPD
Outcome 5.2 Project implement	Project delivery complies with FAO-GEF	NA	Full compliance	Project reports	Project reports	Project reports	Project reports	Project progress reports	M&E Expert PTC

Outcomes & Outputs	Indicators	Baseline	Target	Milestones towards achieving outcome and output targets				Data Collection and Reporting	
				Year 1	Year 2	Year 3	Year 4	Means of verification	Responsible for data collection
Component 5									
ed with results-based management and application of findings/lessons learned	reporting requirements							PIRs	FAO PTM NPD
<u>Output 5.2.1</u> Project monitoring and evaluation system operational providing information on progress in meeting project outcome and output targets	M&E System established and fully operational	NA	M&E operational	M&E established and fully operational Indicators chosen and added to annual work plan	Indicators are helpful to evaluate project progress reports	Indicators contribute to mid-term evaluation	M&E results contribute to final evaluation	Mid-term evaluation/ final evaluation reports	PTC FAO PTM NPD
<u>Output 5.2.2</u> Mid-term and final	Project results are tracked on an annual basis	NA	Project results known to institutions of ASD	National commission well informed about the	OEMAs fully informed and participating in project actions	ASD rural development institutions knowing	Technical assistance institutions using best	Final report	PTC FAO PTM

Outcomes & Outputs	Indicators	Baseline	Target	Milestones towards achieving outcome and output targets				Data Collection and Reporting	
				Year 1	Year 2	Year 3	Year 4	Means of verification	Responsible for data collection
Component 5									
evaluation conducted, project best practices and lessons learned published and disseminated	and disseminated			project		about project actions and purposes	practices in ASD Project publications distributed to rural development and educational institutions of ASD		NPD

APPENDIX 2 : WORK PLAN (RESULTS-BASED)

APPENDIX 2 – WORK PLAN (RESULTS-BASED)																			
Output	Activities	Responsible	Year 1				Year 2				Year 3				Year 4				
			Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
Component 1 - Promoting Integrated Natural Resource Management (INRM) in Production Landscapes																			
Output 1.1.1 INRM best practices identified, evaluated and up scaled at local and landscape levels	Activity 1.1.1.1 Inventory of best traditional and improved INRM practices	INSA																	
	Activity 1.1.1.2 Organization and implementation of a geo-referenced database of best practices	INSA																	
	Activity 1.1.1.3 Seminar to introduce INRM practices to ASD professionals dealing with credit, technical assistance and rural extension regarding natural resource management	INSA																	
	Activity 1.1.1.4 Publication and dissemination of organized data on line and printed	INSA																	
	Activity 1.1.1.5 Replication of best practices in selected project areas within the 904,142 ha	INSA																	
Output 1.1.2	Activity 1.1.2.1 Identification and evaluation of main NTFP supply chains in project areas using FAO's	UNILAB/ ASA/ SDR-BA																	

NTFP from INRM introduced in government programs/projects and local agro-industries	Market Analysis and Development methodology																		
	Activity 1.1.2.2 Identification of the potential for creating added value for NTFP supply chains	Project consultancy																	
	Activity 1.1.2.3 Strengthening local organization for the management of agro-industries	Project consultancy																	
	Activity 1.1.2.4 Identification and execution of marketing studies plans for development and strengthening of microenterprises based on sustainable production and marketing of identified NTFPs	Project consultancy																	
	Activity 1.1.2.5 Regional seminars on credit and finance (including agro-industrial/NTFPs production and markets)	Project consultancies																	
Output 1.1.3 Capacity for identification, evaluation and promotion of INRM systems strengthened at state-level departments and agencies	Activity 1.1.3.1 Natural resource management course for extension workers with the participation of public educational institutions	Federal University of Cariri																	
	Activity 1.1. 3.2 Training seminars on federal and state environmental legislation affecting natural resource management, including the new Forest Law	INSA/ DCD																	
Component 2 - Promoting Multiple-Use Forest Management																			
Output 2.1.1 Innovative small- and large-scale SFM practices identified	Activity 2.1.1.1 Seminars with project partners to design sustainability criteria for forest management plans	APNE																	

protocols at local level	Activity 2.1.3.3 Strengthen the Caatinga Forest Management Network with data generated in the monitoring of SFM activities in project areas	APNE																	
Component 3 - Forest and Landscape Restoration																			
Output 3.1.1 Smallholders and public nurseries in ASD legalized with improved native seed and seedling production	Activity 3.1.1.1 Working group to identify and update data on forest seed collectors in ASD	DCD/MMA																	
	Activity 3.1.1.2. Assessment of the 165 nurseries in ASD according to tree nurseries technical and registration standards	DCD/MMA																	
	Activity 3.1.1.3. Based on outcomes of activity 3.1.1.2., selection of 35 tree nurseries for support for registration and improvement of production practices	DCD/MMA																	
	Activity 3.1.1.4 Support for marketing forest seeds and seedlings through websites, information bulletins of seed production associations and participation in agricultural and industrial fairs	Project consultancies																	
Output 3.1.2 Seed collectors and nursery workers	Activity 3.1.2.1 Identification of agents for processing forest seeds and seedlings	Universities of Patos and Cariri and Pronatec																	

trained and registered in the National System of Seeds and Seedlings	Activity 3.1.2.2 Training for seed collectors to improve technical capacities and comply with official standards	Universities of Patos and Cariri and Pronatec																
	Activity 3.1.2.3 Installation of equipment for seed collectors	Universities of Patos and Cariri																
	Activity 3.1.2.4 Support for seed collection in order to comply with federal requirements	Universities of Patos and Cariri and Pronatec																
	Activity 3.1.2.5 Training for seed collectors and nursery personnel on legal issues required for professional regularization	Universities of Patos and Cariri and Pronatec																
Output 3.2.1	Activity 3.2.1.1 Selection of potential areas for corridors and connectivity	DCD/MMA																
Appropriate sites identified and work plans made for restoration and establishment of forest connectivity	Activity 3.2.1.2 Action plan designed together with government and CSO for restoration of degraded forest to constitute bio-corridors	DCD/MMA																
Output 3.2.2	Activity 3.2.2.1 Methodological proposal for sustainable production landscapes through local participatory projects	DCD/MMA																
Participatory projects for restoration of degraded lands and improvement of productive landscapes and land-use practices	Activity 3.2.2.2 Training in agroforestry systems for large landowners and family farmers in order to provide connectivity among the islands of biodiversity in project areas	DCD/MMA																

	Activity 3.2.2.3. Assessment of current initiatives carried out by rural extension and development institutions	DCD/MMA																
	Activity 3.2.2.4 Support to interested framers and producers in developing restoration projects for funding under Government and appropriate schemes	DCD/MMA																
Component 4 – Knowledge Management, Communication and Awareness-Raising																		
Output 4.1.1 Strengthened learning and action networks facilitating field exchanges in ASD	Activity 4.1.1.1 Identification of institutions, programs, projects and networks promoting actions against LD and desertification in ASD	DCD																
	Activity 4.1.1.2 Training for multiplier agents in partner institutions in ASD	DCD																
	Activity 4.1.1.3. Establishment of an on-line database network to be hosted at INSA for exchange of information , knowledge and projects relevant to ASD issues	INSA/consultancies																
Output 4.2.1 Guidelines and briefs developed on best practices and lessons learned on SFM and INRM in ASD	Activity 4.2.2.1 Promotion of events and exchanges for discussing technical regulations for SFM FLR and INRM (linked to activity 3.1.3.3).	Project consultancies																
	Activity 4.2.2.2 Transformation of best practices into technical guidelines for SFM	APNE																
Output 4.2.2	Activity 4.2.2.1 Inventory of relevant scientific publications on LD and desertification in ASD	INSA/ consultancy																

ASD academic community engaged against LD and desertification	Activity 4.2.2.2 Seminar for presentation of material collected in the inventory	INSA																	
	Activity 4.2.2.3 Organization, reprinting and distribution of selected materials	INSA/BNB																	
Output 4.2.3 Awareness about sustainable forest restoration in ASD	Activity 4.2.3.1 Media production according to project orientations in project selected sites	INSA																	
	Activity 4.2.3.2 Implementation of media production in the project selected sites	INSA																	
	Activity 4.2.3.3 Systematization of media production and presentation of results at two events (micro-regional and ASD regional level)	INSA																	

APPENDIX 3: RESULTS BASED BUDGET



Brazil budget
REDESER 25jan2016.

APPENDIX 3: RESULTS-BASED BUDGET

[Brazil budget REDESER.xls](#)

APPENDIX 4: RISK MATRIX

Risk statement	Impact	Likelihood ²⁸	Mitigation measures
<p>Environmental risks:</p> <p>Increased frequency of droughts and drastic reduction in rainfall.</p> <p>Sequence of climate change related events affect the target population.</p>	<p>Accelerated destruction of agricultural activities and production in the most vulnerable areas of the Caatinga.</p> <p>Disappearance of natural water sources and drying up of large surface water sources such as reservoirs and dams result in the loss of staple crops, death of livestock, increased wood extraction as a last resort for cash, increased migration to urban areas and closure of school activities.</p>	H	<p>The project will introduce best practices for conservation of soil moisture and water accumulation by installing underground dams and surface water collection systems and disseminating systems favoring the penetration of water under regional conditions soil structure.</p> <p>Other preventive or mitigating actions are planned to support small irrigation projects and diversification of initiatives of family farming for food security, including the distribution and production of traditional seeds with greater resilience to the effects of climate change, and the introduction of agroforestry and silvopastoral systems compatible with semiarid environments.</p> <p>The project will use forms of participatory planning to deal with climate uncertainty, supporting seminars for exchange of experience on appropriate practices for crops in semi-arid conditions.</p>
<p>Increased fragmentation of forest in the selected areas.</p> <p>Growing pollution of water resources due to unsustainable land and forest management practices.</p>	<p>Fragmentation of forests and pollution of water resources by pesticides results in significant biodiversity loss, causing damage to production processes in ASD.</p> <p>Disappearance of bees seriously affects pollination, the production of honey and extra</p>	ML	<p>The project will promote best sustainable land management practices and adoption of sustainable forest management. Regarding the maintenance of productive landscape mosaics, the project will contribute to the training of staff in OEMAs for implementing CAR and the PRA as one way to comply with the new Forest Code, ensuring compliance with requirements of APP and RL throughout landscapes.</p>

²⁸ Estimate of likelihood: High, Moderately High, Moderately Low, or Low, as per the FAO Project Cycle Guidelines.

Risk statement	Impact	Likelihood²⁸	Mitigation measures
	income for farmers, extractive and traditional peoples in the Caatinga, increasing levels of food and nutritional insecurity. There can also be loss of bird fauna due to deforestation.		
Increasing pressure from agribusiness resulting in growing clearing of forests in vulnerable transition areas	Increased land degradation and loss of biodiversity due to clearing of forests.	H	The project will expand actions supported by international cooperation for capacity building and institutional strengthening of OEMAs for implementation of CAR and PRA. The project will promote systematic actions of the staff of OEMAs for understanding adoption of SFM as an alternative to the removal of all vegetation for alternative land use.
Institutional/financial risk: Participating entities fail to meet financial commitments	Public funding is subject to budget cuts and the government resources available are not sufficient to carry out actions agreed upon between the project and government agencies in the ASD.	ML	<p>The project will ensure that co-financing is maintained through project governance bodies such as the National Committee to Combat Desertification, insisting on the need to keep international commitments. The project will maintain an ongoing dialogue with civil society through their organizations in order to ensure the fulfillment of commitments between the project and various partners.</p> <p>Participating institutions have signed co-financing letters for the project. These institutions are also members of the Project Steering Committee; this will help to ensure to a greater extent their commitment to the project. Under the PSC, issues related to co-financing contributions will be coordinated to ensure these commitments in the annual budgetary allocations of institutions and contributions, either in cash or in-kind, will be monitored.</p>

APPENDIX 5: DRAFT TERMS OF REFERENCE (TORS)¹

1. PROJECT TECHNICAL COORDINATOR & NATIONAL EXPERT IN SUSTAINABLE FOREST MANAGEMENT (TECHNICAL COORDINATOR OF COMPONENT 2)

Under the overall supervision of the FAO Representative in Brazil, the National Project Director (NPD) and the FAO Lead Technical Officer (LTO), and in close coordination with the Head of the Program Unit at FAO Brazil and the GEF Project Task Manager (PTM) in FAO Brazil, the Project Technical Coordinator (PTC) will be responsible for leading, supervising and coordinating all activities aimed at the successful implementation of the five REDESER components, budget execution, team management, and maintenance of institutional relationships with project partners. The PTC will be responsible for overall and annual planning, the preparation of contracts and agreements with organizations and consultants, technical supervision of the Project Execution Unit (PEU) members and advisers, and the daily management of the project.

Main responsibilities

- i. Direct the execution of the project's technical and administrative activities, in cooperation with the Project Component Coordinators (PCCs) of Components 1, 3, and 4 under the LTO technical supervision at the FAO Regional Office and FAO Headquarters in Rome.
- ii. Coordinate and participate in the start-up workshop, and the planning workshops with local stakeholders and project partners for the preparation of the Annual Work Plan(s) and Budget(s) (AWP/B).
- iii. Provide technical assistance and guide project partners in the implementation of activities related to the project.
- iv. Periodically conduct supervisory visits in the field and advise the technical personnel of the project partners.
- v. Permanent coordination and communication with project partners' personnel in charge of project activities.
- vi. Monitor risks according to the risk matrix (see APPENDIX 4) and ensure the implementation of mitigation measures.
- vii. Ensure that the SFM approach is applied throughout the implementation of the project components 2, 3 and 4.
- viii. Prepare the Project Progress Reports (PPRs) and the Terminal Report (TR) in coordination with the project team and submit it for the consideration and review of the LTO, the Project Steering Committee (PSC), and the Project Task Force (FAO).

¹ Consultants' Terms of Reference will be revised and validated during the project's inception.

- ix. Prepare a draft version of Annual Project Implementation Review(s) (PIR) to be finalized by the LTO, and cleared by the PSC and the FAO Representative in Brazil, and submitted to the FAO/GEF Coordination Unit.
- x. Advise project partners in the preparation of reports on in-kind and in-cash co-financing provided by co-financiers and other partners that were not foreseen in the Project Document.
- xi. In consultation with the PSC, the FAO Evaluation Office, the LTO and the FAO-GEF Coordination Unit, assist in organizing the mid-term and final evaluations.
- xii. Coordinate the review and approval of the terms of reference and technical specifications, in order to proceed to the corresponding contracts.
- xiii. Coordinate work plans with the consultants hired to implement the project.
- xiv. Organize and serve as Secretary for the PSC and Project Management Unit (PMU) meetings.
- xv. Make the necessary arrangements to facilitate—through agreements and interagency partnerships with local or national government bodies, as well as the private sector—the development of the project and the achievement of its outcomes.
- xvi. Conduct, in cooperation with the PCCs, inventories of the contracts agreed to for the implementation of project activities.
- xvii. Ensure technical compliance with project objective, outcomes and outputs, and follow the monitoring and evaluation plan prepared by the M&E Expert.
- xviii. Coordinate the implementation of the project's communication strategy and the institutional strengthening activities.

Required professional profile

- Professional with an advanced degree in the agricultural, forestry or environmental disciplines.
- At least 8 years of experience in the management of rural development projects with a focus on the sustainable management of natural resources, sustainable forest management, territorial development, and work with rural communities.
- Minimum of three years' experience in coordinating development projects or components financed by international organizations.
- Experience in the coordination of multidisciplinary teams.
- Knowledge and experience on results-based management, development and implementation of budgets, preparation of technical and financial reports, and monitoring and evaluation.
- Ability to prepare concise reports according to United Nations standards.
- Knowledge and use of participatory planning tools.
- Extensive knowledge of the socioeconomic reality of Brazilian rural and indigenous areas and the problems of gender equality.
- Proven ability to lead a team and capacity for teamwork.
- Excellent oral and written skills.
- Experience managing GEF projects desired.

- Experience in implementation and evaluation of FAO projects desired.

Languages: Advanced knowledge of Portuguese and English. Knowledge of Spanish desirable.

Duration: 48 months.

Place of Work: INSA (Campina Grande, PB)

2. INTEGRATED NATURAL RESOURCES MANAGEMENT (INRM) SPECIALIST

Under overall supervision of the FAO Representative in Brazil, the National Project Director (NPD) and the FAO Lead Technical Officer (LTO), and the direct supervision of the Project Technical Coordinator, the INRM Specialist Awareness-Raising and Capacity Development Specialist will be responsible for the implementation of Component 1 of the project. In particular, he/she will develop the following activities:

Main responsibilities and functions

1) Contribute to the development of key documents and an information system that is key to the project's management and promotion (Component 1)

- Provide necessary information and data for the integration of the annual work plans and budgets (AWP/B), co-financing budgets, and quarterly schedules for the project in the micro-regions (MRs).
- Prepare and monitor the AWP/B at MR level.
- Contribute to the implementation of the monitoring and evaluation (M&E) system for the project, including the preparation of the six-monthly Project Progress Report (PPRs) and the Annual Project Implementation Review(s) (PIR).
- Contribute to the project's communications strategy.

2) Coordinate the implementation and cofinancing of the project Component 1

- Ensure proper implementation of activities AWP/Bs for Component 1.
- Monitor and assess the performance of the activities and expected results of the Local Implementing Agencies (LIAs), according to the Letters of Agreement signed with FAO.
- Promote communication channels and transparency of the information generated by the project with government institutions, municipal and agricultural authorities, producer organizations, and the LIAs.
- Coordinate field activities to deliver expected outcomes and outputs of Component 1 as described in Appendix 1 of the Project Document;
- Coordinate actions and supervise the delivery of the Local Implementing Agencies responsible for field activities under Component 1;
- Support the PTC in preparing the Terms of Reference for the consultancy on Non-Timber Forest Products (NTFP) Value Chain and participate in the supervision of the development of the study;
- In coordination with the Awareness-Raising and Capacity Development Specialist, prepare information and training materials for awareness-raising and training of the managerial and technical staff of the relevant local institutions and key stakeholders involved in landscape policy and management, including environmental authorities of the federal states of

- North Eastern Brazil, to develop their capacities for mainstreaming INRM criteria in accordance with the MMA's and FAO's guidelines
- viii. Support the organization and implementation of training workshops on INRM and FLR/INRM integration, in coordination with the Awareness-Raising and Capacity Development Specialist;
- ix. Provide technical inputs on the risks that may arise during project implementation and propose the mitigation measures that may be needed to reduce their impacts;
- x. Collaborate with the Project Technical Coordinator, the Project Component Coordinators of components 2 and 3, and the M&E Expert as required in the field of his/her competencies.

Required qualifications:

University degree in Geography specializing in Land Use Planning, or other related fields.

Knowledge and skills:

Knowledge and experience in INRM and preparation of land use and development plans at landscape or protected area level. Proven capacity to conduct fieldwork and ability to work in teams and establish working relationships with central and local government institutions and civil society organizations.

Experience: At least 5 years of professional experience in the field of land use planning and management. Experience in training processes in the domains related to INRM. Prior working experiences in international cooperation projects. Preferable to have working experience in the Brazilian Northeast. Excellent oral and written communication skills.

Languages: Portuguese and some understanding of English and Spanish.

Duration: 48 months.

Place of Work: INSA (Campina Grande, PB)

3. MONITORING AND EVALUATION EXPERT

Under the overall supervision of the FAO Representative in Brazil, the National Project Director (NPD) and the FAO Lead Technical Officer (LTO), and the direct supervision of the Project Technical Coordinator, the Monitoring and Evaluation Expert will advise the Project Execution Unit (PEU) on the design and establishment of a monitoring and evaluation (M&E) system for the project to record progress in meeting goals, assessing results, and facilitating the systematization of experiences.

Main responsibilities

- Design an M&E system taking into account the project Results Framework, the GEF Tracking Tools, and the outcomes, outputs and activities set forth in the Work Plan (Appendix 2 Project Document), and the Annual Work Plan(s) and Budget(s) (AWP/Bs)
- Generate monitoring tools that can be used in each micro-region and consolidated nationwide.

- Develop proposals that consider participatory evaluation in each micro-region as a method to help strengthen the capabilities of local actors in systematization and planning and to include young people and women.

Functions and activities

- i. Review the project Results Framework and make recommendations to adapt it to the needs of the project and the micro regions (MRs).
- ii. Complete the evaluations made in the preparatory phase of the project to ensure that baseline data for the project is taken into account.
- iii. Based on the project Results Framework, the Work Plan, and the AWP/B for Project Year 1 (PY1), create a tracking system for the physical progress of the project that can also be related to the costs of the various components.
- iv. Based on the Results Framework of the project, create a system to assess project indicators and tools for recording information that the Local Implementing Agencies (LIAs) and the Project Component Coordinators (PCCs) should use in each MR.
- v. Develop the structure of semiannual Project Progress Reports (PPRs) that the PCCs and the Project Technical Coordinator should use.
- vi. Design methodologies and tools to be used for the development of participatory evaluation exercises to be carried out in each MR and other stakeholders.
- vii. Design training processes aimed at PCCs and the LIAs to develop M&E system, including the model of participatory evaluation.
- viii. Make recommendations so that the M&E system and its reports can be distributed easily, at the national, regional and MR levels.
- ix. Report to the Project Technical Coordinator of the PEU, making recommendations on the development of the M&E system.

Required professional profile

- Professional with higher education in institutional development, economics, planning or related subjects.
- Minimum of 8 years' experience in collaborating with research centers, government institutions, or rural development projects for the implementation of M&E systems.
- Experience in the implementation of methodologies for assessing gender equity, the participation of indigenous peoples, capacity building, and the sustainable management of natural resources, among others.
- Knowledge and use of computer systems for the development of M&E tools that can be shared by several users.

Duration: 6 months

Location: Brasilia and Campina Grande, PB.

Language: Portuguese and English

4. FOREST RESTORATION SPECIALIST (COORDINATOR OF COMPONENT 3)

Duties and responsibilities: Under overall supervision of the FAO Representative in Brazil, the National Project Director (NPD) and the FAO Lead Technical Officer (LTO), and the direct supervision of the Project Technical Coordinator, the Forest Restoration

Specialist will be responsible for the implementation of Component 3 of the project. In particular, he/she will develop the following activities:

Main responsibilities and functions

1) Contribute to the development of key documents and an information system that is key to the project's management and promotion (Component 3)

- i. Provide necessary information and data for the integration of the annual work plans and budgets (AWP/B), co-financing budgets, and quarterly schedules for the project in the micro-regions (MRs).
- ii. Prepare and monitor the AWP/B at MR level.
- iii. Contribute to the implementation of the monitoring and evaluation (M&E) system for the project, including the preparation of the six-monthly Project Progress Report (PPRs) and the Annual Project Implementation Review(s) (PIR).
- iv. Contribute to the project's communications strategy.

2) Coordinate the implementation and cofinancing of the project Component 3

- i. Ensure proper implementation of activities AWP/Bs for Component 3.
- ii. Monitor and assess the performance of the activities and expected results of the Local Implementing Agencies (LIAs), according to the Letters of Agreement signed with FAO.
- iii. Promote communication channels and transparency of the information generated by the project with government institutions, municipal and agricultural authorities, producer organizations, and the LIAs. Coordinate field activities to deliver expected outcomes and outputs of Component 3 as described in Appendix 1 of the Project Document;
- iv. Coordinate actions and supervise the delivery of the Local Implementing Agencies responsible for field activities under Component 3:
- v. Design field surveys and record all relevant initiatives of recollection, storage and distribution/marketing of forest species (seeds/seedlings) in the region of the project, in particular in the intervention areas;
- vi. Support the register of the producers in the National Network of Seed stocks (RENAVAM)
- vii. Disseminate suitable treatment and storage techniques of forest seeds
- viii. Rescue local seed assets in Caatinga region;
- ix. Elaborate a training program for nursery technicians promoting suitable storage methods and facilities;
- x. Elaborate and dissemination of training/extension materials over nurseries and forest seed stocks;
- xi. Contribute to the planning strategy aimed at connecting preservation areas;
- xii. Collaborate with the Project Technical Coordinator, the Project Component Coordinators of components 1 and 4, and the M&E Expert as required in the field of his/her competencies.

3) Project administration

- i. According to the formats established in the MOP, report financial and administrative information generated by the implementation of the Project Component 3 in coordination with the Project Technical Coordination.

- ii. Ensure that the LIAs and others hired by the project in the MRs adequately prepare reports that are delivered on time to the Project Execution Unit (PEU) and the Project Management Unit (PMU).
- iii. Contribute to obtaining financial information regarding investment and execution of financing obtained from the co-financiers detailed in the 1st page of the Project Document, according to the work plans in Component 3.

Required qualifications:

University degree in Forest Engineering or related discipline. Master in Forest Restoration in semi-arid environments is desirable.

Knowledge and skills:

- Proven capacities in forest management and restoration in semi-arid areas, or areas susceptible to desertification.
- Proven skills in forest nursery design and management
- Capacity in knowledge management and extension.

Experience: At least 5 years' working experience in projects/activities related to forest and landscape restoration.

Languages: Portuguese and some understanding of English and Spanish.

Desirable qualifications:

- Prior working experiences in international cooperation projects;
- Prior collaboration in forest research or technology with INSA

Duration: 48 months.

Place of Work: INSA (Campina Grande, PB)

5. AWARENESS-RAISING AND CAPACITY DEVELOPMENT SPECIALIST (COORDINATOR OF COMPONENT 4)

Duties and responsibilities:

Under overall supervision of the FAO Representative in Brazil, the National Project Director (NPD) and the FAO Lead Technical Officer (LTO), and the direct supervision of the Project Technical Coordinator, and in close coordination with the Communication Office of Ministry of Environment (ASCOM) and with INSA Communication Office, the Awareness-Raising and Capacity Development Specialist will be responsible for the implementation of Component 4 of the project. In particular, he/she will develop the following activities:

Main responsibilities and functions

3) Contribute to the development of key documents and an information system that is key to the project's management and promotion (Component 4)

- v. Provide necessary information and data for the integration of the annual work plans and budgets (AWP/B), co-financing budgets, and quarterly schedules for the project in the micro-regions (MRs).
- vi. Prepare and monitor the AWP/B at MR level.

- vii. Contribute to the implementation of the monitoring and evaluation (M&E) system for the project, including the preparation of the six-monthly Project Progress Report (PPRs) and the Annual Project Implementation Review(s) (PIR).
 - viii. Contribute to the project's communications strategy.
- 4) Coordinate the implementation and cofinancing of the project Component 4**
- xi. Ensure proper implementation of activities AWP/Bs for Component 4.
 - xii. Monitor and assess the performance of the activities and expected results of the Local Implementing Agencies (LIAs), according to the Letters of Agreement signed with FAO.
 - xiii. Promote communication channels and transparency of the information generated by the project with government institutions, municipal and agricultural authorities, producer organizations, and the LIAs.
 - xiv. Coordinate field activities to deliver expected outcomes and outputs of Component 4 as described in Appendix 1 of the Project Document;
 - xv. Coordinate actions and supervise the delivery of the Local Implementing Agencies responsible for field activities under Component 4:
 - xvi. Support the Project Technical Coordinator and the other Project Component Coordinators in all capacity development related activities, including design of proper materials, capacity assessment tools, surveys and dissemination, with a gender-sensitive approach.
 - xvii. Based on the assessment raised during full project preparation, build a matrix of needs and priorities the current capacities and further needs in terms of awareness-raising and communication strategy for promoting INRM, SFM and restoration and methods to reach different stakeholder target groups
 - xviii. Develop an Integrated Natural Resources Management (INRM), SFM and restoration awareness-raising and communication programme to be supported by the project. The programme should include: (i) awareness-raising and communication methods and means targeted to different stakeholder groups; (ii) activities and their costs by co-financier; (iii) roles and responsibilities of institutions involved in the implementation of the programme; and (iv) targets and baseline for the outputs and outcomes of the implementation of the programme.
 - xix. Elaborate communication materials such as pamphlets, folders, receiving technical inputs from the professionals of the respective areas at Project Management Unit (PMU), Ministry of Environment (MMA) and partner institutions, and collaborate to the elaboration of technical manuals giving contributions related to language and style suitable for the target audience/trainees.
 - xx. Promote awareness campaigns directed to policy-makers and key officers and technicians in the state governments and their agencies aimed at enhancing the concept of SLM, SFM and forest restoration in the Caatinga Bioma.
 - xxi. Collaborate with the Project Technical Coordinator, the Project Component Coordinators of components 1 and 3, and the M&E Expert as required in the field of his/her competencies.

Required qualifications:

University degree in Journalism, Social Sciences, and/or Communication. Gender studies are an asset.

Knowledge and skills:

Communication with specialization in communication and awareness-raising on environmental issues.

Experience: At least 5 working experience in projects/activities related to capacity-development in the rural sector, communication and dissemination activities, design of gender-sensitive activities and indicators, surveys and monitoring of socio-cultural variables. Prior working experiences in international cooperation projects.

Languages: Portuguese and some understanding of English and Spanish.

Duration: 48 months.

Place of Work: INSA (Campina Grande, PB)

6. ADMINISTRATIVE AND OPERATIONS OFFICER

Under the general supervision of the FAO Representative in Brazil (Budget Holder) and the GEF Project Task Manager–FAO Brazil, and in close collaboration with the project executing partners, the Administrative and Operations Officer will take the operational responsibility for timely delivery of the project outcomes and outputs. In particular, he/she will perform the following main tasks:

- Ensure smooth and timely implementation of project activities in support of the results-based work plan, through operational and administrative procedures according to FAO rules and standards;
- Coordinate the project operational arrangements through contractual agreements with key project partners;
- Arrange the operations needed for signing and executing Letters of Agreement (LoA) and Government Cooperation Programme (GCP) agreement with relevant project partners;
- Maintain inter-departmental linkages with FAO units for donor liaison, Finance, Human Resources, and other units as required;
- Day-to-day manage the project budget, including the monitoring of cash availability, budget preparation and budget revisions to be reviewed by the Project Technical Coordinator and the PTM-FAO Brazil;
- Ensure the accurate recording of all data relevant for operational, financial and results-based monitoring;
- Ensure that relevant reports on expenditures, forecasts, progress against work plans, project closure, are prepared and submitted in accordance with FAO and GEF defined procedures and reporting formats, schedules and communications channels, as required;
- Execute accurate and timely actions on all operational requirements for personnel-related matters, equipment and material procurement, and field disbursements;

- Participate and represent the project in collaborative meetings with project partners and the Project Steering Committee, as required;
- Undertake missions to monitor the outputs-based budget, and to resolve outstanding operational problems, as appropriate;
- Be responsible for results achieved within her/his area of work and ensure issues affecting project delivery and success are brought to the attention of higher level authorities through the BH in a timely manner,
- In consultation with the FAO Evaluation Office and the FAO Project Task Force, support the organization of the mid-term and final evaluations, and provide inputs regarding project budgetary matters;
- Undertake any other duties as required.

Minimal requirements:

- University Degree in Economics, Business Administration, or related fields.
- At least five years' experience in project operation and management related to natural resources management, including field experience in developing countries.
- Proven capacity to work and establish working relationships with government and non-government representatives.
- Knowledge of FAO's project management systems.

Location: Brasilia

Duration: 48 months

Language: Portuguese and English

APPENDIX 6: BIBLIOGRAPHY

The following list includes the references to literature that was consulted and is most directly pertinent to the project design and implementation.

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APPENDIX 7: ENVIRONMENTAL AND SOCIAL REVIEW FORM



Environmental and
Social Review Form.

APPENDIX 8: THREATENED SPECIES OF FLORA IN THE CAATINGA

The threatened species of flora in the Caatinga according to the list issued by the Ministry of Environment (MMA) in Normative Instruction 6 of September 23, 2008, are:

1. Amaranthaceae *Gomphrena chrestoides* C.C.Townsend BA Caatinga
2. Anacardiaceae *Myracrodruon urundeuva* (Aroeira-do-sertão) Engl. BA, DF, GO, MA, MG, MS, MT, SP Cerrado / Caatinga
3. Anacardiaceae *Schinopsis brasiliensis* Engl. BA, CE, DF, GO, MA, MG, MS, PI, TO Cerrado / Caatinga
4. Apocynaceae *Blepharodon hirsutum* Goyder BA Caatinga
5. Apocynaceae *Cynanchum morrenioides* Goyder BA Cerrado / Caatinga
6. Bignoniaceae *Jacaranda rugosa* A.H.Gentry PE Caatinga
7. Bignoniaceae *Tabebuia selachidentata* A.H.Gentry BA Caatinga
8. Bromeliaceae *Aechmea carioca* L.B.Sm BA Caatinga / Mata Atlântica
9. Bromeliaceae *Aechmea eurycorymbus* Harms PA, PE Caatinga / Mata Atlântica
10. Bromeliaceae *Orthophytum amoenum* (Ule) L.B.Sm. BA Caatinga
11. Cactaceae *Brasilicereus markgrafii* Backeb. & Voll MG Caatinga / Cerrado
12. Cactaceae *Cipocereus pusilliflorus* (F.Ritter) Zappi & N.P.Taylor MG Caatinga / Cerrado
13. Cactaceae *Coleocephalocereus purpureus* (Buining & Brederoo) F.Ritter MG Caatinga
14. Cactaceae *Espositoopsis dybowskii* (Rol.-Goss.) Buxb. BA Caatinga
15. Cactaceae *Facheiroa cephaliomelana ssp estevesii* (P.J. Braun) N. P. Taylor & Zappi BA Caatinga
16. Cactaceae *Melocactus azureus* Buining & Brederoo BA Caatinga
17. Cactaceae *Melocactus deinacanthus* Buining & Brederoo BA Caatinga
18. Cactaceae *Melocactus glaucescens* Buining & Brederoo BA Caatinga
19. Cactaceae *Melocactus pachyacanthus* Buining & Brederoo BA Caatinga
20. Cactaceae *Micranthocereus auriazureus* Buining & Brederoo MG Caatinga / Cerrado
21. Cactaceae *Micranthocereus polyanthus* (Werderm.) Backeb. BA Caatinga
22. Cactaceae *Micranthocereus streckeri* Van Heek & Van Crieke BA Caatinga
23. Cactaceae *Pilosocereus azulensis* N. P. Taylor & Zappi MG Caatinga
24. Cactaceae *Tacinga braunii* Esteves MG Caatinga
25. Cyperaceae *Rhynchospora warmingii* Boeck. BA Caatinga
26. Eriocaulaceae *Syngonanthus bahiensis* Moldenke BA Caatinga
27. Eriocaulaceae *Syngonanthus harleyii* Moldenke BA Caatinga
28. Erythroxylaceae *Erythroxylum bezerrae* (Pirunga, maçarenga) Plowman CE, PI Caatinga
29. Erythroxylaceae *Erythroxylum pauferrense* (Guarda-orvalho, pau-crioulo) Plowman PB Caatinga
30. Erythroxylaceae *Erythroxylum tianguanum* Plowman CE Caatinga
31. Isoetaceae *Isoetes luetzelburgii* U.Weber PA, PB Caatinga
32. Lamiaceae *Hyptis carvalhoi* Harley BA Caatinga
33. Lamiaceae *Hyptis pinheiroi* Harley BA Caatinga
34. Lamiaceae *Hyptis simulans* Epling CE, MG, PE Caatinga

35. Orchidaceae *Cattleya labiata* (Catlêia, parasita-roxa) Lindl. AL, CE, PB, PE, SE
Caatinga / Mata Atlântica
36. Orchidaceae *Cattleya tenuis* M.A.Campacci & P.L.Vedovello BA Caatinga
37. Orchidaceae *Phragmipedium lindleyanum* (Sapatinho) (R.H.Schomb. ex Lindl.)
Rolfe AL, BA, PE Caatinga / Mata Atlântica
38. Orchidaceae *Thelyschista ghillanyi* (Pabst) Garay BA Caatinga
39. Ricciaceae *Riccia ridleii* A.Gepp PE Caatinga
40. Verbenaceae *Lippia bromleyana* Moldenke BA Caatinga
41. Violaceae *Hybanthus albus* (A.St.-Hil.) Baill. BA, MG Caatinga
42. Xyridaceae *Xyris almae* Kral & Wand. BA Caatinga
43. Xyridaceae *Xyris morii* Kral & L.B.Sm. BA Caatinga

It can be seen that the most numerous threatened flora species are the cacti. The knowledge base is notoriously incomplete, as is made clear in the continuation of the MMA list, about species with insufficient knowledge. It seems that research has been concentrated in the state of Bahia.

Sampaio (1995) reports that among 38 published studies on the Caatinga, 339 woody species were found, belonging to 161 genera and 48 families (Rodal, Sampaio, Pereira 1988). The families with most species or subspecies were *Caesalpinoideae*, *Mimosoideae*, *Euphorbiaceae*, *Papilionoideae* and *Cactaceae*, with 45, 43, 32, 30 and 14 species, respectively, and the main genera were *Cassia*, *Mimosa* and *Pithecellobium* (14, 10 and 9 species, respectively). There is great variation by location, dryness and soil types. This suggests that fragmentation is leading to isolation and that connectivity among fragments is important.

Amorim et al. (2009) studied ten woody species (*Capparis flexuosa*, *Erythroxylum pungens*, *Erythroxylum pungens*, *Aspidosperma pyrifolium*, *Tabebuia impetiginosa*, *Mimosa acutistipula*, *Amburana cearensis*, *Anadenanthera colubrina*, *Pithecellobium foliolosum* and *Tabebuia impetiginosa*) and found that dryness affected flowering and fruiting. This suggests that increasing dryness and drought due to climate change may hinder reproduction of tree species, as well as the fauna which depend on their flowers and fruits and disperse their pollen and the seeds.

APPENDIX 9: MAPS

Figure 1. Project Intervention Areas

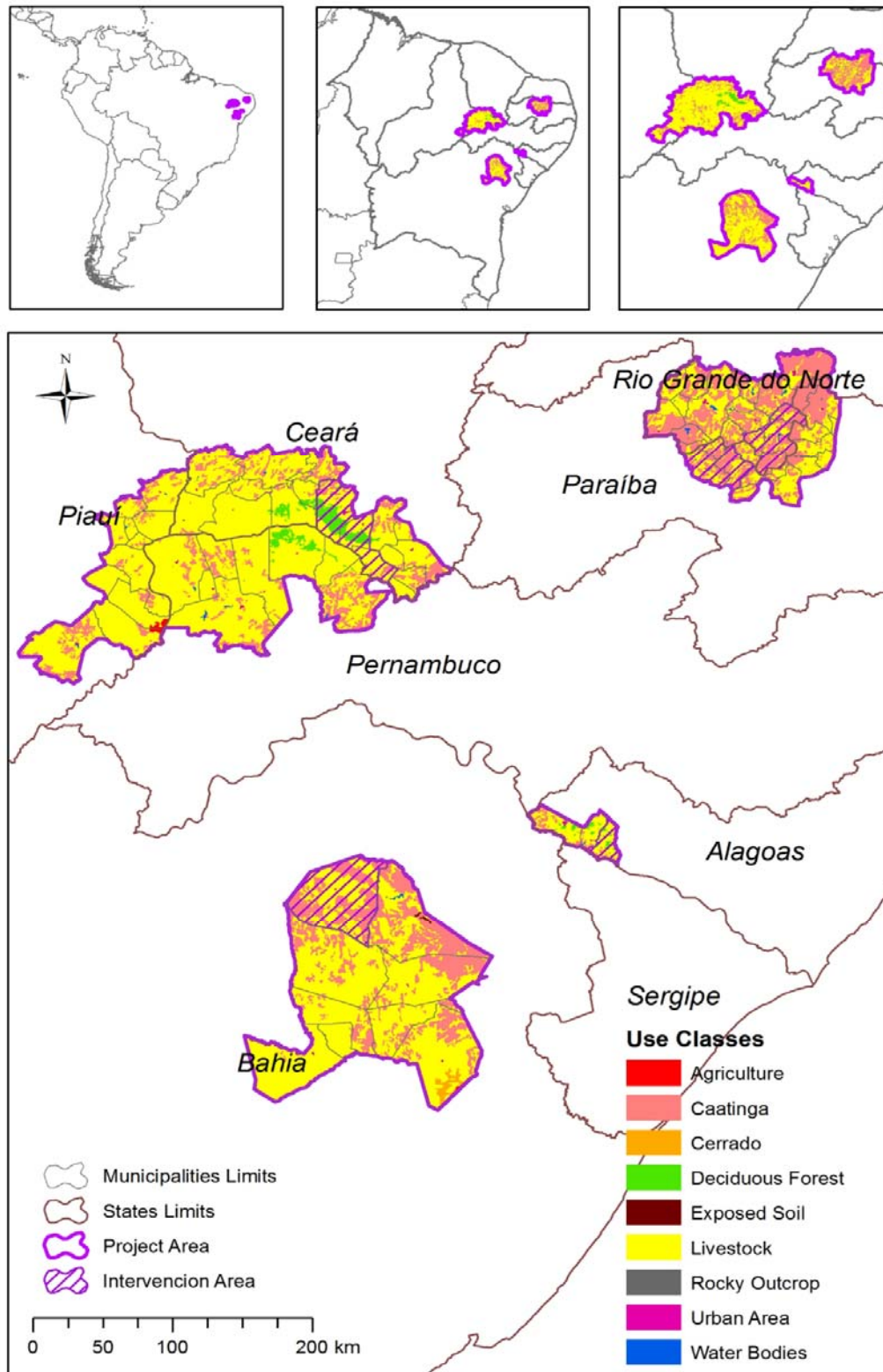


Figure 2. Project Intervention Areas (Municipality of Chapada do Araripe)

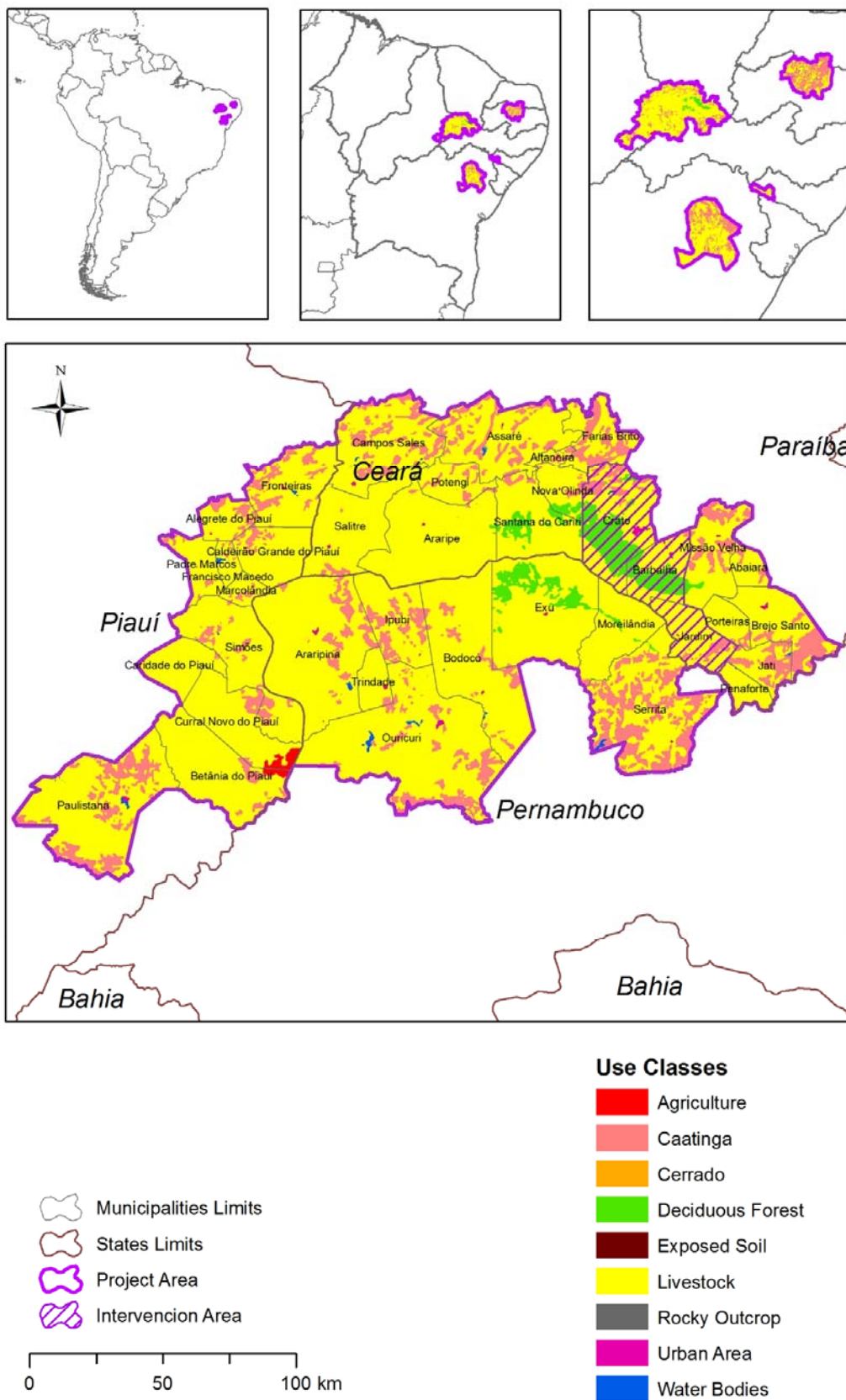


Figure 3. Project Intervention Areas (Municipalities in the Uauá region)

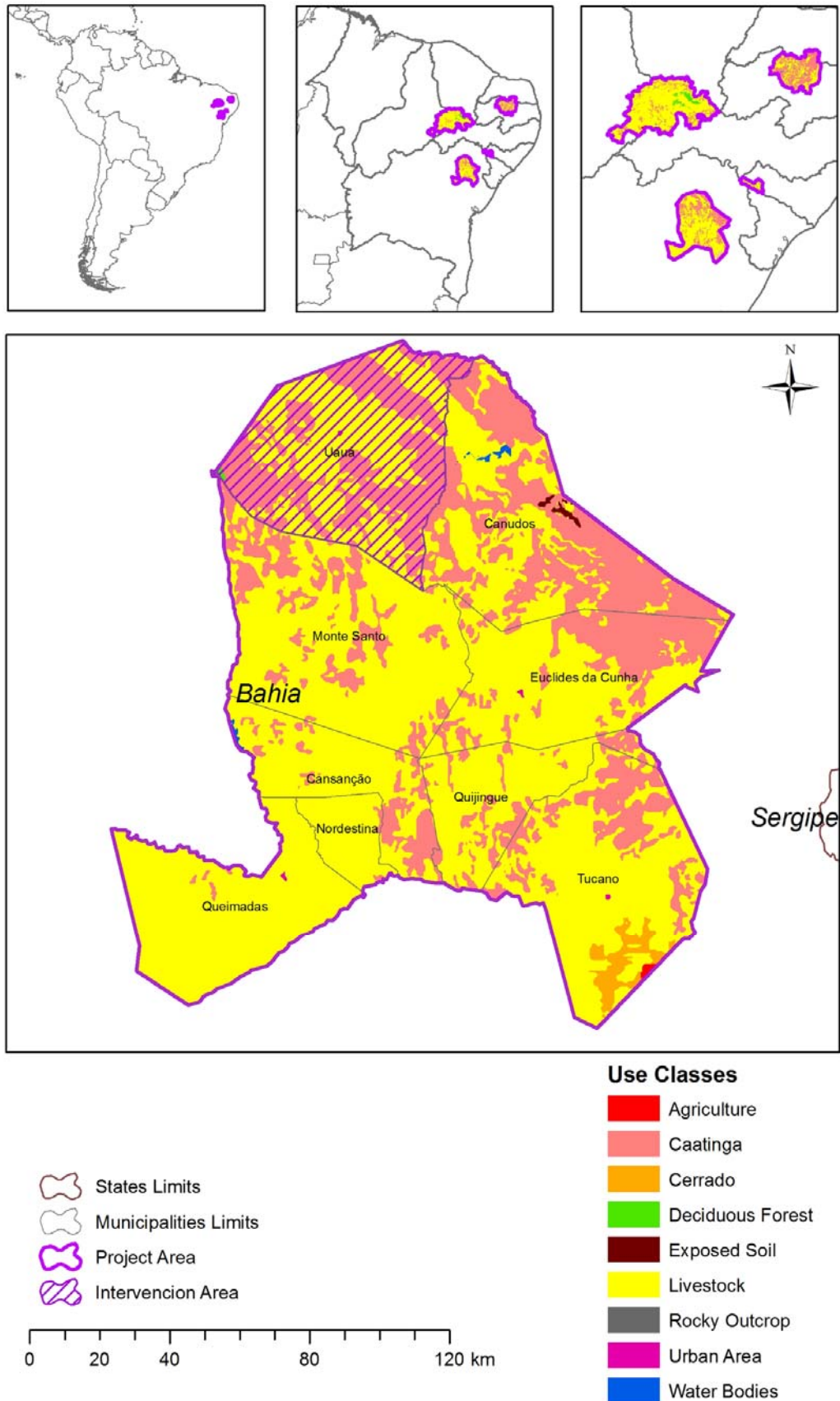


Figure 4. Project Intervention Areas (Municipalities of Seridó region)

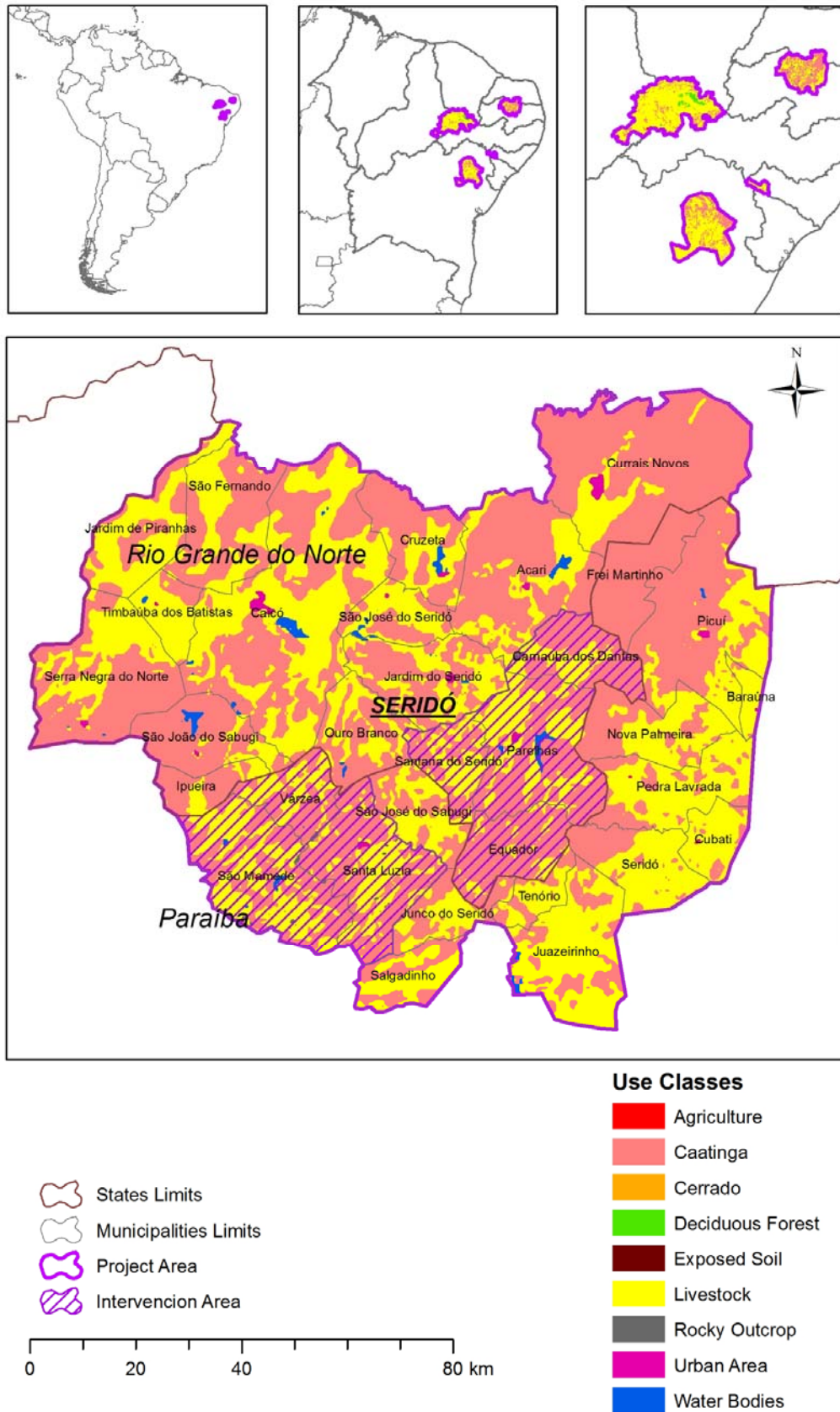


Figure 5. Project Intervention Areas (Municipalities of the Xingó region)

